1.2 Hydraulic Unit

Compact Unit
Model KA und KAW

Compact unit
Model HK, HKF und HKL

Compact hydraulic power packs

Type	Design / tank volume (l)	p_{max} (bar)	V_{max} (cm^3/rev)
NPC	**Radial piston pump** ▪ With integrated electric motor ▪ Direct current supply ▪ Suitable for short period operation – Fill volume 1.0 – Usable volume 0.65	11: 750 12: 750	11: 0.46 12: 0.46
HC, HCW	**Radial piston or gear pump** ▪ With integrated electric motor ▪ 3-phase or AC version ▪ Suitable for intermittent operation – Vertical approx. 1.16 – 2.5 – Usable volume approx. 0.50 – 1.5	HP/LP: 1: 700/180 2: 700/180	 1: 0.76 2: 1.59
KA, KAW	**Radial piston or gear pump** ▪ With integrated electric motor ▪ 3-phase or AC version ▪ Suitable for intermittent operation **KA 2** – Fill volume approx. 3.9 – 11.1 – Vertical approx. 1.85 – 8.95 **KA 4** – Fill volume approx. 13 – 31 – Vertical approx. 5 – 25	HP/LP: 2: 700/180 4: 700/180	HP/LP: 2: 3.61/7.9 4: 9.17/30.2
MP, MPN	**Radial piston pump and/or gear pump** ▪ With integrated electric motor ▪ Single-circuit or dual-circuit pump ▪ Suitable for intermittent or load/no load operation – Fill volume approx. 17 – 100 – Usable volume approx. 10 – 75	HP/LP: MP - 1: 700/220 MP - 2: 700/200 MPN - 4: 700/220	HP/LP: MP - 1: 0.95/4.76 MP - 2: 1.59/26 MPN - 4: 9.17/60
HK, HKF, HKL	**Radial piston pump and/or gear pump** ▪ With integrated electric motor ▪ 3-phase version ▪ Suitable for continuous and intermittent operation **HK 2** – Fill volume approx. 2.77 – Usable volume approx. 0.85 **HK 3** – Fill volume approx. 4.65 – 6.1 – Usable volume approx. 1.45 – 2.90 **HK 4, HKF 4** – Fill volume approx. 5.8 – 15.4 – Usable volume approx. 1.9 – 11.1 **HKL 3** – Fill volume approx. 3.7 – 13 – Usable volume approx. 1.7 – 9.1	HP/LP: HK - 2: 700 HK - 3: 700/180 HK - 4: 700/180 HKF - 4: 700/180 HKL - 3: 700/180	HP/LP: HK - 2: 1.59 HK - 3: 4.58/4.8 HK - 4: 9.17/17.0 HKF - 4: 9.17/17.0 HKL - 3: 6.11/14.5

Standard hydraulic power packs

Type	Design / tank volume (l)	p_{max} (bar)	V_{max} (cm^3/rev)
FXU	**Radial piston pump / dual-stage pump** ▪ Standard hydraulic power pack – Fill volume approx. 26-650	R: 700 Z: 260 RZ: 700/200	R: 64.2 Z: 63 RZ: 64.2/89.6
A, B, C Connection block Model **A, B, C**	**Connection blocks** ▪ For connecting to the Hydraulic Unit ▪ Pumping Units – Flange valve for Pipe connection or Valve assembly	700	20
LP	**Air-driven hydraulic pump** ▪ Single pump ▪ Hydraulic power pack – Fill volume approx. 5.8–33 – Usable volume approx. 3.8–28	80: 700 125: 700 160: 700	80: 6.00 125: 28.30 160: 28.30

1.2 Compact hydraulic power pack type NPC

Compact hydraulic power packs are a type of hydraulic power pack. They are characterised by a highly compact design, since the motor shaft of the electric motor also acts as the pump shaft.

The ready-for-connection compact hydraulic power pack type NPC is suitable for hydraulic systems with operating mode S2. Type NPC includes a DC motor. The power pack is available in a horizontal or vertical version. Either single-circuit systems or dual-circuit systems can be selected. A radial piston pump or an external gear pump can be used as a hydraulic pump.

The compact hydraulic power pack type NPC is suitable for use as a highly compact control system, since the pressure-limiting valve is integrated and valve banks can be directly mounted.

Nomen-clature:	**Radial piston pump with integrated electric motor (DC)**
Design:	**Oil immersed compact hydraulic power pack For short period operation**
p_{max}:	**750 bar**
Q_{max}:	**1.36 lpm ($V_{g\ max}$ = 0.76 cm³/rev)**

Features and benefits:

- Very low space requirements and easy to transport
- Supplied with direct current at 12V DC or 24V DC
- Particularly suited to mobile applications and construction site operation
- Long lifetime and excellent reliability achieved by using radial piston pumps
- Environmentally sound thanks to low oil fill volumes and minimum cost of disposal
- Low costs for hydraulic fluid
- Co-ordinated range of valves and accessories from the modular system

Intended applications:

- Riveting
- Brakes for wind power plants
- Hydraulic jigs
- Crimping
- Embossing

Design and order coding example

NPC 11	/ 0,87	- 1/170	- R	- G12	BWN 1 - NN - 35 - 1 - G12

Valve assembly
- BWN1, BWH1, VB01
- Can be directly assembled without connection blocks according to D 7470 B/1, D 7302

Motor voltage 12V DC or 24V DC

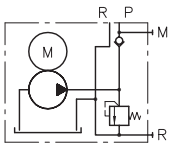
Check valve With/without check valve

Pressure limiting valve and setting
- 1 = Fixed
- 2 = Manually adjustable

Delivery flow [lpm]

Basic type, size Type NPC, size 11 and 12

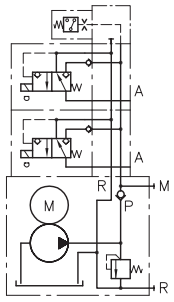
Function



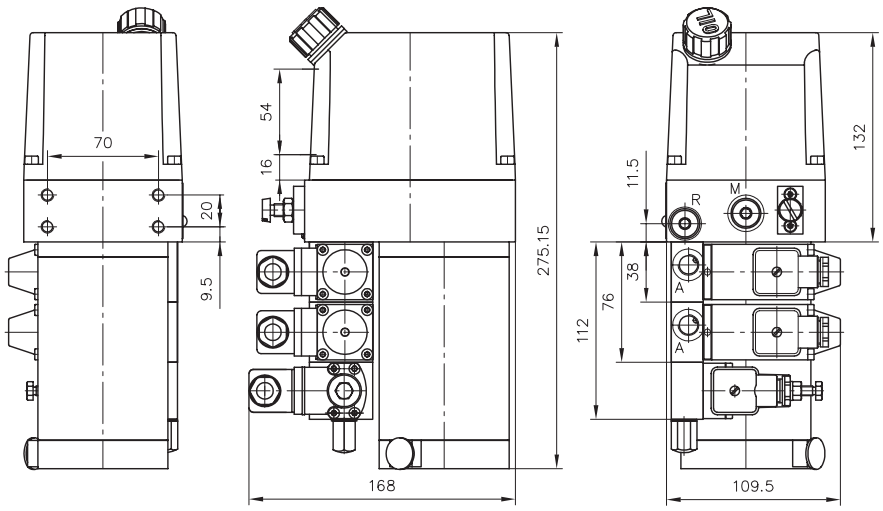
Circuit example:

NPC 11 / 0.87 - 1/170 - R - G 12
Compact hydraulic power pack type NPC
pump delivery flow approx. 0.87 lpm

BWN 1 - NN - 35 - 1 - G 12
Directly mounted valve bank type BWN with two valve sections and pressure switch in P gallery, solenoid voltage 12V DC



General parameters and dimensions



	Delivery flow						Max. pressure		
	Q_{pu} [lpm]						p_{max} [bar]	P_N [kW]	m [kg]
NPC 11 (24 V)	0.2	0.31	0.44	0.61	0.87	1.05	750	0.1/0.3	6
NPC 11 (12 V)								0.1/0.25	6
NPC 12 (24 V)	0.4	0.65	0.94	1.28	1.71	2.14	750	0.6	8
NPC 12 (12 V)								0.6	8

Associated technical data sheets:

- Compact hydraulic power pack type NPC: D 7940

Directly mountable valve banks:

- Type VB: Page 114
- Type BWH, BWN: Page 120
- Pressure switches type DG: Page 262
- Electronic pressure transducer type DT: D 5440 T/1, D 5440 T/2

Compact hydraulic power packs

1.2 Compact hydraulic power pack type HC and HCW

Compact hydraulic power packs are a type of hydraulic power pack. They are characterised by a highly compact design, since the motor shaft of the electric motor also acts as the pump shaft.

