

Type KA4 compact hydraulic power pack

Assembly instructions
with operating and maintenance information



Hydraulic power pack with radial piston or gear pump
and integrated electric drive



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1 About these instructions

This manual is part of the product and describes the safe and proper use in all operating phases.

All photos and drawings in this manual show an available product variant. For precise details concerning the variant you have purchased, please refer to the type plate attached to the product.

-  ▶ Read instructions before use.
- ▶ Make the manual accessible to operating and maintenance personnel at all times.
- ▶ Keep this manual for the lifetime of the product.
- ▶ Only pass on the product to third parties together with this manual.

1.1 Target audience

The target audience of this manual is trained and qualified personnel who are familiar with the installation, operation and maintenance of machines.

The manual provides relevant information for the machine manufacturer and machine operator as well as for training courses.






1.2 Applicable documents

Title/purpose	Document
Machine manufacturer's hydraulic and electrical connection schematic Document required to install hydraulic power pack correctly in entire machine	Manufacturer's operating instructions
Data sheet Characteristics and application ranges for this product	D 8010-4
Oil recommendations	D 5488/1
Optional add-ons to hydraulic power pack from other manufacturers e.g. hydraulic accumulator, filter etc.	Manufacturer's operating instructions
Declaration of incorporation	"Declaration of incorporation (EU)", page 57 "Declaration of incorporation (UK)", page 58
Declaration of conformity	"Declaration of conformity (EU)", page 59 "Declaration of conformity (UK)", page 60













1.3 Safety instructions and symbols

Safety indication




In these instructions, the following warning and safety notes are used:

Symbol	Meaning
	Draws your attention to a hazardous situation that can lead directly to serious injury or death if not avoided.
	Draws your attention to a hazardous situation that can indirectly lead to serious injury or death if not avoided.
	Draws your attention to a hazardous situation that can indirectly lead to light to moderate injury if not avoided.
	Notice to prevent environmental and material damage.
	Information to ensure the correct use of the product.

Safety symbols

	General safety symbol Draws your attention to additional safety information.		
	Slipping hazard		Dragging hazard from moving parts
	Harmful substances		Tripping and falling hazard
	Fire accelerants		Falling loads
	Burn hazard		Crushing hazard
	Electrical voltage		Suspended loads
	No access to persons with pacemakers and defibrillators		

Mandatory signs

Protective equipment	
	Safety boots Wear appropriate safety boots to protect your feet against mechanical hazards
	Work gloves Wear suitable work gloves to protect your hands against chemical and mechanical hazards.
	Safety goggles Wear safety goggles to protect your eyes against chemical and mechanical hazards.

Protective equipment**Protective clothing**

- ▶ Wear fitted clothing without protruding parts.
- ▶ Follow the safety data sheet of the hydraulic fluid.

The product is built according to the state of the art and recognized safety regulations.

Nevertheless, there is a risk of personal injury and damage to property if this chapter and the safety instructions in this manual are not observed.

2.1 Intended use

The compact hydraulic power pack is designed as a hydraulic fluid supply in hydraulic systems.

The compact hydraulic power pack is designed for the following operating modes

- S2: Short period operation
- S3: Periodic intermittent operation

- The product is a technical work tool and intended for commercial and industrial use only.
- The product may only be operated in accordance with the technical data, operating conditions and performance limits specified in this manual.
- Only use original accessories and original spare parts approved by the manufacturer.



Partly completed machinery

The product is a partly completed machine according to the EC Machinery Directive 2006/42/EC and is intended exclusively for installation in a machine or system. The product is controlled via the manufacturer's machine / plant control.

- ▶ Comply with the manufacturer's operating instructions.

2.2 Misuse

- Use in other operating modes than specified in the intended use
- Using the product beyond the specified performance limits

- Use of hydraulic fluids other than those specified in these instructions
- Connecting consumers other than those specified
- Improperly installed, outdated, un-secured or damaged pipes and hose lines
- Use in atmospheres at risk of explosion
- Structural changes, especially if function and safety are compromised

2.3 Residual risks

⚠ DANGER

Danger from hydraulically operated parts when installing the compact hydraulic power pack in a complete system

Risk of serious or fatal injury

The compact hydraulic power pack produces, directs or regulates flow rates. These flows usually power hydraulic consumers in machines or systems.

- ▶ Observe the compact hydraulic power pack's project documentation when incorporating it into a machine or system.
- ▶ Note that new potential dangers may arise when the compact hydraulic power pack is incorporated into a complete system.
- ▶ Assess and document the new dangers in the complete system's manual.

⚠ WARNING

Fire hazard due to flammable and oxidising hydraulic fluid.

Risk of serious injury or death.

- ▶ Avoid fire and open light and do not smoke anywhere near the hydraulic power pack.
- ▶ Ensure that no hydraulic fluid can escape.
- ▶ Do not use any flammable or corrosive cleaning agents.
- ▶ Observe the safety data sheet from the hydraulic fluid manufacturer.
- ▶ Shield ignition sources with a surface temperature of > 200°C.

⚠ CAUTION

Danger of burning due to hot metal surfaces on the hydraulic power pack, particularly on the tank, motor, valve blocks and valves.

Risk of minor burns

- ▶ Do not touch the hydraulic power pack or directional valve solenoids during operation.
- ▶ Allow the hydraulic power pack and directional valve solenoids to cool down before any work.
- ▶ Wear protective gloves.
- ▶ If surface temperatures >60°C occur during operation, set up safety barriers.
- ▶ 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.

⚠ CAUTION

Exposure to hydraulic fluid.

Health risk.

- ▶ Wear protective gloves and goggles.
- ▶ Avoid prolonged skin contact with hydraulic fluids.
- ▶ Thoroughly wash any body parts exposed to hydraulic fluid.
- ▶ Observe safety instructions on the safety data sheet of the hydraulic fluid manufacturer.

⚠ CAUTION**Risk of falling from leaking hydraulic fluid**

Spilled or leaked hydraulic fluid can form a slippery film on the floor.

- ▶ Use suitable aids when filling or bleeding.
- ▶ Check all connecting elements that convey oil for leaks before switching on the motor in the parent system.
- ▶ Wipe up leaked hydraulic fluid with suitable aids.

2.4 Duties of the operator

Observe and comply with regulations:

- ▶ Do not put the product into operation until the complete machine or system complies with the country-specific regulations, safety regulations and standards of the application.
- ▶ Observe and apply regulations for accident prevention and environmental protection.

Operate product safely:

- ▶ Despite safety devices, the product still poses residual risks. Observe the safety instructions in this manual to reduce health hazards and avoid dangerous situations.
- ▶ The operator must ensure that the operating conditions (see general, hydraulic and electrical data) are within the operating limits of the product.
- ▶ Keep all instructions / signs on the product in legible condition and observe them.

Instruct personnel:

- ▶ Regularly train the personnel in all points of these instructions and ensure that they are observed.
- ▶ Ensure the terms of the industrial safety and operating instructions are observed.
- ▶ Only use qualified personnel. Due to their training and experience, the qualified personnel must be able to recognize risks and avoid possible hazards.

2.5 Qualification of the personnel

The activities described in these instructions require basic knowledge of mechanics, hydraulics and electrics.

For the transport and handling of heavy loads, additional knowledge in handling hoists and slings is required.

- ▶ The activities may only be carried out by an appropriate specialist or an instructed person under the supervision of a specialist.
- ▶ Activities other than those described in these instructions may only be performed by HAWE or authorized specialist companies.
- ▶ The personnel must have read and understood these instructions.

Trained personnel

Personnel instructed comprehensively, by skilled staff on behalf of the owner, in how to perform their appointed tasks and in how to use the product safely.

Specialist personnel

Due to their technical training, knowledge and experience, specialists are able to assess and carry out the assigned work and can independently recognize possible dangers.

Qualified electrician

A person with appropriate professional training, knowledge and experience, so that he/she can recognize and avoid dangers that can be caused by electricity.

Auditor

Persons of a technical inspection body who are authorized to perform testing and monitoring tasks for pressure equipment and electrical systems.

2.6 Personal protective equipment

Personal protective equipment is designed to prevent and reduce hazards.

In the instructions, safety instructions with mandatory symbols indicate the wearing of special protective equipment for special activities.

Instruction and supply is carried out by the operator.

3 About this product

3.1 Identification

Order coding and type plate shown are only an example.

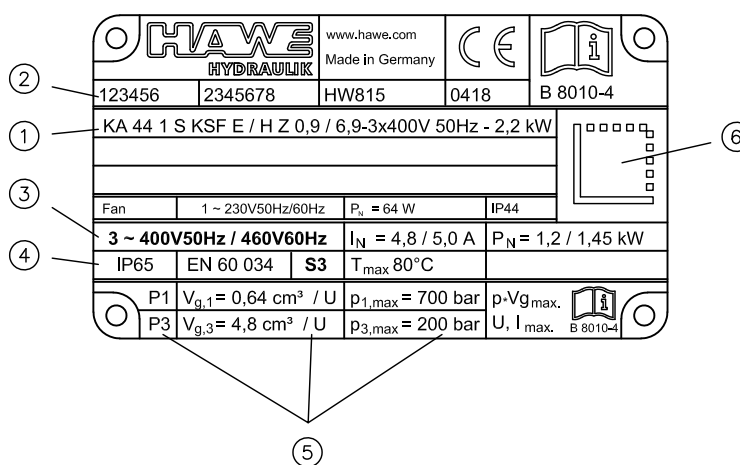
KA 42	1	S	K	/	HZ 2,45/ 3,5			- 3x400 V 50 Hz - 3,9 kW		
KA 44		S	KS	E/	H 5,1	- AB 1 K C 280		- 3x400 V 50 Hz - 2,0 kW		
KA 44	12	L	KDT	/	HH 1,5/ 1,5	- NA 21	- FSR-24V	- 3x400 V 50 Hz - 2,35 kW		
KA 404	22	L1	KTF	P/	Z 8,8	- AB 1 K C 80		- 3x400 V 50 Hz - 0,75 kW	/24 V DC	- G 3/4 x 300

										Oil drain hose
										Fan motor voltage (additional option)
										Motor voltage and nominal power
										Fan (on side)
										Valve combination acc. to commission number
										Pump version
										Electrical connection
										Additional options
										Installation position
										Tank size
										Basic type and motor power

Type plate

The commission number on the type plate identifies the product uniquely and completely, including all fitted components.

The data are stored with the manufacturer and encoded in the DataMatrix on the type plate.



- 1 Order coding, type coding
- 2
 - Customer order, commission number
 - Production order
 - Customer material number
 - Date of manufacture (week XX in Year XX)
- 3
 - Motor voltage/power frequency
 - Nominal current I_N (50 Hz/60 Hz)
 - Nominal power P_N (50 Hz/60 Hz)

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

- 4
 - Protection class
 - EN standard
 - Operating mode
 - max. temperature
- 5
 - Pump port (P1 = single circuit, P3 = dual circuit)
 - Geometric output volume V_G (cm³/rev)
 - Pump's max. permissible operating pressure
- 6 DataMatrix code

3.2 Product description

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 drive also acts as the pump shaft. Compact hydraulic power packs are designed to supply hydraulic circuits with hydraulic fluid.

