Compact hydraulic power pack type CPU

Product documentation

for short period operation and standby mode (S2 and S3)

Operating pressure p_{max}:	350 bar
Geometric displacement V_g:	7.9 cm³/rev
Usable volume V_{use}:	Max. 12.6 l

D 8010 CPU
08-2019-1.3

HAWE HYDRAULIK

Printing date / document generated on: 26.08.2019

Contents

1 Overview of compact hydraulic power pack type CPU

C Line

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 compact hydraulic power pack CPU is suited for nominal operating modes S2 (short period operation) and S2 (intermittent operation).

Compact hydraulic power pack type CPU

Features and benefits:

- Excellent price-performance ratio
- Resource-saving due to small oil filling volume
- Vertical and horizontal installation possible

Intended applications:

- Machine tools
- Handling systems
- Wind turbines
- Solar systems

2 Available versions, main data

Order coding example:

CPU 34	1	S	KDT	/H 0,91	- 3 x 400 V 50 Hz	- 0,37 kW
CPU 34	5	L	S	/Z 5,2	- 3 x 400 V 50 Hz	- 0,75 kW

Motor voltage and motor power Table 8 Motor data

Pump version Pump version See Chapter 2.2, "Pump"

Additional options Table 4 Additional options

Installation position Table 3 Installation position

Tank size Table 2 Tank size

Basic type Table 1 Basic type

2.1 Motor and container

Table 1 Basic type

Basic type	Motor voltage
	Nominal voltage
CPU 34	3x400 V 50 Hz 3x460 V 60 Hz

NOTE
The actual power consumption depends on the load and can be up to 1.8 x nominal power.

Table 2 Tank size

	CPU 34 - 0.37 kW			CPU 34 - 0.75 kW			CPU 34 - 1.5 kW		
Coding	Fill volume V_{fill} (l)	Usable volume V_{usable} (l)		Fill volume V_{usable} (l)	Usable volume V_{usable} (l)		Fill volume V_{usable} (l)	Usable volume V_{usable} (l)	
		Vertical	Horizontal		Vertical	Horizontal		Vertical	Horizontal
0	6.5	3.0	4.3	6.0	2.5	3.0	---	---	---
1	7.8	4.3	5.0	7.0	3.5	3.5	6.4	2.9	3.2
2	10.5	7.0	5.3	9.8	6.3	5.2	9.2	5.8	4.7
3	12	8.5	6.3	11.1	7.7	5.5	10.6	7.2	5.6
4	14.0	10.5	7.3	13.2	9.8	6.7	12.7	9.3	6.4
5	16.1	12.6	8.5	15.2	11.8	7.7	14.8	11.3	7.5

Table 3 Installation position

Coding	Comment
S	Vertical
L	Horizontal

NOTE

- The horizontal version can be incorporated vertically.
- The vertical version within radial piston design (coding H) cannot be inserted horizontally.

Table 4 Additional options

Coding	Comment	Vertical	Horizontal
K	Oil level gauge (series)	●	●
S	Level switch (N/O contact)	-	●
D	Level switch (N/C contact)	-	●
KS/KD	Fixed combination coding K with coding D/S	●	-
T	Temperature switch (switching point 80°C)	●	●

NOTE

Coding S and D cannot be combined together.

2.2 Pump

NOTE

- The delivery flow Q_{max} relates to the rated speed and varies depending on the load.
- In pump version **Z**, the max. hydraulic work value $(pV_g)_{max}$ is to be reduced by 10%.

Radial piston pump H

Installed pump elements type MPE

	Delivery flow coding			H 0.33	H 0.47	H 0.59	H 0.66	H 0.91	H 0.93
	Piston diameter (mm)			4	5	4	6	7	5
	Number of pump elements			3	3	6	3	3	6
	Displacement volume V_g (cm^3/rev)			0.23	0.35	0.45	0.51	0.69	0.71
CPU 34 - 0.37 kW	Permissible pressure p_{max}	(bar)		350	350	350	350	315	310
	Delivery flow Q_{max}	(lpm)	50 Hz	0.31	0.48	0.62	0.69	0.94	0.96
			60 Hz	0.37	0.58	0.75	0.48	1.14	1.17
CPU 34 - 0.75 kW	Permissible pressure p_{max}	(bar)		350	350	350	350	350	350
	Delivery flow Q_{max}	(lpm)	50 Hz	0.31	0.48	0.62	0.69	0.94	0.96
			60 Hz	0.37	0.58	0.75	0.48	1.14	1.17
CPU 34 - 1.5 kW	Permissible pressure p_{max}	(bar)		350	350	350	350	350	350
	Delivery flow Q_{max}	(lpm)	50 Hz	0.31	0.48	0.62	0.69	0.94	0.96
			60 Hz	0.37	0.58	0.75	0.84	1.14	1.17

