Industrial Hydraulic Pumps T7/T67/T6

Denison Vane Technology, fixed displacement

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker

ENGINEERING YOUR SUCCESS.

CHARACTERISTICS

These vane pumps have been specially designed for high/low circuits. The combination of different cartridges in double and triple pumps allows low flow at high pressure (300 bar max.) and high flow at lower pressure. This is a clever way to optimize your circuit design.
This pump feature will also allow a very fast pressure cycle change with a very precise flow repeatability.

GREATER FLOW

Size A : 5,8 to 40,0 ml/rev.
Size B : 5,8 to 50,0 ml/rev.
Size C : 10,8 to 100,0 ml/rev.
Size D : 44,0 to 158,0 ml/rev.
Size E : 132,3 to 268,7 ml/rev.

HIGHER PRESSURE

A : up to 300 bar max.
B : up to 320 bar max. (300 bar for multiple pump).
C : up to 275 bar max.
D : up to 280 bar max. (250 bar for multiple pump).
E : up to 240 bar max.

WIDE SPEED RANGE

Industrial pumps : Min. : 600 RPM - Max. up to 3600 RPM

BETTER EFFICIENCY

Increases productivity, reduces heating and reduces operation costs.

LOW NOISE LEVELS

Increases operator safety and eases machines acceptances.

MOUNTING FLEXIBILITY

Single pumps : 4 different positions.
Double pumps : 32 different positions.
Triple pumps : 128 different positions.

CARTRIDGE DESIGN

Provides for drop-in assemblies. They permit easy conversion and service.
A, B and D cartridges : bi-directional technology.
C and E cartridges : uni-directional technology.

WIDE RANGE OF ACCEPTABLE VISCOSITIES

Viscosities from 860 to 10 cSt permit colder starts and hotter running. The balanced design compensates for wear and temperature changes. At high viscosity or cold temperature, the rotor to side plates gap is well lubricated and improves mechanical efficiency.

FIRE RESISTANT FLUIDS AND BIODEGRADABLE FLUIDS

Phosphate esters, organic esters, chlorinated hydrocarbons, water glycols, rapeseed may be pumped at high pressures and with long service life by these pumps.

GENERAL APPLICATIONS INSTRUCTIONS

1. Check speed range, pressure, temperature, fluid quality, fluid viscosity and pump rotation.
2. Check inlet conditions of the pump, if it can accept the application requirements.
3. Check the type of shaft : if it will support the operating torque.
4. Check the coupling must be chosen to minimize pump shaft load (weight, misalignment).
5. Filtration : must be adequate for the lowest contamination level.
6. Check the environment of the pump : as to avoid noise reflection, pollution and shocks.

Model of pump	Series	Theoretical Displacement Vi	Minimum Speed	Maximum Speed [3]		Maximum Pressure					
				HF-0, HF-1 HF-2	HF-3, HF-4 HF-5	HF-0, HF-2		HF-1, HF-4, HF-5		HF-3	
						Int.	Cont.	Int.	Cont.	Int.	Cont.
		ml/rev.	RPM	RPM	RPM	bar	bar	bar	bar	bar	bar
T7**A**S[2]	**B06**	5,8	600	3600	1800	300	275	240	210	175	140
	B10	9,8									
	B11	11,0									
	B13	12,8									
	B17	17.2									
	B20	19,8									
	B22	22,5									
	B25	24,9		3000		275	240				
T7**A**SW[2]	**B26**	26,0	600	3600	1800	300	275	240	210	175	140
	B28	28,0									
	B30	30,0									
	B32	31,8									
	B34	34,0		3000		280	240				
	B36	36,0									
	B40	40,0									
T7**B** T7**B**S	**B02**	5,8	600	3600	1800	320[1]	290	240	210	175	140
	B03	9,8									
	B04	12,8									
	B05	15,9									
	B06	19,8									
	B07	22,5									
	B08	24,9									
	B09	28,0									
	B10	31,8									
	B11	35,0		3000		300	275				
	B12	41,0									
	B14	45,0									
	B15	50,0				280	240				
T6**C**	**003**	10,8	600	2800	1800	275	240	210	175	175	140
	005	17,2									
	006	21,3									
	008	26,4									
	010	34,1									
	012	37,1									
	014	46,0									
	017	58,3									
	020	63,8									
	022	70,3									
	025	79,3		2500		210	160		160		
	028	88,8									
	031	100,0									

HF-0, HF-2 = Antiwear Petroleum Base - HF-1 = Non Antiwear Petroleum Base - HF-3 = Water in oil Invert Emulsions
HF-4 = Water Glycols Solutions - HF-5 = Synthetic Fluids

[1] Please consult Parker for application over 300 bar.
[2] Please be careful as these cartridge designation are now in ml/rev. (example : B22 = 22,5 ml/rev.)
[3] Please be sure that the inlet velocity is under 1,9 m/sec. (see page 12, start-up & check-up).

For further information, or if the performance characteristics outlined here above do not meet your particular requirements, please consult your local Parker office.

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Model of pump	Series	Theoretical Displacement Vi	Minimum Speed	Maximum Speed [3]		Maximum Pressure					
				HF-0, HF-1 HF-2	HF-3, HF-4 HF-5	HF-0, HF-2		HF-1, HF-4, HF-5		HF-3	
						Int.	Cont.	Int.	Cont.	Int.	Cont.
		ml/rev.	RPM	RPM	RPM	bar	bar	bar	bar	bar	bar
T7**D** T7**D**S	**B14**	44,0	600	3000	1800	300	250	240	210	175	140
	B17	55,0									
	B20	66,0									
	B22	70,3									
	B24	81,1									
	B28	90,0									
	B31	99,2									
	B35	113,4		2800		280					
	B38	120,6									
	B42	137,5		2500		260	230				
	045[1]	145,7		2200		240	210	210	175		
	050[1]	158,0				210	160		160		
T7**E** [2] T7**E**S	**042**	132,3	600	2200	1800	240	210	210	175	175	140
	045	142,4									
	050	158,5									
	052	164,8									
	054	171,0									
	057	183,3									
	062	196,7									
	066	213,3									
	072	227,1									
	085	268,7		2000		90	75	75	75	75	75

HF-0, HF-2 = Antiwear Petroleum Base
HF-1 = Non Antiwear Petroleum Base
HF-3 = Water in oil Invert Emulsions
HF-4 = Water Glycols Solutions
HF-5 = Synthetic Fluids

[1] Ten vane technology.
[2] For T7E, below 10 bar, please contact Parker.
[3] Please be sure that the inlet velocity is under 1,9 m/sec. (see page 12, start-up & check-up).

For further information, or if the performance characteristics outlined here above do not meet your particular requirements, please consult your local Parker office.

Parker Hannifin SAS
VPDE, Denison Vane Pumps
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Model of pump	Series	Theoretical Displacement Vi	Minimum Speed	Maximum Speed [3]		Maximum Pressure					
				HF-0, HF-1 HF-2	HF-3, HF-4 HF-5	HF-0, HF-2		HF-1, HF-4, HF-5		HF-3	
						Int.	Cont.	Int.	Cont.	Int.	Cont.
		ml/rev.	RPM	RPM	RPM	bar	bar	bar	bar	bar	bar
T7**BB**/S T67C**B** T7D**B**/S T7E**B**/S T7D**BB**/S T7DC**B**/S T7DD**B**/S T7ED**B**/S	**B02**	5,8	600	2200[2]	1800	T7BB T7BBS 320[1] Other pumps 300	T7BB T7BBS 290 Other pumps 275	240	210	175	140
	B03	9,8									
	B04	12,8									
	B05	15,9									
	B06	19,8									
	B07	22,5									
	B08	24,9									
	B09	28,0									
	B10	31,8									
	B11	35,0									
	B12	41,0									
	B14	45,0									
	B15	50,0				280	240				
T6**CC** T67**C**B T67D**C** T67E**C** T7D**C**B/S T7D**CC**/S T67DD**C**S T67ED**C**/S T7EE**C**/S	**003**	10,8	600	2200[2]	1800	275	240	210	175	175	140
	005	17,2									
	006	21,3									
	008	26,4									
	010	34,1									
	012	37,1									
	014	46,0									
	017	58,3									
	020	63,8									
	022	70,3									
	025	79,3									
	028	88,8				210	160		160		
	031	100,0									
T7**D**B/S T67**D**C T7**DD**/S T7E**D**S T7**D**BB/S T7**D**CB/S T7**D**CC/S T7**DD**B/S T67**DD**CS T7E**D**B/S T67E**D**C/S	**B14**	44,0	600	2200[2]	1800	300	250	240	210	175	140
	B17	55,0									
	B20	66,0									
	B22	70,3									
	B24	81,1									
	B28	90,0									
	B31	99,2									
	B35	113,4				280					
	B38	120,6									
	B42	137,5				260	230				
	045[1]	145,7				240	210	210	175		
	050[1]	158,0				210	160		160		
T7**E**B/S T67**E**C T7**E**DS T7**EE**/S T7**EE**C/S T67**E**DB/S T67**E**DC/S	**042**	132,3	600	2200[2]	1800	240	210	210	175	175	140
	045	142,4									
	050	158,5									
	052	164,8									
	054	171,0									
	057	183,3									
	062	196,7									
	066	213,3									
	072	227,1									
	085	268,7		2000		90	75	75	75	75	75

HF-0, HF-2 = Antiwear Petroleum Base HF-1 = Non Antiwear Petroleum Base HF-3 = Water in oil Invert Emulsions
HF-4 = Water Glycols Solutions HF-5 = Synthetic Fluids

[1] Please consult Parker for application over 300 bar.

[2] Please consult Parker with higher speeds.

[3] Please be sure that the inlet velocity is under 1,9 m/sec. (see page 12, start-up & check-up).

For further information or if the performance characteristics outlined above do not meet your particular requirements, please consult your local Parker office.

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Minimum allowable inlet pressure (bar absolute)

Cartridge		Speed RPM										Series
Size	Series	1200	1500	1800	2100	2200	2300	2500	2800	3000	3600	
AS	B06	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	B06
	B10											B10
	B11											B11
	B13											B13
	B17										0,88	B17
	B20										0,94	B20
	B22										1,00	B22
	B25									0,85		B25
ASW	B26	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	B26
	B28											B28
	B30											B30
	B32											B32
	B34										0,88	B34
	B36										0,94	B36
	B40										1,00	B40
B	B02	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	B02
	B03											B03
	B04											B04
	B05											B05
	B06									0,82	0,98	B06
	B07											B07
	B08									0,85	1,05	B08
	B09											B09
	B10									0,90	1,15	B10
	B11											B11
	B12											B12
	B14							0,84	0,99	1,13		B14
	B15											B15
C	003	0,80	0,80	0,80	0,80	0,80	0,80	0,90	1,00			003
	005											005
	006											006
	008											008
	010											010
	012						0,85	0,92				012
	014							0,95				014
	017					0,85	0,90		1,03			017
	020											020
	022				0,85	0,90		0,98	1,05			022
	025				0,90	0,95	0,95	1,05				025
	028					0,98	0,98	1,08				028
	031				0,85	0,90	1,11	1,11				031

Inlet pressure is measured at inlet flange with petroleum base fluids at viscosity between 10 and 65 cSt. The difference between inlet pressure at the pump flange and atmospheric pressure must not exceed 0,2 bar to prevent aeration.
Multiply absolute pressure by 1,25 for HF-3, HF-4 fluids.
by 1,35 for HF-5 fluid.
by 1,10 for ester or rapeseed base.
For double and triple pumps, prefer the cartridge requiring the highest absolute pressure.

Minimum allowable inlet pressure

T7/T67/T6C Industrial, Denison Vane Pumps

Cartridge		Speed RPM										Series
Size	Series	1200	1500	1800	2100	2200	2300	2500	2800	3000	3600	
D	B14	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80		B14
	B17											B17
	B20								0,82	0,86		B20
	B22								0,83	0,88		B22
	B24								0,86	0,95		B24
	B28								0,88	1,00		B28
	B31								0,90	1,05		B31
	B35							0,84	0,97			B35
	B38							0,86	1,01			B38
	B42							0,90				B42
	045			0,85	0,98	1,05						B45
	050				1,02	1,09						B50
E	042	0,80	0,80	0,80	0,90	1,00						042
	045											045
	050											050
	052											052
	054											054
	057			0,85	0,95							057
	062											062
	066	0,85	0,85	0,95	1,00	1,09						066
	072			0,85		1,05						072
	085	0,90	0,90	1,00								085

Inlet pressure is measured at inlet flange with petroleum base fluids at viscosity between 10 and 65 cSt. The difference between inlet pressure at the pump flange and atmospheric pressure must not exceed 0,2 bar to prevent aeration.
Multiply absolute pressure by 1,25 for HF-3, HF-4 fluids.
by 1,35 for HF-5 fluid.
by 1,10 for ester or rapeseed base.
For double and triple pumps, prefer the cartridge requiring the highest absolute pressure.

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VPDE, Denison Vane Pumps
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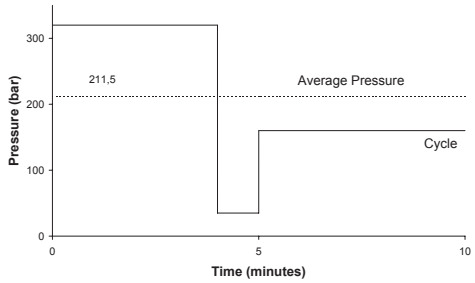
MAIN CALCULATION

To resolve *Volumetric displ. .. Vi [ml/rev.]* *Available flow..... Q_{eff} [l/min]* *Input power..... P_{eff} [kW]*	Performances required Requested flow .... Q [l/min] 42 Speed..... n [RPM] 1500 Pressure ..... p [bar] 250
Routine :	Example :
1. First calculation $Vi = \frac{1000\ Q}{n}$	$Vi = \frac{1000 \times 42}{1500} = 28$ ml/rev.
2. Choice Vi of pump immediately greater (see tabulation)	T7B B10, Vi = 31,8 cm^3/rev.
3. Theoretical flow of this pump $Q_{theo} = \frac{Vi \times n}{1000}$	$Q_{theo} = \frac{31,8 \times 1500}{1000} = 47,7$ l/min
4. Find qvs leakage function of pressure $q_{Vs} = f(p)$ on curve at 10 or 24 cSt	T7B (page 22) : q_{Vs} = 3 l/min at 250 bar, 24 cSt
5. Available flow $Q_{eff} = Q_{theo} - q_{Vs}$	Q_{eff} = 47,7 - 3 = 44,7 l/min
6. Theoretical input power $P_{theo} = \frac{Q_{theo} \times p}{600}$	$P_{theo} = \frac{47,7 \times 250}{600} = 19,9$ kW
7. Find Ps hydrodynamic power loss on curve	T7B (page 22) : Ps at 1500 RPM, 250 bar = 1 kW
8. Calculation of necessary input power $P_{eff} = P_{theo} + Ps$	P = 19,9 + 1 = 20,9 kW
9. Results	Vi = 31,8 ml/rev. Q_{eff} = 47,7 l/min P_{eff} = 20,9 kW | T7B B10

These calculation steps must be followed for each application.

INTERMITTENT PRESSURE RATING

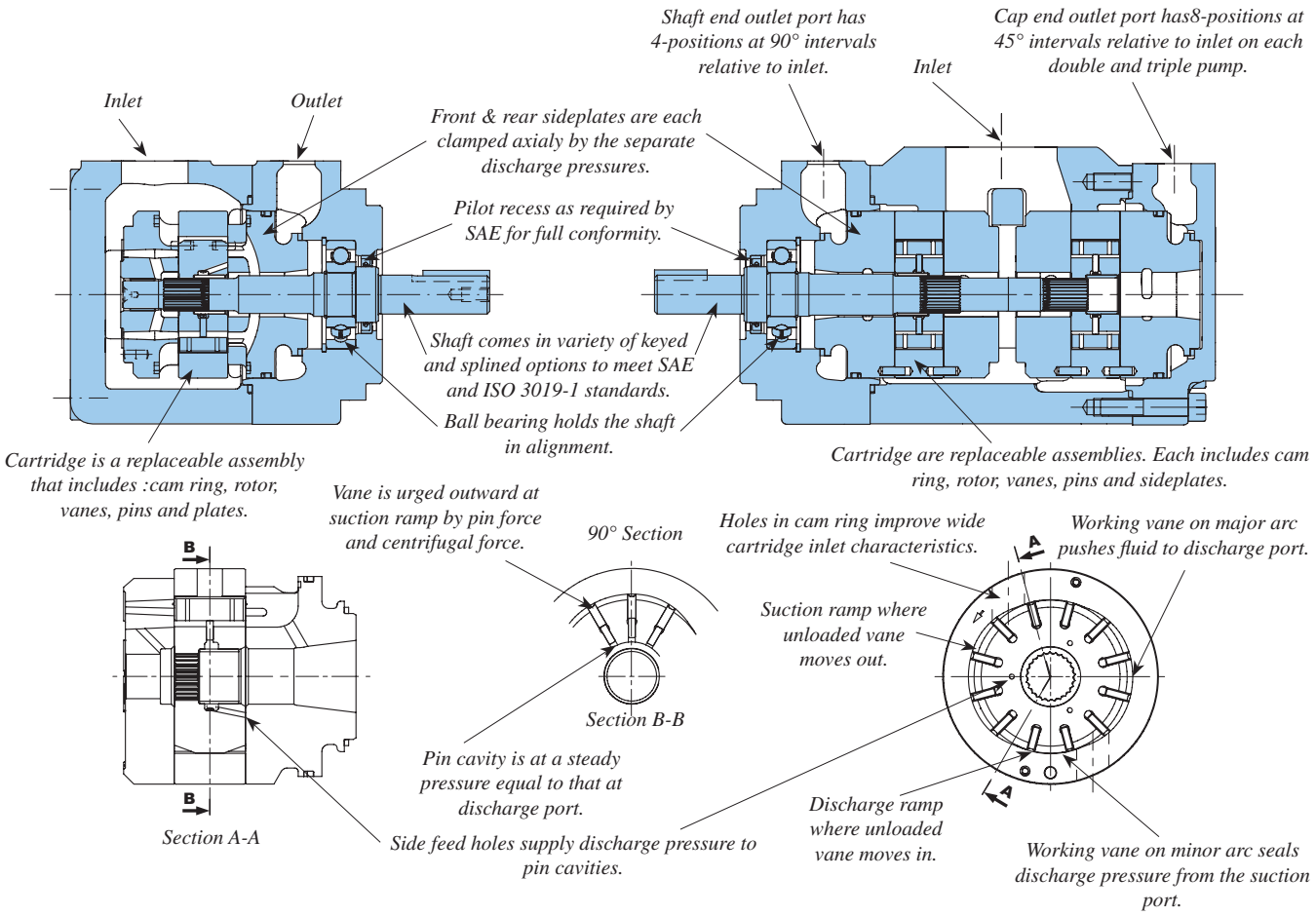
T7 and T67 units may be operated intermittently at pressures higher than the recommended continuous rating when the time weighted average of pressure is less than or equal to the continuous duty pressure rating. This intermittent pressure rating calculation is only valid when the other parameters : speed, fluid, viscosity and contamination level are respected.
For total cycle time longer than 15 minutes, please consult your Parker representative.



Example : T7B - B10
Duty cycle ..... 4 min. at 320 bar
..... 1 min. at 35 bar
..... 5 min. at 160 bar

$\frac{(4 \times 320) + (1 \times 35) + (5 \times 160)}{10} = 211,5$ bar

211,5 bar is lower than 290 bar allowed as continuous pressure for T7B - B10 with HF-0 fluid.



APPLICATION ADVANTAGES

- The high pressure capability up to 320 bar, in the small envelope, reduces installation costs and provides extended life at reduced pressure.
- The high volumetric efficiency, reduces heat generation, and allows speeds down to 600 RPM at full pressure.
- The high mechanical efficiency, typically better than 94%, reduces energy consumption.
- The wide speed range (600 RPM at 3600 RPM), combined with large size cartridge displacements will optimize operation for the lowest noise level in the smallest envelope.
- The low speed (600 RPM), low pressure, high viscosity (860 cSt) allows application in cold environment with a minimum energy consumption and without risk of seizure.
- The low ripple pressure (± 2 bar) reduces piping noise and increases lifetime of the other components in the circuit.
- The high resistance to particle contamination, thanks to the double lip technology increasing the pump lifetime.
- The large variety of options (cam displacement, shaft, porting) allows customized installation.
- Noise : Specially designed to optimize the low noise level characteristics.
- Cartridge concept : drops maintenance costs.

GENERAL :

All Parker vane pumps are individually tested to provide the best quality & reliability. Modifications, conversions & repairs can only be done by authorized dealers or OEM to avoid invalidation of the guarantee.

The pumps are to be used in the design limits indicated in all the sales bulletins. Please contact Parker when tresspassing the catalogue limits.

Do not modify or work on the pump under pressure or when the electric motor (or any drive) is on.

Qualified personnel is required to assemble and set-up hydraulic devices.

Always conform yourself to the valid regulations (safety, electrical, environment...).

The following instructions are important to follow to obtain a good service life time from the unit.

ROTATION & PORTS INDICATION

The rotation and ports orientation are viewed from the shaft end.

CW stands for clockwise = right-hand rotation.

CCW stands for counter-clockwise = left-hand rotation.

START-UP CHECK-UP

Check that the assembly of the power unit is correct :

The distance between the suction pipe & the return lines in the tank should be at its maximum.

A bevel on both suction & return lines is recommended to increase the surface and so lower the velocity. We suggest a 45° minimum angle.

Velocities : inlet 0,5 < x < 1,9 m/s (1,64 < x < 6,23 ft per sec.)
: return x < 6 m/s (x < 19,7 ft per sec.)
: Always insure that all return and suction lines are under the oil level to avoid forming aeration or vortex effect. This should be done under the most critical situation (all cylinders extended for example). Straight and short pipes are the best.

$$V = \frac{Q\ (Lpm)}{6 \times \pi \times r^2\ (cm)} = m/s \qquad V = \frac{Q\ (GPM)}{3.12 \times \pi \times r^2\ (in)} = ft/s$$

The size of the air filter should be 3 times greater than the max. instant return flow (all cylinders in movement for example).

If the pump is in the tank, please choose the NOP option (no paint) and use a short inlet pipe.

Parker does not recommend inlet strainers. If needed, a 100 mesh (149 microns) is the finest mesh recommended.

A coaxial drive is recommended. For any other type of drives, please contact Parker.

Make sure that all protective plugs & covers have been removed.

Check the pump rotation versus the E-motor or engine rotation.

Start-up :

The tank has been filled up with a clean fluid in proper conditions.

We recommend to flush the system with an external pump prior to the start-up.

It is important to bleed the air off the circuit & the pump itself.

The first valve on the circuit should be open to tank.

We recommend the use of air bleed off valves.

It is possible to bleed off the air by creating a leak in the P port of the pump. **Warning : this has to be done in a low pressure mode as it could create a dangerous fluid leak. Make sure that the pressure cannot rise (open center valve to tank, pressure relief valve unloaded ...).**

When oil free of air appears, tighten the connectors to the correct torque.

The pump should prime within a few seconds. If not, please consult our troubleshooting guide (document 1 - EN0721 - *).

If the pump is noisy, please troubleshoot the system.

Never operate the pump at top speed and pressure without checking the completion of pump priming.

SHAFT & COUPLING DATA :

COUPLINGS AND FEMALE SPLINES

- The mating female spline should be free to float and find its own center. If both members are rigidly supported, they must be aligned within 0,15 TIR (0.006" TIR) or less to reduce fretting. The angular alignment of two splines axes must be less than ± 0,05 per 25,4 radius (± 0.002" per 1" radius).
- The coupling spline must be lubricated with a lithium molydisulfide grease, disulfide of molybdenum or a similar lubricant.
- The coupling must be hardened to a hardness between 29 and 45 HRC.
- The female spline must be made to conform to the Class 1 fit as described in SAE-J498b (1971). This is described as a Flat Root Side Fit.

KEYED SHAFTS

Parker supplies the T7 series keyed shaft pumps with high strength heat-treated keys. Therefore, when installing or replacing these pumps, the heat-treated keys must be used in order to ensure maximum life in the application. If the key is replaced, it must be a heat-treated key between 27 and 34 R.C. hardness. The corners of the keys must be chamfered by 0,76 mm to 1,02 mm (0.03 to 0.04) at 45° to clear the radii in the key way.

The alignment of keyed shafts must be within tolerances given for splined shafts here above.

SHAFT LOADS

These products are primarily designed for coaxial drives which do not impose axial or side loading on the shaft. Contact Parker for specific applications.

SPECIFIC POINTS :

MINIMUM INLET PRESSURE

Please read the charts in the sales leaflets as the minimum requested inlet pressure varies versus the displacement and the speed.
Never go under 0,8 bar Absolute (-0,2 bar relative)
11.6 PSI Absolute (-2.9 PSI G).

MAXIMUM INLET PRESSURE

It is recommended to always have at least 1,5 bar (22 PSI) differential between inlet and outlet.
Standard shaft seals are limited to 0,7 bar (10 PSI G) but some allow 7 bar (100 PSI G). Please contact Parker for more information.

MINIMUM OUTLET PRESSURE

It is recommended to always have at least 1,5 bar (22 PSI) differential between inlet and outlet.

VERTICAL MOUNT

When assembled vertically, always be careful to prevent any air from being trapped in the pump (behind the shaft seal for example).

FLUIDS :

DENISON CLASSIFICATION

Type of fluids : For each type of fluids, Parker vane pumps will have different pressures, speeds & temperature limits. Please refer to the sales leaflets.
HF-0 = Anti-wear petroleum base.
HF-1 = Non anti-wear petroleum base.
HF-2 = Anti-wear petroleum base.
HF-3 = Water-in-oil invert emulsions.
HF-4 = Water glycol solutions.
HF-5 = Synthetic fluids.

FILTRATION RECOMMENDATIONS

NAS 1638 class 8 or better.
ISO 19 / 17 / 14 or better.
Inlet strainer : Parker does not recommend inlet strainers.
If requested, a 100 mesh (149 microns) is the finest mesh recommended.

RECOMMENDED FLUIDS

Petroleum based antiwear R & O fluids.
These fluids are the recommended fluids for pumps & motors. Maximum catalogue (UK version) ratings and performance datas are based on operation with these fluids. These fluids are covered by Denison HF-0 and HF-2 specifications.

ACCEPTABLE ALTERNATE FLUIDS

The use of fluids other than petroleum based antiwear R & O fluids requires that the maximum ratings of the pumps will be reduced. In some cases the minimum replenishment pressures must be increased. Consult specific sections for more details.

VISCOSITY

	Indutrial
Max. (cold start, low speed & pressure)	860 cSt - 3900 SUS
Max. (full speed & pressure)	108 cSt - 500 SUS
Optimum (max. life)	30 cSt - 140 SUS
Min. (full speed & pressure for HF-1, HF-3, HF-4 & HF-5 fluids)	18 cSt - 90 SUS
Min. (full speed & pressure for HF-0 & HF-2 fluids)	10 cSt - 60 SUS

VISCOSITY INDEX

90 min. Higher values extend the range of operating temperatures.

TEMPERATURES

The usual limitating factor of temperature (low or high) comes from the obtained viscosity. The seals are sometimes the limit : standard seals range from -30° C to 90° C (-9.4° F to 194° F).

Maximum fluid temperature (θ)	° C	° F
HF-0, HF-1, HF-2	+ 100	+ 212
HF-3, HF-4	+ 50	+ 122
HF-5	+ 70	+ 158
Biodegradable fluids (esters & rapeseed base)	+ 65	+ 149

Minimum fluid temperature (θ) (also depend on max. viscosity)	° C	° F
HF-0, HF-1, HF-2, HF-5	- 18	- 0.4
HF-3, HF-4	+ 10	+ 50
Biodegradable fluids (esters & rapeseed base)	- 18	- 0.4

Over or under these values, please contact Parker.

WATER CONTAMINATION IN THE FLUID

Maximum acceptable content of water :
• 0,10 % for mineral base fluids.
• 0,05 % for synthetic fluids, crankcase oils, biodegradable fluids.
If the amount of water is higher, then it must be drained off the circuit.

FLUID POWER FORMULAS

Pump input torque	N.m	$\frac{\text{pressure (bar) x displacement cm}^3\text{/rev}}{20\ \pi \text{ x mech. eff.}}$
Pump input power	kW	$\frac{\text{rpm x (cm}^3\text{/rev) x pressure (bar)}}{600000 \text{ x overall eff.}}$
Pump output flow	Lpm	$\frac{\text{rpm x (cm}^3\text{/rev) x volumetric eff.}}{1000}$
Fluid motor speed	rpm	$\frac{1000 \text{ x flow rate (Lpm) x volumetric eff.}}{\text{displacement (cm}^3\text{/rev.)}}$
Fluid motor torque	N.m	$\frac{\text{pressure (bar) x displacement (cm}^3\text{/rev) x mech. eff.}}{20\ \pi}$
Fluid motor power	kW	$\frac{\text{rpm x (cm}^3\text{/rev) x (bar) x overall eff.}}{600000}$

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	Mounting standard	Weight without connector and bracket - kg	Moment of inertia $Kgm^2 \times 10^{-4}$	SAE 4 bolts - J518 - 1S0/DIS6162-1		
				Suction	Pressure	
				S	P1	
T7AS	SAE J744 SAE A	9,5	2,6	1"-SAE 4 bolts J518-ISO/DIS 6162-1	3/4"-SAE 4 bolts J518-ISO/DIS 6162-1	
				SAE 16-SAE threads 1.5/16"-12 UNF-2B	SAE 12-SAE threads 1.1/16"-12 UNF-2B	
				NPTF threads 1.1/4" NPTF	NPTF threads 3/4" NPTF	
				1" BSP	3/4" BSP	
T7ASW	SAE J744 SAE A	11,3	3,2	1.1/4"-SAE 4 bolts J518-ISO/DIS 6162-1	3/4"-SAE 4 bolts J518-ISO/DIS 6162-1	
				SAE 20-SAE threads 1.5/8"-12 UNF-2B	SAE 12-SAE threads 1.1/16"-12 UNF-2B	
				NPTF threads 1.1/4" NPTF	SAE 12-SAE threads 1.1/16"-12 UNF-2B	
				1.1/4" BSP	3/4" BSP	
T7B	ISO/3019-2 100 A2 HW	23,0	3,2	1.1/2"	1" or 3/4"	
T7BS	SAE J744 SAE B					
T6C	SAE J744 SAE B	15,7	7,5	1.1/2"	1"	
T7D	ISO 3019-2 125 A2 HW	26,0	19,6	2"	1.1/4"	
T7DS	SAE J744 SAE C					
T7E	ISO 3019-2 125 A2 HW	43,3	62,5	3"	1.1/2"	
T7ES	SAE J744 SAE C					
				S	**P1**	**P2**
T7BB	ISO 3019-2 100 A2 HW	32,6	6,7	2.1/2"	1" or 3/4"	3/4"
T7BBS	SAE J744 SAE B					
T6CC	SAE J744 SAE B	26,0	16,9	2.1/2" or 3"	1"	1" or 3/4"
T67CB	SAE J744 SAE B	26,0	11,4	2.1/2"	1"	3/4"
T7DB	ISO 3019-2 125 A2 HW	38,6	22,7	3"	1.1/4"	1" or 3/4"
T7DBS	SAE J744 SAE C					
T67DC	SAE J744 SAE C	38,6	26,3	3"	1.1/4"	1" or 3/4"
T7DD	ISO 3019-2 125 A2 HW 125 B4HW	56,0	36,3	4"	1.1/4"	1.1/4"
T7DDS	SAE J744 SAE C					
T7EB	ISO 3019-2 125 A2 HW	55,0	65,9	3.1/2"	1.1/2"	3/4"
T7EBS	SAE J744 SAE C					
T67EC	SAE J744 SAE C	55,0	70,8	3.1/2"	1.1/2"	1"
T7ED	ISO 3019-2 125 A2 HW	66,0	79,7	4"	1.1/2"	1.1/4"
T7EDS	SAE J744 SAE C					
T7EE	ISO 3019-2 250 B4 HW	95,0	97,4	4"	1.1/2"	1.1/2"
T7EES	SAE J744 SAE E					

	Mounting standard	Weight without connector and bracket - kg	Moment of inertia $Kgm^2 \times 10^{-4}$	SAE 4 bolts - J518 - 1S0/DIS6162-1			
				Suction	Pressure		
				S	P1	P2	P3
T7DBB	ISO/3019-2 125 A2 HW 125 B4 HW	61,0	26,1	4"	1.1/4"	1"	1" or 3/4"
T7DBBS	SAE J744 SAE C						
T7DCB	ISO/3019-2 125 A2 HW 125 B4 HW		29,7				
T7DCBS	SAE J744 SAE C						
T7DCC	ISO/3019-2 125 A2 HW 125 B4 HW		33,3				
T7DCCS	SAE J744 SAE C						
T7DDB	ISO/3019-2 125 A2 HW 125 B4 HW	66,0	39,5	4"	1.1/4"	1.1/4"	1" or 3/4"
T7DDBS	SAE J744 SAE C						
T67DDCS	SAE J744 SAE C	66,0	43,1	4"	1.1/4"	1.1/4"	1" or 3/4"
T7EDB	ISO 3019-2 250 B4 HW	102,0	76,6	4"	1.1/2"	1.1/4"	1" or 3/4"
T7EDBS	SAE J744 SAE E						
T67EDC	ISO 3019-2 250 B4 HW	102,0	80,2	4"	1.1/2"	1.1/4"	1" or 3/4"
T67EDCS	SAE J744 SAE E						
T7EEC	ISO/3019-2 250 B4 HW	114,8	99,1	4"	1.1/2"	1.1/2"	1" or 3/4"
T7EECS	SAE J744 SAE E						

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Model No. T7AS - B17 - 1 R 00 - A 1 - 00 - ..

T7AS series - SAE A 2 bolts
J744 mounting flange

Displacement *
Volumetric displacement (ml/rev.)
B06 = 5,8
B10 = 9,8
B11 = 11,0
B13 = 12,8
B17 = 17,2
B20 = 19,8
B22 = 22,5
B25 = 24,9

Type of shaft T7AS
1 = keyed (non SAE) Ø 19,05
3 = splined 16/32 (SAE B) 13 teeth
4 = splined 16/32 (SAE A) 9 teeth

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

Modifications

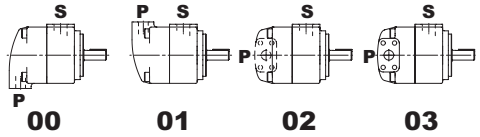
Mounting w/connection variables
00 = 4 bolts SAE flanges (J518) UNC thread
S = 1" SAE
P = 3/4" SAE
02 = SAE thread
S = 1.5/16" (SAE 16)
P = 1.1/16" (SAE 12)
03 = NPTF thread
S = 1.1/4" NPTF
P = 3/4" NPTF
04 = BSP threads
S = 1" BSP
P = 3/4" BSP

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
5 = S5 VITON® - 0,7 bar max. (for mineral oil and fire resistant fluids)

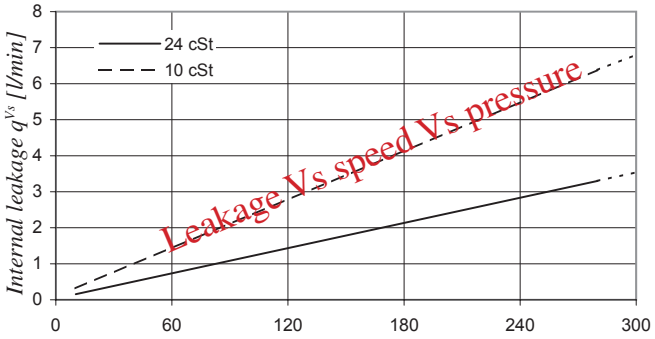
Design letter

Porting combination
00 = standard

P = Pressure
S = Suction



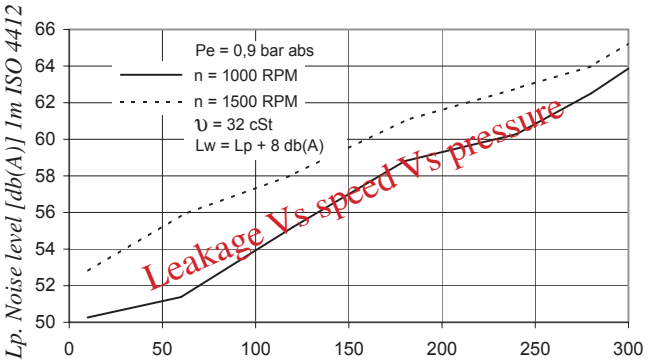
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

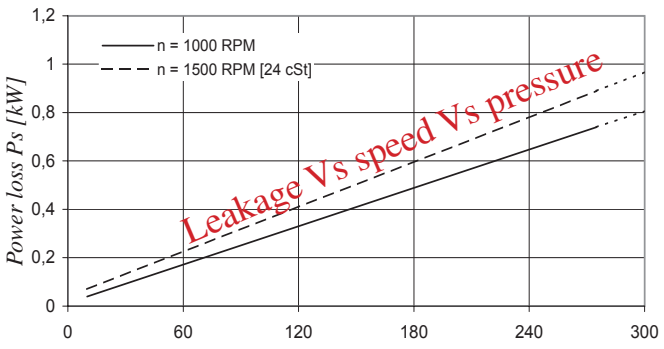
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.

NOISE LEVEL (TYPICAL) - T7AS - B20



Pressure p [bar]

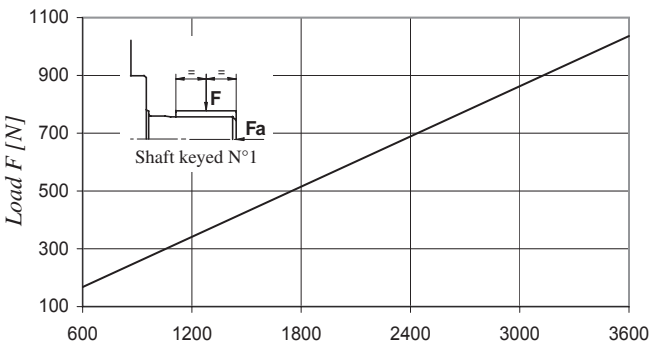
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

** Cartridge designation is now in ml/rev. (example : B22 = 22,5 ml/rev.)*

PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 600 N

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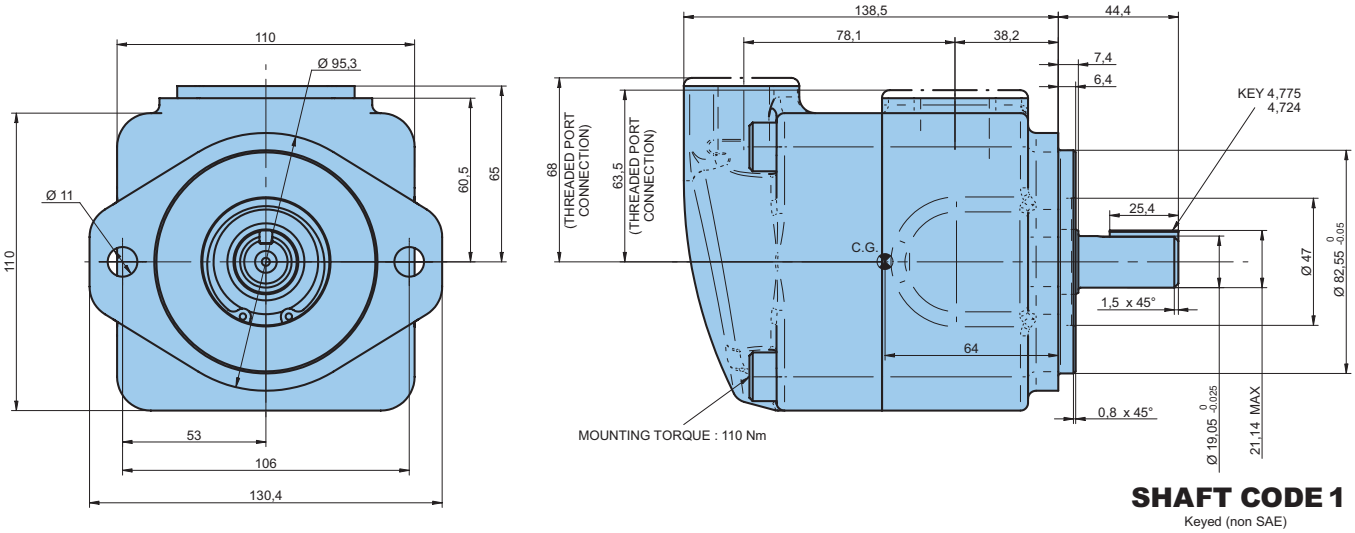
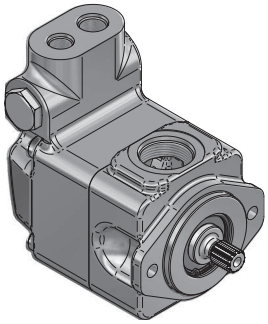
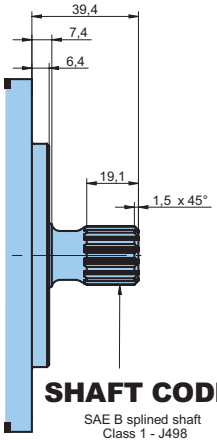
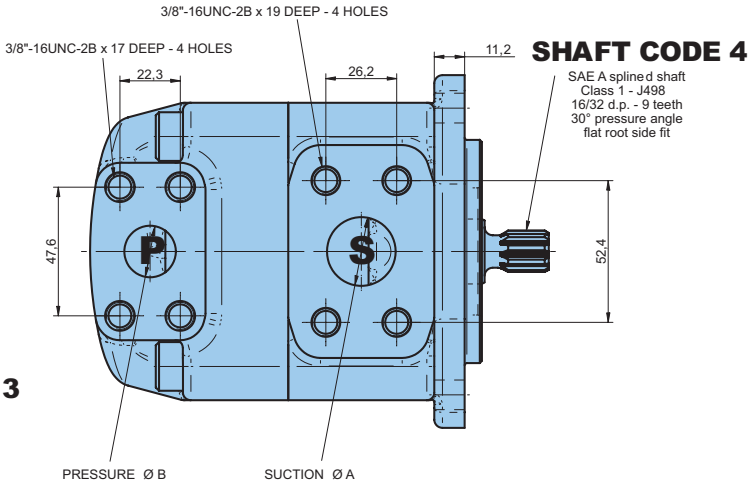


Option : built in valve







Code	00	02	03	04
A	Ø 25,40	SAE # 16 1.5/16" - 12 UNF - 2B	1.1/14" NPTF	1" BSP
B	Ø 19,05	SAE # 12 1.1/16" - 12 UNF - 2B	3/4" NPTF	3/4" BSP

Shaft torque limits [ml/rev. x bar]	
Shaft	Vi x p max.
1	8720
3	8720
4	6550

If inlet velocity > 1,9 m/s, please contact Parker.

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{Ve} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 300 bar	p = 7 bar	p = 140 bar	p = 300 bar
T7AS	B06	5,8 ml/rev	8,7	7,0	5,2	0,2	2,7	6,0
	B10	9,8 ml/rev	14,7	13,0	11,2	0,3	4,1	9,0
	B11	11,0 ml/rev	16,5	14,8	13,0	0,4	4,5	9,9
	B13	12,8 ml/rev	19,2	17,5	15,7	0,4	5,1	11,3
	B17	17,2 ml/rev	25,8	24,1	22,3	0,5	6,6	14,6
	B20	19,8 ml/rev	29,7	28,0	26,2	0,6	7,6	16,5
	B22	22,5 ml/rev	33,8	32,1	30,2	0,6	8,5	18,6
	B25	24,9 ml/rev	37,4	35,7	33,8[1)]	0,7	9,3	20,4[1)]

[1)] *B25 = 275 bar max. int.*

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Model No. **T7ASW - B32 - 1 R 00 - A 1 - 00 - ..**

T7ASW series - SAE A 2 bolts
J744 mounting flange

Displacement *
Volumetric displacement (ml/rev.)
B26 = 26,0
B28 = 28,0
B30 = 30,0
B32 = 31,8
B34 = 34,0
B36 = 36,0
B40 = 40,0

Type of shaft T7ASW
1 = keyed (non SAE) Ø 19,05
3 = splined 16/32 (SAE B) 13 teeth
4 = splined 16/32 (non SAE) 11 teeth

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

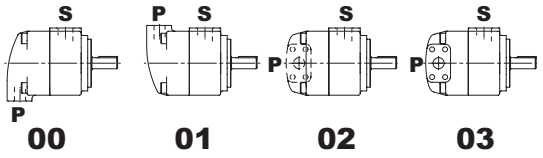
Modifications

Mounting w/connection variables
00 = 4 bolts SAE flanges (J518) UNC threads
S = 1.1/4" SAE
P = 3/4" SAE
02 = SAE thread
S = 1.5/8" (SAE 20)
P = 1.1/16" (SAE 12)
03 = NPTF & SAE threads
S = 1.1/4" NPTF
P = 1.1/16" (SAE 12)
04 = BSP threads
S = 1.1/4" BSP
P = 3/4" BSP

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)

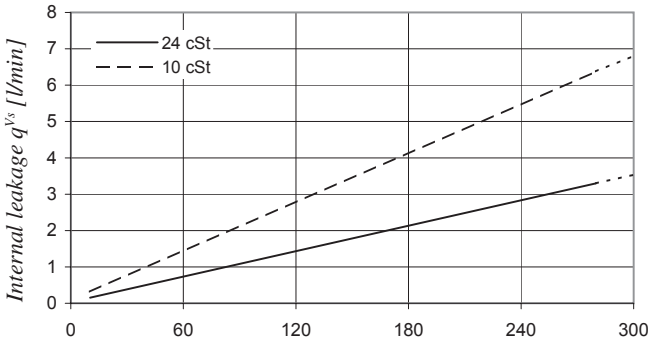
Design letter

Porting combination
00 = standard



P = Pressure
S = Suction

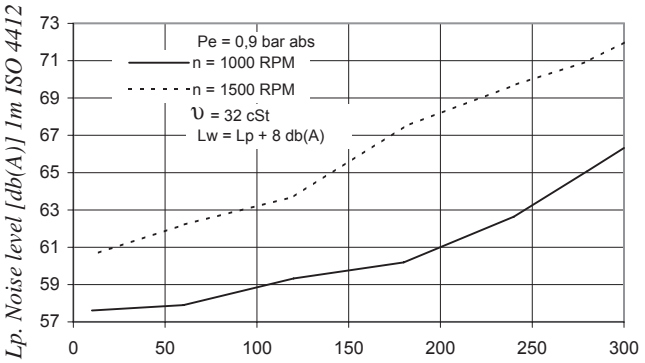
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

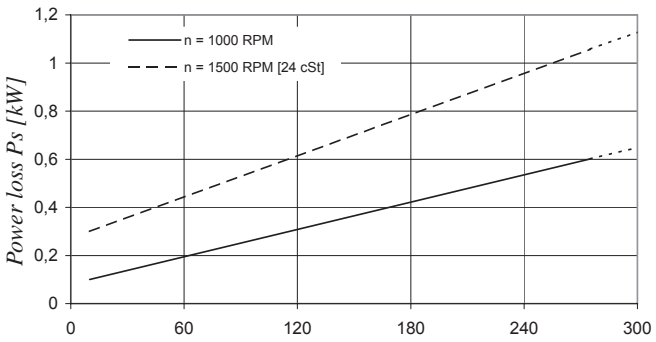
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.

NOISE LEVEL (TYPICAL) - T7ASW B28



Pressure p [bar]

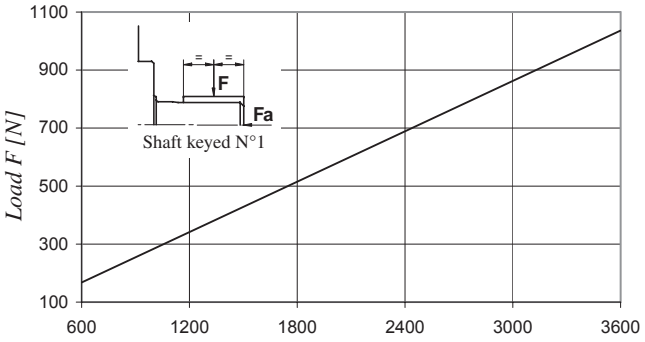
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

** Cartridge designation is now in ml/rev. (example : B26 = 26 ml/rev.)*

PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 800 N

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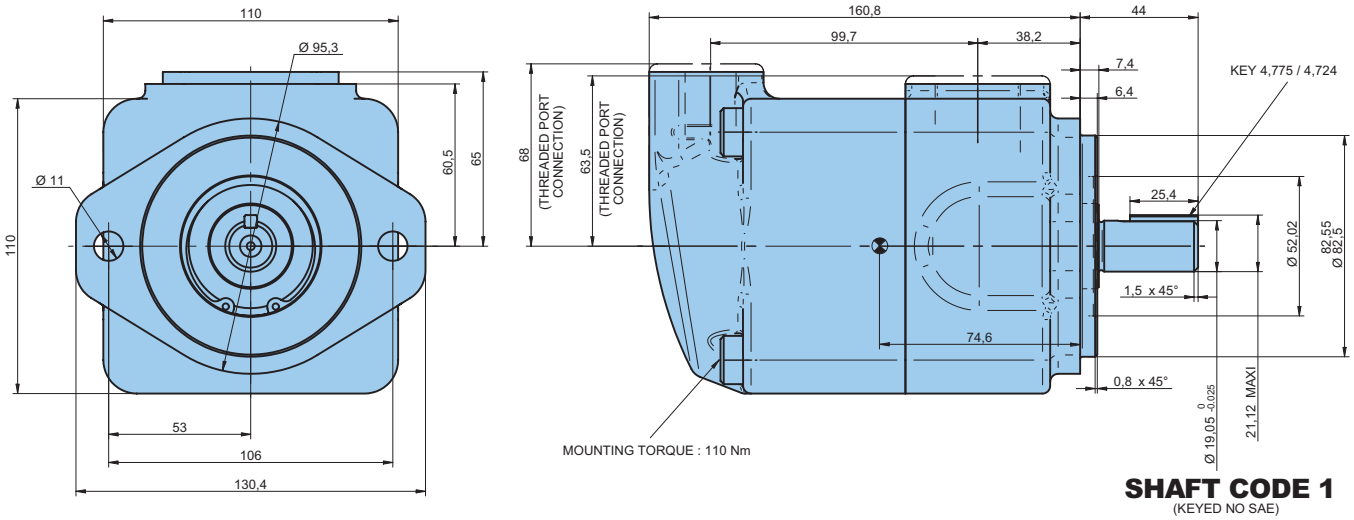

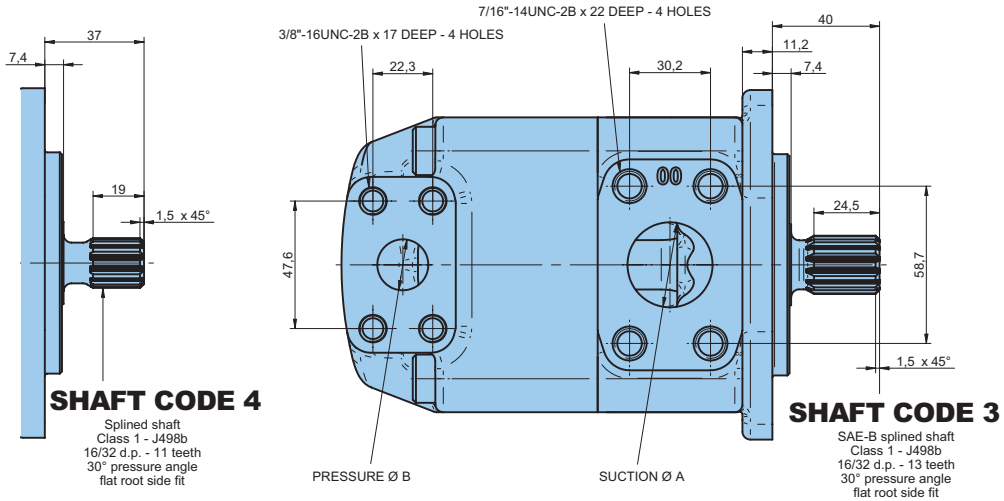

Code	00	02	03	04
A	Ø 31,80	SAE # 20 1.5/8" - 12 UNF - 2B	1.1/14" NPTF	1.1/4" BSP
B	Ø 19,05	SAE # 12 1.1/16" - 12 UNF - 2B	SAE # 12 1.1/16" - 12 UNF - 2B	3/4 " BSP

Shaft torque limits [ml/rev. x bar]	
Shaft	Vi x p max.
1	18530
3	18530
4	12660

If inlet velocity > 1,9 m/s, please contact Parker.

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{ve} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 300 bar	p = 7 bar	p = 140 bar	p = 300 bar
T7ASW	B26	26,0 ml/rev	39,0	37,3	35,5	0,8	9,5	20,6
	B28	28,0 ml/rev	42,0	40,3	38,5	0,9	10,2	22,1
	B30	30,0 ml/rev	45,0	43,3	41,5	0,9	10,9	23,6
	B32	31,8 ml/rev	47,7	46,0	44,2	0,9	11,6	25,0
	B34	34,0 ml/rev	51,0	49,3	47,5[1)]	1,0	12,3	26,6[1)]
	B36	36,0 ml/rev	54,0	52,3	50,5[1)]	1,0	13,0	28,1[1)]
	B40	40,0 ml/rev	60,0	58,3	56,5[1)]	1,1	14,4	31,1[1)]

[1)] *B34 - B36 - B40 = 280 bar max. int.*

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Model No. **T7B or T7BS - B10 - 1 R 00 - A 1 - M0 - ..**

T7B series - 100 A2 HW
ISO 2 bolts 3019-2 mounting flange
T7BS series - SAE B 2 bolts
J744 mounting flange

Displacement
Volumetric displacement (ml/rev.)

B02 = 5,8	B07 = 22,5	B11 = 35,0
B03 = 9,8	B08 = 24,9	B12 = 41,0
B04 = 12,8	B09 = 28,0	B14 = 45,0
B05 = 15,9	B10 = 31,8	B15 = 50,0
B06 = 19,8		

Type of shaft T7B - T7BS
2 = keyed (ISO R775)

Type of shaft T7BS
1 = keyed (SAE B) Ø 22,2
3 = splined (SAE B) 13 teeth
4 = splined (SAE BB) 15 teeth

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

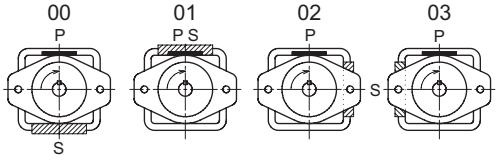
	T7B-T7BS		T7BS	
	Metric thread		UNC thread	
	M0	M1	00	01
P	1"	3/4"	1"	3/4"
S	1.1/2"			

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 0,7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 0,7 bar max. (for mineral oil and fire resistant fluids)

Design letter

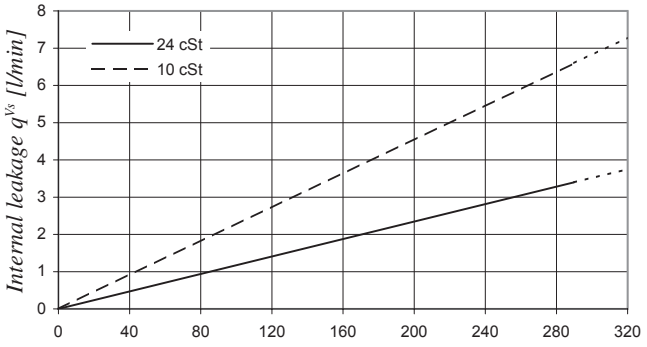
Porting combination
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise



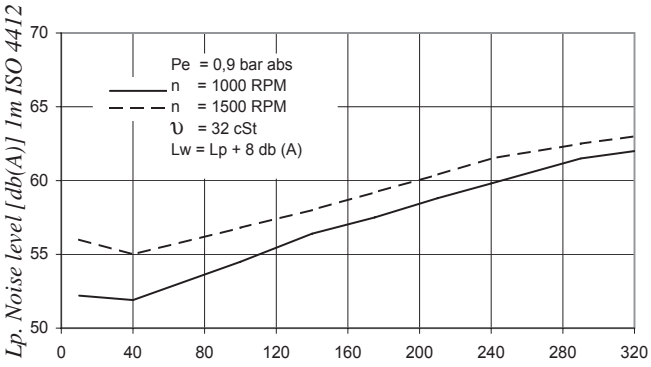
P = Pressure port
S = Suction port

INTERNAL LEAKAGE (TYPICAL)

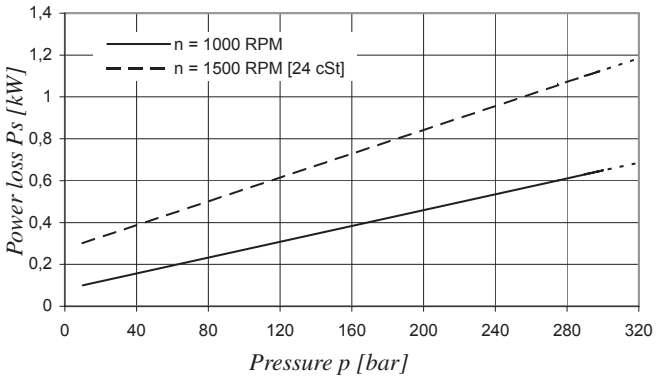


Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.

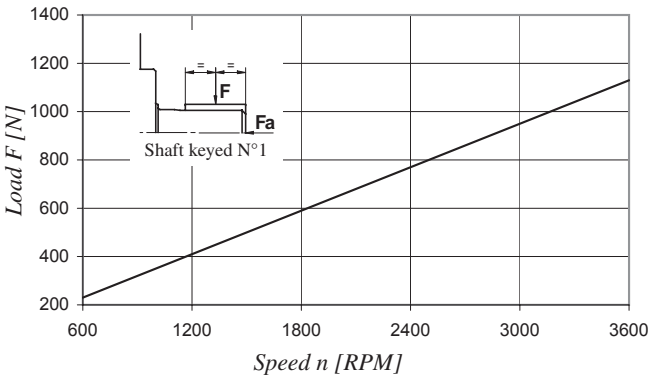
NOISE LEVEL (TYPICAL) - T7B - B10



POWER LOSS HYDROMECHANICAL (TYPICAL)



PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 800 N

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VPDE, Denison Vane Pumps
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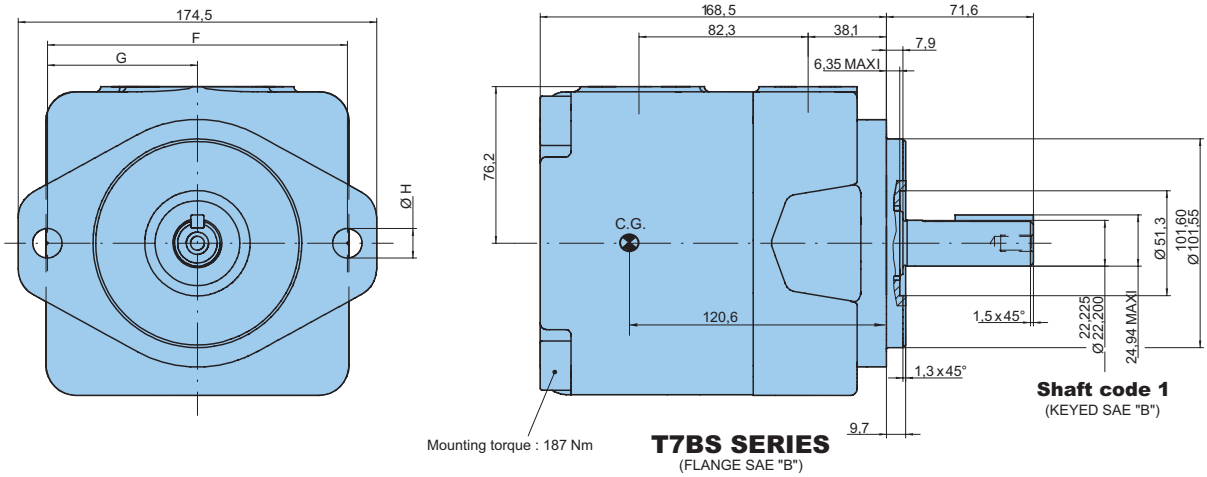
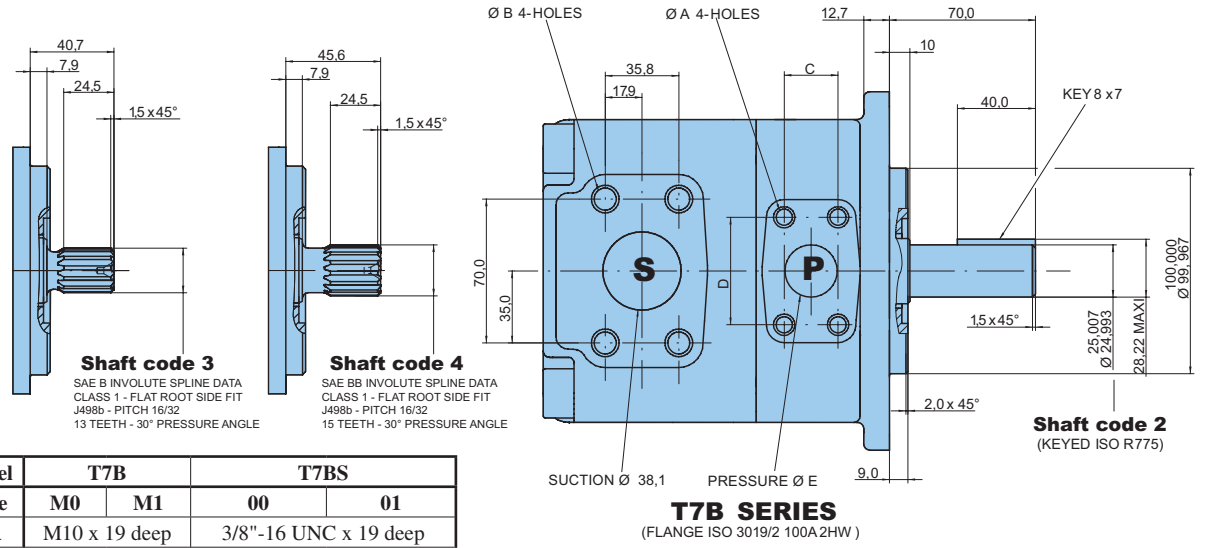
T7B/BS - Dimensions - Weight : 23,0 kg
T7/T67/T6C Industrial, Denison Vane Pumps





Model	T7B		T7BS	
Code	M0	M1	00	01
Ø A	M10 x 19 deep		3/8"-16 UNC x 19 deep	
Ø B	M12 x 22,4 deep		1/2"-13 UNC x 22,4 deep	
C	26,20	22,25	26,20	22,25
D	52,4	47,65	52,4	47,65
Ø E	25,4	19,1	25,4	19,1
F	140		146	
G	70		73	
Ø H	14,0		14,3	

Shaft torque limits [ml/rev. x bar]	
Shaft	Vi x p max.
1	16500
2	20600
3	20600
4	20600

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{v_e} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 320 bar	p = 7 bar	p = 140 abr	p = 320 bar
T7B T7BS	B02	5,8 ml/rev	8,7	7,0	4,8	0,5	2,6	5,4
	B03	9,8 ml/rev	14,7	13,0	10,8	0,6	4,0	8,6
	B04	12,8 ml/rev	19,2	17,5	15,3	0,6	5,0	11,0
	B05	15,9 ml/rev	23,9	22,2	20,0	0,7	6,1	13,5
	B06	19,8 ml/rev	29,7	28,0	25,8	0,7	7,5	16,6
	B07	22,5 ml/rev	33,7	32,0	29,9	0,8	8,5	18,8
	B08	24,9 ml/rev	37,4	35,7	33,5	0,8	9,3	20,7
	B09	28,0 ml/rev	42,0	40,3	38,1	0,9	10,4	23,2
	B10	31,8 ml/rev	47,7	46,0	43,8	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9[1)]	1,0	12,8	27,0[1)]
	B12	41,0 ml/rev	61,5	59,8	57,9[1)]	1,1	14,9	31,5[1)]
	B14	45,0 ml/rev	67,5	65,8	63,9[1)]	1,2	16,3	34,5[1)]
	B15	50,0 ml/rev	75,0	73,3	71,6[2)]	1,3	18,1	35,7[2)]

1) B11 - B12 - B14 = 300 bar max. int. 2) B15 = 280 bar max. int.

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Model No. **T6C* - 022 - 1 R 00 - B 1 - ..**

Series - SAE B 2 bolts
J744 mounting flange
* Rear drive option available, please contact Parker

Displacement
Volumetric displacement (ml/rev.)