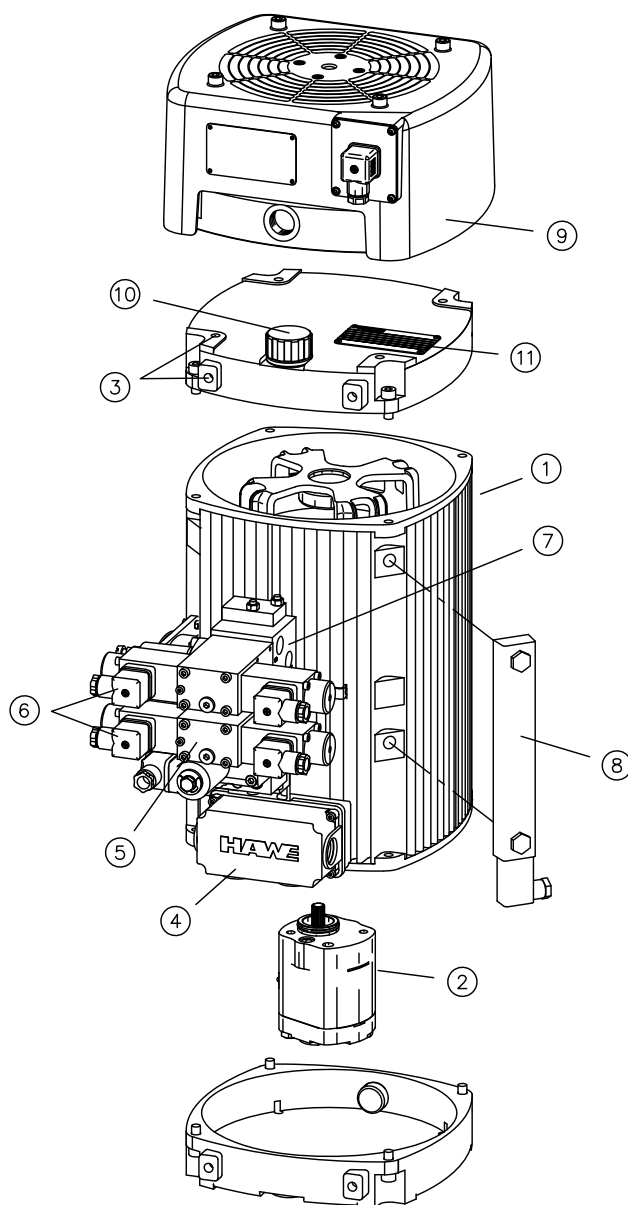
The compact hydraulic power pack type KA consists of the tank, the integrated motor and the radial piston or gear pump directly attached to the motor shaft. The compact design that this achieves is a crucial advantage compared to conventional hydraulic power packs.

The compact hydraulic power pack's uncompromisingly module design will enable you to quickly and easily set up a variety of usage volumes and sizes. Compatible, ready-for-connection, complete solutions can be assembled easily using a wide range of connection blocks and the valve banks that can be combined with them.



Compact power pack type KA 4

3.3 Assembly



- 1 Hydraulic fluid tank with motor
- 2 Pump
- 3 Fastening, e.g. for transport eyelets
Here: 2 x eye-bolts
- 4 Terminal box for electrically connecting motor and monitoring components, e.g. temperature and level switches
- 5 Connection block and valve bank
- 6 Electrical connection of valves and monitoring components, e.g. pressure switches
- 7 Hydraulic connection to consumers
- 8 Level gauge
- 9 Fan
- 10 Hydraulic fluid filler neck and breather filter
- 11 Type plate

4 Transport and storage

4.1 Safety instructions

WARNING

Falling, tipping and toppling heavy loads

Risk of serious injury

- ▶ Make sure that the danger zone, the area beneath suspended loads and the transport path is clear of people.
- ▶ Wear proper PPE.

NOTICE

Risk of damage from improper transport

- ▶ Only use the intended eyelets for transport.
- ▶ Make sure that belts or chains do not tear or knock components off the hydraulic power pack during transport.

NOTICE

Pollution from transport while filled with hydraulic fluid

Hydraulic fluid must be prevented from escaping into the environment.


- ▶ When transporting after prior use, drain the hydraulic fluid from the tank.
- ▶ Collect cleaning, operating and lubrication fluids and consumable materials in suitable containers and dispose of them according to local regulations.

4.2 Transport

Transporting the product

- Make sure that the eye-bolts are firmly attached, that there are enough of them and that they are in the correct positions on the hydraulic power pack.
- ▶ Use the specified eye-bolts when moving the unit using belts, chains or carry handles.
- ▶ Transport methods depend on the hydraulic power pack's weight, see "Technical data", page 54.
- ▶ Use suitable lifting gear and industrial trucks or have two people lift and carry the unit by its carry handles.

Attachment points for transport eye-bolts

-  The eye-bolts are included with the product.

4.3 Scope of delivery

Included in scope of delivery

- Hydraulic power pack (motor and pump in tank) with power connection (terminal box or Harting plug) and, if applicable, suppressor
- 2 transport eye-bolts on container
- Breather filter, with oil dipstick on some versions
- Oil drain screw or oil drain hose
- Cap for oil filler or filler reduction with screen

Additional accessories

depending on the variant chosen.



Type-specific parameters are listed on the product's type plate, e.g.: Data on motor and pump power.

For further technical data, refer to HAWE publication **D 8010**.

"Applicable documents", page 5

Not included in scope of delivery

Electrical connection

- Line connector M12x1, 5-pin for option **KD, KS** (vertical version):
(Coding **KD, KS** is level gauge with N/C or N/O contact switch)

Motor

- Motor protection circuit

Accessories for commissioning

- Damping elements for fastening
- Hydraulic fluid
- Electronic controller elements for the hydraulic system

4.4 Checking the delivery

Unpacking and inspecting

1. Take out the product. Use the eye-bolts to help when doing so.
2. Check that the product is complete and check for transport damage.
 - If there is any damage, refuse shipment or sign for damage when accepting it.
 - Note all transport damage on the transport documents or the carrier's delivery note.
 - Take photos of any product damage and submit a claim to the manufacturer immediately.
3. Dispose of the packaging in accordance with local regulations.

4.5 Storage

NOTICE

Damage from incorrect storage

Protect the product from soiling and damage.

- ▶ Keep the product wrapped in a plastic bag when storing it to protect it from dust and constant air circulation.
- ▶ Seal all hydraulic fluid ports with caps or dummy plugs.
- ▶ Store the product in a position matching its intended mounting position, with the hydraulic fluid filler port at the top and the fluid drain at the bottom.

Storage conditions

Storage space	<ul style="list-style-type: none">▪ dark▪ keep away from direct sunlight and other light sources with heavy UV share▪ constant temperature and humidity▪ do not store close to facilities that produce ozone (electric drives, high-voltage equipment or similar)
Storage temperature	+15°C to +20°C
Relative humidity	65% +/- 10%

5 Assembly and installation

5.1 Mechanical connection

Assembly

Setting up and attaching

1. Check the order coding to identify the intended mounting position.
 - Vertical (type: **KA...S...**) or
 - Horizontal (type: **KA...L...**)
2. Check that the support/frame possesses sufficient load capacity. This depends on the hydraulic power pack's weight.
3. Drill fastening holes as instructed by the mounting hole pattern.
4. Bolt into the M8 threaded holes using the recommended damping elements.

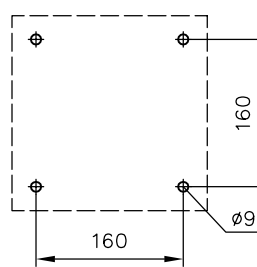
- i**
- The horizontal version can also be incorporated vertically.
 - If you are installing a horizontal version vertically:
 - Position with bleeder at top.
 - Position the integrated pump at the bottom.
 - Turn only the top housing covers, keep the extensions in their original positions.

Mounting hole pattern

Horizontal version coding **L**

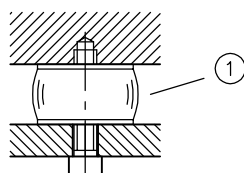


Vertical version coding **S**



Coding tank size	a	Coding tank size	a
Without coding	375	22, 3	875
1, 01	480	41	835
11	585	31, 5	980
2, 02	625	51	1085
12, 21, 4	730		

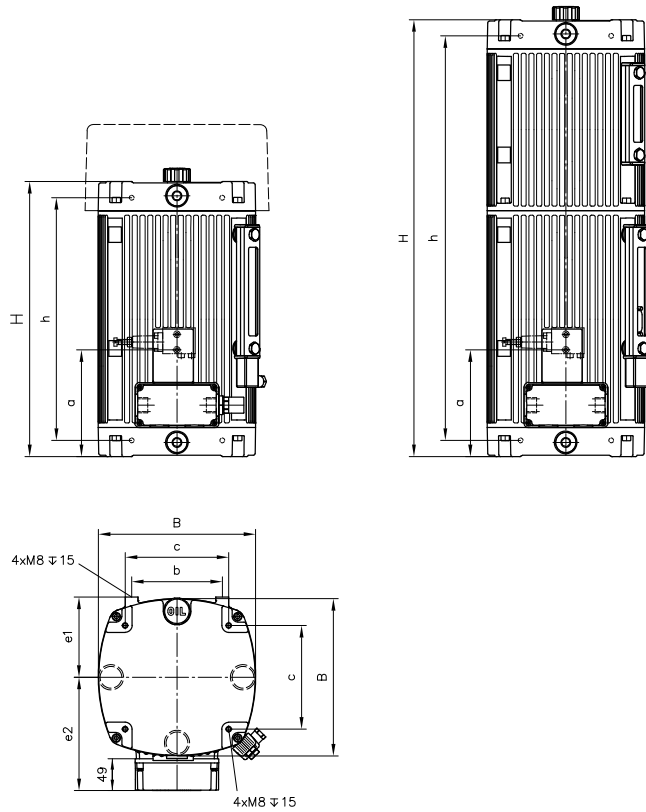
Recommended fastening with damping element



