

# Fixed displacement axial piston pump type K61N-DIN

## Product documentation



Open circuit, for the power take-off of commercial vehicles

Nominal pressure  $p_{\text{nom max}}$ : 400 bar

Displacement volume  $V_{\text{max}}$ : 108 cm<sup>3</sup>/rev



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## 1 Overview: Type K61N-DIN fixed displacement axial piston pump

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.

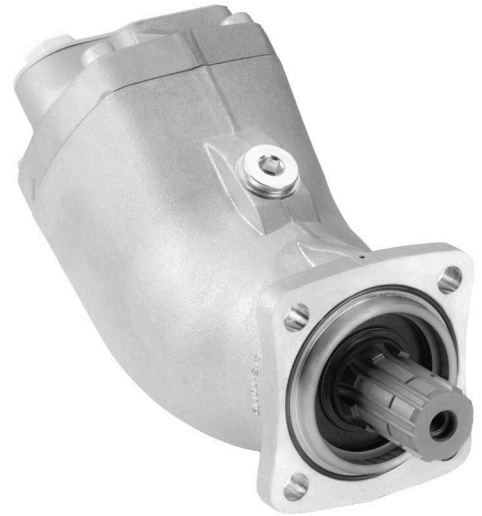
The axial piston pump type K61N is designed for open circuits in mobile hydraulics and operates on the bent axis principle. The pump is fitted mainly to the power take-off on commercial vehicle transmissions.

### Features and advantages

- Optimized power-to-weight ratio
- High speed
- Different shaft and flange versions
- Smooth running across entire speed range
- Low heat generation

### Intended applications

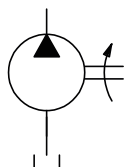
- Municipal trucks
- Fire trucks
- Loading cranes and elevating work platforms
- Tipper trucks and skip trucks
- Suction dredgers and sewer cleaning vehicles



*Fixed displacement axial piston pump type K61N-DIN*

## 2 Available versions

### Circuit symbol



### Ordering example

K61N-064	R	-N	-DL4	-L35	-S0	S	-0	00
								Accessories without
								Special equipment Standard
								Ports DIN EN ISO 228-1
								Connection cover Standard, 40°
								Parallel key splined shaft similar to DIN ISO 14 (trucks) B8x32x34.9
								DIN 4-Hole flange ISO 7653
								Seal NBR
								2.2 "Rotation direction"

2.1 "Basic type and nominal size"

### 2.1 Basic type and nominal size

Coding	Displacement volume (cm <sup>3</sup> /rev)	Nominal pressure p <sub>nom</sub> (bar)
K61N-012	12.6	400
K61N-017	17.0	400
K61N-025	25.4	400
K61N-034	34.2	400
K61N-040	41.2	400
K61N-047	47.1	400
K61N-056	56.0	400
K61N-064	63.6	400
K61N-084	83.6	400
K61N-108	108.0	400

2.2 Rotation direction

Coding	Description
L	Anti-clockwise
R	Clockwise

## 3 Parameters

### 3.1 General data

Designation	Fixed displacement axial piston pump
Design	Axial piston pump based on bent axis design
Mounting	Mounting flange according to ISO 7653
Material	Pump housing: Aluminium connection cover: Cast iron
Installation position	any
Rotation direction	Clockwise or anticlockwise
Change of rotating direction	Turning the connection cover of the pump by 180°  Tightening torque of the four screws on the end:  Nominal size      012 ... 064:      70 Nm  084, 108:      100 Nm
Ports/connections	<ul style="list-style-type: none"><li>▪ Suction port</li><li>▪ Pressure connection</li><li>▪ Drain port</li></ul>
Hydraulic fluid	Hydraulic fluid, according to DIN 51 524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 10 – 700 mm²/s Optimal operating range: approx. 20 – 40 mm²/s Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.
Cleanliness level	<b>ISO 4406</b> <hr/> 18/16/13
Temperatures	Environment: approx. -40 to +60 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -40 °C is permissible (take account of the start viscosities!), as long as the steady-state temperature is at least 20 K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.

