Pumps

1.1 Hydraulic pumps

Radial piston pump type R and RG

Variable displacement axial piston pump type V60N

Radial piston pumps

Type	Design / features	p_{max} (bar)	V_{max} (cm^3/rev)
R, RG, RZ	**Radial piston pump / dual-stage pump** ▪ Single pump ▪ Motor pump ▪ Hydraulic power pack **Features and benefits:** – High level of efficiency – Compact design – Max. 14 separate pressure outlets – Available from the modular product range as a hydraulic power pack with valve banks	R 7631: 700 R, RG 6010: 700 R, RG 6011: 700 R, RG 6012: 700 R, RG 6014: 700 R, RG 6016: 700 HP/LP: RZ 7631: 700/200 RZ 6910: 700/200 RZ 6911: 700/200 RZ 6912: 700/200 RZ 6914: 700/200 RZ 6916: 700/200	R 7631: 1.59 R, RG 6010: 4.58 R, RG 6011: 10.7 R, RG 6012: 21.39 R, RG 6014: 42.78 R, RG 6016: 64,18 HP/LP: RZ 7631: 1.59/7.9 RZ 6910: 4.58/26 RZ 6911: 10.7/89.6 RZ 6912: 21.4/89.6 RZ 6914: 42.8/89.6 RZ 6916: 64.2/89.6

Axial piston pumps

Type	Design / features	p_{max} (bar) (Operation/peak)	V_{max} (cm^3/rev)
V30D	**Variable displacement axial piston pump** ▪ Single pump ▪ Pump combination **Features and benefits:** – Low-noise emissions – Wide controller options – Full torque available at the second pump in tandem pump applications	045: 350/420 075: 350/420 095: 350/420 115: 250/300 140: 350/420 160: 250/300 250: 350/420	045: 45 075: 75 095: 95 115: 115 140: 140 160: 160 250: 250
V30E	**Variable displacement axial piston pump** ▪ Single pump ▪ Pump combination **Features and benefits:** – Low noise emissions – Wide controller options – Full torque available at the second pump in tandem pump applications	095: 350/420 160: 350/420 270: 350/420	095: 95 160: 160 270: 270
V80M	**Variable displacement axial piston pump** ▪ Single pump ▪ Pump combination **Features and benefits:** – High rotation speed – High nominal pressure – Less installation space – Full torque available at the second pump in tandem pump applications	200: 400/450	200: 202
V60N	**Variable displacement axial piston pump** ▪ Single pump ▪ Pump combination **Features and benefits:** – Optimized power-to-weight ratio – High self-suction speed – Wide controller options	060: 350/400 090: 350/400 110: 350/400 130: 400/450	060: 60 090: 90 110: 110 130: 130
K60N	**Fixed displacement axial piston pump** ▪ Single pump **Features and benefits:** ▪ Optimized power-to-weight ratio ▪ High rotation speed ▪ Different shaft and flange versions	012: 400 017: 400 025: 400 034: 400 047: 400 064: 400 084, 984: 400 108, 9108: 400	012: 12.6 017: 17.0 025: 25.4 034: 34.2 047: 47.1 064: 63.5 084, 984: 83.5 108, 9108: 108

Air-driven hydraulic pumps

Type	Design / features	p_{max} (bar)	V_{max} (cm^3/stroke)
LP	**Air-driven hydraulic pump** ▪ Single pump ▪ Hydraulic power pack **Features and benefits:** – High operating pressures – Suitable for explosion-proof systems and equipment – No electrical energy – Hydraulic power packs with direct valve mounting	80: 700 125: 1500 160: 1500	80: 6.00 125: 28.30 160: 28.30

Hand pumps

Type	Design / features	p_{max} (bar)	V_{max} (cm^3/stroke)
H, HE, HD	**Hand pump** ▪ Single-acting ▪ Double-acting **Features and benefits:** – Sturdy design – Hand pumps with integrated tank – Safety and drain valve	H - 16: 350 H - 20: 220 H - 25: 150 HE - 3: 800 HE - 4: 600 HD - 13: 350 HD - 20: 220 HD - 30: 150	H - 16: 6.00 H - 20: 9.40 H - 25: 14.70 HE - 3: 3.00 HE - 4: 4.00 HD - 13: 13.00 HD - 20: 20.00 HD - 30: 30.00

Individual pumps

1.1 Radial piston pump type R, RG and RZ

Radial piston pumps are a type of hydraulic pump. They consist of valve-controlled pump cylinders that are arranged radially.
The radial piston pump type R, RG and RZ has a closed pump housing. Therefore, besides use as a motor pump outside an oil tank, installation in the container of a hydraulic power pack is also possible. The radial piston pump is available with several pressure outlets which enable the same or several different volumetric flows. Type RZ is a classic dual-stage pump consisting of a radial piston pump and a gear pump. The radial piston pump type RG has plain bearings which have a longer storage life. This type is therefore used in extreme operating conditions.
Extremely high volumetric flows can be achieved by arranging up to 6 radials in parallel. When the radial piston pump is used in the hydraulic power pack, it is suitable for use as a highly compact control system. Connection blocks and valve banks can be mounted on the cover plate of the hydraulic power packs.

Nomen-clature:	Radial piston pump
Design:	Single pump ; dual-stage pump
p_{max}:	700 bar
Q_{max}:	91.2 l/min
V_g:	64.18 cm³/rev

Features and benefits:
- High level of efficiency
- Compact design
- Max. 14 separate pressure outlets
- Available from the modular product range as a hydraulic power pack with valve banks

Intended applications:
- Press construction
- Jig construction
- Testing and laboratory devices
- Lubricating systems

Design and order coding example

RZ 0,9 / 2 - 16

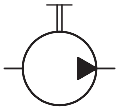
Sizes Delivery flow gear pump [lpm]

Basic type, delivery flow [lpm]
- Type R (version with roller bearing)
- Type RG (version with plain bearing)
- Type RZ (dual-stage pump)

Additional versions:
- With several pressure ports
- With separate ports for the flow of one or two pump elements (Q_{max} = 4,4 lpm) e.g. as control oil supply

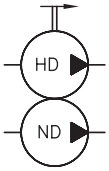
Function

Single pump type R and RG



Single pump type RZ
only high-pressure section,
low-pressure section is
installed by customer

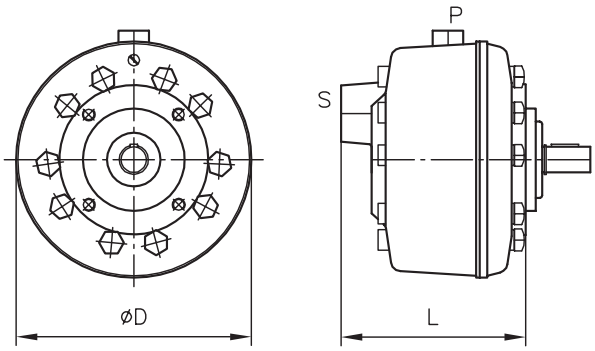
Single pump type RZ
High and low-pressure section



