HYDAC INTERNATIONAL

HYDAC Systems:
Pump
Specifications

E 2.902.0/08.09

1. GENERAL INFORMATION

1.1 HYDRAULIC FLUID

	Description	Standard	Characteristics	Base Chemical Composition	Recommended Seal Material
Standard hydraulic fluid	HL	DIN 51524 ISO 6743	Improved corrosion protection and anti-oxidation characteristics	Mineral oil (Petroleum base oil)	NBR FPM
	HLP (HM)		HL + abrasion reduction at boundary friction conditions		
	HV (HVLP)		HLP + improved viscosity characteristic		
	HLPD	–	HLP + detergent and dispensing additives		
Fire resistant fluid	HFA	ISO 6743	Fire resistant, corrosive **reduced** pressure rating and component life time	Oil in water emulsion Water content > 80 %	NBR
	HFC		Improved viscosity characteristic environmentally sound **reduced** pressure rating and component life time	Water based solutions (Water glycols) Water content > 35 %	NBR AU EU
	HFD		Standard pressure range increased temperature range potentially **toxic**	Water free synthetic fluids - R: Phosphate ester - U: Polyol ester POE	FPM EPDM
Environment friendly fluid	HETG		Small temperature range **risk** of hydrolysis and gumming	Vegetable oil based (Triglyceride, Rape seed)	NBR FPM AU EU
	HEES		Good temperature characteristics, good lubrication and anti corrosion properties, dissolvable in mineral oil, good aging resistance	Saturated or unsaturated synthetical fluid based (Polyol ester POE)	NBR FPM AU
	HEPG		Good ageing and lubrication properties, **incompatible** with mineral oil, polyurethane seals, standard paints and coatings and Plexiglas, problematic water and foaming characteristics	Poly glycol based synthetic fluids	NBR FPM
	HEPR		Good ageing and lubrication properties, wide temperature range	Poly alpha olefin based	

1.2 SEAL MATERIAL

NBR	Nitrile Butadiene Rubber
FPM (ISO) **FKM (ASTM)**	Fluorinated Propylene Monomer Rubber
EPDM	Ethylene Propylene Diene Monomer Rubber
AU	Polyester Urethane Rubber
EU	Polyether Urethane Rubber

1.3.1 NAS 1638 (National Aerospace Standard)

Particle Size (µm)	NAS Grade (particles per 100 ml)											
	1	2	3	4	5	6	7	8	9	10	11	12
5 - 15	500	1000	2000	4000	8000	16000	32000	64000	128000	256000	512000	1024000
15 - 25	89	178	356	712	1425	2850	5700	11400	22800	45600	91000	182000
25 - 50	16	32	63	126	253	506	1012	2025	4050	8100	16200	32400
50 - 100	3	6	11	22	45	90	180	360	720	1440	2880	5760
> 100	1	1	2	4	8	16	32	64	128	256	512	1024

1.3.2 ISO 4406 (International Organization for Standardization)

ISO-Code	Particles per 100 ml	
	from	to
24	8000000	16000000
23	4000000	8000000
22	2000000	4000000
21	1000000	2000000
20	500000	1000000
19	250000	500000
18	130000	250000
17	64000	130000
16	32000	64000
15	16000	32000
14	8000	16000
13	4000	8000
12	2000	4000
11	1000	2000
10	500	1000
9	250	500
8	130	250
7	64	130
6	32	64

1.3.3 ISO 4406 / NAS 1638 Code Comparison

ISO 4406	Particles per 100 ml			NAS 1638
	> 2 µm	> 5 µm	> 15 µm	
23 / 21 / 18	8000000	2000000	250000	**12**
22 / 20 / 18	4000000	1000000	250000	**–**
22 / 20 / 17	4000000	1000000	130000	**11**
22 / 20 / 16	4000000	1000000	64000	**–**
21 / 19 / 16	2000000	500000	64000	**10**
20 / 18 / 15	1000000	250000	32000	**9**
19 / 17 / 14	500000	130000	16000	**8**
18 / 16 / 13	250000	64000	8000	**7**
17 / 15 / 12	130000	32000	4000	**6**
16 / 14 / 12	64000	16000	4000	**–**
16 / 14 / 11	64000	16000	2000	**5**
15 / 13 / 10	32000	8000	1000	**4**
14 / 12 / 9	16000	4000	500	**3**
13 / 11 / 8	8000	2000	250	**2**
12 / 10 / 8	4000	1000	250	**–**
12 / 10 / 7	4000	1000	130	**1**
12 / 10 / 6	4000	1000	64	**–**