The ready-for-connection compact hydraulic power pack type HC and HCW includes an electric drive which runs in oil. The stator is securely attached to the housing (tank). The compact hydraulic power pack is suitable for hydraulic systems with the operating modes S2 or S3. The heat is dissipated via surface convection so that no external cooler is usually necessary.

A radial piston pump or external gear pump can be used as a hydraulic pump.

The compact hydraulic power pack type type HC and HCW is suitable as a highly compact control system, since connection blocks and valve banks can be directly mounted.

Nomen-clature:	Radial piston or gear pump with integrated electric motor (three-phase or alternating current design)
Design:	Oil immersed hydraulic power pack for intermittent service (S3-service)
p_{max}:	Radial piston pump 700 bar Gear pump 180 bar
Q_{max}:	Radial piston pump 4.4 lpm (V_g = 1.6 cm³/rev) Gear pump approx. 3.4 lpm (V_g = 1.3 cm³/rev)
$V_{usable\ max}$:	8 l

Features and benefits:

- Long lifetime and high pressures thanks to use of radial piston pumps
- Low oil fill volumes make it environmentally sound thanks to small amount of oil to be disposed of and low costs for hydraulic fluid
- Co-ordinated range of valves and accessories from modular system
- Suitable for vertical and horizontal installation

Intended applications:

- Clamping systems on machine tools and jigs
- Rivets and clinching equipment
- Welding robots

Design and order coding example

HC24	/0,6	- A1/400	- BWH1F-HH-1-1-G24	- 400V 50 Hz

Motor voltage 3 ~ 400V 50 Hz, 3 ~ 460V 60 Hz
1 ~ 230V 50 Hz, 1 ~ 110V 60 Hz (3~phase motor)

Optional directly mounted directional valve bank

Connection block

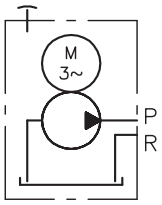
Pump version **Single circuit pump**

- Radial piston pump H (3-, 5- or 6-cylinders) oder Gear pump Z

Basic type, size Type HC (3-phase motor) and type HCW (single-phase-motor, power reduction of 30 ... 50% depending on size), size 1 to 2, type HCG (direct current motor), size 1

- Lying at low installation Heights (Model HC..L)
- Alternative standing version
- Usable volume V_{usable} 0.5 l to 1.5 l
- With/without fluid level gauge
- With DC-motor (Type HCG) for short time operation

Function



Example circuit:

HC 24/0.64

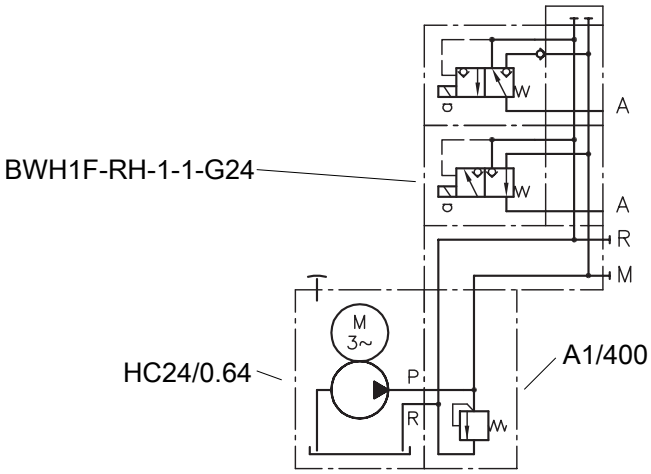
Pump unit type HC, size 24, pump delivery flow approx. 0.64 lpm

- A1/400

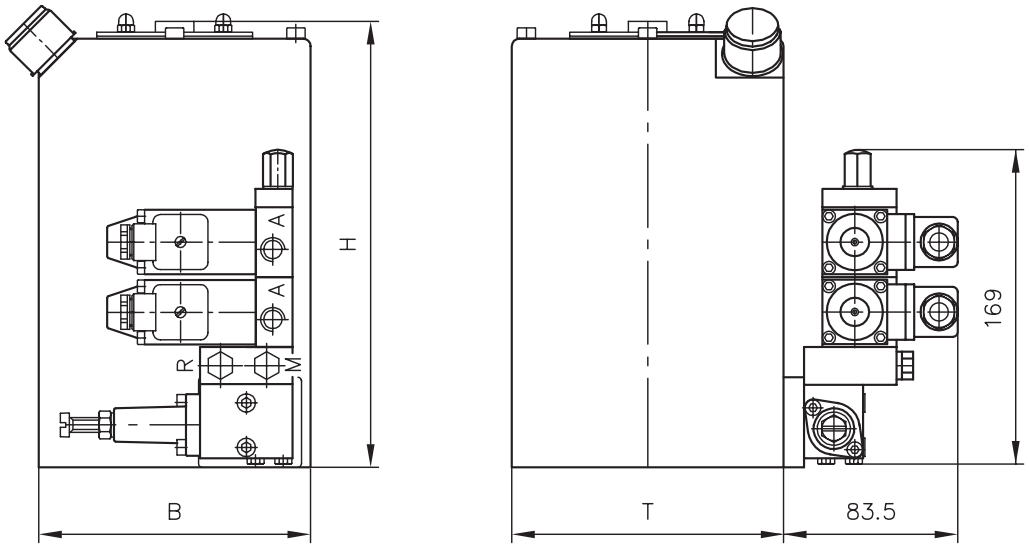
Connection block type A and pressure-limiting valve (400 bar)

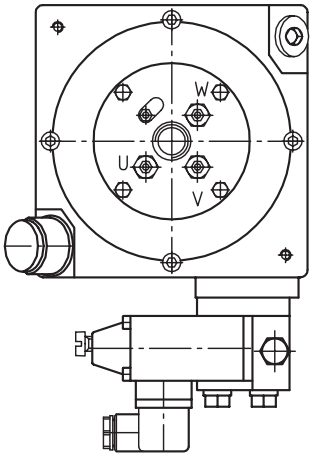
- BWH1F - RH1 - 1 - 1 - G 24

Directly mounted valve bank type BWH 1



General parameters and dimensions



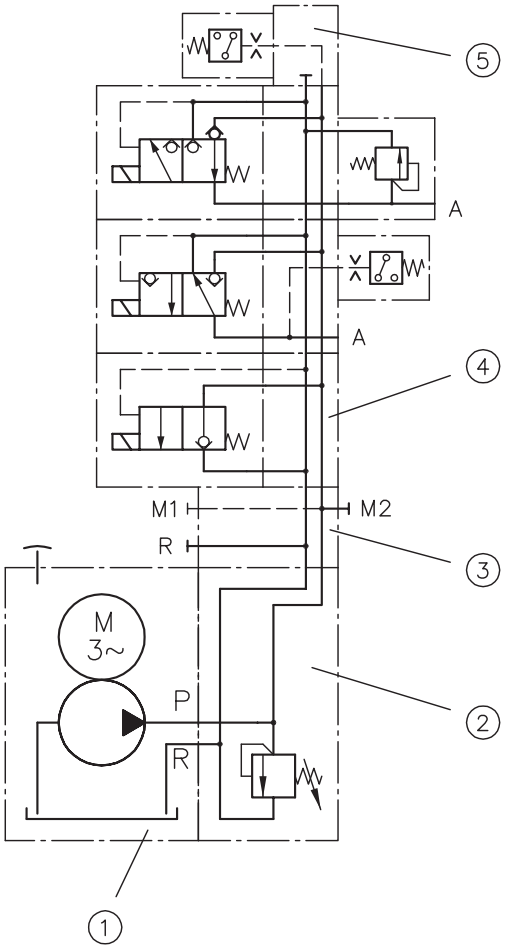


	Radial piston pump (3 cylinders)			Gear pump					Dimensions [mm]		
	Max. pressure	Delivery flow		Max. pressure	Delivery flow						
	p_{max} [bar]	Q_{pu} [lpm] 50 Hz	Q_{pu} [lpm] 60 Hz	p_{max} [bar]	Q_{pu} [lpm] 50 Hz	Q_{pu} [lpm] 60 Hz	P_N [kW] 1)	m [kg] 2)	H	B	T
HC 14	700 - 160	0.2 - 1.05	0.2 - 1.2	-	-	-	0.18	6.3	197	120	120
HC 12	600 - 120	0.4 - 2.15	0.5 - 2.5	-	-	-	0.25				
HC 24	700 - 185	0.27 - 2.27	0.3 - 2.7	150	0.4 - 1.6	0.5 - 1.9	0.55	10.1	243	148	148
HC 22	700 - 140	0.52 - 4.41	0.6 - 5.3	150	0.9 - 3.4	1.1 - 4	0.55				