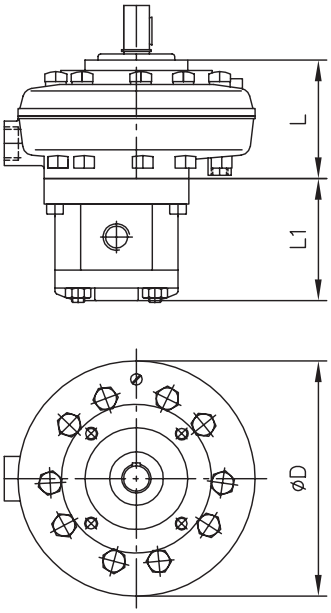
Pump with several pressure
outlets (example for an Single
pump)

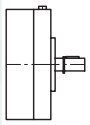
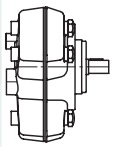
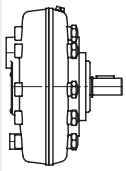
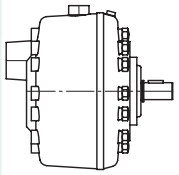
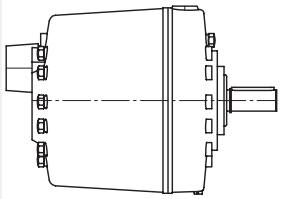
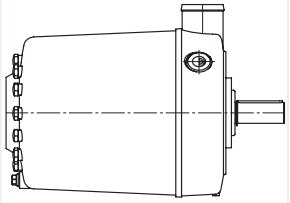
General parameters and dimensions

Single pump type R and RG



Single pump type RZ



Design		Number of cylinders	Delivery flow Q_{pu} (lpm) (approximate reference value at 1450 rpm) and max. pressure p_{max} (bar)						Dimensions [mm]		
			700 bar	550 bar	450 bar	250 bar	160 bar	P_N [kW]	D	L	m [kg]
7631		2	0.18	0.28	0.43	0.92	-	0.25...0.55	130	53/58	3.2
		3	0.27	0.42	0.64	1.35	-				
		5	0.46	0.7	1.08	2.27	-				
6010/ 6910		1	0.3	0.5	0.8	1.7	2.2	0.25...3	174	82.5/85.5	3.1
		2	0.6	1.0	1.6	3.3	4.4				
		3	0.9	1.5	2.5	5.1	6.5				
6011/ 6911		5	1.4	2.6	4.2	8.3	10.9	0.55...5.5	185	86/85	5.8
		7	2.1	3.7	5.8	11.8	15.3				
6012/ 6912		10	2.7	5.3	8.2	16.8	21.7	2.2...11	185	146/125	10.5
		14	4.0	7.4	11.6	23.5	30.4				
6014/ 6914		20	6.1	11.0	17.4	35.0	43.4	5.5...22	218	250/221	24.2
		28	8.0	15.0	23.0	47.0	60.8				
6016/ 6916		42	12.7	22.0	34.5	70.0	91.2	11...30	238	311/320	39.1

- The data listed represent only a selection of the various different versions
1) Standard motor, design IM B 35 for motor pumps or IM B 5 for hydraulic power packs

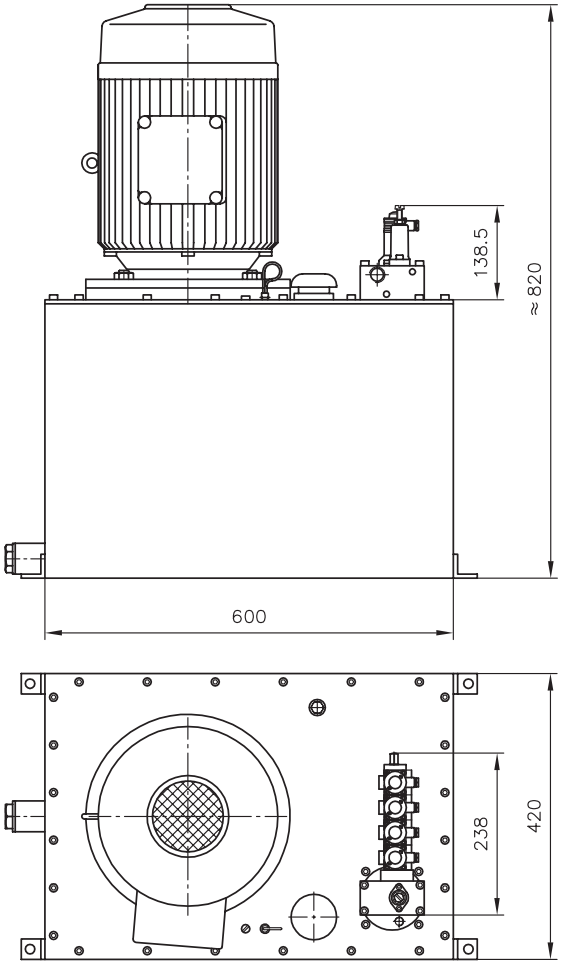
Gear pump

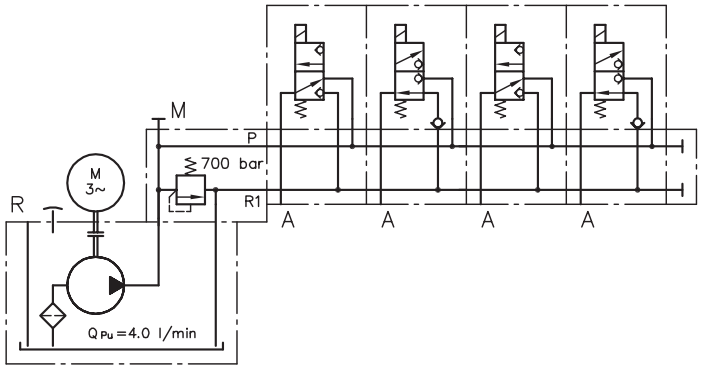
Size	Delivery flow Q_{pu}[lpm] and max. pressure p_{max} [bar]			Dimensions [mm]	m [kg]
	120 bar	80 bar	40 ... 60 bar	L1	
/1	5,2	8,8	11,3	70 ... 86	1,2
/2	12,3	16	37	96 ... 132	3,1
/3	24	110	135	140 ... 178	8,4

- The data listed represent only a selection of the various different versions

Circuit example:

R 4.0/B 50 A 700 - VB 11 DM - HRHR - 1 - G 24 - V 5.5





Associated technical data sheets:

- Radial piston pump type R and RG: D 6010
- Motor pump and hydraulic power pack type R and RG: D 6010 H
- Radial piston pumps with several pressure connections type R, RG: D 6010 D, D 6010 DB
- Radial piston pump type R and RG with one main pressure connection and one or two ancillary pressure connections: D 6010 S

Directly mountable valve banks:

- Type VB:Page 114
- Type BWH(N):Page 120
- Type SWR: Page 76

Individual pumps

1.1 Variable displacement axial piston pump type V30E

Variable displacement axial piston pumps operate according to the bent axis principle. They adjust the geometric output volume from maximum to zero. As a result they vary the flow rate that is provided to the loads.

The axial piston pump type V30E is designed for open circuits in mobile hydraulics and operate according to the swash plate principle. They are available with the option of a thru-shaft for operating additional hydraulic pumps in series.

The sturdy pump is particularly suitable for continuous operation in challenging applications. The range of pump controllers allows the axial piston pump to be used in a variety of applications.