	Delivery flow coding			H 1.18	H 1.33	H 1.51	H 1.81	H 2.36	H 2.99
	Piston diameter (mm) Number of pump elements			8 3	6 6	9 3	7 6	8 6	9 6
	Displacement volume V_g (cm³/rev)			0.91	1.02	1.15	1.39	1.81	2.29
CPU 34 - 0.37 kW	Permissible pressure p_{max}	(bar)		240	215	190	155	120	95
	Delivery flow Q_{max}	(lpm)	50 Hz	1.23	1.38	1.56	1.88	2.46	3.11
			60 Hz	1.49	1.68	1.98	2.29	2.99	3.78
CPU 34 - 0.75 kW	Permissible pressure p_{max}	(bar)		350	350	350	350	325	255
	Delivery flow Q_{max}	(lpm)	50 Hz	1.23	1.38	1.56	1.88	2.46	3.11
			60 Hz	1.49	1.68	1.98	2.29	2.99	3.78
CPU 34 - 1.5 kW	Permissible pressure p_{max}	(bar)		350	350	350	350	350	350
	Delivery flow Q_{max}	(lpm)	50 Hz	1.23	1.38	1.56	1.88	2.46	3.11
			60 Hz	1.49	1.68	1.89	2.29	2.99	3.78

Installed pump elements type PE

	Delivery flow coding			H 1.84	H 2.66	H 3.12	H 3.61	H 4.14	H 4.72
	Piston diameter (mm) Number of pump elements			10 3	12 3	13 3	14 3	15 3	16 3
	Displacement volume V_g (cm³/rev)			1.41	2.04	2.39	2.77	3.18	3.62
CPU 34 - 0.75 kW	Permissible pressure p_{max}	(bar)		350	285	245	210	185	160
	Delivery flow Q_{max}	(lpm)	50 Hz	1.91	2.76	3.23	3.74	4.30	4.89
			60 Hz	2.31	3.34	3.91	4.54	5.21	5.93
CPU 34 - 1.5 kW	Permissible pressure p_{max}	(bar)		350	350	330	290	250	220
	Delivery flow Q_{max}	(lpm)	50 Hz	1.91	2.76	3.23	3.74	4.30	4.89
			60 Hz	2.31	3.34	3.91	4.54	5.21	5.93

Gear pump Z

	Delivery flow coding			Z 1.1	Z 1.7	Z 2.0	Z 2.7	Z 3.5	Z 4.5
	Size			1	1	1	1	1	1
	Displacement volume V_g (cm³/rev)			0.8	1.1	1.4	1.9	2.4	3.1
CPU 34 - 0.75 kW	Permissible pressure p_{max}	(bar)		200	200	200	200	200	160
	Delivery flow Q_{max}	(lpm)	50 Hz	1.09	1.5	1.90	2.58	3.26	4.22
			60 Hz	1.32	1.82	2.31	3.14	3.96	5.12
CPU 34 - 1.5 kW	Permissible pressure p_{max}	(bar)		200	200	200	200	200	160
	Delivery flow Q_{max}	(lpm)	50 Hz	1.09	1.5	1.90	2.58	3.26	4.22
			60 Hz	1.32	1.82	2.31	3.14	3.96	5.12

	Delivery flow coding			Z 5.2	Z 6.4	Z 6.9	Z 8.8	Z 9.8	Z 11.3
	Size			1	1	1	1	1	1
	Displacement volume V_g (cm³/rev)			3.61	4.39	4.79	6.21	7.01	7.89
CPU 34 - 0.75 kW	Permissible pressure p_{max}	(bar)		145	120	110	85	75	65
	Delivery flow Q_{max}	(lpm)	50 Hz	4.90	5.98	6.53	8.30	9.52	10.74
			60 Hz	5.94	7.26	7.92	10.07	11.55	13.04
CPU 34 - 1.5 kW	Permissible pressure p_{max}	(bar)		200	175	160	125	110	95
	Delivery flow Q_{max}	(lpm)	50 Hz	4.90	5.98	6.53	8.30	9.52	10.74
			60 Hz	5.94	7.26	7.92	10.07	11.55	13.04

3 Parameters

3.1 General

General information

Conformity	▪ Declaration of incorporation according to Machinery Directive 2006/42/EC, see Chapter 6.2, "Explanations" ▪ Declaration of conformity according to Low-Voltage Directive 2006/95/EC, see Chapter 6.2, "Explanations"
Designation	Hydraulic power pack
Design	Valve-controlled radial piston pump or gear pump
Model	Compact hydraulic power pack (closed unit with a pump, electric drive and tank)
Material	Housing: Aluminium
Attachment	M8 threaded holes, see dimensioned drawings
Installation position	Vertical (CPU...S) or horizontal (CPU...L) Take note of the installation instructions for horizontal positioning in section 4.2.
Rotation direction	Radial piston pump – any Gear pump – anticlockwise (Rotation direction only ascertainable from check of delivery flow; if there is no delivery flow in the three-phase version, replace two of the three main conductors)
Speed range	Radial piston pump H: 100 ... 3500 rpm Gear pump Z 1.1 ... Z 2.7: 800 to 4000 rpm Z 3.5 ... Z 8.4: 500 ... 3800 rpm Z 8.8 ... Z 11.3: 500 ... 3500 rpm
Line connection	only via bolted-on connection blocks, connection drilling pattern See Chapter 4.3, "Electrical and hydraulic connections"

Hydraulic fluid	Hydraulic oil: according to DIN 51 524 Part 1 to 3; ISO VG 10 to 68 according to DIN 51 519 Viscosity range: min. approx. 4; max. approx. 800 mm ²/s Optimal operating range: approx. 10 ... 500 mm²/s Also suitable for biologically degradable pressure fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.
Cleanliness level	**ISO 4406** 21/18/15...19/17/13
Temperature	Ambient: approx. -40 ... +80°C, Fluid: -25 ... +80°C, Note the viscosity range! Permissible temperature during start: -40°C (observe start-viscosity!), as long as the service temperature is at least 20K higher for the following operation. Biologically degradable pressure fluids: Observe manufacturer's specifications. By consideration of the compatibility with seal material not over +70°C.