1 Damping element $\phi 40 \times 30 / M8$ (65 Shore)

5.1.1 Pump dimensions

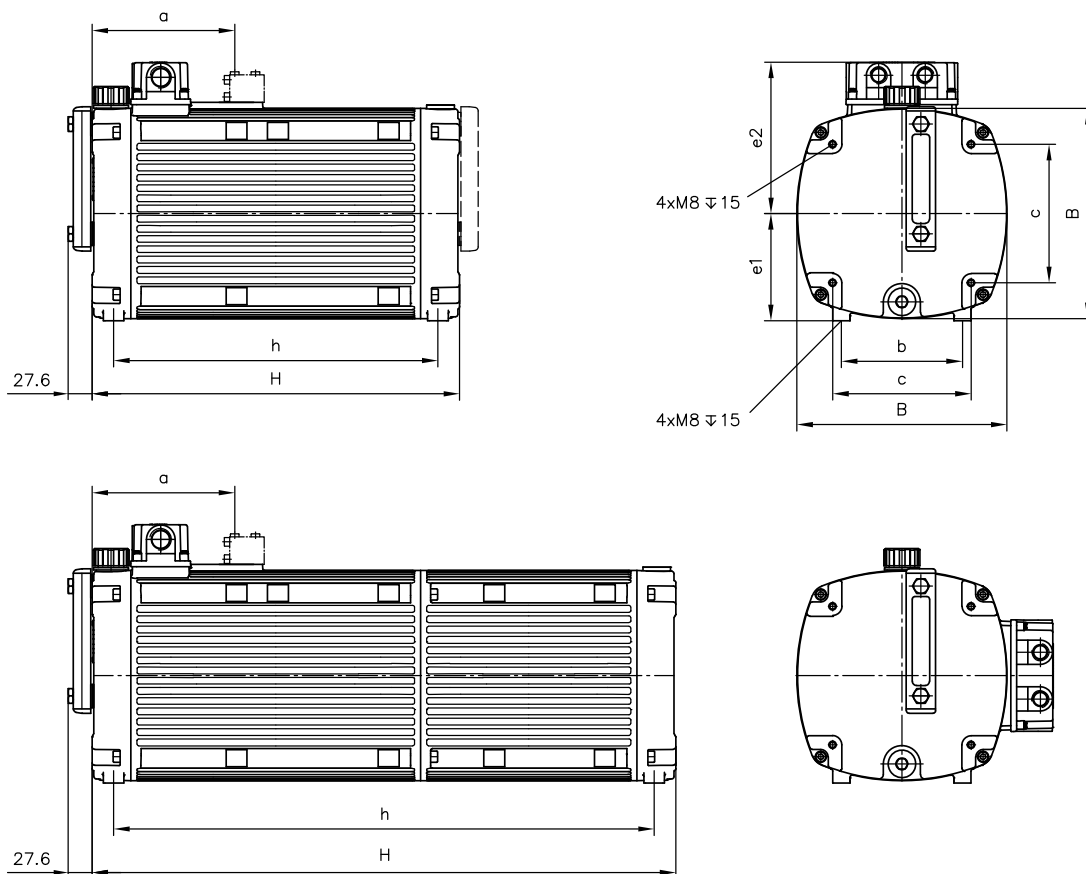
Vertical version



Basic type	B	e1	e2	c	b	a
KA 4	43	124	175	160	140	165
Coding tank size	H	h				
Without coding	425	375				
1, 01	530	480				
11	635	585				
2, 02*	675	625				
12*, 21, 4	780	730				
22*, 3	925	875				
41	885	835				
31, 5	1030	980				
51	1135	1085				

* Tank sizes 02, 12, 22 only appropriate for horizontal version

Horizontal version



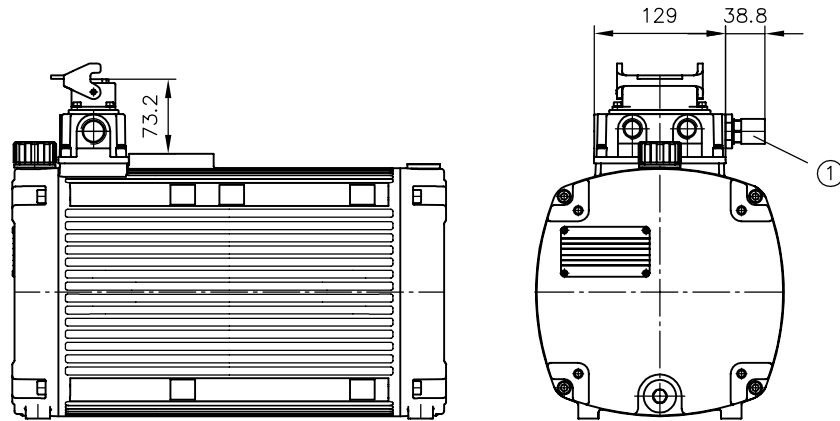
Basic type	B	e1	e2	c	b	a
KA 4	43	124	175	160	140	165
Coding tank size	H	h				
Without coding	425	375				
1, 01	530	480				
11	635	585				
2, 02*	675	625				
12*, 21, 4	780	730				
22*, 3	925	875				
41	885	835				
31, 5	1030	980				
51	1135	1085				

* Tank sizes 02, 12, 22 only appropriate for horizontal version

5.1.2 Additional components' dimensions

Terminal box

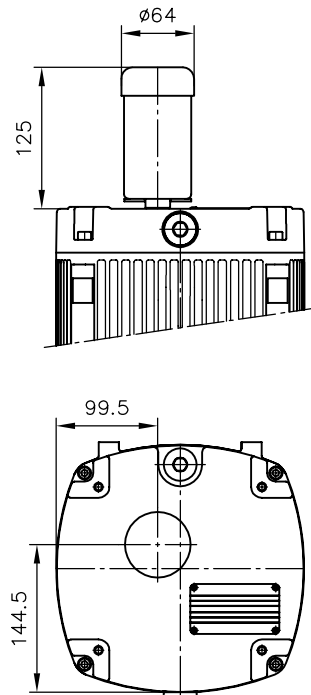
Coding P



1 Suppressor coding PE

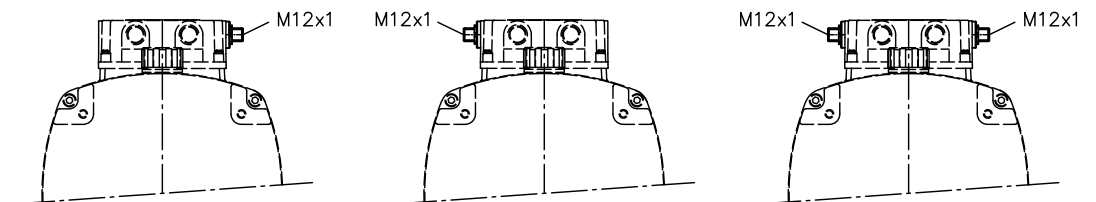
Silica gel filter

Coding G




Temperature and/or level switch

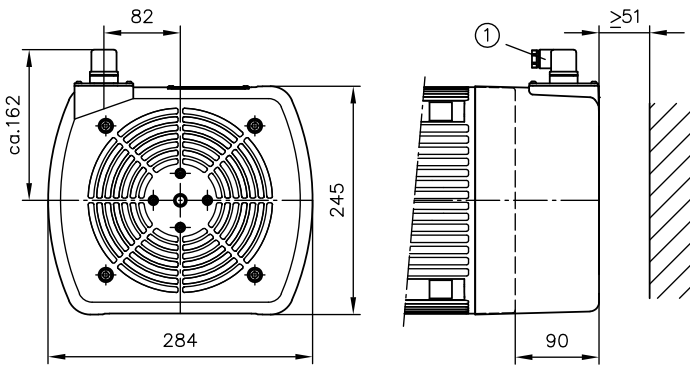
Terminal box: M12 connections for temperature and/or level switch



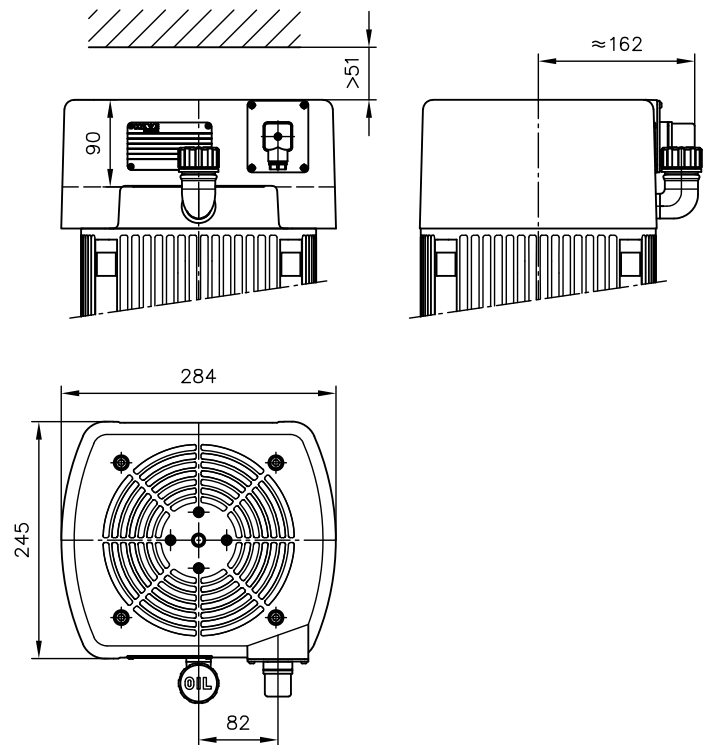
Fan

 Minimum gap see drawing.

Horizontal version
Coding F

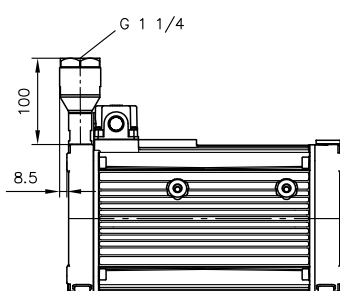


Vertical version
Coding F

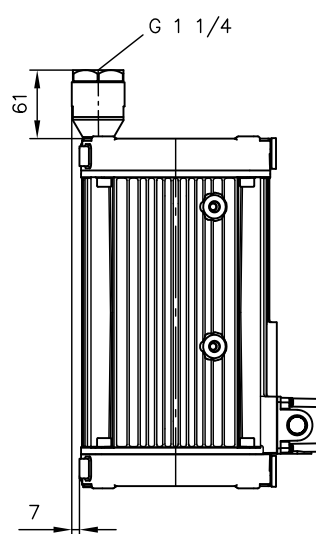


Filler reduction

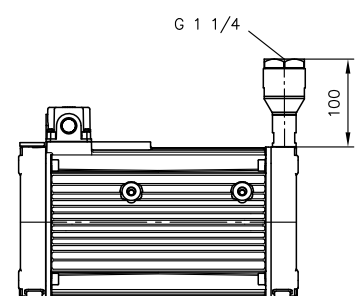
Coding B
Horizontal version



Coding B
Vertical version



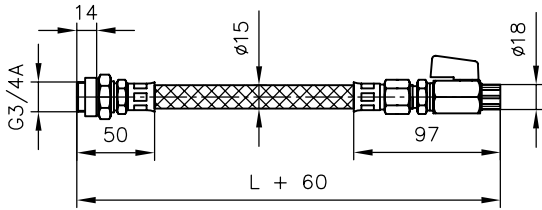
Coding B1
Horizontal version



Oil drain hose

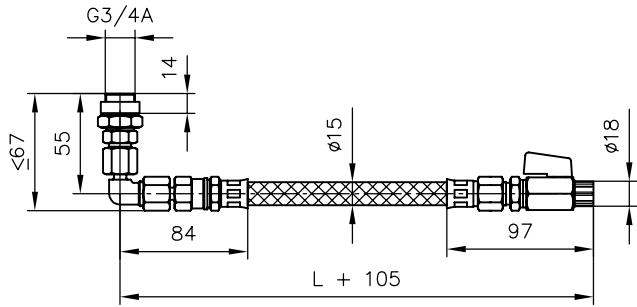
Coding

G 1/2 x L
L = 300 mm/500 mm
with ball valve



Coding

G 1/2 W x L
L = 300 mm/500 mm
with ball valve and elbow




5.2 Hydraulic connection

NOTICE

Prerequisites for assembling hydraulic connections

- ▶ The dimensions of all access and connecting lines must correspond to the specifications of the system. Pipes, hose lines, fittings and connectors must be designed for the maximum pressure of the system.
- ▶ Pipes, hose lines, fittings and connectors that have an insufficient inner diameter or that are too long will lead to pressure losses. This impairs the performance of the hydraulic system.
- ▶ Keep lines as short as possible and avoid kinks. Do not go below the smallest bend radius specified by the manufacturer.
- ▶ Keep the number of employed fittings to a minimum to avoid potential leakage spots.
- ▶ All hydraulic lines are to be mounted tension-free to prevent noise generation and damage due to resonances.
- ▶ No contamination from the cylinders, screw fittings, connectors and hose lines may enter the hydraulic system. Flush before use.