003 = 10,8	017 = 58,3
005 = 17,2	020 = 63,8
006 = 21,3	022 = 70,3
008 = 26,4	025 = 79,3
010 = 34,1	028 = 88,8
012 = 37,1	031 = 100,0
014 = 46,0	

Type of shaft
1 = keyed (SAE B) Ø 22,2
2 = keyed (non SAE)
3 = splined (SAE B) 13 teeth
4 = splined (SAE BB) 15 teeth

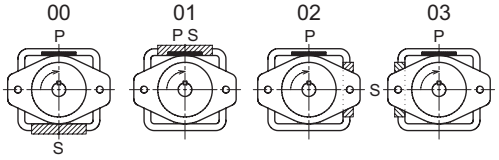
Modifications

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

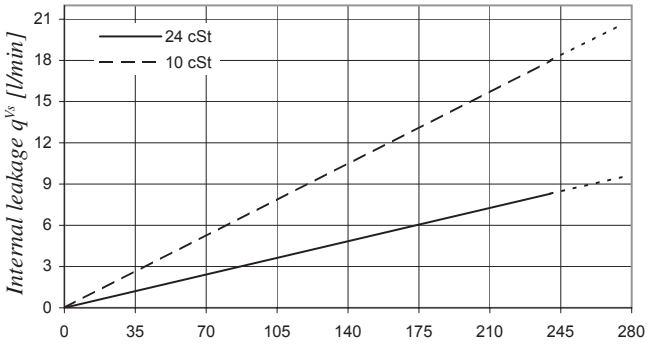
Porting combination
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise



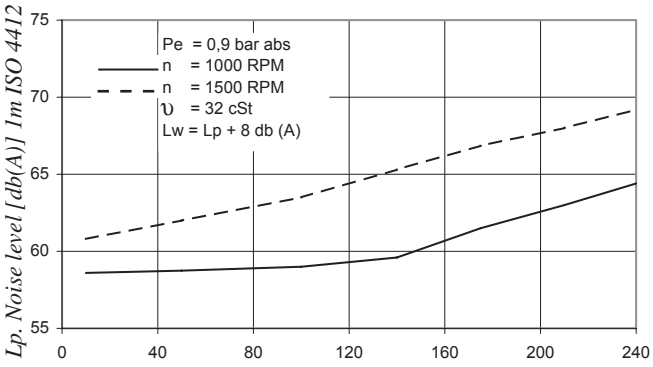
P = Pressure port
S = Suction port

INTERNAL LEAKAGE (TYPICAL)

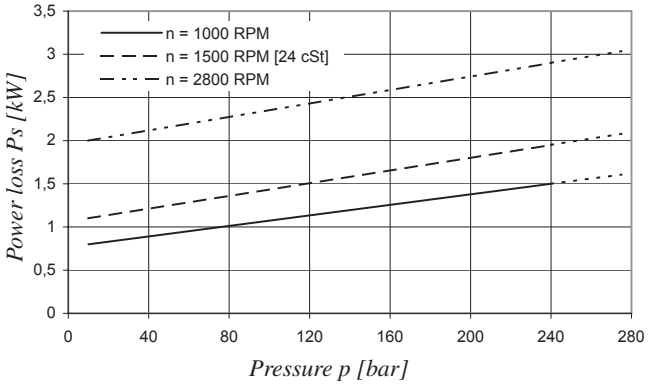


Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.

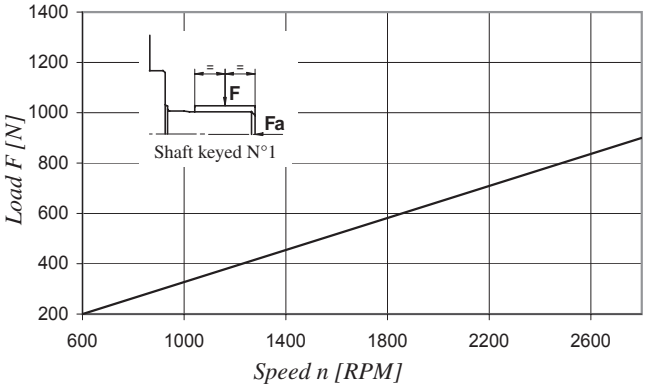
NOISE LEVEL (TYPICAL) - T6C - 022



POWER LOSS HYDROMECHANICAL (TYPICAL)



PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 800 N

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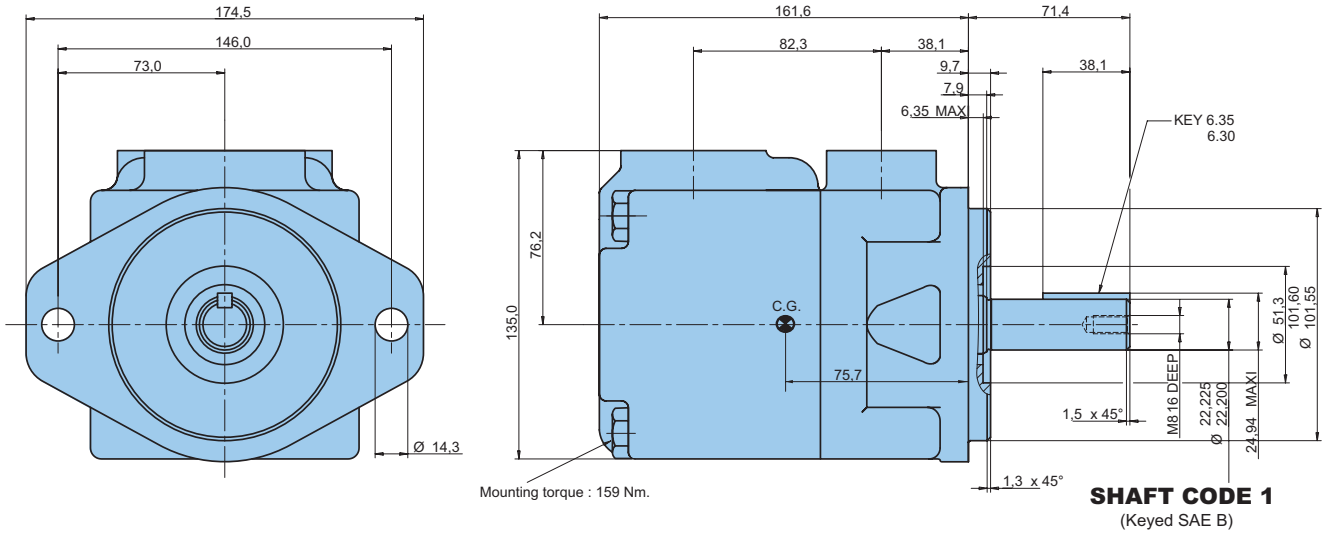
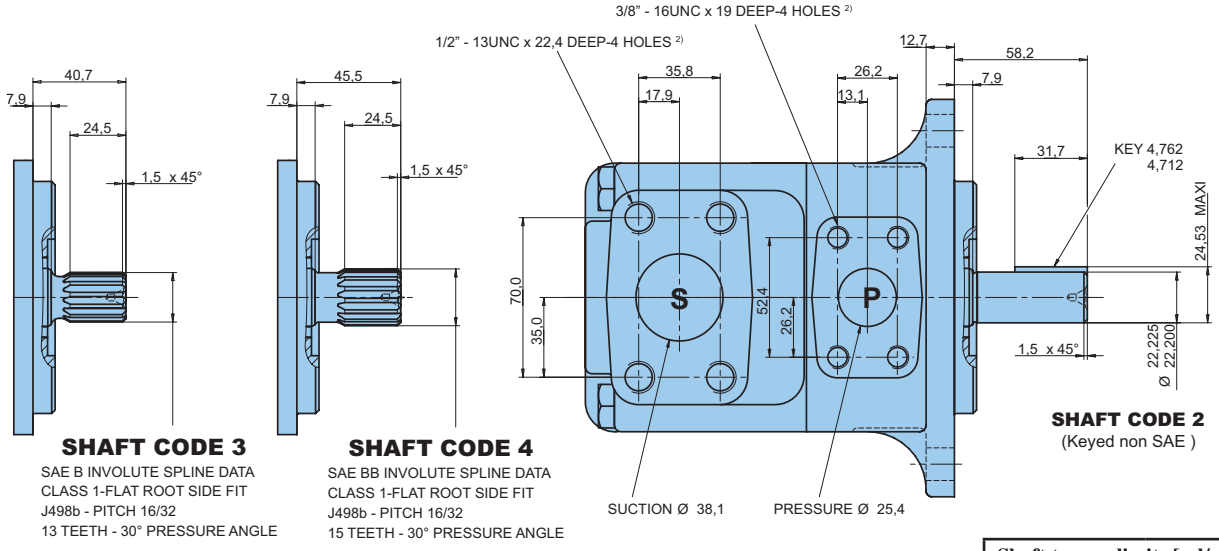
T6C - Dimensions - Weight : 15,7 kg





Shaft torque limits [ml/rev. x bar]	
Shaft	**Vi x p max.**
1	16340
2	14300
3	20600
4	21800

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{vc} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
T6C	003	10,8 ml/rev	16,2	11,2	7,7	1,3	5,3	8,4
	005	17,2 ml/rev	25,8	20,8	17,3	1,4	7,5	12,2
	006	21,3 ml/rev	31,9	26,9	23,4	1,5	8,9	14,7
	008	26,4 ml/rev	39,6	34,6	31,1	1,6	10,7	17,7
	010	34,1 ml/rev	51,1	46,1	42,6	1,7	13,4	22,3
	012	37,1 ml/rev	55,6	50,6	47,1	1,7	14,4	24,1
	014	46,0 ml/rev	69,0	64,0	60,5	1,9	17,6	29,5
	017	58,3 ml/rev	87,4	82,4	78,9	2,1	21,9	36,9
	020	63,8 ml/rev	95,7	90,7	87,2	2,2	23,8	40,2
	022	70,3 ml/rev	105,4	100,4	96,9	2,3	26,1	44,1
	025	79,3 ml/rev	118,9	113,9	110,4	2,5	29,2	49,5
	028	88,8 ml/rev	133,2	128,2	125,8[1)]	2,8	32,7	48,5[1)]
	031	100,0 ml/rev	150,0	145,0	142,6[1)]	2,8	36,5	54,4[1)]

[1)] *028 - 031 = 210 bar max. int.*

[2)] *Port connection can be supplied with metric threads (Please contact Parker).*

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VPDE, Denison Vane Pumps
Vierzon - France

Model No. **T7D* or T7DS - B42 - 1 R 00 - A 1 - M0 - ..**

T7D series - 125 A2 HW
ISO 2 bolts 3019-2 mounting flange
T7DS series - SAE C 2 bolts
J744 mounting flange
* Rear drive option available, please contact Parker

Displacement
Volumetric displacement (ml/rev.)

B14 = 44,0	B31 = 99,2
B17 = 55,0	B35 = 113,4
B20 = 66,0	B38 = 120,6
B22 = 70,3	B42 = 137,5
B24 = 81,1	045 = 145,7
B28 = 90,0	050 = 158,0

Type of shaft T7D - T7DS
5 = keyed (ISO 3019-2 - G32M)

Type of shaft T7DS
1 = keyed (SAE C) Ø 31,7
2 = keyed (non SAE)
3 = splined (SAE C) 14 teeth
4 = splined (non SAE)

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

	P = 1.1/4" - S = 2"		
	Metric thread		UNC thread
T7D	M0		
T7DS	M0	Y0[1)]	00

[1)] 250 bar max. int.

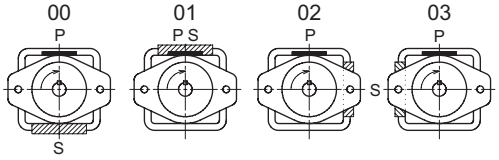
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

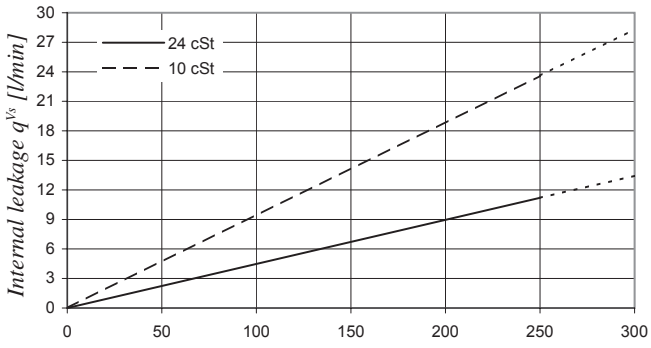
Porting combination
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

P = Pressure port
S = Suction port

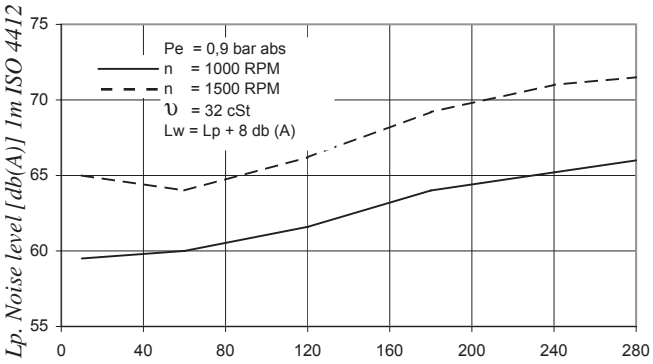


INTERNAL LEAKAGE (TYPICAL)

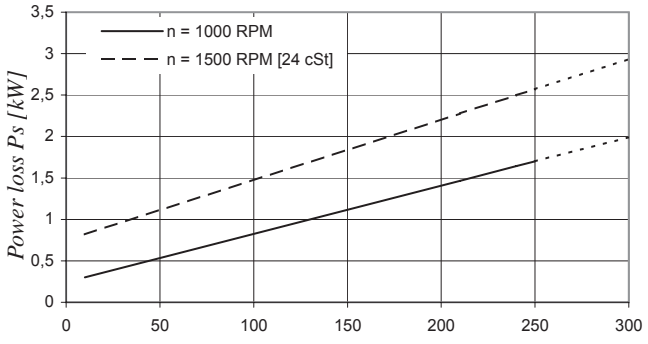


Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.

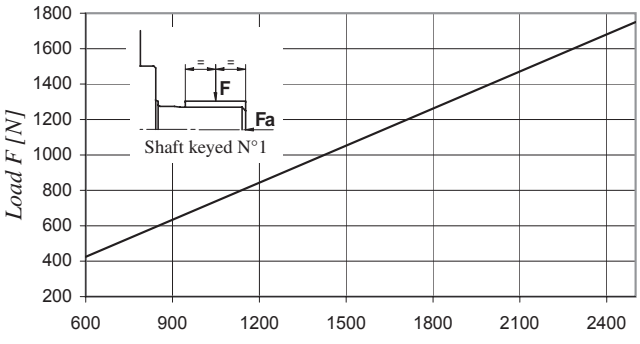
NOISE LEVEL (TYPICAL) - T7D - B31



POWER LOSS HYDROMECHANICAL (TYPICAL)



PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 1200 N

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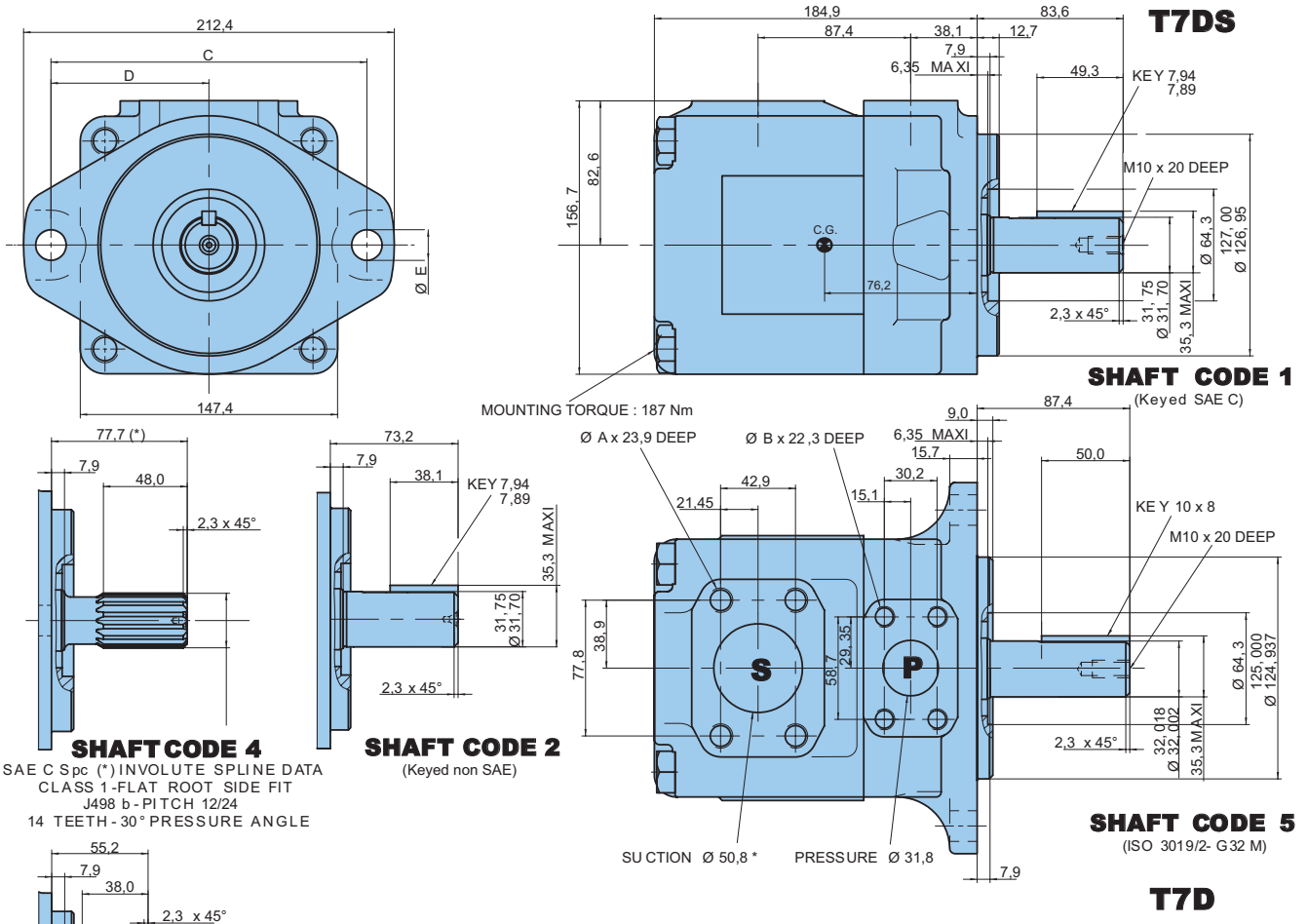


Model	T7D	T7DS		
Code	M0	00	M0	YO[1]
Ø A	M12	1/2" - 13 UNC	M12	M12
Ø B	M12	7/16" - 14 UNC	M12	M10
C	180,0	181,0		
D	90,0	90,5		
Ø E	18,0	17,5		

[1] *250 bar max. int.*

Shaft torque limits [ml/rev. x bar]	
Shaft	Vi x p max.
1	43240
2	34590
3	61200
4	61200
5	44300

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{ve} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 300 bar	p = 7 bar	p = 140 bar	p = 300 bar
T7D T7DS	B14	44,0 ml/rev	66,0	59,4	51,9	1,5	16,6	34,2
	B17	55,0 ml/rev	82,5	75,9	68,4	1,7	20,4	42,4
	B20	66,0 ml/rev	99,0	92,4	84,9	1,9	24,3	50,7
	B22	70,3 ml/rev	105,5	98,8	91,3	2,0	25,8	53,9
	B24	81,1 ml/rev	121,7	115,0	107,5	2,2	29,5	62,0
	B28	90,0 ml/rev	135,0	128,4	120,9	2,3	32,7	68,7
	B31	99,2 ml/rev	148,8	142,2	134,7	2,5	35,9	75,6
	B35	113,4 ml/rev	170,1	163,5	156,9[1]	2,7	40,8	80,5[1]
	B38	120,6 ml/rev	180,9	174,3	167,7[1]	2,9	43,4	85,6[1]
	B42	137,5 ml/rev	206,3	199,6	194,0[2]	3,2	49,3	90,5[2]
	045	145,7 ml/rev	218,6	209,2	202,6[3]	4,1	52,8	89,5[3]
	050	158,0 ml/rev	237,0	227,7	223,0[4]	4,4	57,1	85,0[4]

[1] *B35 - B38 = 280 bar max. int.* [2] *B42 = 260 bar max. int.* [3] *045 = 240 bar max. int.* [4] *050 = 210 bar max. int.*

** special 2.1/2" (Ø 63,5) suction also available - Please contact Parker.*

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France

Model No. **T7E* or T7ES - 072 - 1 R 00 - A 1 - M0 - ..**

T7E series - 125 A2 HW
ISO 2 bolts 3019-2 mounting flange
T7ES series - SAE C 2 bolts
J744 mounting flange
* Rear drive option available, please contact Parker.

Displacement
Volumetric displacement (ml/rev.)

042 = 132,3	057 = 183,3
045 = 142,4	062 = 196,7
050 = 158,5	066 = 213,3
052 = 164,8	072 = 227,1
054 = 171,0	085 = 268,7

Type of shaft T7E - T7ES
5 = keyed (ISO R775 - G38M)

Type of shaft T7ES
1 = keyed (SAE CC)
2 = keyed (non SAE)
3 = splined (SAE C) 14 teeth
4 = splined (SAE CC) 17 teeth

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

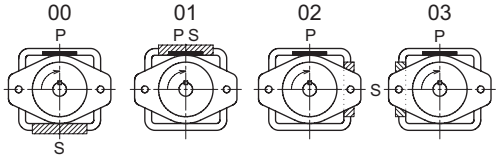
	T7E - T7ES Metric thread	T7ES UNC thread
	M0	00
P	1.1/2"	
S	3"	

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

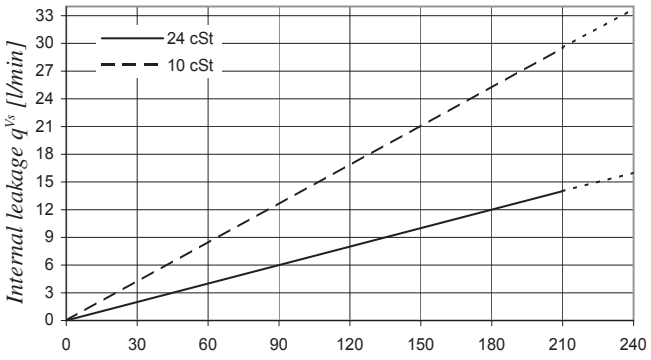
Porting combination
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise



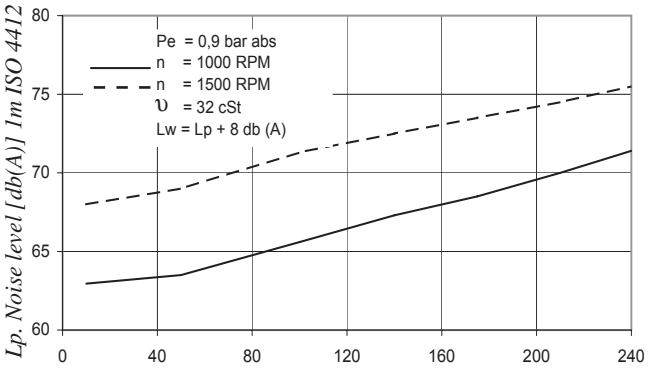
P = Pressure port
S = Suction port

INTERNAL LEAKAGE (TYPICAL)

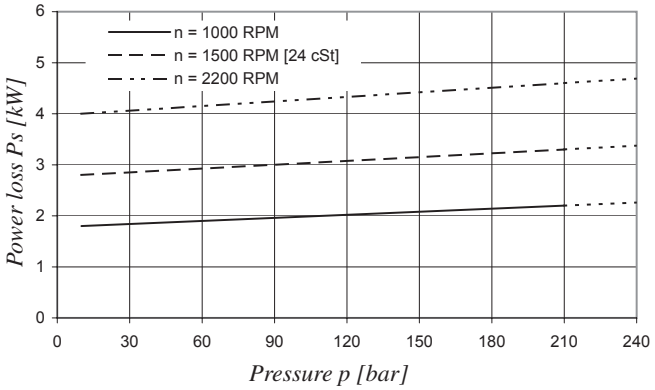


Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.

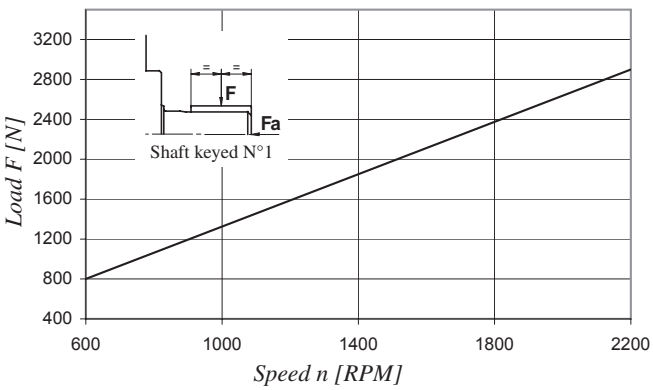
NOISE LEVEL (TYPICAL) - T7ES - 050



POWER LOSS HYDROMECHANICAL (TYPICAL)



PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 2000 N

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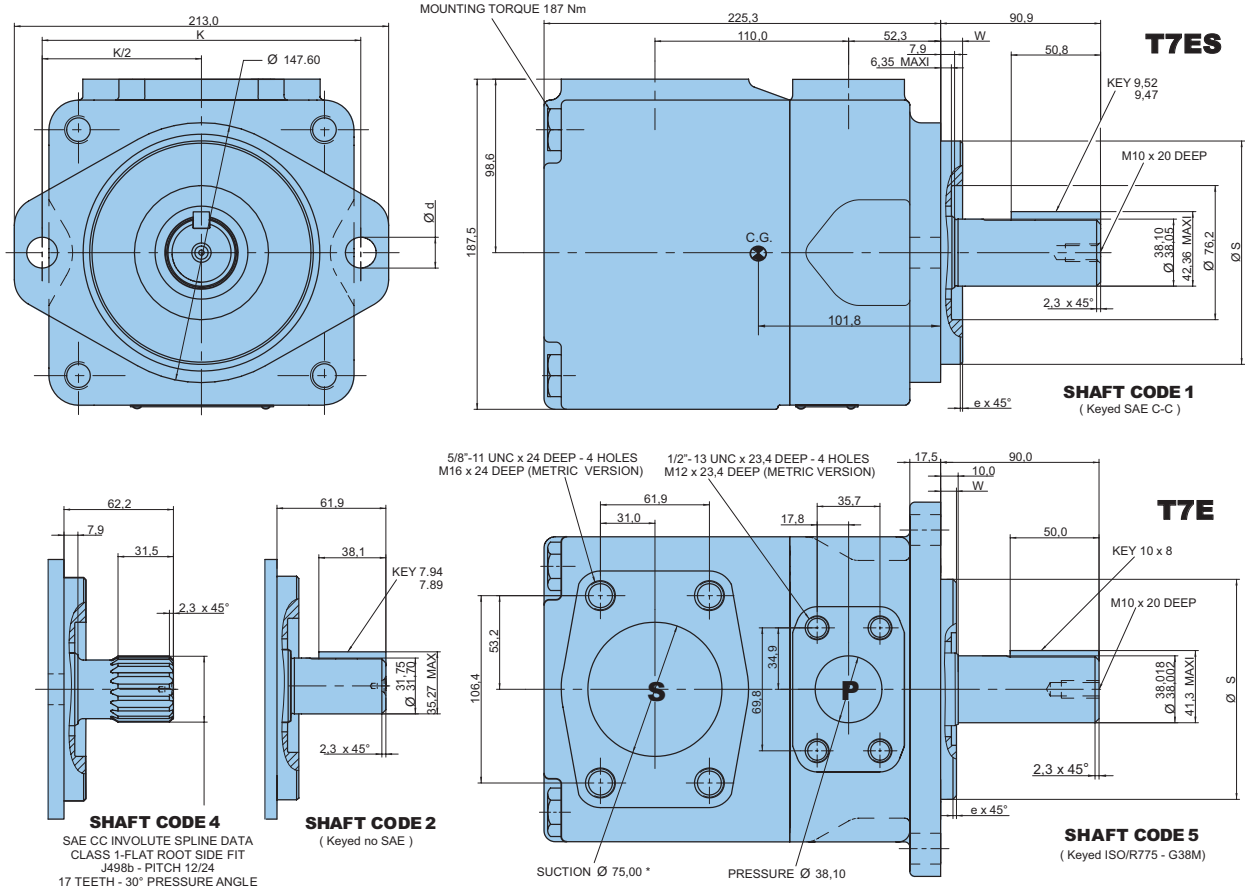
T7E/ES - Dimensions - Weight : 43,3 kg
T7/T67/T6C Industrial, Denison Vane Pumps



Shaft torque limits [ml/rev. x bar]	
Shaft	**Vi x p max.**
1	54500
2	34590
3	61200
4	61200
5	54500

Alternate mounting flange						
	Dia S		e x 45°	W	K	Dia d
	Max.	Min.				
T7E	125,000	124,937	2,0	9,5	180,0	18,0
T7ES	127,000	126,950	1,3	12,7	181,0	17,5

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{Ve} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
T7E T7ES	042	132,3 ml/rev	198,5	188,5	181,3	5,2	49,4	82,6
	045	142,4 ml/rev	213,6	203,6	196,5	5,4	52,9	88,7
	050	158,5 ml/rev	237,7	227,7	220,6	5,7	58,5	98,3
	052	164,8 ml/rev	247,2	237,2	230,1	5,8	60,8	102,1
	054	171,0 ml/rev	256,5	246,5	239,4	5,9	63,0	105,8
	057	183,3 ml/rev	275,0	265,0	257,9	6,1	67,3	113,2
	062	196,7 ml/rev	295,0	285,0	277,9	6,4	71,9	121,3
	066	213,3 ml/rev	319,9	309,0	302,8	6,7	77,7	131,2
	072	227,1 ml/rev	340,6	330,6	323,5	6,9	82,6	139,5
	085	268,7 ml/rev	403,0	392,0[1)]	-	9,1	65,8[1)]	-

[1)] *085 = 90 bar max. int.*

** special 3"1/2 (Ø 88,9) suction also available - Please contact Parker.*

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France

Model No. **T7BB or T7BBS - B10 - B10 - 1 R 00 - A 1 - M1 - ..**

T7BB series - 100 A2 HW
ISO 2 bolts 3019-2 mounting flange
T7BBS series - SAE B 2 bolts
J744 mounting flange

P1 P2

Displacement P1 & P2
Volumetric displacement (ml/rev.)

B02 = 5,8	B09 = 28,0
B03 = 9,8	B10 = 31,8
B04 = 12,8	B11 = 35,0
B05 = 15,9	B12 = 41,0
B06 = 19,8	B14 = 45,0
B07 = 22,5	B15 = 50,0
B08 = 24,9	

Type of shaft T7BB - T7BBS
5 = keyed (ISO R775)

Type of shaft T7BBS
1 = keyed (non SAE)
2 = keyed (SAE BB)
3 = splined (SAE B) 13 teeth
4 = splined (SAE BB) 15 teeth

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

Porting combination (see page 72)
00 = standard

Design letter

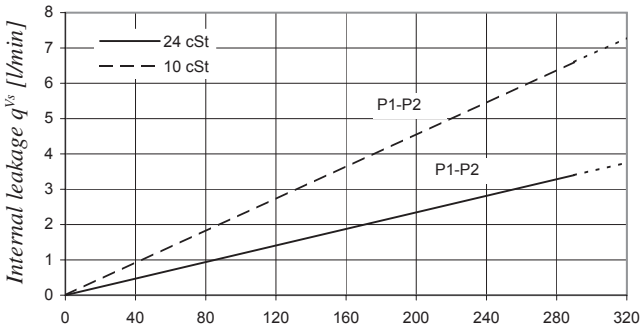
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 0,7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 0,7 bar max. (for mineral oil and fire resistant fluids)

Mounting w/connection variables
4 bolts SAE flange J518

	T7BB- T7BBS Metric thread		T7BBS UNC thread	
	M0	M1	00	01
P1	1"	3/4"	1"	3/4"
P2	3/4"			
S	2.1/2"			

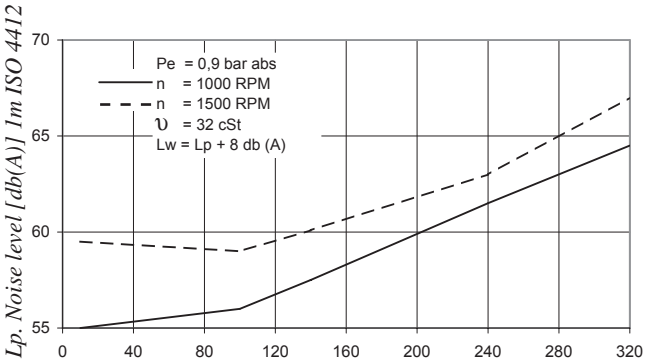
Modifications

INTERNAL LEAKAGE (TYPICAL)



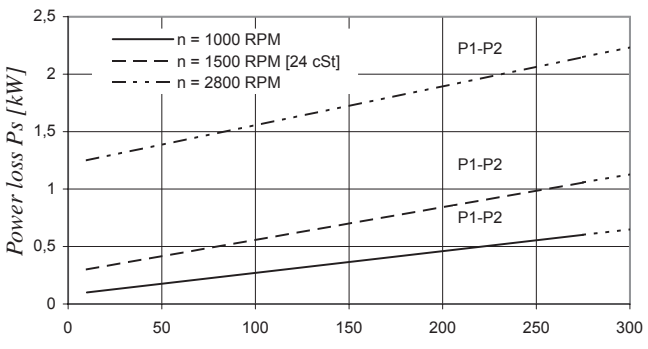
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T7BB - B10 - B04



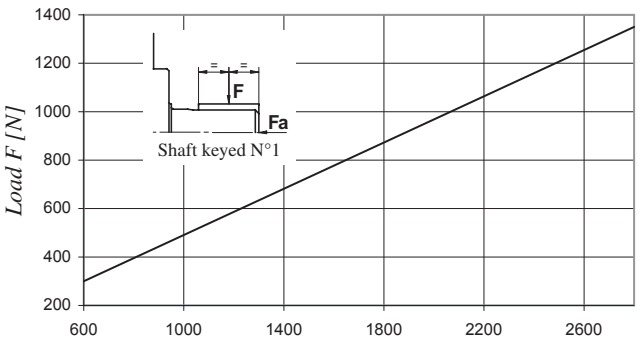
Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



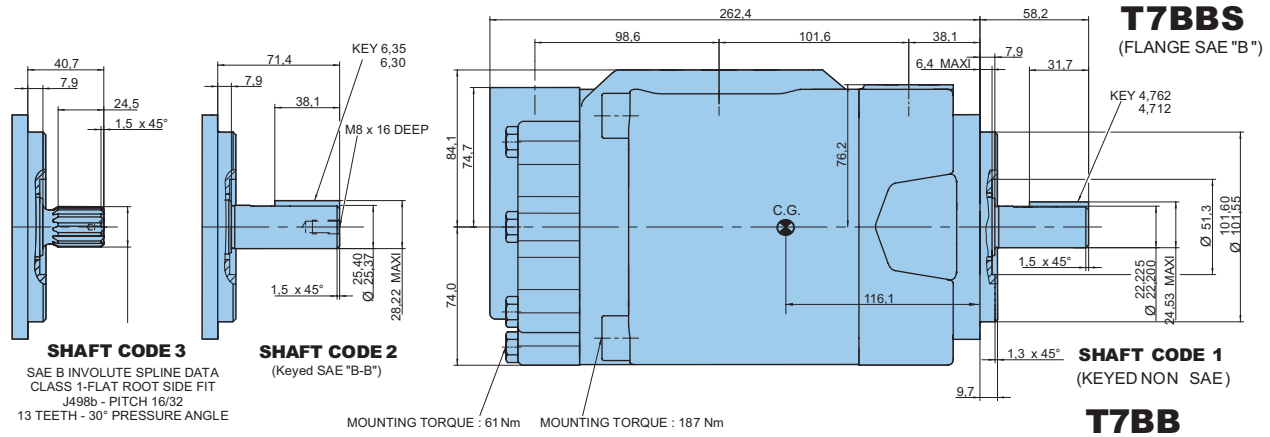
Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

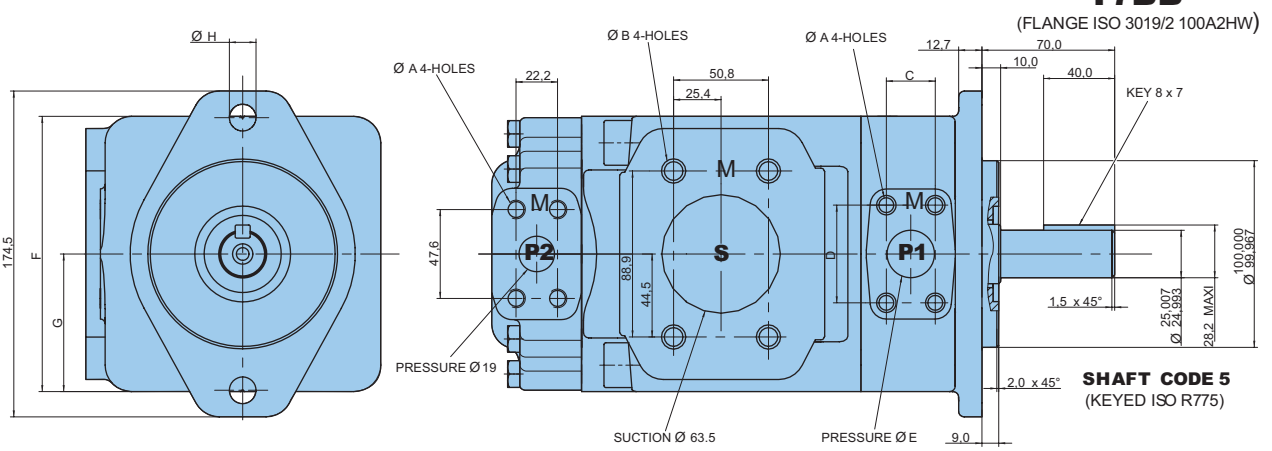
PERMISSIBLE RADIAL LOAD

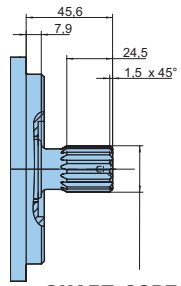


Maximum permissible axial load Fa = 800 N

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France







Shaft torque limits [ml/rev. x bar]	
Shaft	**Vi x p max.**
1	14300
2	21420
3	20600
4	32670
5	25300

Model	**T7BB**		**T7BBS**	
Code	**M0**	**M1**	**00**	**01**
Ø A	M10 x 19 deep		3/8"-16 UNC x 19 deep	
Ø B	M12 x 22,4 deep		1/2"-13 UNC x 22,4 deep	
C	26,20	22,25	26,20	22,25
D	52,4	47,65	52,4	47,65
Ø E	25,4	19,1	25,4	19,1
F	140		146	
G	70		73	
Ø H	14,0		14,3	

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{Vc} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 320 bar	p = 7 bar	p = 140 bar	p = 320 bar
P1 & P2	B02	5,8 ml/rev	8,7	7,0	4,8	0,5	2,6	5,4
	B03	9,8 ml/rev	14,7	13,0	10,8	0,6	4,0	8,6
	B04	12,8 ml/rev	19,2	17,5	15,3	0,6	5,0	11,0
	B05	15,9 ml/rev	23,9	22,2	20,0	0,7	6,1	13,5
	B06	19,8 ml/rev	29,7	28,0	25,8	0,7	7,5	16,6
	B07	22,5 ml/rev	33,7	32,0	29,9	0,8	8,5	18,8
	B08	24,9 ml/rev	37,4	35,7	33,5	0,8	9,3	20,7
	B09	28,0 ml/rev	42,0	40,3	38,1	0,9	10,4	23,2
	B10	31,8 ml/rev	47,7	46,0	43,8	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9[1)]	1,0	12,8	27,0[1)]
	B12	41,0 ml/rev	61,5	59,8	57,9[1)]	1,1	14,9	31,5[1)]
	B14	45,0 ml/rev	67,5	65,8	63,9[1)]	1,2	16,3	34,5[1)]
	B15	50,0 ml/rev	75,0	73,3	71,6[2)]	1,3	18,1	35,7[2)]

1) B11 - B12 - B14 = 300 bar max. int. 2) B15 = 280 bar max. int.

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Model No. T6CC W - 022 - 008 - 1 R 00 - C 1 00 - ..

Series - SAE B 2 bolts
J744 mounting flange

Severe duty shaft option

Displacement P1 and P2
Volumetric displacement (ml/rev.)

003 = 10,8	017 = 58,3
005 = 17,2	020 = 63,8
006 = 21,3	022 = 70,3
008 = 26,4	025 = 79,3
010 = 34,1	028 = 88,8
012 = 37,1	031 = 100,0
014 = 46,0	

Type of shaft
1 = keyed (non SAE)
3 = splined (SAE BB) 15 teeth
5 = splined (SAE B) 13 teeth

Severe duty shaft (T6CCW only)
2 = keyed (SAE BB)

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

Modifications

Mounting w/connection variables

	P1 = 1" - S = 3"			
	UNC thread		Metric thread	
	00	01	0M	W0
P2	1"	3/4"[1)]	1"	3/4

	P1 = 1" - S = 2.1/2"[2)]			
	UNC thread		Metric thread	
	10	11	1M	W1
P2	1"	3/4"[1)]	1"	3/4

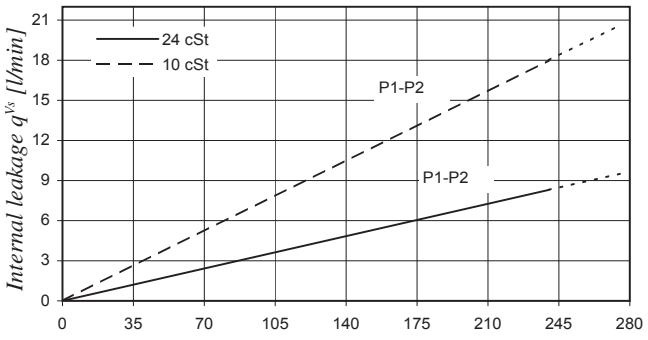
[1)] up to 46 ml/rev. max.
[2)] up to 126 ml/rev. max.
Always select the largest cartridge in the front place.

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see page 72)
00 = standard

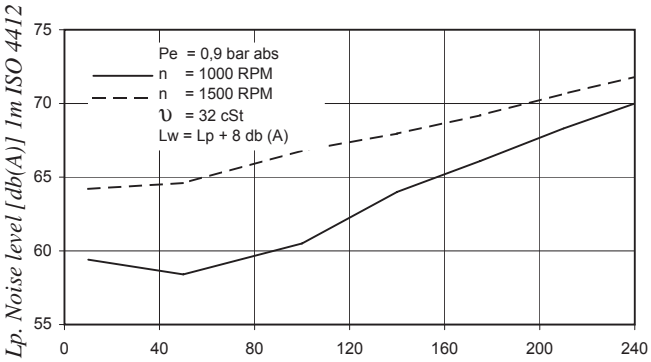
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

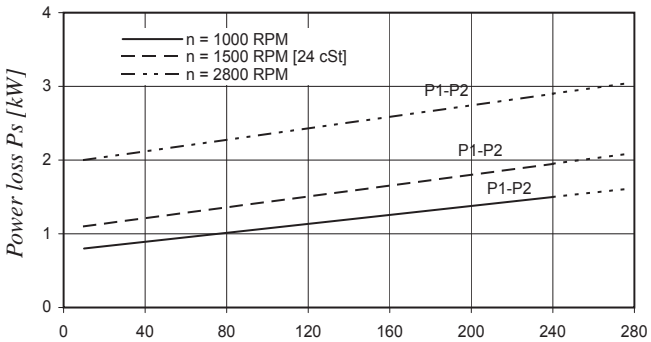
NOISE LEVEL (TYPICAL) - T6CC - 022 - 022



Pressure p [bar]

Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

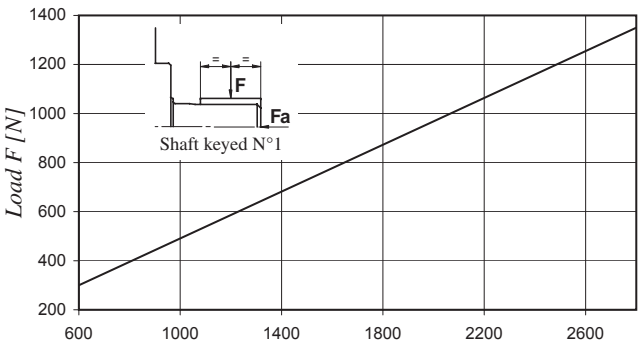
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

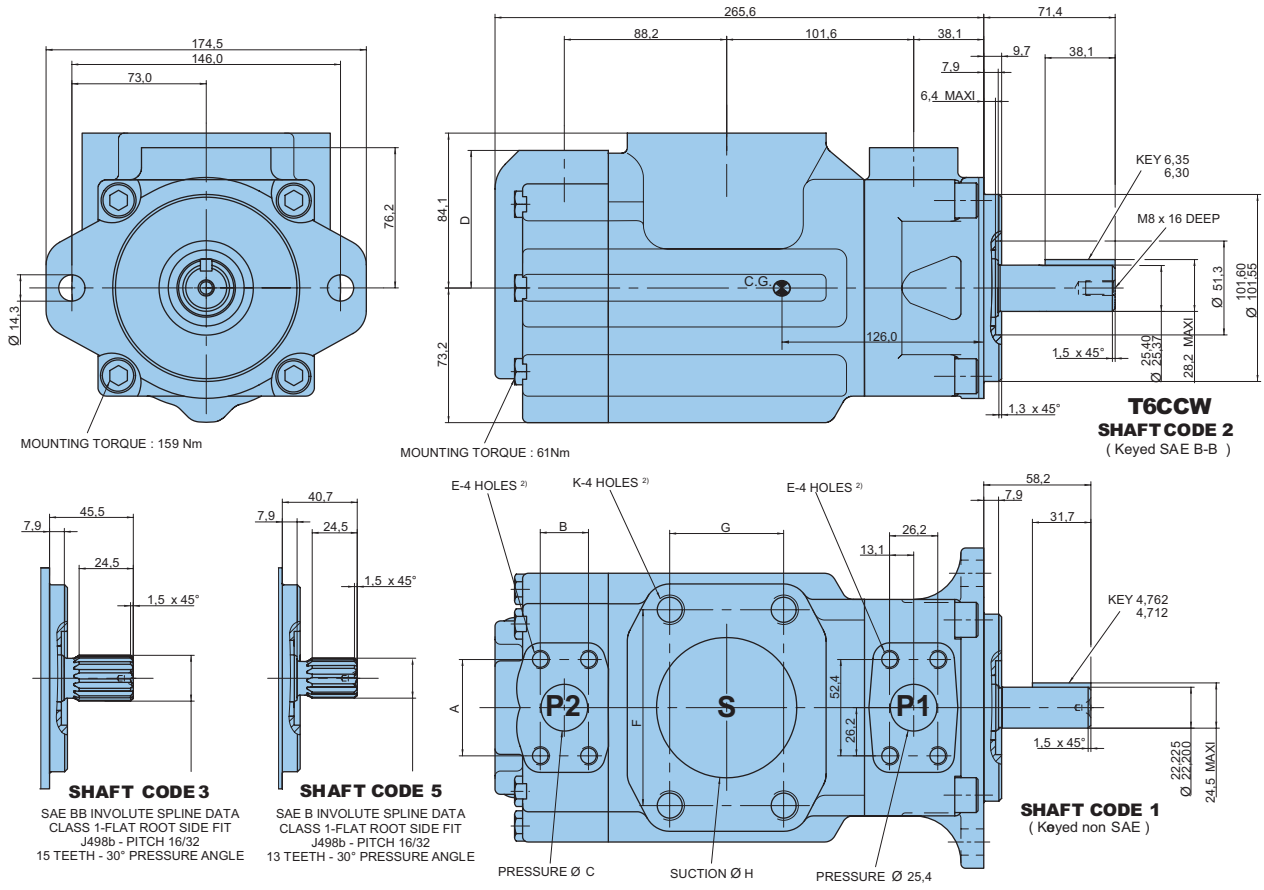
PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 800 N

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France



Alternate ports								
	S = 3"				S = 2.1/2"2)			
Code	00	01[1]	0M	W0[1]	10	11[1]	1M	W1[1]
A	52,4	47,7	52,4	47,7	52,4	47,7	52,4	47,7
B	26,2	22,4	26,2	22,4	26,2	22,4	26,2	22,4
Ø C	25,4	19,0	25,4	19,0	25,4	19,0	25,4	19,0
D	74,7	76,2	74,7	76,2	74,7	76,2	74,7	76,2
E	3/8"-16 UNC x 19 deep		M10 x 19 deep		3/8"-16 UNC x 19 deep		M10 x 19 deep	
F	106,4				88,9			
G	61,9				50,9			
Ø H	76,2				63,5			
K	5/8"-11UNC x 28,4 deep		M16 x 28,4 deep		1/2"-13 UNC x 23,9 deep		M12 x 23,9 deep	

Shaft torque limits [ml/rev. x bar]	
Shaft	**Vi x p max.**
1	14300
2	21420
3	32670
5	20600

1) Max. cam 014 *2) P1 + P2 = 126 ml/rev. max.*

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{v_e} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
P1 & P2	003	10,8 ml/rev	16,2	11,2	7,7	1,3	5,3	8,4
	005	17,2 ml/rev	25,8	20,8	17,3	1,4	7,5	12,2
	006	21,3 ml/rev	31,9	26,9	23,4	1,5	8,9	14,7
	008	26,4 ml/rev	39,6	34,6	31,1	1,6	10,7	17,7
	010	34,1 ml/rev	51,1	46,1	42,6	1,7	13,4	22,3
	012	37,1 ml/rev	55,6	50,6	47,1	1,7	14,4	24,1
	014	46,0 ml/rev	69,0	64,0	60,5	1,9	17,6	29,5
	017	58,3 ml/rev	87,4	82,4	78,9	2,1	21,9	36,9
	020	63,8 ml/rev	95,7	90,7	87,2	2,2	23,8	40,2
	022	70,3 ml/rev	105,4	100,4	96,9	2,3	26,1	44,1
	025	79,3 ml/rev	118,9	113,9	110,4	2,5	29,2	49,5
	028	88,8 ml/rev	133,2	128,2	125,8[1]	2,8	32,7	48,5[1]
	031	100,0 ml/rev	150,0	145,0	142,6[1]	2,8	36,5	54,4[1]

1) 028 - 031 = 210 bar max. int. *2) Port connection can be supplied with metric threads, please contact Parker.*

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VPDE, Denison Vane Pumps
Vierzon - France

Model No. **T67CB W - 010 - B10 - 1 R 00 - A 1 M1 - ..**

Series - SAE B 2 bolts
J744 mounting flange
Severe duty shaft

Displacement P1
Volumetric displacement (ml/rev.)
003 = 10,8 017 = 58,3
005 = 17,2 020 = 63,8
006 = 21,3 022 = 70,3
008 = 26,4 025 = 79,3
010 = 34,1 028 = 88,8
012 = 37,1 031 = 100,0
014 = 46,0

Displacement P2
Volumetric displacement (ml/rev.)
B02 = 5,8 B09 = 28,0
B03 = 9,8 B10 = 31,8
B04 = 12,8 B11 = 35,0
B05 = 15,9 B12 = 41,0
B06 = 19,8 B14 = 45,0
B07 = 22,5 B15 = 50,0
B08 = 24,9

Type of shaft
1 = keyed (non SAE)
3 = splined (SAE BB) 15 teeth
5 = splined (SAE B) 13 teeth

Severe duty shaft (T67CW only)
2 = keyed (SAE BB)

Modifications

Mounting w/connection variables
11 = 4 bolts SAE flange
(J518) UNC thread
M1 = 4 bolts SAE flange
(J518) Metric thread

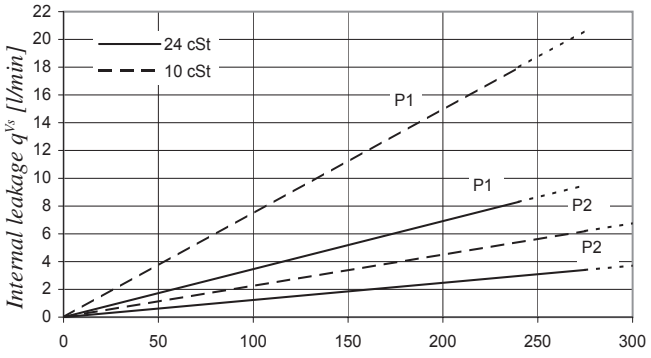
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination(see page 72)
00 = standard

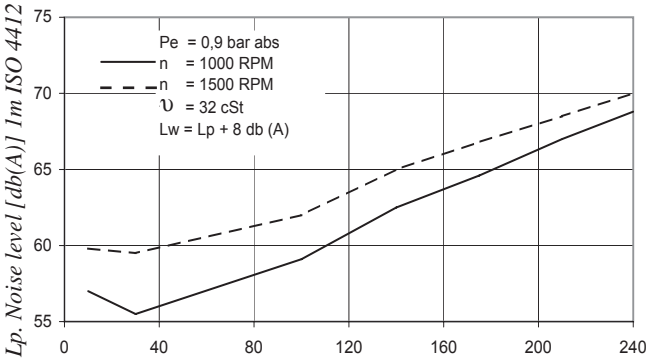
Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

INTERNAL LEAKAGE (TYPICAL)



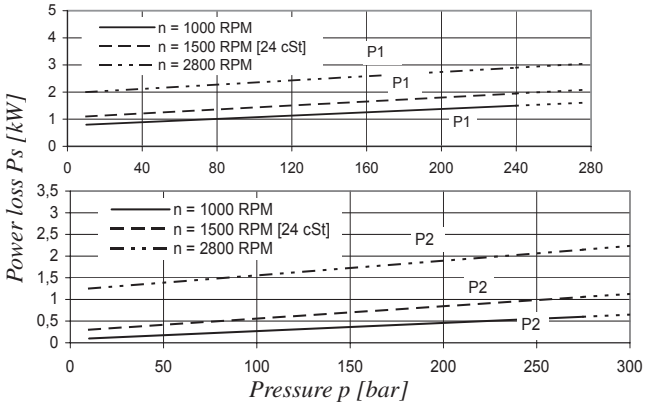
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T67CB - 014 - B03



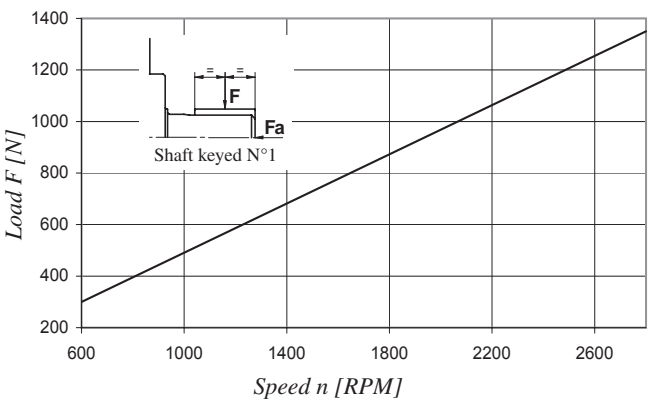
Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



Total hydromechanical power loss is the sum of each section loss under its respective operaring conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 800 N

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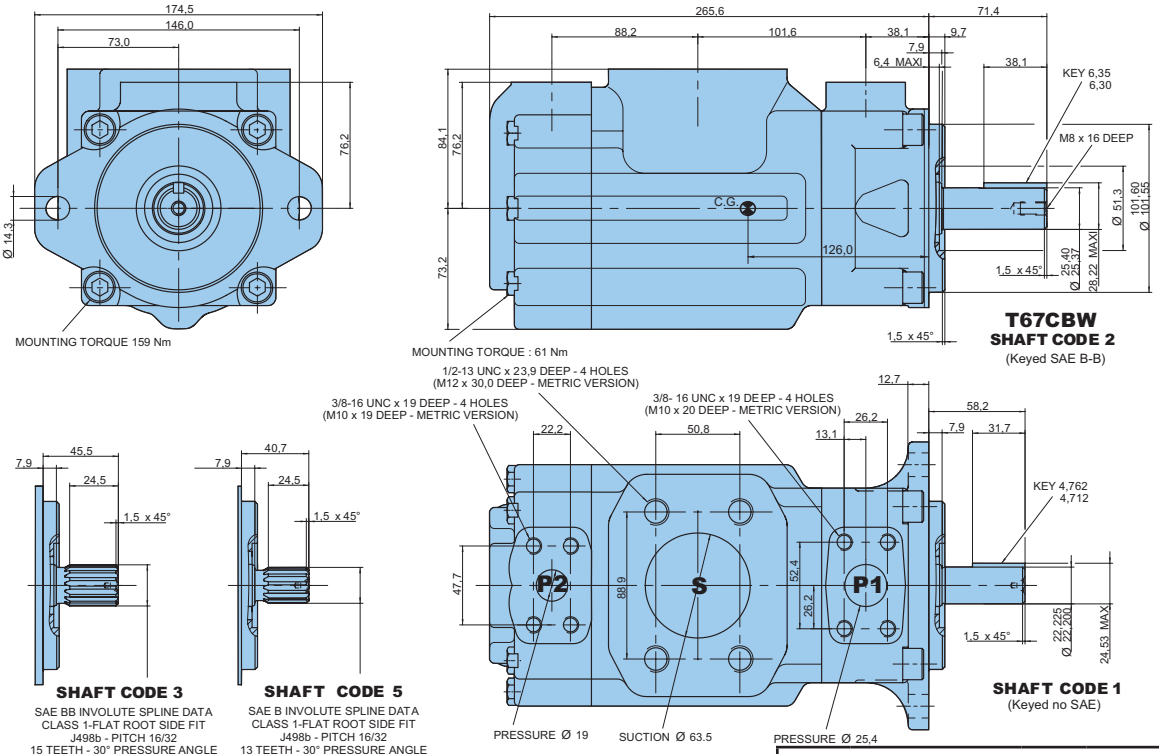
T67CB - Dimensions - Weight : 26,0 kg



Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max.	Shaft	Vi x p max.
1	14300	3	32670
2	21420	5	20600

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{Ve} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 275 bar	p = 7 bar	p = 140 bar	p = 275 bar
P1	003	10,8 ml/rev	16,2	11,2	*	1,3	5,3	*
	005	17,2 ml/rev	25,8	20,8	16,1	1,4	7,5	13,9
	006	21,3 ml/rev	31,9	26,9	22,2	1,5	8,9	16,8
	008	26,4 ml/rev	39,6	34,6	29,9	1,6	10,7	20,3
	010	34,1 ml/rev	51,1	46,1	41,4	1,7	13,4	25,6
	012	37,1 ml/rev	55,6	50,6	45,9	1,7	14,4	27,6
	014	46,0 ml/rev	69,0	64,0	59,3	1,9	17,6	33,7
	017	58,3 ml/rev	87,4	82,4	77,7	2,1	21,9	42,2
	020	63,8 ml/rev	95,7	90,7	86,0	2,2	23,8	46,0
	022	70,3 ml/rev	105,4	100,4	95,7	2,3	26,1	50,4
	025	79,3 ml/rev	118,9	113,9	109,2	2,5	29,2	56,6
	028	88,8 ml/rev	133,2	128,2	125,8[1)]	2,8	32,7	48,5[1)]
	031	100,0 ml/rev	150,0	145,0	142,6[1)]	2,8	36,5	54,4[1)]
			p = 0 bar	p = 140 bar	p = 300 bar	p = 7 bar	p = 140 bar	p = 300 bar
P2	B02	5,8 ml/rev	8,7	7,0	5,1	0,5	2,6	5,1
	B03	9,8 ml/rev	14,7	13,0	11,1	0,6	4,0	8,1
	B04	12,8 ml/rev	19,2	17,5	15,6	0,6	5,0	10,4
	B05	15,9 ml/rev	23,9	22,2	20,2	0,7	6,1	12,7
	B06	19,8 ml/rev	29,7	28,0	26,1	0,7	7,5	15,6
	B07	22,5 ml/rev	33,7	32,0	30,2	0,8	8,5	17,6
	B08	24,9 ml/rev	37,4	35,7	33,7	0,8	9,3	19,5
	B09	28,0 ml/rev	42,0	40,3	38,4	0,9	10,4	21,8
	B10	31,8 ml/rev	47,7	46,0	44,1	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9	1,0	12,8	27,0
	B12	41,0 ml/rev	61,5	59,8	57,9	1,1	14,9	31,5
	B14	45,0 ml/rev	67,5	65,8	63,9	1,2	16,3	34,5
	B15	50,0 ml/rev	75,0	73,3	71,6[2)]	1,3	18,1	35,7[2)]

** We do not recommand to use the size 003 in P1 at 275 bar & 1500 RPM as the internal is over 50% of theoretical flow.*

[1)] 028 - 031 = 210 bar max. int. *[2)] B15 = 280 bar max.int.*

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France

Model No. **T7DB or T7DBS - B42 - B10 - 1 R 00 - A 1 M1 - ..**

T7DB series - 125 A2 HW
ISO 2 bolts 3019-2 mounting flange
T7DBS series - SAE C 2 bolts
J744 mounting flange

P1 P2

Displacement P1
Volumetric displacement (ml/rev.)

B14 = 44,0	B31 = 99,2
B17 = 55,0	B35 = 113,4
B20 = 66,0	B38 = 120,6
B22 = 70,3	B42 = 137,5
B24 = 81,1	045 = 145,7
B28 = 90,0	050 = 158,0

Displacement P2
Volumetric displacement (ml/rev.)