Weight

More possible additional weight per

- Tank size
- Pump type

Weight per motor size		Additional weight per tank size	
Type		**Tank size**	
CPU 34 - 0.37 kW	16.6 kg	0	--
CPU 34 - 0.75 kW	12.5 kg	1	+ 0.6 kg
CPU 34 - 1.5 kW	24.4 kg	2	+ 2.0 kg
		3	+ 2.8 kg
		4	+ 3.8 kg
		5	+ 4.9 kg

Additional weight per pump type

H		Z	
3 x MPE	--	**Z 2.0...Z 4.5**	+ 1.2 kg
6 x MPE	+ 0.3 kg	**Z 5.2**	+ 1.3 kg
3 x PE	+ 0.6 kg	**Z 6.9...Z 9.8**	+ 1.4 kg
		Z 11.3	+ 1.5 kg

3.2 Electrical

Data applies to radial piston pumps and gear pumps
The drive motor forms a closed, inseparable unit with the pump, see description Chapter 1, "Overview of compact hydraulic power pack type CPU".

Port	Version with integrated terminal box, flat plug sleeve 6.3 AMP cable fitting M20 x 1.5 not part of the delivery
Protection class	IP 65 according to IEC 60529
Protection class	VDE 0100 Protection class 1
Insulation	designed in accordance with EN 60664-1

Table 8 Motor data

3-phase motor

Type	Nominal voltage and power frequency U_N (V), f (Hz)	Nominal power P_N (kW)	Rated speed n_N (rpm)	Nominal current I_N (A)	Starting current ratio I_A / I_N	Power factor cos φ	Hydraulic work value (pV_g)max (bar cm³)
CPU 34 - 0.37 kW	3x400 V 50 Hz 3x460 V 60 Hz	0.37 0.44	1360 1700	1.86 1.07	4.0 5.0	0.69 0.70	220 220
CPU 34 - 0.75 kW	3x400 V 50 Hz 3x460 V 60 Hz	0.75 0.86	1380 1655	1.93 1.93	6.0 5.6	0.76 0.75	590 590
CPU 34 - 1.5 kW	3x400 V 50 Hz 3x460 V 60 Hz	1.5 1.8	1390 1665	3.8 3.8	6.5 6.0	0.73 0.73	1150 1150

Temperature switch
Electrical connection See Chapter 4.3

Coding **T**

Technical data:
Bimetallic-element switch

Contact	N/C contact
Switching point	80 ±5°C
Max. voltage	
Nominal current	1.6 A
Max. current at 24 V	1.5 A

Level switch
Electrical connection See Chapter 4.3
Coding **D, S** (horizontal)

Max. DC/AC switching capacity	30 VA
Max. DC/AC current	10.5 A (cos φ = 1)
Max. voltage	230 V DC/AC

Coding **D, S** (vertical)

Coding	**D**	**S**
Max. DC/AC switching capacity	5 W	10 W
Max. DC/AC current	0.25 A	
Max. voltage	50 V DC/AC	

D (N/C contact)

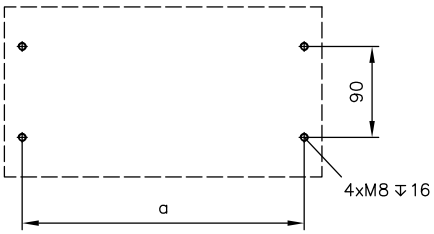
S (N/O contact)

4 Dimensions

All dimensions in mm, subject to change.

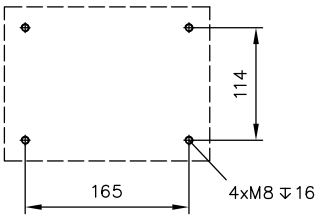
4.1 Mounting hole pattern

Horizontal version coding **L**

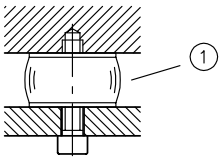


Tank size	a
CPU...0	328
CPU...1	378
CPU...2	484
CPU...3	538
CPU...4	618
CPU...5	698