## Additional parameters

Designation		Nominal size									
		012	017	025	034	040	047	056	064	084	108
Absolute inlet pressure required in open circuit	bar	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Max. rotation speed, continuously ( $n_{nom}$ )	min <sup>-1</sup>	2300	2300	2300	2300	1900	1900	1900	1900	1600	1600
Max. rotation speed, briefly ( $n_{max}$ )	min <sup>-1</sup>	3000	3000	3000	3000	2500	2500	2500	2500	2100	2100
Flow rate at 500 min <sup>-1</sup>	l/min	6	9	13	17	21	24	28	32	42	54
Flow rate at 1000 min <sup>-1</sup>	l/min	13	17	25	34	41	47	57	64	84	108
Flow rate at 1500 min <sup>-1</sup>	l/min	19	26	38	51	62	71	85	95	125	162
Required drive torque at 100 bar	Nm	21	28	43	57	69	79	94	107	140	181
Drive power at 250 bar and 1500 min <sup>-1</sup>	kW	8	11	17	23	27	31	37	42	55	71
Weight torque	Nm	6.0	6.0	6.5	6.5	11.5	11.5	11.5	11.5	18.0	18.0

## 3.2 Weight

### Type

K61N-DIN-012	= 6.9 kg
K61N-DIN-017	= 6.9 kg
K61N-DIN-025	= 7.1 kg
K61N-DIN-034	= 7.1 kg
K61N-DIN-040	= 9.8 kg
K61N-DIN-047	= 9.8 kg
K61N-DIN-056	= 9.8 kg
K61N-DIN-064	= 9.8 kg
K61N-DIN-084	= 13.9 kg
K61N-DIN-108	= 13.9 kg

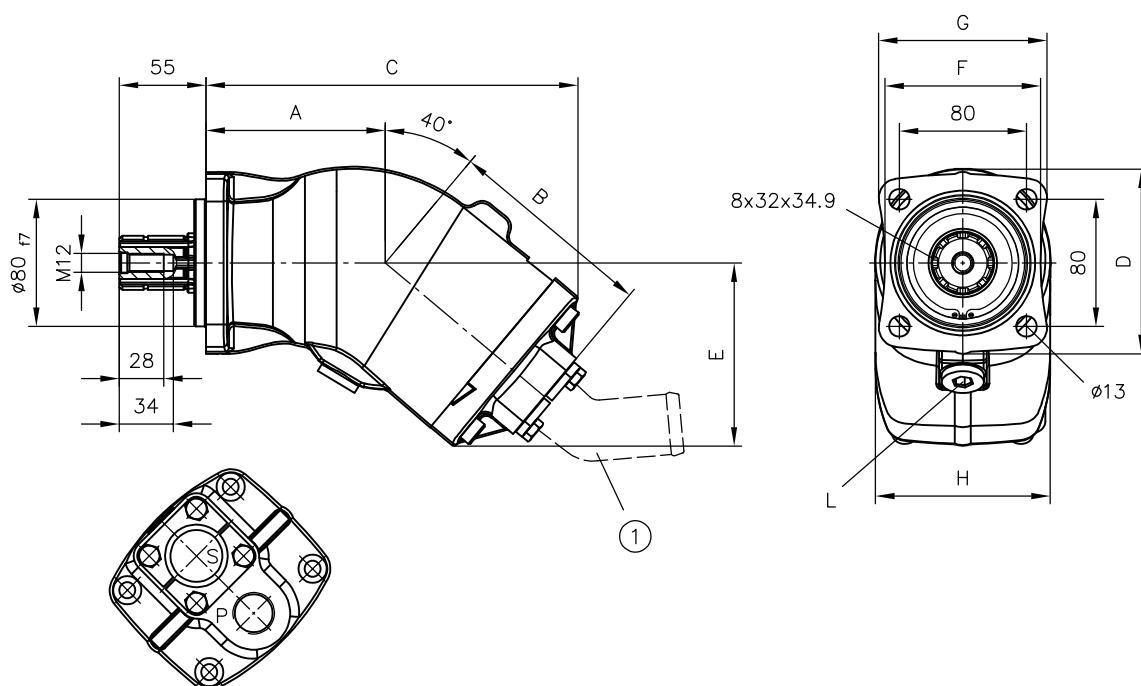
## 3.3 Pressure and delivery flow

Operating pressure	400 bar
Displacement volume	see Chapter 2.1, "Basic type and nominal size"



## 4 Dimensions

All dimensions in mm, subject to change.