1) The actual power consumption depends on the respective operation pressure and can be up to 1.5 x P_N
2) Without oil filling

Circuit example:

HC 24/0.64 - A2/400
- BWH 1 F 1-DH3 R/230-33-G24
- 3x400V 50Hz



1 Compact hydraulic power pack
2 Connection block
3 Adapter plate
4 Valve section
5 End plate

Associated technical data sheets:
- Compact hydraulic power pack type HC and HCW: D 7900
- Compact hydraulic power pack type HCG: D 7900 G

Connection blocks:
- Type A, B and C: Page 62

Directly mountable valve banks:
- Type VB: Page 114
- Type BWH, BWN: Page 120

Directly mountable valve banks:
- Type BA: Page 144
- Type BVH: Page 124

Compact hydraulic power packs

1.2 Compact hydraulic power pack type KA and KAW

Compact hydraulic power packs are a type of hydraulic power pack. They are characterised by a highly compact design, since the motor shaft of the electric motor also acts as the pump shaft.

The ready-for-connection compact hydraulic power pack type KA and KAW includes an electric drive which runs in oil. The stator is securely attached to the housing (tank). The compact hydraulic power pack is suitable for hydraulic systems with the operating modes S2 or S3. The heat is dissipated via surface convection so that no external cooler is usually necessary.

For systems with high loads, an external fan that enables additional heat dissipation can be optionally mounted on the housing. The fan is powered by a separate motor independently of the pump motor. The type KA contains a 3-phase motor, the type KAW contains a single-phase-motor. The compact hydraulic power pack type KA and KAW is available in horizontal and vertical versions. Modules can be added to the tank so that different usable oil volumes are possible. Either single-circuit systems or dual-circuit systems can be selected. A radial piston pump or external gear pump can be used as a hydraulic pump. The compact hydraulic power pack type KA and KAW is suitable as a highly compact control system, since connection blocks and valve banks can be directly mounted.

Nomenclature:	**Radial piston or gear pump with integrated electric motor (3-phase or 1-phase version)**
Design:	**Oil immersed hydraulic power pack for intermittent or load/no load operation (S3-service)**
p_{max}:	**Radial piston pump 700 bar Gear pump 180 bar**
Q_{max}:	**Radial piston pump 7 lpm (V_g = 2.29 cm³/rev) Gear pump approx. 24.1 lpm (V_g = 7.9 cm³/rev)**
$V_{tank\ max}$:	**30 l**

Features and benefits:

- Additional separately driven fan for maximum utilisation of power
- Fill/usable volumes can be flexibly extended by modular tank extensions
- Long lifetime and excellent reliability achieved by using radial piston pumps
- Low oil fill volumes make it environmentally sound thanks to small cost of disposal and low costs for hydraulic fluid
- Co-ordinated range of valves and accessories from modular system
- Suitable for vertical and horizontal installation
- Optimum efficiency thanks to suboil motor cooling, direct transmission of force and cleverly designed heat dissipation

Intended applications:

- Brake and rotor adjustment modules on wind turbines
- Clamping systems on machine tools and appliances
- Hydraulic torque wrenches
- Rivets and clinching equipment
- Presses
- Handling systems

Design and order coding example

KA28	22	L1	KFTP	/HZ0,59/8,8	- ...	- 3x400V	- G1/2x300

Oil drain hose

Motor voltage 3 ~ 400V 50 Hz, 3 ~ 460V 60 Hz, 3 ~ 690V 50 Hz, 1 ~ 230V 50 Hz, 1 ~ 110V 60 Hz (1~phase motor)

Valve design

Pump version

Single circuit pump
- Radial piston pump H or gear pump Z

Dual circuit pump
- with joint connection pedestal for pressure connections P1 and P3
- Combinations: Radial piston pump - radial piston pump (HH) and radial piston pump - gear pump (HZ)

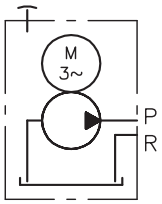
Additional function
- Oil sight glass
- Level gauge with level switch
- Temperature switch
- Silica gel filter (instead of breather filter)
- Additional fans
- Various electrical connection variants

Installation position Horizontal for low installation heights (type KA..L) or vertical (type KA..S)

Tank size

Basic type, size Type KA (3~phase motor) and KAW (1~phase motor, power reduction 30 ... 50% dep. on size), size 2 and 4

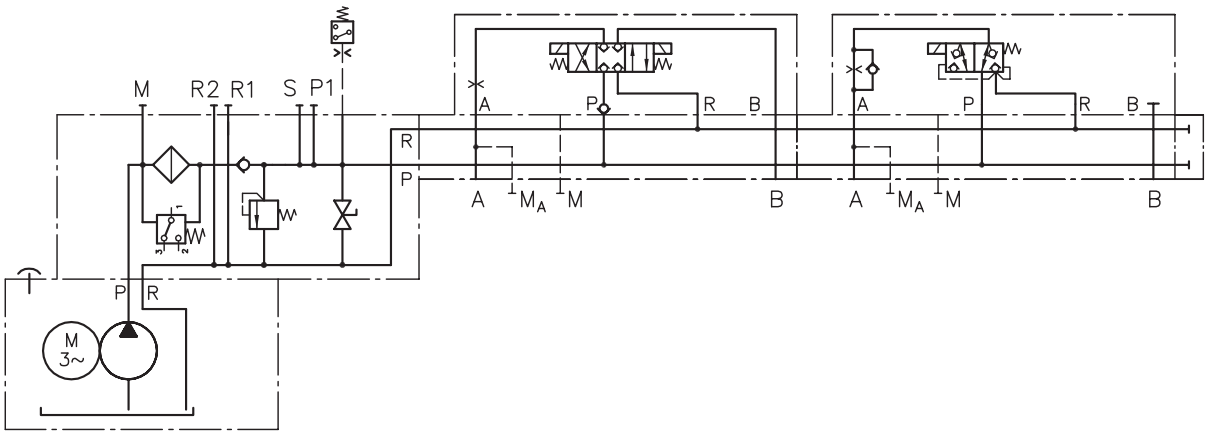
Function



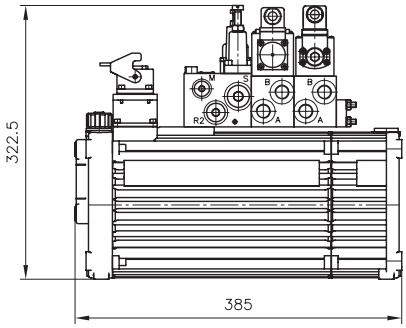
Circuit example:

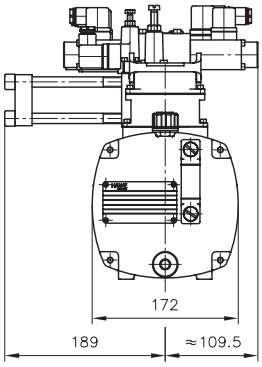
KA 231 LKP/H 0.59 - AX 34 D101VE1B/400 - BA 2

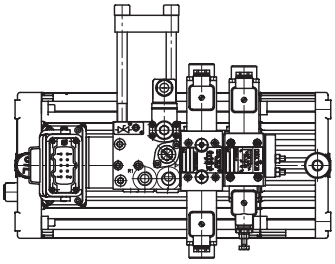
- NBVP 16 G/R/AB 2.0 - M/0
- NBVP 16 Y/ABR 1.5/4 - M/0
- 1 - G 24