Vertical version coding **S**



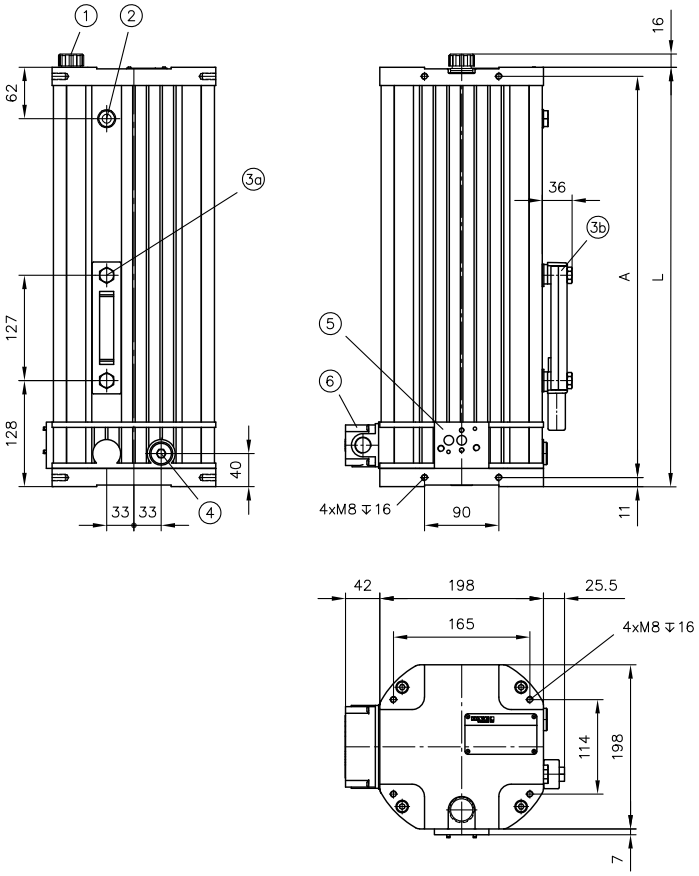
Recommended attachment



1 Damping element ∅40x30/M8 (65 Shore)

4.2 Basic pump

Vertical version

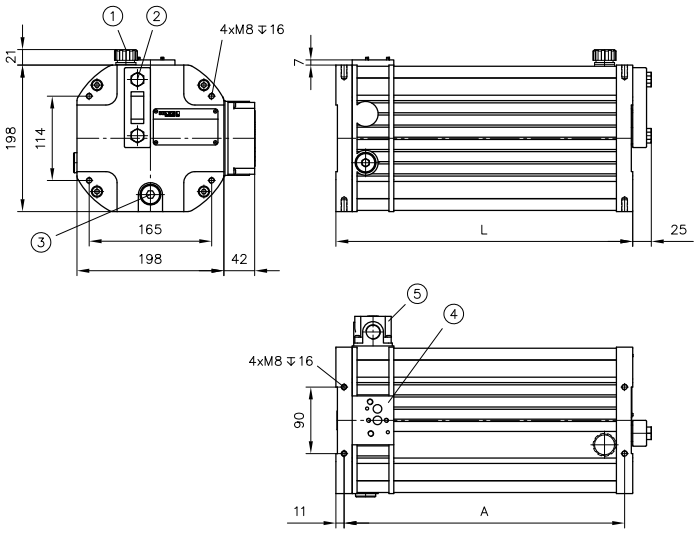


Coding	L	A
0	350	328
1	400	378
2	506	484
3	560	538
4	640	618
5	720	698

1 Bleeding (G 1/2) 10 µm
2 Oil level gauge (K) - round
3a Oil level gauge (pipe) without level switch
3b Oil level gauge (pipe) with level switch
4 Oil drain (G 1/2)
5 Hydraulic connection
6 Electrical connection

NOTE
If a horizontal version is used in a vertical position, ensure that the vent is on top and the built-in internal pump is at the bottom.

Horizontal version



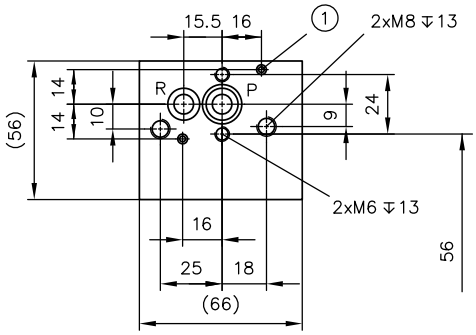
Coding	L	A
0	350	328
1	400	378
2	506	484
3	560	538
4	640	618
5	720	698

1 Bleeding (G 1/2) 10 µm
2 Oil level gauge (K)
3 Oil drain (G 1/2)
4 Hydraulic connection
5 Electrical connection

4.3 Electrical and hydraulic connections

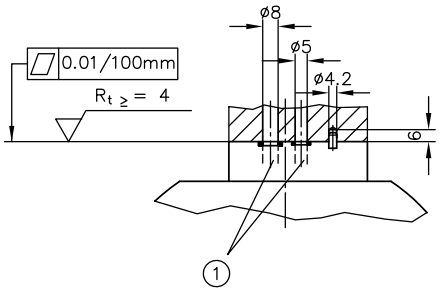
Hydraulic

Pump



1 Centring pin

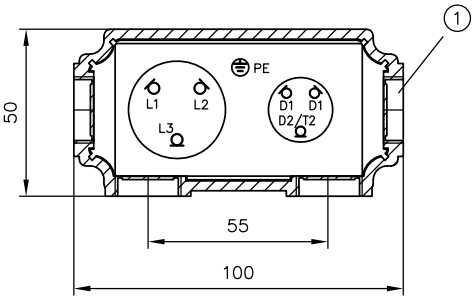
Hole for self-made connection block



1 Sealing of the connections:
P, P1, P3 = 8x2 NBR 90 Sh
R = 10.5x1.4x1.9 NBR (Kantseal)

Electrical

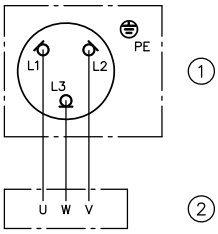
Terminal box



1 4 x M 20 x 1.5; cable fitting / cable gland (not part of the delivery)

Motor connection

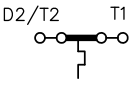
3 x 400/460V 50/60 Hz, Y



1 Connection box
2 CPU motor

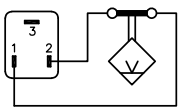
Temperature switch

Coding **T**
(Terminal box)

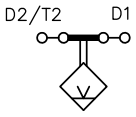


Coding **D, S**

CPU...S
(Connection ISO 6952)



CPU...L
Terminal box



5 Assembly, operation and maintenance recommendations

5.1 Intended use

These hydraulic components is intended exclusively for hydraulic applications (fluid technology).