B02 = 5,8	B09 = 28,0
B03 = 9,8	B10 = 31,8
B04 = 12,8	B11 = 35,0
B05 = 15,9	B12 = 41,0
B06 = 19,8	B14 = 45,0
B07 = 22,5	B15 = 50,0
B08 = 24,9	

Type of shaft T7DBS
1 = keyed (SAE C) 3 = splined (SAE C) 14 teeth
2 = keyed (non SAE) 4 = splined (spec. SAE C)
Type of shaft T7DB - T7DBS
5 = keyed (ISO 3019 -2 - G32 M)

Modifications

Mounting w/connection variables
4 bolts SAE flanges J518

	Metric thread T7DB - T7DBS		UNC thread T7DBS	
	M0	M1	00	01
P1	1.1/4"	1.1/4"	1.1/4"	1.1/4"
P2	1"	3/4"	1"	3/4"
S	3"	3"	3"	3"

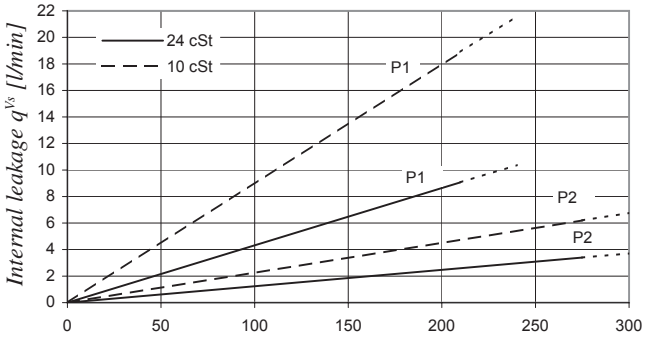
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see page 72)
00 = standard

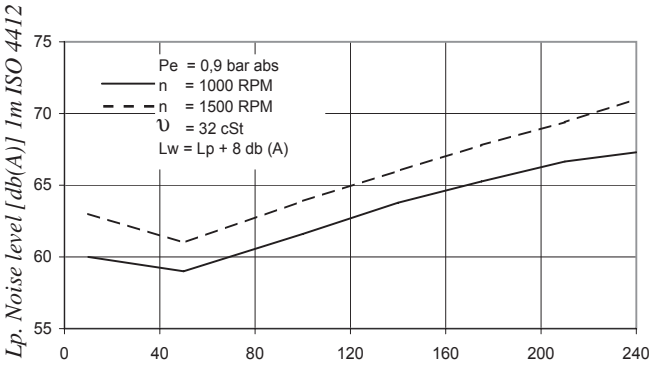
Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

INTERNAL LEAKAGE (TYPICAL)



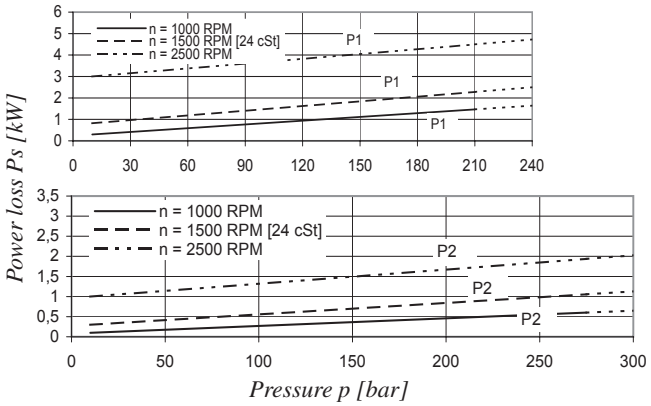
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T7DBS - B31 - B10



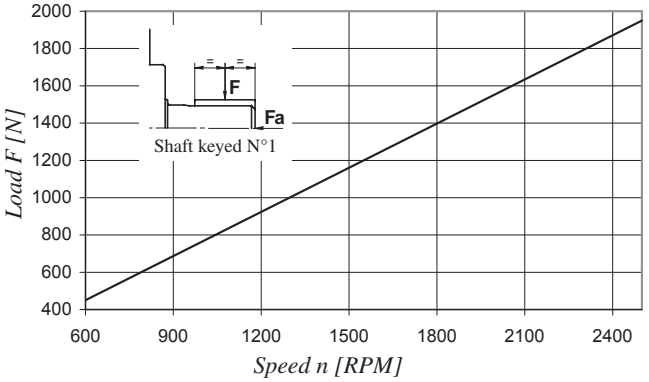
Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



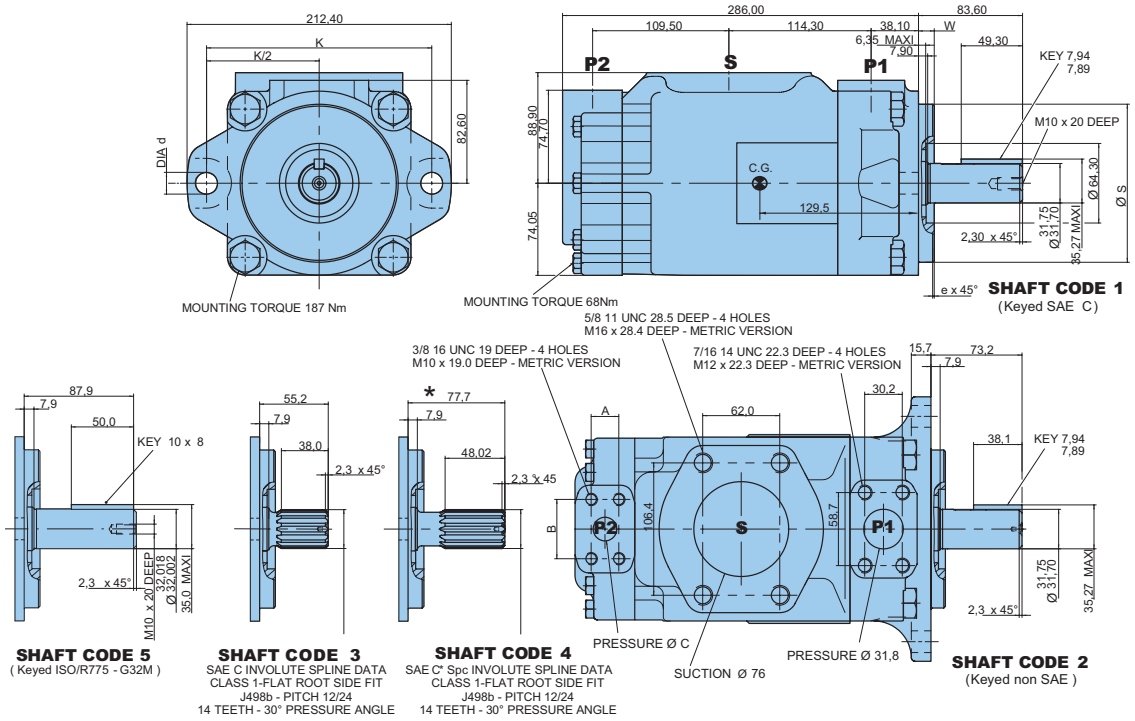
Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 1200 N

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France



Alternate mounting flange						
	Dia S		e x 45°	W	K	Dia d
	Max.	Min.				
T7DB	125,000	124,937	2,0	9,5	180,0	18,0
T7DBS	127,000	126,950	1,3	12,7	181,0	17,5

Alternate connect. variables		
	00 & M0	01 & M1
A	26,20	22,20
B	52,35	47,6
C	25,00	19,0

Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max.	Shaft	Vi x p max.
1	43240	4	61200
2	34590	5	42500
3	61200		

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{v_e} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P1	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[1)]	4,1	52,8	89,5[1)]
	050	158,0 ml/rev	237,0	227,7	223,0[2)]	4,4	57,1	85,0[2)]
			p = 0 bar	**p = 140 bar**	**p = 300 bar**	**p = 7 bar**	**p = 140 bar**	**p = 300 bar**
P2	B02	5,8 ml/rev	8,7	7,0	5,1	0,5	2,6	5,1
	B03	9,8 ml/rev	14,7	13,0	11,1	0,6	4,0	8,1
	B04	12,8 ml/rev	19,2	17,5	15,6	0,6	5,0	10,4
	B05	15,9 ml/rev	23,9	22,2	20,2	0,7	6,1	12,7
	B06	19,8 ml/rev	29,7	28,0	26,1	0,7	7,5	15,6
	B07	22,5 ml/rev	33,7	32,0	30,2	0,8	8,5	17,6
	B08	24,9 ml/rev	37,4	35,7	33,7	0,8	9,3	19,5
	B09	28,0 ml/rev	42,0	40,3	38,4	0,9	10,4	21,8
	B10	31,8 ml/rev	47,7	46,0	44,1	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9	1,0	12,8	27,0
	B12	41,0 ml/rev	61,5	59,8	57,9	1,1	14,9	31,5
	B14	45,0 ml/rev	67,5	65,8	63,9	1,2	16,3	34,5
	B15	50,0 ml/rev	75,0	73,3	71,6[3)]	1,3	18,1	35,7[3)]

[1)] 045 = 240 bar max. int. *[2)] 050 = 210 bar max. int.* *[3)] B15 = 280 bar max. int.*

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VPDE, Denison Vane Pumps
Vierzon - France

Model No. **T67DC W - B42 - 010 - 1 R 00 - A 1 M1 - ..**

Series - SAE C 2 bolts
J744 mounting flange

Severe duty shaft option

Displacement P1
Volumetric displacement (ml/rev.)
B14 = 44,0 B31 = 99,2
B17 = 55,0 B35 = 113,4
B20 = 66,0 B38 = 120,6
B22 = 70,3 B42 = 137,5
B24 = 81,1 045 = 145,7
B28 = 90,0 050 = 158,0

Displacement P2
Volumetric displacement (ml/rev.)
003 = 10,8 017 = 58,3
005 = 17,2 020 = 63,8
006 = 21,3 022 = 70,3
008 = 26,4 025 = 79,3
010 = 34,1 028 = 88,8
012 = 37,1 031 = 100,0
014 = 46,0

Type of shaft
1 = keyed (SAE C) 3 = splined (SAE C) 14 teeth
2 = keyed (non SAE) 4 = splined (spec. SAE C)
Type of shaft - Severe duty (T67DCW only)
5 = keyed (non SAE)

Modifications

Mounting w/connection variables
4 bolts SAE flanges J518

	Metric thread		UNC thread	
	M0	M1	00	01
P1	1.1/4"	1.1/4"	1.1/4"	1.1/4"
P2	1"	3/4"	1"	3/4"
S	3"	3"	3"	3"

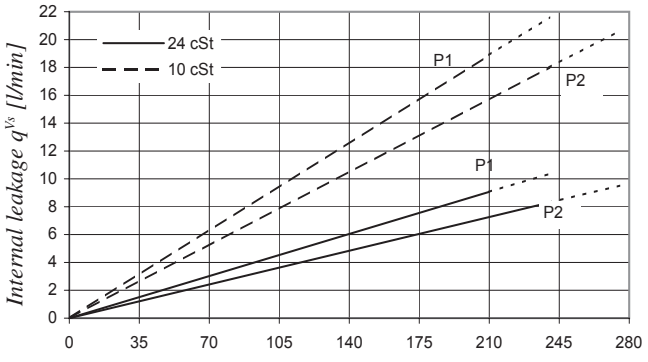
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see page 72)
00 = standard

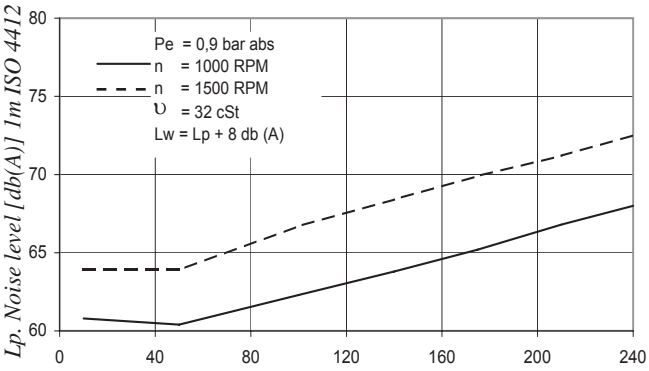
Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

INTERNAL LEAKAGE (TYPICAL)



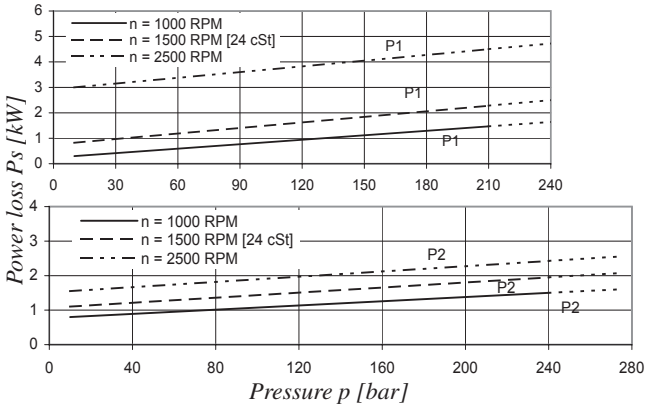
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T67DC - B31 - 022



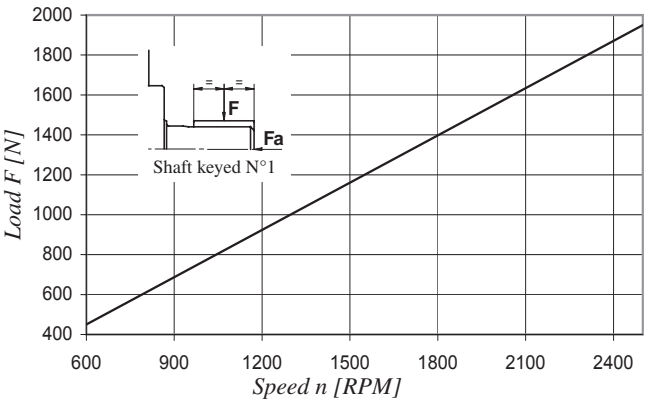
Double pump noise level is given with both stages section discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 1200 N

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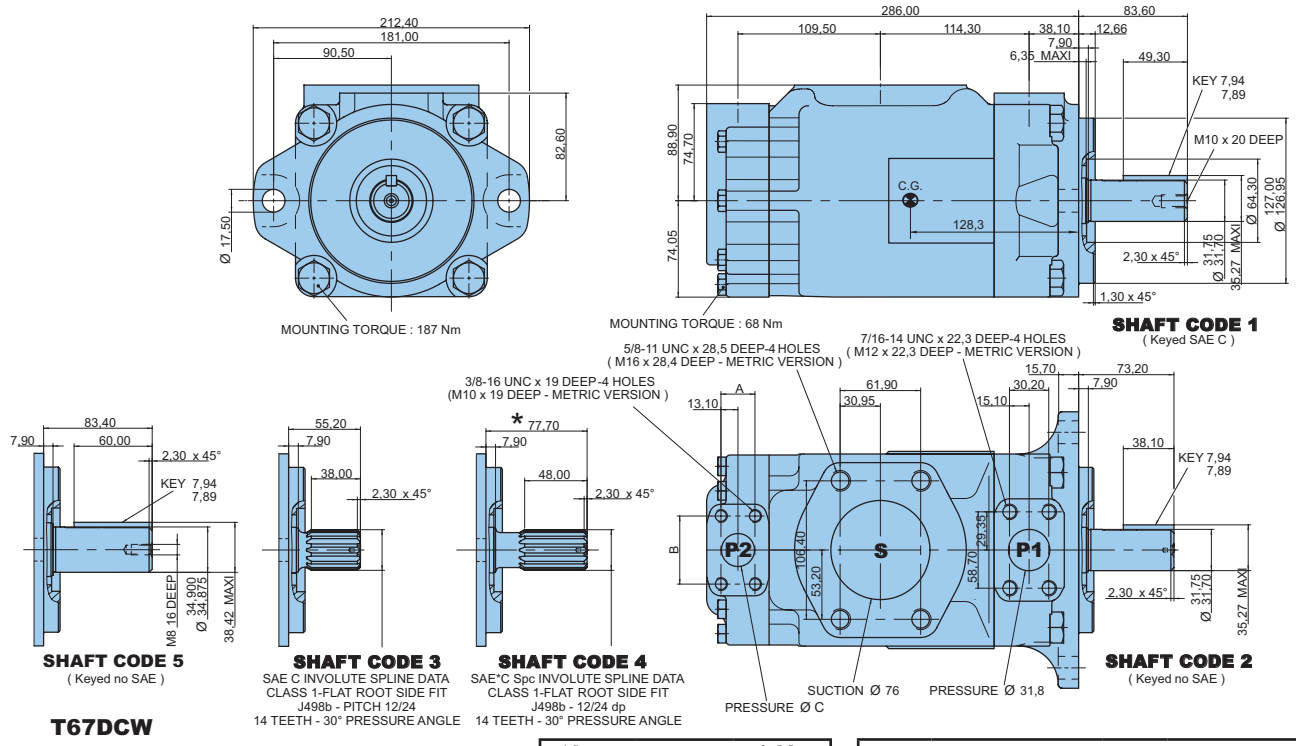
T67DC - Dimensions - Weight : 38,6 kg



Alternate connect. variables		
	00 & M0	01 & M1
A	26,20	22,20
B	52,35	47,60
C	25,00	19,00

Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max.	Shaft	Vi x p max.
1	43240	4	61200
2	34590	5	55600
3	61200		

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{Vc} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P1	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[2)]	4,1	52,8	89,5[2)]
	050	158,0 ml/rev	237,0	227,7	223,0[1)]	4,4	57,1	85,0[1)]
			p = 0 bar	p = 140 bar	p = 275 bar	p = 7 bar	p = 140 bar	p = 275 bar
P2	003	10,8 ml/rev	16,2	11,2	*	1,3	5,3	*
	005	17,2 ml/rev	25,8	20,8	16,1	1,4	7,5	13,9
	006	21,3 ml/rev	31,9	26,9	22,2	1,5	8,9	16,8
	008	26,4 ml/rev	39,6	34,6	29,9	1,6	10,7	20,3
	010	34,1 ml/rev	51,1	46,1	41,4	1,7	13,4	25,6
	012	37,1 ml/rev	55,6	50,6	45,9	1,7	14,4	27,6
	014	46,0 ml/rev	69,0	64,0	59,3	1,9	17,6	33,7
	017	58,3 ml/rev	87,4	82,4	77,7	2,1	21,9	42,2
	020	63,8 ml/rev	95,7	90,7	86,0	2,2	23,8	46,0
	022	70,3 ml/rev	105,4	100,4	95,7	2,3	26,1	50,4
	025	79,3 ml/rev	118,9	113,9	109,2	2,5	29,2	56,6
	028	88,8 ml/rev	133,2	128,2	125,8[1)]	2,8	32,7	48,5[1)]
	031	100,0 ml/rev	150,0	145,0	142,6[1)]	2,8	36,5	54,4[1)]

** We do not recommand to use the size 003 in P2 at 275 bar & 1500 RPM as the internal leakage is over 50% of theoretical flow.*

[1)] 050 - 028 - 031 = 210 bar max. int. *[2)] 045 = 240 bar max. int.*

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Model No. **T7DD or T7DDS - B42 - B22 - 1 R 00 - A 1 M0 - ..**

T7DD series - ISO 6 bolts 3019-2
Mounting flange 125-A2-HW or 125-B4 HW
T7DDS series - SAE C 6 bolts
J744 mounting flange

P1 P2

Displacement P1 & P2
Volumetric displacement (ml/rev.)

B14 = 44,0	B31 = 99,2
B17 = 55,0	B35 = 113,4
B20 = 66,0	B38 = 120,6
B22 = 70,3	B42 = 137,5
B24 = 81,1	045 = 145,7
B28 = 90,0	050 = 158,0

Type of shaft T7DDS
1 = keyed (SAE C) 3 = splined (SAE C) 14 teeth
2 = keyed (SAE CC) 4 = splined (SAE BB)
Type of shaft - T7DD and T7DDS
5 = keyed (ISO 3019-2 - G32M)

Modifications

Mounting w/connection variables
4 bolts SAE flanges J518

	P1 & P2 = 1.1/4" - S = 4"	
Type	**Metric thread**	**UNC thread**
T7DD	M0	
T7DDS	M0	00

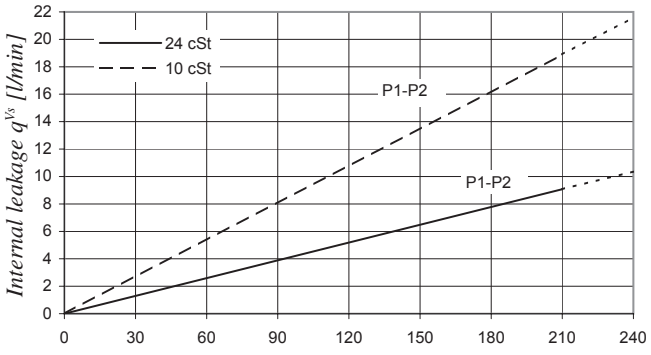
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see page 72)
00 = standard

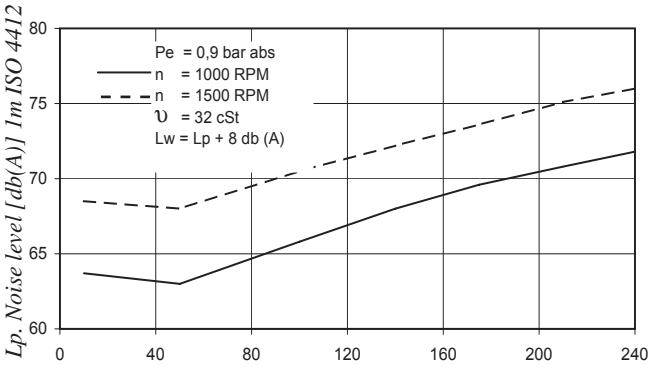
Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

INTERNAL LEAKAGE (TYPICAL)



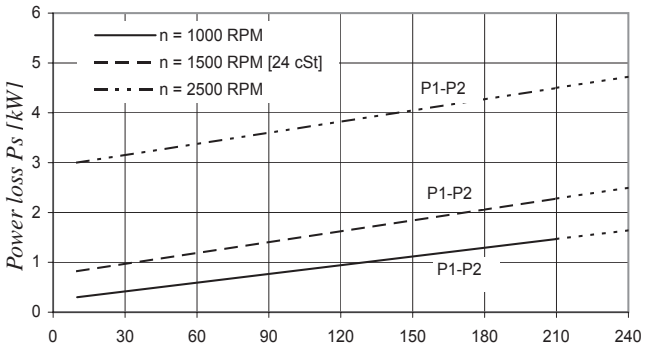
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T7DDS - B31 - B31



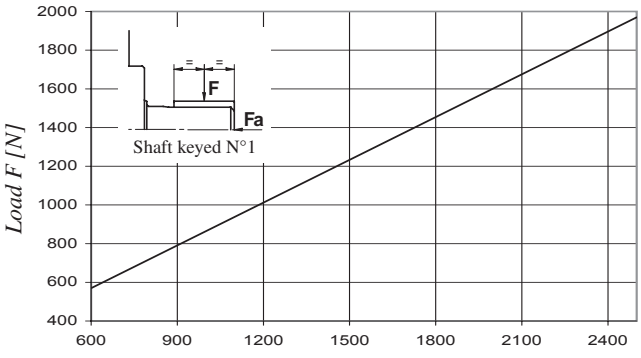
Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



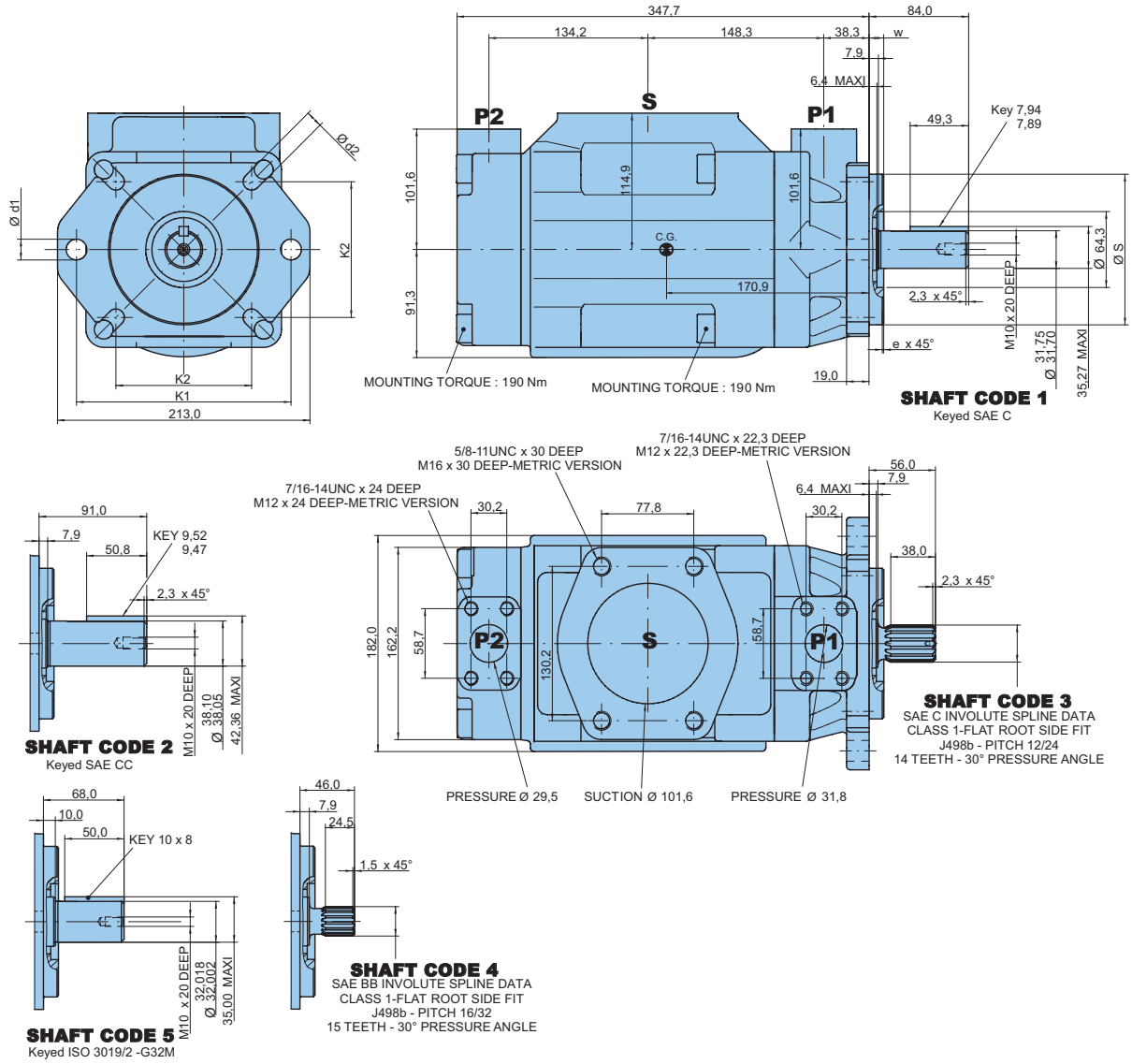
Total hydromechanical power loss is the sum of each section loss under its respective operaring conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 1200 N

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France



Alternate mounting flange								
Series	Dia S		e x 45°	W	K1	Dia d1	K2	Dia d2
	Max.	Min.						
T7DD	125,000	124,937	2,0	9,5	180,0	18,0	113,14	14,0
T7DDS	127,000	126,950	1,3	12,7	181,0	17,5	114,50	14,3

Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max.	Shaft	Vi x p max.
1	43240	4	35880
2	71750	5	45200
3	61200		

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{vc} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P1 & P2	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[1)]	4,1	52,8	89,5[1)]
	050	158,0 ml/rev	237,0	227,7	223,0[2)]	4,4	57,1	85,0[2)]

[1)] *045 = 240 bar max. int.* [2)] *050 = 210 bar max. int.*

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France

Model No. **T7EB or T7EBS - 042 - B12 - 1 R 00 - A 1 M1 - ..**

T7EB series - ISO 2 bolts 3019-2
Mounting flange 125-A2 HW
T7EBS series - SAE C 2 bolts
J744 mounting flange

P1 P2

Displacement P1
Volumetric displacement (ml/rev.)

042 = 132,3	057 = 183,3
045 = 142,4	062 = 196,7
050 = 158,5	066 = 213,3
052 = 164,8	072 = 227,1
054 = 171,0	085 = 268,7

Displacement P2
Volumetric displacement (ml/rev.)

B02 = 5,8	B09 = 28,0
B03 = 9,8	B10 = 31,8
B04 = 12,8	B11 = 35,0
B05 = 15,9	B12 = 41,0
B06 = 19,8	B14 = 45,0
B07 = 22,5	B15 = 50,0
B08 = 24,9	

Type of shaft T7EBS

1 = keyed (SAE CC)	3 = splined (SAE C) 14 teeth
2 = keyed (non SAE)	4 = splined (SAE CC)

Type of shaft T7EB - T7EBS
5 = keyed (ISO /R 775 - G38 M)

Modifications

Mounting w/connection variables
4 bolts SAE flanges J518

P1 = 1.1/2" - P2 = 3/4" - S = 3.1/2"		
	Metric thread T7EB - T7EBS	**UNC thread T7EBS**
Code	M1	01

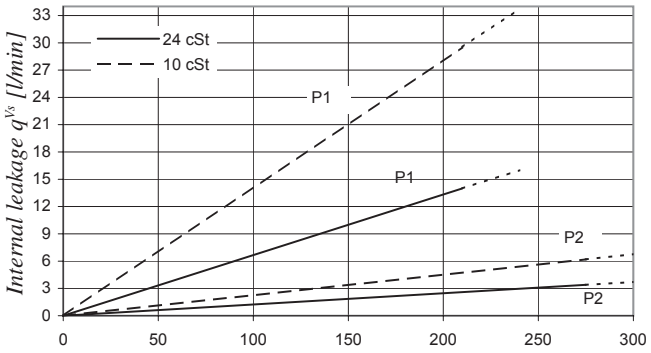
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see page 72)
00 = standard

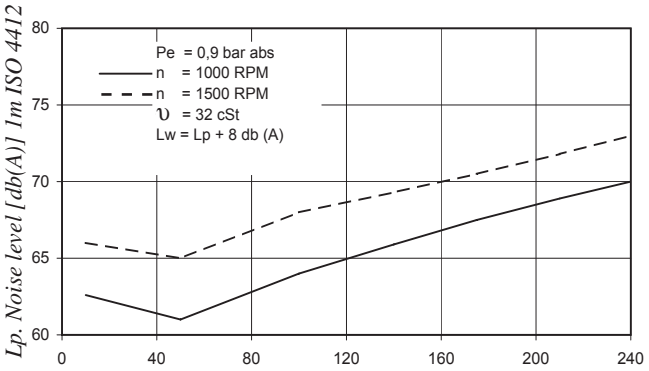
Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

INTERNAL LEAKAGE (TYPICAL)



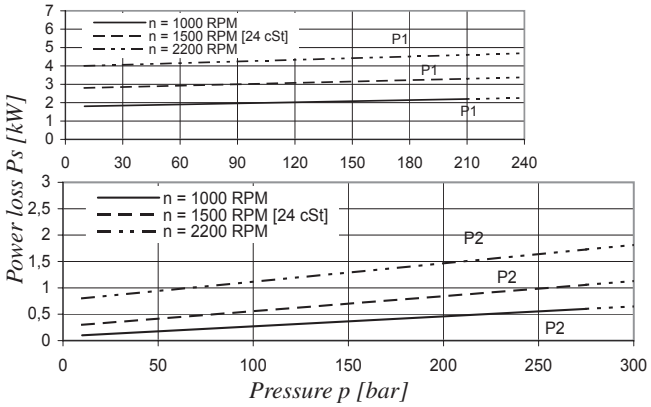
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T7EBS - 050 - B03



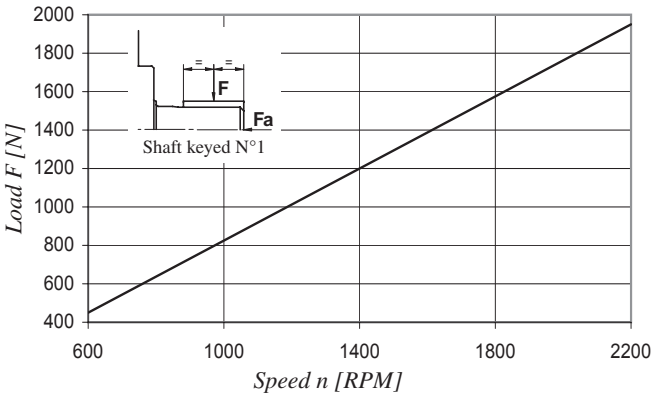
Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

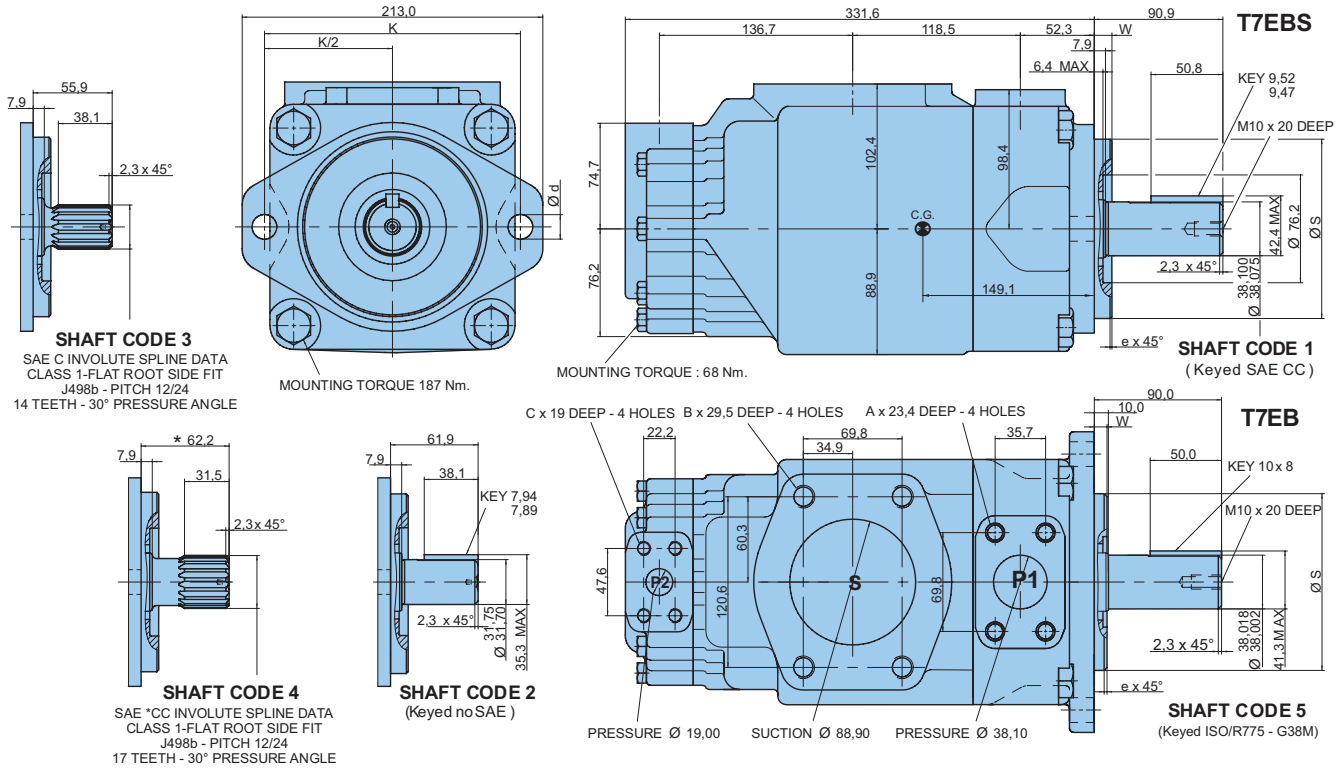
PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 2000 N

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France

T7EB/EBS - Dimensions - Weight : 55,0 kg
T7/T67/T6C Industrial, Denison Vane Pumps



Alternate mounting flange						
	Dia S		e x 45°	W	K	Dia d
	Max.	Min.				
T7EB	125,000	124,937	2,0	9,5	180,0	18,0
T7EBS	127,000	126,950	1,3	12,7	181,0	17,5

Alternate connect. variables		
	01	M1
A	1/2" - 13 UNC	M12
B	5/8" - 11 UNC	M16
C	3/8" - 16 UNC	M10

Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max.	Shaft	Vi x p max.
1	68500	4	68500
2	34590	5	68500
3	61200		

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{Vc} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
P1	042	132,3 ml/rev	198,5	188,5	181,3	5,2	49,4	82,6
	045	142,4 ml/rev	213,6	203,6	196,5	5,4	52,9	88,7
	050	158,5 ml/rev	237,7	227,7	220,6	5,7	58,5	98,3
	052	164,8 ml/rev	247,2	237,2	230,1	5,8	60,8	102,1
	054	171,0 ml/rev	256,5	246,5	239,4	5,9	63,0	105,8
	057	183,3 ml/rev	275,0	265,0	257,9	6,1	67,3	113,2
	062	196,7 ml/rev	295,0	285,0	277,9	6,4	71,9	121,3
	066	213,3 ml/rev	319,9	309,0	302,8	6,7	77,7	131,2
	072	227,1 ml/rev	340,6	330,6	323,5	6,9	82,6	139,5
	085	268,7 ml/rev	403,0	392,0[1)]	-	9,1	65,8[1)]	-
			p = 0 bar	p = 140 bar	p = 300 bar	p = 7 bar	p = 140 bar	p = 300 bar
P2	B02	5,8 ml/rev	8,7	7,0	5,1	0,5	2,6	5,1
	B03	9,8 ml/rev	14,7	13,0	11,1	0,6	4,0	8,1
	B04	12,8 ml/rev	19,2	17,5	15,6	0,6	5,0	10,4
	B05	15,9 ml/rev	23,9	22,2	20,2	0,7	6,1	12,7
	B06	19,8 ml/rev	29,7	28,0	26,1	0,7	7,5	15,6
	B07	22,5 ml/rev	33,7	32,0	30,2	0,8	8,5	17,6
	B08	24,9 ml/rev	37,4	35,7	33,7	0,8	9,3	19,5
	B09	28,0 ml/rev	42,0	40,3	38,4	0,9	10,4	21,8
	B10	31,8 ml/rev	47,7	46,0	44,1	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9	1,0	12,8	27,0
	B12	41,0 ml/rev	61,5	59,8	57,9	1,1	14,9	31,5
	B14	45,0 ml/rev	67,5	65,8	63,9	1,2	16,3	34,5
	B15	50,0 ml/rev	75,0	73,3	71,6[2)]	1,3	18,1	35,7[2)]

[1)] 085 = 90 bar max. int. *[2)] B15 = 280 bar max.int.*

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Model No. **T67EC - 085 - 020 - 1 R 00 - A 1 00 - ..**

Series - SAE C 2 bolts
J744 mounting flange

P1 P2

Displacement P1
Volumetric displacement (ml/rev.)
042 = 132,3 057 = 183,3
045 = 142,4 062 = 196,7
050 = 158,5 066 = 213,3
052 = 164,8 072 = 227,1
054 = 171,0 085 = 268,7

Displacement P2
Volumetric displacement (ml/rev.)
003 = 10,8 017 = 58,3
005 = 17,2 020 = 63,8
006 = 21,3 022 = 70,3
008 = 26,4 025 = 79,3
010 = 34,1 028 = 88,8
012 = 37,1 031 = 100,0
014 = 46,0

Type of shaft
1 = keyed (SAE CC)
2 = keyed (non SAE)
3 = splined (SAE C) 14 teeth
4 = splined (SAE CC) 17 teeth

Modifications

Mounting w/connection variables
4 bolts SAE flanges J518

	Metric thread		UNC thread	
Code	M0	M1	00	01
P1	1.1/2"	1.1/2"	1.1/2"	1.1/2"
P2	1"	3/4"	1"	3/4"
S	3.1/2"	3.1/2"	3.1/2"	3.1/2"

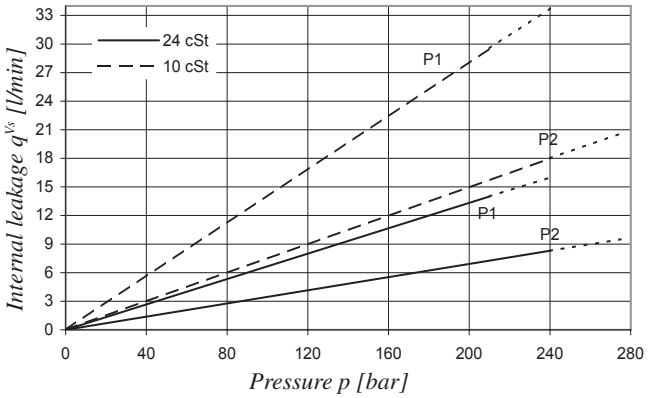
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see page 72)
00 = standard

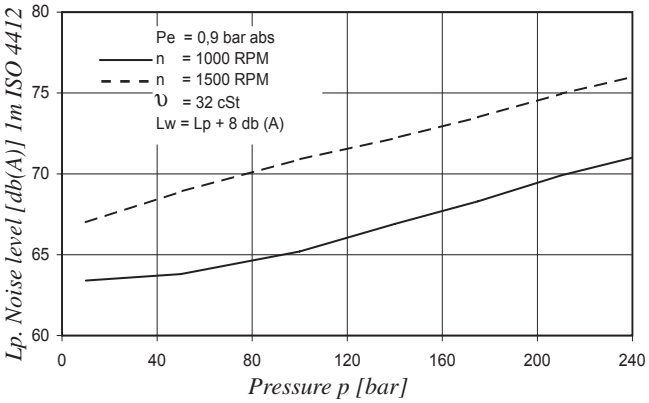
Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

INTERNAL LEAKAGE (TYPICAL)



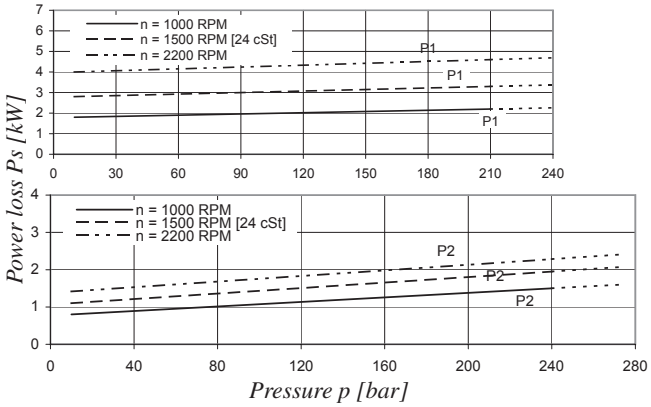
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T67EC - 050 - 022



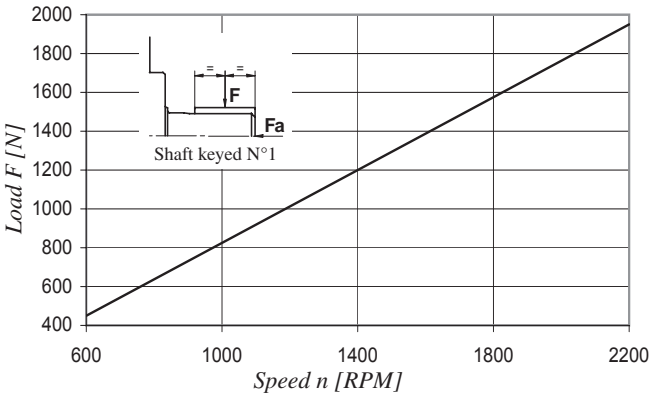
Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 2000 N

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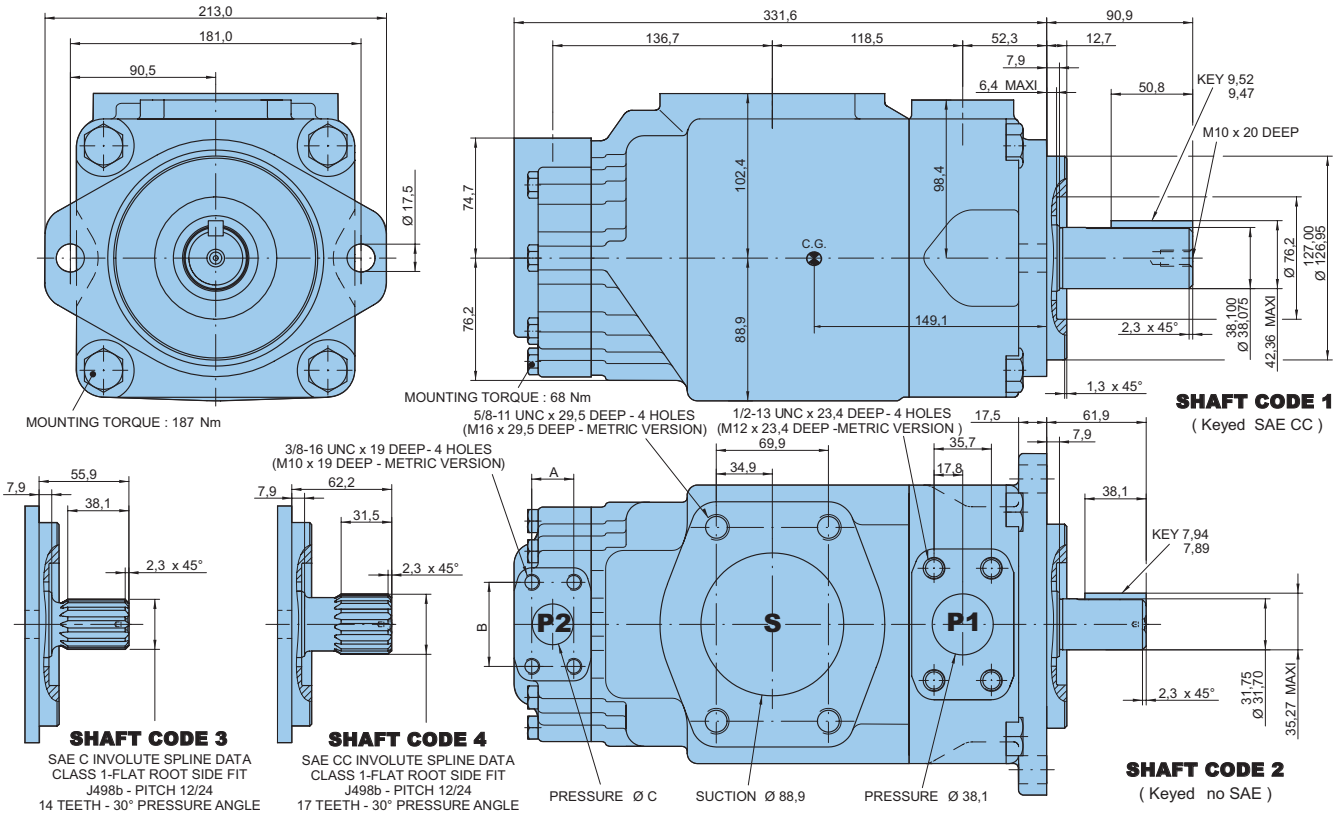
T67EC - Dimensions - Weight : 55,0 kg



Alternate connect. variables		
	00 & M0	01 & M1
A	26,20	22,20
B	52,35	47,60
C	25,40	19,05

Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max.	Shaft	Vi x p max.
1	72300	3	61200
2	34590	4	76300

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{v_e} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
P1	042	132,3 ml/rev	198,5	188,5	181,3	5,2	49,4	82,6
	045	142,4 ml/rev	213,6	203,6	196,5	5,4	52,9	88,7
	050	158,5 ml/rev	237,7	227,7	220,6	5,7	58,5	98,3
	052	164,8 ml/rev	247,2	237,2	230,1	5,8	60,8	102,1
	054	171,0 ml/rev	256,5	246,5	239,4	5,9	63,0	105,8
	057	183,3 ml/rev	275,0	265,0	257,9	6,1	67,3	113,2
	062	196,7 ml/rev	295,0	285,0	277,9	6,4	71,9	121,3
	066	213,3 ml/rev	319,9	309,0	302,8	6,7	77,7	131,2
	072	227,1 ml/rev	340,6	330,6	323,5	6,9	82,6	139,5
	085	268,7 ml/rev	403,0	392,0[1)]	-	9,1	65,8[1)]	-
			p = 0 bar	p = 140 bar	p = 275 bar	p = 7 bar	p = 140 bar	p = 275 bar
P2	003	10,8 ml/rev	16,2	11,2	*	1,3	5,3	*
	005	17,2 ml/rev	25,8	20,8	16,1	1,4	7,5	13,9
	006	21,3 ml/rev	31,9	26,9	22,2	1,5	8,9	16,8
	008	26,4 ml/rev	39,6	34,6	29,9	1,6	10,7	20,3
	010	34,1 ml/rev	51,1	46,1	41,4	1,7	13,4	25,6
	012	37,1 ml/rev	55,6	50,6	45,9	1,7	14,4	27,6
	014	46,0 ml/rev	69,0	64,0	59,3	1,9	17,6	33,7
	017	58,3 ml/rev	87,4	82,4	77,7	2,1	21,9	42,2
	020	63,8 ml/rev	95,7	90,7	86,0	2,2	23,8	46,0
	022	70,3 ml/rev	105,4	100,4	95,7	2,3	26,1	50,4
	025	79,3 ml/rev	118,9	113,9	109,2	2,5	29,2	56,6
	028	88,8 ml/rev	133,2	128,2	125,8[2)]	2,8	32,7	48,5[2)]
	031	100,0 ml/rev	150,0	145,0	142,6[2)]	2,8	36,5	54,4[2)]

** We do not recommand to use the size 003 in P2 at 275 bar & 1500 RPM as the internal leakage is over 50% of theoretical flow.*

[1)] 085 = 90 bar max. int. [2)] 028 - 031 = 210 bar max.int.

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Model No. **T7ED or T7EDS - 042 - B22 - 1 R 00 - A 1 M0 - ..**

T7ED series - ISO 2 bolts 3019-2 mounting flange 125 A2 HW
T7EDS series - SAE C 2 bolts J744 mounting flange

P1 P2

Displacement P1
Volumetric displacement (ml/rev.)

042 = 132,3	057 = 183,3
045 = 142,4	062 = 196,7
050 = 158,5	066 = 213,3
052 = 164,8	072 = 227,1
054 = 171,0	085 = 268,7

Displacement P2
Volumetric displacement (ml/rev.)

B14 = 44,0	B31 = 99,2
B17 = 55,0	B35 = 113,4
B20 = 66,0	B38 = 120,6
B22 = 70,3	B42 = 137,5
B24 = 81,1	045 = 145,7
B28 = 90,0	050 = 158,0

Type of shaft T7EDS

1 = keyed (SAE CC)	3 = splined (SAE C) 14 teeth
2 = keyed (non SAE)	4 = splined (SAE CC) 17 teeth

Type of shaft T7ED - T7EDS
5 = keyed (ISO R775 - G38M)

Modifications

Mounting w/connection variables
4 bolts SAE flanges J518

P1 = 1.1/2" - P2 = 1.1/4" - S = 4"		
	T7ED - T7EDS	**T7EDS**
Type	**Metric thread**	**UNC thread**
Code	M0	00

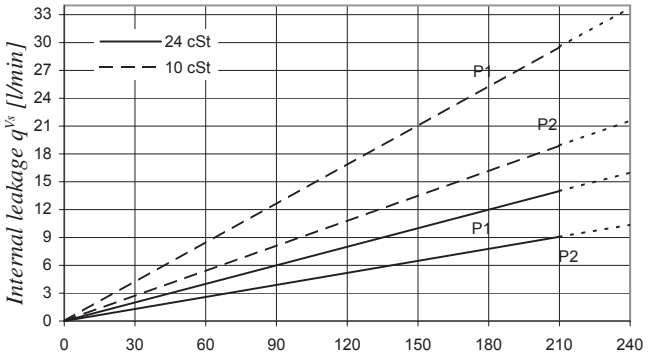
Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see page 72)
00 = standard

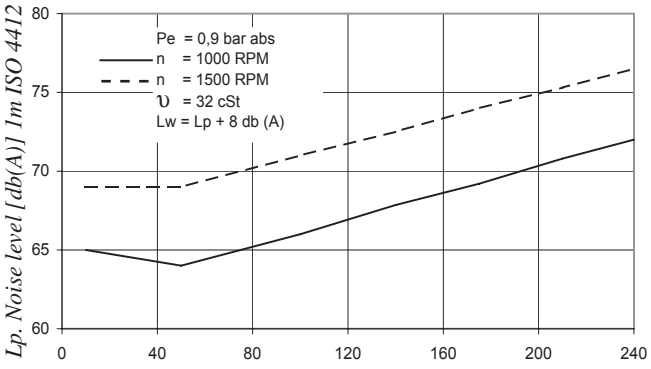
Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

INTERNAL LEAKAGE (TYPICAL)



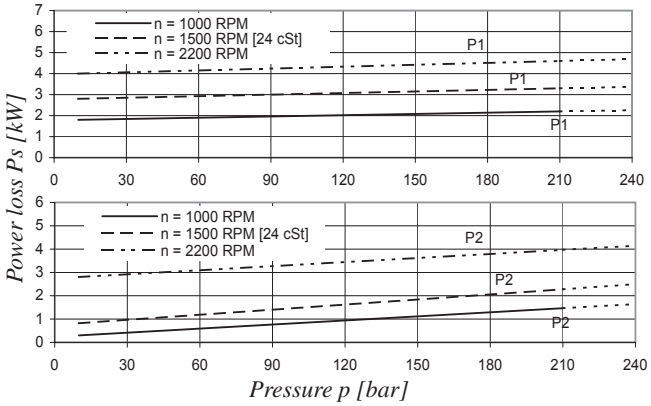
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T7EDS - 050 - B31



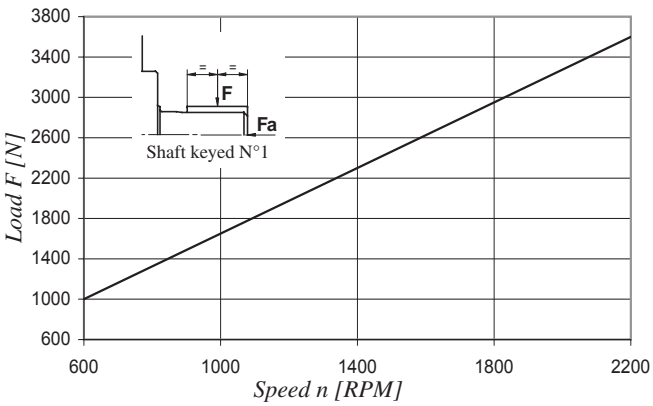
Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 2000 N

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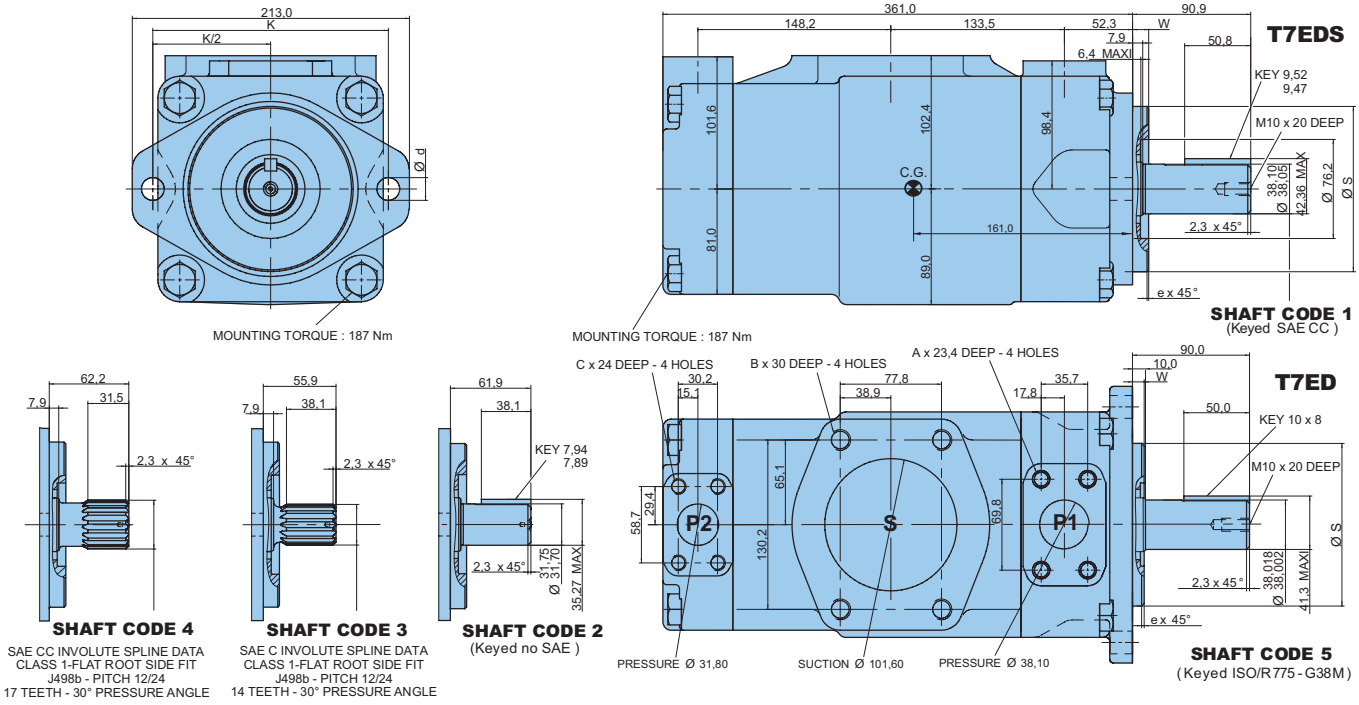

Alternate mounting flange						
	Dia S		e x 45°	W	K	Dia d
	Max.	Min.				
T7ED	125,000	124,937	2,0	9,5	180,0	18,0
T7EDS	127,000	126,950	1,3	12,7	181,0	17,5

Alternate connect. variables		
	00	M0
A	1/2" - 13 UNC	M12
B	5/8" - 11 UNC	M16
C	7/16" - 14 UNC	M12

Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max.	Shaft	Vi x p max.
1	72300	4	68500
2	34590	5	68500
3	61200		

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{Vc} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
P1	042	132,3 ml/rev	198,5	188,5	181,3	5,2	49,4	82,6
	045	142,4 ml/rev	213,6	203,6	196,5	5,4	52,9	88,7
	050	158,5 ml/rev	237,7	227,7	220,6	5,7	58,5	98,3
	052	164,8 ml/rev	247,2	237,2	230,1	5,8	60,8	102,1
	054	171,0 ml/rev	256,5	246,5	239,4	5,9	63,0	105,8
	057	183,3 ml/rev	275,0	265,0	257,9	6,1	67,3	113,2
	062	196,7 ml/rev	295,0	285,0	277,9	6,4	71,9	121,3
	066	213,3 ml/rev	319,9	309,0	302,8	6,7	77,7	131,2
	072	227,1 ml/rev	340,6	330,6	323,5	6,9	82,6	139,5
	085	268,7 ml/rev	403,0	392,0[1)]	-	9,1	65,8[1)]	-
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P2	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[3)]	4,1	52,8	89,5[3)]
	050	158,0 ml/rev	237,0	227,7	223,0[2)]	4,4	57,1	85,0[2)]

[1)] 085 = 90 bar max. int. [2)] 050 = 210 bar max. int. [3)] 045 = 240 bar max. int.

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Vierzon - France

Model No. **T7EE or T7EES - 066 - 045 - 1 R 00 - A 1 0 00 - ..**

T7EE series - ISO 4 bolts 3019-2
Mounting flange 250 B4 HW
T7EES series - SAE E 4 bolts
J744 mounting flange

P1 P2

Displacement P1 & P2
Volumetric displacement (ml/rev.)

042 = 132,3	057 = 183,3
045 = 142,4	062 = 196,7
050 = 158,5	066 = 213,3
052 = 164,8	072 = 227,1
054 = 171,0	085 = 268,7

Type of shaft T7EES
1 = keyed (SAE CC)
3 = splined (SAE CC) 17 teeth
4 = splined (SAE D & E) 13 teeth
5 = keyed (SAE D & E)

Type of shaft T7EE
2 = keyed (ISO 3019-2 - G45N)

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

Modifications

Mounting w/connection variables
4 bolts SAE flanges J518

P1 & P2 = 1.1/2" - S = 4"		
	T7EE - T7EES	**T7EES**
Type	**Metric thread**	**UNC thread**
Code	M0	00

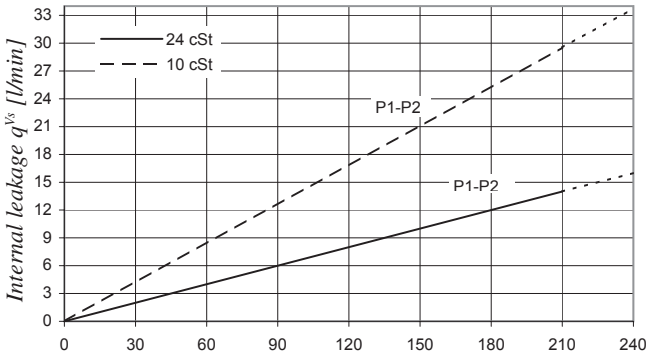
Coupling adaptor
0 = none
2 = SAE B
3 = SAE BB
* for SAE C, please contact Parker

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

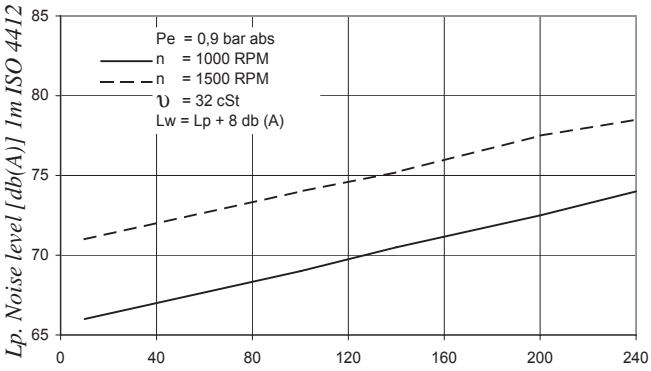
Porting combination (see page 72)
00 = standard

INTERNAL LEAKAGE (TYPICAL)



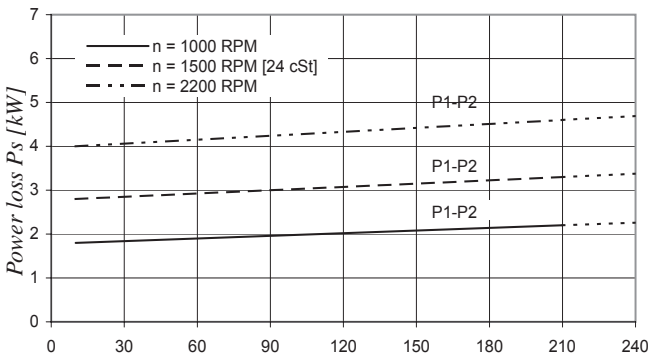
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T7EE - 050 - 050



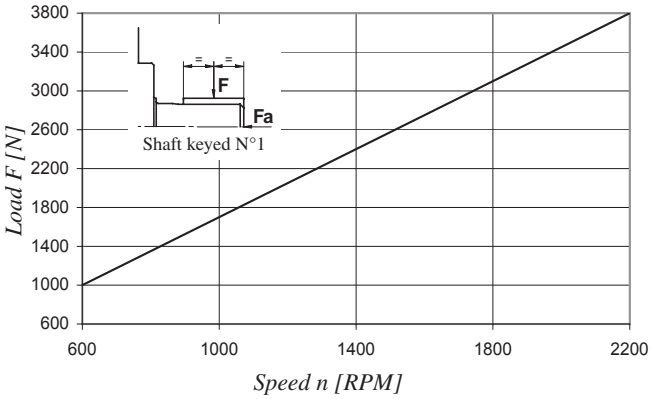
Double pump noise level is given with both stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 2000 N

Parker Hannifin SAS
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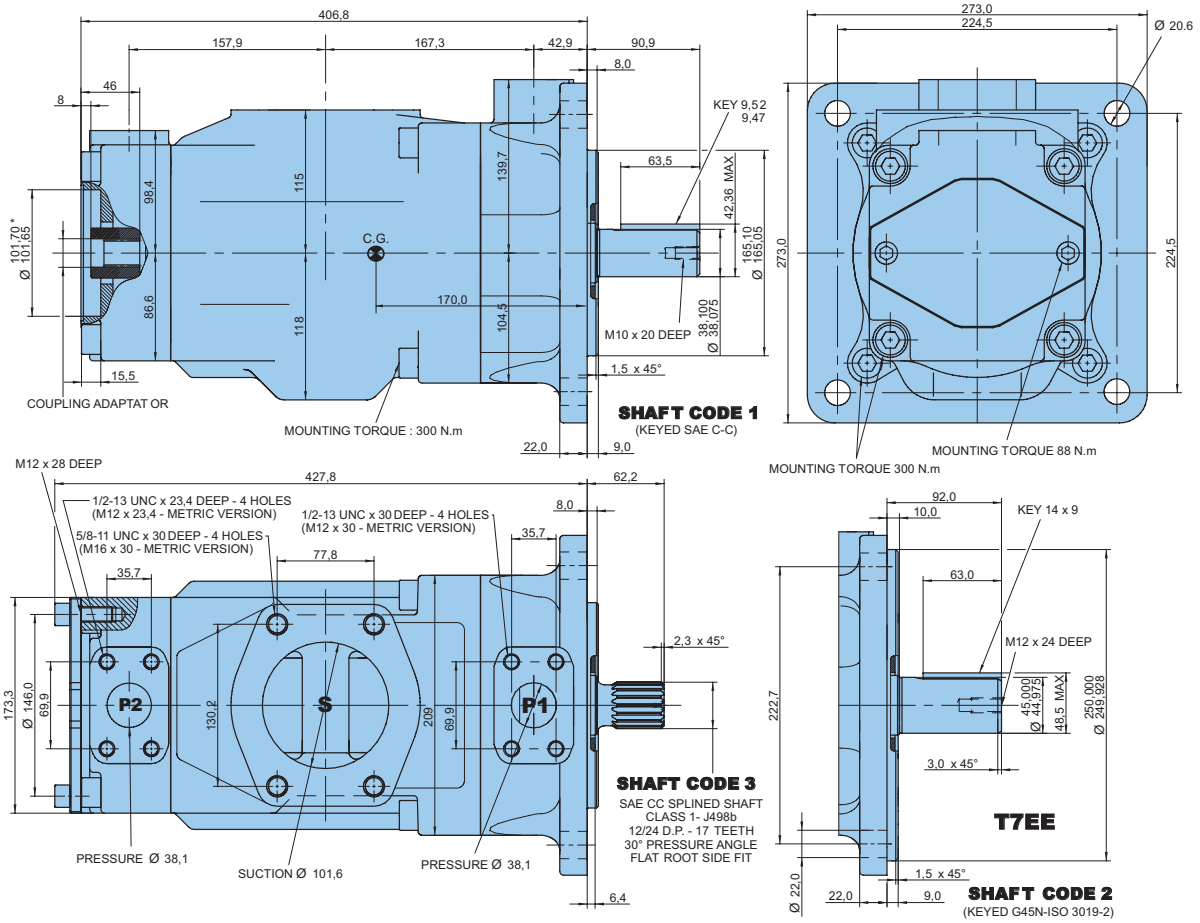
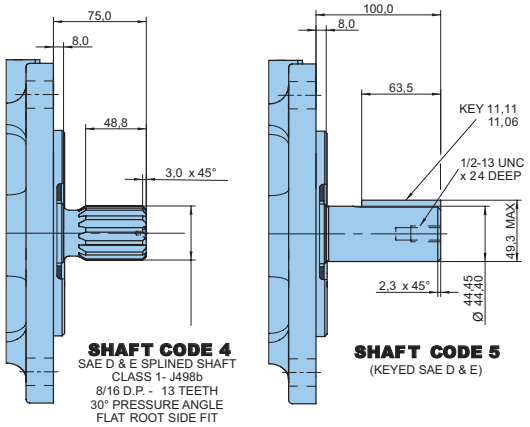


Code	Coupling adaptor
0	Without coupling
2	SAE B - 13 teeth - Pitch 16/32 Major dia. (min) 22,225 - Minor dia. (min) 19,134
3	SAE BB - 15 teeth - Pitch 16/32 Major dia. (min.) 25,400 - Minor dia. (min.) 22,268

Shaft torque limits [ml/rev. x bar]			
Shaft	**Vi x p max.**	**Coupling drive**	**Vi x p max.**
1	90380	SAE B	20600
2	114600	SAE BB	32670
3	126800		
4	126800		
5	118340		



OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{ve} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
P1 & P2	042	132,3 ml/rev	198,5	188,5	181,3	5,2	49,4	82,6
	045	142,4 ml/rev	213,6	203,6	196,5	5,4	52,9	88,7
	050	158,5 ml/rev	237,7	227,7	220,6	5,7	58,5	98,3
	052	164,8 ml/rev	247,2	237,2	230,1	5,8	60,8	102,1
	054	171,0 ml/rev	256,5	246,5	239,4	5,9	63,0	105,8
	057	183,3 ml/rev	275,0	265,0	257,9	6,1	67,3	113,2
	062	196,7 ml/rev	295,0	285,0	277,9	6,4	71,9	121,3
	066	213,3 ml/rev	319,9	309,0	302,8	6,7	77,7	131,2
	072	227,1 ml/rev	340,6	330,6	323,5	6,9	82,6	139,5
	085	268,7 ml/rev	403,0	392,0[1)]	-	9,1	65,8[1)]	-

[1)] *085 = 90 bar max. int.*

** For SAE C, please contact Parker.*

Parker Hannifin SAS
VPDE, Denison Vane Pumps
Vierzon - France

Model No. **T7DBB or T7DBBS - B38 - B14 - B08 - 1 R 00 - A 1 - M1 - ..**

T7DBB series - ISO 6 bolts 3019-2
Mounting flange 125-A2-HW or 125-B4-HW

T7DBBS series - SAE C 6 bolts
J744 mounting flange

P1 **P2** **P3**

Displacement for "P1"
Volumetric displacement (ml/rev)

B14 = 44,0	B31 = 99,2
B17 = 55,0	B35 = 113,4
B20 = 66,0	B38 = 120,6
B22 = 70,3	B42 = 137,5
B24 = 81,1	045 = 145,7
B28 = 90,0	050 = 158,0

Displacement for "P2" & "P3"
Volumetric displacement (ml/rev)

B02 = 5,8	B09 = 28,0
B03 = 9,8	B10 = 31,8
B04 = 12,8	B11 = 35,0
B05 = 15,9	B12 = 41,0
B06 = 19,8	B14 = 45,0
B07 = 22,5	B15 = 50,0
B08 = 24,9	

Type of shaft T7DBBS
1 = keyed (non SAE)
2 = keyed (SAE CC)
3 = splined 12/24 (SAE C) (14 teeth)
4 = splined 12/24 (SAE CC) (17 teeth)

Type of shaft T7DBB & T7DBBS
5 = keyed (ISO 3019/2 - G38M)

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

P1 = 1.1/4" - P2 = 1" - S = 4"		
	Metric thread	**UNC thread**
T7DBB-P3 = 3/4"	M1	
T7DBBS-P3 = 3/4"	M1	01
T7DBB-P3 = 1"	M0	
T7DBBS-P3 = 1"	M0	00

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see pages 72 - 73)
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{vo} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P1	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[1)]	4,1	52,8	89,5[1)]
	050	158,0 ml/rev	237,0	227,7	223,0[2)]	4,4	57,1	85,0[2)]
			p = 0 bar	**p = 140 bar**	**p = 300 bar**	**p = 7 bar**	**p = 140 bar**	**p = 300 bar**
P2 & P3	B02	5,8 ml/rev	8,7	7,0	5,1	0,5	2,6	5,1
	B03	9,8 ml/rev	14,7	13,0	11,1	0,6	4,0	8,1
	B04	12,8 ml/rev	19,2	17,5	15,6	0,6	5,0	10,4
	B05	15,9 ml/rev	23,9	22,2	20,2	0,7	6,1	12,7
	B06	19,8 ml/rev	29,7	28,0	26,1	0,7	7,5	15,6
	B07	22,5 ml/rev	33,7	32,0	30,2	0,8	8,5	17,6
	B08	24,9 ml/rev	37,4	35,7	33,7	0,8	9,3	19,5
	B09	28,0 ml/rev	42,0	40,3	38,4	0,9	10,4	21,8
	B10	31,8 ml/rev	47,7	46,0	44,1	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9	1,0	12,8	27,0
	B12	41,0 ml/rev	61,5	59,8	57,9	1,1	14,9	31,5
	B14	45,0 ml/rev	67,5	65,8	63,9	1,2	16,3	34,5
	B15	50,0 ml/rev	75,0	73,3	71,6[3)]	1,3	18,1	35,7[3)]

[1)] 045 = 240 bar max. int. *[2)] 050 = 210 bar max. int.* *[3)] B15 = 280 bar max. int.*

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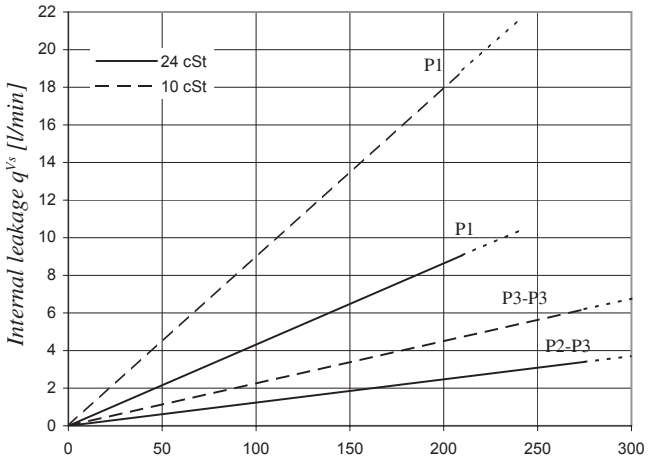
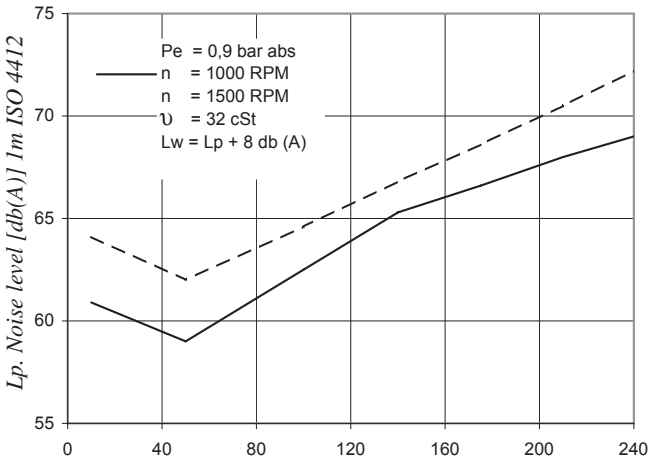
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

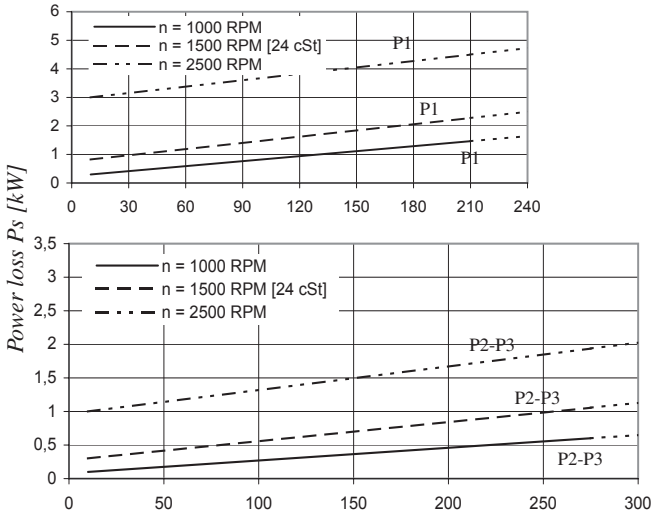
NOISE LEVEL (TYPICAL) - T7DBB - B38 - B06 - B04



Pressure p [bar]

Triple pump noise level is given with all stages discharging at the pressure value indicated on the curve.