1 Suction intake

### Ports (ISO 228-1)

P	Pressure connection G 3/4 (nominal size K61N-012...064)
	Pressure connection G 1 (nominal size K61N-084...108)
S	Flange suction port
L	Drain port G 1/2

Nominal size	A	B	C	D	E	F	G	H
012	97	116	206	115	102	98	106	97
017	97	116	206	115	102	98	106	97
025	97	116	206	115	102	98	106	97
034	97	116	206	115	102	98	106	97
040	113	131	235	118	115	98	106	111
047	113	131	235	118	115	98	106	111
056	113	131	235	118	115	98	106	111
064	113	131	235	118	115	98	106	111
084	122	147	264	127	133	98	106	118
108	122	147	264	127	133	98	106	118

**5****Installation, operation and maintenance information**

Observe the document B 5488 "General operating instructions for assembly, commissioning, and maintenance."

**5.1 Intended use**

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this document.

**Essential requirements for the product to function correctly and safely:**

- ▶ All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ▶ The product must only be assembled and put into operation by specialist personnel.
- ▶ The product must only be operated within the specified technical parameters described in detail in this document.
- ▶ All components must be suitable for the operating conditions when using an assembly.
- ▶ The operating instructions for the components, assemblies and the specific complete system must also always be observed.

**If the product can no longer be operated safely:**

1. Remove the product from operation and mark it accordingly.
  - ✓ It is then not permitted to continue using or operating the product.

**5.2 Assembly information**

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).

**DANGER****Sudden movement of the hydraulic drives when disassembled incorrectly**

Risk of serious injury or death

- ▶ Depressurise the hydraulic system.
- ▶ Perform safety measures in preparation for maintenance.

### 5.2.1 General information

The fixed displacement axial piston pump is suitable for use in an open or semi-closed circuit.

The pump can be flange-mounted on the usual mounting points (e.g. gearbox power take-off, combustion engine or electric motor, cardan shaft). Suitable coupling flanges are available as accessories for attachment to a cardan shaft "coupling flanges for cardan shafts".

A change of rotating direction is possible by turning the connection cover. For conversion instructions, please contact HAWE Hydraulik.

**During assembly, note the following principles:**

- Only trained persons are allowed to mount or remove the pump.
- Always ensure absolute cleanliness to prevent contamination from affecting the pump.
- Remove all plastic plugs before operation.
- Avoid installation above the tank ( see Chapter 5.2.3, "Installation position").
- Observe the electric reference values.
- Before initial use, fill the pump with hydraulic fluid and bleed. Automatic pump filling via the suction line by opening the drain ports is not possible.
- Always supply the pump with hydraulic fluid from the start. Even just a short period with insufficient hydraulic fluid can damage the pump. Such damage is not immediately visible once the pump is put into operation.
- Never drain the pump.
- Hydraulic fluid which flows back into the tank must not be sucked back in immediately (install baffles!).
- Before first use, run the pump for approx. 10 minutes at max. 50 bar after initial start-up.
- Do not use the entire pressure range of the pump until it has been thoroughly bled and flushed.
- From the start, always keep the temperature within the specified range . Never exceed the maximum temperature.
- Always comply with the cleanliness level of the hydraulic fluid. In addition, filter the hydraulic fluid appropriately .
- Self-installed filters in the suction line must be approved beforehand by HAWE Hydraulik.
- A system pressure-limiting valve must be installed in the pressure line so that the maximum system pressure is not exceeded.

### 5.2.2 Connections

The connecting lines' nominal width depends on:

- the given usage conditions
- viscosity of the hydraulic fluid
- start-up and operating temperature
- pump speed

HAWE recommends: Use hose lines (improved damping characteristics) instead of rigid pipelines.