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

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 qualified personnel.
- The product must only be operated within the specified technical parameters. The technical parameters are described in detail in this documentation.
- The operating and maintenance manual of 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 dismounting (in particular in combination with hydraulic accumulators).

⚠ **DANGER**

Risk to life caused by sudden movement of the hydraulic drives when dismantled incorrectly!

Risk of serious injury or death.

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

NOTE

The pump unit may only be installed and connected by a qualified specialist who is familiar with and adheres to general engineering principles and relevant applicable regulations and standards.

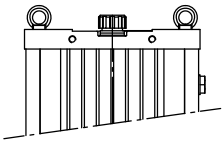
The electrical connection is to be carried out by a qualified specialist who has received appropriate training.

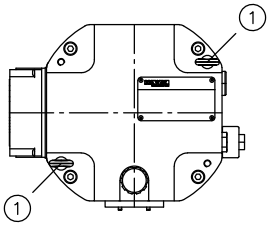
The following directives and standards must be observed:

- ISO 4413 Hydraulic fluid power – general rules for application
- D 5488/1 Oil recommendations
- B 5488 General operating and maintenance manual

5.2.1 Transport notes

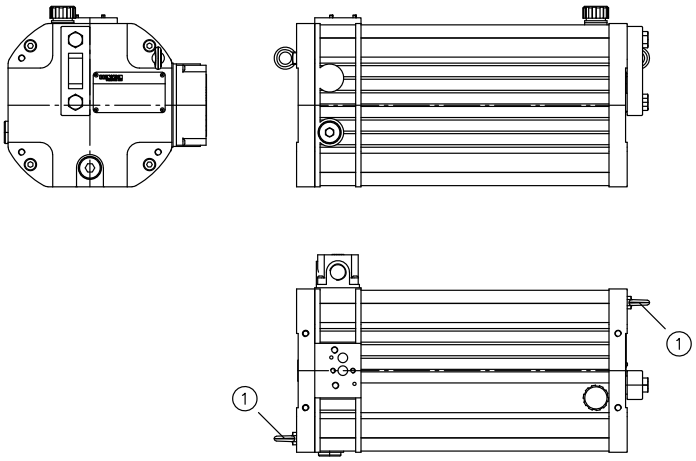
Vertical version





1 Eye-bolt screw-in points

Horizontal version



1 Eye-bolt screw-in points

The eye-bolts are contained in the scope of delivery of the CPU hydraulic power pack.

Material number 6016 1203-00
Eye-bolt ISO 3266 M8 x 13

5.2.2 Identification

See type plate or option table

5.2.3 Setting up and attaching

- Set-up

DANGER

Risk of injury due to hot compact hydraulic power pack and hot directional valve solenoids during operation.

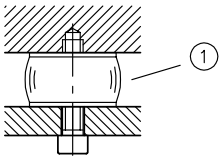
Danger of burning.

- Do not touch the compact hydraulic power pack or directional valve solenoids during operation.
- Allow the compact hydraulic power pack and directional valve solenoids to cool down before any work.
- Wear protective gloves.

NOTE

If surface temperatures >60°C occur during operation, isolating safety devices are to be provided. Ensure that fresh air can be drawn in and that warm air can escape. No changes of any kind (mechanical, welding or soldering work) may be made.

- Installation position in accordance with version, see Chapter 2.1, "Motor and container", Table 1c
- For dimensions, see Chapter 4.2, "Basic pump"
- For mounting hole pattern, see Chapter 4.1, "Mounting hole pattern"
- Recommended attachment



1 Damping element ∅40x30/M8 (65 Shore)

- Weight (for the basic power pack, without valve mounting and oil filling)
  See Chapter 3.1, "General", weight

5.2.4 Electrical connection and selection of the motor protection circuit-breaker

- Connecting the electric drive (see Chapter 3.2, "Electrical")
- Connecting the float and level gauge (see Chapter 3.2, "Electrical")

> **NOTE**
> Response temperature in accordance with the built-in temperature switch (see Chapter 2.1, "Motor and container", Table 1d and Chapter 3.2, "Electrical").

> **NOTE**
> If the amount of oil removed during each operating cycle causes the oil level to fall below the monitoring level of the level switch, then suitable electrical measures are to be taken in order to ignore the signal until the oil level rises above the monitoring level once again as a result of the oil flowing back in at the end of the operating cycle.

- Setting the motor protection circuit breaker
  - The motor protection circuit is set to approximately (0.85 ... 0.9) I_N (see motor current Chapter 3.2, "Electrical"). This ensures that the motor protection circuit breaker is not triggered prematurely during normal operation, but that the response of the pressure-limiting valve before switch-off is not so long that the max. permissible oil temperature is exceeded.
  - The settings of the motor protection circuit breaker must be checked during the test run. Temperature switches, level switches and pressure switches are further safety measures against malfunctions.