 For detailed hydraulic data, see the type plate.

5.3 Hydraulic data

Pressure	Pressure side (port P): depends on version and delivery flow. Suction side (vessel interior): ambient air pressure. Not suitable for charging. $p_{min} = 30 \text{ bar}$ (due to dynamic pressure)
Start against pressure	The version with 3-phase motor can start against the pressure p_{max} .
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: 4 - 800 mm ² /s Optimal operating range: approx. 10 - 500 mm ² /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	ISO 4406 <u>21/18/15...19/17/13</u>
Temperatures	Environment: approx. -40 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -40°C is permissible (observe start viscosities) as long as the steady-state temperature is at least 20K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.

Hydraulic assembly

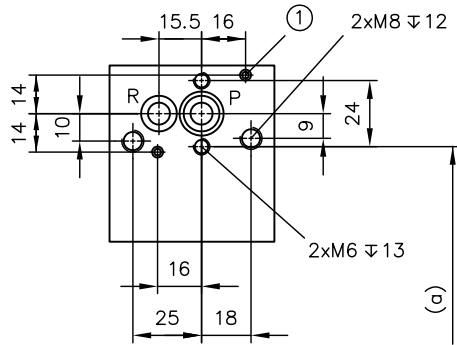
Fastening hydraulic ports

☑ Note the prerequisites for assembling hydraulic connections

1. **Port P:** Connect the hydraulic hoses properly.
2. **Hydraulic fluid drain:** Screw in the drain screw.
3. **Directional valves:** Connect any solenoid valves to the controller in accordance with the hydraulic schematic and function diagram.

Dimensions

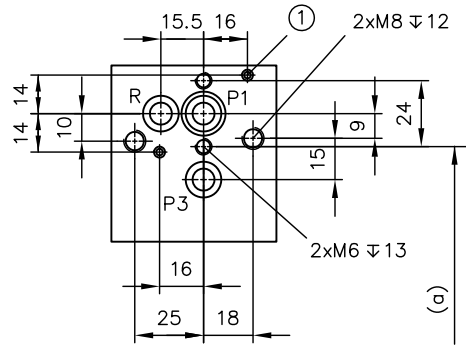
Single-circuit pump



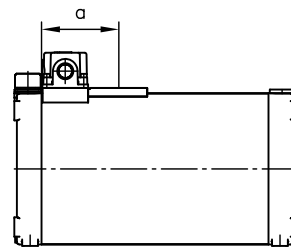
1 Centring pin $\varnothing 4$ mm

a = 165

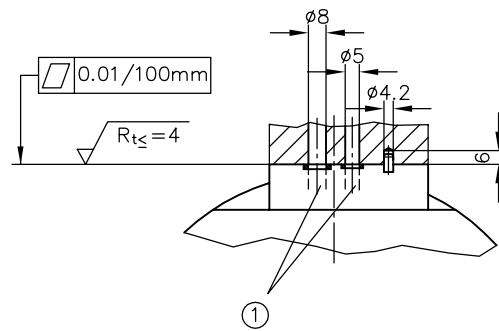
Dual-circuit pump with shared pedestal



1 Centring pin $\varnothing 4$ mm



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)

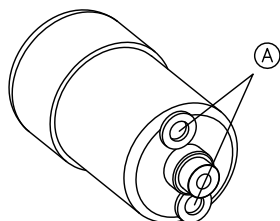
Silica gel filter**Installing the silica gel filter**

Red caps are screwed onto the silica gel filter for protection during transport and storage.

1. Remove the caps.
2. Screw in the silica gel filter by hand. Caution: risk of breakage!

! NOTICE**Remove the silica gel filter's caps before commissioning**

There is a risk of damaging the hydraulic power pack during operation.



A Cap

5.4 Electrical connection

In this chapter

- Chapter 5.4.3, "Connecting the electric drive"
- Chapter 5.4.4, "Connecting level switch and temperature switch"
- Chapter 5.4.5, "Connecting the fan"

5.4.1 Safety instructions

⚠ WARNING

Risk of injury due to electric shock caused by incorrect assembly of electric cabling.

Risk of serious injury or death.

- ▶ Only have work performed on the electrical system by an electrically skilled person or by trained personnel working under the supervision of an electrically skilled person.
- ▶ Please note that incorrect assembly of electric cabling may result in material damage.

! NOTICE

Notes on electrical connection and earthing

are included in the terminal box and in this manual.

Earthing see "Connecting the electric drive", page 29.

! NOTICE

Disconnecting electrical power sources

- ▶ Plug connection on compact hydraulic power pack (various types of plug optionally available) or
- ▶ Power supply unit in overall machinery (see owner's operating instructions)

! NOTICE

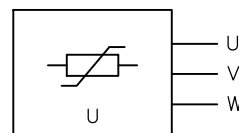
Ensuring electromagnetic compatibility (EMC)

If the product ⁽¹⁾ is connected to a system ⁽²⁾, it will not produce any impermissible interference ⁽³⁾.

Tests validating immunity to interference for demonstrating compliance with the standard EN 60034-1 para. 12.1.2.1 or VDE 0530-1 are not required.

Any transient electromagnetic fields generated when switching the motor on or off that may cause interference can be attenuated using a suppressor⁽⁴⁾.

Suppressor coding **E, PE**



Legend:

1 Induction motor acc. to EN 60034-1 para. 12.1.2.1

2 e.g. power supply acc. to EN 60034-1 para. 6

3 EN 60034-1 para. 19

4 Type 23140, 3x400 V AC 4 kW 50-60 Hz by Murr-Elektronik, D-71570 Oppenweiler or from HAWE.

5.4.2 Electrical connection markings

KA 42	1	S	K	/	HZ 2.45/ 3.5	- C 6		- 3x400 V 50 Hz - 3.9 kW		
KA 44		S	KS	E/	H 5.1	- U 20	- AB 1 K C 280	- 3x400 V 50 Hz - 2.2 kW		
KA 44	12	L	KDT	/	HH 1.5/1.5		- NA 21	- 3x400 V 50 Hz - 2.35 kW		
KA 404	22	L1	KTF	P/	Z 8.8		- AB 1 K C 280	- 3x400 V 50 Hz - 0.75 kW	/24 V DC	- G 1/2 x 300

Motor voltage and nominal power

Electrical connection


Basic type and motor power

Coding	Comment
Without coding	Terminal box (as standard)
P	HARTING plug
E, PE	Additional suppressor on terminal box or HARTING plug

5.4.3 Connecting the electric drive

5.4.3.1 Electrical data

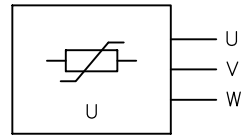
- Data applies to radial piston pumps and gear pumps
- The drive motor forms a closed, non-separable unit with the pump.

Connection	<p>part of product</p> <ul style="list-style-type: none"> For version with HARTING plug, housing with female insert HARTING HAN 1 CE or equivalent, cable cross section 1.5 mm² For version with integrated terminal box, flat plug sleeve 6.3 AMP <p>not supplied</p> <ul style="list-style-type: none"> For terminal box version: cable fittings M20x1.5 for option KD, KS (vertical version): M12x1, 5-pole
Protection class	IP 65 according to IEC 60529
	 The breather filter must be safeguarded against moisture penetration.
Protection class	VDE 0100 Protection class 1
Insulation	<p>designed in accordance with EN 60 664-1</p> <ul style="list-style-type: none"> For 4-wire AC voltage systems L1-L2-L3-PE (3-phase systems) <ul style="list-style-type: none"> with an earthed neutral point up to 500 V AC nominal phase voltage phase-phase For 3-wire AC voltage systems L1-L2-L3 (3-phase systems) <ul style="list-style-type: none"> without an earthed neutral point up to a nominal phase voltage of 300 V AC phase-phase for a single-phase and earthed 2-wire alternating current system L-N (alternating current or mains) up to a nominal voltage of 300 V AC.
Insulation material class	F

Suppressor
Coding E, PE

Type RC 3 R

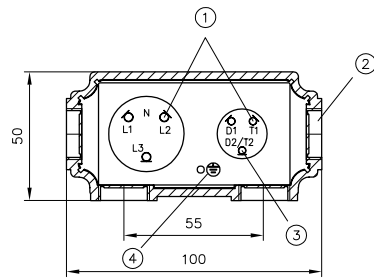
- Operating voltage: 3x 575 V AC
- Frequency: 10 to 400 Hz
- max. motor power: 4.0 kW



5.4.3.2 Connections on terminal box

Terminal box

3-phase motor



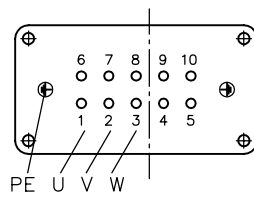
- 1 Flat plug
- 2 4x cable fittings M20x1.5
- 3 For vertical version (only D2/T2-T1)
- 4 Earth

5.4.3.3 Connections with Harting plug

Harting plug HAN 10 E

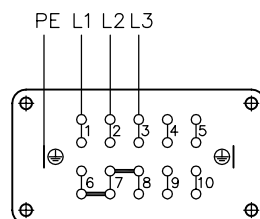
Coding **P**

3-phase motor

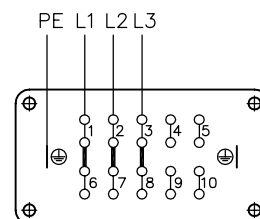


Harting male connector (on-site connection)

3-phase motor Υ



3-phase motor Δ



5.4.3.4 Motor data

3-phase motor

! NOTICE

Additional motor voltages available on request.