Pressure connection	<ul style="list-style-type: none"> <li>▪ The pressure connection for type K61N-012...064 is established via a threaded connection G 3/4, for type K61N-084...108 via a threaded connection G 1.</li> <li>▪ Observe the fitting manufacturers' specified tightening torques.</li> </ul>
Suction port	<ul style="list-style-type: none"> <li>▪ The suction port on all pumps is established via standardised suction intakes with a size which depends on the max. delivery flow of the pump. The specifications of the max. delivery flow Q<sub>max</sub> must be observed.</li> <li>▪ If possible, route the suction line to the tank on a rising gradient. This allows trapped air to escape.</li> <li>▪ The absolute suction pressure must not fall below 0.85 bar.</li> <li>▪ A hose line should generally be used in preference to a rigid pipe line.</li> </ul>
Drain port	<ul style="list-style-type: none"> <li>▪ The pump features one drain port G 1/2.</li> <li>▪ The nominal width of the leakage line must not be less than 16 mm. The cross-section is determined by the max. permissible housing pressure.</li> <li>▪ Integrate the leakage line in the system in such a way as to prevent direct connection with the suction line of the pump.</li> <li>▪ All drain ports can be used simultaneously.</li> <li>▪ A separate leakage line from the controller to the tank is not required.</li> </ul>

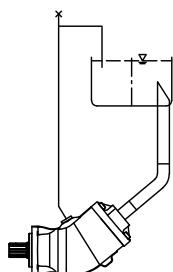
### 5.2.3 Installation position

The fixed displacement axial piston pump can be mounted in any installation position.

#### Horizontal installation

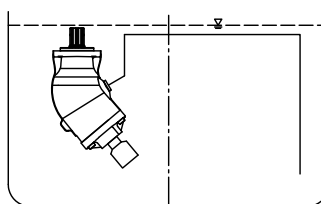
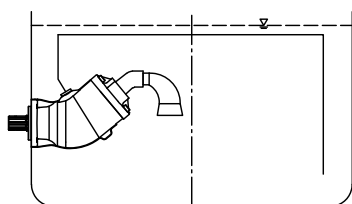
Pump below the min. fill level

► For horizontal installation, use the uppermost drain port



### 5.2.4 Tank installation

The pump can be operated either with or without a suction intake. Use of a short suction intake is recommended (see page 15).



## 5.3 Commissioning

☒ Select a suction line that is as large as possible.

1. Attach flexible hoses with two strong hose clamps.
2. Do not use a screen on the suction side.
3. Fill the pump housing at the upper drain port.

#### **i** INFORMATION

Ensure cleanliness when filling!

4. Before initial commissioning, flush all lines with the fluid provided for this purpose.
5. Before the first start-up, check the rotation direction of the drive and pump.
6. When starting up and during the first few minutes, set the main pressure-limiting valve to 50 bar or less.

## 5.4 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.

The instructions for the complete technical system must also always be followed.

### NOTICE

- ▶ Read the documentation carefully before usage.
- ▶ The documentation must be accessible to the operating and maintenance staff at all times.
- ▶ Keep documentation up to date after every addition or update.

### CAUTION

#### **Overloading components due to incorrect pressure settings.**

Risk of minor injury. Parts may burst or fly off, and uncontrolled leakage of hydraulic fluid.

- Pay attention to the maximum operating pressure of the pump, valves and fittings.
- Always monitor the pressure gauge when setting and changing the pressure.

## Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the product. Contamination can cause irreparable damage.

### **Examples of fine contamination include:**

- Swarf
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

### NOTICE

#### **New hydraulic fluid from the manufacturer may not have the required purity.**

Damage to the product is possible.

- ▶ Filter new hydraulic fluid to a high quality when filling.
- ▶ Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level [see Chapter 3, "Parameters"](#)).

Additionally applicable document: [D 5488/1](#) oil recommendations

## 5.5 Maintenance information

This product is largely maintenance-free.