1.3.4 Determination of Displacement

$$Q = \frac{Vg * n}{1000}$$

Q [L/min] Flow
Vg [cm³/rev] Geometric Displacement
n [rev/min] Shaft Speed

$$M = \frac{\Delta p * Vg}{20 * \pi}$$

M [Nm] Moment (Drive Torque)
Δp [bar] Differential Pressure

$$P = \frac{Q * \Delta p}{600}$$

P [kW] Power (Drive Power)

INTRODUCTION

With over 5,500 employees worldwide HYDAC is one of the leading suppliers of fluid technology, hydraulic and electronic equipment.

HYDAC is your reliable partner for various hydraulic pump types.

Application-based engineering designs are developed and manufactured in product-orientated laboratories, testing and production facilities for applications in mobile and industrial machinery and systems.

With 40 overseas subsidiaries and over 500 distributors and service partners, HYDAC is your reliable partner worldwide.

Germany

France

Italy

Poland

CONTENT

Note:
In addition to our regional technical sales departments the HYDAC Drive Center is available to support you in all hydraulic pump and drive matters.

2. VARIABLE DISPLACEMENT AXIAL PISTON PUMP STANDARD MODELS
for Open Loop Hydraulic Systems

2.1 MEDIUM PRESSURE SERIES

Series	Geometric Displacement [cm³/rev]	Operating Pressure Rated [bar]	Operating Pressure Peak [bar]	Maximum Shaft Speed [min⁻¹]
PPV100-16	16.3	280	350	3600
PPV100-37	37.1			2700
PPV100-56	56.3			2500
PPV100-71	70.7			2300
PPV100-100	100.5			2100
PPV100-145	145.2			1800
PPV100-180	180.7			1800

2.2 LIGHT HEAVY DUTY SERIES

Series	Geometric Displacement [cm³/rev]	Operating Pressure Rated [bar]	Operating Pressure Peak [bar]	Maximum Shaft Speed [min⁻¹]
PPV101-45	45.0	320	350	2700
PPV101-80	80.0			2400
PPV101-112	112.0			2200
PPV101-140	140.0			2200
PPV101-200	200.0	350	400	1900

2.3 HEAVY DUTY SERIES

Series	Geometric Displacement [cm³/rev]	Operating Pressure Rated [bar]	Operating Pressure Peak [bar]	Maximum Shaft Speed [min⁻¹]
PPV102-63	63.0	350	400	1800
PPV102-112	112.0			1800
PPV102-180	180.0			1800
PPV102-280	280.0			1500
PPV102-360	2 x 180.0			1800
PPV102-560	2 x 280.0			1500

2.4 LIGHT MEDIUM PRESSURE SERIES

Series	Geometric Displacement [cm³/rev]	Operating Pressure Rated [bar]	Operating Pressure Peak [bar]	Maximum Shaft Speed [min⁻¹]
PPV103-10	10.0	160	210	1800
PPV103-16	15.8			1800
PPV103-22	22.2		160	1800
PPV103-37	36.9		210	1800
PPV103-56	56.2			1800
PPV103-70	70.0	250	280	1800
PPV103-90	91.0			1800
PPV103-145	145.0			1800