General parameters and dimensions





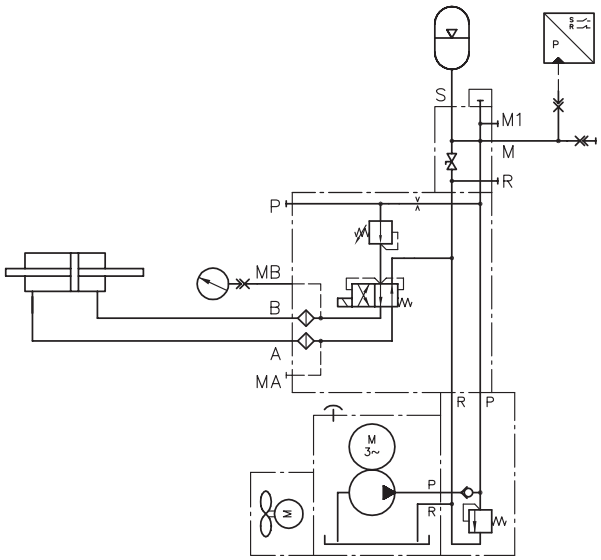


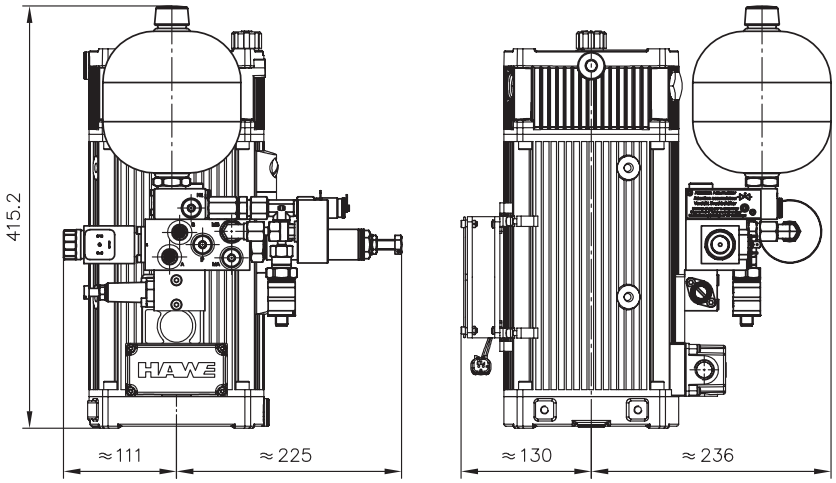
	3-cylinder radial piston pump			6-cylinder radial piston pump			Gear pump			
	p_{max} [bar]	Q_{max} [lpm] 50 Hz	Q_{max} [lpm] 60 Hz	p_{max} [bar]	Q_{max} [lpm] 50 Hz	Q_{max} [lpm] 60 Hz	p_{max} [bar]	Q_{max} [lpm] 50 Hz	Q_{max} [lpm] 60 Hz	P_N [kW]
KA 21	700 - 45	0,63 - 10,02	0,76 - 12,05	360 - 55	1,26 - 7,84	1,52 - 9,42	170 - 60	2,23 - 6,7	2,68 - 8,04	0,55
KA 22	700 - 140	0,63 - 0,02	0,76 - 12,05	700 - 180	1,26 - 7,84	1,52 - 9,42	170 - 55	2,23 - 22,04	2,68 - 26,47	1,1
KA 23	700 - 60	0,31 - 4,89	0,37 - 5,93	485 - 30	0,62 - 9,79	0,75 - 11,85	170 - 50	1,09 - 4,90	1,32 - 5,94	0,37
KA 24	700 - 160	0,31 - 4,89	0,37 - 5,93	700 - 80	0,62 - 9,79	0,75 - 11,85	170 - 65	1,09 - 10,74	1,32 - 13,04	0,75
KA 26	700 - 160	0,63 - 10,02	0,76 - 12,05	700 - 205	1,26 - 7,84	1,52 - 9,42	170 - 65	2,23 - 22,04	2,68 - 26,47	1,4
KA 28	700 - 185	0,31 - 4,89	0,37 - 5,93	700 - 90	0,62 - 9,79	0,75 -11,85	170 - 75	1,09 - 10,74	1,32 - 13,04	1.2

	3-cylinder radial piston pump			6-cylinder radial piston pump			Gear pump			
	p_{max} [bar]	Q_{max} [lpm] 50 Hz	Q_{max} [lpm] 60 Hz	p_{max} [bar]	Q_{max} [lpm] 50 Hz	Q_{max} [lpm] 60 Hz	p_{max} [bar]	Q_{max} [lpm] 50 Hz	Q_{max} [lpm] 60 Hz	P_N [kW]
KA 42	700 - 220	0.84 - 11.8	2.0 - 14.4	700 - 110	3.3 - 23.8	4.0 - 28.9	200 - 130	1.6 - 18.0	2.0 - 22.0	- 2.6
										- 3.9
KA 44	700 - 220	1.6 - 5.98	1,01 - 7,25	700 - 110	1,68 - 11,97	2,04 - 14,53	200 - 130	0,84 - 9,1	1,01 - 11,1	- 1,5
										- 2,2
										- 3,0

Circuit example:

KA 281 S16K/H3.61-FSHS-24VDC
-A 14/230
-BVH 11 W/CZ52/117GM/B3.5H
-82 - AC1002/130/3A
-XM 24
3x400V 50Hz





Associated technical data sheets:

- Compact hydraulic power packs type KA: D 8010, D 8010-4

Similar products:

- Type HC, HCG: Page 42

Suitable connection blocks:

- Type A, B and C: Page 62

Directly mountable valve banks:

- Type VB: Page 114
- Type BWH, BWN:Page 120
- Type SWR, SWS: Page 76
- Type BA: Page 144
- Type BVH: Page 124

Compact hydraulic power packs

1.2 Compact hydraulic power pack type MPN

Compact hydraulic power packs are a type of hydraulic power pack. They are characterised by a highly compact design, since the motor shaft of the electric motor also acts as the pump shaft.

The ready-for-connection compact hydraulic power pack type MPN and MPNW includes an electric drive which runs in oil. The stator is securely attached to the housing (tank). The compact hydraulic power pack is suitable for hydraulic systems with the operating modes S2 or S3. The heat is dissipated via surface convection so that no external cooler is usually necessary.

The type MPN contains a 3-phase motor, the type MPNW contains a single-phase-motor. Different tank sizes enable different usable oil quantities. Either single-circuit systems or dual-circuit systems can be selected. A radial piston pump , an external gear pump or internal gear pump can be used as a hydraulic pump.

The compact hydraulic power pack type MPN and MPNW is suitable as a highly compact control system, since connection blocks and valve banks can be directly mounted.

Nomen-clature:	**Radial piston and/or gear pump with integrated motor single or dual-circuit pump**
Design:	**Oil immersed hydraulic power pack for intermittent or load/no load operation (S2-/S3-/S6-service)**
p_{max}:	**Radial piston pump 700 bar (high pressure), gear pump 220 bar (low pressure)**
Q_{max}:	**12.4 lpm (high pressure) (V_g = 9.17 cm^3/rev) 83 lpm (low pressure) (V_g = 61 cm^3/rev)**
$V_{t\ max}$:	**100 l**

Features and benefits:

- Intermittent or load/no load operation (S2-/S3-/S6-service)
- Long lifetime and excellent reliability achieved by using radial piston pumps
- Low oil fill volumes make it environmentally sound thanks to small cost of disposal and low costs for hydraulic fluid
- Two-stage valves and switch units for press control systems can be directly flange mounted
- Co-ordinated range of valves and accessories from modular system
- Dual-circuit pumps available

Intended applications:

- Brake and rotor adjustment modules on wind turbines
- Counterbalance as well as machine tools
- Presses and other shaping machines
- Handling and clamping systems on machine tools and fixtures
- Lubrication systems

Design and order coding example

MPN 44	- H 1,5	- B10.20	D	- ...	- 3 ~ 230V 50 Hz

Motor voltage 3 ~ 230/400V Δγ 50 Hz, 3 ~ 500V γ 50 Hz,
1 ~ 230V 50 Hz, 1 ~ 110V 60 Hz (single-phase-motor)

Valve mounting

Additional options
- Level gauge
- Level switch
- Temperature switch
- Various means of electrical connection

Design
- For installation in self-made oil tanks: as single pump or cover plate version
- With tank, usable volume V_{usable} 10 l to 75 l

Pump version

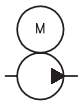
Single-circuit pump
- Radial piston pump H or gear pump Z
- Internal gear pump IZ

Dual-circuit pump
- Combinations:
  - Radial piston pump - radial piston pump (HH)
  - Radial piston pump - gear pump (HZ)