5.2.5 Information on ensuring EMC (electromagnetic compatibility)

If compact hydraulic power packs (induction machine in accordance with EN 60034-1 Section 12.1.2.1) are connected to a system (for example, power supply in accordance with EN 60034-1 Section 6), they do not generate any impermissible fault signals (EN 60034-1 Section 19). Tests of immunity to interference to verify compliance with the standards EN 60034-1 Section 12.1.2.1 and VDE 0530-1 are not required. Any brief and potentially disruptive electromagnetic fields generated when switching the motor on and off can be weakened, for example, using suppressor type 23140, 3x400 V AC 4 kW 50-60 Hz, made by Murr-Elektronik, D-71570 Oppenweiler, Germany.

5.3 Operating instructions

Note product configuration and pressure / flow rate

The statements and technical parameters in this documentation must be strictly observed.
The instructions for the complete technical system must also always be followed.

NOTE

- 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

Risk of injury on overloading components due to incorrect pressure settings!
Risk of minor injury.

- 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 hydraulic component. Contamination can cause irreparable damage.

Examples of fine contamination include:

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

NOTE

Fresh hydraulic fluid from the drum does not always have the necessary degree of purity.
When pouring in hydraulic fluid, filter it.

Pay attention to the cleanliness level of the hydraulic fluid to maintain faultless operation.
(See also cleanliness level in Chapter 3, "Parameters")

Additionally applicable document: D 5488/1 Oil recommendations

Always fill the hydraulic fluid via the system filter or a mobile filter station.

Check for correct connection

- Electrical: power supply, control
- Hydraulic: piping, hoses, cylinders, motors
- Mechanical: attachment to the machine, the frame and the base

Motor protection

- The electric drive must be protected with a motor protection circuit.

Fill volume and usable volume

	CPU 34 - 0.37 kW			CPU 34 - 0.75 kW			CPU 34 - 1.5 kW		
Coding	Fill volume V_{fill} (l)	Usable volume V_{usable} (l)		Fill volume V_{usable} (l)	Usable volume V_{usable} (l)		Fill volume V_{usable} (l)	Usable volume V_{usable} (l)	
		Vertical	Horizontal		Vertical	Horizontal		Vertical	Horizontal
0	6.5	3.0	4.3	6.0	2.5	3.0	---	---	---
1	7.8	4.3	5.0	7.0	3.5	3.5	6.4	2.9	3.2
2	10.5	7.0	5.3	9.8	6.3	5.2	9.2	5.8	4.7
3	12	8.5	6.3	11.1	7.7	5.5	10.6	7.2	5.6
4	14.0	10.5	7.3	13.2	9.8	6.7	12.7	9.3	6.4
5	16.1	12.6	8.5	15.2	11.8	7.7	14.8	11.3	7.5

Rotation direction

- Radial piston pump – any
- Gear pump – anticlockwise

Start and bleeding

☑ Directional valve is in switching position in which the depressurised circulation of the pump is possible.

1. Switch the pump on and off several times so that the pump cylinders bleed automatically.

☑ If the controller is not designed for this,

2. a pipe screw connection with a short pipe bracket and a transparent plastic tube can be attached to connection P.
3. Insert the other end into the opening for the oil filler (unscrew the air filter).

✓ When the oil flow is free of bubbles, the pump has been bled.

4. Then move the consumer(s) back and forth several times until the air is largely removed there too and the movement is smooth.
5. If the consumers have bleed points, loosen the locking elements and only tighten them once bubble-free oil emerges.

Directional valves

– Any solenoid valves must be connected to the controller in accordance with the hydraulic schematic and function diagram.

Accumulator systems

– Accumulators should be filled using designated equipment in accordance with the pressure specifications of the hydraulic schematic. The relevant operating and maintenance manuals must be followed.

⚠ **CAUTION**

Risk of injury due to incorrect transportation.

Risk of minor injury.

- Comply with the regulations on transportation and safety.
- Wear protective equipment.

5.4 Maintenance information

Conduct a visual inspection at regular intervals, but at least once per year, to check if the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the device surface of dust deposits and dirt at regular intervals, but at least once per year.

NOTE
Before starting maintenance or repair work:

- Depressurise the system on the fluid side. This applies in particular for systems with hydraulic accumulators.
- Switch off or interrupt the power supply.

Repairs and spare parts

– Repairs (replacement of wearing parts) can be carried out by trained specialists themselves. A spare parts list is available on request. The electric drive cannot be replaced.

5.4.1 Disposal information

- Valve control
  - Mixed scrap
- Pump housing with motor
  - Electronic waste
- Tank or hydraulic accumulator, as applicable (depressurised on the gas side)
  - Scrap iron
- Hydraulic fluid
  - Waste oil

6 Other information

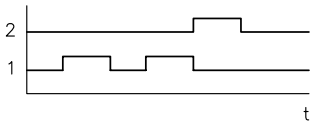
6.1 Planning information

6.1.1 Selection advice

The procedure for the selection and design of compact hydraulic power packs with a valve attachment is described below. In order to find the ideal solution, several iterative steps generally have to be carried out.

a) Setting up a function diagram

The required or desired (hydraulically activated) functions form the basis for the function diagram.



b) Definition of pressures and flow rates

- Dimensioning and selection of actuators on the basis of the reaction forces arising
- Calculation of the individual flow rates on the basis of the required velocity profiles

> **NOTE**
> Take note of the reset times for spring-loaded clamping cylinders.