3. VARIABLE DISPLACEMENT VANE PUMP
for Open Loop Hydraulic Systems

3.1 HYDRAULIC COMPENSATION

Series	Geometric Displacement [cm³/U]	Operating Pressure Rated [bar]	Maximum Shaft Speed [min⁻¹]
PVV100-1-16	17.9	160	1 800
PVV100-1-20	22.1		1 800
PVV100-1-25	26.9		1 800
PVV100-2-31	34.5		1 800
PVV100-2-40	42.8		1 800
PVV100-2-50	53.1		1 800
PVV100-3-63	69.0	150	1 800
PVV100-3-80	86.2		1 800
PVV100-3-100	105.5		1 800

3.2 MECHANICAL COMPENSATION

Series	Geometric Displacement [cm³/U]	Operating Pressure Rated [bar]	Maximum Shaft Speed [min⁻¹]
PVV101-05-6	6.9	150	1 800
PVV101-05-10	11.0		1 800
PVV101-05-12	13.1		1 800
PVV101-1-16	17.9	100	1 800
PVV101-1-20	22.1		1 800
PVV101-1-25	26.9		1 800
PVV101-2-31	34.5		1 800
PVV101-2-40	42.8		1 800
PVV101-2-50	53.1		1 800
PVV101-3-63	69.0	80	1 800
PVV101-3-80	86.2		1 800
PVV101-3-100	105.5		1 800

4. FIXED DISPLACEMENT VANE PUMP PREFERENCES
for Open Loop Hydraulic Systems

4.1 FIXED DISPLACEMENT

Series	Geometric Displacement [cm³/U]	Operating Pressure Rated [bar]	Maximum Shaft Speed [min⁻¹]
PVF100-1-6	5.8	210	1800
PVF100-1-8	8.0		1800
PVF100-1-10	9.4		1800
PVF100-1-12	12.2		1800
PVF100-1-14	13.7		1800
PVF100-1-17	16.6		1800
PVF100-1-19	18.6		1800
PVF100-1-23	22.7		1800
PVF100-1-25	25.3		1800
PVF100-1-31	31.0	160	1800
PVF100-2-41	41.3	210	1800
PVF100-2-47	47.2		1800
PVF100-2-53	52.5		1800
PVF100-2-59	58.2		1800
PVF100-2-65	64.7		1800
PVF100-3-76	76.4		1800
PVF100-3-94	93.6		1800
PVF100-3-116	115.6	160	1800
PVF100-4-136	136.0	175	1800
PVF100-4-153	153.0		1800
PVF100-4-184	184.0		1800
PVF100-4-200	201.0		1800
PVF100-4-237	237.0		1800

5. EXTERNAL GEAR PUMPS

5.1 SIZE 1

Series	Geometric Displacement [cm³/rev]	Operating Pressure Rated [bar]	Operating Pressure Peak [bar]	Maximum Shaft Speed [min⁻¹]
PGE101-100	1	220	250	3500
PGE101-125	1.25			
PGE101-160	1.6			
PGE101-200	2			
PGE101-250	2.5			
PGE101-315	3.15			
PGE101-365	3.65			
PGE101-420	4.2			
PGE101-500	5			3000
PGE101-610	6.1	170	200	2500
PGE101-740	7.4	150	180	2500

5.2 SIZE 2

Series	Geometric Displacement [cm³/rev]	Operating Pressure Rated [bar]	Operating Pressure Peak [bar]	Maximum Shaft Speed [min⁻¹]
PGE102-450	4.5	220	250	3500
PGE102-630	6.3			
PGE102-820	8.2			
PGE102-1000	10			
PGE102-1100	11.3			
PGE102-1200	12			
PGE102-1400	14			
PGE102-1500	15			3000
PGE102-1600	16			
PGE102-1730	17.3	200	230	
PGE102-1900	19	170	200	
PGE102-2200	22	150	180	2500
PGE102-2500	25	130	160	
PGE102-2800	28	100	130	

5.3 SIZE 3

Series	Geometric Displacement [cm^3/rev]	Operating Pressure Rated [bar]	Operating Pressure Peak [bar]	Maximum Shaft Speed [min^{-1}]
PGE103-2000	20	220	250	3000
PGE103-2250	22.5			
PGE103-2500	25			
PGE103-2800	28			
PGE103-3200	32			3000
PGE103-3600	36			2800
PGE103-4200	42	200	230	2500
PGE103-4600	46			2300
PGE103-5000	50	170	200	2100
PGE103-5500	55			1750
PGE103-6000	60	150	180	