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

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 $\cos \varphi$	Hydraulic work value $(pV_g)_{\max}$ (bar, cm ³ /U)
KA 42 2.0/2.4 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	2.00	2825	4.0/6.9	5.5	0.91	750
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	2.40	3340	4.0/6.9	5.7	0.93	
KA 42 2.6/3.1 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	2.60	2830	5.2/9.0	6.4	0.9	1000
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	3.10	3420	5.2/9.0	6.0	0.91	
KA 42 3.9/4.65 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	3.90	2860	7.8/13.5	7.7	0.88	1800
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	4.65	3455	7.8/13.5	7.4	0.90	
KA 42 5.4/6.5 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	5.40	2850	10.4/18.0	7.6	0.91	2800
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	6.50	3440	10.4/18.0	7.4	0.91	
KA 42 7.2/8.65 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	7.2	2820	14.2/24.6	6.5	0.9	3350
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	8.65	3405	14.2/24.6	6.1	0.92	
KA 44 1.6/1.9 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	1.60	1390	3.75/6.5	4.7	0.84	1100
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	1.90	1680	3.75/6.5	5.6	0.85	
KA 44 2.35/2.8 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	2.35	1390	5.3/9.2	4.8	0.84	1750
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	2.80	1680	5.3/9.2	5.7	0.86	
KA 44 3.2/3.85 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	3.20	1385	7.0/12.1	5.1	0.86	2500
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	3.85	1680	7.0/12.1	5.9	0.88	
KA 44 4.2/5.0 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	4.20	1385	8.8/15.2	5.3	0.87	3500
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	5.00	1680	8.8/15.2	6.1	0.88	
KA 44 5.7/6.85 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	5.70	1380	12.8/22	5.3	0.82	4200
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	6.85	1670	12.8/22	5.0	0.84	
KA 404 0.75/0.9 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	0.75	1360	2.2/3.8	4.3	0.74	590
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	0.9	1650	2.1/3.6	5.4	0.74	
KA 404 0.75 kW	3 ~ 200 V 50 Hz Υ^*	0.75	1390	4.5	4.8	0.67	610
	3 ~ 200 V 60 Hz Υ^*	0.75	1680	3.9	4.9	0.75	460
KA 404 1.1 kW	3 ~ 200 V 50 Hz Υ^*	1.1	1390	6.3	5.1	0.67	785
	3 ~ 200 V 60 Hz Υ^*	1.1	1690	5.5	5.1	0.76	665
KA 404 1.2/1.45 kW	3 ~ 400/230 V 50 Hz $\Upsilon\Delta$	1.2	1380	3.4/5.9	5.0	0.70	870
	3 ~ 460/265 V 60 Hz $\Upsilon\Delta$	1.45	1680	3.2/5.6	5.3	0.74	

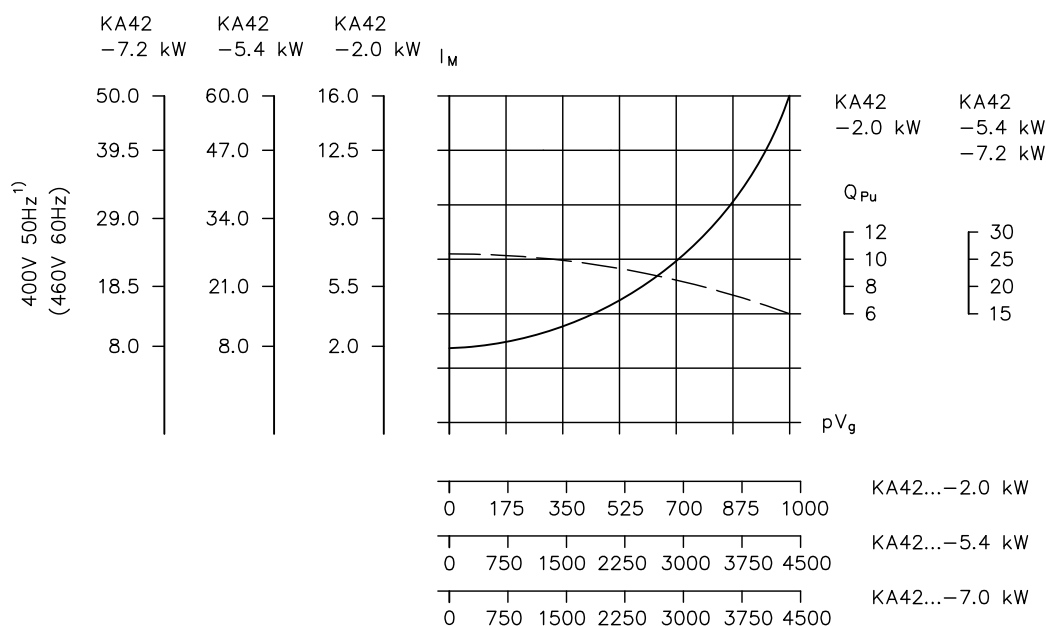
* Motors for 200 V 50 Hz or 200 V 60 Hz networks (Japan)

5.4.3.5 Current consumption characteristic lines

Current consumption characteristic lines KA 42

Operating voltage

3x400/230 V 50 Hz $\Upsilon\Delta$, 3x460/265 V 60 Hz $\Upsilon\Delta$



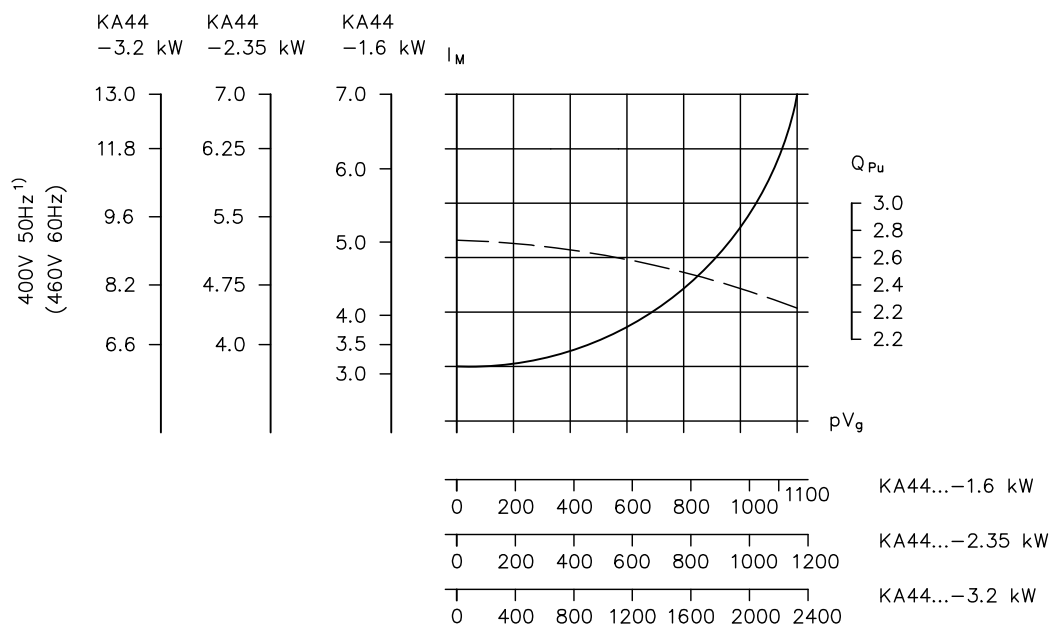
pV_g hydraulic work value (bar cm³); I_M motor current (A); Q_{Pu} delivery flow characteristic (trend) 1.0

1) For values at 230 V 50 Hz (265 V 60 Hz), values must be multiplied by $\sqrt{3}$.

Current consumption characteristic lines KA 44

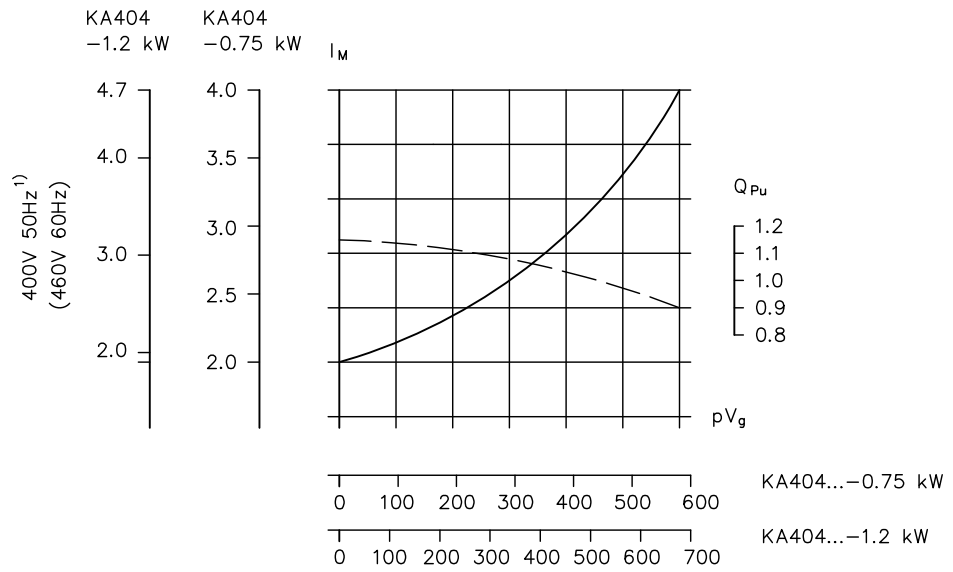
Operating voltage

3x400/230 V 50 Hz $\Upsilon\Delta$, 3x460/265 V 60 Hz $\Upsilon\Delta$



pV_g hydraulic work value (bar cm³); I_M motor current (A); Q_{Pu} delivery flow characteristic (trend) 1.0

1) For values at 230 V 50 Hz (265 V 60 Hz), values must be multiplied by $\sqrt{3}$.



pV_g hydraulic work value (bar cm³); I_M motor current (A); Q_{Pu} delivery flow characteristic (trend) 1.0

1) For values at 230 V 50 Hz (265 V 60 Hz), values must be multiplied by $\sqrt{3}$.

5.4.4 Connecting level switch and temperature switch



Level switch duty cycle

Dropping hydraulic fluid level:

If the amount of hydraulic fluid removed during each duty cycle causes the oil level to fall below the level switch's monitoring level, take suitable electrical measures to mute the signal until the fluid level rises above the monitoring level once again when the hydraulic fluid flows back in at the end of the duty cycle.


Level switch for type KA...L (horizontal)

Max. DC/AC switching capacity	30 VA	
Max. DC/AC current	0.5 A ($\cos \varphi = 1$)	
Max. voltage	230 V AC/DC	
Electrical connection	on terminal box/HARTING plug	
Circuit symbol	Coding D (N/C contact) 	Coding S (N/O contact)

Level switch for type KA...S (vertical)


DC/AC switching capacity	10 W	
Max. DC/AC current	1 A	
Max. voltage	150 V 50/60 Hz 200 V DC	
Electrical connection	Line connector industry standard contact gap 9.4 mm	
Circuit symbol	Coding KD (N/C contact) 	Coding KS (N/O contact)

Temperature switch

 Response temperature acc. to installed temperature switch.