In the case of time-linked clamping devices, the release of spring-loaded clamping cylinders may often have a greater influence over the time interval than clamping. The return stroke times are determined exclusively by the forces of the reset springs. They drive the cylinder pistons ahead, against the flow resistance from directional valves and pipelines. This must be noted in the dimensions of pipelines or hose lines, as well as valves.

- Calculation of the individual operation pressures required
- Determination of the maximum (pump) delivery flow required – Q (lpm)
- Determination of the (system) operating pressure – p_{max} (bar)

Q - flow rate

p - pressure

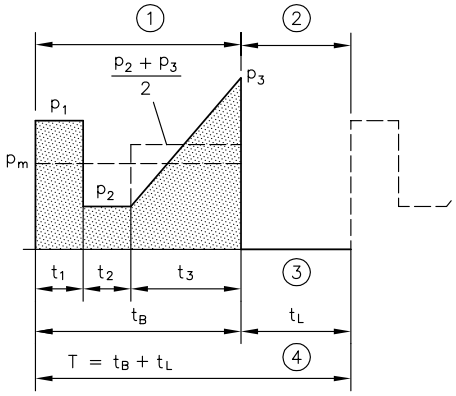
A - Area

v - Velocity

F - Force

$$Q\left(l/\min\right) = 0.06 \cdot A\left(mm^2\right) \cdot v\left(\frac{m}{s}\right)$$

$$p\left(bar\right) = \frac{10 \cdot F(N)}{A(mm^2)}$$



1 Load time

2 No-load time

3 No load

4 One working cycle

c) Preparation of the hydraulic schematic

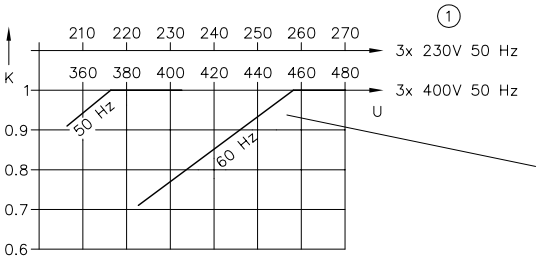
- Criteria:
  - single circuit system
  - Accumulator charging mode
  - Dual-circuit systems with two separately operating hydraulics circuits
  - Dual-circuit systems with a shared hydraulics circuit (for instance, in presses or hydraulic tools as high-pressure systems / low-pressure systems, in handling systems with velocity controlrapid feed/creep)
  - Use of an accumulator for the short-term support of the pump delivery flow

d) Setting up a time/load diagram on the basis of a function diagram

- Deriving the mode for the compact hydraulic power pack
  - Calculation of the relative ON-time %ED
  - S1 – continuous operation (not suitable for compact hydraulic power packs)
  - S2 – short period operation
  - S3 – standby mode

e) Selection of a compact hydraulic power pack

- Definition of the basic type on the basis of the power supply
  - Three-phase current
- Motor selection
  - Voltage tolerances: ± 10% (IEC 38), at 3x460/265 V 60 Hz ± 5%
  - A 3-phase motor 400 V 50 Hz can be used without restrictions in 460 V 60 Hz supply networks.
    Single-phase-motors can only be used in supply networks at the nominal voltage and nominal frequency.
  - It can be operated at undervoltage. Bear in mind that this will involve performance restrictions.
    $p_{max\ red} = p_{max} * k$
    p_{max} (bar) – max. operating pressure in accordance with the selection tables
    $p_{max\ red}$ (bar) – reduced max. available operating pressure
    * k – correction factor from the diagram



U supply voltage (V); K correction factor

1 Motor design

NOTE
Pump delivery flow 1.2 x greater than at 50 Hz operation!

- Selection of the pump type (radial piston pump, gear pump pump combination)
- Selection of the key figure for the pump delivery flow with due regard for the maximum permissible pressure and definition of the basic type with the motor size
- Estimation of the noise level from the diagrams in Chapter 3, "Parameters"

f) Calculation of the hydraulic work value

- Calculation of the average pressure
- Calculation of the average hydraulic work value (average pressure x output volume)
- Calculation of the maximum hydraulic work value (maximum operating pressure x output volume)

p_m (bar) = calculated average pressure per cycle during the load time

$t_B = t_1 + t_2 + t_3 + \ldots$

$$p_m = \frac{1}{t_B}\left(p_1 \cdot t_1 + p_2 \cdot t_2 + \frac{p_2 + p_3}{2} \cdot t_3 + \ldots\right)$$

$p_m V_g$ = average hydraulic work value

V_g = geometric displacement volume in accordance with the tables Chapter 2.2, "Pump"

$pV_{g\ max}$ (bar cm³) = $p_{max} * V_g$

EU-Konformitätserklärung

EU Declaration of Conformity

Wir — HAWE Oil.Hydraulic Technology (Shanghai) Co., Ltd.
We

mit Hauptsitz — *No.155 Jindian Road, Pudong*
with head office — *201206 Shanghai*

erklären hiermit unter alleiniger Verantwortung, dass das Produkt
declare under our sole responsibility that the product

Kompaktaggregat Typ CPU

nach unserer Dokumentation D 8010 CPU
according to our pamphlet

mit den Anforderungen folgender Europäischen Richtlinien übereinstimmt:
is conforming with the following European Directives:

2014/35/EU (Niederspannungsrichtlinie/Low Voltage)

Die Konformität des oben genannten Produktes wurde durch die Anwendung folgender Normen sichergestellt:
The compliance of the product named above was proved by following standards:

EN 60034-1:2010

Das bezeichnete Produkt ist zum Einbau an/in eine andere Maschine bestimmt.
Diese Erklärung ist keine Zusicherung von Eigenschaften im Sinne einer Produkthaftung. Die Sicherheitshinweise der Produktdokumentation sind zu beachten.
The designated product is intended for installation into/to another machine. This statement does not provide a confirmation of product characteristics in terms of product liability.
Safety instructions stated in the product dokumentation must be adhered to.