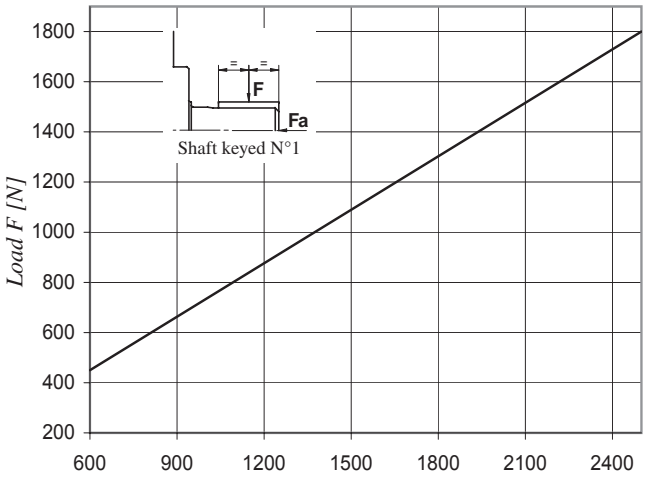
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 1200 N

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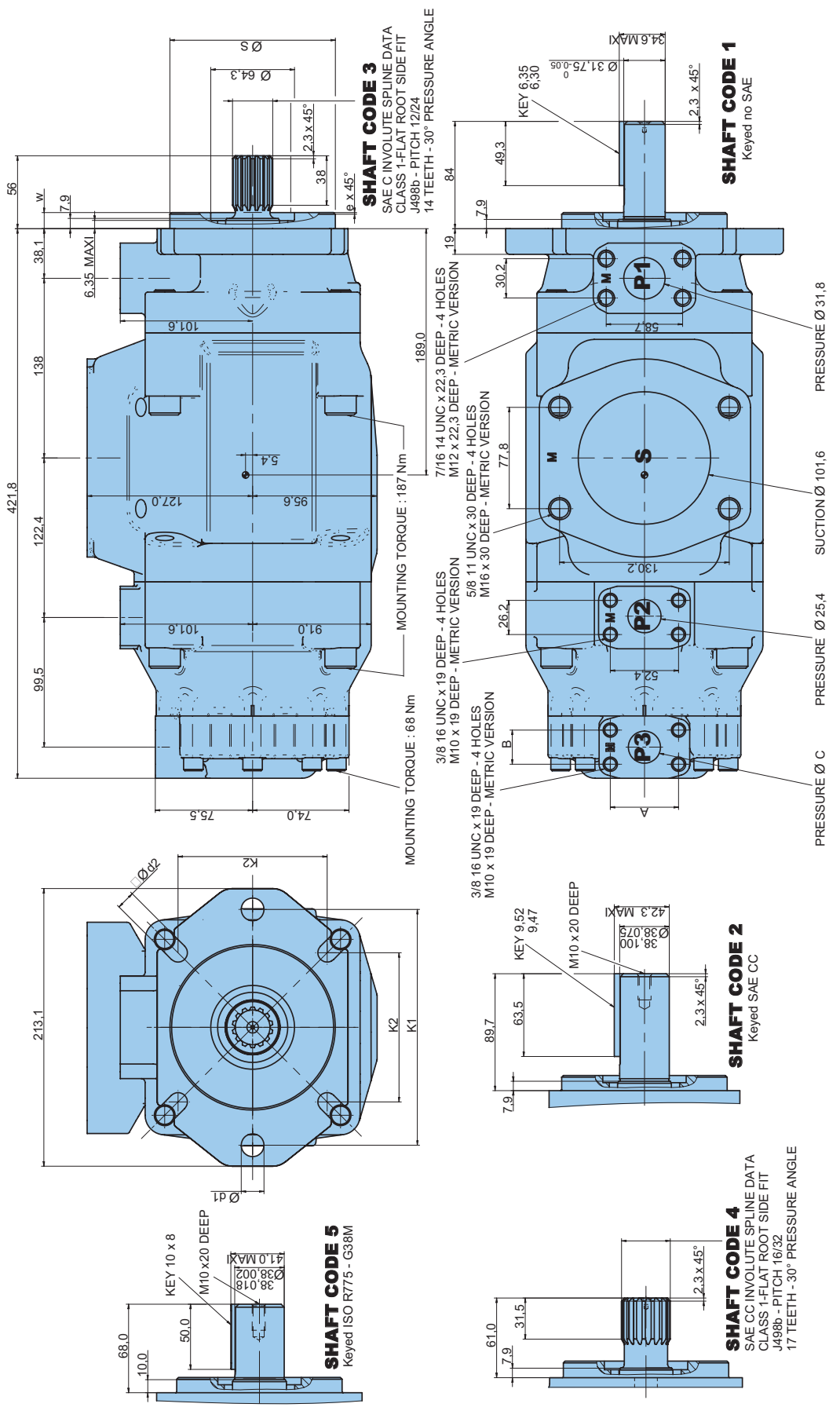
T7DBB/S-DCB/S-DCC/S - Dimensions - Weight : 61 kg T7/T67/T6C Industrial, Denison Vane Pumps



Alternate connect. variables		
	00 & M0	01 & M1
A	52,4	47,6
B	26,2	22,2
C	25,4	19,0

Alternate mounting flange								
Series	Dia S		e x 45°	W	K1	Dia d1	K2	Dia d2
	Max.	Min.						
T7DBB - T7DCB - T7DCC	125,000	124,937	2,0	9,5	180,0	18,0	113,14	14,0
T7DBBS - T7DCBS - T7DCCS	127,000	126,950	1,3	12,7	181,0	17,5	114,50	14,3

Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max. P1 + P2 + P3	Shaft	Vi x p max. P1 + P2 + P3
1	43240	4	83400
2	71750	5	56500
3	61200		

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Model No. **T7DCB or T7DCBS - B38 - 028 - B08 - 1 R 00 - A 1 - M1 - ..**

T7DCB series - ISO 6 bolts 3019-2 mounting flange 125-A2-HW or 125-B4-HW

T7DCBS series - SAE C 6 bolts J744 mounting flange

P1

Displacement for "P1"
Volumetric displacement (ml/rev)

B14 = 44,0	B24 = 81,1	B38 = 120,6
B17 = 55,0	B28 = 90,0	B42 = 137,5
B20 = 66,0	B31 = 99,2	045 = 145,7
B22 = 70,3	B35 = 113,4	050 = 158,0

P2

Displacement for "P2"
Volumetric displacement (ml/rev)

003 = 10,8	012 = 37,1	022 = 70,3
005 = 17,2	014 = 46,0	025 = 79,3
006 = 21,3	017 = 58,3	028 = 88,8
008 = 26.4	020 = 63,8	031 = 100,0
010 = 34,1		

P3

Displacement for "P3"
Volumetric displacement (ml/rev)

B02 = 5,8	B07 = 22,5	B12 = 41,0
B03 = 9,8	B08 = 24,9	B14 = 45,0
B04 = 12,8	B09 = 28,0	B15 = 50,0
B05 = 15,9	B10 = 31,8	
B06 = 19,8	B11 = 35,0	

Type of shaft T7DCB & T7DCBS
5 = keyed (ISO 3019/2 - G38M)

Type of shaft T7DCBS
1 = keyed (non SAE)
2 = keyed (SAE CC)
3 = splined 12/24 (SAE C) (14 teeth)
4 = splined 12/24 (SAE CC) (17 teeth)

Porting combination (see pages 72 - 73)
00 = standard

Direction of rotation (shaft end view)
R = Clockwise L = Counter-clockwise

Design letter

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM- 7 bar max. (for fire resistant fluids)
5 = S5 VITON - 7 bar max. (for mineral oil and fire resistant fluids)

Mounting w/connection variables
4 bolts SAE flange J518

P1 = 1.1/4 " - P2 = 1" - S = 4"		
	Metric thread	**UNC thread**
T7DCB-P3 = 3/4"	M1	
T7DCBS-P3 = 3/4"	M1	01
T7DCB-P3 = 1"	M0	
T7DCBS-P3 = 1"	M0	00

Modifications

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_v [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P1	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[2)]	4,1	52,8	89,5[2)]
	050	158,0 ml/rev	237,0	227,7	223,0[1)]	4,4	57,1	85,0[1)]
			p = 0 bar	**p = 140 bar**	**p = 275 bar**	**p = 7 bar**	**p = 140 bar**	**p = 275 bar**
P2	003	10,8 ml/rev	16,2	11,2	*	1,3	5,3	*
	005	17,2 ml/rev	25,8	20,8	16,1	1,4	7,5	13,9
	006	21,3 ml/rev	31,9	26,9	22,2	1,5	8,9	16,8
	008	26,4 ml/rev	39,6	34,6	29,9	1,6	10,7	20,3
	010	34,1 ml/rev	51,1	46,1	41,4	1,7	13,4	25,6
	012	37,1 ml/rev	55,6	50,6	45,9	1,7	14,4	27,6
	014	46,0 ml/rev	69,0	64,0	59,3	1,9	17,6	33,7
	017	58,3 ml/rev	87,4	82,4	77,7	2,1	21,9	42,2
	020	63,8 ml/rev	95,7	90,7	86,0	2,2	23,8	46,0
	022	70,3 ml/rev	105,4	100,4	95,7	2,3	26,1	50,4
	025	79,3 ml/rev	118,9	113,9	109,2	2,5	29,2	56,6
	028	88,8 ml/rev	133,2	128,2	125,8[1)]	2,8	32,7	48,5[1)]
	031	100,0 ml/rev	150,0	145,0	142,6[1)]	2,8	36,5	54,4[1)]
			p = 0 bar	**p = 140 bar**	**p = 300 bar**	**p = 7 bar**	**p = 140 bar**	**p = 300 bar**
P3	B02	5,8 ml/rev	8,7	7,0	5,1	0,5	2,6	5,1
	B03	9,8 ml/rev	14,7	13,0	11,1	0,6	4,0	8,1
	B04	12,8 ml/rev	19,2	17,5	15,6	0,6	5,0	10,4
	B05	15,9 ml/rev	23,9	22,2	20,2	0,7	6,1	12,7
	B06	19,8 ml/rev	29,7	28,0	26,1	0,7	7,5	15,6
	B07	22,5 ml/rev	33,7	32,0	30,2	0,8	8,5	17,6
	B08	24,9 ml/rev	37,4	35,7	33,7	0,8	9,3	19,5
	B09	28,0 ml/rev	42,0	40,3	38,4	0,9	10,4	21,8
	B10	31,8 ml/rev	47,7	46,0	44,1	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9	1,0	12,8	27,0
	B12	41,0 ml/rev	61,5	59,8	57,9	1,1	14,9	31,5
	B14	45,0 ml/rev	67,5	65,8	63,9	1,2	16,3	34,5
	B15	50,0 ml/rev	75,0	73,3	71,6[3)]	1,3	18,1	35,7[3)]

** We do not recommand to use the size 003 in P2 at 275 bar & 1500 RPM as the internal leakage is over 50% of theoretical flow.*

[1)] 050 - 028 - 031 = 210 bar max. int. [2)] 045 = 240 bar max. int. [3)] B15 = 280 bar max. int.

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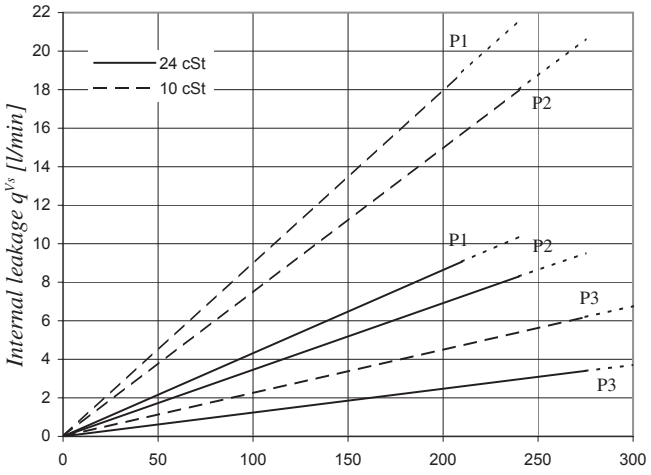
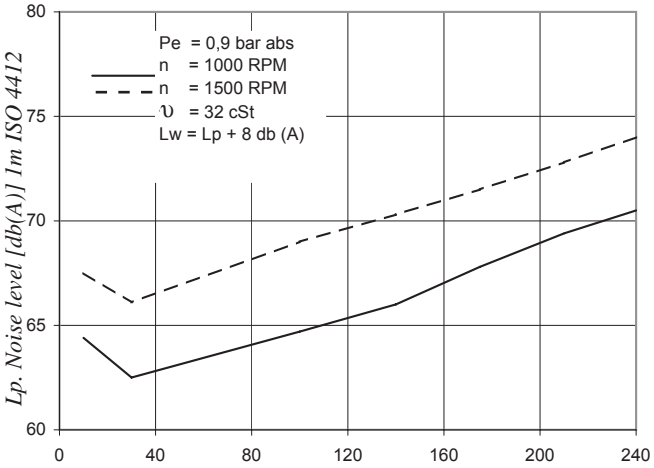
INTERNAL LEAKAGE (TYPICAL)



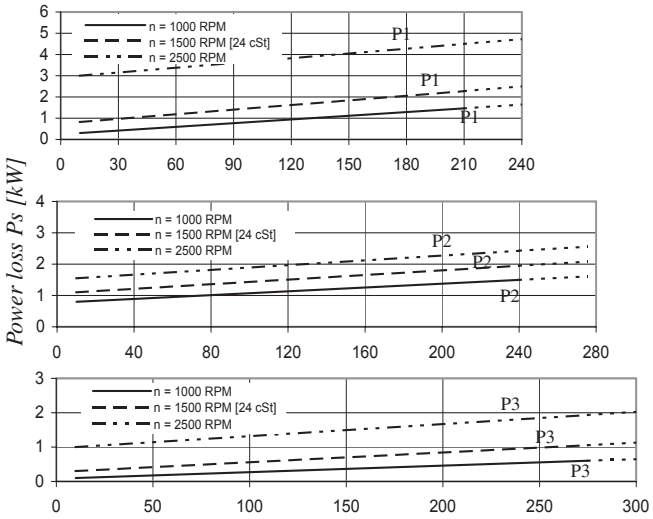
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T7DCB - B38 - 022 - B10



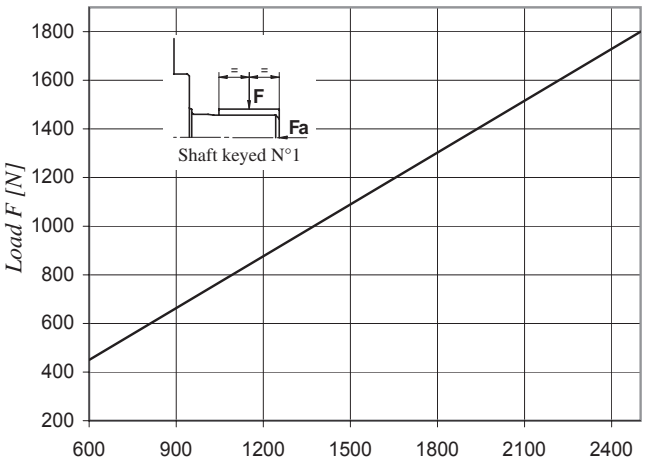
Triple pump noise level is given with all stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 800 N

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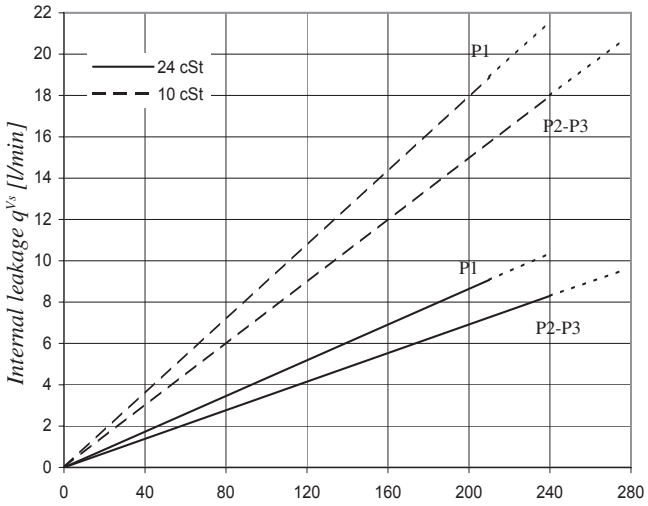
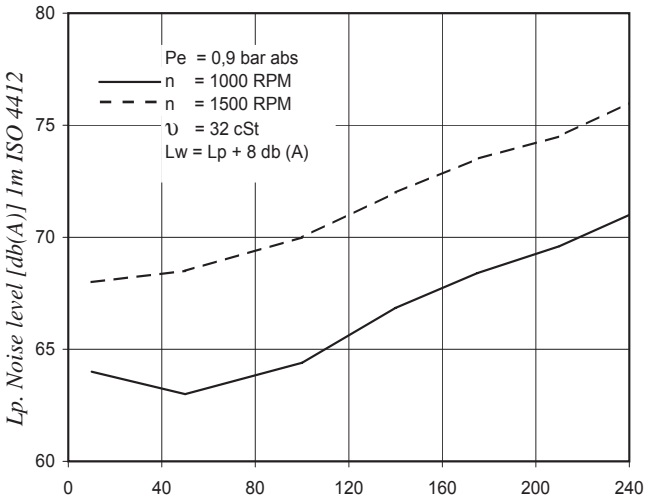
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

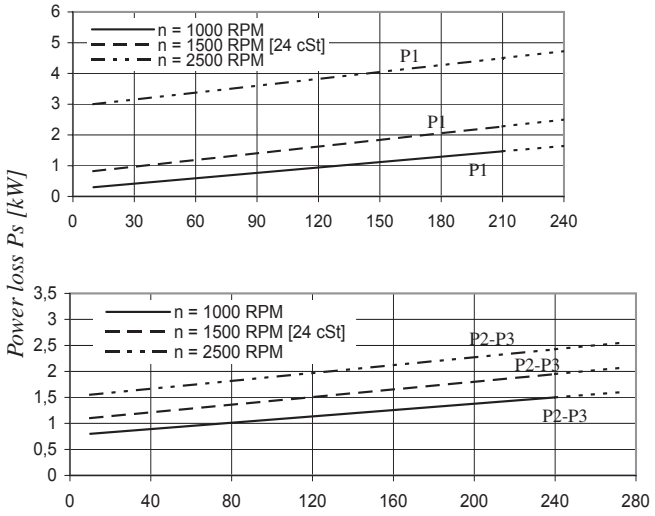
NOISE LEVEL (TYPICAL) - T7DCC - B31 - 022 - 022



Pressure p [bar]

Triple pump noise level is given with all stages discharging at the pressure value indicated on the curve.

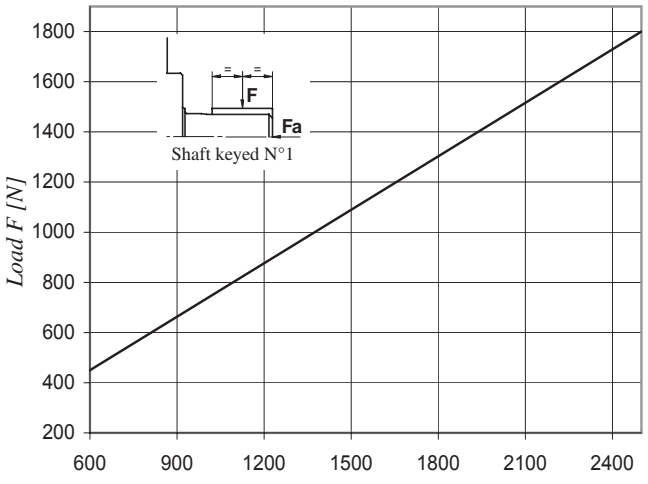
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 1200 N

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Model No. T7DCC or T7DCCS - B38 - 028 - 010 - 5 R 00 - A 1 - M0 - ..

T7DCC series - ISO 6 bolts 3019-2
Mounting flange 125-A2-HW or 125-B4-HW

T7DCCS series - SAE C 6 bolts
J744 mounting flange

P1 P2 P3

Displacement for "P1"
Volumetric displacement (ml/rev)
B14 = 44,0 B31 = 99,2
B17 = 55,0 B35 = 113,4
B20 = 66,0 B38 = 120,6
B22 = 70,3 B42 = 137,5
B24 = 81,1 045 = 145,7
B28 = 90,0 050 = 158,0

Displacement for "P2" & P3
Volumetric displacement (ml/rev)
003 = 10,8 017 = 58,3
005 = 17,2 020 = 63,8
006 = 21,3 022 = 70,3
008 = 26.4 025 = 79,3
010 = 34,1 028 = 88,8
012 = 37,1 031 = 100,0
014 = 46,0

Type of shaft T7DCCS
1 = keyed (non SAE)
2 = keyed (SAE CC)
3 = splined 12/24 (SAE C)
4 = splined 12/24 (SAE CC)

Type of shaft T7DCC & T7DCCS
5 = keyed (ISO 3019/2 - G38M)

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

P1 = 1.1/4" - P2 = 1" - S = 4"		
	Metric thread	**UNC thread**
T7DCC-P3 = 3/4"	M1	
T7DCCS-P3 = 3/4"	M1	01
T7DCC-P3 = 1"	M0	
T7DCCS-P3 = 1"	M0	00

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see pages 72 - 73)
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{ve} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P1	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[1)]	4,1	52,8	89,5[1)]
	050	158,0 ml/rev	237,0	227,7	223,0[2)]	4,4	57,1	85,0[2)]
			p = 0 bar	**p = 140 bar**	**p = 275 bar**	**p = 7 bar**	**p = 140 bar**	**p = 275 bar**
P2 & P3	003	10,8 ml/rev	16,2	11,2	*	1,3	5,3	*
	005	17,2 ml/rev	25,8	20,8	16,1	1,4	7,5	13,9
	006	21,3 ml/rev	31,9	26,9	22,2	1,5	8,9	16,8
	008	26,4 ml/rev	39,6	34,6	29,9	1,6	10,7	20,3
	010	34,1 ml/rev	51,1	46,1	41,4	1,7	13,4	25,6
	012	37,1 ml/rev	55,6	50,6	45,9	1,7	14,4	27,6
	014	46,0 ml/rev	69,0	64,0	59,3	1,9	17,6	33,7
	017	58,3 ml/rev	87,4	82,4	77,7	2,1	21,9	42,2
	020	63,8 ml/rev	95,7	90,7	86,0	2,2	23,8	46,0
	022	70,3 ml/rev	105,4	100,4	95,7	2,3	26,1	50,4
	025	79,3 ml/rev	118,9	113,9	109,2	2,5	29,2	56,6
	028	88,8 ml/rev	133,2	128,2	125,8[2)]	2,8	32,7	48,5[2)]
	031	100,0 ml/rev	150,0	145,0	142,6[2)]	2,8	36,5	54,4[2)]

** We do not recommand to use the size 003 in P2 and P3 at 275 bar & 1500 RPM as the internal leakage is over 50% of theoretical flow.*

[1)] 045 = 240 bar max. int. [2)] 050 - 028 - 031 = 210 bar max. int.

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Model No. T7DDB or T7DDBS - 050 - B22 - B12 - 1 R 00 - A 1 - M0 - ..

T7DDB series - ISO 6 bolts 3019-2
Mounting flange 125-A2-HW or 125-B4-HW

T7DDBS series - SAE C 6 bolts
J744 mounting flange

P1 P2 P3

Displacement for "P1" & "P2"
Volumetric displacement (ml/rev)

B14 = 44,0	B31 = 99,2
B17 = 55,0	B35 = 113,4
B20 = 66,0	B38 = 120,6
B22 = 70,3	B42 = 137,5
B24 = 81,1	045 = 145,7
B28 = 90,0	050 = 158,0

Displacement for "P3"
Volumetric displacement (ml/rev)

B02 = 5,8	B09 = 28,0
B03 = 9,8	B10 = 31,8
B04 = 12,8	B11 = 35,0
B05 = 15,9	B12 = 41,0
B06 = 19,8	B14 = 45,0
B07 = 22,5	B15 = 50,0
B08 = 24,9	

Type of shaft T7DDBS
1 = keyed (SAE C)
2 = keyed (SAE CC)
3 = splined 12/24 (SAE C) (14 teeth)
4 = splined 12/24 (SAE CC) (17 teeth)

Type of shaft T7DBB & T7DBBS
5 = keyed (ISO 3019/2 - G38M)

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

P1 & P2 = 1.1/4" - S = 4"		
	Metric thread	**UNC thread**
T7DDB-P3 = 1"	M0	
T7DDB-P3 = 3/4"	M1	
T7DDBS-P3 = 1"	M0	00
T7DDBS-P3 = 3/4"	M1	01

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see pages 72 - 73)
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{v_e} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P1 & P2	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[1)]	4,1	52,8	89,5[1)]
	050	158,0 ml/rev	237,0	227,7	223,0[2)]	4,4	57,1	85,0[2)]
			p = 0 bar	p = 140 bar	p = 300 bar	p = 7 bar	p = 140 bar	p = 300 bar
P3	B02	5,8 ml/rev	8,7	7,0	5,1	0,5	2,6	5,1
	B03	9,8 ml/rev	14,7	13,0	11,1	0,6	4,0	8,1
	B04	12,8 ml/rev	19,2	17,5	15,6	0,6	5,0	10,4
	B05	15,9 ml/rev	23,9	22,2	20,2	0,7	6,1	12,7
	B06	19,8 ml/rev	29,7	28,0	26,1	0,7	7,5	15,6
	B07	22,5 ml/rev	33,7	32,0	30,2	0,8	8,5	17,6
	B08	24,9 ml/rev	37,4	35,7	33,7	0,8	9,3	19,5
	B09	28,0 ml/rev	42,0	40,3	38,4	0,9	10,4	21,8
	B10	31,8 ml/rev	47,7	46,0	44,1	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9	1,0	12,8	27,0
	B12	41,0 ml/rev	61,5	59,8	57,9	1,1	14,9	31,5
	B14	45,0 ml/rev	67,5	65,8	63,9	1,2	16,3	34,5
	B15	50,0 ml/rev	75,0	73,3	71,6[3)]	1,3	18,1	35,7[3)]

[1)] *045 = 240 bar max. int.* [2)] *050 = 210 bar max. int.* [3)] *B15 = 280 bar max.int.*

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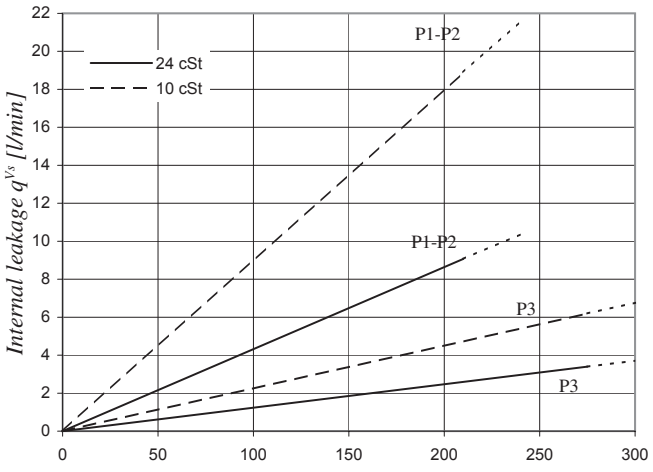
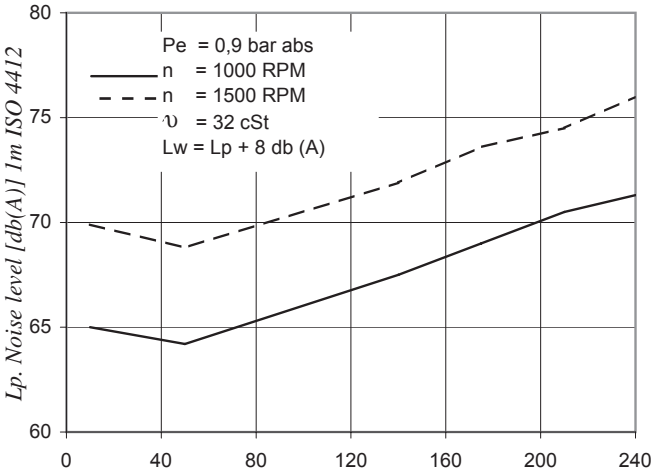
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

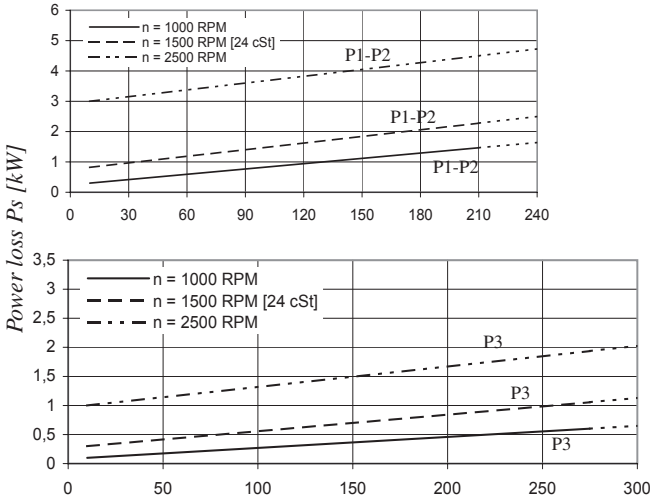
NOISE LEVEL (TYPICAL) - T7DDB - B31 - B31 - B10



Pressure p [bar]

Triple pump noise level is given with all stages discharging at the pressure value indicated on the curve.

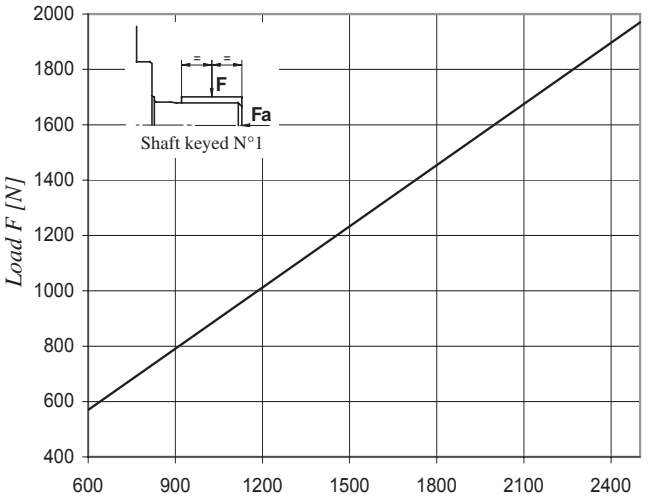
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 1200 N

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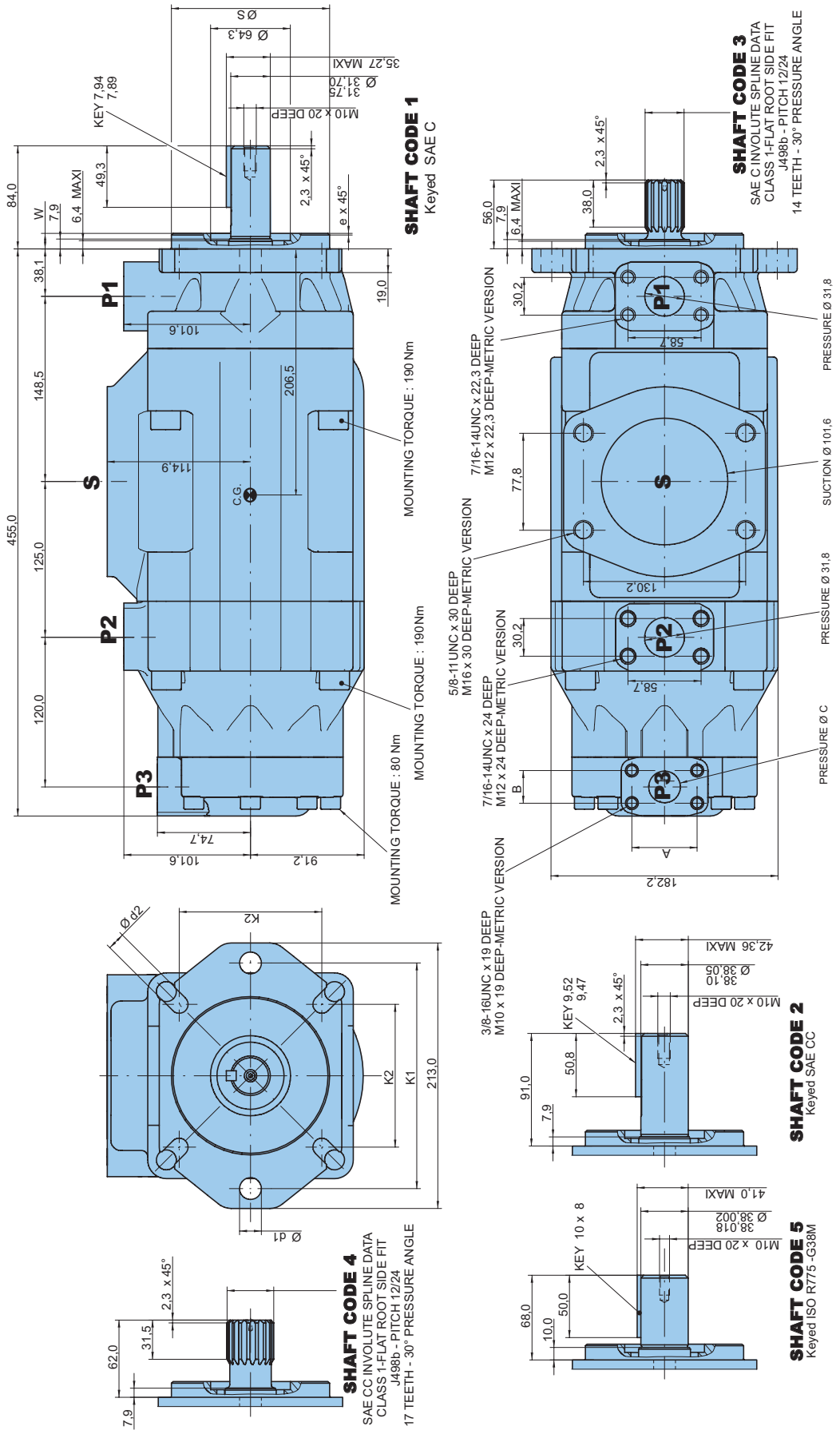
T7DDB/DDBS - Dimensions - Weight : 66 kg T7/T67/T6C Industrial, Denison Vane Pumps



Alternate connect. variables

	00 & M0	01 & M1
A	52,4	47,6
B	26,2	22,2
C	25,4	19,0

Alternate mounting flange

Series	Dia S		e x 45°	W	K1	Dia d1	K2	Dia d2
	Max.	Min.						
T7DDB	125,000	124,937	2,0	9,5	180,0	18,0	113,14	14,0
T7DDBS	127,000	126,950	1,5	12,7	181,0	17,5	114,50	14,3

Shaft torque limits [ml/rev. x bar]

Shaft	Vi x p max. P1 + P2 + P3	Shaft	Vi x p max. P1 + P2 + P3
1	43240	4	66500
2	72306	5	53100
3	61200		

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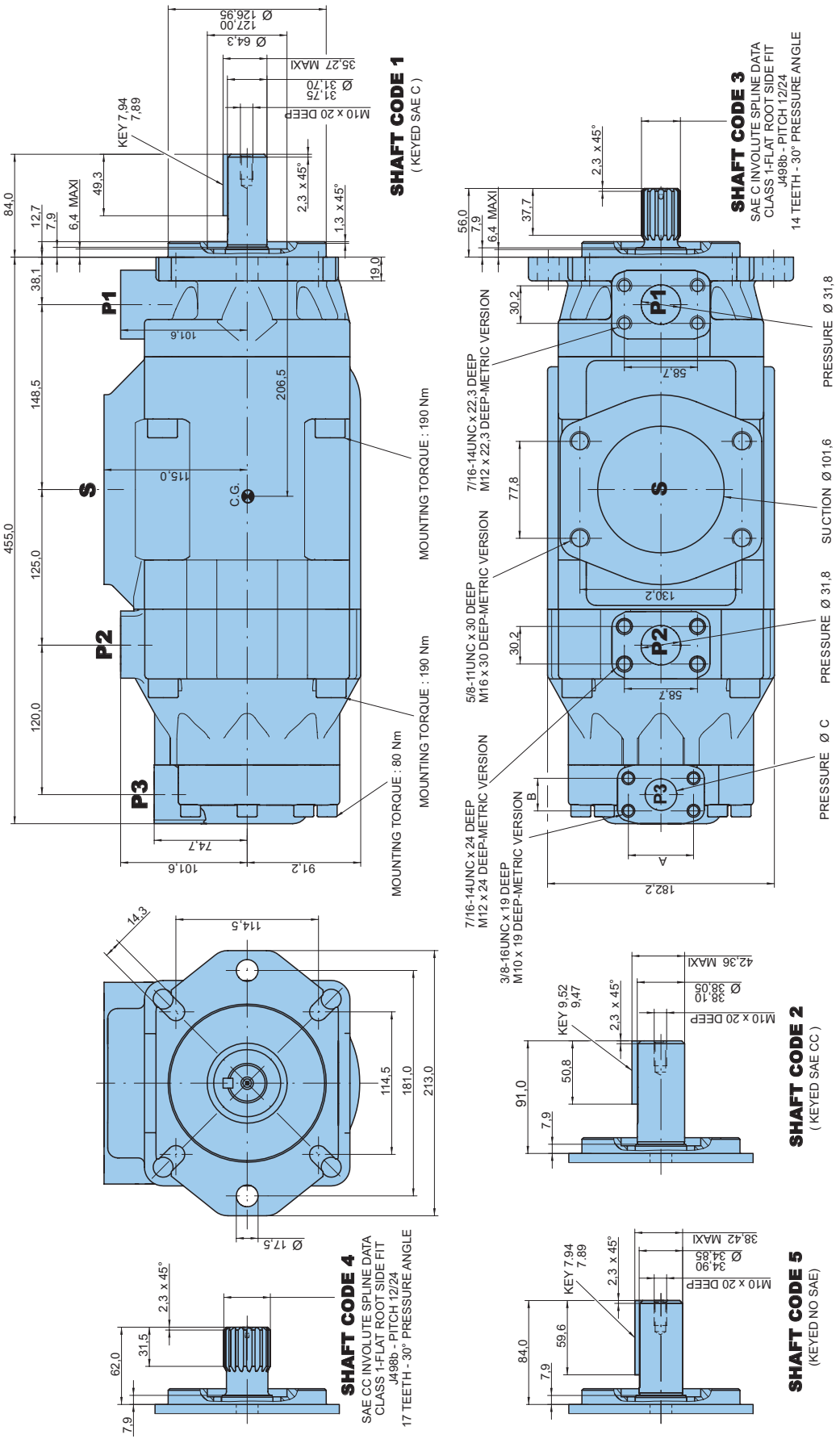

Alternate connect. variables		
	00 & M0	01 & M1
A	52,4	47,6
B	26,2	22,2
C	25,4	19,0

Shaft torque limits [ml/rev. x bar]			
Shaft	Vi x p max. P1 + P2 + P3	Shaft	Vi x p max. P1 + P2 + P3
1	43240	4	66500
2	72306	5	55600
3	61200		

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VPDE, Denison Vane Pumps
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Model No. T67DDCS - 050 - B35 - B08 - 1 R 00 - A 1 - M0 - ..

Series - SAE C 6 bolts
J744 mounting flange

Displacement for "P1" & "P2"
Volumetric displacement (ml/rev)
B14 = 44,0 B31 = 99,2
B17 = 55,0 B35 = 113,4
B20 = 66,0 B38 = 120,6
B22 = 70,3 B42 = 137,5
B24 = 81,1 045 = 145,7
B28 = 90,0 050 = 158,0

Displacement for "P3"
Volumetric displacement (ml/rev)
003 = 10,8 017 = 58,3
005 = 17,2 020 = 63,8
006 = 21,3 022 = 70,3
008 = 26,4 025 = 79,3
010 = 34,1 028 = 88,8
012 = 37,1 031 = 100,0
014 = 46,0

Type of shaft
1 = keyed (SAE C)
2 = keyed (SAE CC)
3 = splined 12/24 (SAE C) (14 teeth)
4 = splined 12/24 (SAE CC) (17 teeth)
5 = keyed (non SAE)

P1 P2 P3

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

P1 & P2 = 1.1/4" - S = 4"				
	Metric thread		UNC thread	
P3	1"	3/4"	1"	3/4"
Code	M0	M1	00	01

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see pages 72 - 73)
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{v_e} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 250 bar	p = 7 bar	p = 140 bar	p = 250 bar
P1 & P2	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[1)]	4,1	52,8	89,5[1)]
	050	158,0 ml/rev	237,0	227,7	223,0[2)]	4,4	57,1	85,0[2)]
			p = 0 bar	p = 140 bar	p = 275 bar	p = 7 bar	p = 140 bar	p = 275 bar
P3	003	10,8 ml/rev	16,2	11,2	*	1,3	5,3	*
	005	17,2 ml/rev	25,8	20,8	16,1	1,4	7,5	13,9
	006	21,3 ml/rev	31,9	26,9	22,2	1,5	8,9	16,8
	008	26,4 ml/rev	39,6	34,6	29,9	1,6	10,7	20,3
	010	34,1 ml/rev	51,1	46,1	41,4	1,7	13,4	25,6
	012	37,1 ml/rev	55,6	50,6	45,9	1,7	14,4	27,6
	014	46,0 ml/rev	69,0	64,0	59,3	1,9	17,6	33,7
	017	58,3 ml/rev	87,4	82,4	77,7	2,1	21,9	42,2
	020	63,8 ml/rev	95,7	90,7	86,0	2,2	23,8	46,0
	022	70,3 ml/rev	105,4	100,4	95,7	2,3	26,1	50,4
	025	79,3 ml/rev	118,9	113,9	109,2	2,5	29,2	56,6
	028	88,8 ml/rev	133,2	128,2	125,8[2)]	2,8	32,7	48,5[2)]
	031	100,0 ml/rev	150,0	145,0	142,6[2)]	2,8	36,5	54,4[2)]

** We do not recommand to use the size 003 in P3 at 275 bar & 1500 RPM as the internal leakage is over 50% of theoretical flow.*
[1)] 045 = 240 bar max. int. [2)] 050 - 028 - 031 = 210 bar max. int.

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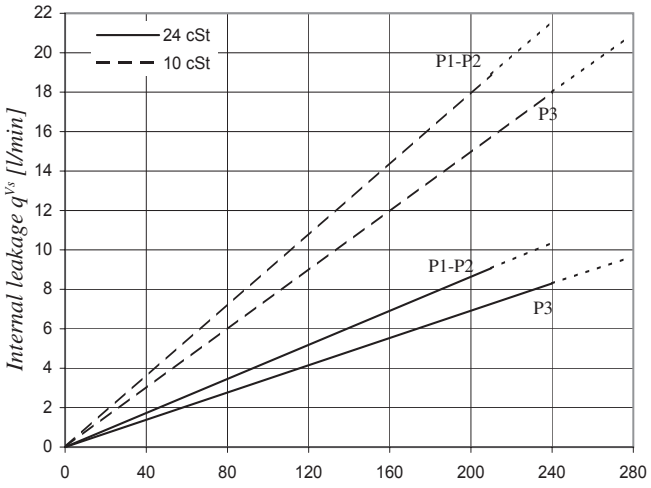
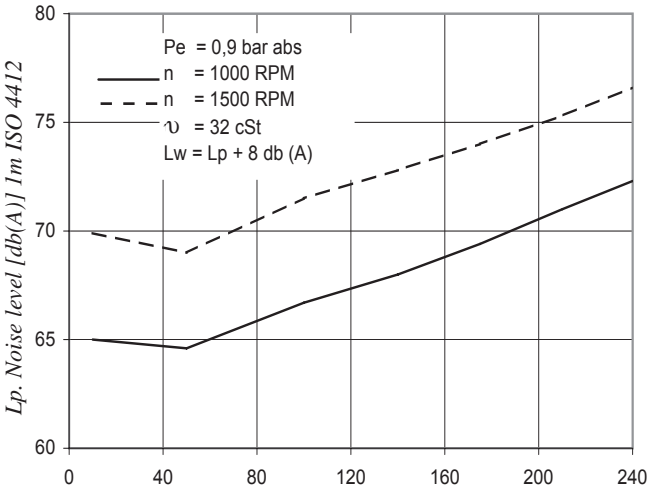
INTERNAL LEAKAGE (TYPICAL)



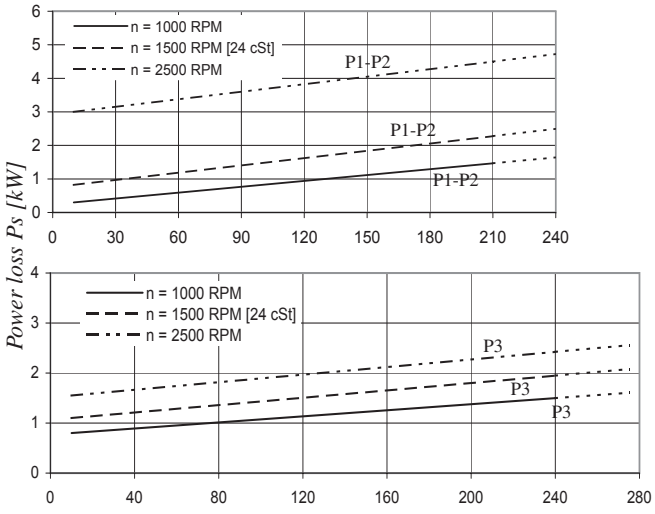
Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

NOISE LEVEL (TYPICAL) - T67DDCS - B31 - B31 - 022



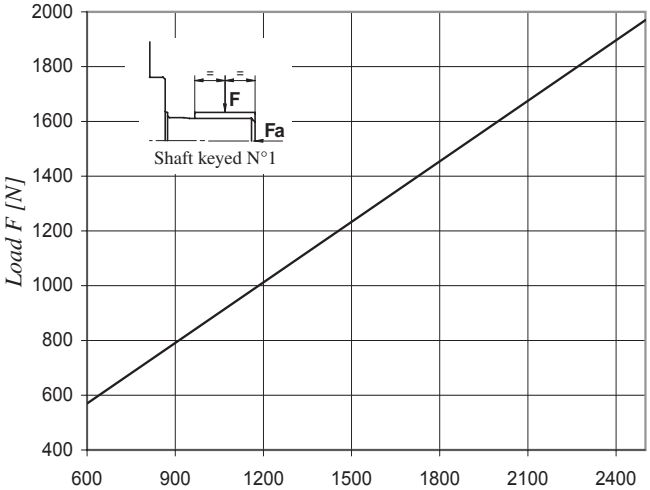
Triple pump noise level is given with all stages discharging at the pressure value indicated on the curve.

POWER LOSS HYDROMECHANICAL (TYPICAL)



Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Maximum permissible axial load Fa = 1200 N

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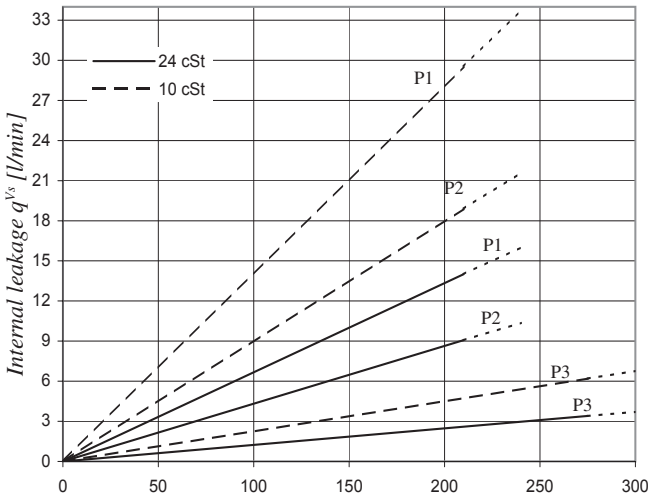
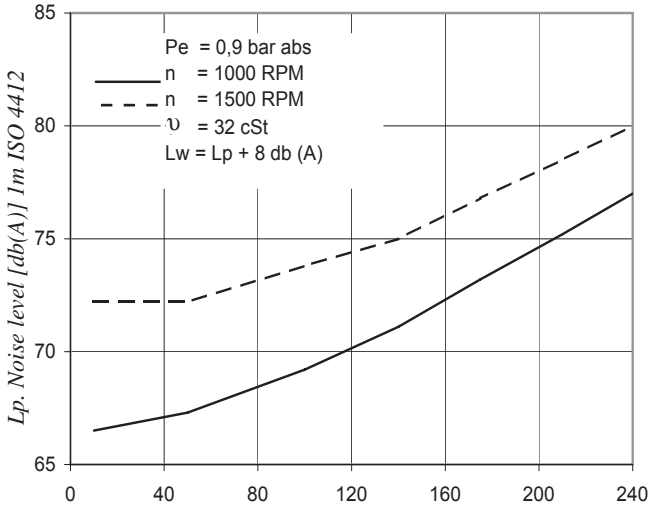
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

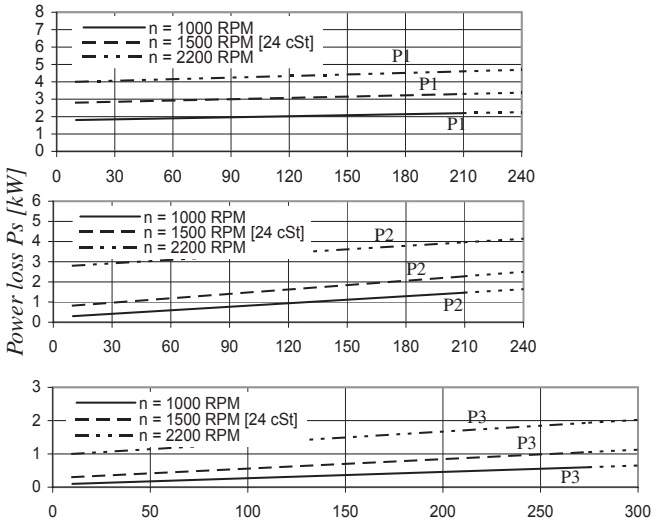
NOISE LEVEL (TYPICAL) - T7EDB - 062 - B35 - B04



Pressure p [bar]

Triple pump noise level is given with all stages discharging at the pressure value indicated on the curve.

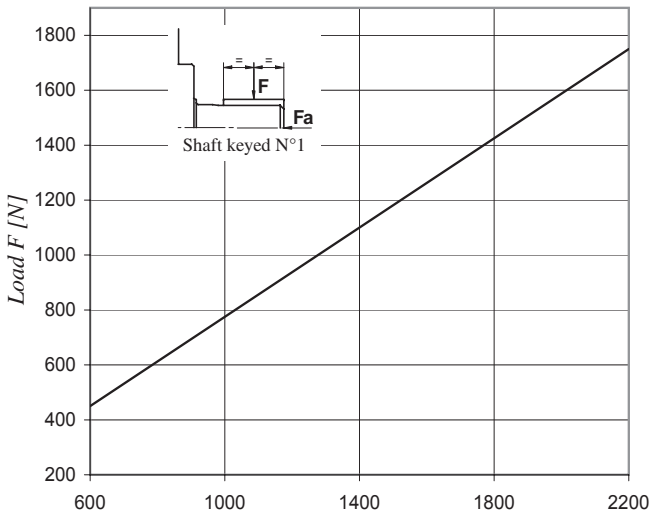
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 2000 N

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Model No. **T7EDB or T7EDBS - 062 - B35 - B10 - 1 R 00 - A 1 - 01 - ..**

T7EDB series - ISO 4 bolts 3019-2
Mounting flange 250-B4-HW
T7EDBS series - SAE E 4 bolts
J744 mounting flange

P1 P2 P3

Displacement for "P1"
Volumetric displacement (ml/rev)
042 = 132,3 045 = 142,4 050 = 158,5 052 = 164,8 054 = 171,0 057 = 183,3 062 = 196,7 066 = 213,3 072 = 227,1 085 = 268,7

Displacement for "P2"
Volumetric displacement (ml/rev)
B14 = 44,0 B17 = 55,0 B20 = 66,0 B22 = 70,3 B24 = 81,1 B28 = 90,0 B31 = 99,2 B35 = 113,4 B38 = 120,6 B42 = 137,5 045 = 145,7 050 = 158,0

Displacement for "P3"
Volumetric displacement (ml/rev)
B02 = 5,8 B03 = 9,8 B04 = 12,8 B05 = 15,9 B06 = 19,8 B07 = 22,5 B08 = 24,9 B09 = 28,0 B10 = 31,8 B11 = 35,0 B12 = 41,0 B14 = 45,0 B15 = 50,0

Type of shaft T7EDB
1 = keyed (ISO 3019/2 - G45N)

Type of shaft T7EDBS
2 = keyed (SAE D & E)
3 = splined 8/16 (SAE D & E) (13 teeth)

Direction of rotation (shaft end view)
R = Clockwise L = Counter-clockwise

Porting combination (see pages 72 - 73)
00 = standard

Design letter

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Mounting w/connection variables
4 bolts SAE flange J518

P1 = 1.1/2" - P2 = 1.1/4" - S = 4"		
	Metric thread	**UNC thread**
T7EDB-P3 = 1"	M0	
T7EDB-P3 = 3/4"	M1	
T7EDBS-P3 = 1"	M0	00
T7EDBS-P3 = 3/4"	M1	01

Modifications

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{Vc} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
P1	042	132,3 ml/rev	198,5	188,5	181,3	5,2	49,4	82,6
	045	142,4 ml/rev	213,6	203,6	196,5	5,4	52,9	88,7
	050	158,5 ml/rev	237,7	227,7	220,6	5,7	58,5	98,3
	052	164,8 ml/rev	247,2	237,2	230,1	5,8	60,8	102,1
	054	171,0 ml/rev	256,5	246,5	239,4	5,9	63,0	105,8
	057	183,3 ml/rev	275,0	265,0	257,9	6,1	67,3	113,2
	062	196,7 ml/rev	295,0	285,0	277,9	6,4	71,9	121,3
	066	213,3 ml/rev	319,9	309,0	302,8	6,7	77,7	131,2
	072	227,1 ml/rev	340,6	330,6	323,5	6,9	82,6	139,5
	085	268,7 ml/rev	403,0	392,0[1]	-	9,1	65,8[1]	-
			p = 0 bar	**p = 140 bar**	**p = 250 bar**	**p = 7 bar**	**p = 140 bar**	**p = 250 bar**
P2	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[3]	4,1	52,8	89,5[3]
	050	158,0 ml/rev	237,0	227,7	223,0[2]	4,4	57,1	85,0[2]
			p = 0 bar	**p = 140 bar**	**p = 300 bar**	**p = 7 bar**	**p = 140 bar**	**p = 300 bar**
P3	B02	5,8 ml/rev	8,7	7,0	5,1	0,5	2,6	5,1
	B03	9,8 ml/rev	14,7	13,0	11,1	0,6	4,0	8,1
	B04	12,8 ml/rev	19,2	17,5	15,6	0,6	5,0	10,4
	B05	15,9 ml/rev	23,9	22,2	20,2	0,7	6,1	12,7
	B06	19,8 ml/rev	29,7	28,0	26,1	0,7	7,5	15,6
	B07	22,5 ml/rev	33,7	32,0	30,2	0,8	8,5	17,6
	B08	24,9 ml/rev	37,4	35,7	33,7	0,8	9,3	19,5
	B09	28,0 ml/rev	42,0	40,3	38,4	0,9	10,4	21,8
	B10	31,8 ml/rev	47,7	46,0	44,1	0,9	11,7	26,2
	B11	35,0 ml/rev	52,5	50,8	48,9	1,0	12,8	27,0
	B12	41,0 ml/rev	61,5	59,8	57,9	1,1	14,9	31,5
	B14	45,0 ml/rev	67,5	65,8	63,9	1,2	16,3	34,5
	B15	50,0 ml/rev	75,0	73,3	71,6[4]	1,3	18,1	35,7[4]

[1] 085 = 90 bar max. int. [2] 050 = 210 bar max. int. [3] 045 = 240 bar max. int. [4] B15 = 280 bar max. int.