Features and benefits:

- Low noise emissions
- Wide controller options
- Full torque available at the second pump in tandem pump applications

Intended applications:

- Machines for forestry and agricultural purposes
- Cranes and lifting equipment
- Construction machines

Nomenclature:	Axial piston pump Variable pump
Design:	Single pump Multiple pump
p_{max}:	System pressure: 350 bar Peak pressure: 420 bar
$V_{g\ max}$:	270 cm³/rev

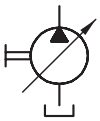
Design and order coding example

V30E	- 095	R	S	F	N	- 1	- 2	- XX	/LSP	/120	- 200

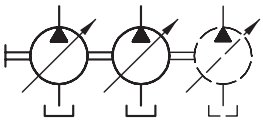
- **Pressure specification [bar]**
- **Torque setting [Nm]**
- **Controllers** See section "Controller"
- **Release**
- **swash plate angle indicator** With/without swash plate angle indicator
- **Housing version** With/without thru-shaft
- **Seal material**
  - NBR (N)
  - EPDM (E)
  - FKM (V, C)
- **Flange version**
  - Flange ISO 3019-2 (G)
  - Flange SAE J744 (F, W)
- **Shaft version**
  - Spline shaft DIN 5480 (D)
  - Parallel key (K)
  - Spline shaft SAE J744 (S, U)
- **Rotating direction** Anti-clockwise (L), clockwise (R)
- **Nominal size**
- **Basic type**

Function

Single pump



Multiple pump



Controller

Pressure controller:

- Pressure controller (P, Pb)
- Electro-proportional pressure controller (P-PMVPS)

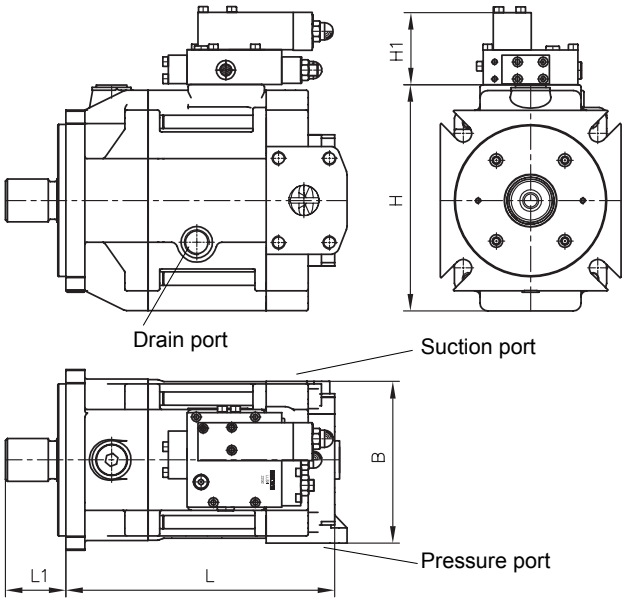
Flow controller

- Load-sensing controller with integrated pressure limitation (LSP, LSPb)
- Load-sensing controller with integrated pressure limitation and electric pump direction switching (LSP-BVPM)
- Electro-hydraulic flow controller with integrated pivoting angle pick-up and control electronics for adjustment of setpoint and actual value (EM.CH)

Power controller:

- Power controller (L)
- Power controller (Lf, Lf1)

General parameters and dimensions



(connection locations for clockwise operation)

1 Drain port
2 Suction port
3 Pressure connection

Parameters

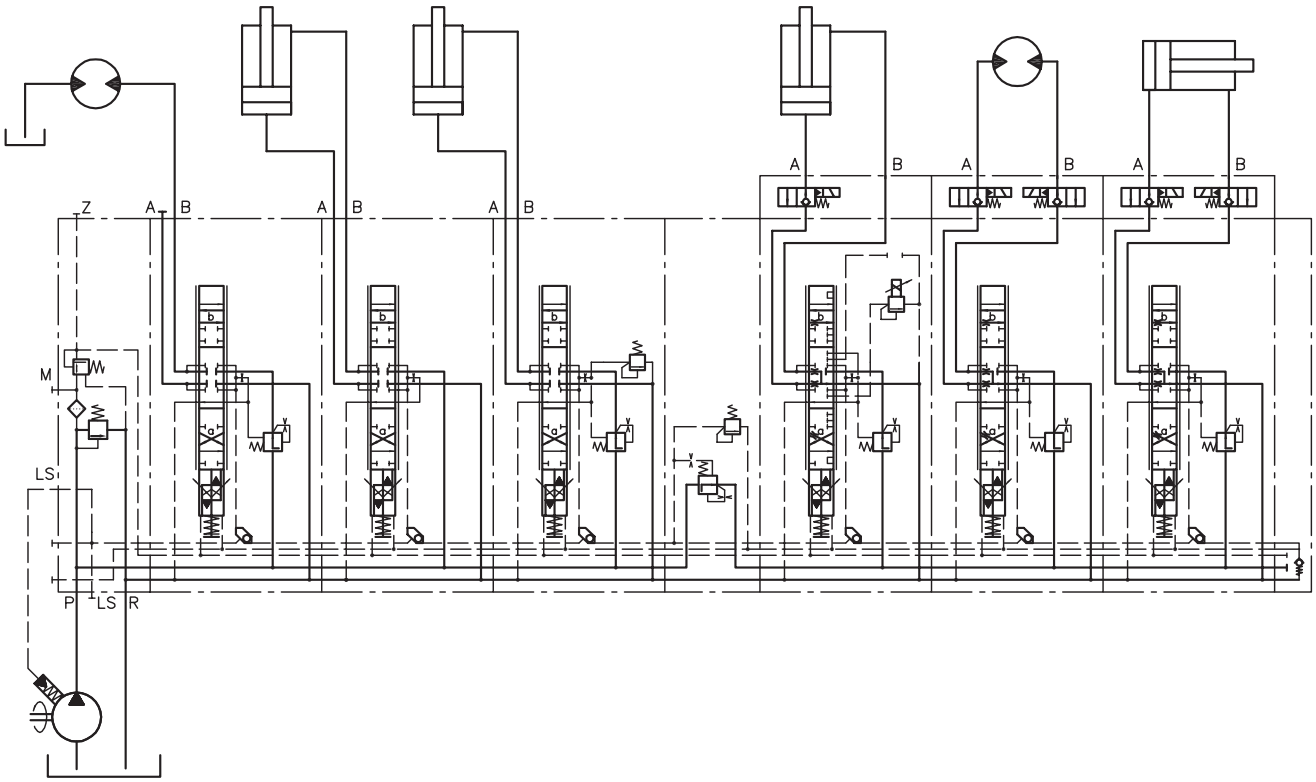
	Geom. delivery volume	Nominal pressure	Max. rotation speed	Dimensions [mm] approx.					m [kg]
	V_g [cm³/rev]	p_{nom} (p_{max}) [bar]	n [rpm]	L	L1	H	H1	B	(with controller)
V30E - 095	95	350 (420)	2500	296	75	236	36	190	57
V30E - 160	160		2100	332	75	273	36	212	77
V30E - 270	270		1800	399	88	326	36	266	129

Ports

	Pressure connection	Suction port	Drain port
V30E - 095	1 1/4" SAE J518	2 1/2" SAE J518	G 3/4
V30E - 160	1 1/4" SAE J518	2 1/2" SAE J518	G 3/4
V30E - 270	1 1/2" SAE J518	3" SAE J518	G 1

Circuit example:

V30E-270-LSFN-2-1/03-LSP-320



Associated technical data sheets:

- Variable displacement axial piston pump type V30E: D 7960 E

Similar products:

- Variable displacement axial piston pump type V30D: Page 20
- Variable displacement axial piston pump type V60N: Page 26
- Fixed displacement axial piston pump type K60N: Page 30
- Variable displacement axial piston pump type V80M: Page 24

Suitable proportional directional spool valve:

- Type EDL: Page 82
- Type PSL/PSV size 2, 3 and 5: Page 90
- Type PSLF/PSVF size 3, 5 and 7: Page 96

Suitable accessories:

- Proportional amplifier type EV1M3: Page 272
- Proportional amplifier type EV2S: Page 274
- Proportional amplifier type EV1D: Page 272

Individual pumps

1.1 Variable displacement axial piston pump type V30D

Variable displacement axial piston pumps operate according to the bent axis principle. They adjust the geometric output volume from maximum to zero. As a result they vary the flow rate that is provided to the loads.
The axial piston pump type V30D is designed for open circuits in industrial hydraulics and operate according to the swash plate principle. They are available with the option of a thru-shaft for operating additional hydraulic pumps in series.
The sturdy pump is particularly suitable for continuous operation in challenging applications. The range of pump controllers allows the axial piston pump to be used in a variety of applications.

Features and benefits:
- Low-noise emissions
- Wide controller options
- Full torque available at the second pump in tandem pump applications

Intended applications:
- Presses
- Industrial plants
- Marine cranes and winches
- Power pack assembly

Nomenclature:	Axial piston pump Variable pump
Design:	Single pump Multiple pump
p_{max}:	System pressure: 350 bar Peak pressure: 420 bar
$V_{g\ max}$:	250 cm³/rev

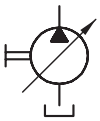
Design and order coding example

V30D	- 095	R	SF	N	- 1	- 1	- XX	/LN	-2	/120	- 200

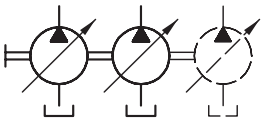
- **Pressure specification [bar]**
- **Torque setting [Nm]**
- **Additional versions** e.g. stroke limitation
- **Controller** See section "Controller"
- **Release**
- **swash plate angle indicator** With/without swash plate angle indicator
- **Housing version** With/without thru-shaft
- **Seal material**
  - NBR (N)
  - EPDM (E)
  - FKM (V)
- **Shaft version/flange version**
  - Spline shaft DIN 5480 (D)
  - Spline shaft SAE J744 (S)
  - Parallel key (K)
- **Rotating direction** Anti-clockwise (L), clockwise (R)
- **Nominal size**
- **Basic type**

Function

Single pump



Multiple pump



Controller

Pressure controller:

- Pressure controller (N)
- Pressure controller with remote-control port (P, Pb)

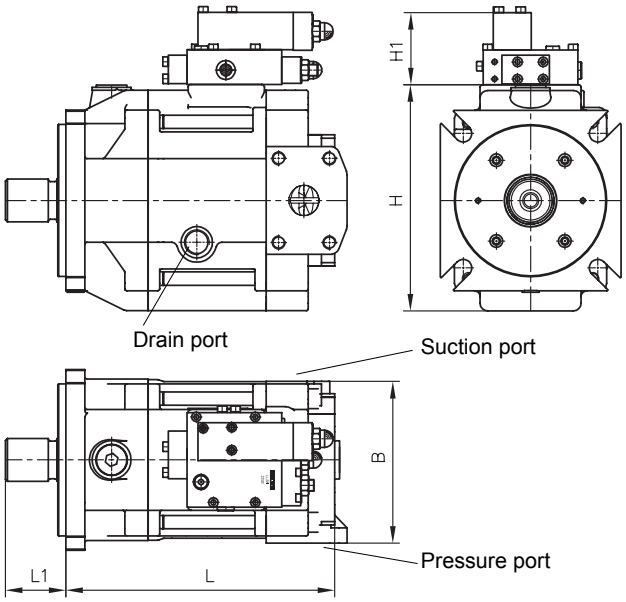
flow controller

- Load-sensing controller (LS)
- Load-sensing controller with integrated pressure limitation (LSN)
- Flow controller for setting a constant, speed-independent volumetric flow (Q, Qb)
- Electro-proportional flow controller with rising characteristic (V)
- Hydraulic-proportional flow controller with rising characteristic (VH)

Power controller:

- Power controller (L)
- Power controller, hydraulically adjustable (Lf1)

General parameters and dimensions



(connection locations for clockwise operation)

1 Drain port
2 Suction port
3 Pressure connection

Parameters

	Geom. delivery volume	Nominal pressure	Max rotation speed	Dimensions [mm]					m [kg]
	V_g [cm³/rev]	p_{nom} (p_{max}) [bar]	n [rpm]	L	L1	H	H1	B	(with controller)
V30D - 045	45	350 (420)	2600	268	68	150	82	160	40 (46)
V30D - 075	75		2400	310	80	170	86	178	60 (66)
V30D - 095	95		2200	341	93	196	87	196	70 (76)
V30D - 115	115	250 (300)[1)]	2000	341	93	196	87	196	70 (76)
V30D - 140	140	350 (420)	2200	363	90	212	85	212	85 (91)
V30D - 160	160	250 (300)[1)]	1900	363	90	212	85	212	85 (91)
V30D - 250	265	350 (420)	1800	432	115	224	97	272	130 (136)

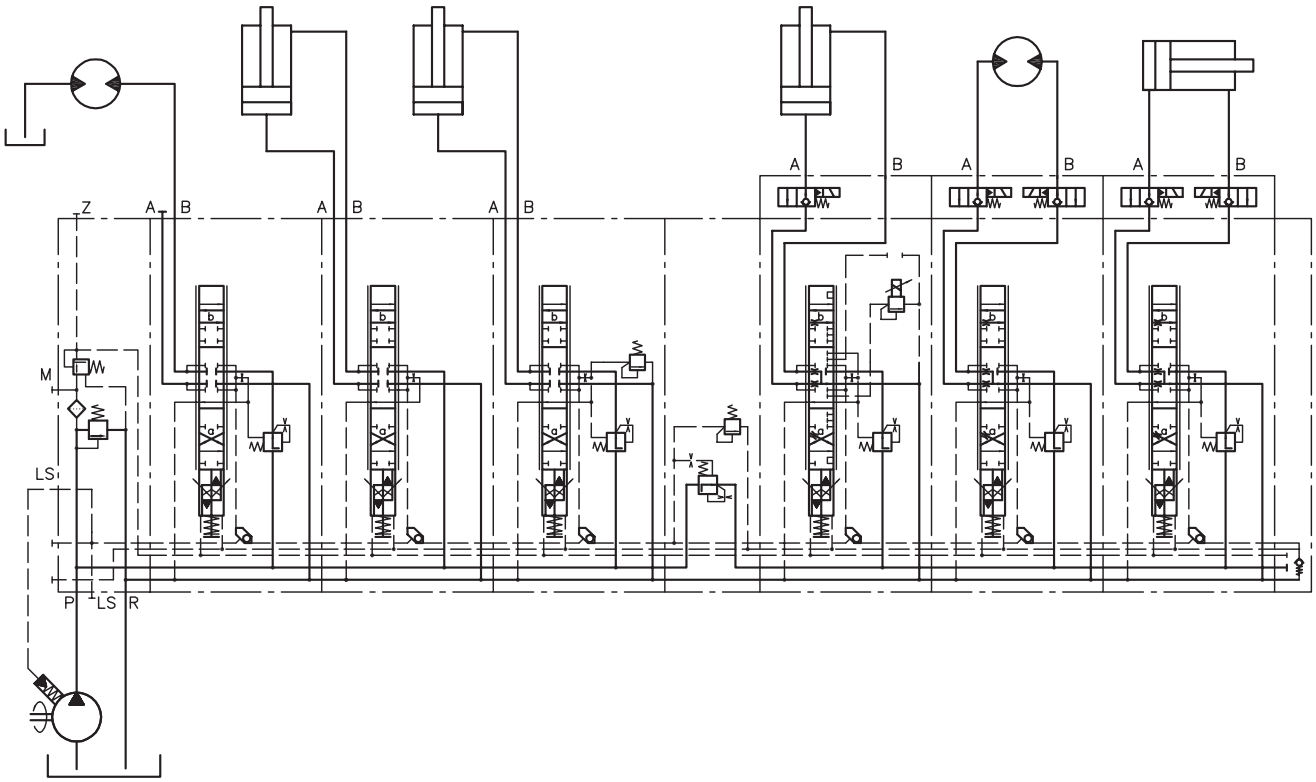
1) Higher pressures are possible with reduced delivery flow