NOTE

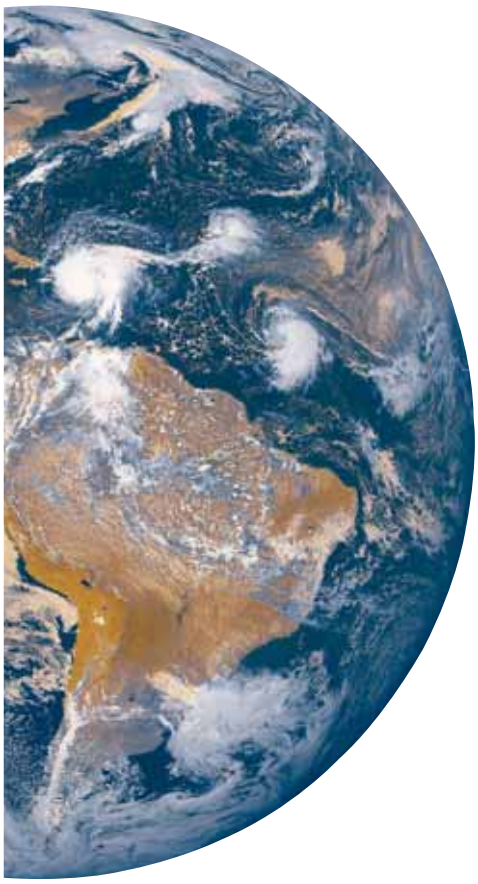
The information in this brochure relates to the operating conditions and applications described.
For applications and operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

6. INDUSTRIES AND APPLICATIONS

HYDAC Pumps are used in almost all industries worldwide.

The main sectors of application are industrial hydraulics, mobile technology and process technology.

The following list provides a selection of typical application examples for industrial hydraulics:



6.1. INDUSTRIAL HYDRAULICS

Machine tools, cutting
- Hydraulic weight compensation for tool shafts.

Standard drive concepts:
- External gear pumps, pressure compensated vane pumps

Machine tools, non-cutting
- Holding and clamping functions
- Tool drives

Standard drive concepts:
- Fixed displacement pumps with accumulator charging circuit
  External and internal gear pumps
  Controlled axial piston pumps
  Variable speed drive controlled fixed displacement pump

Plastics technology
- Closing cylinder drive, including holding function
- Hydraulic drive technology is preferable to electrical drive technology as the machine size increases.

Standard drive concepts:
- Controlled axial piston pumps;
  Vane pumps for smaller machines and pressure ranges below 160 bar.
  Variable speed drive controlled fixed displacement pump

Die-casting machines
- Closing cylinder drive, including holding function

Standard drive concepts:
- Controlled axial piston pumps;
  Vane pumps for smaller machines and pressure ranges below 160 bar.
  Variable speed drive controlled fixed displacement pump

Steel industry
Standard drive concepts:
- Controlled axial piston pumps
  Accumulator charging circuit with fixed displacement pump drives

Power plants
Standard drive concepts:
- Controlled axial piston pumps
  Accumulator charging circuit with fixed displacement pump drives

Paper industry
Standard drive concepts:
- Accumulator charging circuit with fixed displacement pump drives
  Controlled axial piston pumps

Wind energy
Standard drive concepts:
- Controlled axial piston pumps
  Accumulator charging circuit with fixed displacement pump drives

NOTES

Pro.: Speichertechnik DEF 3.000

Prospekt: Filtertechnik DEF 7.000

Pro.: Verfahrenstechnik DEF 7.700

Prospekt: Filter Systems DEF 7.929

Pro.: Compact-Hydraulik DEF 5.300

Prospekt: Accessories DEF 6.100

Prospekt: Elektronik DEF 18.000

Prospekt: Kühlsysteme DEF 5.700

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Local expertise.
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- HYDAC Companies
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