Bimetallic-element switch

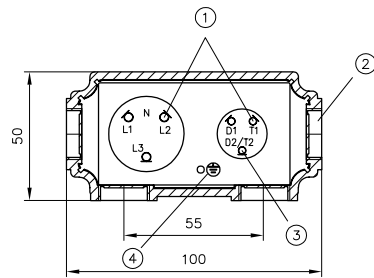
- design: separate temperature switch (type **KA**)

Signal indication	80°C ± 5K (coding T, TT60) 60°C ± 5K (coding T60, TT60)
Max. voltage	250 V 50/60 Hz
Nominal current (cos φ ~ 0.95 / 0.6)	1.6 A
Max. current at 24 V (cos φ = 1)	1.5 A
Electrical connection	on terminal box/HARTING plug
Circuit symbol	N/C contact 

5.4.4.1 Connections on terminal box

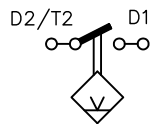
Terminal box

3-phase motor

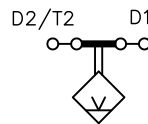


- 1 Flat plug
- 2 4x cable fittings M20x1.5
- 3 For vertical version (only D2/T2-T1)
- 4 Earth

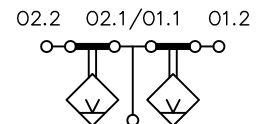
Level switch
Coding **S**



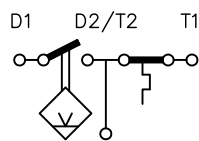
Level switch
Coding **D**



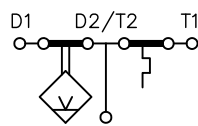
Level switch
Coding **DD**



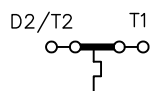
Level switch
Coding **ST**



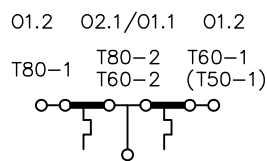
Level switch
Coding **DT**



Temperature switch
Coding **T**



Temperature switch
Coding **TT50, TT60**

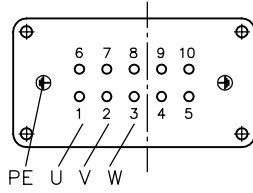


5.4.4.2 Connections with Harting plug

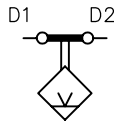
Harting plug HAN 10 E

Coding P

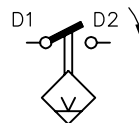
3-phase motor



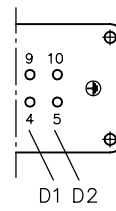
Coding **D**
(N/C contact)



Coding **S**
(N/O contact)

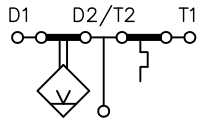


Coding **D, S**
(Harting plug)



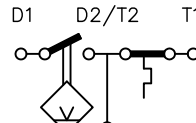
Level switch

Coding **DT**



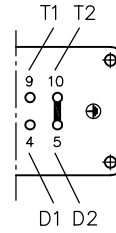
Level switch

Coding **ST**



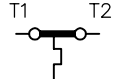
Harting plug

Coding **DT, ST**



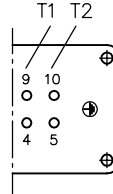
Temperature switch

Coding **T**



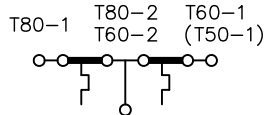
Harting plug

Coding **T**



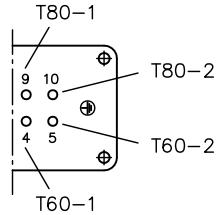
Temperature switch

Coding **TT50, TT60**



Harting plug

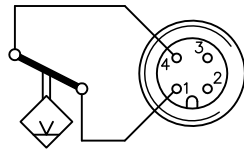
Coding **TT50, TT60**



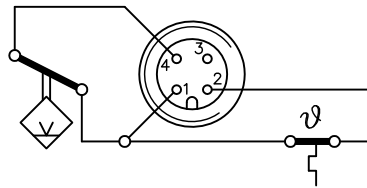
5.4.4.3 Terminal box with additional connection

Additional connection
M12x1, 4-pin

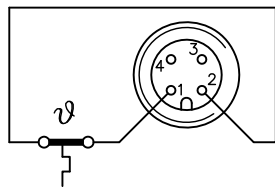
Pin assignment for level switch
Coding **D, S**



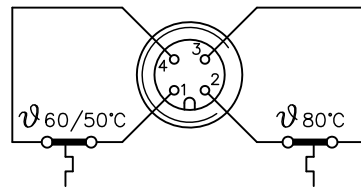
Pin assignment for temperature switch and level switch
(horizontal version only)
Coding **ST, DT**



Pin assignment for temperature switch
Coding **T**



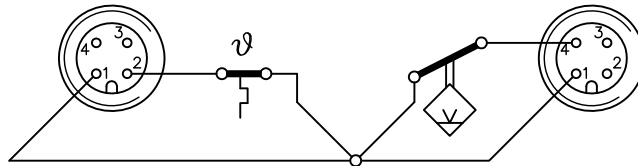
Pin assignment for two temperature switches
Coding **TT50, TT60**



5.4.4.4 Harting plug with additional connection

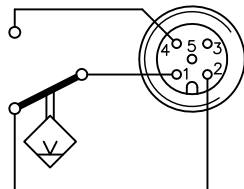
Additional connection
2x M12x1, 4-pin

Coding **DT, ST**
One temperature switch and one level switch (horizontal version):

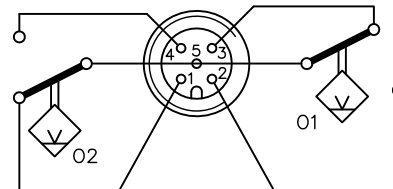


Additional connection
M12x1, 5-pin

Coding **KD, KS**



Coding **KDD**



5.4.5 Connecting the fan

Fan connection and motor data Coding **F, F1**

Temperature range	-30°C ... +50°C			
Electrical connection	male connector acc. to DIN EN 175 301-803 A			
Motor data	U_N	P_N(W)	Rotation speed (rpm)	Protection class
	1x230 V 50/60 Hz ⊥	45	2800/3250	IP 44
	1x110 V 60 Hz ⊥	38	3250	IP 44
	24 V DC	12	3050	IP 20

6 Start-up

6.1 Safety instructions

NOTICE

Prerequisites for commissioning

The product may only be put into commission once it has been installed in the machine or system it is intended for and this machine or system complies fully with the European Machinery Directive.

DANGER

Improper commissioning may cause the hydraulic drives to move unexpectedly.

Risk of serious injury or death.

- ▶ Before beginning disassembly, relieve the system of hydraulic pressure.
- ▶ A corresponding warning sign (HAWE order number 7788 022 (4708 4258-00)) must be attached in an easily visible place on or near the hydraulic accumulator.
- ▶ No modifications of any kind (mechanical, welding or soldering work) may be made to the accumulator.

CAUTION

Overloading components due to incorrect pressure settings.

Risk of minor injury.

- ▶ Always monitor the pressure gauge when setting and changing the pressure.
- ▶ Take note of the maximum pressure of the pump.

CAUTION

Danger of burning due to hot metal surfaces on the hydraulic power pack, particularly on the tank, motor, valve blocks and valves.

Risk of minor burns

- ▶ Do not touch the hydraulic power pack or directional valve solenoids during operation.
- ▶ Allow the hydraulic power pack and directional valve solenoids to cool down before any work.
- ▶ Wear protective gloves.
- ▶ If surface temperatures $>60^{\circ}\text{C}$ occur during operation, set up safety barriers.
- ▶ 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.

6.2 Checks before commissioning

Check for correct connection

1. Mechanical:
 - fastening to machine, frame and base
2. Electrical:
 - Power supply
 - Control
 - Motor protection circuit
3. Hydraulic:
 - piping and hoses
 - Cylinder
 - Motors

6.3 Set motor protection circuit

Set motor protection circuit

1. Set motor protection circuit to approximately 0.85 to 0.9 times the motor current (I_M).
 - ✓ When operating normally, the motor protection circuit will not trip prematurely.
 - ✓ When the pressure-limiting valve triggers, the period until shutdown does not become long enough for the hydraulic fluid's temperature to exceed its permissible maximum.
2. Run a test run to check the motor protection circuit's settings.

 Additional safety precautions against malfunctions are the temperature switches, level switches and pressure switches. These are optionally available for the hydraulic power pack.

6.4 Filling hydraulic fluid

NOTICE

Dirt must not enter the product

Otherwise, the product may suffer damage

- ▶ Always fill hydraulic fluid via the system filter or a mobile filter station.
- ▶ Observe the recommended cleanliness class for the hydraulic fluid.
- ▶ Keep all pipes, hose lines, fittings and couplings clean.
- ▶ Carry out all work in a clean environment.
- ▶ Clean hands and clothing before working.

NOTICE

Accumulator systems


- ▶ Fill accumulators using designated equipment in accordance with the pressure specifications of the hydraulic schematic.
- ▶ Observe the manufacturer's corresponding operating instructions and hydraulic schematics.

Filling hydraulic fluid

Only use the hydraulic fluid specified for the system.

1. Refer to the table for filling quantity.
2. Fill hydraulic fluid via the system filter or a mobile filter station.
3. Fill up to the top marking on the fill level monitor.

Coding	Fill volume V_{fill} (l)	Usable volume vertical V_{usable} (l)	Usable volume horizontal V_{usable} (l)
--	13	5	6
2	22	15	11
02	22	--	11
22	31	--	16
3	31	25	16

 The fill volume and usable volume may deviate slightly from the indicated values, depending on the motor and pump.

6.5 Setting pump's rotation direction

1. Briefly run the drive motor
 - The pump is pumping hydraulic fluid
 - The pump is not pumping hydraulic fluid
2. Check that the motor's rotation direction matches the pump's rotation direction
 - Radial piston pump = any
 - Gear pump = anticlockwise

6.6 Starting and bleeding

WARNING

Risk of injury from pressurised components

Risk of serious injury or death.

- ▶ Check all components for correct installation before charging the hydraulic system to operating pressure.

WARNING

Risk of injury from pressurised bleeder screw

Risk of serious injury or death

- ▶ Depressurise the hydraulic power pack before bleeding.

NOTICE

The hydraulic system is bled using bleeder screws.

Bleed the system through a consumer that has a high point within the hydraulic system.

Starting and bleeding

On the hydraulic power pack

The directional valve is in the switching position in which the pump can idle (see manufacturer's hydraulics schematic).

1. Slightly unscrew the bleeder screw.
2. Switch the pump on and off several times so that the pump cylinders bleed automatically.

Optional procedure if the controller lacks the requisite capability

3. Connect a pipe screw connection with a short pipe bracket and a transparent plastic hose to port P.
4. Insert the other end into the hydraulic fluid filler opening.
 - ✓ The bleeding process is complete when hydraulic fluid flows out without bubbles.
5. Then move the consumer(s) back and forth several times until the air is largely removed and the movement is smooth.
6. Tighten the bleeder screw again.

On a consumer in a high position

1. Slightly unscrew the bleeder screw.
 - ✓ The bleeding process is complete when hydraulic fluid flows out without bubbles.
2. Tighten the bleeder screw again.