Ports

	Pressure connection	Suction port	Drain port
V30D - 045	3/4" SAE J518	1 1/2" SAE J518	G 1/2
V30D - 075	1" SAE J518	2" SAE J518	G 3/4
V30D - 095	1 1/4" SAE J518	2" SAE J518	G 3/4
V30D - 115	1 1/4" SAE J518	2" SAE J518	G 3/4
V30D - 140	1 1/4" SAE J518	2 1/2" SAE J518	G 3/4
V30D - 160	1 1/4" SAE J518	2 1/2" SAE J518	G 3/4
V30D - 250	1 1/2" SAE J518	3" SAE J518	M 33x 2

Circuit example:

V30D-250-LSN-2-1/05-LSN-320



Associated technical data sheets:

- Variable displacement axial piston pump type V30D: D 7960,

Similar products:

- Variable displacement axial piston pump type V30E: Page 16
- Variable displacement axial piston pump type V60N: Page 26
- Fixed displacement axial piston pump type K60N: Page 30
- Variable displacement axial piston pump type V80M: Page 24

Suitable proportional directional spool valve:

- Type EDL: Page 82
- Type PSL/PSV 2, 3 and 5: Page 90
- Type PSLF/PSVF 3, 5 and 7: Page 96

Suitable accessories:

- Proportional amplifier type EV1M3: Page 272
- Proportional amplifier type EV2S: Page 274
- Proportional amplifier type EV1D: Page 272

Individual pumps

1.1 Variable displacement axial piston pump type V80M

Variable displacement axial piston pumps operate according to the bent axis principle. They adjust the geometric output volume from maximum to zero. As a result they vary the flow rate that is provided to the loads.
The axial piston pump type V80M is designed for open circuits in mobile hydraulics and operate according to the swash plate principle. They are available with the option of a thru-shaft for operating additional hydraulic pumps in series.
The sturdy pump is particularly suitable for continuous operation in challenging applications. The range of pump controllers allows the axial piston pump to be used in a variety of applications.

Features and benefits:

- High speed
- High nominal pressure
- Less installation space
- Full torque available at the second pump in tandem pump applications

Intended applications:

- Machines for forestry and agricultural purposes
- Cranes and lifting equipment
- Construction machines

Nomenclature:	**Axial piston pump**
Version:	**Single pump** **Multiple pump**
p_{max}:	**System pressure: 400 bar** **Peak pressure: 450 bar**
$V_{g\ max}$:	**202 cm³/rev**

Design and order coding example

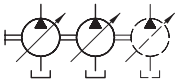
V80M	- 200	R	S	F	N	- 1	- 1	- XX	/LN	-2	/120	- 200

- **Pressure specification [bar]**
- **Torque setting [Nm]**
- **Additional versions**
- **Controller** See section "Controller"
- **Release**
- **swash plate angle indicator** With/without swash plate angle indicator
- **Versions with housing** With/without thru-shaft
- **Seals**
  - NBR (N)
  - FKM (V)
- **Flange version**
  - DIN (W)
  - SAE (F)
- **Shaft version**
  - Spline shaft (DIN 5480) (D)
  - Spline shaft and flange SAE (S)
- **Rotating direction** Counter clockwise (L), clockwise (R)
- **Nominal size**
- **Basic type**

Function

Single pump

Multiple pump



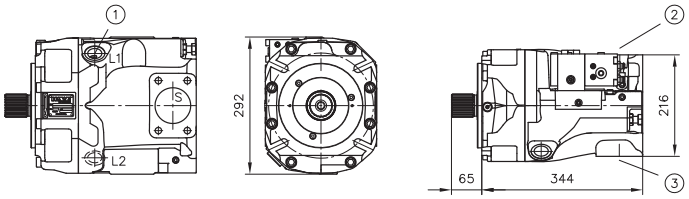
Controller

Pressure controller:
- Pressure controller (N)

Flow controller:
- Load-sensing controller (LSN)

Power controller:
- Power controller (L)

General parameters and dimensions



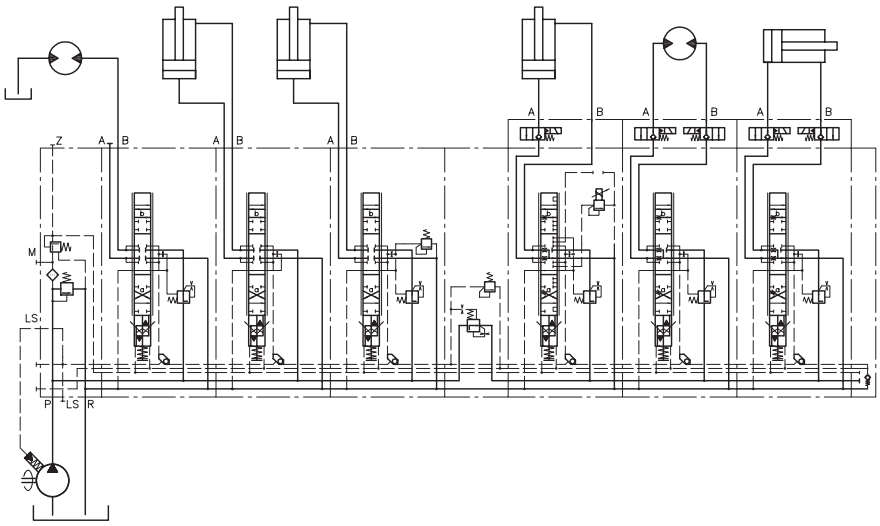
(connection locations for clockwise operation)

1 Drain port
2 Suction port
3 Pressure connection

Parameters

	Geom. output volume V_g [cm³/rev]	Nominal pressure p_{nom} (p_{max}) [bar]	Self-suction speed n [min⁻¹]	Ports			m [kg] (with controller)
				Drain port	Suction port	Pressure port	
V80M - 200	200	400 (450)	1800	G 1	3"	1 1/2"	130 (136)