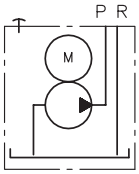
Basic type, size Type MPN (3-phase motor) and MPNW (single-phase motor)
Depending on the size, single-phase motor has 30 to 50% less power

Function

Single stage pump
(radial piston pump, gear pump)

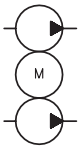


Installation pump

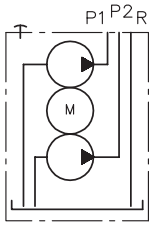


Hydraulic power pack (incl. tank)

Dual stage pump
(radial piston/gear pump,
gear pump/gear pump)

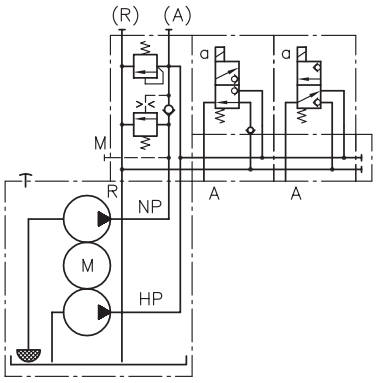


Installation pump

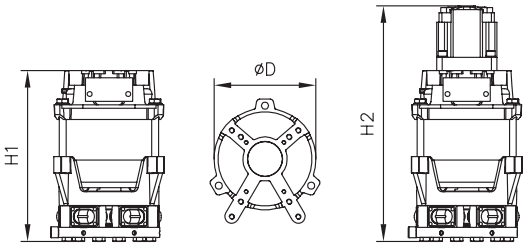


Hydraulic power pack (incl. tank)

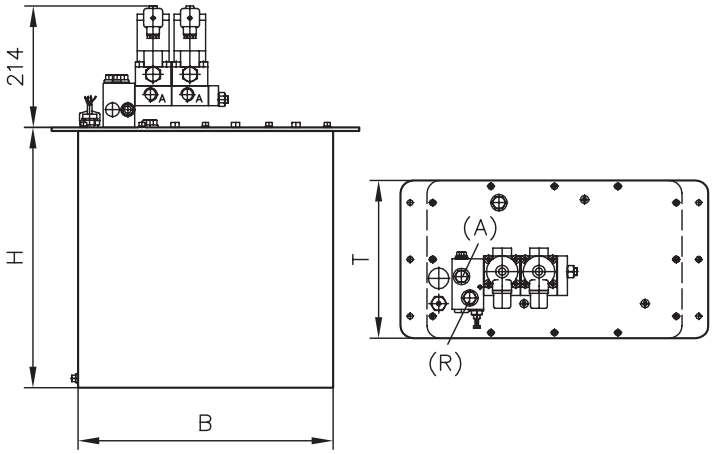
Circuit example:



Single-circuit pump, dual-circuit pump
(without tank)



Compact hydraulic power pack
(tank with mounted valves)



	Radial piston pump (3 cyl.)			Gear pump					Dimensions [mm]		
	Max. pressure	Delivery flow		Max. pressure	Delivery flow						
	p_{max} [bar]	Q_{pu} [lpm] 50 Hz	Q_{pu} [lpm] 60 Hz	p_{max} [bar]	Q_{pu} [lpm] 50 Hz	Q_{pu} [lpm] 60 Hz	P_N [kW][1]	m [kg][2]	H1[2]	$H2_{max}$	ÆD
MPN 42	700 - 250	2,39 - 7,33	2,87 - 8,8	200 - 60	8,46 - 30,02	10,2 - 36,02	2,1	12,9	251/258	431	
MPN 44	700 - 250	1,53 - 5,37	1,84 - 6,44	200 - 55	5,37 - 25,99	6,4 - 31,19	2,1				
MPN 46	700 - 250	3,16 - 11,12	3,8 - 13,34	200 - 40	12,41 - 71,73	14,89 - 86,08	3,0	18,5	274/281	454	165
MPN 48	700 - 330	2,36 - 4,06	2,83 - 4,87	220 - 60	4,16 - 34,91	4,99 - 41,89	3,0				
MPN 404	700 - 340	3,1 - 3,49	3,7 - 4,19	220 - 45	2,7 - 68,16	2,25 - 81,79	4,2	26,4	298/313	486	

1) The actual power consumption is dependent on the respective operation pressure and can be up to 1.5xP_N
2) Values apply to radial piston pump/gear pump versions

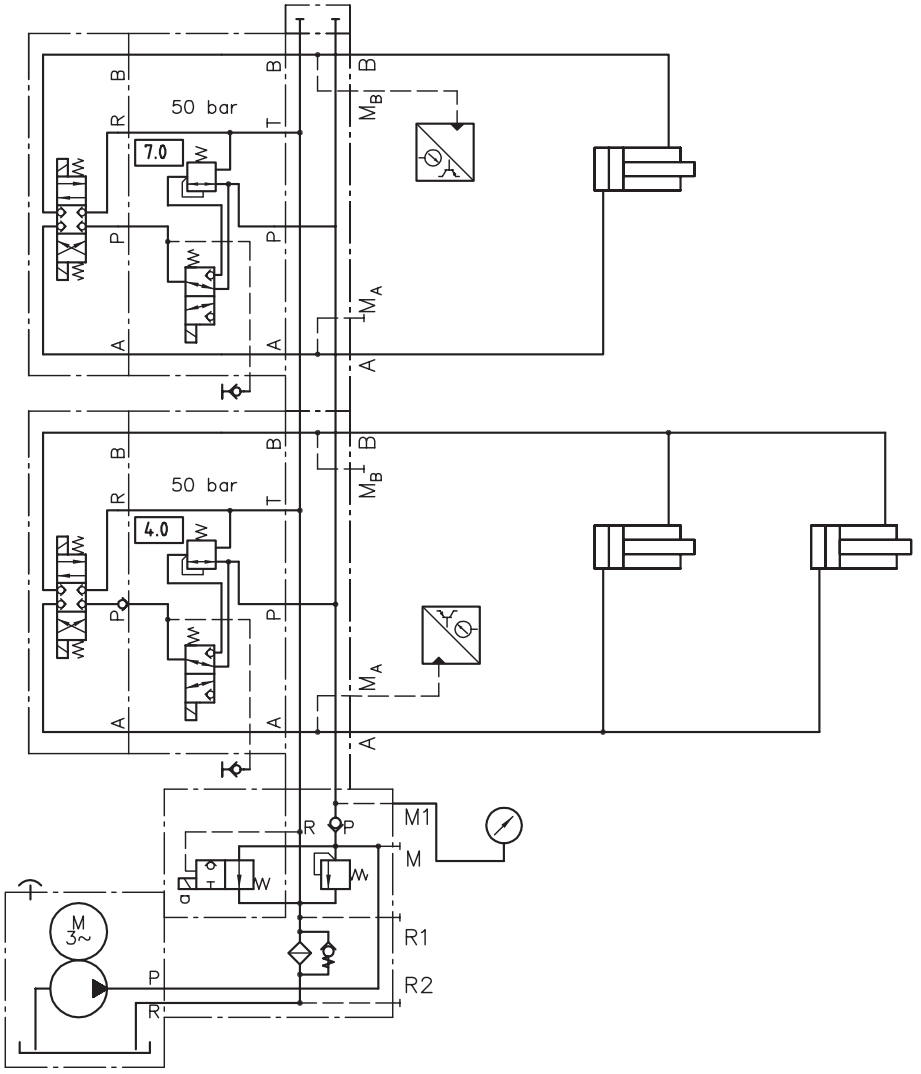
Version with tank:

Size	Tank size	H [mm]	W [mm]	D [mm]
MPN 4.	B 25	458	402	250
	B 55	470	560	350
	B 110	495	560	350
	B 25 L	283	623	250
	B 55 L	305	560	350

Circuit example:

MPN 44-Z 8.8-B 10 KT

-AS 1 F 3/160
-BA 2
-NBVP 16 G/R-GM/NZP 16 LZY 5/50-G 8 MA/GM/3-X 84 V-DG 5E-250-1/4
-NBVP 16 G-GM/NZP 16 LZY 5/50-G 8 MA/GM/3-X 84 V-DG 62
-1-G 24
-X 84 V-9/250
-3 x 400/230 V 50 Hz



Associated technical data sheets:

- Compact hydraulic power pack type MPN and MPNW: D 7207

Connection blocks:

- Type A, B and C: Page 62

Flange-mountable valve banks:

- Type VB: Page 114
- Type BWH, BWN: Page 120
- Type BA: Page 144
- Type BVH: Page 124

Compact hydraulic power packs

1.2 Compact hydraulic power pack type HK, HKF and HKL

Compact hydraulic power packs are a type of hydraulic power pack. They are characterised by a highly compact design, since the motor shaft of the electric motor also acts as the pump shaft.