7 Maintenance

7.1 Safety instructions

Maintenance measures consist of inspection, service and repair. Maintenance measures are described here.

- ▶ Maintenance work must only be carried out by qualified personnel.
- ▶ Tasks not described in this chapter may only be carried out by HAWE Service.
- ▶ If faults or damage occur, switch off the hydraulic system immediately.
- ▶ Observe the information in the supplier documentation.
- ▶ Document all activities in a maintenance log.

WARNING

Danger of accident and fatal injury due to lack of maintenance or careless maintenance

Omitted or negligently performed maintenance can cause the hydraulic system to malfunction. Improperly performed maintenance or improperly conducted troubleshooting can pose a danger to personnel.

- ▶ Read and abide by all instructions provided in this section.

WARNING

Risk of injury from electrical, mechanical or hydraulic hazards when working on the hydraulic power pack

Risk of serious injury or death

- ▶ Prior to all work on the hydraulic power pack, disconnect the power supply from the drive motor.
- ▶ Prior to all work on the hydraulic power pack, relieve the pressure in the hydraulic system.

CAUTION

The hydraulic power pack and valves' solenoids may become hot during operation.

Risk of injury from minor burns

- ▶ If surface temperatures >60°C occur during operation, set up safety barriers.
- ▶ Allow the hydraulic power pack and the solenoids to cool sufficiently before touching them.
- ▶ Ensure the device can aspirate sufficient volumes of fresh air and hot air can escape.
- ▶ Modifications of any kind, especially mechanical, welding or soldering, are prohibited.

NOTICE

Disconnecting electrical power sources

- ▶ Plug connection on compact hydraulic power pack (various types of plug optionally available) or
- ▶ Power supply unit in overall machinery (see owner's operating instructions)

7.2 Cleaning

NOTICE

Damage from improper cleaning

- ▶ Only clean with the hydraulic connections sealed to prevent cleaner from entering.
- ▶ Do not use aggressive cleaning agents.
- ▶ Treat the product only with suitable cleaning agents.
- ▶ Do not use a high-pressure cleaner.

7.3 Maintenance plan

	as required	Every 3 months	Every 6 months	Once a year	Every 2 years	Every 6 years, after 10 years at the latest
Check safety markings				✓		
Hydraulic fluid: "Checking the fluid level", page 49		✓				
"Changing hydraulic fluid", page 48	✓			✓		
"Checking and replacing the silica gel filter", page 49			✓			
Change pressure and return line filter (if present)	✓			✓		
"Visual check: Hydraulic lines (pipes and hoses)", page 47 and replace if necessary	✓			✓		
"Visual check: Electrics (cables, connections, plugs)", page 47 and replace if necessary	✓			✓		
Electric drive: "Checking electrical equipment", page 47					✓	
"Checking and replacing hydraulic hoses", page 47						✓

7.4 Service

7.4.1 Visual check: Hydraulic lines (pipes and hoses)

Immediately repair any damage of this kind to hydraulic lines:

- ▶ External leakages
- ▶ Visible signs of external damage cracks, kinks, detaching, cuts, abrasion, material fatigue etc.
- ▶ Hose deformation when unpressurised and when pressurised

7.4.2 Visual check: Electrics (cables, connections, plugs)

Immediately repair any damage of this kind to electrical systems:

- ▶ Visible signs of external damage, like brittle insulation, abrasion, kinks, material aging etc.
- ▶ Corroded electrical plugs and sockets

7.4.3 Checking electrical equipment

NOTICE

Testing electrical equipment

- ▶ The testing must only be performed by an electrically skilled person or by electrically instructed personnel.
- ▶ Only use suitable measurement and test devices.
- ▶ The high-voltage test values or results of the insulation test may be impaired due to old or contaminated hydraulic fluid.

NOTICE

Operating electrical systems safely

You can only properly and reliably operate electrical systems or equipment in a safe manner if their condition is guaranteed to be perfect at all times. The German DGUV Vorschrift 3 accident prevention regulations specify inspection intervals and test methods. The associated instructions (DA) detail how the safety goals can be achieved.

Recurring inspections acc. to DGUV Vorschrift 3

- Visual check
- Check PE and equipotential bonding
- Check insulation
- Check shutdown conditions
- Check circuit breakers
- Measure ground
- Test certificate

7.4.4 Checking and replacing hydraulic hoses

NOTICE

When handling hydraulic hoses, observe the applicable standards, regulations and rules:

- ISO 17165-2: Recommended practices for hydraulic hose lines.
- DGUV Rule 113-015 (BGR 237 – German regulations for occupational insurance schemes) hydraulic hose lines – “Rules for safe use”.
- DGUV information sheet no. 015 “Testing and replacing hydraulic hose lines”.

7.4.5 Changing hydraulic fluid

Draining hydraulic fluid

⚠ WARNING

Danger of scalding from hot hydraulic fluid.

Danger of scalding.

- ▶ Please note hydraulic fluid remains very hot even a long time after switching off.
- ▶ Allow the complete system to cool down before carrying out any work.
- ▶ Avoid skin contact with hot hydraulic fluid.

! NOTICE

- ▶ Do not release hydraulic fluid into the environment.
- ▶ Collect cleaning, operating and lubrication fluids and consumable materials in suitable containers and dispose of them according to local regulations.

Draining

Draining hydraulic fluid

Keep a vessel handy to catch the expended hydraulic fluid. The vessel needs to be big enough to catch all the fluid.

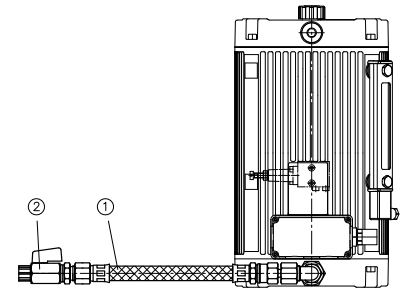
1. Depressurise the hydraulic system.
2. Unscrew and remove the filler and breather filter.
3. Optional: Remove and check the silica gel filter, replace it if necessary.
4. Drain the used hydraulic fluid.

through hydraulic fluid drain screw

1. Undo the drain screw on the product.
2. Drain the expended hydraulic fluid into a separate vessel.
3. Screw the drain screw back in again (tightening torque: 9 Nm).

through hydraulic fluid drain hose (1)

1. Open the drain valve (2) on the drain hose (1).
2. Drain the expended hydraulic fluid into a separate vessel.
3. Close the drain valve (2) again



- 1 Drain hose
- 2 Drain valve

Filling hydraulic fluid

! NOTICE

Dirt must not enter the product

Otherwise, the product may suffer damage

- ▶ Always fill hydraulic fluid via the system filter or a mobile filter station.
- ▶ Observe the recommended cleanliness class for the hydraulic fluid.
- ▶ Keep all pipes, hose lines, fittings and couplings clean.
- ▶ Carry out all work in a clean environment.
- ▶ Clean hands and clothing before working.

! NOTICE

Replace the oil filter when changing the hydraulic fluid.

- ▶ Otherwise, the fresh hydraulic fluid will be contaminated again.

Filling hydraulic fluid

1. Fill hydraulic fluid into the hydraulic power pack through the system filter or a mobile filter station.
2. While changing the hydraulic fluid, keep an eye on the level switch and monitor its signals.
3. Screw the breather filter or silica gel filter back in again.
4. Switch on the hydraulic power pack.
 - ✓ The hydraulic accumulator fills automatically.
5. Bleed the hydraulic system.
 - ✓ The hydraulic power pack is ready for operation.

7.4.6 Checking the fluid level

i Dropping hydraulic fluid levels may indicate leaks in the system.

Electric fill level monitor

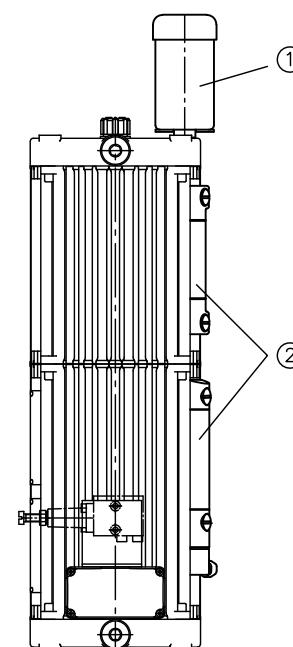
Level gauge with level switch

- ▶ The level switch triggers a signal when the minimum fluid level is reached.
- ▶ Top up the hydraulic fluid at the latest when the fluid level has reached its minimum.

Visual fill level monitor

Visual level gauge

- ▶ Use the visual level gauge to check the hydraulic fluid level when the system is unpressurised.
- ▶ Top up the hydraulic fluid at the latest when the fluid level has reached its minimum.



- 1 Silica gel filter
- 2 Visual level gauge

7.4.7 Checking and replacing the silica gel filter
Replacing the silica gel filter if it is clogged

Contamination indicator: The filter material on the silica gel filter has turned pink

1. Depressurise the system
2. Remove the used silica gel filter
3. Screw in a new silica gel filter
4. Before commissioning, take the red sealing plug off the underside of the new silica gel filter
 - ✓ The silica gel filter is ready for use

7.5 Repairs

Spare and wearing parts

- ▶ Trained specialist personnel can perform repairs themselves.
- ▶ Order spare and wearing parts from the manufacturer by providing the commission number (see type plate).



The motor cannot be replaced as it is an integral part of the tank.



NOTICE

For safety reasons, only genuine spare parts and accessories may be used.

HAWE Hydraulik SE disclaims any liability or warranty for damage caused by the use of non-genuine spare parts and accessories.

8 Troubleshooting

Fault	Possible cause	Remedy
Excessive noise production	Hydraulic fluid level too low (foaming hydraulic fluid)	▶ "Filling hydraulic fluid", page 48
	Pump/motor faulty	Hydraulic power pack ▶ Shut down ▶ Repair or replace
Insufficient or no pressurisation	Faulty connections	▶ Check connections ▶ "Visual check: Hydraulic lines (pipes and hoses)", page 47
	Pump/motor faulty	Hydraulic power pack ▶ Shut down ▶ Repair or replace
	Delivery flow direction wrong	▶ "Setting pump's rotation direction", page 43
	Deviations of the pressure specifications	▶ "Get in touch with manufacturer", page 61

9.1 Safety instructions**⚠ 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.

⚠ CAUTION**Danger of burning due to hot metal surfaces on the hydraulic power pack, particularly on the tank, motor, valve blocks and valves.**

Risk of minor burns

- ▶ Do not touch the hydraulic power pack or directional valve solenoids during operation.
- ▶ Allow the hydraulic power pack and directional valve solenoids to cool down before any work.
- ▶ Wear protective gloves.
- ▶ If surface temperatures $>60^{\circ}\text{C}$ occur during operation, set up safety barriers.
- ▶ 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.

! NOTICE

- ▶ Do not release hydraulic fluid into the environment.
- ▶ Collect cleaning, operating and lubrication fluids and consumable materials in suitable containers and dispose of them according to local regulations.