Circuit example:



Associated technical data sheets:
- Variable displacement axial piston pump V80M: D 7962 M

Similar products:
- Variable displacement axial piston pump type V30D: Page 20
- Variable displacement axial piston pump type V30E: Page 16
- Variable displacement axial piston pump type V60N: Page 26
- Fixed displacement axial piston pump type K60N: Page 30

Suitable prop. directional spool valve:
- Type EDL: Page 82
- Type PSL/PSV size 2, 3 and 5: Page 90
- Type PSLF/PSVF size 3, 5 and 7: Page 96

Suitable accessories:
- Proportional amplifier type EV1M3: Page 272
- Proportional amplifier type EV2S: Page 274
- Proportional amplifier type EV1D: Page 272

Individual pumps

1.1 Variable displacement axial piston pump type V60N

Variable displacement axial piston pumps operate according to the bent axis principle. They adjust the geometric output volume from maximum to zero. As a result they vary the flow rate that is provided to the loads.
The axial piston pump type V60N is designed for open circuits in mobile hydraulics and operate according to the swash plate principle. They are available with the option of a thru-shaft for operating additional hydraulic pumps in series.
The pump is fitted above all to the power take-off on commercial vehicle transmissions.
The range of pump controllers allows the axial piston pump to be used in a variety of applications.

Features and benefits:
- Optimized power-to-weight ratio
- High self-suction speed
- Wide controller options

Intended applications:
- Municipal trucks
- Cranes and lifting equipment
- Machines for forestry and agricultural purposes
- Truck-mounted concrete pumps

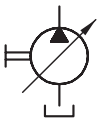
Nomen-clature:	Axial piston pump Variable pump
Design:	Single pump Multiple pump
p_{max}:	System pressure: 400 bar Peak pressure: 450 bar
$V_{g\ max}$:	130 cm³/rev

Design and order coding example

V60N	- 110	R	S	F	N	- 1	- 0	- 03	/LSNR	-2	- 320

- **Pressure specification [bar]**
- **Stroke limitation** — With/without max. stroke limitation
- **Controller** — See section "Controller"
- **Release**
- **Additional function**
- **Housing version**
  - Axial ports
  - Radial ports with thru-shaft
  - Radial ports
- **Seal material**
  - NBR (N), FKM (V)
- **Flange version**
  - Flange ISO 7653-1985 (Y, P)
  - Flange ISO 3019-2 (G)
  - Flange SAE J744 (X, Z, F)
- **Shaft version**
  - ISO 14 parallel key splined shaft (D)
  - Spline shaft DIN 5480 (M)
  - Spline shaft SAE J744 (H, U, T, S, Q)
- **Rotating direction** — Anti-clockwise (L), clockwise (R)
- **Nominal size**
- **Basic type**

Function



Controller

Pressure controller

- Pressure controller (NR)
- Electro-proportional pressure controller with rising characteristic (PR)
- Electro-proportional pressure controller with falling characteristic (P1R)

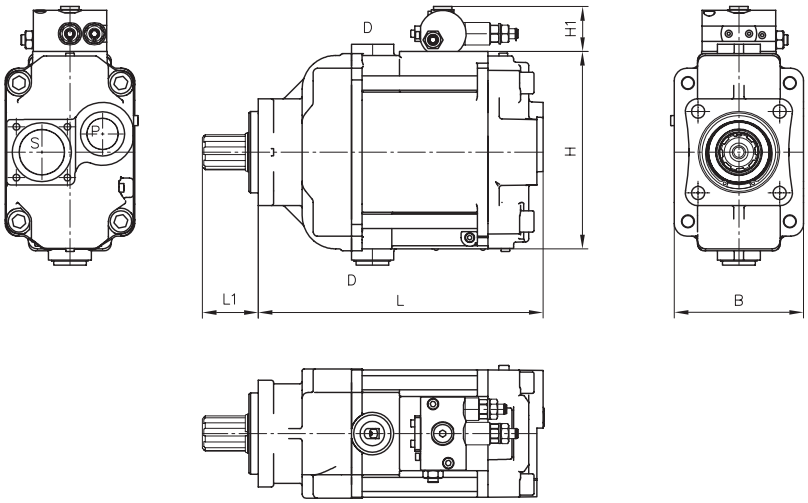
Flow controller

- Load-sensing controller with integrated pressure limitation (LSNR, LSNRT)
- Flow controller for setting a constant, speed-independent volumetric flow (QNR)
- Electro-proportional flow controller with rising characteristic (V)
- Electro-proportional flow controller with falling characteristic (V1)

Power controller

- Power controller (L, /ZL)

General parameters and dimensions



Parameters

	Geom. output volume	Nom. pressure	Max. speed	Dimensions [mm]					m [kg]
	V_g [cm³/rev]	p_{nom} (p_{max}) [bar]	n [rpm]	L	L1	H	H1	B	
V60N - 060	60	350 (400)	2500	254	55	177	45	115	24
V60N - 090	90		2300	278	55	184	45	120	27
V60N - 110	110		2200	280	55	194	45	125	30
V60N - 130	130	400 (450)	2100	270	55	210	45	130	31

Ports

	Pressure port P	Suction port S	Drain port D	LS connection
V60N - 060	G 3/4	1 1/2" SAE J518	G 3/4	G 1/4
V60N - 090	G 1			
V60N - 110				
V60N - 130				

Circuit example:

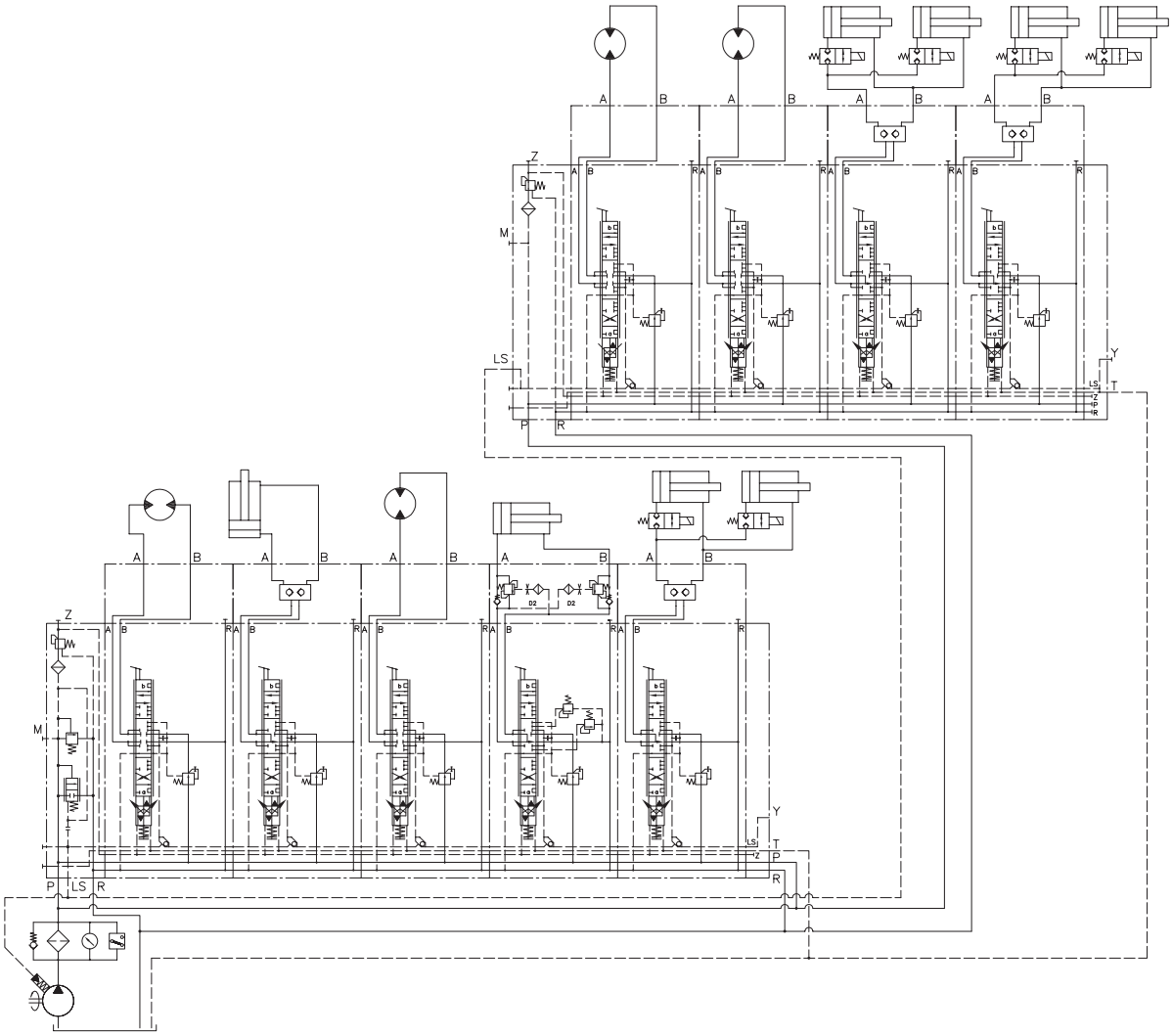
V60N-130 RSFN-1-0-03 / LSNR-2-250

PSV 31/D280-2

- A 2 L 25/25/EA1/2
- A 2 H 40/40/EA1/2 DRH
- A 2 L 25/25/EA1/2
- A 2 H 3/3 A 100 B 100/EA1/2 AL-0-D 4/120-BL-0-D 4/120
- A 2 H 3/3/EA1/2 DRH
- E 18-G 24

PSV 31-1

- A2 L 25/25/EA1/2
- A2 L 25/25/EA1/2
- A2 H 3/3/EA1/2 DRH
- A2 H 3/3/EA1/2 DRH
- E 1 - G24



Associated technical data sheets:

- Variable displacement axial piston pump type V60N: D 7960 N

Similar products:

- Variable displacement axial piston pump type V30D:Page 20
- Variable displacement axial piston pump type V30E: Page 16
- Fixed displacement axial piston pump type K60N:Page 30
- Variable displacement axial piston pump type V80M:Page 24

Suitable prop. directional spool valves:

- Type EDL: Page 82
- Type PSL/PSV size 2, 3 and 5: Page 90
- Type PSLF/PSVF size 3, 5 and 7: Page 96

Suitable accessories:

- Proportional amplifier type EV1M3: Page 272
- Proportional amplifier type EV2S: Page 274
- Proportional amplifier type EV1D: Page 272

Individual pumps

1.1 Variable displacement axial piston pump type K60N

Fixed displacement axial piston pumps operate according to the bent axis principle. They have a constant output volume and therefore deliver a constant flow rate at a specific rotation speed.

The axial piston pump type K60N is designed for open circuits in mobile hydraulics and operates based on the bent axis principle.

The pump is fitted mainly to the power take-off on commercial vehicle transmissions.

Features and benefits:

- Optimized power-to-weight ratio
- High rotation speed
- Different shaft and flange versions

Intended applications:

- Machines for forestry and agricultural purposes
- Cranes and lifting equipment
- Truck-mounted concrete pumps
- Municipal trucks

Nomen-clature:	Axial piston pump Constant pump
Design:	Single pump
p_{max}:	400 bar
$V_{g\ max}$:	108 cm³/rev

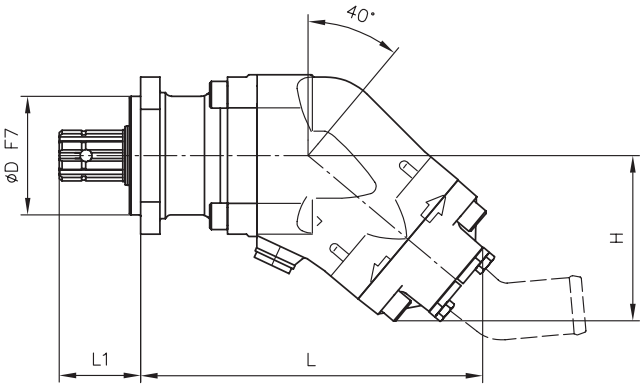
Design and order coding example

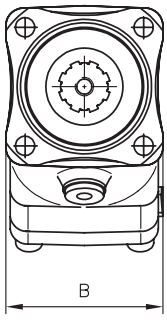
K60N - 064 R S F N - S - F12

- **Additional versions** Bypass valve
- **Seal material** ▪ NBR (N), FKM (V)
- **Flange version** ▪ DIN ISO 7653 (Y) ▪ SAE-C, SAE-B J 744 (F)
- **Shaft version** ▪ ISO 14 parallel key splined shaft (D) ▪ SAE-C, SAE-B J 744 spline shaft (S)
- **Rotating direction** Counter clockwise (L), clockwise (R)
- **Nominal size**
- **Basic type**

Function

General parameters and dimensions





Parameters

	Geom. output volume	Nom. pressure	Self-suction speed	Dimensions [mm]					m [kg]
	V_g [cm³/rev]	p_{nom} (p_{max}) [bar]	n [rpm]	L	L1	H	B	∅D	
K60N - 012	12,6	400	3300	207	48	145	95	80/101.6/--	7,5
K60N - 017	17,0	400	3200						
K60N - 025	25,4	400	2550	209	53	156	118	80/101.6/--	8,5
K60N - 034	34,2	400	2250						
K60N - 040	41,2	400	2200	246	67	185	143	80/101.6/127	15,5
K60N - 047	47,1	400	2200						
K60N - 056	56,0	400	2100						
K60N - 064	63,6	400	2050						
K60N - 084	83,6	400	1700	276	72	212	160	80/--/127	27,0
K60N - 090	90,7	400	1700						
K60N - 108	108,0	400	1700	276	85	231	180	80/--/127	29,5
K60N - 130	130,0	350	1600						

Associated technical data sheets:

- Fixed displacement axial piston pump type K60N: D 7960 K

Similar products:

- Variable displacement axial piston pump type V30D: Page 20
- Variable displacement axial piston pump type V30E: Page 16
- Variable displacement axial piston pump type V60N: Page 26
- Variable displacement axial piston pump type V80M: Page 24
- Axial piston motor type M60N: Page 254

Suitable prop. directional spool valves:

- Type EDL: Page 82
- Type PSL/PSV size 2, 3 and 5: Page 90
- Type PSLF/PSVF size 3, 5 and 7: Page 96

Suitable load-holding valves:

- Type LHK, LHDV, LHT: Page 198

Individual pumps

1.1 Air-driven hydraulic pump type LP

Air-driven hydraulic power packs are pneumatically driven, reciprocally acting plunger pumps. They operate as pneumatic pressure amplifiers with oscillating movement and automatic stroke reversal control.
The air-driven hydraulic pump type LP can generate up to 1500 bar. It is available as an single pump or as a hydraulic power pack with different tank sizes and valve banks. The delivery flow is dependent on the air pressure set and the flow resistance currently present. It can decay to standstill.
Applications are in laboratory presses, in fixture design, in lubrication systems or in potentially explosive atmospheres.