The ready-for-connection compact hydraulic power pack type HK, HKF, HKL and HKLW includes an electric drive which runs in oil. The stator is securely attached to the housing (tank). The compact hydraulic power pack is suitable for hydraulic systems with the operating modes S2, S3 or S6.

A fan, which effectively dissipates the heat from the hydraulic system, is mounted on the housing. In the case of type HKF, the fan is powered by a separate motor independently of the pump motor. In the case of type HK, the fan is securely attached to the motor shaft. An external cooler is not generally required. The type HK, HKF and HKL contains a 3-phase motor, the type HKLW contains a single-phase-motor. The compact hydraulic power pack type HK and HKF has a vertical housing, while type HKL and HKLW has a horizontal housing. Single-circuit, dual-circuit or triple-circuit systems can be selected. A radial piston pump , an external gear pump or internal gear pump can be used as a hydraulic pump.

The compact hydraulic power pack type HK, HKF, HKL and HKLW is suitable as a highly compact control system, since connection blocks and valve banks can be directly mounted.

Nomenclature:	**Radial piston pump and/or gear pump with integrated motor (version for 3-phase mains)**
Design:	**Oil immersed compact hydraulic power pack for permanent and intermittent operation (S1/S6 service)**
p_{max}:	**Radial piston pump 700 bar (high pressure) Gear pump 180 bar (low pressure)**
Q_{max}:	**Radial piston pump (high pressure) 13.0 lpm (V_g = 9.17 cm³/rev) Gear pump (low pressure) 24 lpm (V_g = 17.0 cm³/rev)**
$V_{usable\ max}$:	**11.1 l**

Features and benefits:

- Suitable for continuous operation with intermittent load S6 and continuous operation S1
- Additional external fan for optimum use of power
- Wide range of applications, with three sizes available
- Long lifetime and excellent reliability thanks to use of radial piston pumps
- Environmentally friendly thanks to low oil filling volume; low cost of disposal and low hydraulic fluid costs
- Tailored range of valves and accessories from modular system
- One-circuit to three-circuit pumps available

Intended applications:

- Clamping systems on machine tools and turning centres
- Handling and clamping systems on machine tools and fixtures
- Welding machines, robots
- Endurance test bench construction
- Hydraulic torque wrenches

Design and order coding example

HK 34	8	LST	- H 3,6	3 x 400V 50Hz

Motor voltage 3 ~ 230/400V Δγ 50 Hz, 3 ~ 265/460V Δγ 60 Hz
1 ~ 230V 50 Hz, 1 ~ 115V 60 Hz (1~phase motor)

Pump version

Single circuit pump
- Radial piston pump H, gear pump Z, internal gear pump IZ

Dual circuit pump with joint connection pedestal for pressure ports P1 and P3
- Combinations:
  - Radial piston pump - radial piston pump (HH)
  - Radial piston pump - gear pump (HZ)

Dual circuit pump with separate connection pedestals
- Radial piston pump H or gear pump Z

Additional functions
- Temperature and level switch, single or double version
- Additional leakage port (Type HK 4.L)

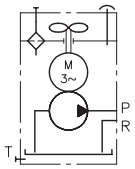
Tank size Type HK: Usable volume V_{usable} 0.85 l to15.4 l, Type HKL: Usable volume V_{usable} 1.7 l to 9.1 l
- Various filler neck designs

Basic type, size Type HK, size 2 to 4, type HKF (with auxiliary blower for increased cooling), size 4
Type HKL (3~phase motor) and HKLW (1~phase motor), size 3

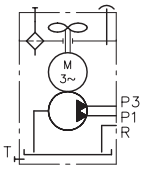
Additional versions:
- With molded motor
- With frequency-controlled drive

Function

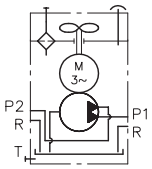
Single stage pump
(radial piston pump, or
gear pump)



Dual stage pump
(radial piston/radial piston pump, or
gear pump/gear pump, or radial piston pump/gear pump)

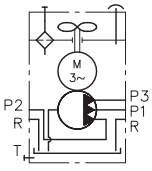


Joint pump pedestal



Separate pump pedestals

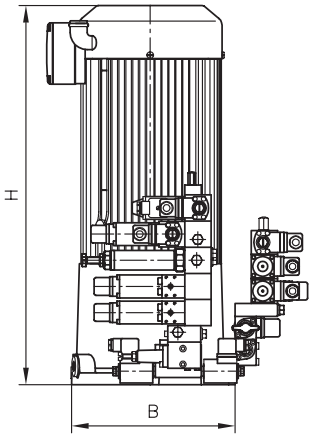
Triple-circuit pump
(only radial piston pump)

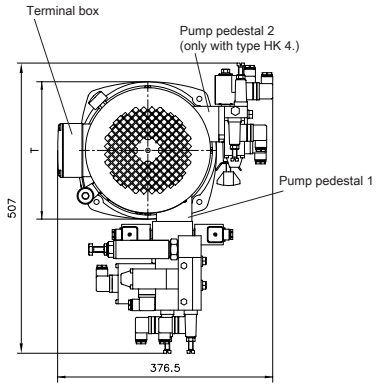


Separate pump pedestals

General parameters and dimensions

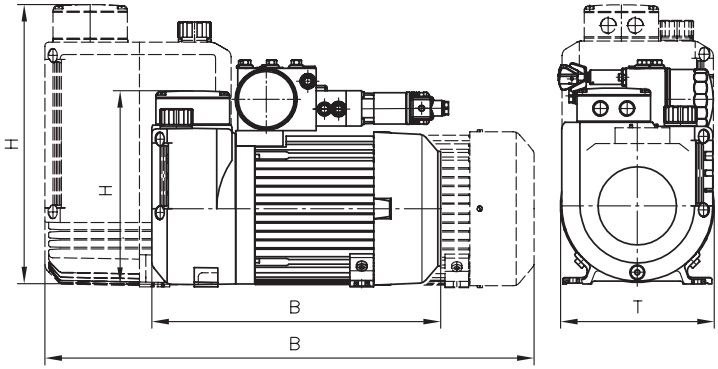
HK..





1 Terminal box
2 Pump pedestal 2 (only for type HK 4.)
3 Pump pedestal 1

HKL..



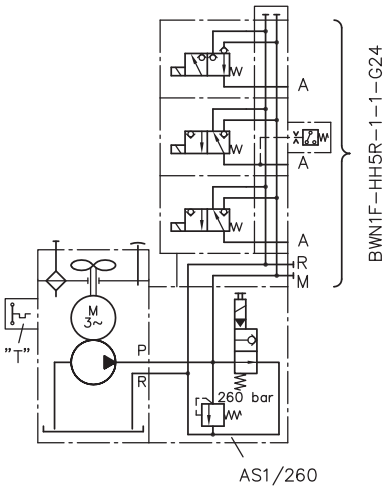
	Radial piston pump			Gear pump				Dimensions [mm]			
	Max. pressure	Delivery flow		Max. pressure	Delivery flow						
	p_{max} [bar]	Q_{pu} [lpm] 50 Hz	Q_{pu} [lpm] 60 Hz	p_{max} [bar]	Q_{pu} [lpm] 50 Hz	Q_{pu} [lpm] 60 Hz	P_N [kW]1)	H_{max}	B	T	m [kg]
HK 24	700 - 220	0.46 - 1.77	0.55 - 2.12	-	-	-	0.55	340	196	196	13
HK 33	560 - 100	1.25 - 6.5	1.5 - 7.8	170 - 100	2.7 - 6.9	3.24 - 8.28	0.8	405	212	212	20.5
HK 34	700 - 170	1.25 - 6.5	1.5 - 7.8	170 - 160	2.7 - 6.9	3.24 - 8.28	1.1	405	212	212	20.5
HK(F) 43	610 - 90	2.08 - 13.1	3.36 - 15.72	170 - 80	4.5 - 16	3.29 - 19.2	1.5	460	240	240	29
HK(F) 44	700 - 130	2.08 - 13.1	2.5 - 15.72	170 - 110	4.5 - 24	3.29 - 28.8	2.2	460	240	240	29
HK(F) 48							3	833	240	240	40
HKL(W) 32	700 - 220	1.65 - 8.7	1.98 - 10.44	170 - 130	2.7 - 11.3	3.24 - 13.56	1.8	358	617	196	19.2
HKL(W) 34											
HKL 38	700 - 220	1.65 - 8.7	1.98 - 10.44	170 - 130	2.7 - 11.3	3.24 - 13.56	2.2	358	617	196	22.2