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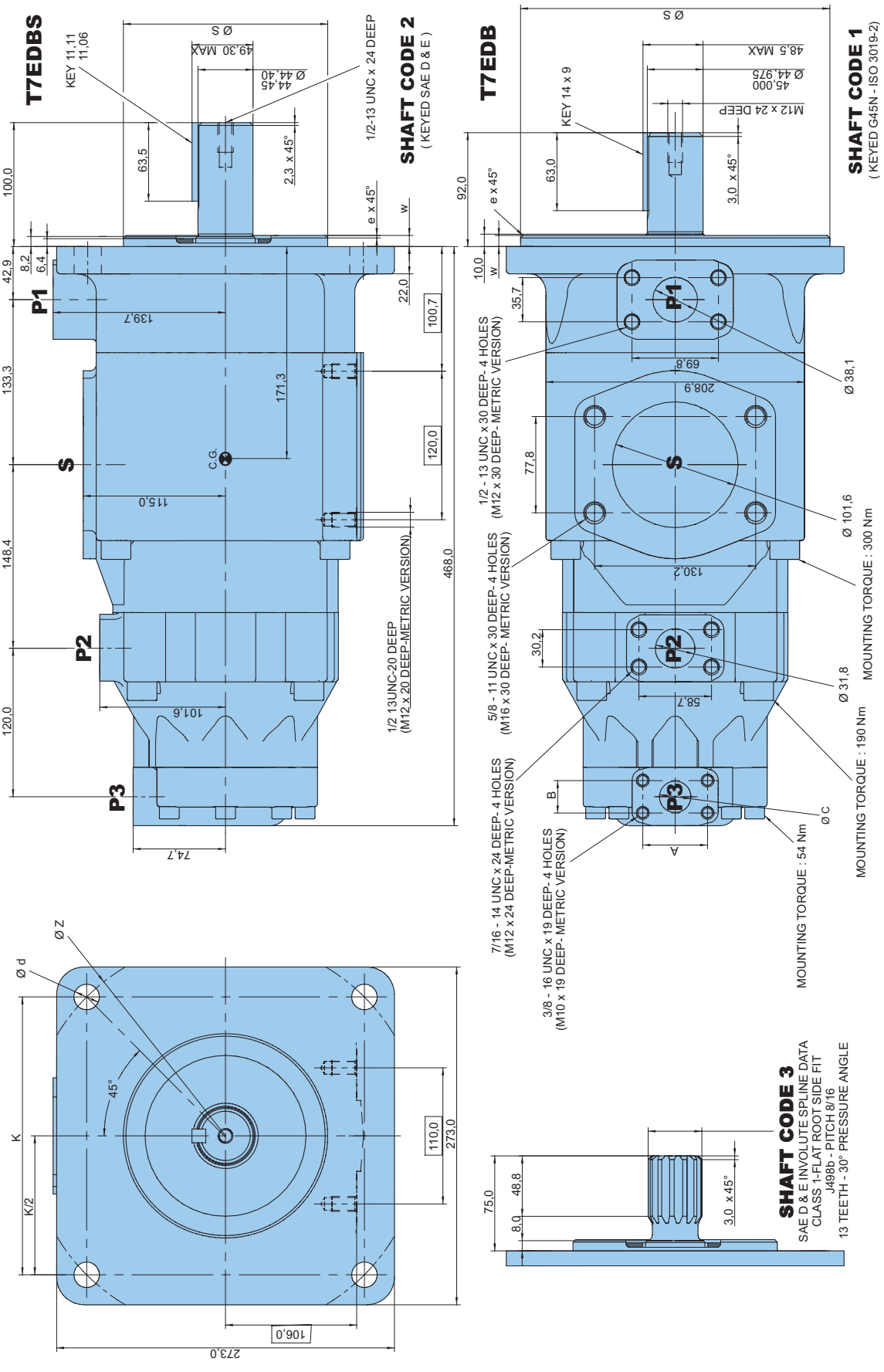

Alternate connect. variables

	00 & M0	01 & M1
A	52,4	47,6
B	26,2	22,2
C	25,4	19,0

Alternate mounting flange

Series	Dia S		e x 45°	W	K	Dia Z	Dia d
	Max.	Min.					
T7EDB	250,000	249,928	2,0	9,0	-	315	22,0
T7EDBS	165,100	165,050	2,0	9,0	224,5	-	20,6

Shaft torque limits [ml/rev. x bar]

Shaft	Vi x p max. P1 + P2 + P3
1	114600
2	118340
3	126800

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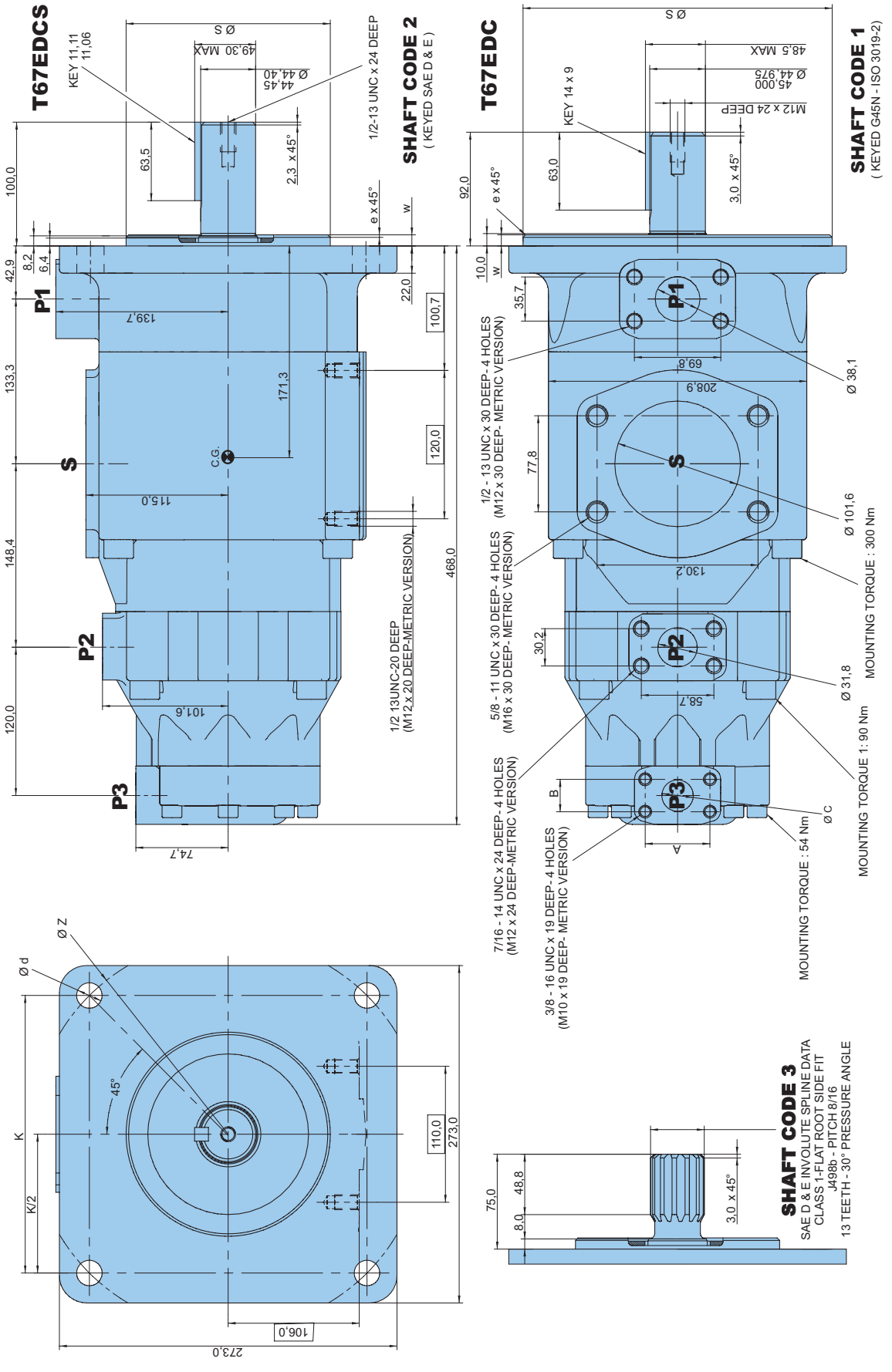

Alternate connect. variables		
	00	01
A	52,4	47,6
B	26,2	22,2
C	25,4	19,0

Alternate mounting flange							
Series	Dia S		e x 45°	W	K	Dia Z	Dia d
	Max.	Min.					
T67EDC	250,000	249,928	2,0	9,0	-	315	22,0
T67EDCS	165,100	165,050	2,0	9,0	224,5	-	20,6

Shaft torque limits [ml/rev. x bar]	
Shaft	Vi x p max. P1 + P2 + P3
1	114600
2	118340
3	126800

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VPDE, Denison Vane Pumps
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Model No. T67EDC or T67EDCS - 062 - B35 - 010 - 1 R 00 - A 1 - M1 - ..

T67EDC series - ISO 4 bolts 3019-2
Mounting flange 250-B4-HW
T67EDCS series - SAE E 4 bolts
J744 mounting flange

P1 **P2** **P3**

Displacement for "P1"
Volumetric displacement (ml/rev)
042 = 132,3 054 = 171,0 066 = 213,3
045 = 142,4 057 = 183,3 072 = 227,1
050 = 158,5 062 = 196,7 085 = 268,7
052 = 164,8

Displacement for "P2"
Volumetric displacement (ml/rev)
B14 = 44,0 B24 = 81,1 B38 = 120,6
B17 = 55,0 B28 = 90,0 B42 = 137,5
B20 = 66,0 B31 = 99,2 045 = 145,7
B22 = 70,3 B35 = 113,4 050 = 158,0

Displacement for "P3"
Volumetric displacement (ml/rev)
003 = 10,8 012 = 37,1 022 = 70,3
005 = 17,2 014 = 46,0 025 = 79,3
006 = 21,3 017 = 58,3 028 = 88,8
008 = 26.4 020 = 63,8 031 = 100,0
010 = 34,1

Type of shaft T67EDC
1 = keyed (ISO 3019/2 - G45N)

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

P1 = 1.1/2" - P2 = 1.1/4" - S = 4"		
	Metric thread	**UNC thread**
T67EDC-P3 = 1"	M0	
T67EDC-P3 = 3/4"	M1	
T67EDCS-P3 = 1"	M0	00
T67EDCS-P3 = 3/4"	M1	01

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)
4 = S4 EPDM - 7 bar max. (for fire resistant fluids)
5 = S5 VITON® - 7 bar max. (for mineral oil and fire resistant fluids)

Design letter

Porting combination (see pages 72 - 73)
00 = standard

Direction of rotation (shaft end view)
R = Clockwise L = Counter-clockwise

Type of shaft T67EDCS
2 = keyed (SAE D & E)
3 = splined 8/16 (SAE D & E) (13 teeth)

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{vc} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
P1	042	132,3 ml/rev	198,5	188,5	181,3	5,2	49,4	82,6
	045	142,4 ml/rev	213,6	203,6	196,5	5,4	52,9	88,7
	050	158,5 ml/rev	237,7	227,7	220,6	5,7	58,5	98,3
	052	164,8 ml/rev	247,2	237,2	230,1	5,8	60,8	102,1
	054	171,0 ml/rev	256,5	246,5	239,4	5,9	63,0	105,8
	057	183,3 ml/rev	275,0	265,0	257,9	6,1	67,3	113,2
	062	196,7 ml/rev	295,0	285,0	277,9	6,4	71,9	121,3
	066	213,3 ml/rev	319,9	309,0	302,8	6,7	77,7	131,2
	072	227,1 ml/rev	340,6	330,6	323,5	6,9	82,6	139,5
	085	268,7 ml/rev	403,0	392,0[2)]	-	9,1	65,8[2)]	-
			p = 0 bar	**p = 140 bar**	**p = 250 bar**	**p = 7 bar**	**p = 140 bar**	**p = 250 bar**
P2	B14	44,0 ml/rev	66,0	59,4	54,2	1,5	16,6	29,0
	B17	55,0 ml/rev	82,5	75,9	70,7	1,7	20,4	35,8
	B20	66,0 ml/rev	99,0	92,4	87,2	1,9	24,3	42,7
	B22	70,3 ml/rev	105,5	98,8	93,7	2,0	25,8	45,4
	B24	81,1 ml/rev	121,7	115,0	109,9	2,2	29,5	52,1
	B28	90,0 ml/rev	135,0	128,4	123,2	2,3	32,7	57,7
	B31	99,2 ml/rev	148,8	142,2	137,0	2,5	35,9	63,5
	B35	113,4 ml/rev	170,1	163,5	158,3	2,7	40,8	72,3
	B38	120,6 ml/rev	180,9	174,3	169,1	2,9	43,4	76,8
	B42	137,5 ml/rev	206,3	199,6	194,5	3,2	49,3	87,4
	045	145,7 ml/rev	218,6	209,2	202,6[3)]	4,1	52,8	89,5[3)]
	050	158,0 ml/rev	237,0	227,7	223,0[1)]	4,4	57,1	85,0[1)]
			p = 0 bar	**p = 140 bar**	**p = 275 bar**	**p = 7 bar**	**p = 140 bar**	**p = 275 bar**
P3	003	10,8 ml/rev	16,2	11,2	*	1,3	5,3	*
	005	17,2 ml/rev	25,8	20,8	16,1	1,4	7,5	13,9
	006	21,3 ml/rev	31,9	26,9	22,2	1,5	8,9	16,8
	008	26,4 ml/rev	39,6	34,6	29,9	1,6	10,7	20,3
	010	34,1 ml/rev	51,1	46,1	41,4	1,7	13,4	25,6
	012	37,1 ml/rev	55,6	50,6	45,9	1,7	14,4	27,6
	014	46,0 ml/rev	69,0	64,0	59,3	1,9	17,6	33,7
	017	58,3 ml/rev	87,4	82,4	77,7	2,1	21,9	42,2
	020	63,8 ml/rev	95,7	90,7	86,0	2,2	23,8	46,0
	022	70,3 ml/rev	105,4	100,4	95,7	2,3	26,1	50,4
	025	79,3 ml/rev	118,9	113,9	109,2	2,5	29,2	56,6
	028	88,8 ml/rev	133,2	128,2	125,8[1)]	2,8	32,7	48,5[1)]
	031	100,0 ml/rev	150,0	145,0	142,6[1)]	2,8	36,5	54,4[1)]

** We do not recommand to use the size 003 in P3 at 275 bar & 1500 RPM as the internal leakage is over 50% of theoretical flow.*

[1)] 050 - 028 - 031 = 210 bar max. int. [2)] 085 = 90 bar max. int. [3)] 045 = 240 bar max. int.

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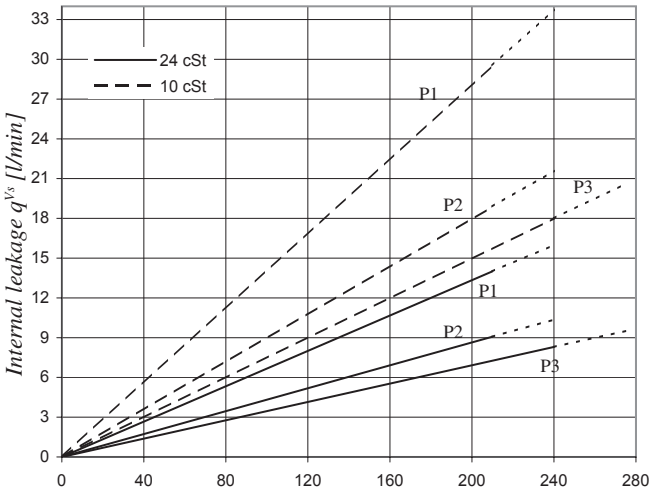
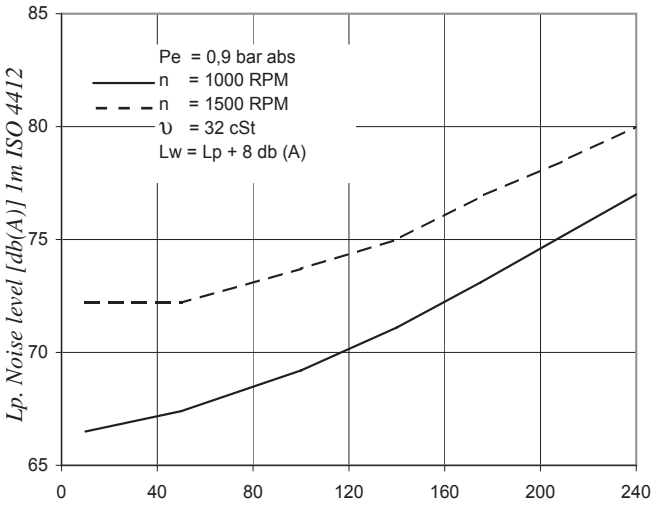
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

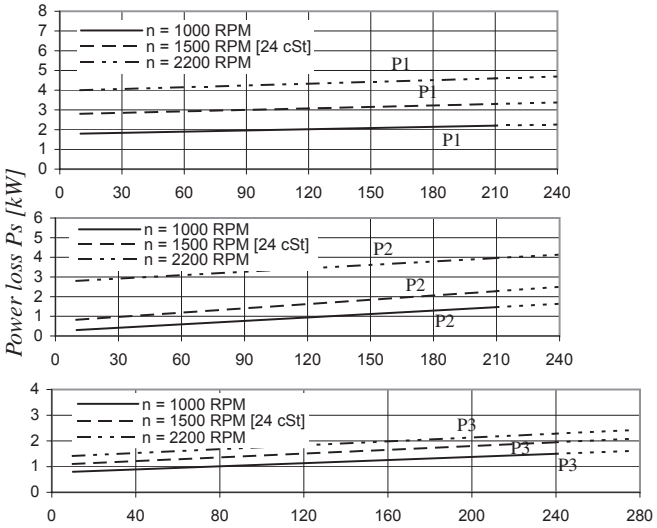
NOISE LEVEL (TYPICAL) - T67EDCS - 062 - B35 - 022



Pressure p [bar]

Triple pump noise level is given with all stages discharging at the pressure value indicated on the curve.

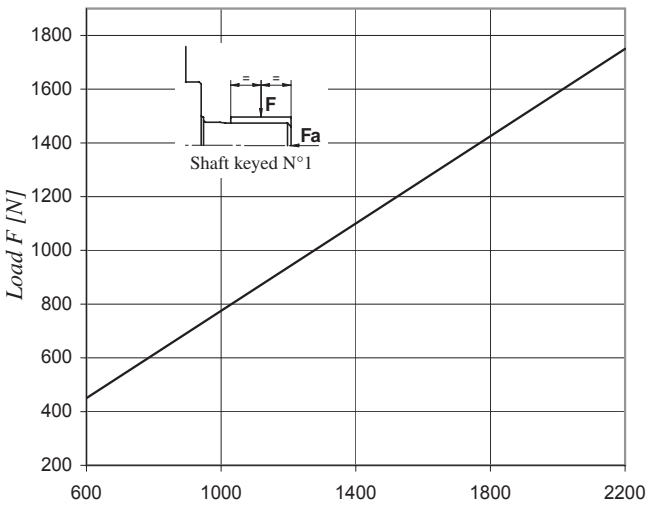
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 2000 N

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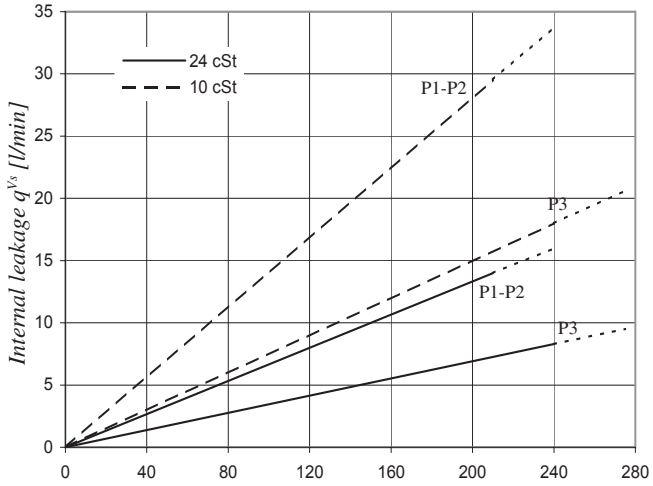
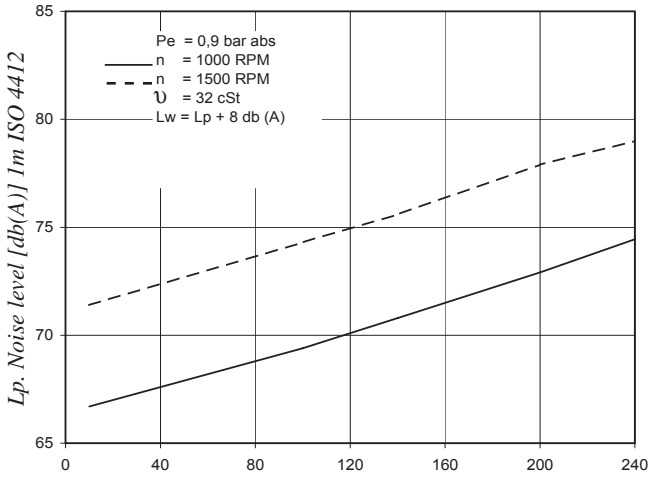
INTERNAL LEAKAGE (TYPICAL)



Pressure p [bar]

Do not operate pump more than 5 seconds at any speed or viscosity if internal leakage is higher than 50% of theoretical flow.
Total leakage is the sum of each section loss under its respective operating conditions.

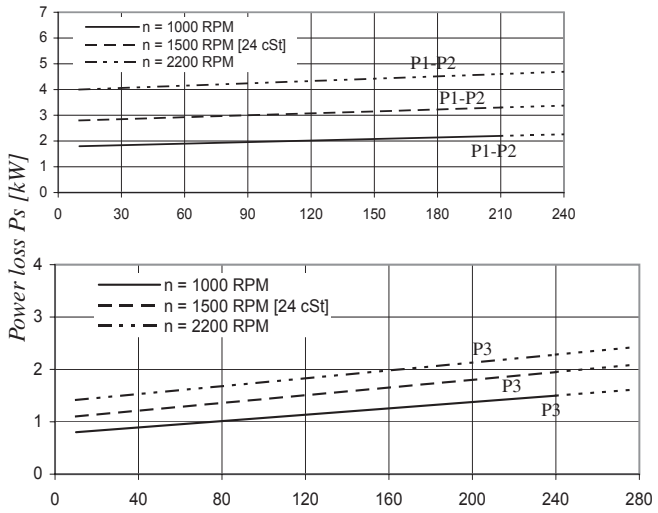
NOISE LEVEL (TYPICAL) - T7EECS - 052 - 052 - 025



Pressure p [bar]

Triple pump noise level is given with all stages discharging at the pressure value indicated on the curve.

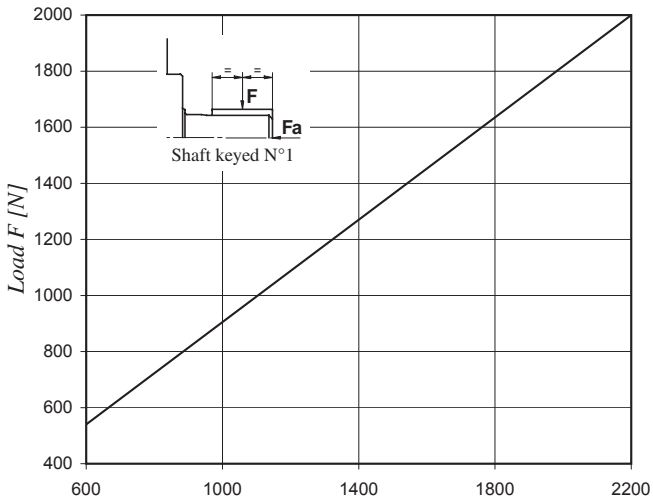
POWER LOSS HYDROMECHANICAL (TYPICAL)



Pressure p [bar]

Total hydromechanical power loss is the sum of each section loss under its respective operating conditions.

PERMISSIBLE RADIAL LOAD



Speed n [RPM]

Maximum permissible axial load Fa = 2000 N

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Model No. T7EEC or T7EECS - 062 - 062 - 017 - 2 R 00 - A 1 - M0 - ..

T7EEC series - 250-B4-HW
ISO 4 bolts 3019-2 mounting flange

T7EECS series - SAE E 4 bolts
J744 mounting flange

P1 P2 P3

Displacement for "P1" & "P2"
Volumetric displacement (ml/rev)
042 = 132,3 057 = 183,3
045 = 142,4 062 = 196,7
050 = 158,5 066 = 213,3
052 = 164,8 072 = 227,1
054 = 171,0 085 = 268,7

Displacement for "P3"
Volumetric displacement (ml/rev.)
003 = 10,8 017 = 58,3
005 = 17,2 020 = 63,8
006 = 21,3 022 = 70,3
008 = 26,4 025 = 79,3
010 = 34,1 028 = 88,8
012 = 37,1 031 = 100,0
014 = 46,0

Modifications

Mounting w/connection variables
4 bolts SAE flange J518

P1 = 1.1/2" - P2 = 1.1/2" - P3 = 3/4" & 1" - S = 4"		
	Metric	**UNC**
T7EEC - 3/4"	M1	
T7EECS - 3/4"	M1	01
T7EEC - 1"	M0	
T7EECS - 1"	M0	00

Seal class
1 = S1 BUNA N - 0,7 bar max. (for mineral oil)

Design letter

Porting combination (see pages 72 - 73)
00 = standard

Direction of rotation (shaft end view)
R = Clockwise
L = Counter-clockwise

Type of shaft T7EEC - T7EECS
2 = keyed (ISO 3019/2 - G45N))

Type of shaft T7EECS
4 = splined 8/16 (SAE D & E) (13 teeth)

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

Pressure port	Series	Vi Volumetric displacement	Flow q_{ve} [l/min] & n = 1500 RPM			Input power P [kW] & n = 1500 RPM		
			p = 0 bar	p = 140 bar	p = 240 bar	p = 7 bar	p = 140 bar	p = 240 bar
P1 & P2	042	132,3 ml/rev	198,5	188,5	181,3	5,2	49,4	82,6
	045	142,4 ml/rev	213,6	203,6	196,5	5,4	52,9	88,7
	050	158,5 ml/rev	237,7	227,7	220,6	5,7	58,5	98,3
	052	164,8 ml/rev	247,2	237,2	230,1	5,8	60,8	102,1
	054	171,0 ml/rev	256,5	246,5	239,4	5,9	63,0	105,8
	057	183,3 ml/rev	275,0	265,0	257,9	6,1	67,3	113,2
	062	196,7 ml/rev	295,0	285,0	277,9	6,4	71,9	121,3
	066	213,3 ml/rev	319,9	309,0	302,8	6,7	77,7	131,2
	072	227,1 ml/rev	340,6	330,6	323,5	6,9	82,6	139,5
	085	268,7 ml/rev	403,0	392,0[2)]	-	9,1	65,8[2)]	-
			p = 0 bar	**p = 140 bar**	**p = 275 bar**	**p = 7 bar**	**p = 140 bar**	**p = 275 bar**
P3	003	10,8 ml/rev	16,2	11,2	*	1,3	5,3	*
	005	17,2 ml/rev	25,8	20,8	16,1	1,4	7,5	13,9
	006	21,3 ml/rev	31,9	26,9	22,2	1,5	8,9	16,8
	008	26,4 ml/rev	39,6	34,6	29,9	1,6	10,7	20,3
	010	34,1 ml/rev	51,1	46,1	41,4	1,7	13,4	25,6
	012	37,1 ml/rev	55,6	50,6	45,9	1,7	14,4	27,6
	014	46,0 ml/rev	69,0	64,0	59,3	1,9	17,6	33,7
	017	58,3 ml/rev	87,4	82,4	77,7	2,1	21,9	42,2
	020	63,8 ml/rev	95,7	90,7	86,0	2,2	23,8	46,0
	022	70,3 ml/rev	105,4	100,4	95,7	2,3	26,1	50,4
	025	79,3 ml/rev	118,9	113,9	109,2	2,5	29,2	56,6
	028	88,8 ml/rev	133,2	128,2	125,8[1)]	2,8	32,7	48,5[1)]
	031	100,0 ml/rev	150,0	145,0	142,6[1)]	2,8	36,5	54,4[1)]

** We do not recommand to use the size 003 in P3 at 275 bar & 1500 RPM as the internal leakage is over 50% of theoretical flow.*

[1)] 028 - 031 = 210 bar max.int. *[2)] 085 = 90 bar max.int.*

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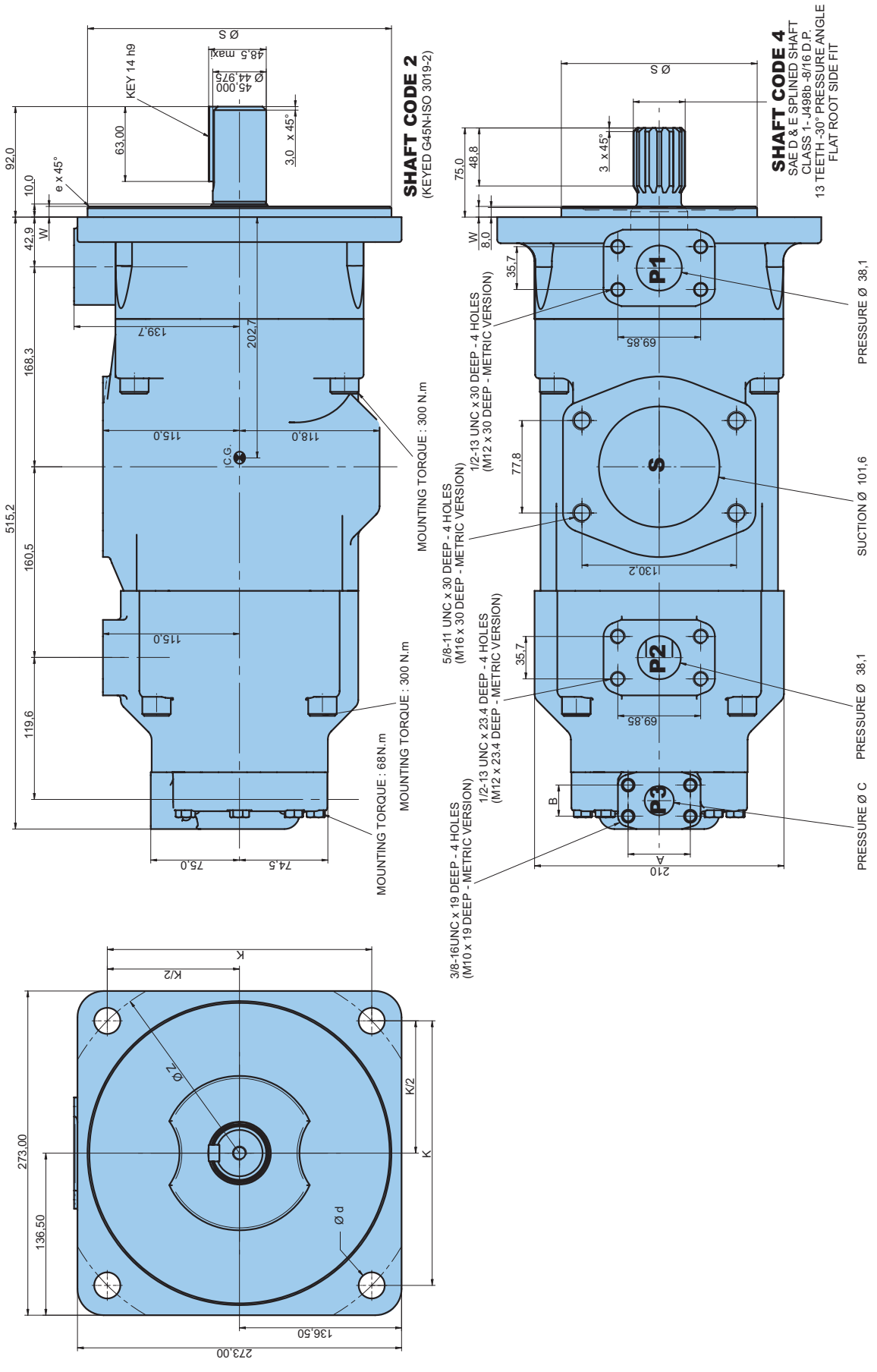
T7EEC/EECS - Dimensions - Weight : 114,8 kg T7/T67/T6C Industrial, Denison Vane Pumps



Alternate connect. variables		
	00 & M0	01 & M1
A	52,4	47,6
B	26,2	22,2
C	25,4	19,0

Alternate mounting flange							
Series	Dia S		e x 45°	W	K	Dia Z	Dia d
	Max.	Min.					
T7EEC	250,000	249,928	2,0	9,0	-	315	22,0
T7EECS	165,100	165,050	2,0	9,0	224,5	-	20,8

Shaft torque limits [ml/rev. x bar]	
Shaft	Vi x p max. P1 + P2 + P3
2	118340
4	126800

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VPDE, Denison Vane Pumps
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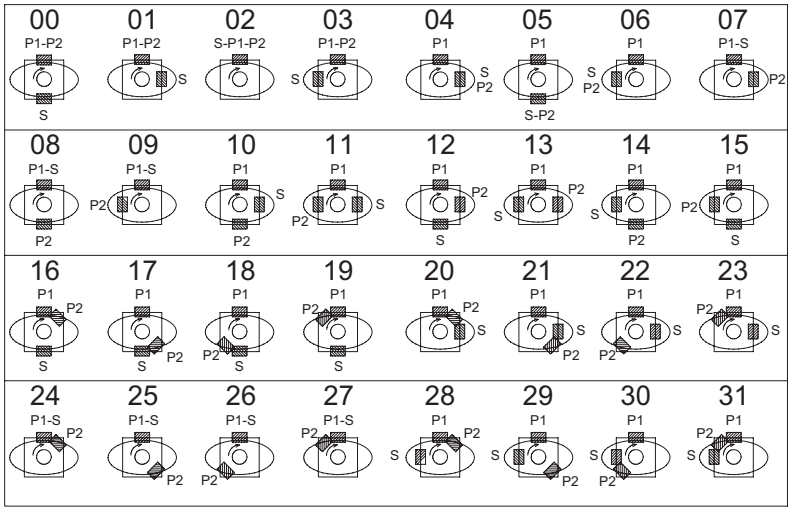
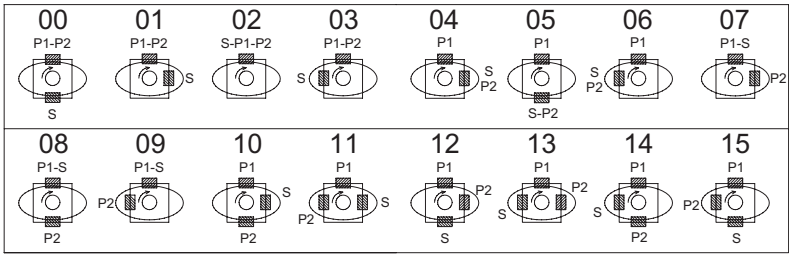
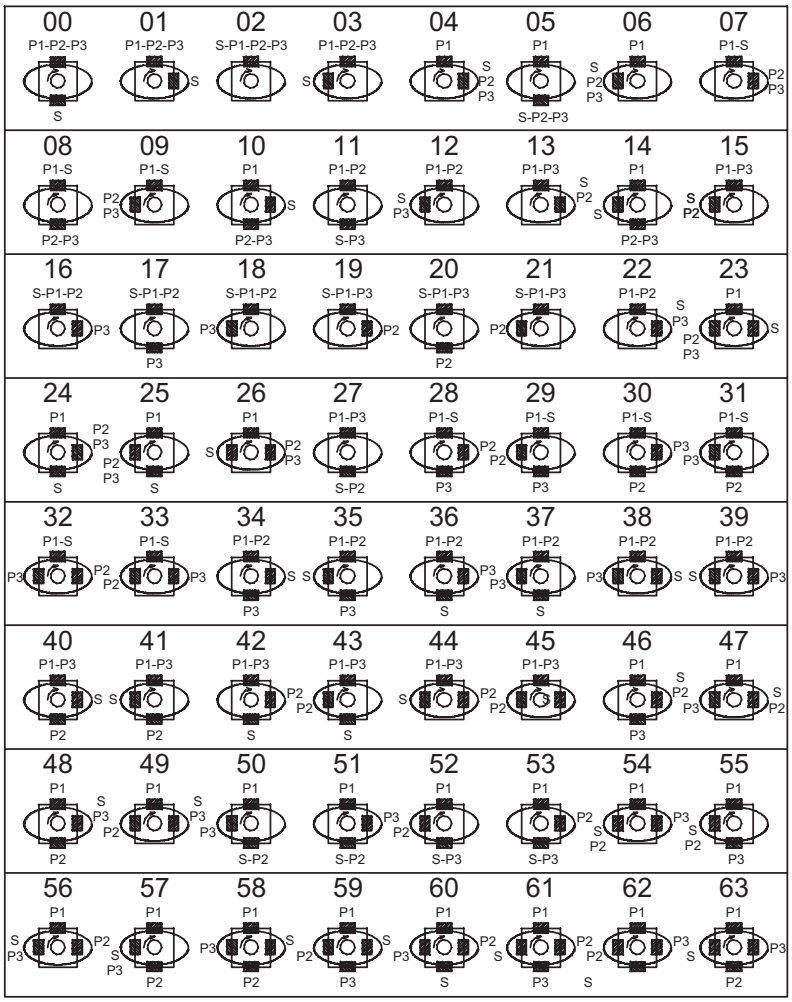
T7BB/T7BBS
T6CC
T67CB
T7DB/T7DBS
T67DC
T7EB/T7EBS
T67EC



T7DD/T7DDS
T7ED/T7EDS
T7EE/T7EES



T7DBB/T7DBBS
T7DCB/T7DCBS
T7DCC/T7DCCS
T7DBB/T7DBBS
T67DDCS
T7EDB/T7EDBS
T67EDC/T67EDCS
T7EEC/T7EECS



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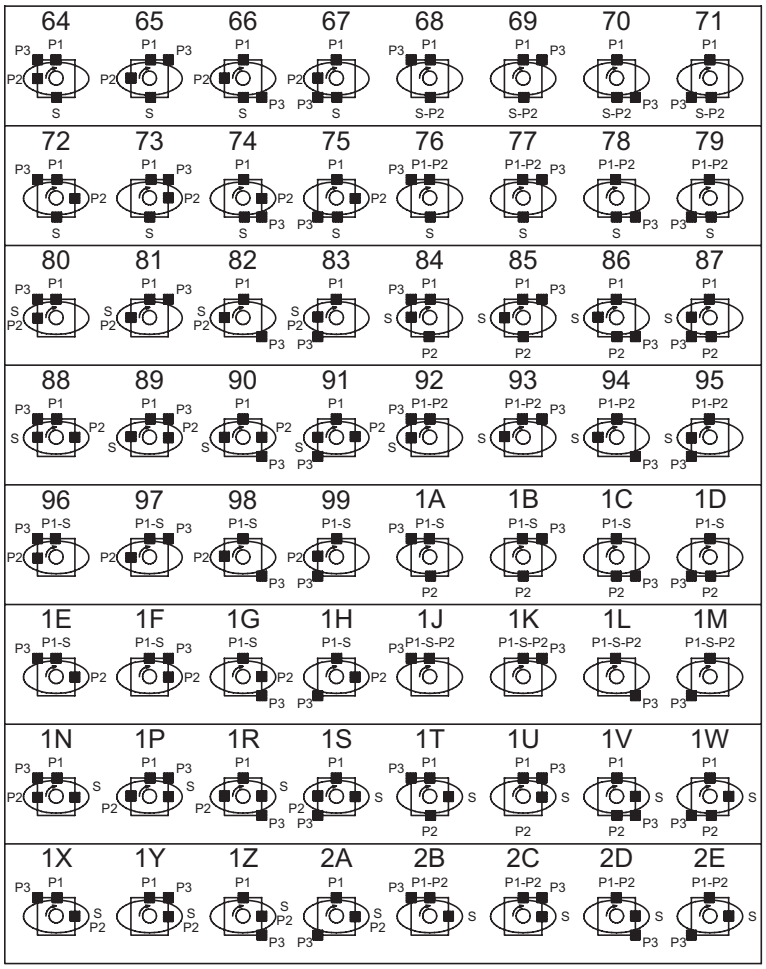
T7DBB/T7DBBS
T7DCB/T7DCBS
T7DCC/T7DCCS
T7DBB/T7DBBS
T67DDCS
T7EDB/T7EDBS
T67EDC/T67EDCS
T7EEC/T7EECS



P1

S	P2	P3				P2	P3			
		02	16	17	18		20	30	08	31
		19	07	28	32		21	33	29	09
		01	22	34	38		40	48	10	58
		13	04	46	47		45	49	59	23
		00	36	11	37		27	51	05	50
		42	24	53	60		43	62	52	25
		03	39	35	12		41	63	14	57
		44	26	61	56		15	54	55	06

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VPDE, Denison Vane Pumps
Vierzon - France

WARNING — USER RESPONSIBILITY

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- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

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Basic formulas for hydraulic motors

Flow (q)

$$q = \frac{D \times n}{1000 \times \eta_v} \text{ [l/min]}$$

Torque (M)

$$M = \frac{D \times \Delta p \times \eta_{hm}}{63} \text{ [Nm]}$$

Power (P)

$$P = \frac{q \times \Delta p \times \eta_t}{600} \text{ [kW]}$$

D - displacement [cm^3/rev]
n - shaft speed [rpm]
η_v - volumetric efficiency
Δp - differential pressure [bar] (between inlet and outlet)
η_{hm} - mechanical efficiency
η_t - overall efficiency ($\eta_t = \eta_v \times \eta_{hm}$)

Basic formulas for hydraulic pumps

Flow (q)

$$q = \frac{D \times n \times \eta_v}{1000} \text{ [l/min]}$$

Torque (M)

$$M = \frac{D \times \Delta p}{63 \times \eta_{hm}} \text{ [Nm]}$$

Power (P)

$$P = \frac{q \times \Delta p}{600 \times \eta_t} \text{ [kW]}$$

D - displacement [cm^3/rev]
n - shaft speed [rpm]
η_v - volumetric efficiency
Δp - differential pressure [bar] (between inlet and outlet)
η_{hm} - mechanical efficiency
η_t - overall efficiency ($\eta_t = \eta_v \times \eta_{hm}$)

Conversion factors

1 kg	2.20 lb
1 N	0.225 lbf
1 Nm	0.738 lbf ft
1 bar	14.5 psi
1 l	0.264 US gallon
1 cm^3	0.061 cu in
1 mm	0.039 in
1°C	$^5/_9$(°F-32)
1 kW	1.34 hp

Conversion factors

1 lb	0.454 kg
1 lbf	4.448 N
1 lbf ft	1.356 Nm
1 psi	0.068948 bar
1 US gallon	3.785 l
1 cu in	16.387 cm^3
1 in	25.4 mm
1°F	$^9/_5$°C + 32
1 hp	0.7457 kW

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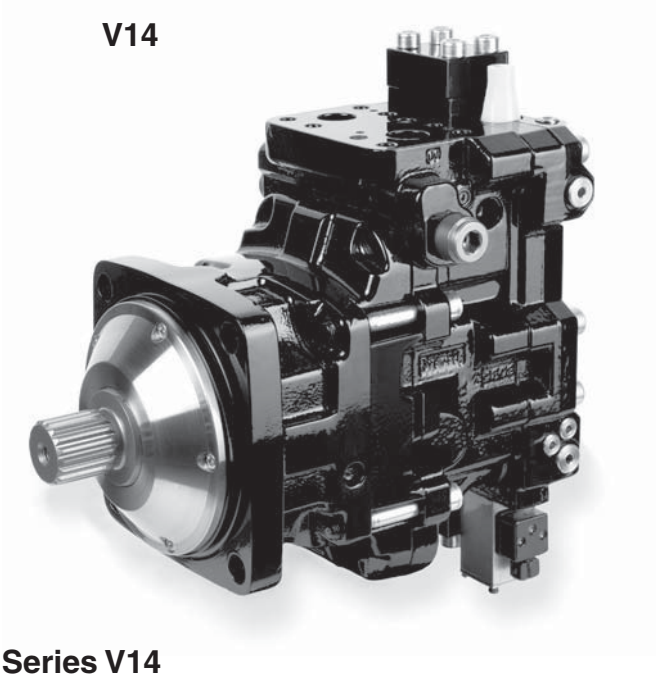
V12

V14



Series V12

Series V12 is a bent-axis, variable displacement motor.

It is intended for both open and closed circuits, mainly in mobile applications, but the V12 can also be utilized in a wide variety of other applications.

Features

- Max intermittent pressure to 480 bar and continuous operating pressure to 420 bar
- Thanks to low weight pistons with laminated piston rings and a compact design of the rotating parts, the V12 tolerates very high speeds
- High allowable speeds and operating pressures means high output power; the overall efficiency remains high throughout the entire displacement range
- The 9-piston design provides high start-up torque and smooth motor operation
- Wide displacement ratio (5:1)
- Broad range of controls and accessory valves for most applications
- Small envelop size and a high power-to-weight ratio
- ISO, cartridge and SAE versions
- Low noise levels due to a very compact and sturdy design with smooth fluid passages
- Positive piston locking, strong synchronizing shaft, heavy-duty bearings and small number of parts add up to a compact and robust motor with long service life and proven reliability.

Series V14

Series V14 is a new generation of variable displacement, bent-axis motors, a further development of our well known V12 motor.

It is designed for both open and closed circuit transmissions with focus on high performance machines .

Applications

- Excavators
- Forestry machines
- Mining and drilling machines
- Wheel loaders
- Winch drives

Optional equipment

- Integrated sensors for speed and displacement
- Integrated flushing or pressure relief valves

Additional benefits (compared to those of the V12)

- Improved speed capability
- Improved control performance
- Reduced number of parts
- Stronger shaft bearing support.

T12

Available motors

Model	Frame size	Version	Chapter
V12	60	ISO	2
V12	60	Cartridge	2
V12	60	SAE	2
V12	80	ISO	2
V12	80	Cartridge	2
V12	80	SAE	2
V14	110	ISO	3
V14	110	Cartridge	3
V14	110	SAE	3
V14	160	ISO	3
V14	160	SAE	3
T12	60	Cartridge	4
T12	80	Cartridge	4

Series T12

The T12 two-displacement motor is tailor-made for track drives. It allows a high ratio between high and low speed and installs as easily as a fixed displacement motor. Max speed ratio is 3.33-to-1.

The T12 is a cartridge motor based on the well proven V12 series. The specially designed end cap with dual ports permits a very short installation.

A simple setting device moves the cylinder barrel to the maximum or minimum displacement position. The setting is controlled by an external hydraulic pilot signal.

Bearing life

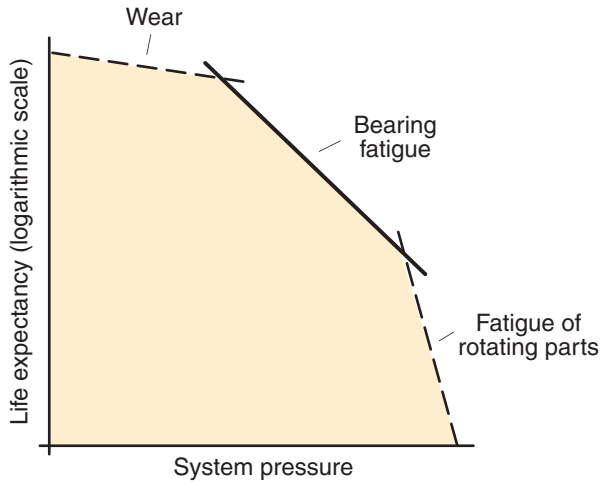
General information

Bearing life can be calculated for that part of the load/life curve (shown below) that is designated 'Bearing fatigue'. 'Fatigue of rotating parts' and 'Wear'caused by fluid contamination, etc., should also be taken into consi-deration when estimating the service life of a motor/pump in a specific application.

In reality, bearing life can vary considerably due to the quality of the hydraulic system (fluid condition, cleanliness, etc.)

Bearing life calculations are mainly used when comparing different motor frame sizes. Bearing life, designated B_{10} (or L_{10}), depends of system pressure, opera-ting speed, external shaft loads, fluid viscosity in the motor case, and fluid contamination level.

The B_{10} value means that 90% of the bearings survive at least the number of hours calculated. Statistically, 50% of the bearings will survive at least five times the B_{10} life.



Hydraulic motor life versus system pressure.

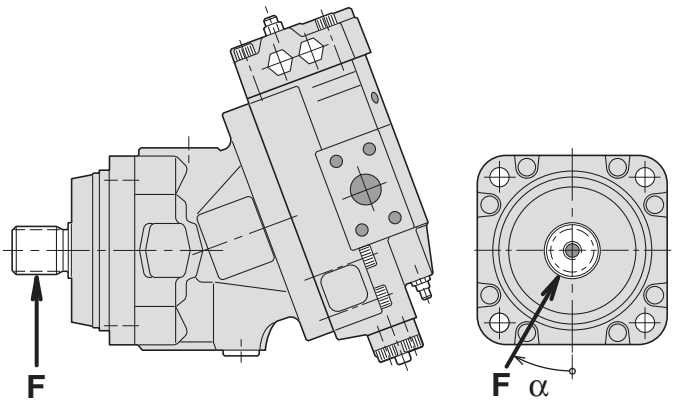
Bearing life calculation

An application is usually governed by a certain duty or work cycle where pressure, speed and displacement vary with time during the cycle.
Bearing life is also dependent on external shaft loads, case fluid viscosity and fluid contamination.

Required information

When requesting a bearing life calculation from Parker Hannifin, the following information (where applicable) should be provided:

- A short presentation of the application
- Motor size and version
- Duty cycle (pressure and speed versus time at specified displacements)
- Low pressure
- Case fluid viscosity
- Life probability (B_{10}, B_{20}, etc.)
- Direction of rotation (L or R)
- Axial load
- Fixed or rotating radial load
- Distance between flange and radial load
- Angle of attack (α) as defined below.



V12

2

Content

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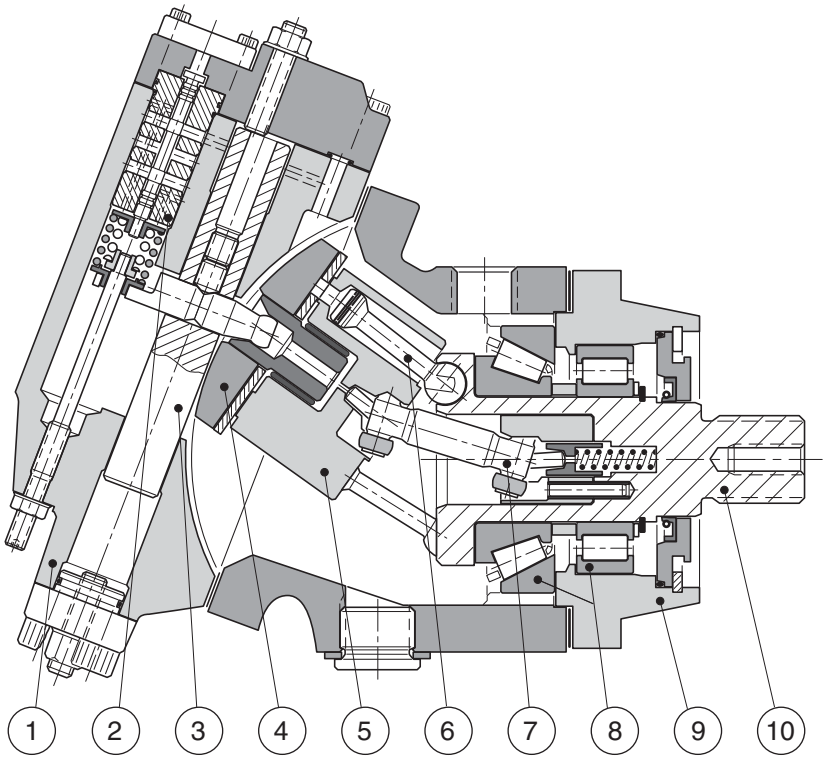
Trollhättan, Sweden

V12 cross section

1. End cap
2. Servo control valve
3. Setting piston
4. Valve segment
5. Cylinder barrel
6. Spherical piston with laminated piston ring
7. Synchronizing shaft
8. Heavy-duty roller bearings
9. Bearing housing
10. Output shaft



Specifications

V12 frame size	**60**	**80**
Displacement [cm³/rev]		
- max, at 35°	60	80
- min, at 6.5°	12	16
Operating pressure [bar]		
- max intermittent [1)]	480	480
- max continuous	420	420
Operating speed [rpm]		
- at 35°, max intermittent [1)]	4 700	4 300
- at 35°, max continuous	4 100	3 700
- at 6.5°–20°, max intermittent [1)]	7 900	7 200
- at 6.5°–20°, max continuous	6 900	6 300
- min continuous	50	50
Flow [l/min]		
- max intermittent [1)]	282	344
- max continuous	246	296
Torque (theor.) at 100 bar [Nm]	95	127
Max Output power [1)] [kW]	170	205
Corner power [kW]		
- intermittent [1)]	380	460
- continuous	290	350
Mass moment of inertia		
($x10^{-3}$) [kg m²]	3.1	4.4
Weight [kg]	28	33

1) Max 6 seconds in any one minute.

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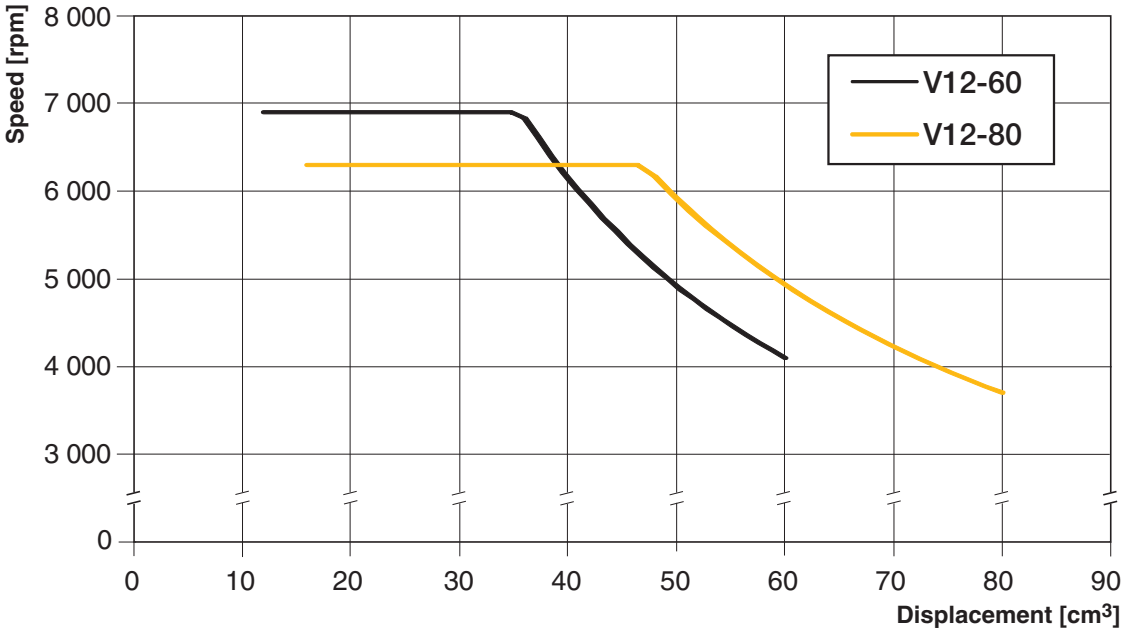
Continuous Speed vs. Displacement



Efficiency diagrams

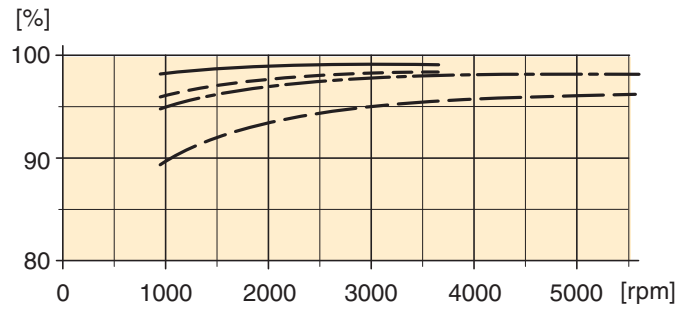
The following diagrams show volumetric and overall efficiencies versus shaft speed at 210 and 420 bar operating pressure, and at full (35°) and reduced (10°) displacements.

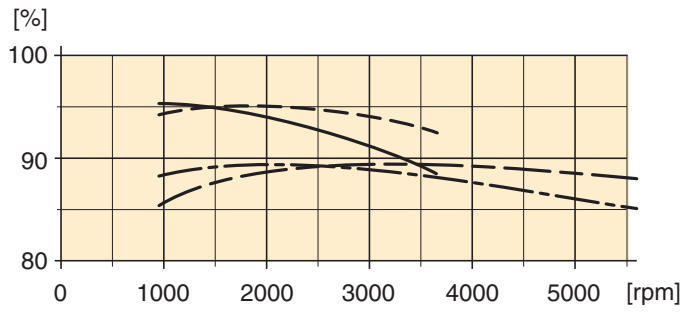
Information on efficiencies for a specific load condition can be made available from Parker Hannifin.

210 bar at full displacement
420 bar " " "

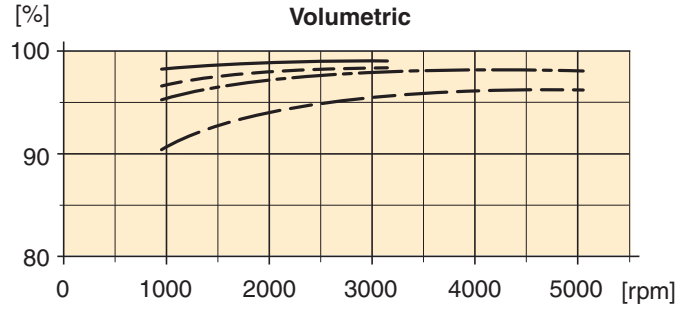
210 bar at reduced displacement
420 bar " " "

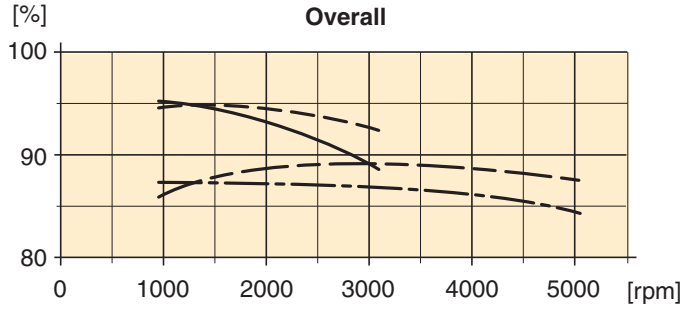
V12-60





V12-80





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Controls (general information)

The following six V12 controls described below satisfy most application requirements:

- **AC** and **AH** (Pressure compensator)
- **EO** and **HO** (Two-position controls)
- **EP** and **HP** (Proportional controls).

All controls utilize a setting piston that connects to the valve segment (refer to the picture on page 8).

The built-in four-way servo valve acts on the setting piston and determines the displacement which can vary between 35° (max) and 6.5° (min).

Servo supply pressure is usually obtained from the main high pressure port through the built-in shuttle valve.

When using external servo supply, the servo pressure should be at least 30 bar.

The response time (i.e. from max to min displacement) is determined by orifices in the servo valve supply and return lines.

NOTE: The modulating pressure/current, Δp/ΔI values are valid for motors that are not displacement limited.

AC pressure compensator

The AC compensator is used in off-road vehicle hydrostatic transmissions; it automatically adjusts motor displacement to the output torque requirement (up to max available system pressure).

Normally, the motor stays in the minimum displacement position. When there is a demand for additional torque, i.e. when the vehicle enters an upgrade, the displacement increases (providing more torque) while the motor shaft speed decreases proportionally.

The threshold pressure ('ps'; refer to the AC diagram) where displacement starts to increase, is adjustable between 150 and 400 bar.

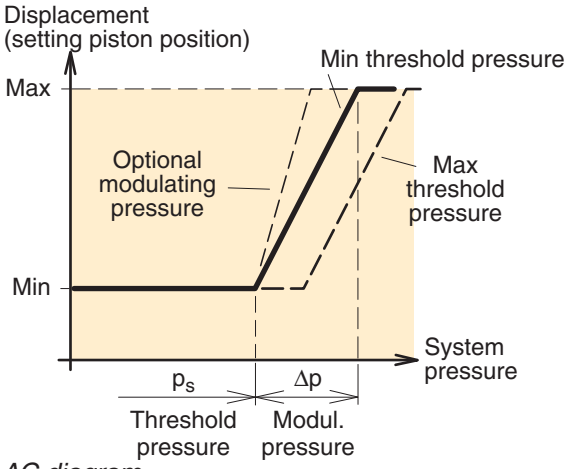
To reach max displacement, an additional modulating pressure (Δp) above the threshold pressure (ps) is required.

To satisfy specific hydraulic circuit requirements, a modulating pressure, Δp, of 15, 25 or 50 bar can be selected.

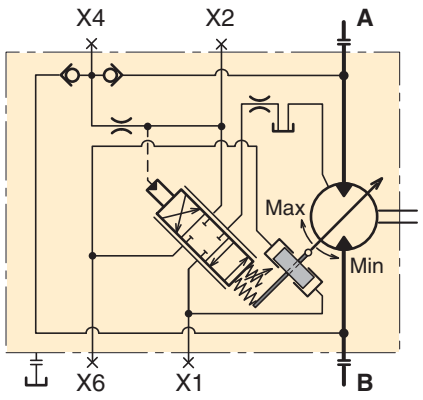
The AC compensator is available in two versions:

ACI 01 I - Internal pilot pressure

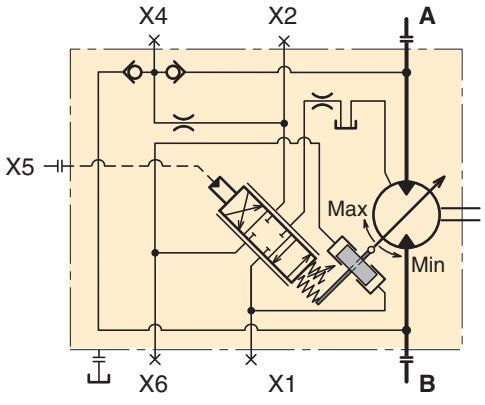
ACE 01 I (optional) - External pilot pressure; port X5 can, for example, be connected to the 'forward drive' pressure line of a vehicle transmission to prevent motor displacement increase when the vehicle is going downhill.



AC diagram.



ACI 01 I schematic (spool in a balanced, mid-pos.).



ACE 01 I schematic (spool in a balanced, mid-pos.).

Gauge/pilot ports (AC compensator):	
X1	Setting piston pressure (increasing displ.)
X2	Servo supply pressure (after orifice)
X4	Servo supply pressure (before orifice)
X5	External pilot pressure
X6	Setting piston pressure (decreasing displ.)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^9/_{16}$"-18 O-ring boss (SAE version).

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AH pressure compensator

The AH compensator is similar to the AC (page 10) but incorporates an hydraulic override device. It is utilized in hydrostatic transmissions where a high degree of manoeuvrability at low vehicle speeds is desirable.

When the override is pressurized, the servo piston moves to the max displacement position irrespective of system pressure, provided the servo supply pressure is at least 30 bar.

The AH compensator is available in two versions:

AHI 01 I - Same as the ACI except for the override; internal pilot pressure.

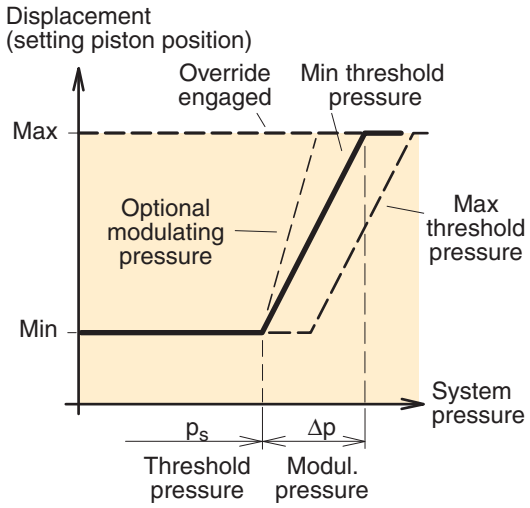
AHE 01 I (optional) - External pilot pressure (port X5; compare ACE, page 10).

Required override pressure, port X7 (min 20 bar):

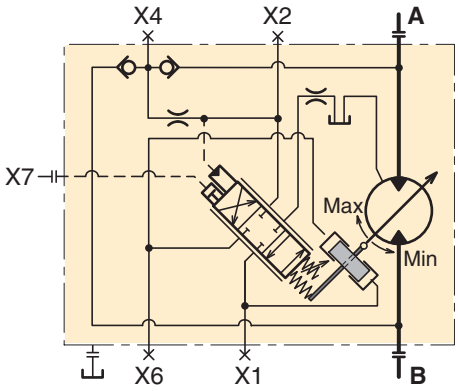
$$p_7 = \frac{p_S + \Delta p}{24} \text{ [bar]}$$

p_7 = Override pressure
p_s = System pressure
Δp = Modulating pressure

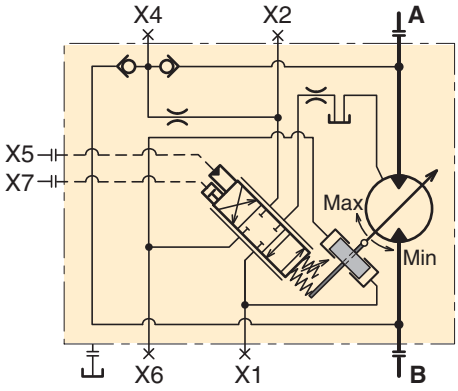
Gauge/pilot ports (AH compensator)	
X1	Setting piston pressure (increasing displ.)
X2	Servo supply pressure (after orifice)
X4	Servo supply pressure (before orifice)
X5	External pilot pressure
X6	Setting piston pressure (decreasing displ.)
X7	Override pressure
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^9/_{16}$"-18 O-ring boss (SAE version).



AH diagram.



AHI 01 I schematic (spool in a balanced, mid-pos.).



AHE 01 I schematic (spool in a balanced, mid-pos.).

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AD pressure compensator with brake defeat

The **AD** control is similar to the ACI (internal pilot pressure supply; page 10) but incorporates a solenoid controlled override function.