14.03.2019

VP -R&D Zhou Chengen

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Vorsitzender des Aufsichtsrats: Hans-Jürgen Thaus · Ehrenvorsitzender des Aufsichtsrats: Joachim Gommlich
Hypo-Vereinsbank München, 1780008454 (BLZ 700 202 70), IBAN DE53 7002 0270 1780 0084 54, BIC HYVEDEMMXXX
Commerzbank München, 150623700 (BLZ 700 400 41), IBAN DE56 7004 0041 0150 6237 00, BIC COBADEFFXXX
Baden-Württembergische Bank, 2368049 (BLZ 600 501 01), IBAN DE90 6005 0101 0002 3680 49, BIC SOLADEST
Bayerische Landesbank, 203693428 (BLZ 700 500 00), IBAN DE86 7005 0000 0203 6934 28, BIC BYLADEMMXXX

Zertifiziert nach
ISO 9001:2015
ISO 14001:2015
ISO 50001
OHSAS 18001

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HAWE Oil-Hydraulic Technology (Shanghai) Co., Ltd.

Declaration of Incorporation within the meaning of the Machinery Directive 2006/42/EC, appendix II, No.1 B

Compact hydraulic power pack type CPU
acc. to our **documentation D 8010 CPU**

is an incomplete machine (acc. to article 2g), which is exclusively intended for installation or assembly of another machinery or equipment.
The specific technical documents, necessary acc. to appendix VII B, can be prepared any time and transmitted in electronic form to the responsible national authority on request.
Risk assessment and analysis are implemented according to appendix I of the Machinery Directive.
The dept. Product, Application & Service is authorized to compile the specific technical documents necessary acc. to appendix VII B.

HAWE Oil-hydraulic technology (Shanghai) Co., Ltd.
No.155 Jindian Road, Pudong, 201206 Shanghai

The following basic safety and health protection requests acc. to appendix I of this guideline do apply and are complying with:
Chapter 1.1.2, 1.1.3, 1.1.5, 1.2 (complete chapter), 1.3.1, 1.3.2, 1.3.4, 1.3.6, 1.3.7, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 1.5.6, 1.5.8, 1.5.9, 1.5.16, 1.6.3, 1.7.1, 1.7.3, 1.7.4 and 1.7.4.3.

The incomplete machine also fulfills below shown EU-Directives:
2014/35/EU:2014-02-26 Directive of electrical equipment designed for use within certain voltage limits
2014/68/EU:2014-05-15 Pressure equipment Directive (applicable if an accumulator is used)

Following harmonized guidelines have been used:
EN 12100-1:2011-03 Safety of machinery - General principles for design
EN ISO 4413:2011-04 Hydraulic fluid power - General rules and safety requirements for systems and their components
EN 60204-1:2014-10 Safety of machinery - Electrical equipment of machines - Part 1: General requirements

We assume that the delivered equipment is intended for the installation into a machine.
Putting in operation is forbidden until it has been verified that the machine, where our products shall be installed, is complying with the Machinery Directive 2006/42/EC.
This Declaration of Incorporation is void, when our product has been modified without our written approval.

2019-02-19

VP- R&D Zhou Chengen

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Further information

Additional versions

- Hydraulic power pack type FXU: D 6020
- Compact hydraulic power packs type KA and KAW size 4: D 8010-4
- Compact hydraulic power pack type KA and KAW size 2: D 8010
- Compact hydraulic power pack type MPN and MPNW: D 7207
- Compact hydraulic power pack type HK 2: D 7600-2
- Compact hydraulic power pack type HK 3: D 7600-3
- Compact hydraulic power pack type HKL and HKLW: D 7600-3L
- Compact hydraulic power pack type HK 4: D 7600-4
- Compact hydraulic power pack type HC and HCW: D 7900
- Compact hydraulic power pack type NPC: D 7940
- 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
- Valve bank (directional seated valve) type VB: D 7302
- Valve bank (directional seated valve) type BWN and BWH: D 7470 B/1
- Directional spool valve type SW: D 7451
- Directional spool valve bank type SWS: D 7951
- Valve bank (nominal size 6) type BA: D 7788
- Valve bank (directional seated valve) type BVH: D 7788 BV
- Directional seated valve type NBVP 16: D 7765 N
- Directional spool valve type NSWP 2: D 7451 N
- Clamping module type NSMD: D 7787
- Intermediate plate type NZP: D 7788 Z
- Fitting type X 84: D 7077
- Diaphragm accumulator type AC: D 7969
- Miniature hydraulic accumulators, type AC: D 7571

D 8010 CPU - 08-2019-1.3

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