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

## 6 Other information

### 6.1 Accessories, spare and individual parts

To purchase spare parts, please see [HAWE Hydraulik interactive contact map](#).

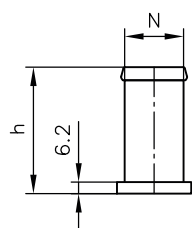
#### 6.1.1 Suction intake

Ordering example:

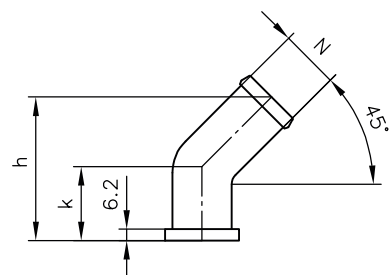
K61N - 064 R - N - DL4 - L35 - S0 S - 0 00 - A45/50

Nominal width (N)	Flow rate Q <sub>max</sub> (l/min)	Geometric shape						
		Straight		45°		90°		Thread
		A00/..		A45/..		A90/..		A5, A6
		h	k	h	k	h	h	
K61N - 012..064								
32 (1 1/4")	50	56	--	--	--	--	--	
38 (1 1/2")	65	65	40	85	70	53	--	
42 (1 5/8")	85	--	40	85	--	--	--	
45 (1 3/4")	110	--	40	85	--	--	--	
50 (2")	120	65	40	96	84	53	--	
64 (2 1/2")	165	--	40	96	--	--	--	
5 (G 1)	50	--	--	--	--	--	29	
K61N - 084..108								
38 (1 1/2")	65	65	--	--	70	53	--	
42 (1 5/8")	85	--	40	85	--	--	--	
45 (1 3/4")	110	--	40	85	--	--	--	
50 (2")	120	65	40	96	84	53	--	
64 (2 1/2")	165	90	40	96	130	108	--	
75 (3")	260	106	40	106	--	--	--	
6 (G 1 1/4)	80	--	--	--	--	--	29	

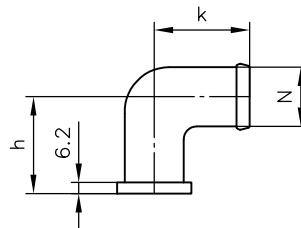
A00/..



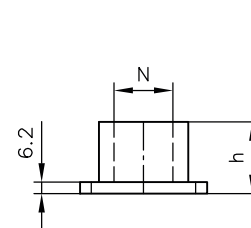
A45/..



A90/..

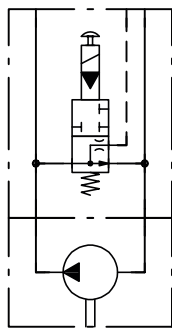


A5, A6



6.1.2 bypass valve

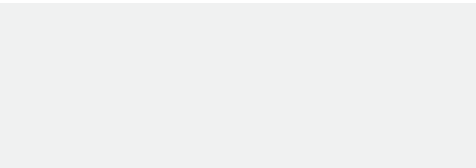
Circuit symbol



Combination nominal size and bypass valve

Type bypass valve	Type fixed displacement axial piston pump	Nominal size fixed displacement axial piston pump
SBP-1-M	K61N-DIN..	012, 017, 025, 034, 040, 047, 056, 064
SBP-2-M	K61N-DIN..	084, 108

Weight



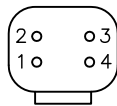
Coding

SBP-1-M	= 2.95 kg
SBP-2-M	= 3.35 kg

Electrical parameters

Nominal voltage	12 V DC	24 V DC
Limit current I <sub>G</sub>	1.67 A	0.83 A
Nominal power P <sub>N</sub>	23 W	23 W
Duty cycle	S1 (100 %)	
Protection class	IP 69K	
Electrical connection	Deutsch DT04-2P	