In addition, the AD includes a brake defeat valve which prevents motor displacement increase in the braking mode.

The **override** consists of a piston built into the AD end cover and an external electrohydraulic solenoid valve. When the solenoid is energized, system pressure is directed to the piston which in turn pushes on the spool of the servo control valve.

This causes the motor to lock in the max displacement position, irrespective of system pressure (min 30 bar).

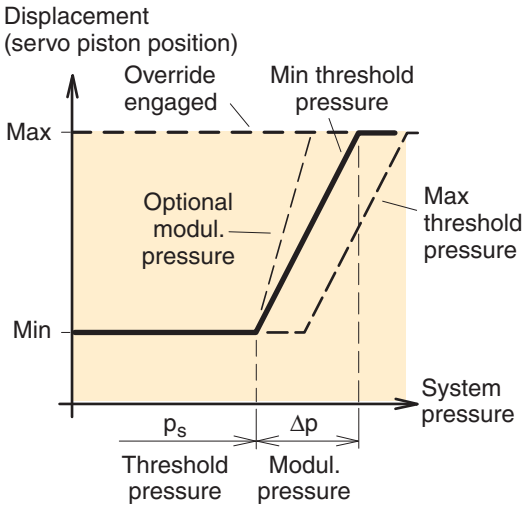
Solenoids are available in 12 VDC (designated **L**) and 24 VDC (design. **H**); the required current is 2 and 1 A respectively.

The **brake defeat** valve is also part of the AD end cover and consists of a two-position, three-way spool. The two ports, x9 and x10 (below) should be connected to the corresponding ports of the displacement control of the variable displacement pump.

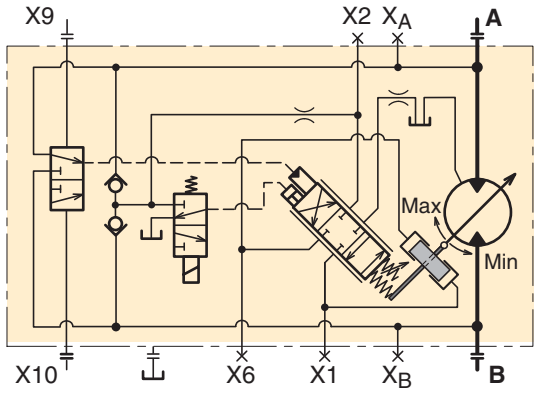
The brake defeat function prevents the motor outlet port pressure to influence the pressure compensator. If, for example, port A is being pressurized when driving 'forward', pressure in port B during braking will not cause the motor to increase its displacement.

Likewise, when driving in 'reverse' (port B pressurized), any braking pressure in port A will not influence the control; refer to the schematic.

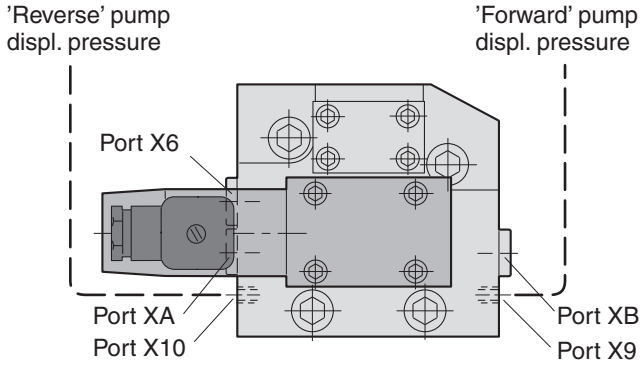
Gauge/pilot ports (AD control)	
XA	System pressure, port A
XB	System pressure, port B
X1	Servo piston pressure (increasing displ.)
X2	Servo supply pressure (after orifice)
X6	Servo piston pressure (decreasing displ.)
X9	Brake defeat, port A
X10	Brake defeat, port B
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).



AD diagram.



AD schematic (spool in balanced, mid-position).



AD end cover with solenoid valve and brake defeat.

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EO two-position control

The EO is a two-position control, where max and min displacements are governed by a DC solenoid attached to the control cover (refer to the installation drawing on page 30).

The EO control is utilized in transmissions where only two operating modes are required: Low speed/high torque or high speed/low torque.

The servo piston, normally in the max displacement position, shifts to the min displacement position when the solenoid is activated. Intermediate displacements cannot be obtained with this control.

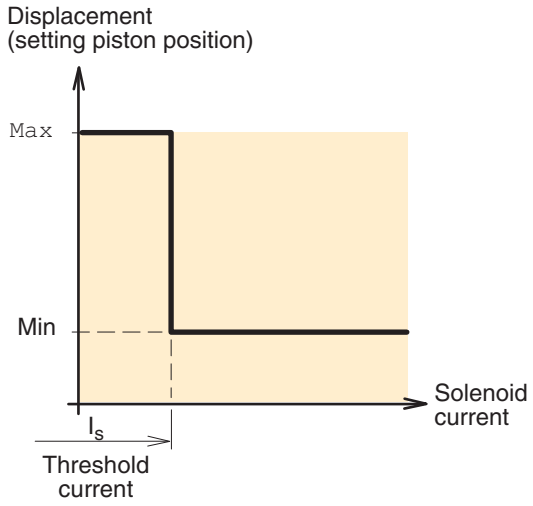
Servo pressure is supplied internally (through the shuttle valve from one of the main high pressure ports) or externally (port X4).

The solenoid is either 12 or 24 VDC, requiring 1200 and 600 mA respectively. An electrical connector is included (DIN 43650/IP54).

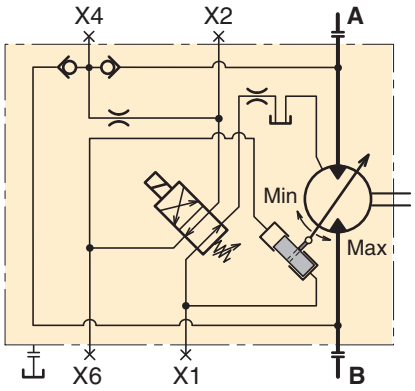
The EO two-position control is available in four versions:

EOH 01 I - Internal servo supply, 24 VDC
EOL 01 I - Internal servo supply, 12 VDC
EOH 01 E - External servo supply, 24 VDC (optional)
EOL 01 E - External servo supply, 12 VDC (optional)

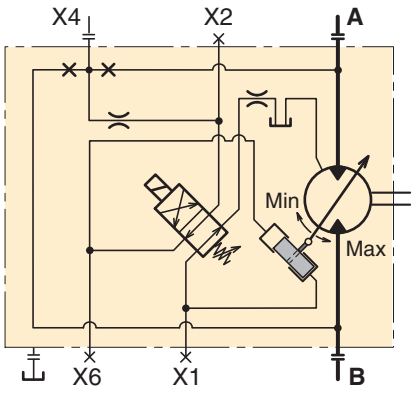
Gauge/pilot ports (EO control):	
X1	Setting piston pressure (max-to-min)
X2	Servo supply pressure (after orifice)
X4	Servo supply pressure (before orifice)
X6	Setting piston pressure (min-to-max)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).



EO diagram.



EO H 01 I schematic (non-activated solenoid).



EO H 01 E schematic (non-activated solenoid).

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EP proportional control

The EP electrohydraulic proportional control is used in hydrostatic transmissions requiring a continuously variable shaft speed. The position of the setting piston is governed by a DC solenoid attached to the control cover.

When the solenoid current increases above the threshold current, the servo piston starts to move from the max towards the min displacement position. The displacement vs. solenoid current is shown in the diagram to the right. Please note, that the shaft speed vs. current is non-linear; refer to the diagram below.

Solenoids are available in 12 and 24 VDC versions, requiring a max current of approx. 1100 and 550 mA respectively. An electrical connector is included (DIN43650/IP54).

The threshold current (I_s) is factory set 400 mA at 12 VDC/200 mA at 24 VDC) but is adjustable (12 VDC: 250–450 mA; 24 VDC: 100–230 mA).

When utilizing the full displacement range, the required modulating current (ΔI) is 600 and 300 mA respectively. In order to minimize hysteresis, a pulse-width modulated control signal of 70 to 90 Hz should be utilized.

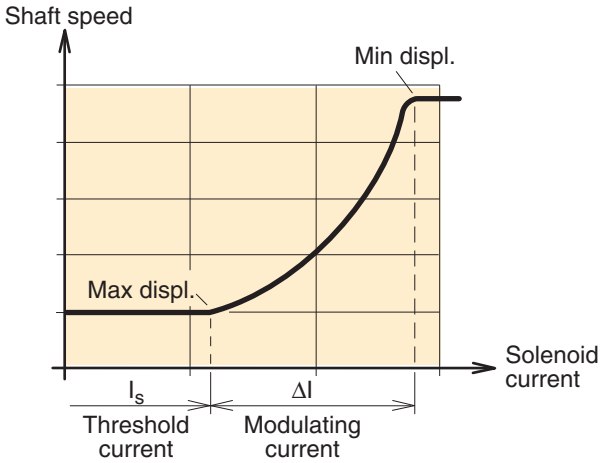
See also “Controls, Note” on page 10.

NOTE: The modulating current (ΔI) is not adjustable.

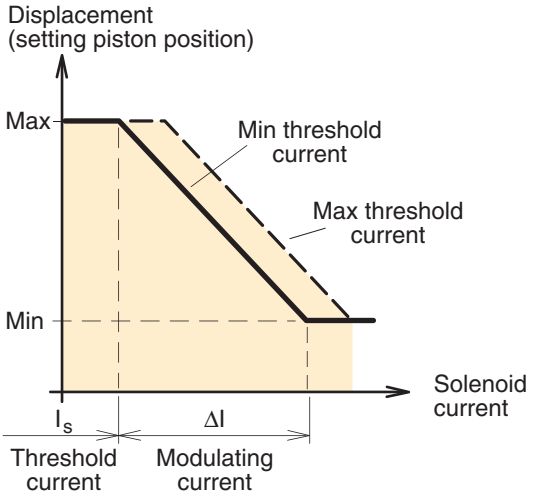
The EP control is available in four versions:

EP H 01 I - Internal servo supply, 24 VDC
EP L 01 I - Internal servo supply, 12 VDC
EP H 01 E - External servo supply, 24 VDC (optional)
EP L 01 E - External servo supply, 12 VDC (optional)

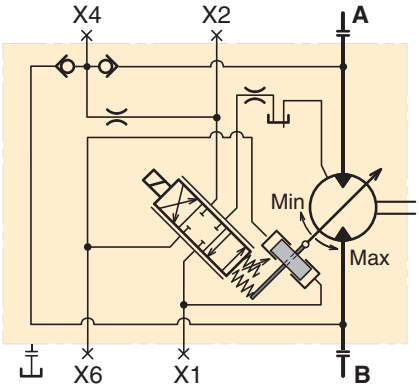
Gauge/pilot ports (EP control):	
X1	Setting piston pressure (decreasing displ.)
X2	Servo supply pressure (after orifice)
X4	Servo supply pressure (before orifice)
X6	Setting piston pressure (increasing displ.)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).



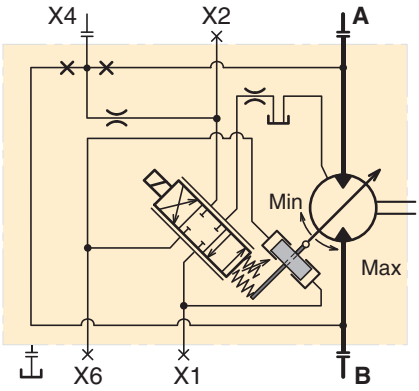
Shaft speed vs. solenoid current (EP control).



EP diagram.



EP H 01 I schematic (spool in a balanced, mid-pos.).



EP H 01 E schematic (spool in a balanced, mid-pos.).

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HO two-position control

The two-position HO control is similar to the EO (page 13) but the pilot signal is hydraulic. The position of the setting piston is governed by the built-in servo valve (same on all compensators and controls).

When the applied pilot pressure (port X5) exceeds the pre-set threshold pressure, the setting piston moves from the max to the min displacement position.

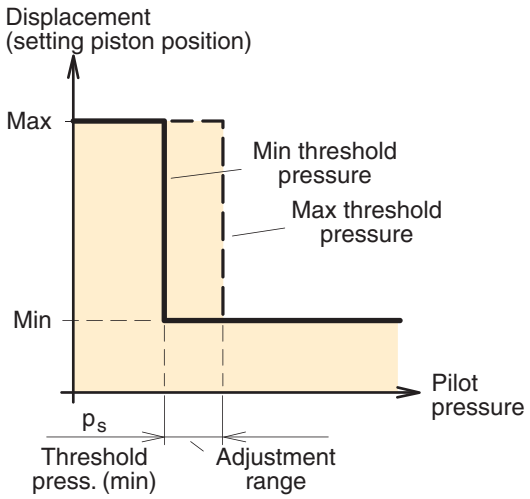
The threshold pressure is factory set at 10 bar but can be adjusted between 5 and 25 bar.

The HO two-position control is available in two versions:

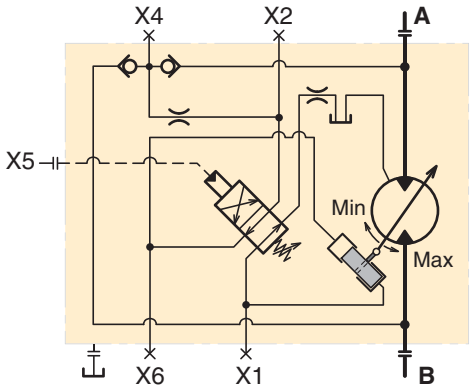
HO S 01 I - Internal servo supply

HO S 01 E - External servo supply (port X4) (optional)

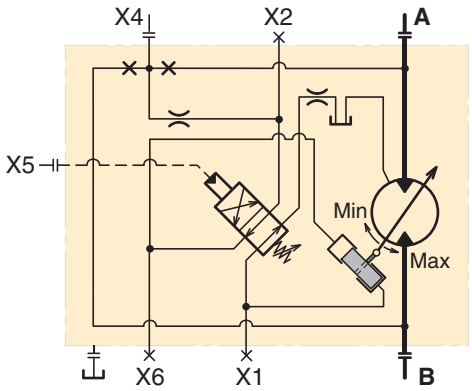
Gauge/pilot ports (HO control):	
X1	Setting piston pressure (max-to-min)
X2	Servo supply pressure (after orifice)
X4	Servo supply pressure (before orifice)
X5	External pilot pressure (max 100 bar)
X6	Setting piston pressure (min-to-max)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).



HO diagram.



HO S 01 I schematic (X5 not pressurized).



HO S 01 E schematic (X5 not pressurized).

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HP proportional control

Like the EP control described on page 14, the HP proportional control offers continuously variable displacement, but the pilot signal is hydraulic.

Normally, the setting piston stays in the max displacement position. When a sufficiently high pilot pressure (p_s) is applied to port X5, the setting piston starts to move towards the min displacement position.

As can be seen in the diagram to the right, the displacement changes in proportion to the applied modulating pressure.

In contrast, shaft speed vs. pilot pressure is non-linear; refer to the diagram below.

The following modulating pressures (Δp) can be selected: 15 or 25 bar.

The threshold pressure (p_s) is factory set at 10 bar but is adjustable between 5 and 25 bar.

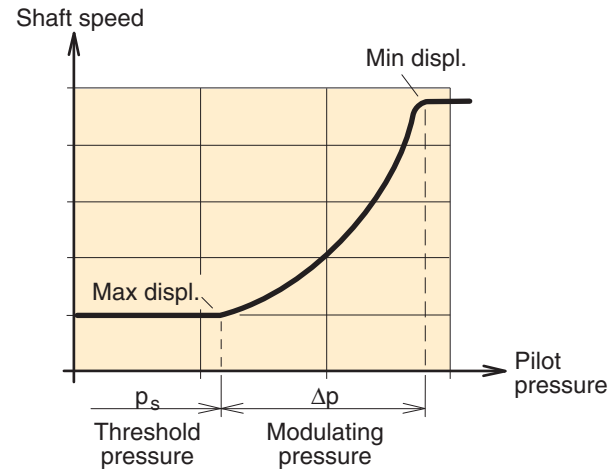
See also “Controls, Note” on page 10.

Two versions of the HP control are available:

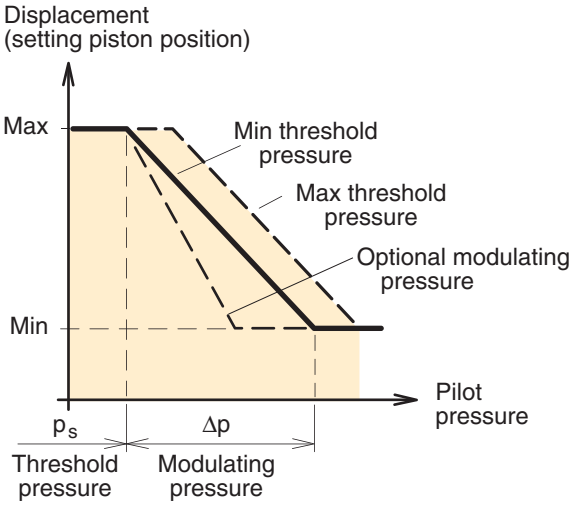
HPS 01 I - Internal servo supply

HPS 01 E - External servo supply (port X5) (optional)

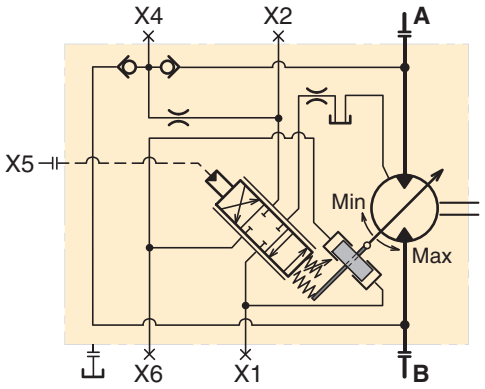
Gauge/pilot ports (HP control):	
X1	Setting piston pressure (decreasing displ.)
X2	Servo supply pressure (after orifice)
X4	Servo supply pressure (before orifice)
X5	External pilot pressure (max 100 bar)
X6	Seetting piston pressure (increasing displ.)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).



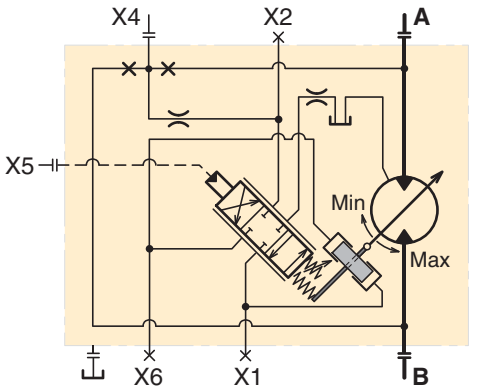
Shaft speed vs. pilot pressure (HP control).



HP diagram.



HP S 01 I schematic (spool in a balanced, mid-pos.).



HP S 01 E schematic (spool in a balanced, mid-pos.).

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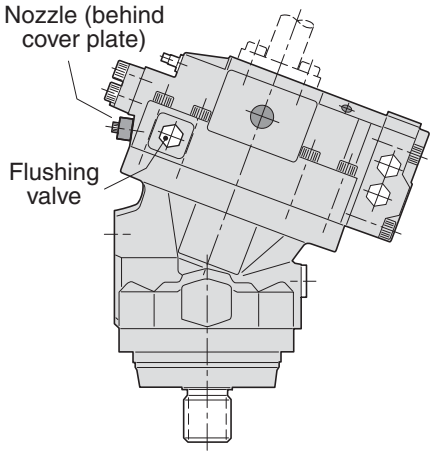
Flushing valve

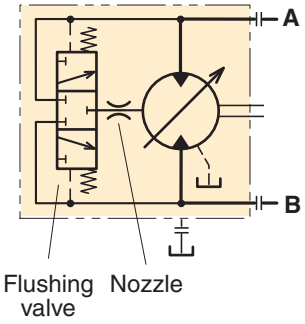
As an option, **L**, the V12 is available with a flushing (or shuttle) valve that supplies the motor with a cooling flow through the case. Cooling the motor may be required when operating at high speeds and/or power levels.

The flushing valve consists of a three-position, three-way spool valve built into a special end cap. It connects the low pressure side of the main circuit to a nozzle (optional size) that empties fluid into the motor case.

In a closed circuit transmission, the flushing valve removes part of the fluid in the main loop. The removed fluid is continuously being replaced by cool, filtered fluid from the low pressure charge pump on the main pump.

NOTE: The flushing valve ordering code is shown on page 23 (‘L 01’).





Nozzle design.	Orifice size [mm]	Status	Flow [l/min] at		
			15 bar	20 bar	25 bar
L01	**1.3**	**Standard**	**3.9**	**4.5**	**5.0**
L02	0.8	Optional	1.5	1.7	1.9
L03	1.0	Optional	2.3	2.7	3.0
L04	1.2	Optional	3.2	3.7	4.1
L05	1.5	Optional	5.2	6.0	6.7
L06	1.7	Optional	6.6	7.7	8.6
L07	2.0	Optional	9.2	10.6	11.9
L08	3.0	Optional	20.0	23.1	25.8

NOTE: ’L00’ = plug

High Speed / High Power operation

Running in procedure at mid. displacement

Running in procedure Parker Motors

We suggest the following procedure to run in the V12 motors.

1.Start @ 500 rpm, differential pressure 250 bar, outlet 10-15 bar.

2.Run until the drain temperature has passed its maximum* and has decreased 1-2 °C

3.Increase differential pressure to 350 bar

4.Run until the drain temperature has passed its maximum* and has decreased 1-2 °C

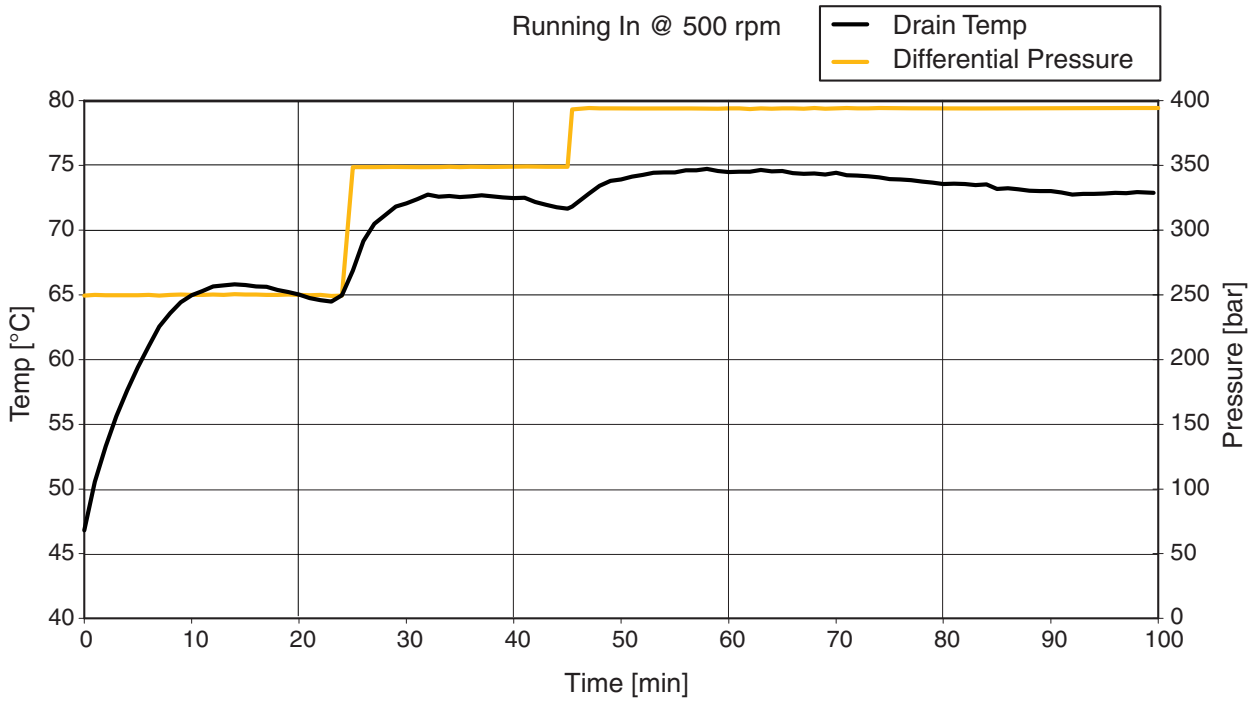
5.Increase differential pressure to 400 bar

6.Run until the drain temperature has passed its maximum* and has stabilized.

*If, at any point, the temperature tends to pass 100 °C, decrease the pressure at once.

Please make sure the drain temperature probe is in the drain oil flow to measure the correct temp.

Running In Example:



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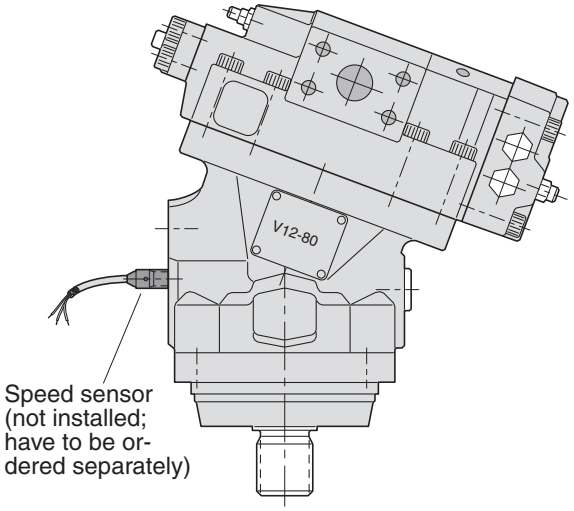
Speed sensor

A speed sensor kit is available for the **ISO, Cartridge** and **SAE** versions of series V12, V12-80-Cartridge excepted.

The ferrostat differential (Hall-effect) sensor installs in a separate, threaded hole in the V12 bearing housing.

The speed sensor is directed towards the V12 shaft flange and outputs a 2 phase shifted square wave signal within a frequency range of 0 Hz to 15 kHz. Number of pulses per shaft rev is 36 which, at 5 Hz, corresponds to approx. 8 rpm.

When a 'Speed sensor' is needed (refer to the ordering codes on pages 20 to 22), the housing is machined with the threaded hole; the speed sensor kit have to be ordered on a separate order line.

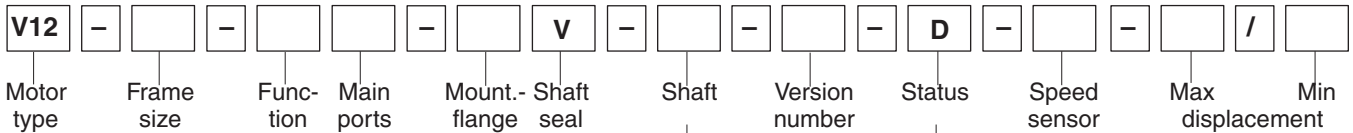


NOTE:
- The motor bearing housing must be prepared for the speed pick-up; refer to the V12 ordering codes on pg. 20, 21 and 22 (Code P).
- Additional information is provided in our publication HY30-8301/UK 'Speed sensor for series F11/F12 and V12/T12/V14'; available from Parker Hannifin.
- The speed sensor is also shown in the illustrations on pg. 24 and 28.

How to order
Please order the speed sensor on a separate order line next to the product order line.

Part number for speed sensor is 3785190.

ISO version (basic configuration)



Frame size	
Code	Displacem. (cm^3/rev)
060	60
080	80

Max and min displacement
[cm^3/rev]

Code	Speed sensor*
P	Prepared for speed sensor
O	None

Frame size		60	80
Code	Function		
M	Motor; normal end cap position: EO, EP, HO and HP	x	x
T	Motor; normal end cap position: AC and AH	x	x

Code	Status
D	Control pressure setting; max and min displacement screws sealed

Frame size		60	80
Code	Main ports		
A	SAE flange; metric threads, rear ports	x	x
F	SAE flange; metric threads, side ports	x	x

Version number
Factory assigned for special versions

* Note.
See information on page 19, Speed Sensor

Frame size		60	80
Code	Mounting flange		
I	ISO flange	x	x
N	ISO flange	(x)	(x)

Frame size		60	80
Code	Shaft seal		
V	PPS	x	x

Frame size		60	80
Code	Shaft (DIN 5480)		
C	Spline	(x)	(x)
D	Spline	x	x

x: Available (x): Optional – : Not available

Controls and flushing valve, see page 23

Cartridge version (basic configuration)

V12	–		–			–	C	V	–		–		–	D	–		–		/	
Motor type		Frame size		Func-tion	Main ports		Mount.-flange	Shaft seal		Shaft		Version number		Status		Speed sensor		Max displacement		Min

Frame size	
Code	Displacem. (cm^3/rev)
060	60
080	80

Frame size		60	80
Code	Function		
M	Motor; normal end cap position: EO, EP, HO and HP	x	x
T	Motor; normal end cap position: AC and AH	x	x

Frame size		60	80
Code	Main ports		
A	SAE flange; metric threads, rear ports	x	x
F	SAE flange; metric threads, side ports	x	x

Frame size		60	80
Code	Mounting flange		
C	Cartridge flange	x	x

Frame size		60	80
Code	Shaft seal		
V	PPS	x	x

Frame size		60	80
Code	Shaft (DIN 5480)		
C	Spline	(x)	(x)
D	Spline	x	x

Version number
Factory assigned for special versions

Code	Status
D	Control pressure setting; max and min displacement screws sealed

Code	Speed sensor*
P	(Speed sensor only available for V12-60)
O	None

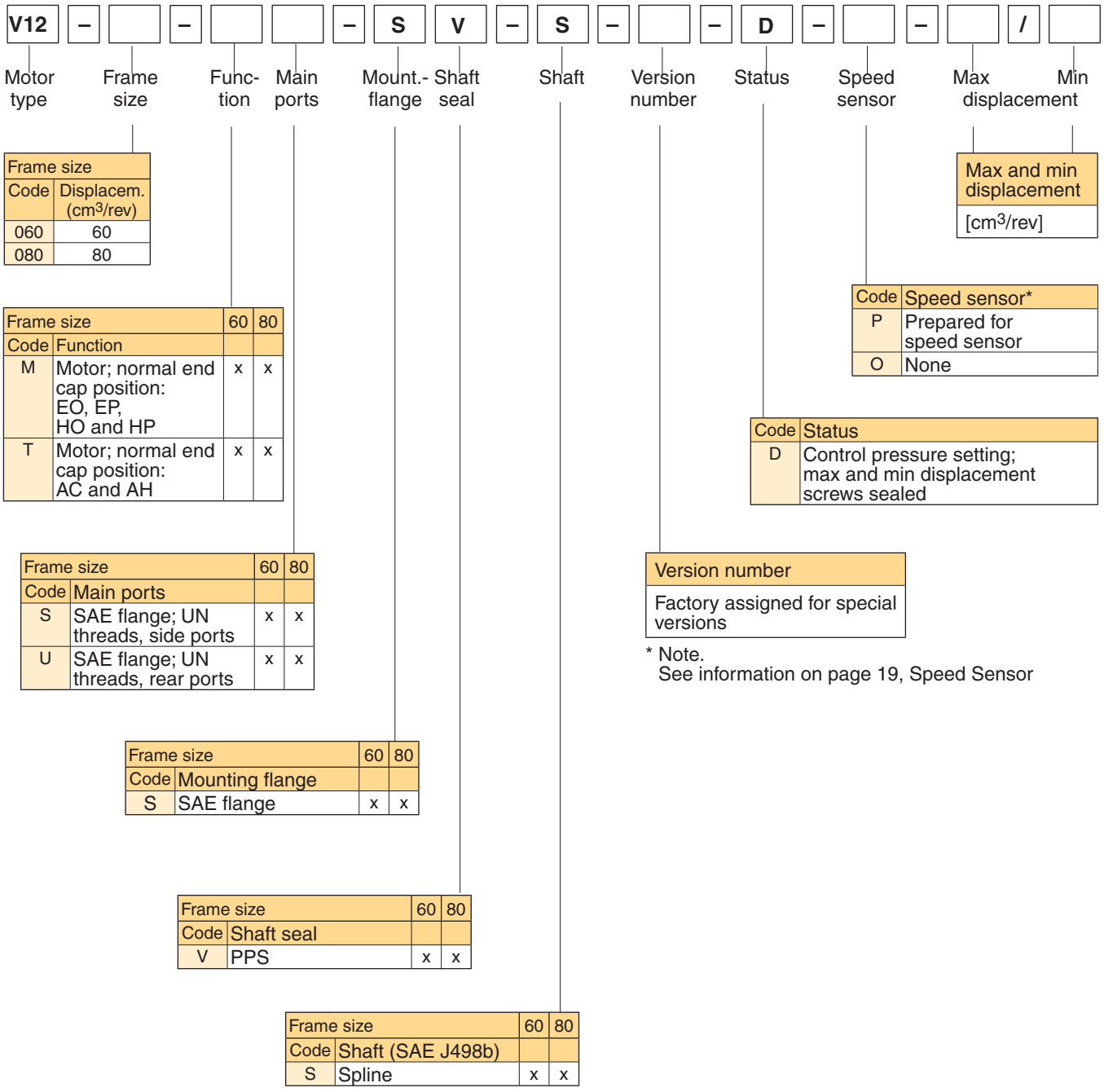
Max and min displacement
[cm^3/rev]

* Note.
See information on page 19, Speed Sensor

x: Available (x): Optional – : Not available

Controls and flushing valve, see page 23

SAE version (basic configuration)



Frame size	
Code	Displacem. (cm^3/rev)
060	60
080	80

Max and min displacement
[cm^3/rev]

Code	Speed sensor*
P	Prepared for speed sensor
O	None

Frame size	60	80
Code	Function	
M	Motor; normal end cap position: EO, EP, HO and HP	x	x
T	Motor; normal end cap position: AC and AH	x	x

Code	Status
D	Control pressure setting; max and min displacement screws sealed

Frame size	60	80
Code	Main ports	
S	SAE flange; UN threads, side ports	x	x
U	SAE flange; UN threads, rear ports	x	x

Version number
Factory assigned for special versions

* Note.
See information on page 19, Speed Sensor

Frame size	60	80
Code	Mounting flange	
S	SAE flange	x	x

Frame size	60	80
Code	Shaft seal	
V	PPS	x	x

Frame size	60	80
Code	Shaft (SAE J498b)	
S	Spline	x	x

x: Available (x): Optional – : Not available

Controls and flushing valve, see page 23

Controls and flushing valve

Basic configuration (ISO, Cartridge or SAE; see previous three pages) – [ ] – [ ] – [ ]

Control designation | Settings | Flushing valve

Frame size		60	80
Code	Control designation		
AC I 01 I	Pressure compensator, internal pilot pressure, internal servo supply	x	x
AC E 01 I	Pressure compensator, external pilot pressure, internal servo supply	(x)	(x)
AH I 01 I	Pressure compensator, hydraulic override, internal pilot pressure, internal servo supply	x	x
AH E 01 I	Pressure compensator, hydraulic override, external pilot pressure, internal servo supply	(x)	(x)
ADL 01 B	Pressure compensator electrohydraulic override, 12 VDC	-	x
ADH 01 B	Pressure compensator electrohydraulic override, 24 VDC	-	x
EOL 01 I	Electrohydraulic, two-position, 12 VDC, internal servo supply	x	x
EOL 01 E	Electrohydraulic, two-position, 12 VDC, external servo supply	(x)	(x)
EOH 01 I	Electrohydraulic, two-position, 24 VDC, internal servo supply	x	x
EOH 01 E	Electrohydraulic, two-position, 24 VDC, external servo supplyv	(x)	(x)
EPL 01 I	Electrohydraulic proportional, 12 VDC, internal servo supply	x	x
EPL 01 E	Electrohydraulic, proportional, 12 VDC, external servo supply	(x)	(x)
EPH 01 I	Electrohydraulic, proportional, 24 VDC, internal servo supply	x	x
EPH 01 E	Electrohydraulic, proportional, 24 VDC, external servo supply	(x)	(x)
HOS 01 I	Hydraulic two-position, standard version internal servo supply	x	x
HOS 01 E	Hydraulic two-position, standard version external servo supply	(x)	(x)
HPS 01 I	Hydraulic proportional, standard version internal servo supply	x	x
HPS 01 E	Hydraulic proportional, standard version external servo supply	(x)	(x)

NOTE: '01' - Standard nozzles x: Available (x): Optional – : Not available

Settings	
AC, AD, AH:	Threshold pressure: 150 to 400 bar / Modulating pressure: 015, 025 or 050 bar
EO, EP:	Threshold current: 12 VDC - 400 mA; 24 VDC - 200 mA Modulating current: EO - 000; EP, 12 VDC - 600 mA; EP, 24 VDC - 300 mA
HO, HP:	Threshold pressure: 010 bar / Modulating pressure: HO - 000; HP - 015 or 025 bar

Code	Flushing valve
L 01	Integrated flushing valve; 01 - std. nozzle 1.3 mm (option; refer to page 17).

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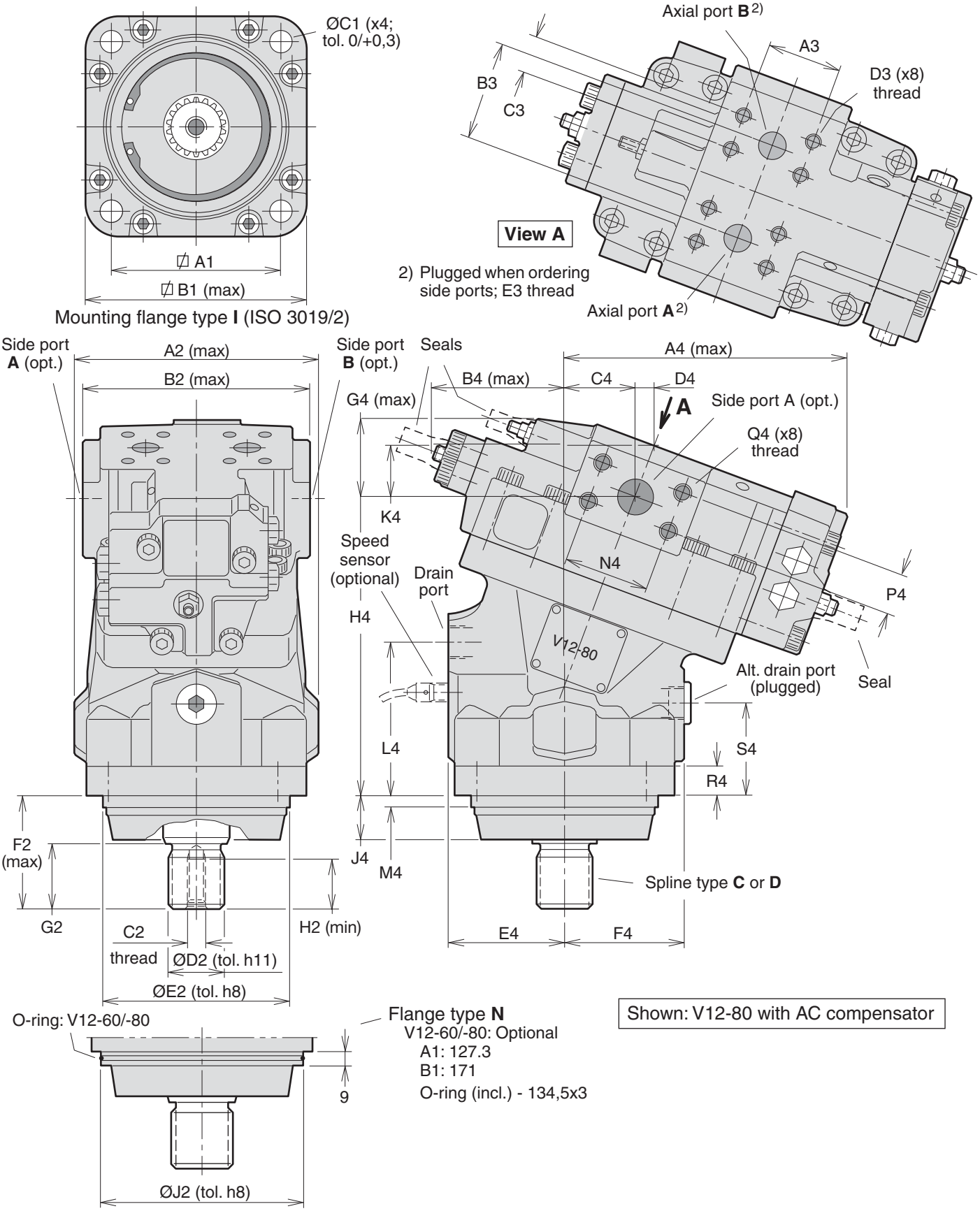
ISO version



Shown: V12-80 with AC compensator

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Size	V12-60	V12-80
A1	113.2	113.2
B1	151	151
C1	14	14
A2	159	165
B2	146	154
C2	M12	M12
D2*	34.6	39.6
E2	125	125
F2*	73	78
G2*	40	45
H2	28	24
J2	140	140
A3	50.8	50.8
B3	66	66
C3	23.8	23.8
D3[1)]	M10x20	M10x20
E3[2)]	M22x1.5	M22x1.5
A4	188	193
B4	87	90
C4	45	48.3
D4	13.4	13.1
E4	76	78
F4	77	80
G4	55	57
H4	188	199
J4	31.5	31.5
K4	35.5	34.6
L4	94	101
M4	9	9
N4	50.8	57.2
P4	23.8	27.8
Q4[1)]	M10x20	M12x23
R4	20	20
S4	57.5	60.5

* Dimension for shaft type **D**.
Shaft type **C** dimensions are 5 mm shorter than those of type D.

1) Metric thread x depth in mm

2) Metric thread x pitch in mm

3) '30° involute spline, side fit'.

Ports

Type	V12-60	V12-80
Axial	19 [$^3/_4$"]	19 [$^3/_4$"]
Side	19 [$^3/_4$"]	25 [1"]
Drain[2)]	M22x1.5	M22x1.5

Main ports: ISO 6162, 41.5 MPa, type II
(SAE J518c, 6000 psi)

Spline type **C** [3)] (DIN 5480)

Size	Dimension
V12-60	W30x2x14x9g
V12-80	W35x2x16x9g

Spline type **D** [3)] (DIN 5480)

Size	Dimension
V12-60	W35x2x16x9g
V12-80	W40x2x18x9g

Flange

Size	I	N
V12-60	standard	optional
V12-80	standard	optional

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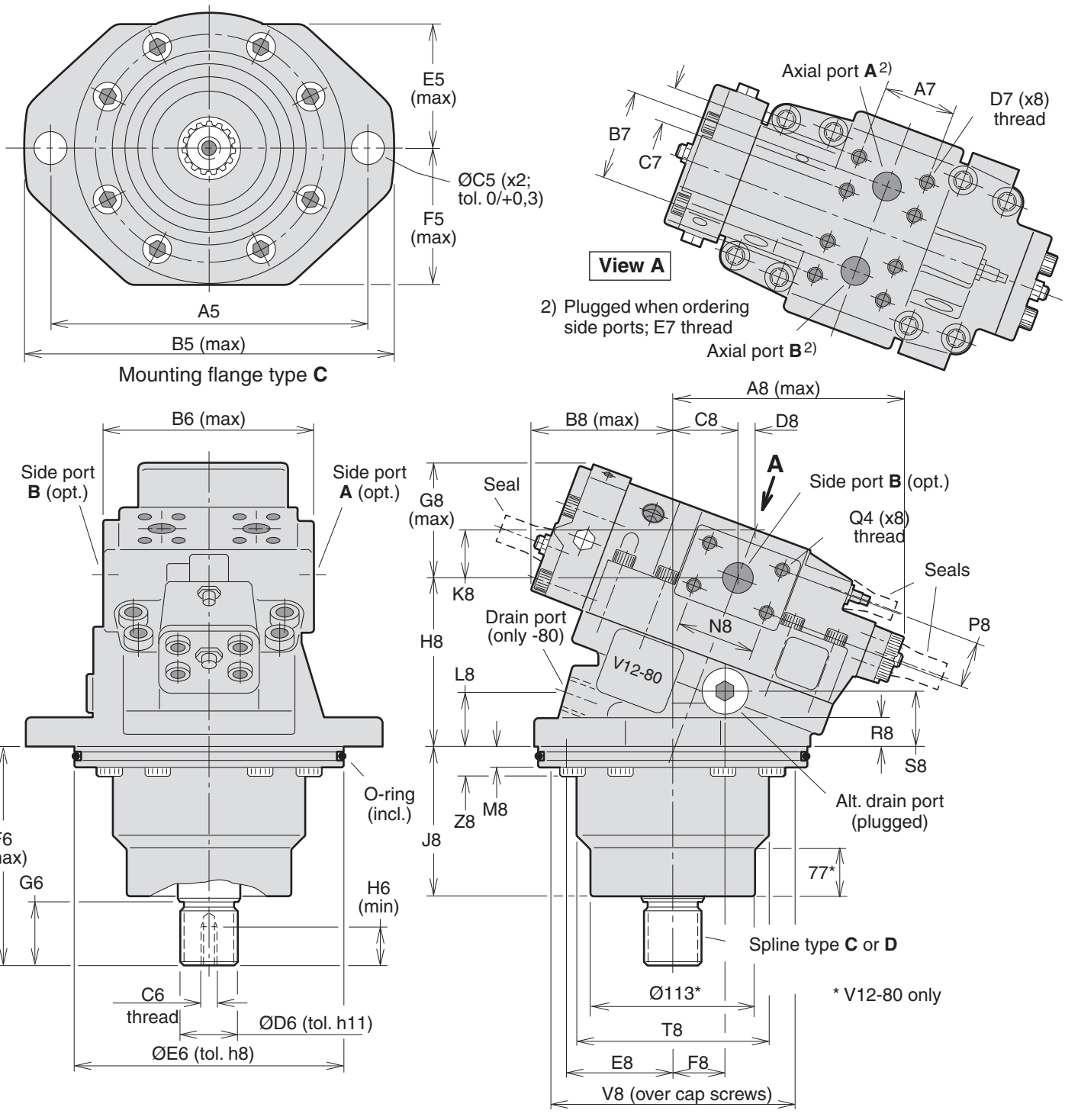
Cartridge version



Shown: V12-80 with HO control

Size	V12-60	V12-80
A5	200	224
B5	238	263
C5	18	22
E5	78.5	89.5
F5	83	99.5
B6	146	154
C6	M12	M12
D6*	34.6	39.6
E6	160	190
F6	133	156.5
G6*	40	45
H6	28	28
A7	50.8	50.8
B7	66	66
C7	23.8	23.8
D7[1)]	M10x20	M10x22
E7[2)]	M22x1.5	M22x1.5
A8	166	173
B8	108	108
C8	45	48.3
D8	13.4	13.1
E8	77	77.5
F8	39	38
G8	86	85
H8	127	120.5
J8	90	106
K8	35.5	34.6
L8	39	39
M8	15	15
N8	50.8	57.2
P8	23.8	27.8
Q8[1)]	M10x20	M12x23
R8	20	20
S8	39	39
T8	121	139
V8	151	177
Z8	22	22

* Dimension for shaft type **D**. Shaft type **C** dimensions are 5 mm shorter than those of type D.

1) Metric thread x depth in mm

2) Metric thread x pitch in mm

3) '30° involute spline, side fit'.

Ports

Type	V12-60	V12-80
Axial	19 [$^3/_4$"]	19 [$^3/_4$"]
Side	19 [$^3/_4$"]	25 [1"]
Drain	–	M22x1.5
Alt. drain	M18x1.5	M18x1.5

Main ports: ISO 6162, 41.5 MPa, type II (SAE J518c, 6000 psi)

Spline type **C** [3)] (DIN 5480)

Size	Dimension
V12-60	W30x2x14x9g
V12-80	W35x2x16x9g

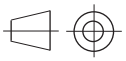
Spline type **D** [3)] (DIN 5480)

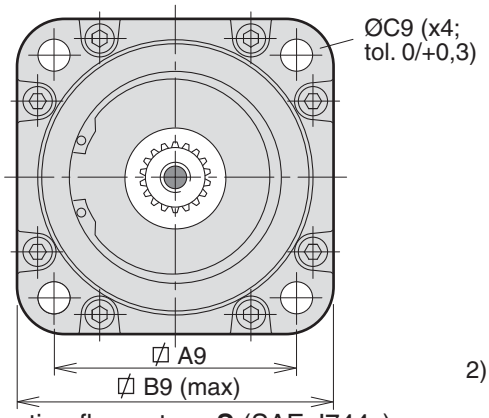
Size	Dimension
V12-60	W35x2x16x9g
V12-80	W40x2x18x9g

O-rings

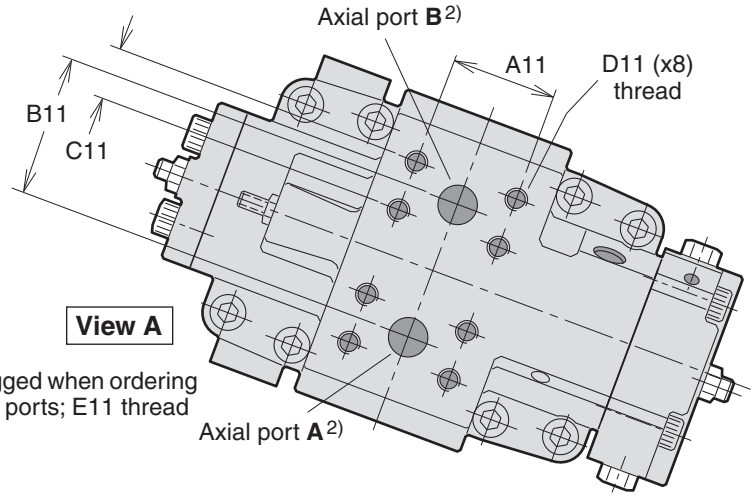
Size	Dimension
V12-60	150x4
V12-80	180x4

SAE version

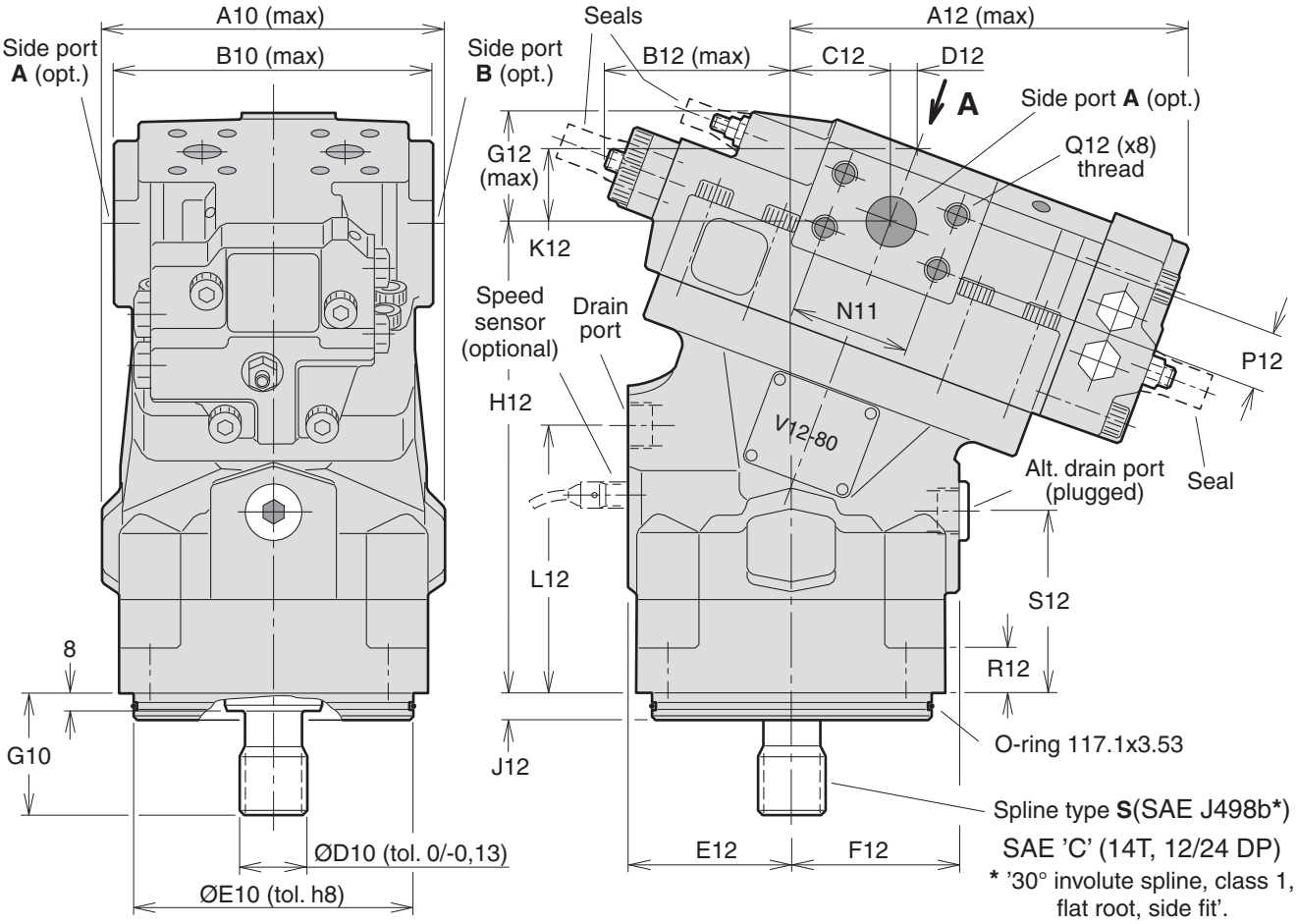




Mounting flange type **S** (SAE J744c)
Dimension SAE C



2) Plugged when ordering side ports; E11 thread



* '30° involute spline, class 1, flat root, side fit'.

Shown: V12-80 with AC compensator

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Size	V12-60	(inch)	V12-80	(inch)
A9	114.5	4.51	114.5	4.51
B9	149	5.87	149	5.87
C9	14.3	0.56	14.3	0.56
A10	159	6.26	165	6.50
B10	146	5.75	154	6.06
D10	31.22	1.23	31.22	1.23
E10	127.00	5.00	127.00	5.00
G10	55.6	2.19	55.6	2.19
A11	50.8	2.00	50.8	2.00
B11	66	2.60	66	2.60
C11	23.8	0.98	23.8	0.98
D11[1)]	3/8"-16 x20	3/8"-16 x0.79	3/8"-16 x20	3/8"-16 x0.79
E11[2)]	M22x1.5	-	M22x1.5	-
A12	188	7.40	193	7.60
B12	87	3.43	90	3.54
C12	45	1.77	48.3	1.90
D12	13.4	0.53	13.1	0.52
E12	76	2.99	78	3.07
F12	77	3.03	80	3.15
G12	55	2.17	57	2.24
H12	212	8.35	223	8.78
J12	12.7	0.50	12.7	0.50
K12	35.5	1.40	34.6	1.36
L12	118	4.65	125	4.92
N12	50.8	2.00	57.2	2.25
P12	23.8	0.93	27.8	1.09
Q12*	3/8"-16 x20	3/8"-16 x0.79	7/16"-14 x20	7/16"-14 x0.79
R12	20	0.79	20	0.79
S12	81.5	3.21	84.5	3.33

1) UNC thread x depth in mm
2) Metric thread x pitch in mm.

Ports

Type	V12-60	V12-80
Axial	3/4"	3/4"
Side	3/4"	1"
Drain	7/8"-14	7/8"-14

Main ports: 6000 psi (SAE J518c).
Drain ports: O-ring boss, UNF thread (SAE 514).

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Control installation dimensions

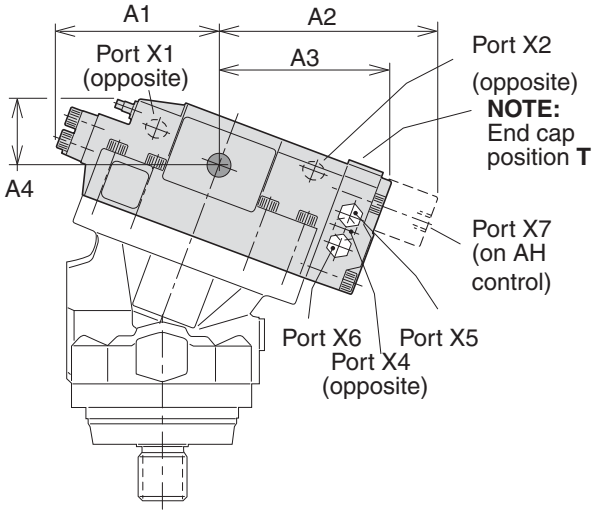
NOTE: - The basic motor side port locations are shown on pages 24, 26 and 28.

- End cap position: Refer to the ordering codes, pages 20-22.

- Control/gauge ports are:
  - M14x1.5 (ISO and cartridge versions).
  - $^{9}/_{16}$"-18 UNF (SAE version).
- All dimensions are max.

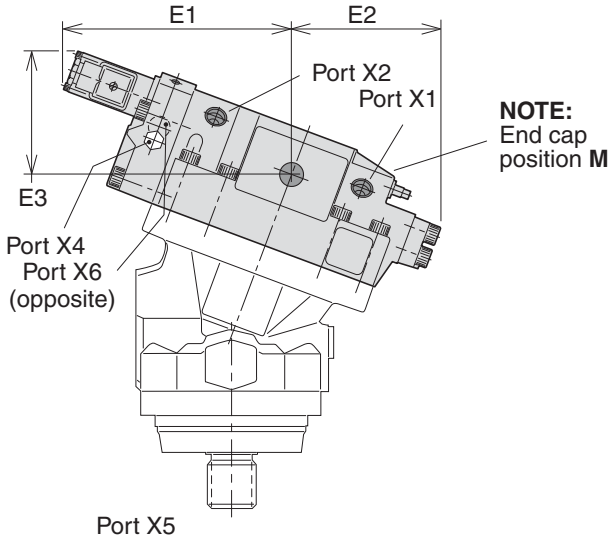
AC and AH compensators

Dim.	V12-60	(inch)	V12-80	(inch)
A1	132	5.20	138	5.43
A2	186	7.32	188	7.40
A3	143	5.63	145	5.71
A4	55	2.17	57	2.24



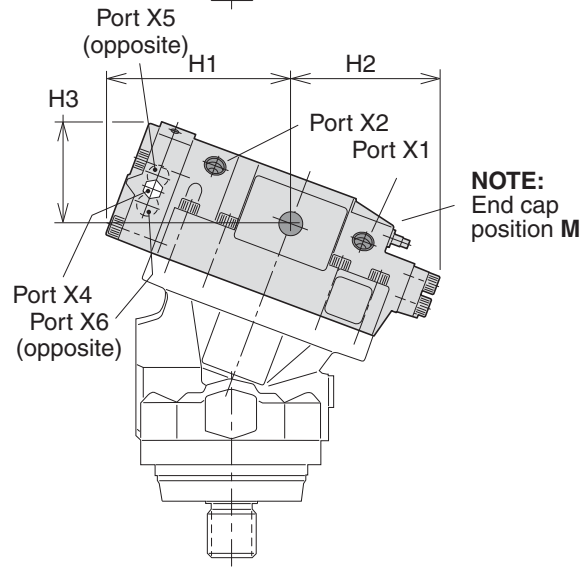
EO and EP controls

Dim.	V12-60	(inch)	V12-80	(inch)
E1	190	7.48	192	7.56
E2	121	4.76	125	4.92
E3	106	4.17	106	4.17

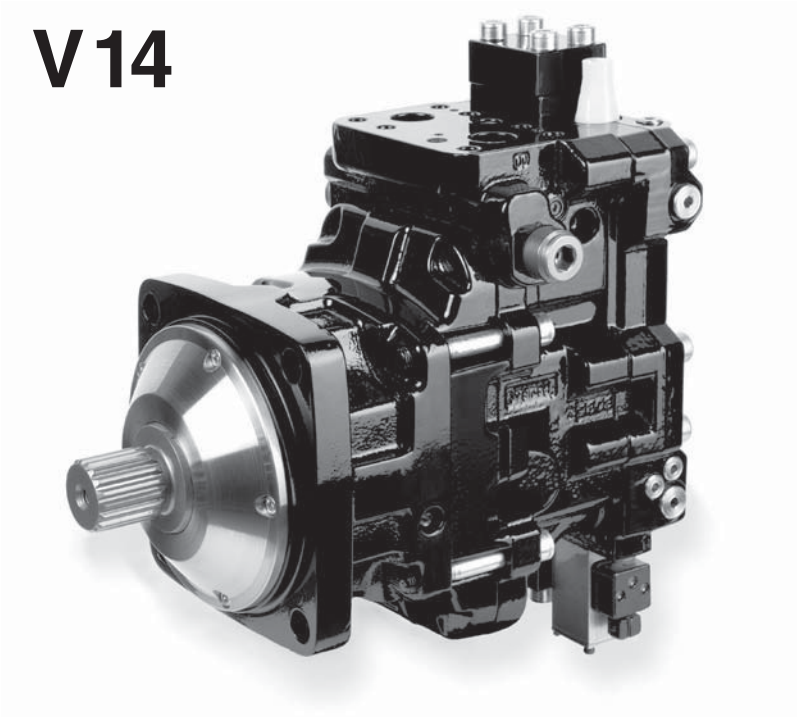


HO and HP controls

Dim.	V12-60	(inch)	V12-80	(inch)
H1	153	6.02	156	6.14
H2	121	4.76	125	4.92
H3	86	3.39	85	3.35



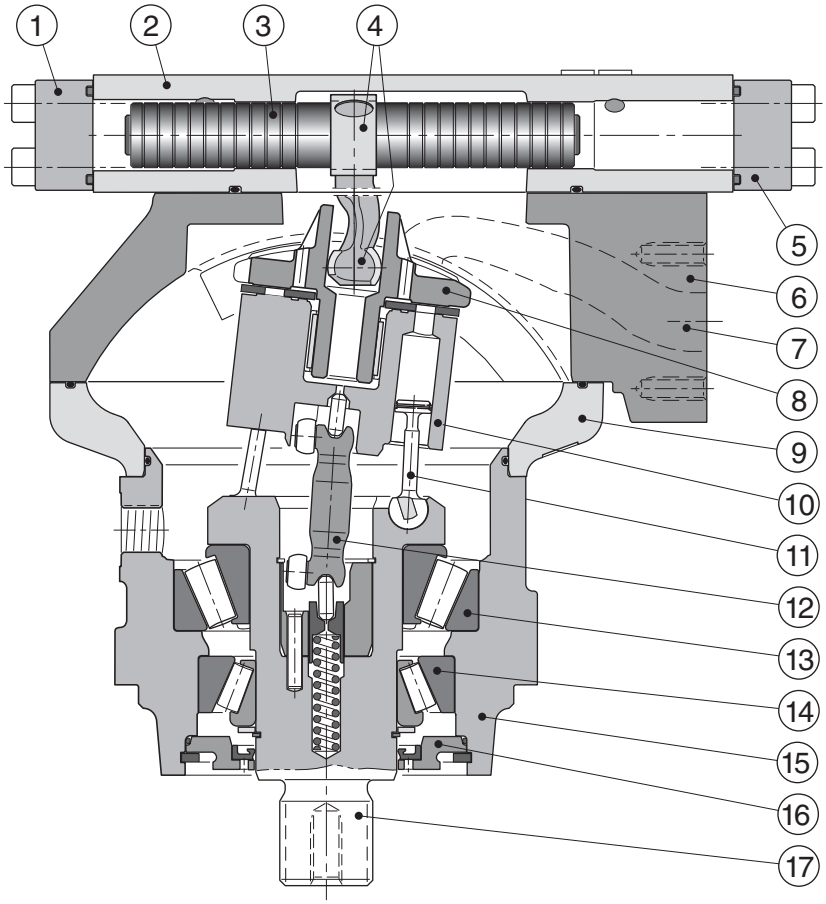
V14



Content

V14 cross section

1. End cover, min displ.
2. Control module
3. Setting piston
4. Connecting arm
5. End cover, max displ.
6. Connection module
7. Main pressure port
8. Valve segment
9. Intermediate housing
10. Cylinder barrel
11. Spherical piston with laminated piston ring
12. Synchronizing shaft
13. Inner roller bearing
14. Outer roller bearing
15. Bearing housing
16. Shaft seal with retainer
17. Output shaft



Specifications

V14 frame size	110	160
Displacement [cm³/rev]		
- max, at 35°	110	160
- min, at 6.5°	22	32
Operating pressure [bar]		
- max intermittent 1)	480	480
- max continuous	420	420
Operating speed [rpm]		
- at 35°, max intermittent 1)	3 900	3 400
- at 35°, max continuous	3 400	3 000
- at 6.5°–20°, max intermittent 1)	6 500	5 700
- at 6.5°–20°, max continuous	5 700	5 000
- min continuous	50	50

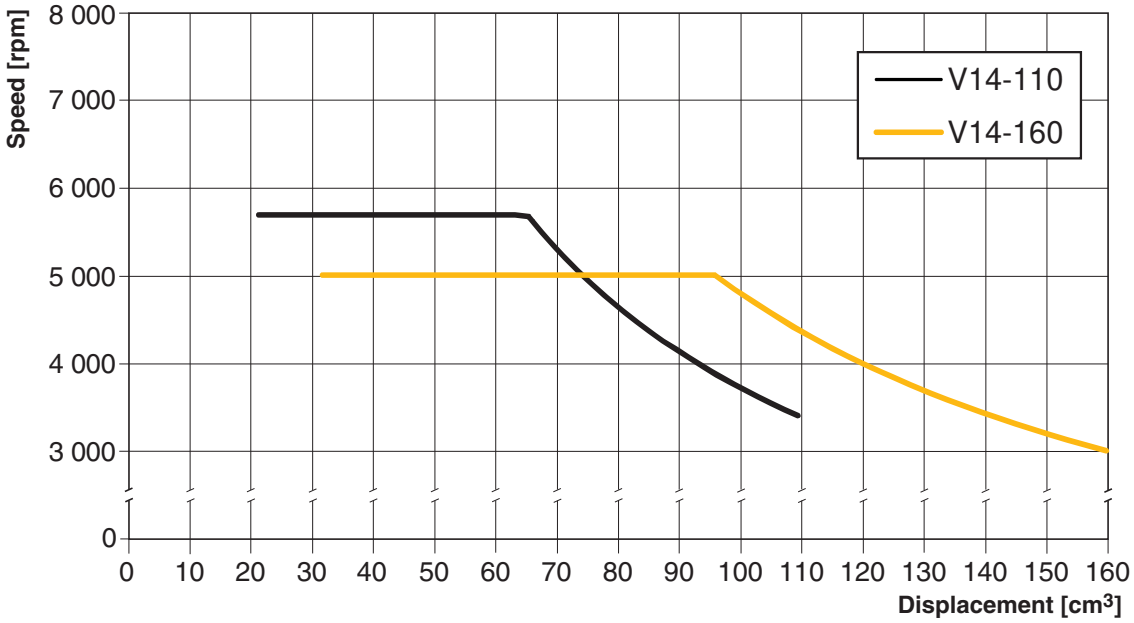
1) Max 6 seconds in any one minute.