1) The actual power consumption is dependent on the respective operation pressure and can be up to 1.5 x P_N

Circuit examples:

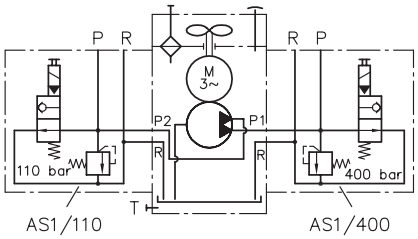
HKF 489 D-DT/1P1M-H2.6
-AS1/260
-BWN1F-HH5R-1-G24
-3x400/230V50Hz

Compact hydraulic power pack HKF 489 with level switch with two switch points (coding D-D);
temperature switch (coding T) with Harting plug coding P1 and oil filler (coding M)



HK449/1P1-H 2.5-Z6.9
-AS1/400-G24
-AS1/110-G24
-3x400/230V50Hz

Compact hydraulic power pack HK 44 with radial piston pump H 2.5 and gear pump Z 6.9 on separate pump pedestals,
two connection blocks (type AS1/..) with pressure limiting valve (400 bar and 110 bar) and idle circulation valve (mounting of valve banks possible)



Associated technical data sheets:

- Compact hydraulic power pack type HK 4: D 7600-4
- Compact hydraulic power pack type HK 3: D 7600-3
- Compact hydraulic power pack type HK 2: D 7600-2
- Compact hydraulic power pack type HKL and HKLW: D 7600-3L

Connection blocks:

- Type A, B and C: Page 62

Directly mountable valve banks:

- Type VB: Page 114
- Type BWH, BWN: Page 120
- Type BA:Page 144
- Type BVH: Page 124

Hydraulic power pack

1.2 Standard hydraulic power pack type FXU

Standard hydraulic power packs are a type of hydraulic power pack. They are characterised by their very flexible design and customer-specific modular adjustment options.
Units of the FXU (Flexunit) range are used to create pressure for stationary oil-hydraulic installations.
The units have oil containers made either of aluminium or of steel. The pump is located in the tank. Single pumps or combinations of pumps are possible.
Both radial piston pumps and external gear pumps are used as well as combinations of external gear pumps with radial piston pumps.
The pumps are installed below the tank cover in an aluminium container or in a steel container.

Nomenclature:	**Standard hydraulic power pack (S1 operation) Single-circuit pump, dual-circuit pump With radial piston pump and/or gear pump in the tank**
Version:	**Radial piston pump and/or gear pump**
p_{max}:	**HP/LP: 700/280 bar**
Q_{max}:	**HP/LP: 91/80 lpm Radial piston pump: Vg = 64.2 cm³/rev Gear pump: Vg = 63 cm³/rev**
V_{Tank} max:	**565 l**

Features and benefits:

- Hydraulic power pack for continuous operation (S1 operation)
- Long lifetime and excellent reliability when using radial piston pumps
- Low noise production when using gear pumps
- Combinations of radial piston pumps and gear pumps available for dual-stage systems
- Quick to configure due to tailored modular system
- Customer-specific documentation with EPlan Fluid schematic, step model and adjusted data sheet
- Possible to directly mount all HAWE valve banks

Intended applications:

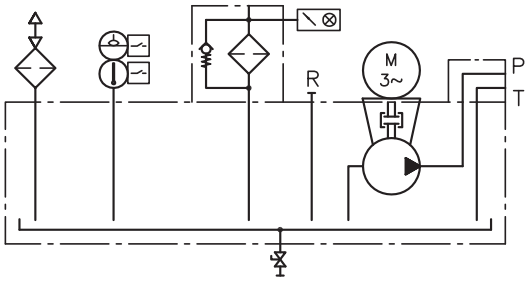
- Machine tools with a continuous flow rate requirement
- Recycling systems
- Plastics machinery
- Unloading stations in material handling
- Pressing applications such as vulcanising and briquetting
- Incremental launching systems for bridge building

Design and order coding example

FXU | **- Z9** | **BL 44** | **- F020/0A** | **- NT1/A** | **- UA** | **- V4,0-3 x 400/230 V 50 Hz** | **- A3/185**

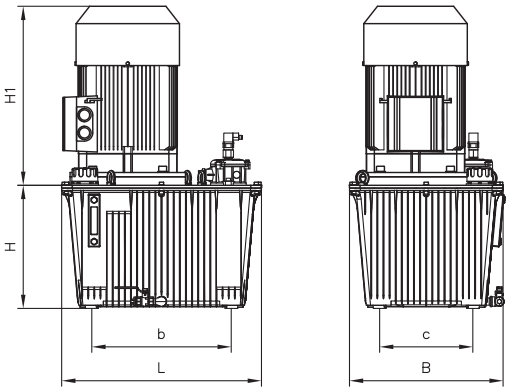
- **Connection block**
- **Motor version, nominal power, nominal voltage**
- **Pedestrial**
- **Monitoring**
- **Filter**
- **Tank** Nominal size
- **Pump** Radial piston pump (R...) or gear pump (Z...)
- **Basic type**

Function

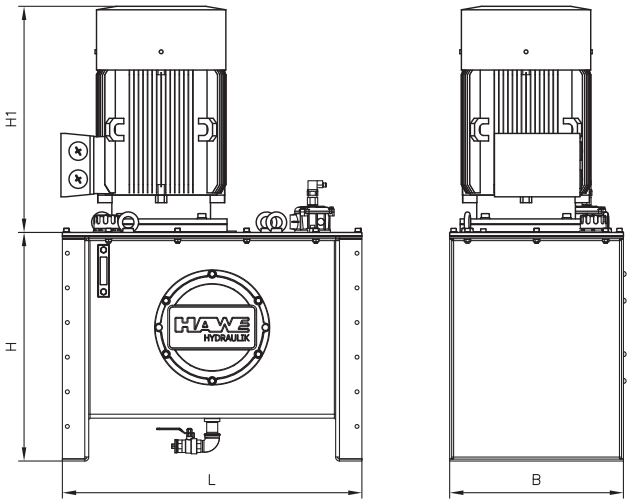


General parameters and dimensions

BL ...



BS ...



Tank size	H [mm]	L [mm]	B [mm]	b [mm]	c [mm]	H1 [mm]	V_{max} tank [l]
BL 30	291	490	350	326	176	445	26
BL 44	324	515	425	341	241	614.5	40
BL 70	374	605	475	422.5	282.5	659.5	63
BS 100	693	670	528	--	--	667	90
BS 160	693	910	528	--	--	759.5	145
BS 250	693	1310	528	--	--	759.5	225
BS 400	765	1270	904	--	--	783	360

Associated technical data sheets:

- Standard hydraulic power pack type FXU: D 6020
- Radial piston pump type R and RG: D 6010
- Dual-stage pump type RZ: D 6910

Suitable connection blocks

- Connection blocks type A for hydraulic power packs: D 6905 A/1
- Connection blocks type B for hydraulic power packs: D 6905 B
- Connection block type C 5 and C 6: D 6905 C

Flange-mountable valve banks

- Valve bank (nominal size 6) type BA: D 7788
- Valve bank type BNG: D 7788 BNG
- Valve bank (directional seated valve) type BVH: D 7788 BV
- Valve bank (directional seated valve) type VB: D 7302
- Valve bank (directional seated valve) type BWN and BWH: D 7470 B/1

Standard power packs

1.2 Air-driven hydraulic power pack 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 power pack type LP can generate up to 1500 bar. It is available as a 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 hydraulic counter pressure currently present. It can drop away 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 power pack
Design:	Hydraulic power pack
$p_{hydraulicmax}$:	1500 bar
p_{airmax}:	10 bar
Q_{max}:	12 l/min