Features and benefits:

- High operating pressures
- Suitable for explosion-proof systems and equipment
  No electrical energy
- Hydraulic power packs with direct valve mounting

Intended applications:

- Construction and construction materials machinery
- fixture design
- Testing and laboratory equipment

Nomen-clature:	Air driven hydraulic pumps
Design:	Single pump
$p_{hydraulicmax}$:	1500 bar
p_{airmax}:	10 bar
Q_{max}:	12 l/min

Design and order coding example

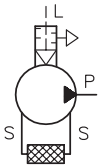
LP 125 - 16 E /S 81

Additional elements
- Suction parts for hydraulic pumps

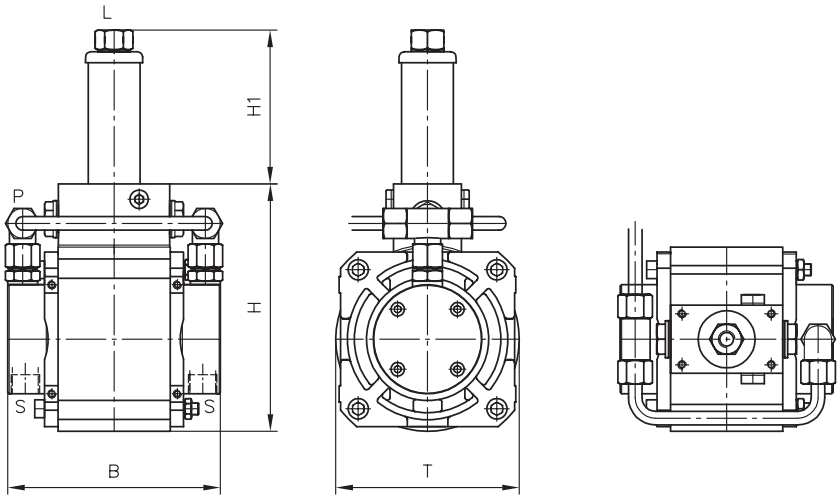
Design **Hydraulic pump**
- Ready-to-connect version
- Individual version for self-installation

Basic type, size Type LP, size 80, 125, 160

Function



General parameters and dimensions



Basic type and size		p_{max} [bar]	Pressure ratio	Geom. volume per double stroke V_{hydr} [cm³]	Tapped port (air) Pipe diameter for pressure connection (hydr)	Dimensions [mm]				m [kg]
						H	H1	B	T	
LP80-	**8**	700	1 : 200	1.5	G 1/4 Æ6 mm	119	94	121	85	5
	...									
	16	240	1 : 24	6						
LP125-	**8**	1500	1 : 243	2	G 3/8 Æ8 mm, Æ10 mm	159	114	156	135	8.5
	...									
	30	160	1 : 16	28.3						
LP160-	**8**	1500	1 : 400	2	G 1/2 Æ8 mm, Æ10 mm	228	136	156	175	11.5
	...									
	30	265	1 : 24	28.3						

Associated technical data sheets:

- Air-driven hydraulic pump type LP: D 7280
- Hydraulic power pack type LP: D 7280 H

Valve banks :

- Type VB:Page 114
- Type BWH(N):Page 120

Individual pumps

1.1 Hand pump type H, HE and HD

Hand pumps are a type of hydraulic pump. They generate a flow rate manually.
The hand pump type H and HE is single-acting. It draws in oil in one direction and pumps it in the opposite direction. The hand pump type HD is double-acting. It pumps and draws in the same quantity of oil in the pressure line during the forward and backward movement of the hand lever. The hand pump type H, HE and HD is available for pipe connection and manifold mounting.
The hand pump is particularly suitable as an emergency pump or for test benches.

Features and benefits:
- Sturdy design
- Hand pumps with integrated tank
- Safety and drain valve

Intended applications:
- Shipbuilding
- Mining machinery
- fixture design
- Testing and laboratory equipment

Nomen-clature:	Piston pump
Design:	Single acting hand pump Double acting hand pump
p_{max}:	800 bar
V_{max}:	30 cm³/stroke

Design and order coding example

HD 13 | AS | - K 0,5 | - 110

Pressure setting (bar)

With/without tank Usable volume $V_{use.}$ 0,35 l and 0,5 l

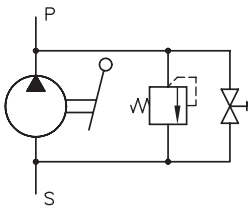
Additional elements
- Drain valve (A)
- Pressure limiting valve (fixed or manually adjustable) (S)

Basic type, size Type H (single-acting, open design),
Type HE (single-acting, encapsulated design)
Type HD (double-acting, encapsulated design)

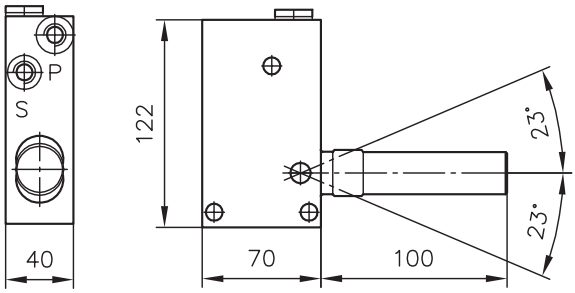
- With/without pressure resistant suction port
- Versions for manifold mounting

Function

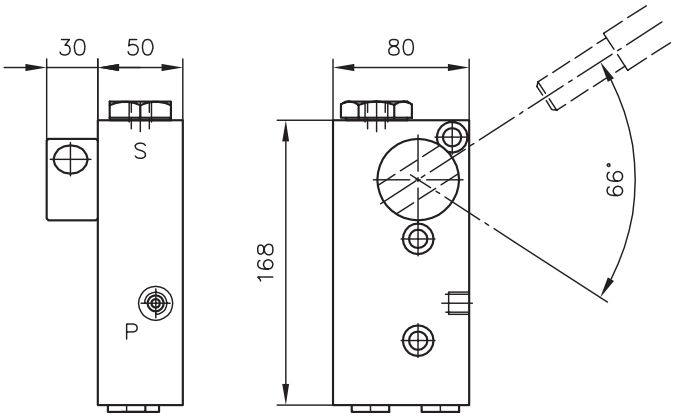
Design with pressure limiting valve and drain valve



H..



HE.. and HD..



	p_{max} [bar]	V_{max} [cm³/stroke]	Tapped ports (BSPP)		m [kg]
			P	S	
H 16	350	6	G 1/4	G 1/4	3.1
H 20	220	9.4			
H 25	150	14.7			
HE 3	800	3	G 1/4	G 1/4 and G 3/8	4.8
HE 3	800	3			
HD 13	350	13			
HD 20	220	20			
HD 30	150	30			

Associated technical data sheets::

- Manual pump type H, HD and HE: D 7147/1