Specifications

V14 frame size	110	160
Flow [l/min]		
- max intermittent 1)	430	550
- max continuous	375	480
Torque (theor.) at 100 bar [Nm]	175	255
Max otput power 1) [kW]	262	335
Corner power [kW]		
- intermittent 1)	570	730
- continuous	440	560
Mass moment of inertia		
($x10^{-3}$) [kg m²]	8.2	14.5
Weight [kg]	54	68

1) Max 6 seconds in any one minute.

Continuous Speed vs. Displacement



Efficiency diagrams

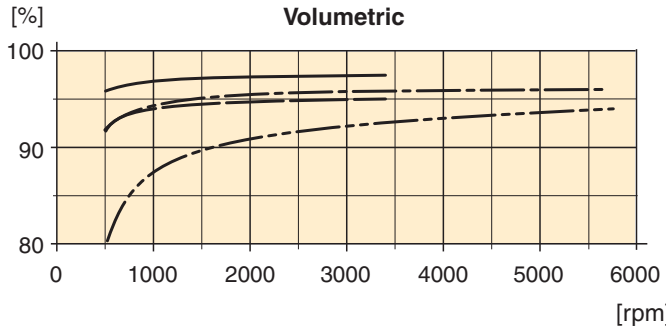
The following diagrams show volumetric, mechanical and overall efficiencies versus shaft speed at 210 and 420 bar operating pressure, and at full (35°) and reduced (10°) displacements.

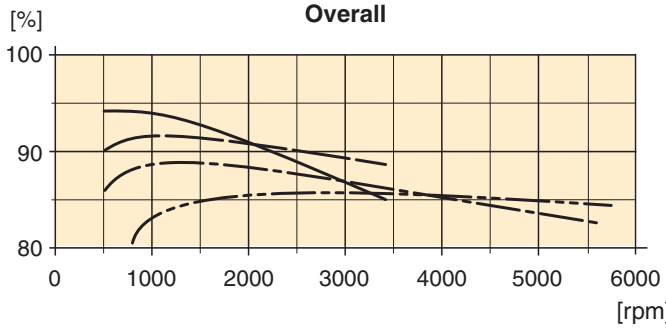
Information on efficiencies for a specific load condition can be made available from Parker Hannifin.

210 bar at full displacement
420 bar " " "

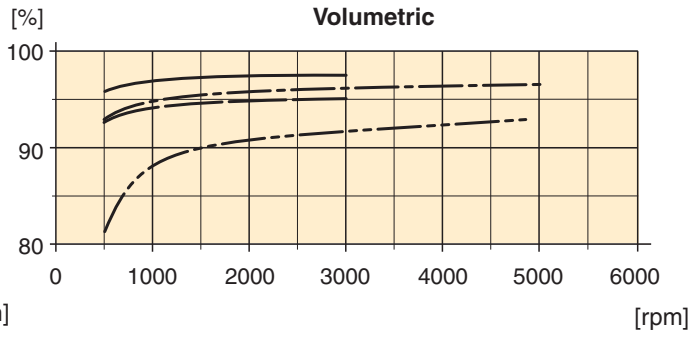
210 bar at reduced displacement
420 bar " " "

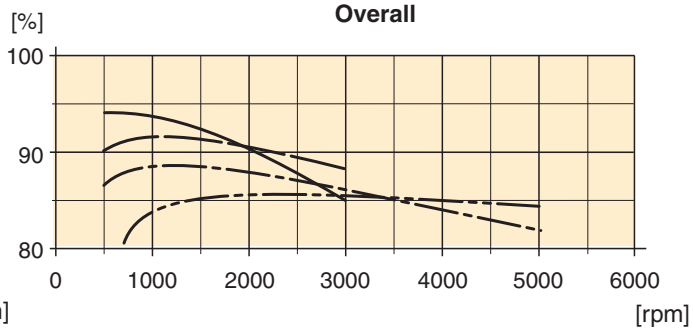
V14-110





V14-160





Controls - general information

The following V14 controls satisfy most application requirements:

- **AC**, **AD** and **AH** (automatic pressure compensators)
- **EO** and **HO** (two-position controls)
- **EP** and **HP** (proportional controls)
- **HPC/EPC** (HP/EP control with pressure cut off, see page 45)

All controls utilize a servo piston that connects to the valve segment (refer to the illustration on page 32).

The built-in four-way servo valve determines the position of the servo piston and, in turn, the displacement.

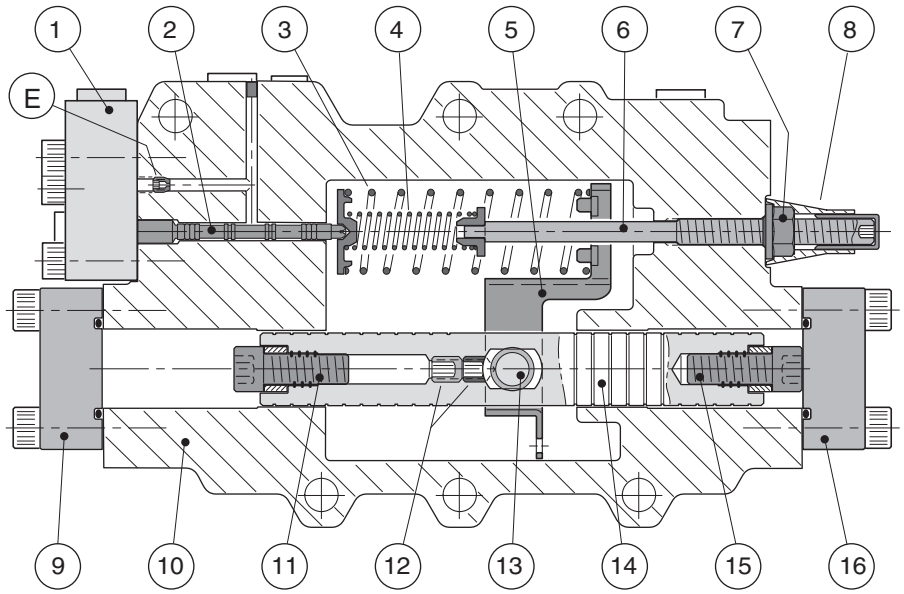
The displacement angle (between output shaft and cylinder barrel) ranges from 35° (max) to 6.5° (min).

Servo supply pressure is obtained from the pressurized, main port through the corresponding, built-in shuttle valve.

The response time (i.e. from max-to-min or from min-to-max displacement) is determined by restrictor nozzles in the servo valve supply and return lines; refer to the schematics.

NOTE: The modulating pressure/current, $\Delta p/\Delta I$ values are valid for motors that are not diplacement limited.

AC pressure compensator



Cross section of the AC pressure compensator module.

1. AC control cover
2. Servo valve spool
3. Modulating spring
4. Threshold spring
5. Feedback arm
6. Threshold adjustment screw
7. Seal nut
8. Two-part seal (threshold adjustm't) *
9. End cover (max displ.)
10. Control module housing
11. Max displ. limiting screw/bushing
12. Set screws
13. Connecting arm
14. Setting piston
15. Min displ. limiting screw/bushing
16. End cover (min displ.).

E. Orifice location; refer to the hydraulic schematics, pages 35-38.

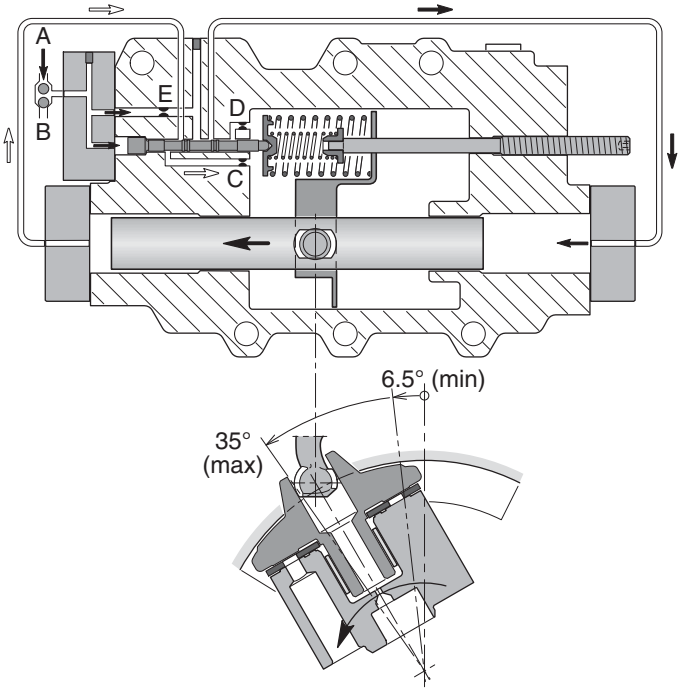
* Yellow cap = factory set.
Red cap 3797065 available as spare part

AC compensator function

Refer to the illustration below (left):

When pressure in port A (or B) increases, the servo valve spool is pushed to the right, directing flow to the right hand setting chamber - the setting piston moves to the left; displacement and output torque increases.

At the same time, the shaft speed decreases correspondingly (at a constant pump flow to the motor).

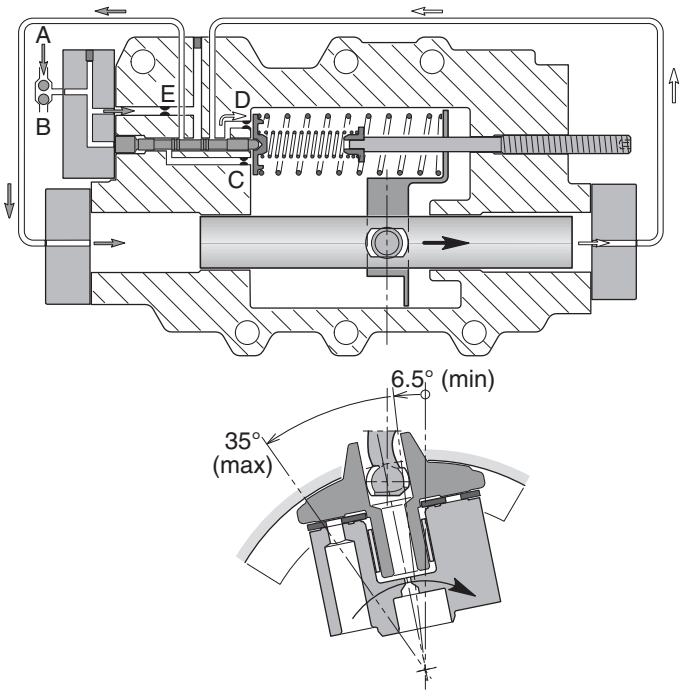


AC function (displ. increases at increasing system pressure).

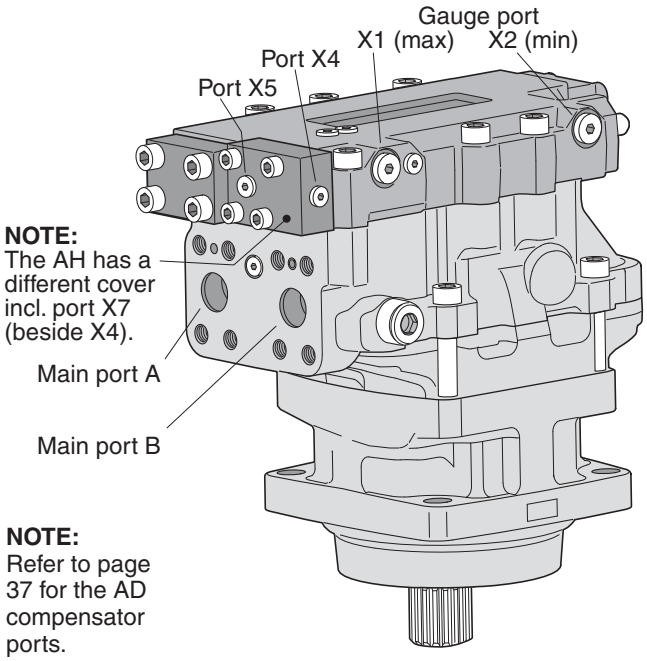
Refer to the illustration below (right):

When pressure in port A (or B) decreases, the servo valve spool moves to the left, directing flow to the left hand setting chamber - the setting piston moves to the right; displacement and output torque decreases.

At the same time, the shaft speed increases correspondingly (at a constant pump flow to the motor).



AC function (displ. decreases at decreasing system pressure).



NOTE:
The AH has a different cover incl. port X7 (beside X4).

NOTE:
Refer to page 37 for the AD compensator ports.

Port locations - V14- with AC or AH compensator.

Gauge/pilot ports (AH compensator)	
X1	Setting piston pressure (decreasing displ.)
X2	Setting piston pressure (increasing displ.)
X4	Servo supply pressure (before orifice and filter)
X5	Pilot pressure
X7	Override pressure (on the AH)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).

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AC compensator function (cont'd)

The AC compensator is used in off-road vehicle hydrostatic propel transmissions. The compensator automatically adjusts motor displacement between available max and min to the output torque requirement (up to max available system pressure).

Normally, the motor stays in the minimum displacement position. When there is a demand for additional torque, e.g. when the vehicle enters an upgrade, the displacement increases (providing more torque) while the motor shaft speed decreases proportionally.

The threshold pressure, where displacement starts to increase ('p_s'; refer to the AC diagram), is adjustable between 100 and 400 bar.

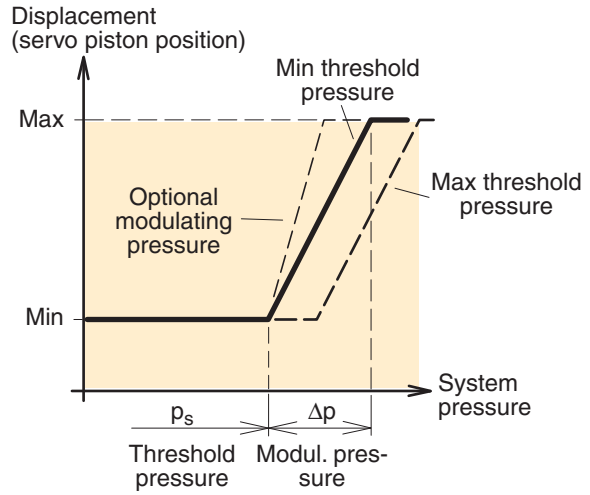
To reach max displacement, an additional modulating pressure (Δp) above the threshold pressure is required.

To satisfy specific hydraulic circuit requirements, a modulating pressure of 15, 25, 50 or 80 bar can be selected.

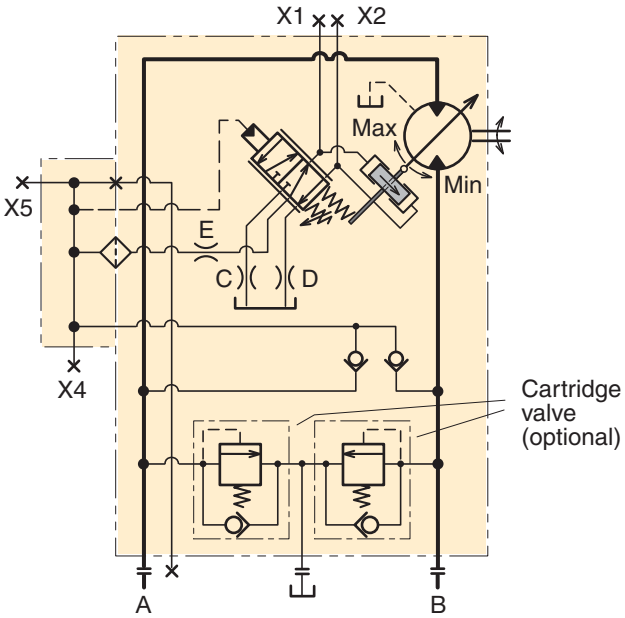
The pressure compensator is supplied with a small filter installed in the AC control cover (between ports X4 and X5); refer to the schematic below right.

Gauge/pilot ports (AC and AH compensators):	
X1	Setting piston pressure (decreasing displ.)
X2	Setting piston pressure (increasing displ.)
X4	Servo supply pressure (before orifice and filter)
X5	Pilot pressure
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^9/_{16}$"-18 O-ring boss (SAE version).

NOTE: Port locations are shown in the illustration on page 35.



AC diagram (displacement vs. system pressure).



AC schematic (shown: control moving towards min displ.)

AD pressure compensator

The AD control is similar to the AC (shown on previous pages) but incorporates a solenoid controlled override function and a brake defeat valve.

Override

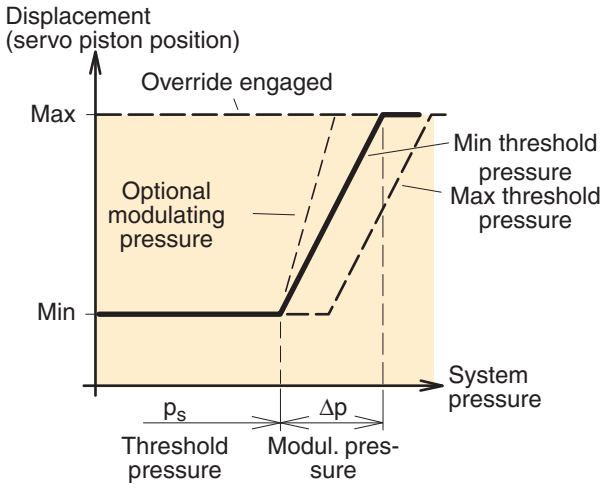
- The override consists of a piston built into a special end cover and an external solenoid.
- When the solenoid is energized, system pressure is directed to the piston which in turn pushes on the servo valve spool. This causes the motor to lock in the max displacement position, irrespective of system pressure (min 30 bar).
- Solenoids are available in 12 VDC (designated **L**) and 24 VDC (design. **H**); the required current is 2 and 1 A respectively.

Brake defeat valve

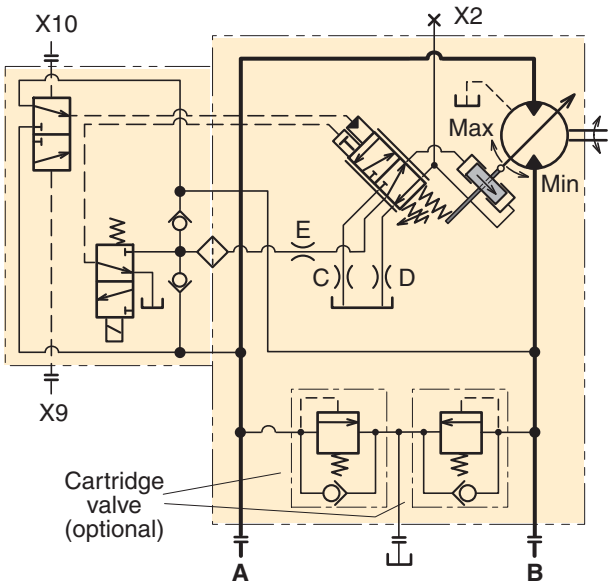
- The brake defeat function, which is also built into the special end cover, consist of a two-position, three-way valve. Ports X9 and X10 (refer to the schematic) are connected to the corresponding ports of the pump displacement control.
- The function prevents any pressure in the motor return port to influence the pressure compensator. Say, e.g., that motor port A is pressurized to move the vehicle 'forward'. Thus, back pressure in return port B, which develops in the braking mode, will not cause the compensator to move towards the max displacement position and vehicle braking will be smooth.
- Likewise, when port B is pressurized when the vehicle moves 'backward', braking presssure in port A will not influence the compensator.

Gauge/pilot ports (AD compensator):	
X2	Setting piston pressure (increasing displ.)
X9	Pressure (from the pump control) to the brake defeat valve (for port A)
X10	Pressure (from the pump control) to the brake defeat valve (for port B)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).

NOTE: X2 port is shown in the illustration on page 35.



AD diagram (displacement vs. system pressure).



AD schematic (shown: override solenoid not engaged; the compensator moves towards min displacement).

AH pressure compensator

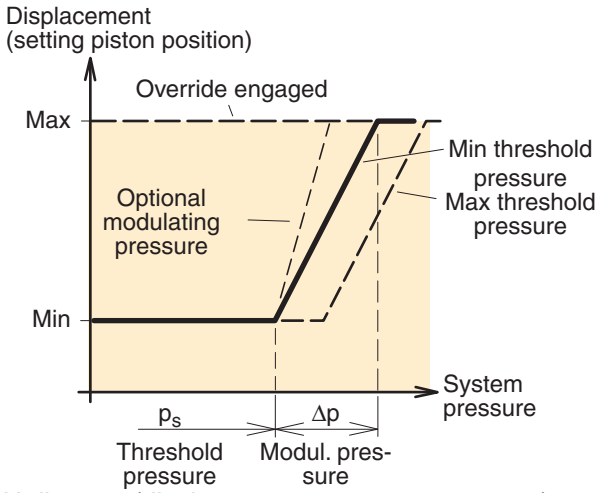
The AH compensator is similar to the AD (shown on previous page) but incorporates only an hydraulic override device. It is utilized in hydrostatic transmissions where a high degree of manoeuvrability at low vehicle speeds is desirable.

When the override is pressurized, the setting piston moves to the max displacement position irrespective of system pressure, provided the servo supply pressure is at least 30 bar.

Required override pressure, port X7 (min 20 bar):

$$p_7 = \frac{p_S + \Delta p}{24} \quad [bar]$$

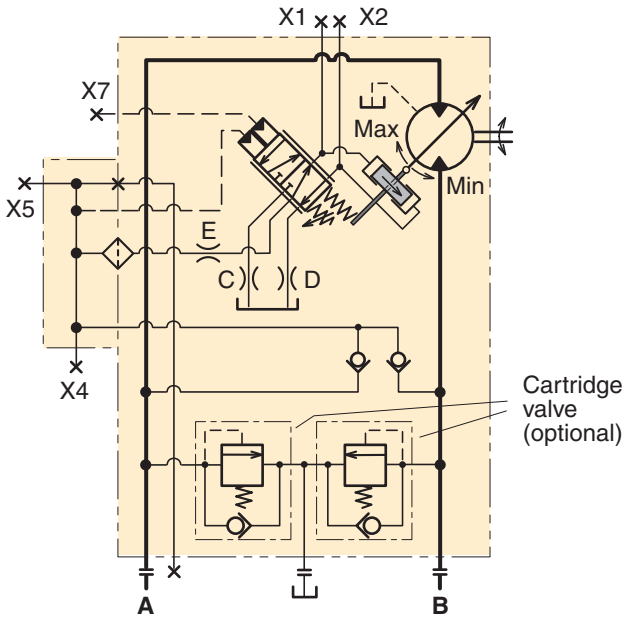
p_7 = Override pressure
p_s = System pressure
Δp = Modulating pressure



AH diagram (displacement vs. system pressure).

Gauge/pilot ports (AH compensator):	
X1	Setting piston pressure (decreasing displ.)
X2	Setting piston pressure (increasing displ.)
X4	Servo supply pressure (before orifice and filter)
X5	Pilot pressure
X7	Override pressure
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^9/_{16}$"-18 O-ring boss (SAE version).

NOTE: Port locations are shown in the illustration on page 35.



AH schematic (shown: override port X7 not pressurized; the compensator is moving towards min displacement).

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EO, EP, HO and HP controls (general information)

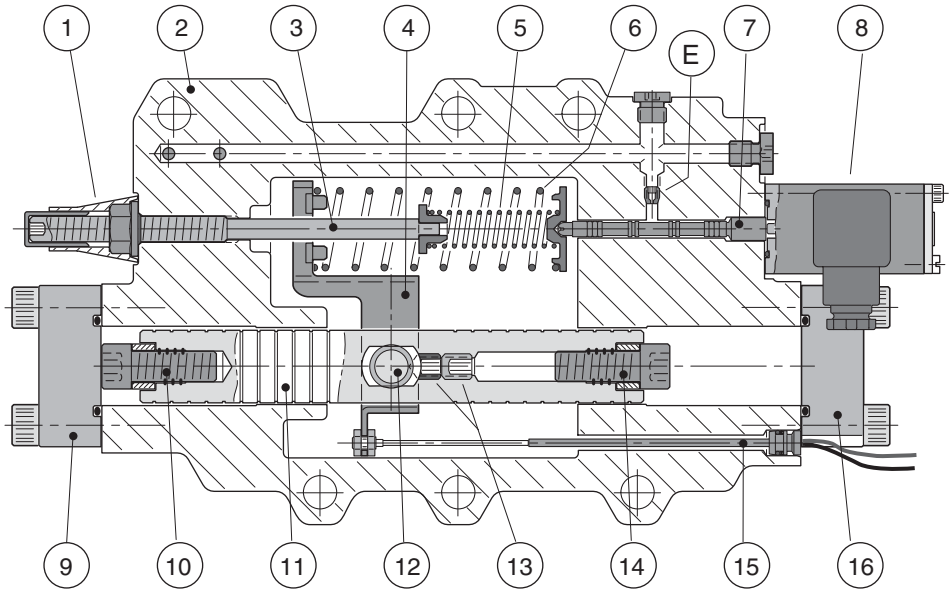
Basically, these controls function in a similar way.

At increasing solenoid current (EP) or increasing pilot pressure (HP) the control moves towards the min displacement position.

At decreasing current or pilot pressure, the control retracts towards max displacement.

In comparison with EP and HP, the EO and HO controls have no modulating spring; this means that only min and max displacements can be obtained with these controls.

Max and min displacements can be limited by a screw with spacer bushing as shown below.



Cross section of the EP control module.

1. Two-part seal (threshold adjustm't) *
2. Control module housing
3. Threshold adjustment screw
4. Feedback arm
5. Threshold spring
6. Modulating spring (EP, HP only)
7. Servo valve spool
8. Solenoid (EO, EP only); cover on HO, HP
9. End cover (max displ. limit)
10. Max displ. limiting screw/bushing
11. Setting piston
12. Connecting arm
13. Set screws
14. Min displ. limiting screw/bushing
15. Setting piston position sensor
16. End cover (min displ. limit)

E. Orifice location; refer to the hydraulic schematics, pages 40-45.

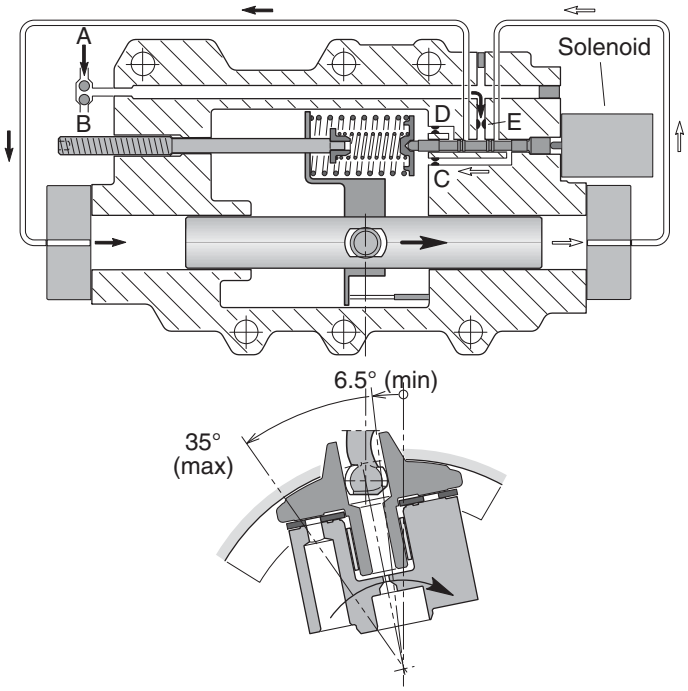
* Yellow cap = factory set.
Red cap 3797065 available as spare part

EP control function (solenoid current increasing)

NOTE: Valid also for the HP at increasing pilot pressure.

Refer to the illustration below left:

At an increasing current (above the threshold value), the solenoid spool pushes left on the servo valve spool, and flow is directed to the left hand setting chamber - the setting piston moves to the right and the displacement decreases. This means, that the shaft speed in-creases while the output torque decreases correspondingly (at a constant pump flow and system pressure).



EP control function (displ. decrease at increasing current).

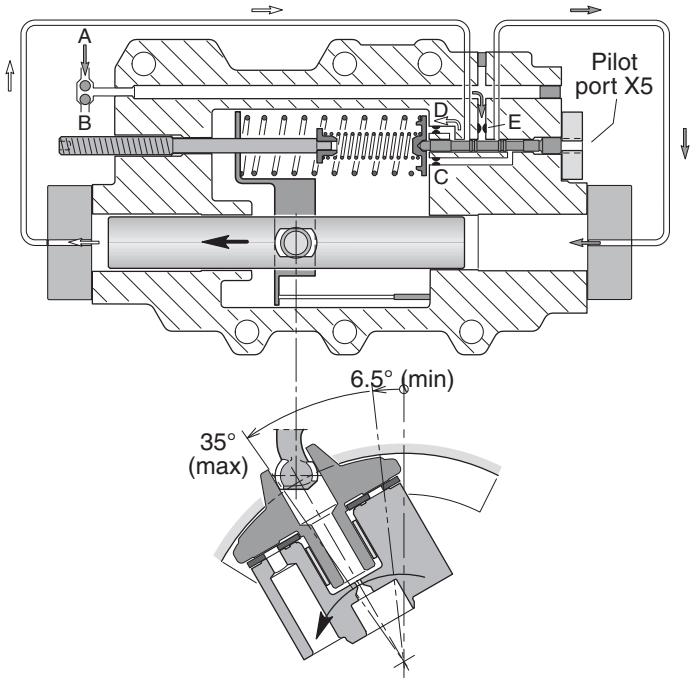
HP control function (decreasing pilot pressure)

NOTE: Valid also for the EP at decreasing current.

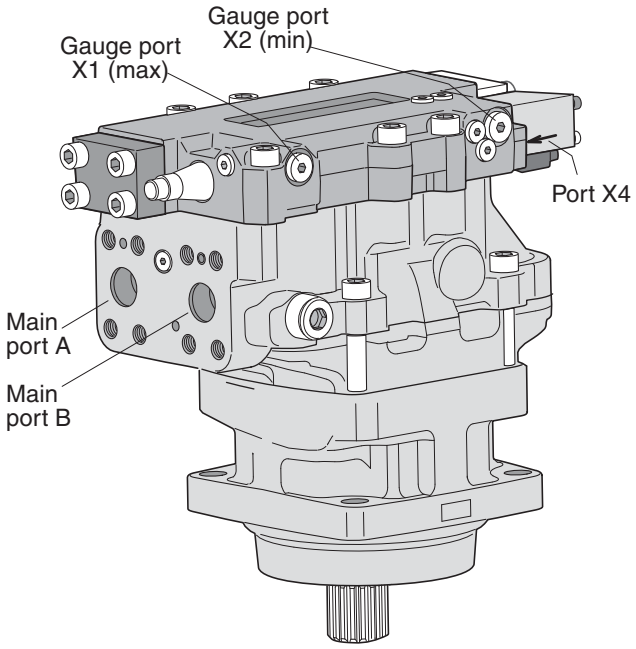
Refer to the illustration below right:

When the pilot pressure decreases, the servo valve spool moves to the right and flow is directed to the right hand setting chamber - the setting piston moves to the left and the displacement increases.

The shaft speed now decreases and the available output torque increases correspondingly (at a constant pump flow and system pressure).



HP control function (displ. increase at decreasing pilot press.).



Port locations - V14- with EO or EP control.

Gauge/pilot ports (EO and EP controls):	
X1	Setting piston pressure (decreasing displ.)
X2	Setting piston pressure (increasing displ.)
X4	Servo supply pressure (before orifice)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).

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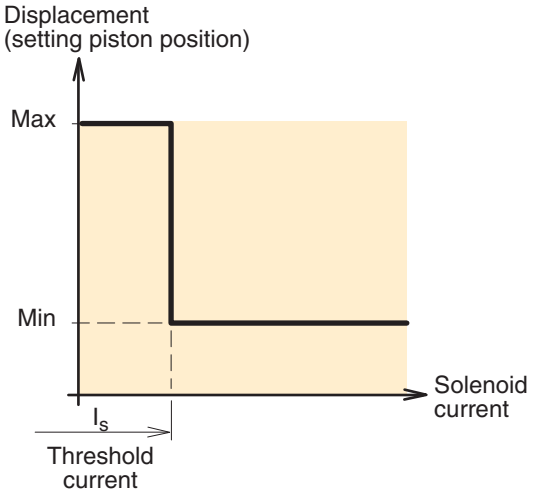
EO electric two-position control

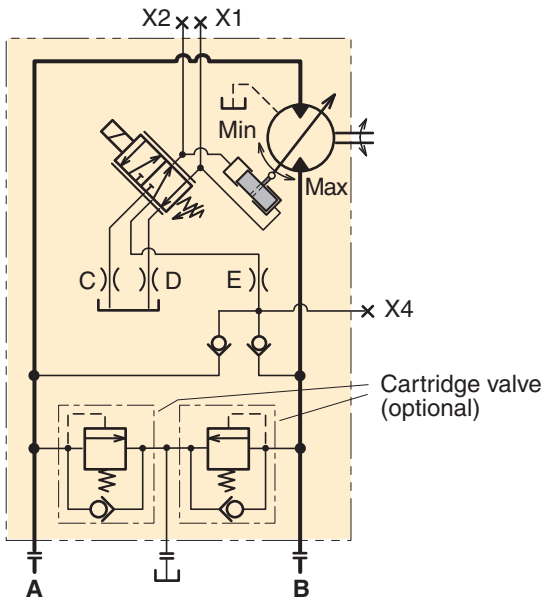
- The EO is a two-position control where the position of the setting piston is governed by a DC solenoid (acting on the servo spool) which is attached to the control module (refer to the illustration on page 40).
- The EO is utilized in transmissions where only two operating modes are required - low speed/high torque and high speed/low torque.
- The setting piston, normally in the max displacement position, shifts to min displacement as soon as the solenoid is activated.
- Intermediate displacements cannot be obtained with this control.



Gauge/pilot ports (EO and EP controls):	
X1	Setting piston pressure (decreasing displ.)
X2	Setting piston pressure (increasing displ.)
X4	Servo supply pressure (before orifice)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).

NOTE: Port locations are shown in the illustration on page 40.

- Servo pressure is supplied internally (through a check valve from the utilized high pressure port); refer to the schematic below.
- The solenoid is either 12 or 24 VDC, requiring 1 200 mA and 600 mA respectively.
- The male connector (type 'Junior Timer') is permanently installed on the solenoid. The corresponding female connector is not included. **Note:** The female connector is available as spare part P-N 3781939.
- The threshold current of the 12 VDC solenoid is factory set at 400 mA; it is adjustable between 200 and 500 mA. The 24 VDC solenoid is factory set at 200 mA and is adjustable between 100 and 500 mA.

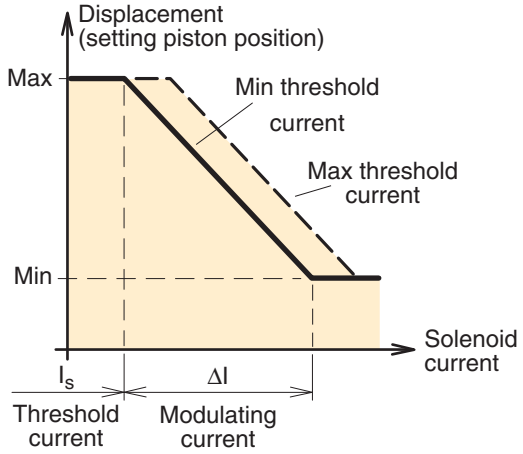


EO schematic (shown: non-activated solenoid; control in max displacement position).

EP electrohydraulic proportional control

- The EP electrohydraulic proportional control is used in hydrostatic transmissions requiring a continuously variable shaft speed. The position of the setting piston is governed by a DC solenoid (acting on the servo valve spool), attached to the control module (refer to the illustration on page 40).
- When the solenoid current increases above the threshold value, the setting piston starts to move from max towards min displacement. The displacement vs. solenoid current is shown in the diagram below.

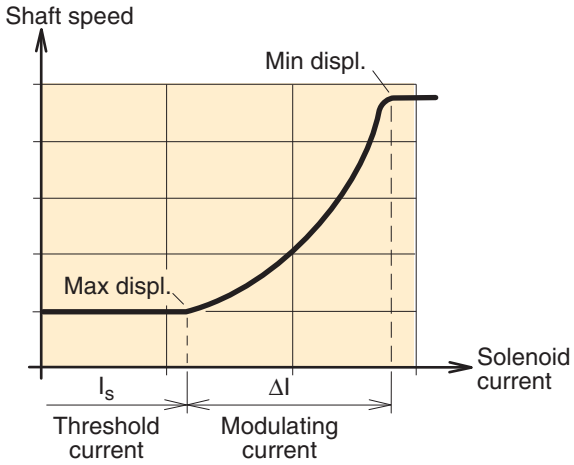
NOTE: The shaft speed is **not** proportional to the solenoid current; refer to the bottom diagram.



EP diagram (displacement vs. solenoid current).

Gauge/pilot ports (EO and EP controls):	
X1	Setting piston pressure (decreasing displ.)
X2	Setting piston pressure (increasing displ.)
X4	Servo supply pressure (before orifice)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^9/_{16}$"-18 O-ring boss (SAE version).

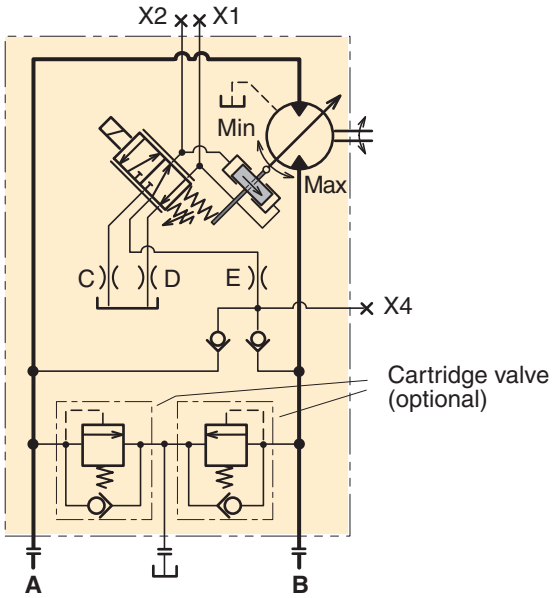
NOTE: Port locations are shown in the illustration on page 40.



Please note: The shaft speed is **not** proportional to the solenoid current.

- The solenoid is either 12 or 24 VDC, requiring 1200 and 600 mA respectively.
- The male connector (type 'Junior Timer') is permanently installed on the solenoid. The corresponding female connector is not included. **Note:** The female connector is available as spare part P-N 3781939
- The threshold current of the 12 VDC solenoid is factory set at 400 mA; it is adjustable between 200 and 500 mA. The 24 VDC solenoid is factory set at 200 mA and is adjustable between 100 and 250 mA.
- When utilizing the full displacement range, the required modulating current (ΔI) is 600 mA (12V solenoid) and 300 mA (24 V solenoid) for V14-110, 345 mA (24 V solenoid) for V14-160 respectively. In order to minimize hysteresis, a pulse-width modulated control signal of 50 to 60 Hz should be provided.

NOTE: The modulating current (ΔI) is not adjustable.



EP schematic (shown: non-activated solenoid; control moving towards max displacement).

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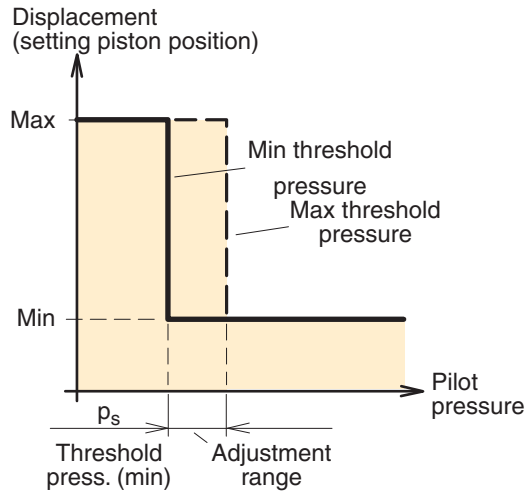
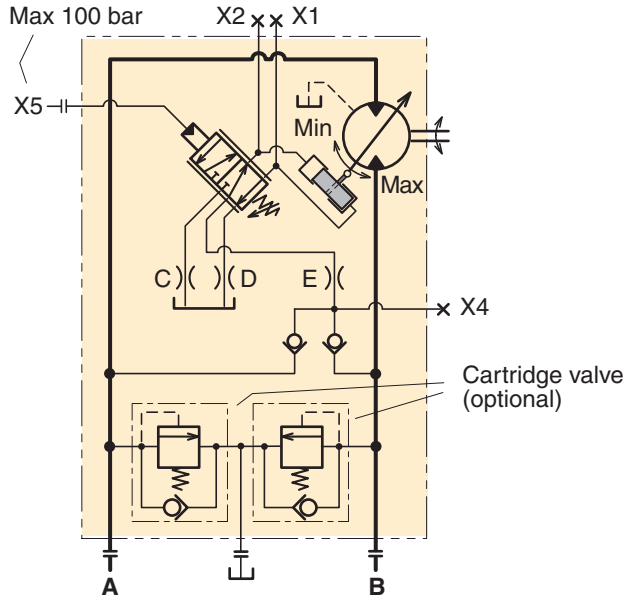
HO hydraulic two-position control

- The two-position HO control is similar to the EO (page 41) but the control signal is hydraulic. The position of the setting piston is governed by the built-in servo valve spool (same as on all controls).
- When the applied pilot pressure (port X5) exceeds the pre-set threshold value, the setting piston moves from the max to the min displacement position.
- Positions between max and min cannot be obtained with this control.
- The threshold pressure is factory set at 10 bar but is adjustable between 5 and 25 bar.

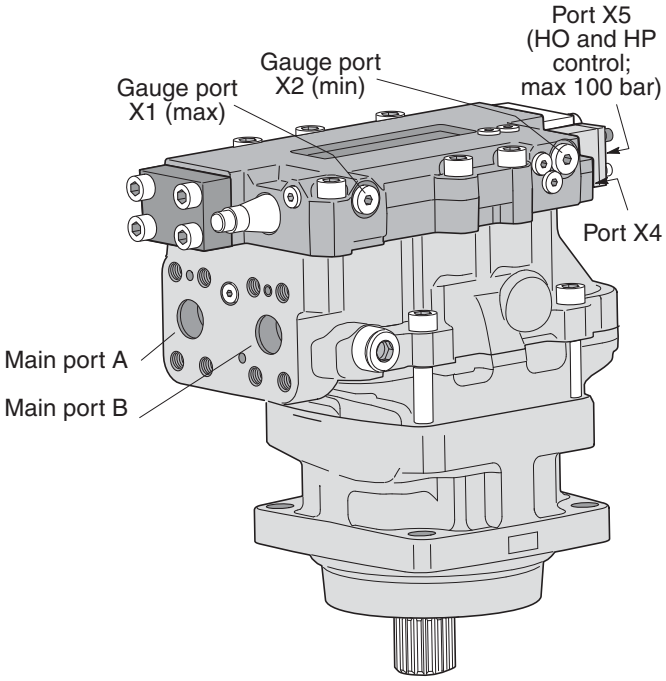


HO diagram (displacement vs. pilot pressure).

Gauge/pilot ports (HO and HP controls):	
X1	Setting piston pressure (decreasing displ.)
X2	Setting piston pressure (increasing displ.)
X4	Servo supply pressure (before orifice)
X5	External pilot pressure (max 100 bar; HO and HP control)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^{9}/_{16}$"-18 O-ring boss (SAE version).



HO schematic (shown: port X5 not pressurized; control in max displ. position).



Port locations - V14-110 with HO or HP control.

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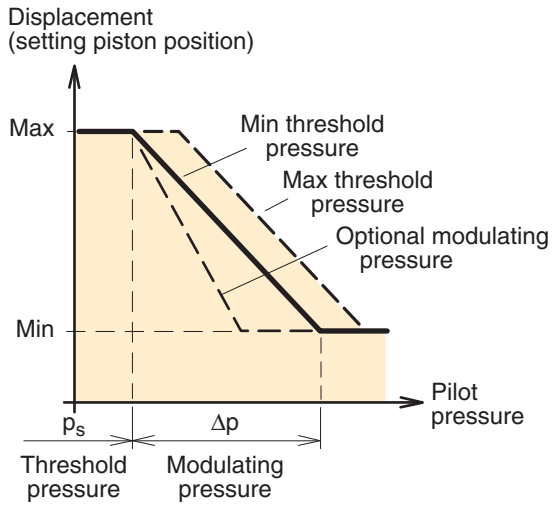
HP hydraulic proportional control

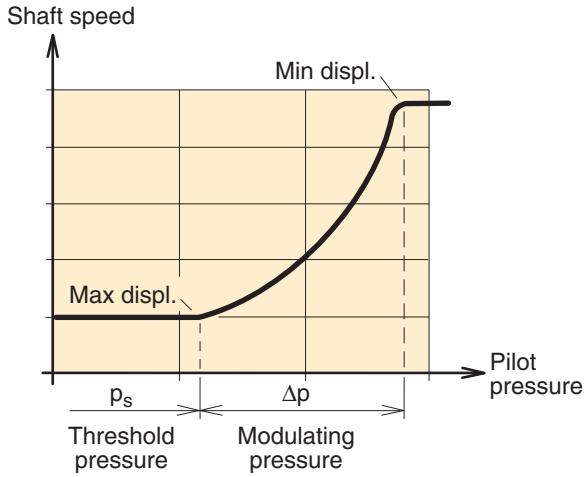
- Like the EP described on page 40, the HP proportional control offers continuously variable displacement, but the controlling signal is hydraulic.
- Normally, the setting piston stays in the max displacement position. When a sufficiently high pilot pressure (p_s) is applied to port X5, the setting piston starts to move towards the min displacement position.



HP diagram (displacement vs. pilot pressure).

Gauge/pilot ports (HP control):	
X1	Setting piston pressure (decreasing displ.)
X2	Setting piston pressure (increasing displ.)
X4	Servo supply pressure (before orifice)
X5	External pilot pressure (max 100 bar)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^9/_{16}$"-18 O-ring boss (SAE version).

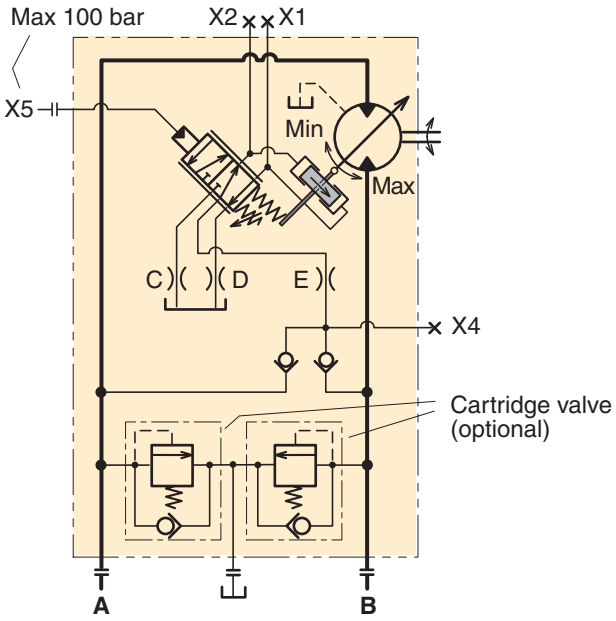
NOTE: Port locations are shown in the illustration on page 43.



Please note: The shaft speed is **not** proportional to the pilot pressure.

- As can be seen from the pilot pressure/displacement diagram below, the displacement changes in proportion to the applied modulating pressure.
- In contrast, the shaft speed is not proportional to the pilot pressure; refer to the bottom left diagram.
- To satisfy specific hydraulic circuit requirements, a modulating pressure of 15 or 25 bar can be selected; the threshold pressure (p_s) is set at 10 bar but is adjustable between 5 and 25 bar.

See also “Controls, Note” on page 34.



HP schematic (shown: port X5 not pressurized; control moving towards max displacement).

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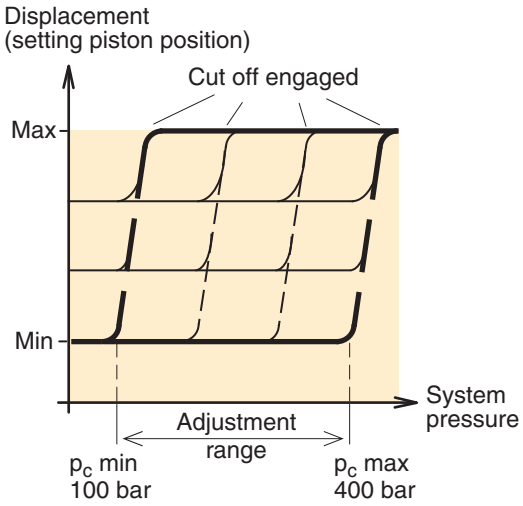
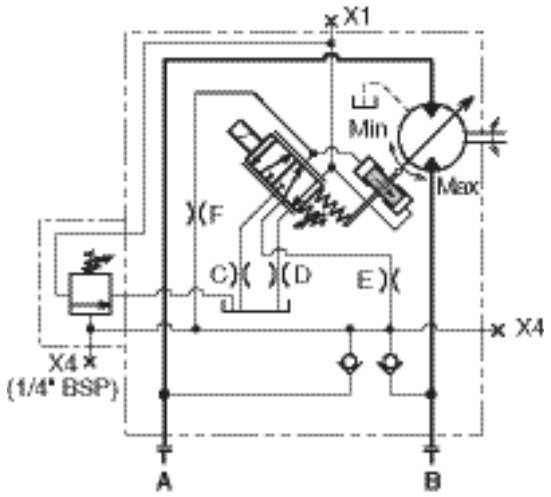
EPC/HPC, EP/HP control with pressure cut off

- The pressure cut off overlays the EP/HP control.
- If the system pressure increase, due to the load or reduced motor displacement to the setting of the pressure cut off valve, the control increases displacement. When displacement increases, the available torque increases as well but the system pressure remains constant.
- Pressure cut off setting range is 100-400 bar.
- Threshold pressure is preset from factory to 10 bar but is adjustable between 5 and 25 bar.
- For EPC the threshold current of the 12 VDC solenoid is factory set at 400 mA; it is adjustable between 200 and 500 mA. The 24 VDC solenoid is factory set at 200 mA and is adjustable between 100 and 250 mA.

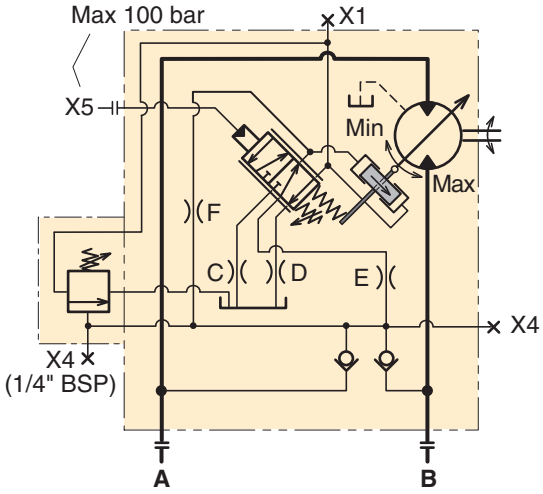


Gauge/pilot ports (EPC control):	
X1	Setting piston pressure (decreasing displ.)
X4	Servo supply pressure (before orifice)
X4	Servo supply pressure (on EPC) BSP1/4” only
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^9/_{16}$"-18 O-ring boss (SAE version).

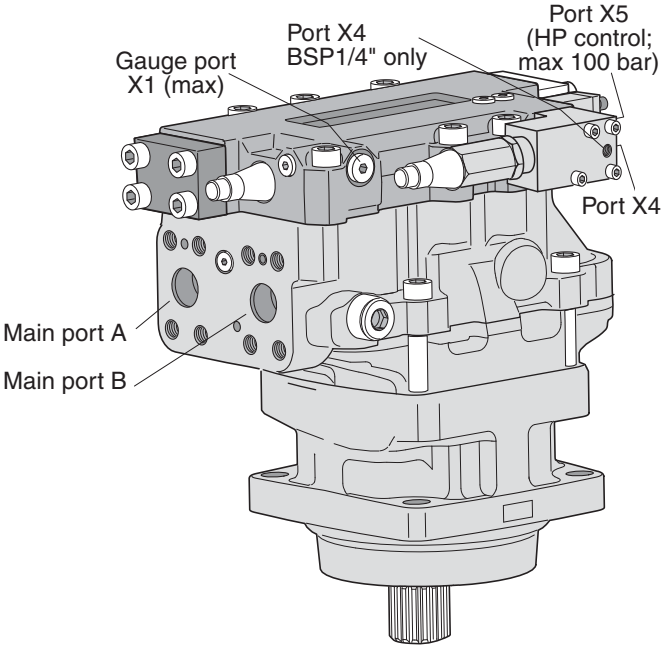
Gauge/pilot ports (HPC control):	
X1	Setting piston pressure (decreasing displ.)
X4	Servo supply pressure (before orifice)
X4	Servo supply pressure (on HPC) BSP1/4” only
X5	External pilot pressure (max 100 bar)
Port sizes:	
–	M14x1.5 (ISO and cartridge versions)
–	$^9/_{16}$"-18 O-ring boss (SAE version).



EPC schematic (control moving towards max displacement).



HPC schematic (shown: port X5 not pressurized; control moving towards max displacement).



Port locations - V14-110 with EPC/HPC control. (HPC shown)

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V14-110/-160

Valve options (overview)

- Brake valve and pressure relief valves (opt. **B**;)*
- Flushing valve (option **L**; below)
- Pressure relief valves (option **P**; page 47)
- Extra valve block (option **R)***
- Load holding valve (option **W**)*

* Contact Parker Hannifin for additional information

Sensor options (overview)

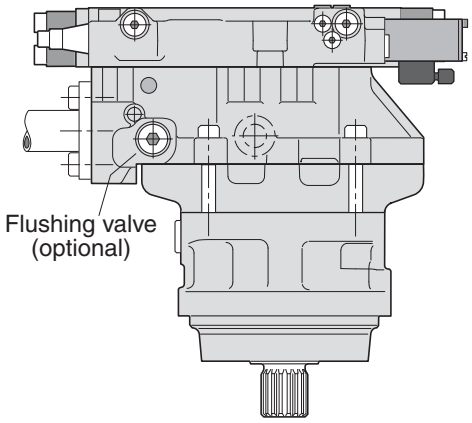
- Shaft speed sensor (option **P**; page 48)
- Setting piston position sensor (option **L**; page 49)

Flushing valve (option L)

The V14 is available with a flushing (or shuttle) valve that supplies the motor with a cooling flow through the case. Cooling the motor may be required when operating at high speeds and/or power levels.

The flushing valve consists of a three-position, three-way spool valve built into the connection module. It connects the low pressure side of the main circuit to a nozzle (optional sizes below) that empties fluid into the motor case.

In a closed circuit transmission, the flushing valve re-moves part of the fluid in the main loop. The removed fluid is continuously being replaced by cool, filtered fluid from the low pressure charge pump on the main pump.

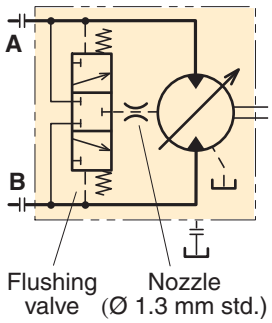


V14-110 (EP control) with built-in flushing valve.

Available nozzles

Ordering code	Orifice size [mm]	Status	Flow [l/min] at		
			15 bar	20 bar	25 bar
L010	1.0	Optional	2.3	2.7	3.0
L013	**1.3**	**Standard**	**3.9**	**4.5**	**5.0**
L015	1.5	Optional	5.2	6.0	6.7
L017	1.7	Optional	6.6	7.7	8.6
L020	2.0	Optional	9.2	10.6	11.9
L030	3.0	Optional	20.0	23.1	25.8

NOTE: 'L000' = plug



Hydraulic schematic - V14 with built-in flushing valve.

Pressure relief valves (option P)

To protect the motor (and the main hydraulic circuit) from unwanted, high pressure peaks, the V14 can be supplied with relief valve cartridges.

The individual cartridge (with integrated check valve function) has a non-adjustable, factory-set opening pressure, available in pressure settings shown below.

The cross section (below right) shows a situation, where the upper cartridge has opened because of high fluid pressure. This, in turn, forces the opposite cartridge to open to the low pressure area (this cartridge now acting as a check valve).

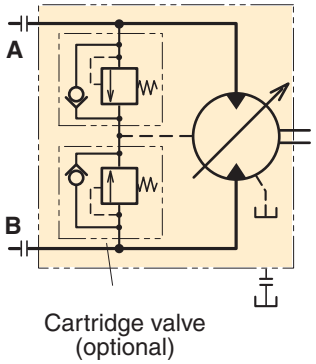
As shown, a small part of the flow may go directly to the reservoir.

PLEASE NOTE:

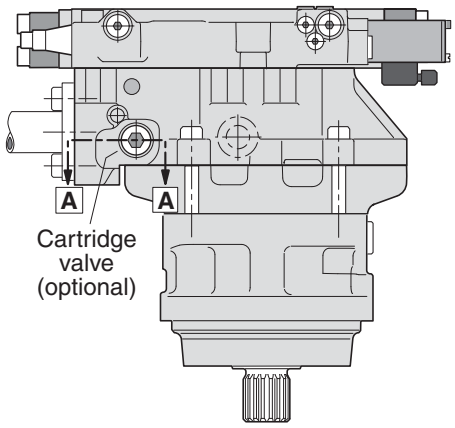
- The pressure relief cartridges should not be used as main pressure reliefs; in a motor application, they should only be relied on to limit short duration pressure peaks (or the temperature of the fluid which circulates through the motor will rapidly reach damaging high levels).
- The main pressure relief is usually installed in the main pump or in the directional control valve, or is line mounted between pump and motor.

Available cartridges

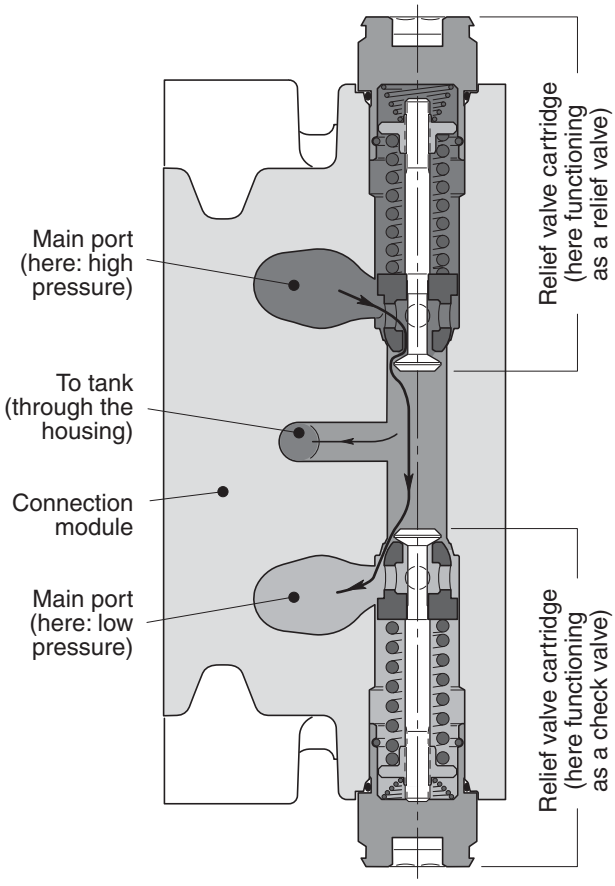
Ordering code	Pressure setting [bar]	Part number
P300	300	3794616
P330	330	3794617
P350	350	3794618
P380	380	3794619
P400	400	3794620
P420	420	3793529
P450	450	3794622



Hydraulic schematic - V14 with cartridge valves.



V14- 110 (EP control) with relief valve cartridges.



Section A-A (showing pressure relief cartridges).

Shaft speed sensor (option P)

A speed sensor kit is available for the V14.

The ferrostat differential (Hall-effect) sensor installs in a separate, threaded hole in the V14 bearing housing.

The speed sensor is directed towards the V14 shaft flange and outputs a 2 phase shifted square wave signal within a frequency range of 0 Hz to 15 kHz. Number of pulses per shaft rev is 36 which, at 5 Hz, corresponds to approx. 8 rpm.

Ordering information

(refer to the ordering codes on pages 50-52)

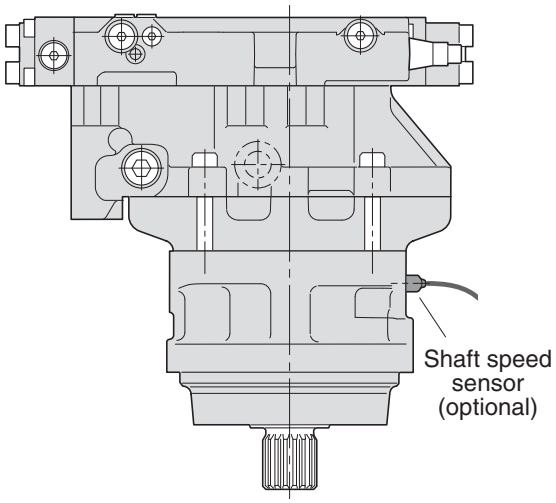
N - None

C - Prepared for setting piston position and shaft speed sensor. To be ordered separate*.

D - Setting piston position sensors and prepared for shaft speed sensor.

P - Prepared for shaft speed sensor. To be ordered separate*.

NOTE: Additional information is provided in our publication HY30-8301/UK, 'Speed sensor for series F11/F12 and V12/T12/V14', available from Parker Hannifin.



V14-160 (AC control) with speed sensor.

***How to order**

Please order the speed sensor on a separate order line next to the product order line.

Part number for speed sensor is 3785190.

High Speed / High Power operation

Running in procedure at mid. displacement

Running in procedure Parker Motors

We suggest the following procedure to run in the V14 motors.

1.Start @ 500 rpm, differential pressure 250 bar, outlet 10-15 bar.