Design and order coding example

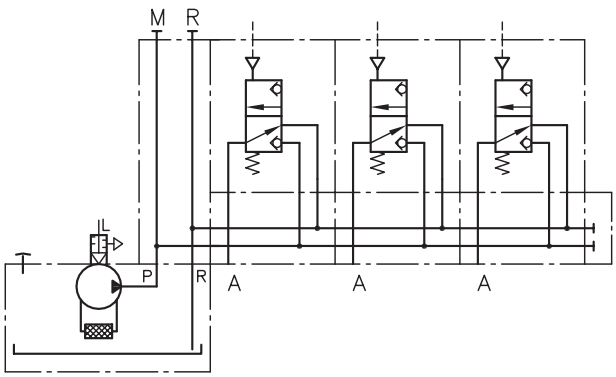
LP 125 - 16 /B4 VB 11 LP - HHH - 1

Valve mounting
- Valve bank type VB
- Valve bank type BWN and BWH

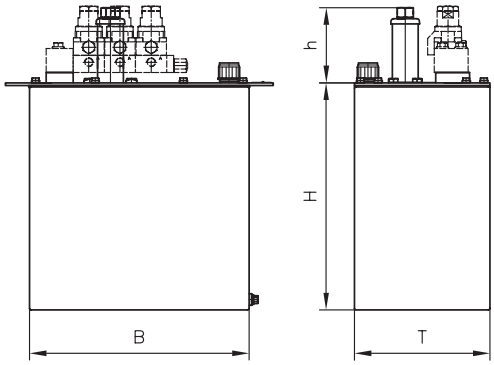
Design Hydraulic power pack
- Tank version, usable volume V_{usable} 5 l to 28 l
- Cover plate version (for installation in self-manufactured oil tanks)

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

Function



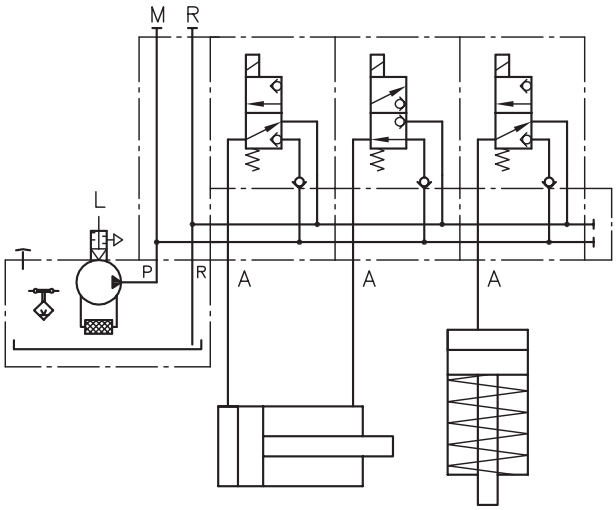
General parameters and dimensions



Basic type and size	B	H	T	h	V_{max} tank (l)	m (kg)
LP 80-..B4	200	242,5	200	94	7	5,7
LP 125-..B4	200	242,5	200	110	5,8	5,7
LP 125-..B10	324	332,5	200	132	16,6	8,5
LP 125-..B25	402	410	250	130	34	15,1
LP 160-..B10	324	332,5	200	132	13,5	8,5
LP 160-..B25	402	410	250	130	33	15,1

Circuit example:

LP 125-10/B 10 D
-VB 11 LM-NRN-1-G 24



Hydraulic power pack in tank version with air-driven hydraulic pump type LP125-10,
tank size B10 as well as level switch D (N/C contact) and valve bank type VB11 attached.

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

1.2 Connection block type A, B and C

A connection block represents the connecting link between the hydraulic power pack and the hydraulic control. The connection blocks described here are suitable for combining with compact hydraulic power packs.

A valve bank can be directly attached to the connection block type A such that a compact hydraulic control unit is produced. As standard the type A contains a pressure-limiting valve that can be supplemented with a pressure or return line filter, or an idle circulation valve, among other items. The connection block type B controls single-acting cylinders, e.g. in pallet lifting equipment. The integrated pressure-limiting valve limits the maximum lifting force. The lowering speed is adjusted using the integrated throttle. The connection block type C has only a pump and return port and is used in hydraulic systems with decentral valve blocks.

The connection blocks type A, B and C can be combined, e.g. with the compact hydraulic power packs type KA, HK and MPN.

Nomen-clature:	Connection blocks to the completion of hydraulic power packs
Design:	Add-on valve enabling pipe connection or direct mounting of valve banks
p_{max}:	System pressure: 700 bar
Q_{max}:	approx. 20 lpm

Features and benefits:

- Enables compact and sturdy direct mounting of ongoing components at the compact power packs of HAWE Hydraulik
- Intermediate plates enable versatile addition of other components
- Efficient and space saving solution for mounting individual valves or valve banks to single and dual circuit pumps
- Pressure/return line filters, pressure-limiting valves, pressure switches, etc. can be directly integrated

Intended applications:

- Lifting devices
- Machine tools
- Modules for braking or rotor blade adjustment at wind power systems
- Tracking systems for solar panels and parabolic antennas

Design and order coding example

AS3F2 /420 - G24

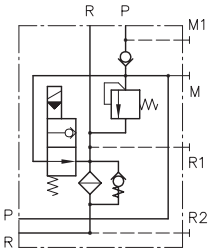
Solenoid voltage 12V DC, 24V DC, 230V AC

Pressure setting (bar)

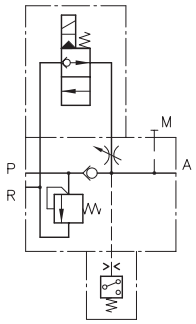
Basic type **Type A, B, C** see table

Function

A



B



C

Options, type A, B, C

Type A with pressure-limiting valve (fixed or manually adjustable, also with unit approval as safety valve for safeguarding hydraulic accumulators)

- For direct pipe connection
- To attach valve banks

Options:

- Check valve in P gallery
- Prop. pressure-limiting valve
- Return line filter, Pressure filter
- Idle circulation valve (solenoid-actuated)
- Shut-off valve, accumulator charging valve

Type B with pressure-limiting valve to actuate single- and double-acting cylinders

- For direct pipe connection

Options:

- Check valve in P gallery
- Throttle for regulating the drain speed
- Idle circulation valve open or closed in neutral position
- Pressure switch in P gallery
- Pressure dispersal for independent return stroke (type B to DW)

Type C without additional elements

- For direct pipe connection

Options:

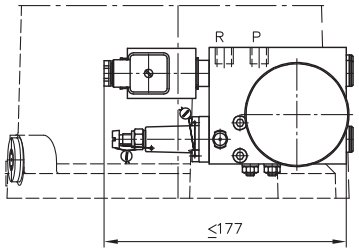
- For pipe connection (pump side) of all type A, B connection blocks (Type C15, C16 - connection block with hole pattern of the pump, type C36)

Additional versions

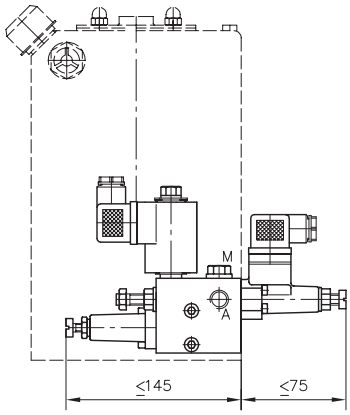
- Connection blocks for dual-stage pumps
- Intermediate blocks for dual-stage pumps type S, V, C30
- Spacer plates for single and dual-circuit pumps type U.
- Additional intermediate block for second pressure stage type V, S

General parameters and dimensions

AS ..
Example: HK 44/1 - H 2.08 **- ASX 3 F2 B/400 - G 24**



B..
Example: HC 14/1.95 **- B 31/180 - EM 11V - 13/3 - G 24**



Associated technical data sheets:

- Connection blocks type A for hydraulic power packs: D 6905 A/1
- Connection block type AX, with unit approval: D 6905 TUV
- Connection blocks type B for hydraulic power packs: D 6905 B
- Connection block type C 5 and C 6: D 6905 C

Suitable compact hydraulic power packs:

- See "Compact hydraulic power packs" section

Products with shared connection pattern:

- Two-stage valves type NE 21: Page 192
- Switch units type CR: Page 152

Suited valve banks for combination:

- Type VB: Page 114
- Type BWH, BWN: Page 120
- Type BA: Page 144
- Type BVH: Page 124