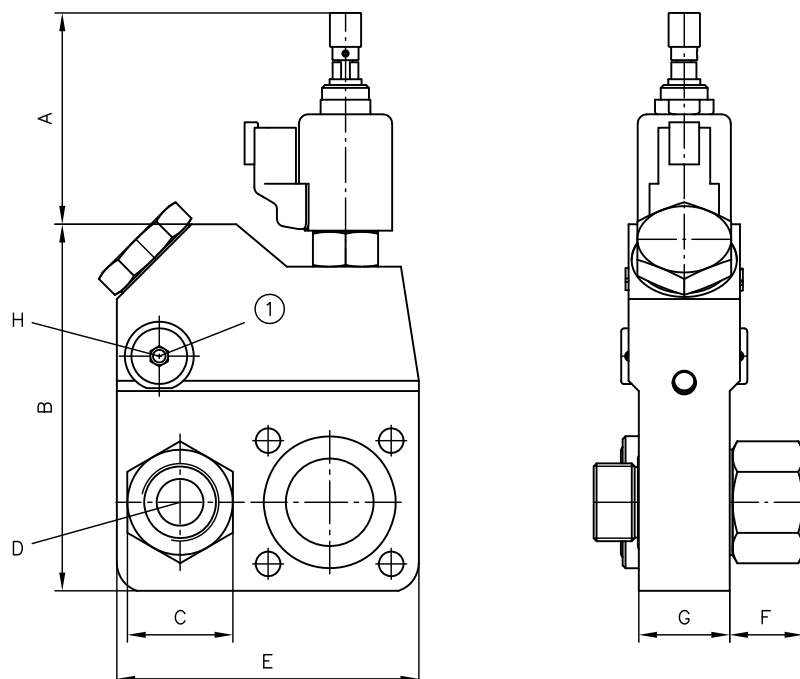
Electrical connection



DT 12(24) type CAN



## Dimensions



1 Drain port

Coding	A	B	C	E	F	G	Ports	
							D	H
SBP-1-M	63	126	36	103	25	31	G 3/4"	G 1/4"
SBP-2-M	51	139	41	119	27.5	31	G 1"	G 3/8"

## 6.2 Planning information

### Determination of nominal sizes

Delivery flow	$Q = \frac{V_g \cdot n \cdot \eta_v}{1000} (l/min)$	Q = Flow rate (l/min)
Drive torque	$M = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}} (Nm)$	M = Torque (Nm)
Drive power	$P = \frac{2\pi \cdot M \cdot n}{60000} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t} (kW)$	P = Power (kW)
		V <sub>g</sub> = Geom. output volume (cm <sup>3</sup> /rev.)
		Δp = Differential pressure
		n = Speed (rpm)
		η <sub>v</sub> = Volumetric efficiency
		η <sub>mh</sub> = Mechanical-hydraulic efficiency
		η <sub>t</sub> = Overall efficiency (η <sub>t</sub> = η <sub>v</sub> · η <sub>mh</sub> )

## References

### Additional versions

- Variable displacement axial piston pump type V30D: D 7960
- Axial piston pump type C40V: D 7964
- Fixed displacement axial piston pump type K60N: D 7960 K
- Axial piston motors type M60N: D 7960 M
- Proportional directional spool valve type EDL: D 8086
- Proportional directional spool valves types PSL, PSV size 2: D 7700-2
- Proportional directional spool valves types PSL/PSV/PSM, size 3: D 7700-3
- Proportional directional spool valve, type PSL, PSM and PSV size 5: D 7700-5
- Proportional directional spool valve type PSLF, PSVF and SLF size 3: D 7700-3F
- Proportional directional spool valve type PSLF, PSVF and SLF size 5: D 7700-5F
- Proportional directional spool valve banks type PSLF and PSVF size 7: D 7700-7F
- Load-holding valve type LHT: D 7918
- Load-holding valve type CLHV: D 7918-VI-C
- Load-holding valve type CLHV: D 7918-VI-PIB
- Load-holding valve type LHDV: D 7770
- Proportional amplifier type EV1M3: D 7831/2
- Proportional amplifier type EV1D: D 7831 D
- Proportional amplifier type EV2S: D 7818/1

### observe operating instructions

- General operating manual for the assembly, initial operation and maintenance of hydraulic components and systems: B 5488