2.Run until the drain temperature has passed its maximum* and has decreased 1-2 °C

3.Increase differential pressure to 350 bar

4.Run until the drain temperature has passed its maximum* and has decreased 1-2 °C

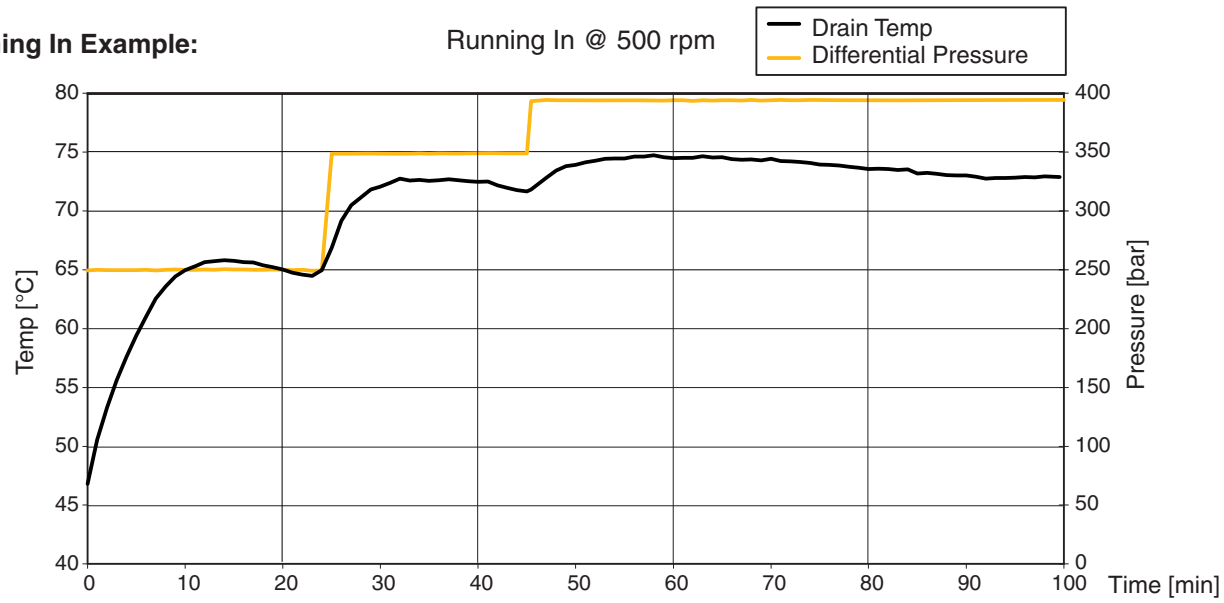
5.Increase differential pressure to 400 bar

6.Run until the drain temperature has passed its maximum* and has stabilized.

*If, at any point, the temperature tends to pass 100 °C, decrease the pressure at once.

Please make sure the drain temperature probe is in the drain oil flow to measure the correct temp.

Running In Example:



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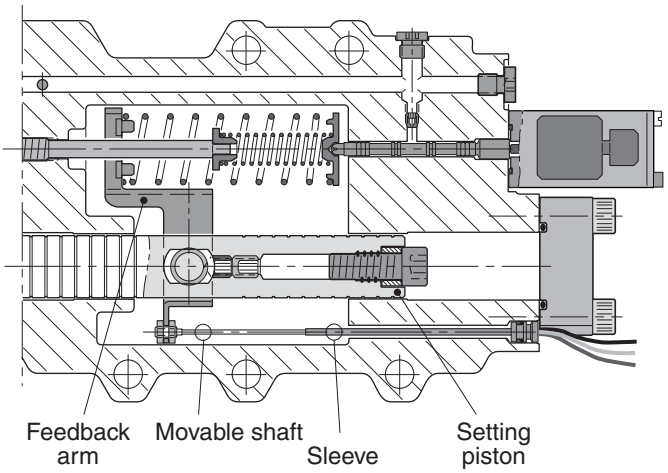
Setting piston position sensor (option L)

The setting piston position sensor, also referred to as a 'Sub-Miniature In-Cylinder Transducer', combines the best features associated with LVDT's (Linear Variable Differential Transformer) and potentiometers into one rugged, contactless, highly reliable position sensor.

The stationary part of the sensor, the sleeve, is provided with a flange that fits in a specially machined boring in the control module housing.

The movable shaft of the sensor is attached to the feedback arm as shown in the illustration to the right. When the sensor is properly connected to the electronic module (packed separately with an installation sheet), the produced output signal is proportional to the position of the setting piston.

In order to obtain the correct electrical max and min position settings, as determined by the utilized max and min displacements, the programming module (part of the electronic module, illustrated below right) must be adjusted; for further information please contact Parker Hannifin.

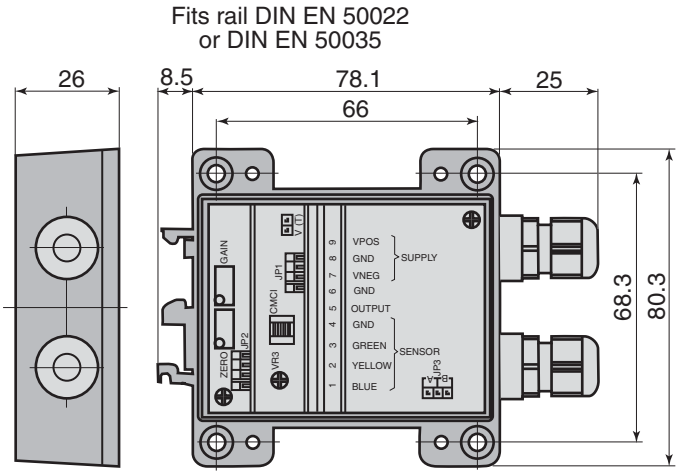


EP control section with setting piston position sensor.

Specifications

Supply voltage	10 to 60 VDC
Supply current	max 10 mA
Output voltage	0.5 to 4.5 VDC*
Output load	max 10 kΩ
Output current - shaft retracted	0.020 mA
- shaft extended	0.5 mA
Linearity	≤ 1% of stroke
Operational temperature	0 °C to +70 °C
Distance between sensor and electronic module	Max 30 m
Electrical wiring	PTFE insulated, heat shrink sleeved 500 mm long leads
Weight	100 g

***** Other voltages can be selected; contact Parker Hannifin.



Electronic module (incl. internal programming module).

Ordering information (refer to 'Sensor options' in the ordering codes on pages 50-52)

Basic V14 configuration (ISO, cartridge or SAE; see pages 50-52) – [ ] [ ]

Sensor options

Code	Sensor options
N	None
C	Prepared for setting piston position and shaft speed sensors
D	Setting piston position sensors and prepared for shaft speed sensor.
L	Setting piston position sensor
P	Prepared for shaft speed sensor
T	Prepared for setting piston position sensor

ISO version

V14	–		–	I	V		–					–			–		–		–		/		–		
Motor type		Frame size		Mounting flange		Shaft end		Control	Control signal	Restrictor set	Modulating press./current		Valve options	Valve opening pressure		Sensor options		Version		Max and min displacement		Threshold setting		Pressure cut off EPC/HPC

Frame size	
Code	Displacem.
110	110 (cm^3/rev)
160	160 (cm^3/rev)

Code	Mounting flange
I	ISO flange
Z	ISO (optional)

Code	Shaft seal
V	PPS

Code	Shaft end
C	DIN (ISO version)
D	DIN (ISO version)

Code	Control
AC	Pressure compensator
AD	Press. compensator with electrohydraulic override and brake defeat valve
AH	Pressure compensator with hydraulic override
EO	Electrohydraulic, two-position
EP	Electrohydraulic, proportional
HO	Hydraulic, two-position
HP	Hydraulic, proportional

Code	Pilot control signal
C	Pressure cut off (EP, HP)
E	External pressure (AC, AH, HO, HP)
I	Internal pressure (AC, AD, AH)
H	24 VDC (AD, EO, EP)
L	12 VDC (AD, EO, EP)

Code	Control orifice set (orifice dia in mm)
1	0.7
2	0.8
3	1.0 (standard)
4	1.2
5	EPC/HPC
X	Special

Code	Control modulating pressure/current
N	AC, AD, AH, EO, HO: 0 bar; EP: Non-selectible current
A	15 [bar] (AC, AD, AH, HP, HPC)
B	25 [bar] (AC, AD, AH, HP, HPC)
C	50 [bar] (AC, AD, AH)
D	80 [bar] (AC, AD, AH)

Code	Valve options (pages 46-47)
N	None
B	Brake valve and pressure relief valves*
L	Flushing valve
P	Pressure relief valves
R	Extra valve block *
W	Load hold valve (for EPC/HPC only) **

Code	Valve opening pressure
000	without pressure relief valve Pressure relief valve opening pressure [bar] (page 47)
	Alternatively: Flushing valve orifice (page 46)

Code	Sensor options (pages 48-49)
N	None
C	Prepared for setting piston position sensor and shaft speed sensor
D	Setting piston position sensor and prepared for shaft speed sensor
L	Setting piston position sensor
P	Prepared for speed sensor
T	Prepared for setting piston position sensor

Factory issued for special versions

Max and min displ. [cm^3/rev]

Threshold setting
AC, AD, AH: Select pressure between 100 and 350 [bar]
EO, EP: 400 [mA] - 12 [VDC] 200 [mA] - 24 [VDC]
HO, HP: 10 [bar]

Note:
* Contact Parker Hannifin for additional information

** Possible to combined with pressure relief valve
Contact Parker Hannifin for additional information

Cartridge version

V14	–	110	–	C	V	C	–					–			–		–		–		/		–		
Motor type		Frame size		Mounting flange	Shaft seal	Shaft end		Control	Control signal	Restrictor set	Modulating press./current		Valve options	Valve opening pressure		Sensor options		Version		Max and min displacement			Threshold setting	Pressure cut off EPC/HPC

Frame size	
Code	Displacem.
110	110 (cm^3/rev)

Code	Mounting flange
C	Cartridge version

Code	Shaft seal
V	PPS

Code	Shaft end
C	DIN (ISO version)

Code	Control
AC	Pressure compensator
AD	Press. compensator with electrohydraulic override and brake defeat valve
AH	Pressure compensator with hydraulic override
EO	Electrohydraulic, two-position
EP	Electrohydraulic, proportional
HO	Hydraulic, two-position
HP	Hydraulic, proportional

Code	Pilot control signal
C	Pressure cut off (EP, HP)
E	External pressure (AC, AH, HO, HP)
I	Internal pressure (AC, AD, AH)
H	24 VDC (AD, EO, EP)
L	12 VDC (AD, EO, EP)

Code	Control orifice set (orifice dia in mm)
1	0.7
2	0.8
3	**1.0 (standard)**
4	1.2
5	EPC/HPC
X	Special

Code	Control modulating pressure/current
N	AC, AD, AH, EO, HO: 0 bar; EP: Non-selectible current
A	15 [bar] (AC, AD, AH, HP, HPC)
B	25 [bar] (AC, AD, AH, HP, HPC)
C	50 [bar] (AC, AD, AH)
D	80 [bar] (AC, AD, AH)

Code	Valve options (pages 46-47)
N	None
B	Brake valve and pressure relief valves*
L	Flushing valve
P	Pressure relief valves
R	Extra valve block *
W	Load hold valve (for EPC/HPC only) **

Code	Valve opening pressure
000	without pressure relief valve Pressure relief valve opening pressure [bar] (page 47)
	Alternatively: Flushing valve orifice (page 46)

Code	Sensor options (pages 48-49)
N	None
C	Prepared for setting piston position sensor and shaft speed sensor
D	Setting piston position sensor and prepared for shaft speed sensor
L	Setting piston position sensor
T	Prepared for setting piston position sensor

Factory issued for special versions

Max and min displ. [cm^3/rev]

Threshold setting
AC, AD, AH: Select pressure between 100 and 350 [bar]
EO, EP: 400 [mA] - 12 [VDC] 200 [mA] - 24 [VDC]
HO, HP: 10 [bar]

Note:
* Contact Parker Hannifin for additional information

** Possible to combined with pressure relief valve
Contact Parker Hannifin for additional information

SAE version

Frame size	
Code	Displacem.
110	110 (cm³/rev)
160	160 (cm³/rev)

Code	Mounting flange
S	SAE version

Code	Shaft seal
V	PPS

Code	Shaft end
S	SAE (SAE version)

Code	Control
AC	Pressure compensator
AD	Press. compensator with electrohydraulic override and brake defeat valve
AH	Pressure compensator with hydraulic override
EO	Electrohydraulic, two-position
EP	Electrohydraulic, proportional
HO	Hydraulic, two-position
HP	Hydraulic, proportional

Code	Pilot control signal
C	Pressure cut off (EP, HP)
E	External pressure (AC, AH, HO, HP)
I	Internal pressure (AC, AD, AH)
H	24 VDC (AD, EO, EP)
L	12 VDC (AD, EO, EP)

Code	Control orifice set (orifice dia in mm)
1	0.7
2	0.8
3	**1.0 (standard)**
4	1.2
5	EPC/HPC
X	Special

Code	Control modulating pressure/current
N	AC, AD, AH, EO, HO: 0 bar; EP: Non-selectible current
A	15 [bar] (AC, AD, AH, HP, HPC)
B	25 [bar] (AC, AD, AH, HP, HPC)
C	50 [bar] (AC, AD, AH)
D	80 [bar] (AC, AD, AH)

Code	Valve options (pages 46-47)
N	None
B	Brake valve and pressure relief valves*
L	Flushing valve
P	Pressure relief valves
R	Extra valve block *
W	Load hold valve (for EPC/HPC only) **

Code	Valve opening pressure
000	without pressure relief valve Pressure relief valve opening pressure [bar] (page 47)
	Alternatively: Flushing valve orifice (page 46)

Code	Sensor options (pages 48-49)
N	None
C	Prepared for setting piston position sensor and shaft speed sensor
D	Setting piston position sensor and prepared for shaft speed sensor
L	Setting piston position sensor
P	Prepared for speed sensor
T	Prepared for setting piston position sensor

Factory issued for special versions

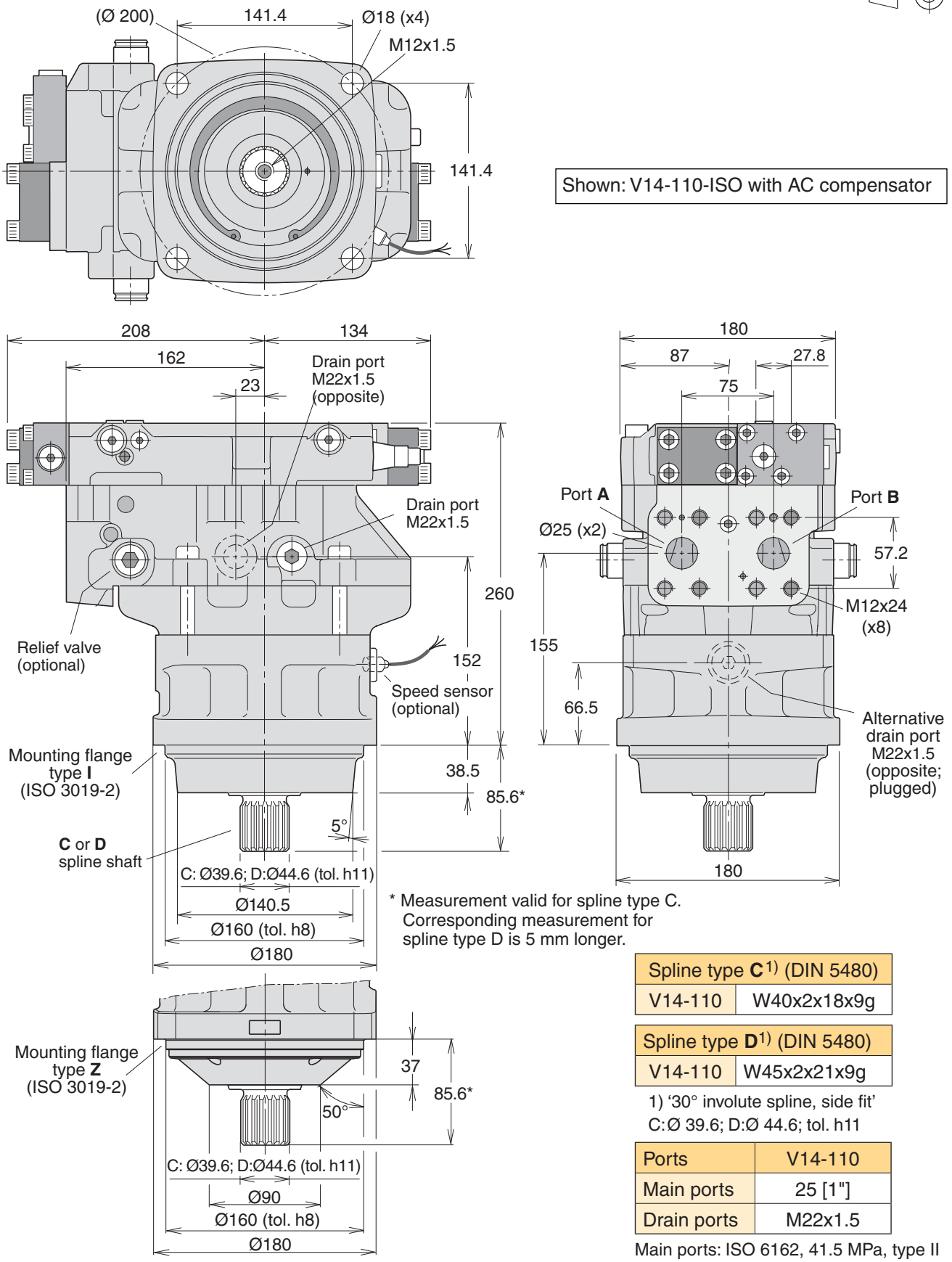
Max and min displ. [cm³/rev]

Threshold setting
AC, AD, AH: Select pressure between 100 and 350 [bar]
EO, EP: 400 [mA] - 12 [VDC] 200 [mA] - 24 [VDC]
HO, HP: 10 [bar]

Note:
* Contact Parker Hannifin for additional information

** Possible to combined with pressure relief valve
Contact Parker Hannifin for additional information

V14-110, ISO version



Shown: V14-110-ISO with AC compensator

* Measurement valid for spline type C. Corresponding measurement for spline type D is 5 mm longer.

Spline type **C**[1] (DIN 5480)	
V14-110	W40x2x18x9g

Spline type **D**[1] (DIN 5480)	
V14-110	W45x2x21x9g

1) '30° involute spline, side fit'
C: Ø 39.6; D:Ø 44.6; tol. h11

Ports	V14-110
Main ports	25 [1"]
Drain ports	M22x1.5

Main ports: ISO 6162, 41.5 MPa, type II

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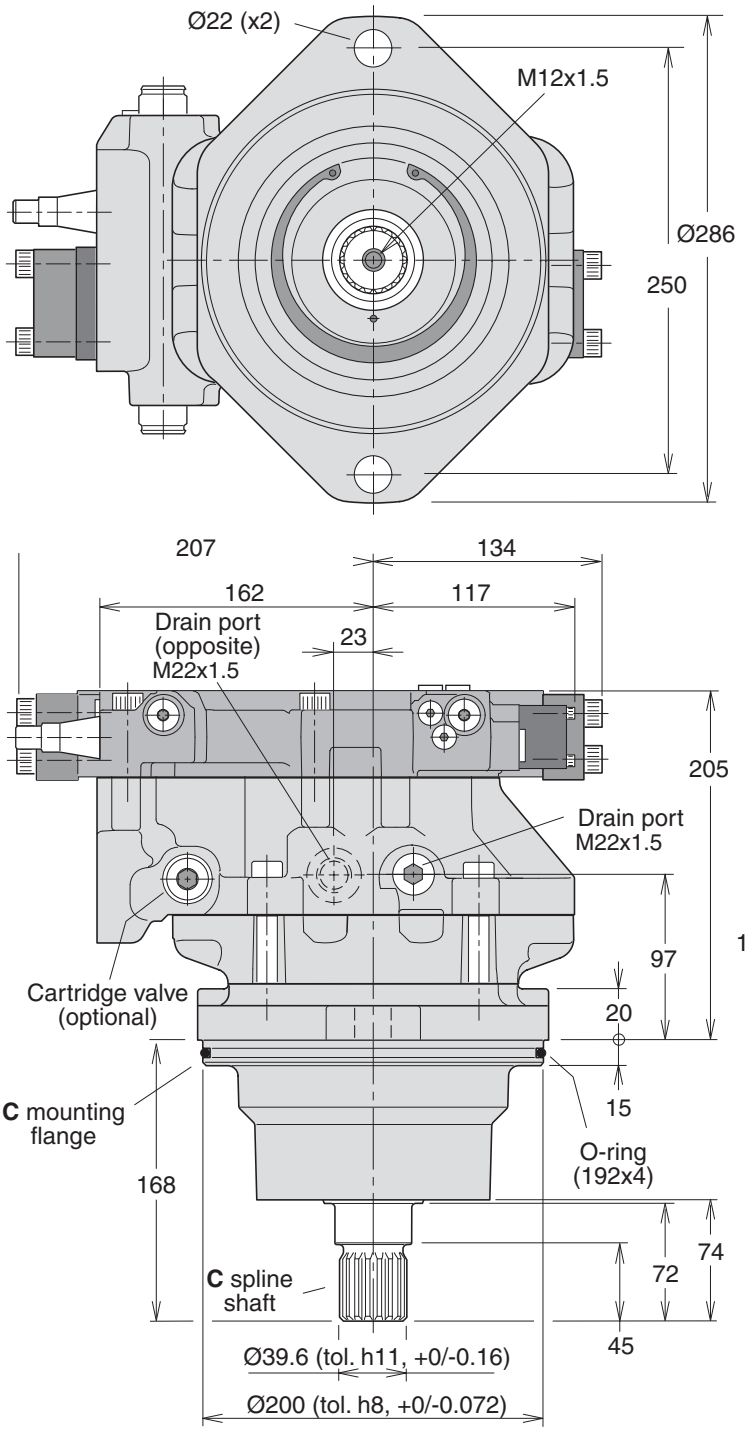
Trollhättan, Sweden

V14-110, Cartridge version



Shown: V14-110-SAE with HO/HP control

Spline type **C*** (DIN 5480)	
V14-110	W40x2x18x9g

***** '30° involute spline, side fit'.

Ports	V14-110
Main ports	25 [1"]
Drain ports	M22x1.5

Main ports: ISO 6162, 41.5 MPa, type II

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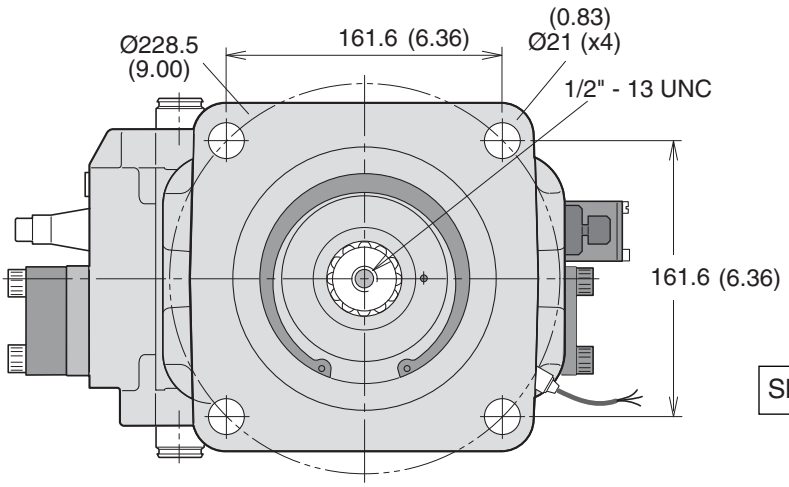
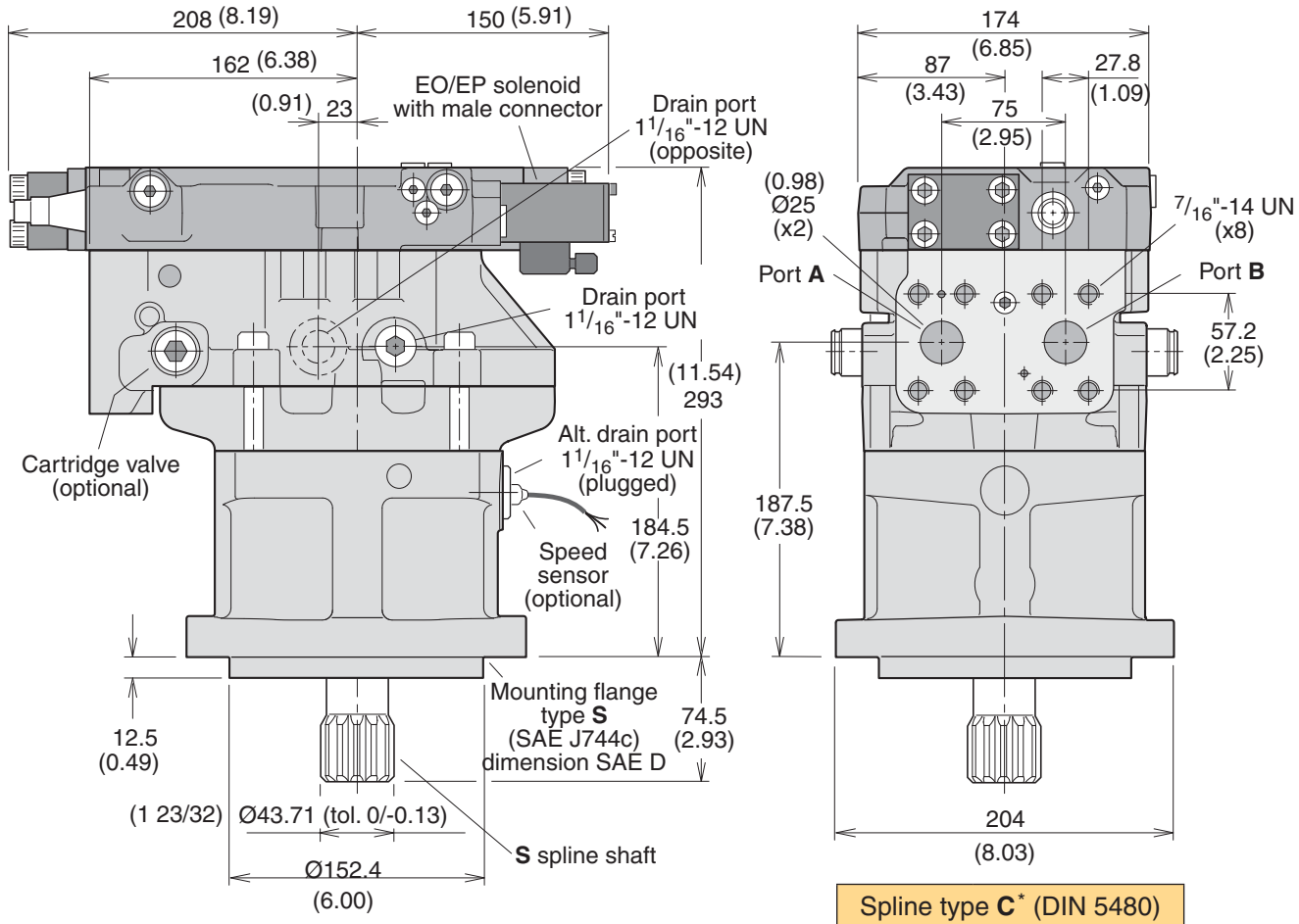
Trollhättan, Sweden

V14-110, SAE version

(inch)



Shown: V14-110-SAE with EO/EP control



Spline type **C*** (DIN 5480)	
V14-110	SAE 'D' (13T, 8/16 DP)

***** '30° involute spline, side fit'.

Ports	V14-110
Main ports	25 [1"]
Drain ports	1 1/16"-12 UN

Main ports: SAE J518c, 6000 psi

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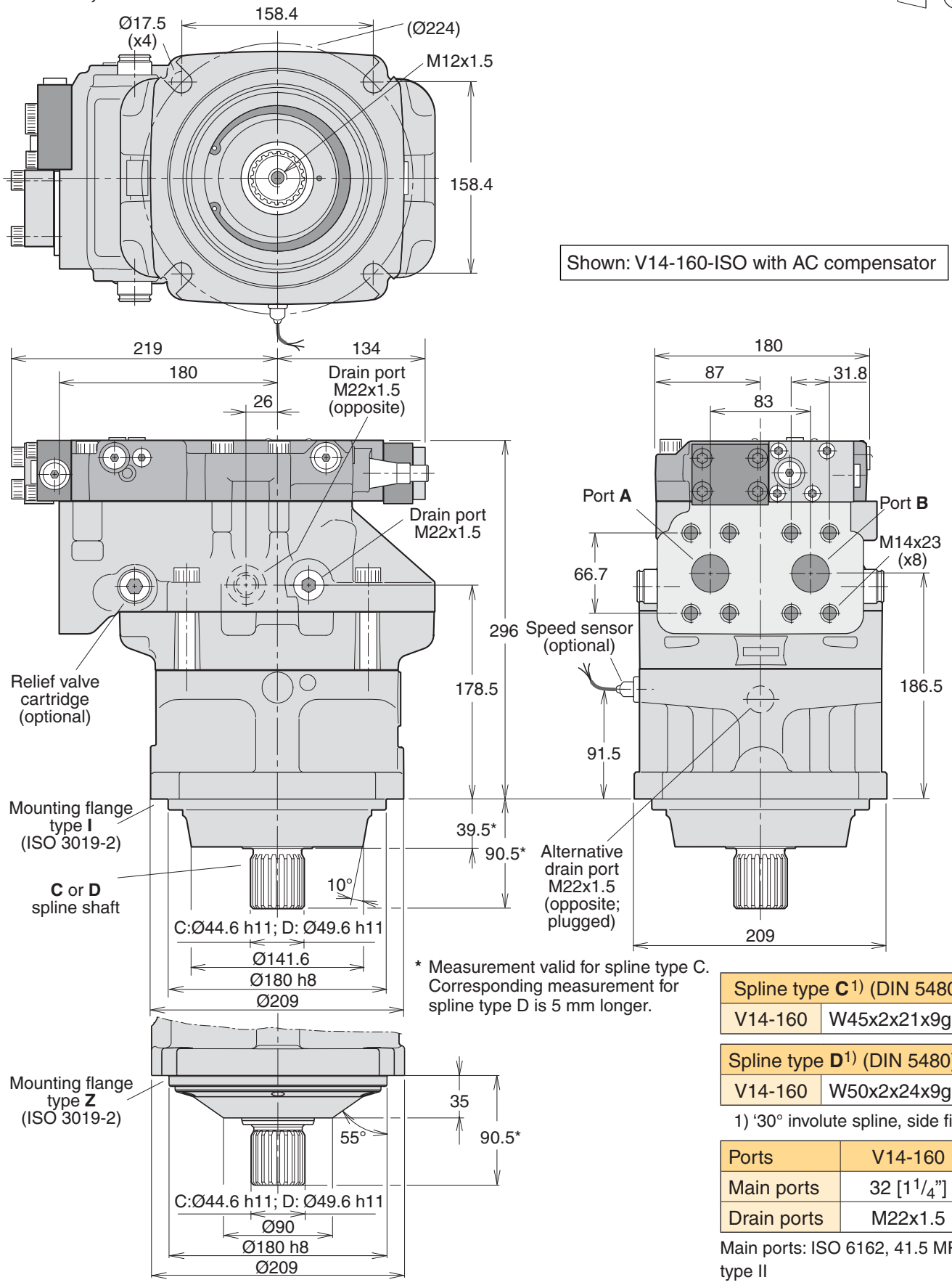
Pump and Motor Division
Trollhättan, Sweden

V14-160, ISO version



* Measurement valid for spline type C. Corresponding measurement for spline type D is 5 mm longer.

Spline type **C**[1] (DIN 5480)	
V14-160	W45x2x21x9g

Spline type **D**[1] (DIN 5480)	
V14-160	W50x2x24x9g

1) '30° involute spline, side fit'

Ports	V14-160
Main ports	32 [$1^1/_4$"]
Drain ports	M22x1.5

Main ports: ISO 6162, 41.5 MPa, type II

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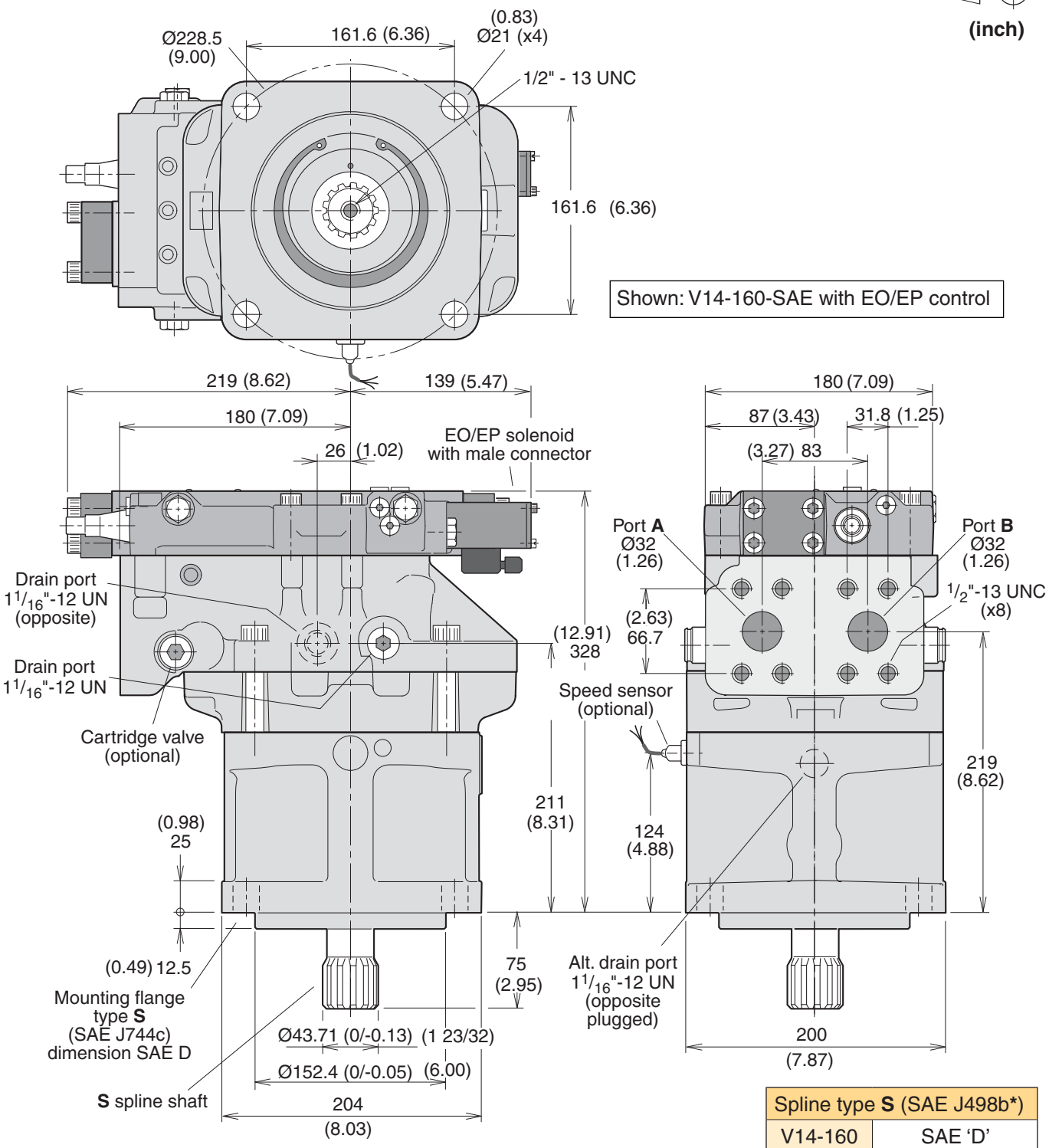
V14-160, SAE version

(inch)



Spline type **S** (SAE J498b*)	
V14-160	SAE 'D' (13T, 8/16 DP)

1) '30° involute spline, side fit'

Ports	V14-160
Main ports	32 [1 1/4"]
Drain ports	11/16"-12 UN

Main ports: SAE J518c, 6000 psi

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Pump and Motor Division
Trollhättan, Sweden

T12

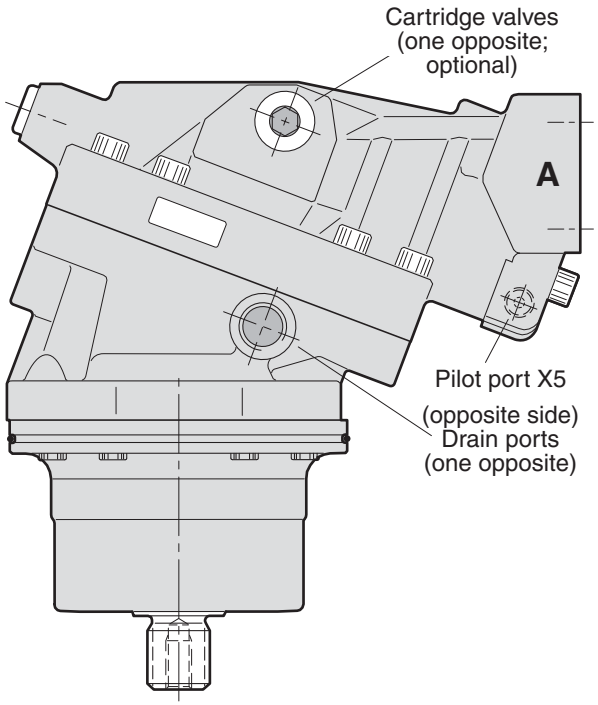
Content

Specifications

T12 frame size	60	80
Displacement [cm³/rev]		
- at 35° (max)	60	80
- at 10° (min)	18	24
Operating pressure [bar]		
- max intermittent[1)]	480	480
- max continuous	420	420
Operating speed [rpm]		
- max intermittent at 35°[1)]	4700	4300
- max continuous at 35°	4100	3700
- max intermittent at 10°[1)]	7900	7200
- max continuous at 10°	6900	6300
- min continuous	50	50
Flow [l/min]		
- max intermittent[1)]	265	320
- max continuous	215	250
Output torque [Nm]		
at 100 bar (theor.)	95	127
Output power [1)][kW]	170	205
Corner power [kW]		
- intermittent[1)]	380	460
- continuous	290	350
Weight [kg]	26	30.5

1) Max 6 sec's in any one minute

Port and relief valve locations



4

Efficiency diagrams

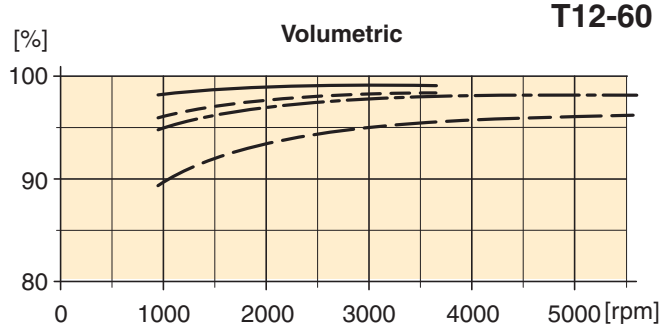
The following diagrams show volumetric and overall efficiencies versus shaft speed at 210 and 420 bar operating pressure, and at full (35°) and reduced (10°) displacements.

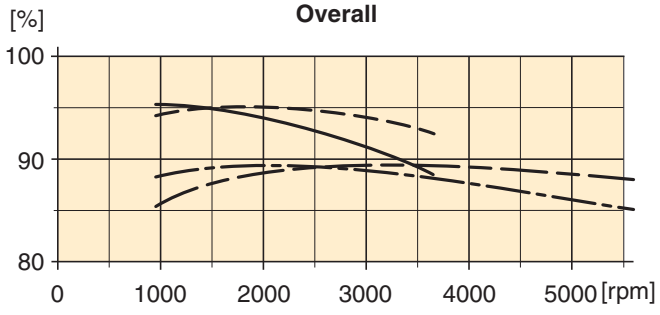
Information on efficiencies for a specific load condition can be made available from Parker Hannifin.

210 bar at full displacement
420 bar " " "

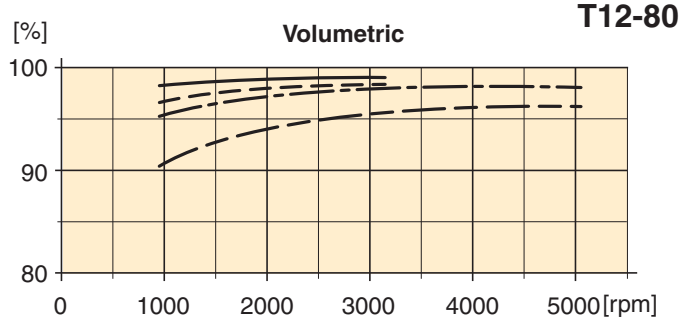
210 bar at reduced displacement
420 bar " " "

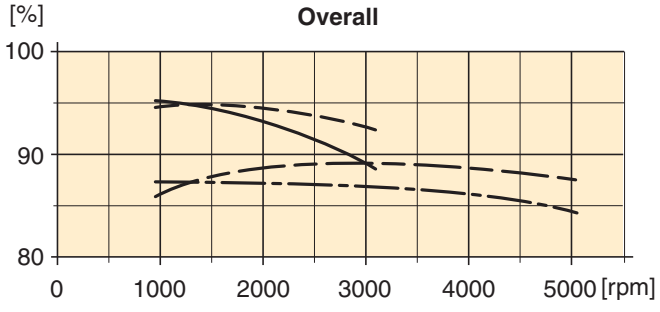
T12-60





T12-80





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Two-position control (HO T _ _ I)

The displacement is controlled by means of pilot pressure in port X5. When this pressure exceeds the threshold pressure, 15 bar, the displacement is switched to min.

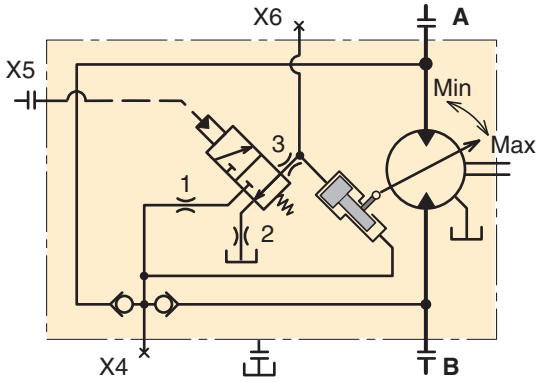
The T12 motor can be ordered with max and/or min displacement limiters.

The control is available in two versions:

- **HO T 01 I** (with standard nozzles) provides a 'fast' control response (max-to-min and min-to-max)
- **HO T 02 I** (optional) with 'slow' control response.

Gauge and pilot ports	
X4	Servo supply (before nozzle)
X5	Pilot pressure (min 15 bar; standard)
X6	Setting piston pressure (decreasing displ.)
Port sizes:	
–	M14x1.5 all

NOTE: '1', '2' and '3' are nozzles.

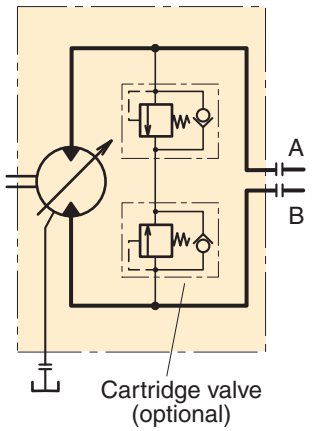


T12 schematic (no pilot pressure; the control is in max displacement position).

Pressure relief valves (optional)

As an option, T12 motors can be ordered with pressure relief valves, designed to protect the motor and the main hydraulic system from short duration pressure peaks.

The non-adjustable cartridge valves are integrated in the motor end cap and available with the following pressure settings:



T12 with cartridge valves.

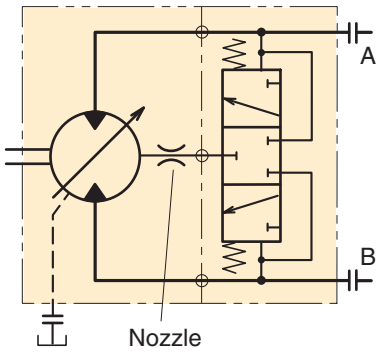
Available cartridges

Ordering code	Pressure setting [bar]	Part number
P300	300	3794616
P330	330	3794617
P350	350	3794618
P380	380	3794619
P400	400	3794620
P420	420	3793529
P450	450	3794622

FV flushing valve block (optional)

The FV flushing valve supplies the T12 motor with a cooling flow usually required when the motor is operating at high speeds and/or high power levels.

The valve block mounts directly on the main port flange.



T12 with flushing valve block type FV.

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Ordering code

T12	-		-	M	T	-	C	V	-		-		-	A	-		-		/		-	HO	T	-		-	I	-	015	/	
Motor type		Frame size		Function	Main ports		Mounting flange	Shaft seal		Shaft end		Serial number		Status		Speed sensor		Max displacement		Min displacement		Control	Function	Control response		Servo supply		Tresh-old		Press. setting	

Frame size	
Code	Displacem.
060	060 (cm^3/rev)
080	080 (cm^3/rev)

Code	Function
M	Motor bi-directional

Code	Main ports
T	Metric threads

Code	Mounting flange
C	Cartridge flange

Code	Shaft seal
V	PPS

Code	Shaft end
C	Spline DIN 5480 (standard)
D	Spline DIN 5480

Serial number (assigned for special versions)

Technical status (factory assigned)

Code	Speed sensor T12-060 CC only (refer to page 19)
P	Prepared for speed sensor
O	None

Max and min displacement
Specify in [cm^3/rev]

Code	Control
HO	Hydraulic two-position

Code	Function
T	Track drive

Code	Control response
01	Fast (standard)
02	Slow (optional)

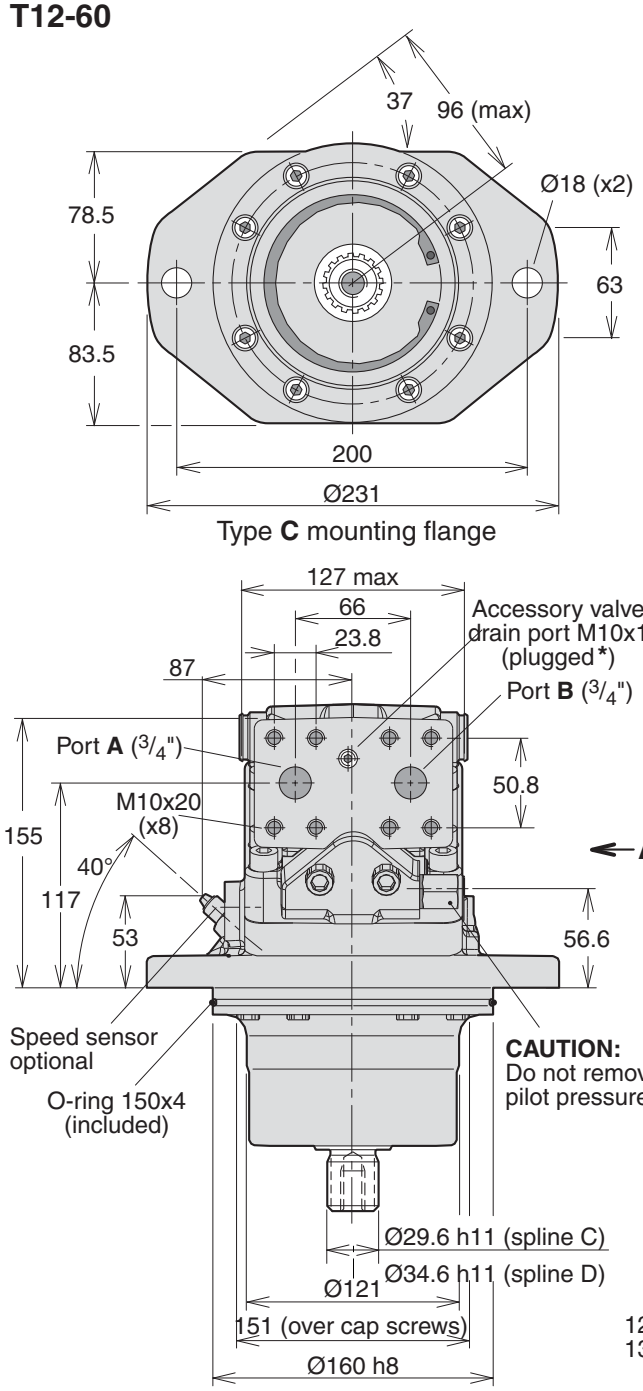
Code	Servo supply
I	Internal

Code	Threshold pressure
015	15 [bar] standard

Code	Pressure relief valve setting [bar]
000	0 [bar] (standard)

4

T12-60

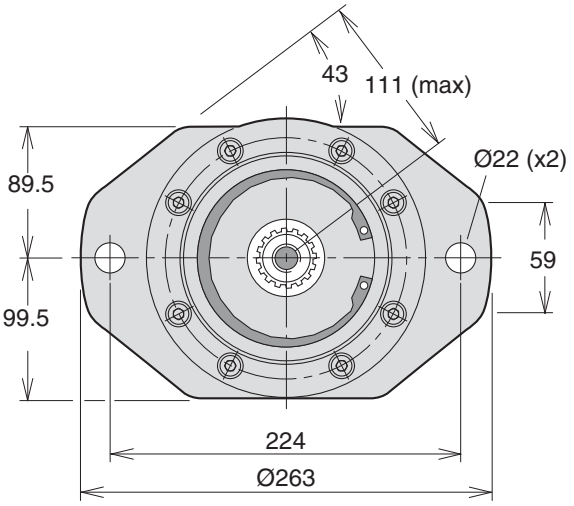


*** NOTE:**
The accessory valve drain port plug **must be removed** before installing the following valve:
- **FV** flushing valve.

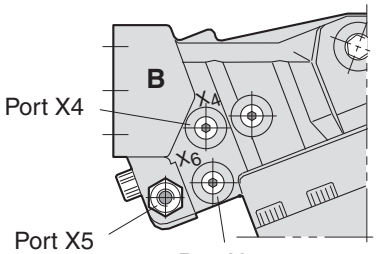
Spline[1)]	**C** (standard)	**D** (optional)
T12-60	W30x2x14x9g	W35x2x16x9g

1) DIN 5480 ('30° involute spline, side fit')

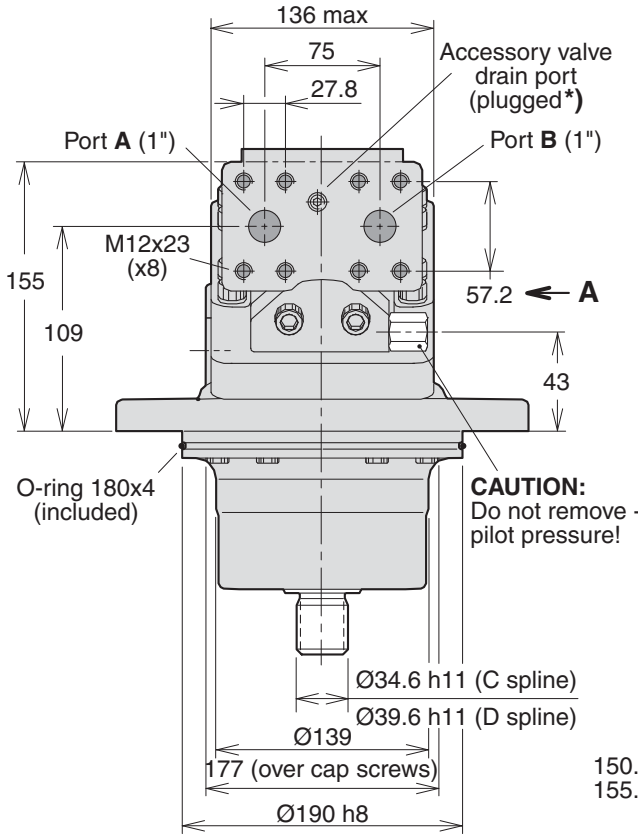
T12-80

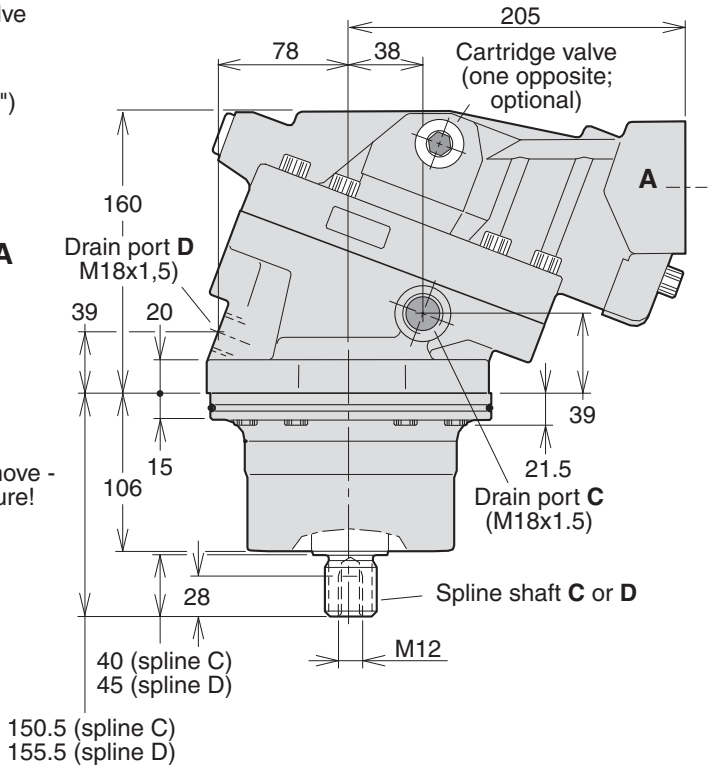


Type **C** mounting flange



View A





*** NOTE:**
The accessory valve drain port plug **must be removed** before installing the following valve:
- **FV** flushing valve.

Spline[1)]	**C** (standard)	**D** (optional)
T12-80	W35x2x16x9g	W40x2x18x9g

1) DIN 5480 ('30° involute spline, side fit')

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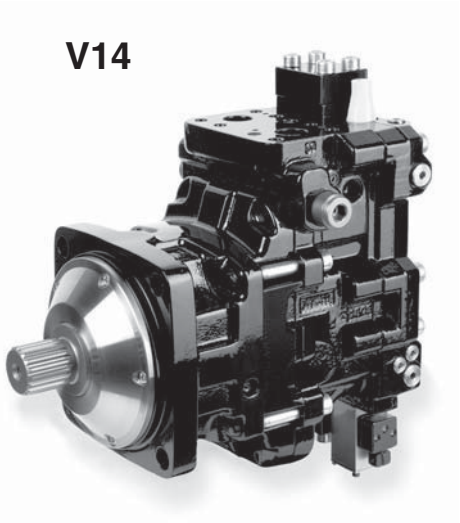
Trollhättan, Sweden

V12

V14



T12

Content

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Direction of rotation versus flow

NOTE: The V12, V14 and T12 motors are bi-directional.

V12 rotation:

- End cap position T (AC, AD and AH controls): When port B (open arrow) is pressurized, the motor rotates clockwise (right hand; R), and when port A (black arrow) is pressurized, the motor turns counter clockwise (left hand; L)
- End cap position M (EO, EP, HO and HP controls): A and B port positions interchange (A-to-B, B-to-A).

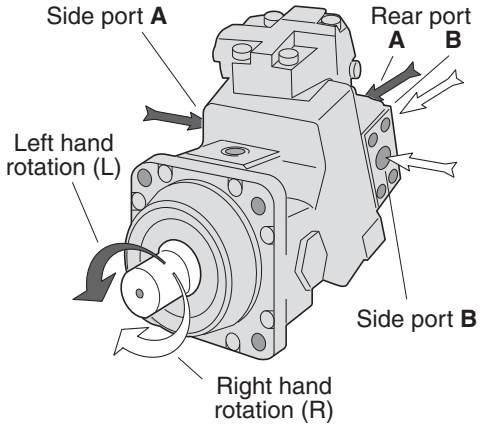
V14 rotation:

- Refer to the V14 illustration below right (valid for all compensators and controls).

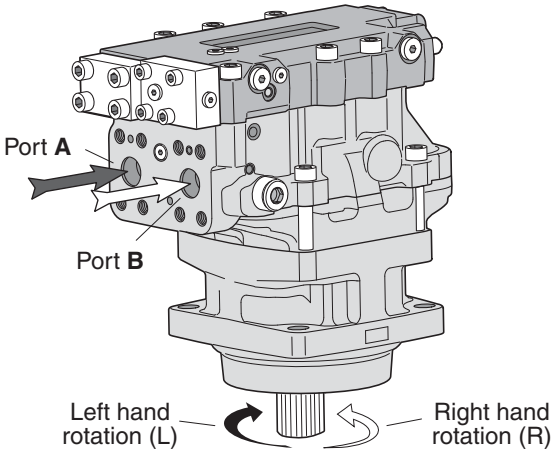
T12 rotation:

- Refer to the V14 illustration below right.

NOTE: Before installing a V12, V14 or T12 motor in series (when both A and B ports can be subject to high pressures simultaneously) contact Parker Hannifin.



Direction of rotation vs. flow for the V12 motor (here shown with AC-compensator; end cap position T).



Direction of rotation vs. flow for the V14 motor (shown with AC-compensator).

Filtration

Maximum motor sevice life is obtained when the fluid cleanlineness meets or exceeds ISO code 20/18/13 (ISO 4406).

A 10 µm (absolute) filter is recommended.

Case pressure

To secure correct case pressure and lubrication, a spring loaded check valve, 1-3 bar, in the drain line (shown on next page) is recommended.

NOTE: Contact Parker Hannifin for information when operating at high speeds.

Frame size	1500	3000	4000	5000	6000
V12-60	max 12	0.5–7	1–5.5	1.5–5	2–5
V12-80	max 12	0.5–7	1–5.5	1.5–5	2.5–5
V14-110	max 10	1–6	1.5–5	2–4.5	3–5
V14-160	max 10	1–6	2–5.5	2.5–5.5	-

Min and max case pressure [bar] vs. shaft speed [rpm].

Required inlet pressure

The motor may operate as a pump under certain conditions. When this occurs, a minimum pressure must be maintained at the inlet port; increased noise and gradually deteriorating performance due to cavitation may otherwise be experienced.

A 15 bar inlet pressure, measured at the motor inlet port, satisfies most operating conditions.

Contact Parker Hannifin for more specific information on inlet pressure requirements.

Operating temperatures

The following temperatures should not be exceeded

Main circuit: 80 °C.

Drain fluid: 115 °C.

Continuous operation at high power levels usually requires case flushing in order for the fluid to stay above the minimum viscosity requirement. A flushing valve and restricting nozzle, available as an option, provide the necessary main circuit flushing flow.

Refer to fig. 1 (next page), and to:

- V12: ‘Flushing valve’, page 17.
- V14: ‘Flushing valve’, page 46.
- T12: ‘Flushing valve block’, page 60.

Parker Hannifin
Pump and Motor Division
Trollhättan, Sweden

Drain ports

There are two drain ports on the V12 and T12 and three on the V14motors. The uppermost drain port should always be utilized.

In order to avoid excessively high case pressure, the drain line should be connected directly to the reservoir.

Hydraulic fluids

Ratings and performance data for the motors are valid when a good quality, contamination-free, petroleum-based fluid is used in the hydraulic system.

Hydraulic fluids type HLP (DIN 51524), automatic trans-mission fluids type A, or API CD engine oils can be used.

When the hydraulic system has reached full operating temperature, the motor drain oil viscosity should be above 8 mm^2/s (cSt).

At start-up, the viscosity should not exceed 1500 mm^2/s.

The ideal operating range for the motor is 15 to 30 mm^2/s.

Fire resistant fluids, when used under modified operating conditions, and synthetic fluids are also suitable.

Contact Parker Hannifin for additional information about:

- Hydraulic fluid specifications
- Fire resistant fluids.

Before start-up

Make sure the motor case as well as the entire hydraulic system is filled with hydraulic fluid.

The internal leakage, especially at low operating pressures, is not sufficient to provide lubrication at start-up.

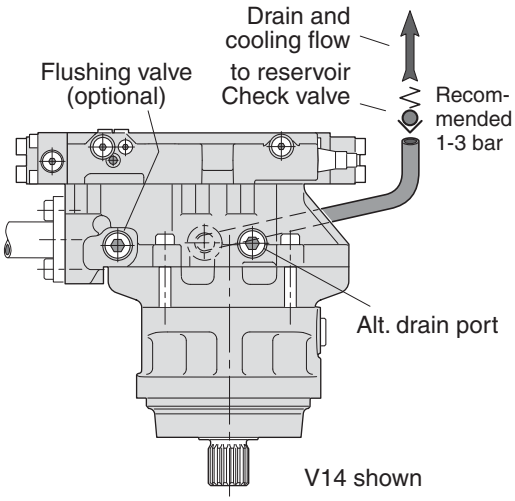


Fig. 1.

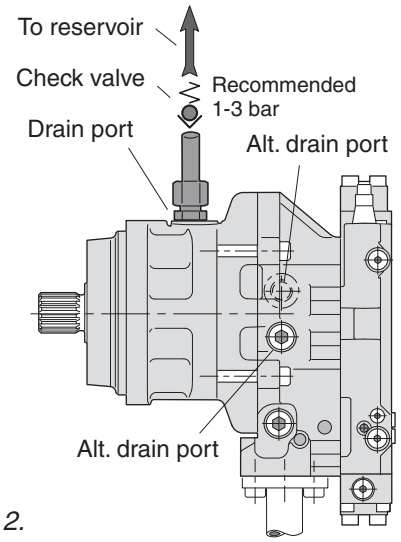


Fig. 2.

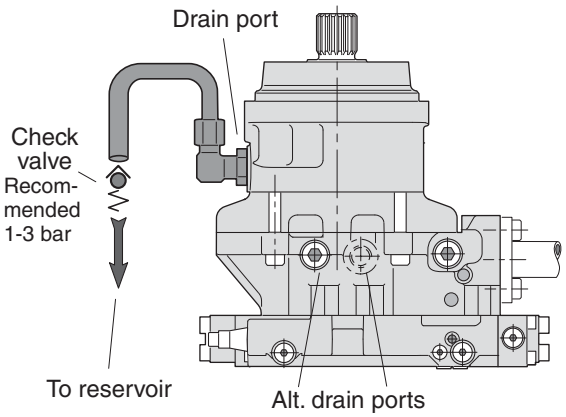


Fig. 3.

High Speed / High Power operation

Running in procedure at mid. displacement

Running in procedure Parker Motors

We suggest the following procedure to run in the V12/V14/T12 motors.

1.Start @ 500 rpm, differential pressure 250 bar, outlet 10-15 bar.

2.Run until the drain temperature has passed its maximum* and has decreased 1-2 °C

3.Increase differential pressure to 350 bar

4.Run until the drain temperature has passed its maximum* and has decreased 1-2 °C

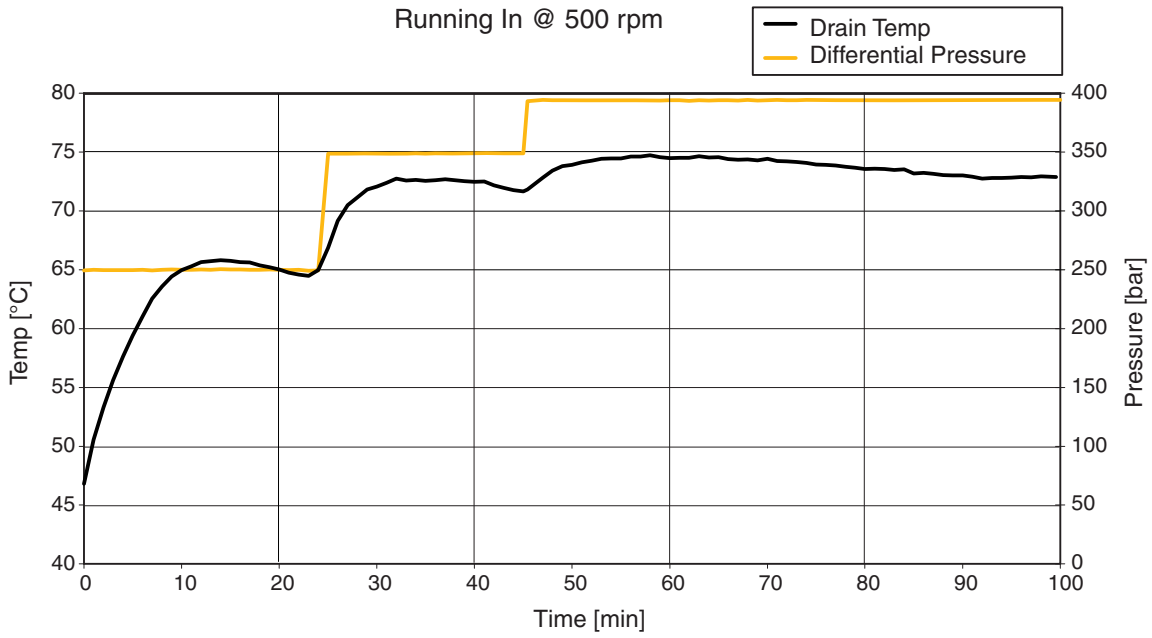
5.Increase differential pressure to 400 bar

6.Run until the drain temperature has passed its maximum* and has stabilized.

*If, at any point, the temperature tends to pass 100 °C, decrease the pressure at once.

Please make sure the drain temperature probe is in the drain oil flow to measure the correct temp.

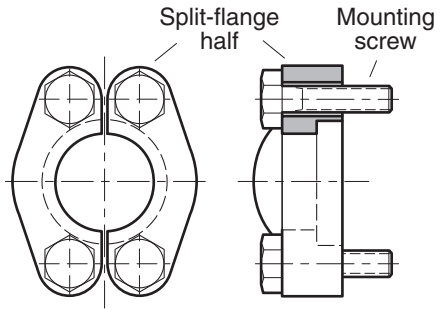
Running In Example:



Split-flange kits

Metric split-flange kits, consisting of two split-flange halves and four mounting screws for use on V12 ISO and cartridge versions, are available from Parker Hannifin.

Part no.	SAE size	For	Screw size
3794405	$^3/_4$"	V12-60/-80	M10x35
3704329	1"	V14-110	M12x40
3704330	$1^1/_4$"	V14-160	M14x45
3794405	$^3/_4$"	T12-60/-80	M10x35



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