9.2 Disassembly and disposal**Disassembly**

1. Shut down the hydraulic system in the machine controls.
2. Secure it against unintentional restarting.
 - ✓ System shut down securely.
3. Drain hydraulic fluid.
 - ✓ The hydraulic system has been depressurized and can be disassembled.
4. Disconnect electrical cables.
5. Disconnect hydraulic lines.
6. Disassemble electrical and hydraulic components.
7. Properly dispose of all disassembled parts.

Disposal information**! NOTICE**

Recommended disposal by waste types:

- Mixed scrap: Valve bank, valve control, manifold
- Electronic waste: Switch box, pump housing with motor
- Scrap iron: Metal frame, accumulator (unpressurised), pump
- Waste oil: Hydraulic fluid

10 Appendix

10.1 Technical data



Type-specific parameters are listed on the product's type plate, e.g.: Data on motor and pump power.

For further technical data, refer to HAWE publication **D 8010**.

"Applicable documents", page 5

10.1.1 General data

Conformity	<ul style="list-style-type: none"> ▪ "EU conformity", page 57 and 59 ▪ "UK conformity", page 58 and 60 ▪ UL conformity of the stators - UL reference E216350 ▪ UL conformity of the fans F, F1 - UL reference E216350 																
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)																
Operating mode	<ul style="list-style-type: none"> ▪ Short period operation (S2) and ▪ Periodic intermittent operation (S3) 																
Material	Housing: Aluminium																
Attachment	M8 threaded holes, see dimensioned drawings																
Installation position	Vertical (KA...S) or horizontal (KA...L)																
Line connection	only via bolted-on connection blocks Basic pump: see mounting hole pattern																
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 3-phase version, replace two of the three main conductors)																
Speed range (min ... max)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Radial piston pump H</td> <td style="width: 50%;">100 ... 3500 rpm</td> </tr> <tr> <td></td> <td>200 ... 2850 rpm (optimal)</td> </tr> <tr> <td colspan="2">Gear pump Z</td> </tr> <tr> <td>Z 1.1 ... Z 1.7</td> <td>800 ... 5000 rpm</td> </tr> <tr> <td>Z 2.0 ... Z 2.7</td> <td>600 ... 4500 rpm</td> </tr> <tr> <td>Z 3.5 ... Z 6.4</td> <td>500 ... 4000 rpm</td> </tr> <tr> <td>Z 6.9 ... Z 8.4</td> <td>500 ... 3800 rpm</td> </tr> <tr> <td>Z 8.8 ... Z 11.3</td> <td>500 ... 3000 rpm</td> </tr> </table>	Radial piston pump H	100 ... 3500 rpm		200 ... 2850 rpm (optimal)	Gear pump Z		Z 1.1 ... Z 1.7	800 ... 5000 rpm	Z 2.0 ... Z 2.7	600 ... 4500 rpm	Z 3.5 ... Z 6.4	500 ... 4000 rpm	Z 6.9 ... Z 8.4	500 ... 3800 rpm	Z 8.8 ... Z 11.3	500 ... 3000 rpm
Radial piston pump H	100 ... 3500 rpm																
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Z 1.1 ... Z 1.7	800 ... 5000 rpm																
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Z 3.5 ... Z 6.4	500 ... 4000 rpm																
Z 6.9 ... Z 8.4	500 ... 3800 rpm																
Z 8.8 ... Z 11.3	500 ... 3000 rpm																

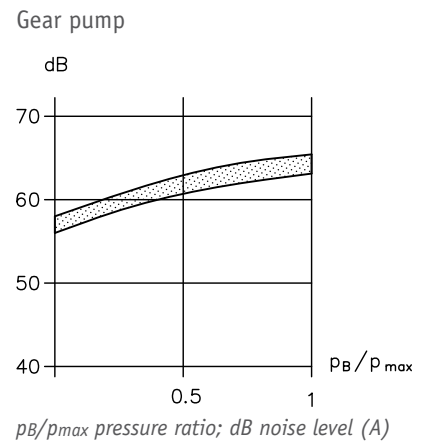
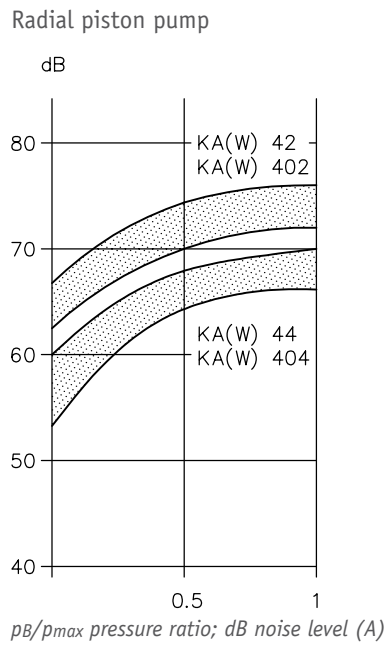
Silica gel filter	Desiccant quantity	100 g
	Absorption capacity	50 ml
	Filter efficiency	3 µm absolute; (β≥200)
	Operating temperature range	-29°C ... +93°C
Filler screen	Coding	B, B1
	Screen mesh size	0.63 mm
	Connection	G 1 1/4

10.1.2 Weight

w/o hydraulic fluid w/o connection blocks	Type	H (3 cylinders*)	H (6 cylinders*)	Z	HZ
	KA 4	29 kg	29.6 kg	30.8 kg	31.5 kg
	Coding tank size		Additional weight		
	Without coding		+ 2.5 kg		
	1, 01		+ 5.0 kg		
	11		+ 4.4 kg		
	2, 02		+ 8.8 kg		
	22, 3		+ 6.9 kg		
	12, 21, 4		+ 9.4 kg		
	41		+ 11.3 kg		
	31.5		+ 13.8 kg		
	Coding fan		Additional weight		
	F, F1		+ 1.8 kg		

* The number of cylinders depends on the delivery flow coding.

10.1.3 Characteristic lines



10.2 Documents

10.2.1 Declaration of incorporation



Solutions for a World under Pressure

Einbauerklärung einer unvollständigen Maschine - Original

nach Maschinenrichtlinie 2006/42/EG, Anhang II B

*Declaration of incorporation of partly completed machinery – original
according to machinery directive 2006/42/EC, Annex II B*

Hersteller:
Manufacturer: HAWE Hydraulik SE
Einsteinring 17
DE-85609 Aschheim/München

Die alleinige Verantwortung für die Ausstellung dieser Einbauerklärung trägt der Hersteller.
This declaration of incorporation is issued under the sole responsibility of the manufacturer.

Unvollständige Maschine:
Partly completed machinery: **Typ KA(W) nach unserer Dokumentation D 8010**
Type KA(W) according to our documentation D 8010

Die folgenden grundlegenden Sicherheits- und Gesundheitsschutzanforderung der Richtlinie 2006/42/EG kommen zur Anwendung:
The following essential health and safety requirements of Directive 2006/42/EC apply:

Abschnitte (chapters) 1.1.2, 1.1.3, 1.1.5, 1.2 komplett (complete), 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 und 1.7.4.3.

Es wurden folgende harmonisierte Normen oder andere technische Spezifikationen zugrunde gelegt:
The following harmonized standards or other technical specifications have been applied:

DIN EN ISO 12100:2011-03

Dokumentationsbevollmächtigter:
Person authorised to compile the technical file: HAWE Hydraulik SE
Abt. Produktmanagement
Einsteinring 17
D-85609 Aschheim/München

Die speziellen technischen Unterlagen nach Anhang VII Teil B wurden erstellt.
The relevant technical documentation is compiled in accordance with part B of Annex VII.

Der Hersteller verpflichtet sich, die speziellen technischen Unterlagen zur unvollständigen Maschine einzelstaatlichen Stellen auf Verlangen elektronisch zu übermitteln.
The manufacturer undertakes to electronically transmit the special technical documents on the partly completed machinery to national authorities on request.

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Richtlinie 2006/42/EG entspricht.
The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the directive 2006/42/EG.

Aschheim, 2022-07-12

Axel Schwerdtfeger, CTO
Dogan Basöz, Product Manager

HAWE Hydraulik SE · Einsteinring 17 · D-85609 Aschheim/München · info@hawe.de · Tel. +49 89 379100-1000 · Fax +49 89 379100-91000
Europäische Aktiengesellschaft (SE) · Sitz der Gesellschaft: München · USt ID Nr: DE180016108 · Registergericht München HRB 174760
Vorstand: Robert Schullian, Axel Schwerdtfeger, Wolfgang Sochor, Markus Unterstein, Jiang Ye
Vorsitzender des Aufsichtsrats: Karl Hauesgen
Hypo-Vereinsbank München, 1780008454 (BLZ 700 202 70), IBAN DE33 7002 0270 1780 0084 54, BIC HYVEDE33XXX
Commerzbank München, 150623700 (BLZ 700 400 41), IBAN DE56 7004 0041 0150 6237 00, BIC COBADE33XXX
Baden-Württembergische Bank, 2368049 (BLZ 600 501 01), IBAN DE90 6005 0101 0002 3680 49, BIC SOLADE33XXX
Bayerische Landesbank, 203693428 (BLZ 700 500 00), IBAN DE86 7005 0000 0203 6934 28, BIC BYLADE33XXX

Zertifiziert nach
ISO 9001
ISO 14001
ISO 50001
ISO 45001

www.hawe.com

Declaration of incorporation of partly completed machinery – original

according to Supply of Machinery (Safety) Regulations 2008, 2008 No. 1597, annex II B
Einbauerklärung einer unvollständigen Maschine - Original
nach Supply of Machinery (Safety) Regulations 2008, 2008 No. 1597, Anhang II B

Manufacturer:
Hersteller: HAWE Hydraulik SE
Einsteinring 17
DE-85609 Aschheim/München

This declaration of incorporation is issued under the sole responsibility of the manufacturer.
Die alleinige Verantwortung für die Ausstellung dieser Einbauerklärung trägt der Hersteller.

Partly completed machinery: **Type KA(W) acc. to our documentation D 8010**
Unvollständige Maschine: Typ KA(W) nach unserer Dokumentation D 8010

The following essential health and safety requirements of Directive 2008 No. 1597 apply:
Die folgenden grundlegenden Sicherheits- und Gesundheitsschutzanforderung der Richtlinie 2008 No. 1597 kommen zur Anwendung:

Chapters (Abschnitte) 1.1.2, 1.1.3, 1.1.5, 1.2 complete (komplett), 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 following designated standards or other technical specifications have been applied:
Es wurden folgende harmonisierte Normen oder andere technische Spezifikationen zugrunde gelegt:

DIN EN ISO 12100:2011-03

Person authorised to compile the technical file:
Dokumentationsbevollmächtigter: Koppen & Lethem Ltd
3 Glenholm Park, Brunel Drive
Newark | Nottinghamshire | NG24 2EG
United Kingdom

The relevant technical documentation is compiled in accordance with part B of Annex VII.
Die speziellen technischen Unterlagen nach Anhang VII Teil B wurden erstellt.

The manufacturer undertakes to electronically transmit the special technical documents on the partly completed machinery to national authorities on request.
Der Hersteller verpflichtet sich, die speziellen technischen Unterlagen zur unvollständigen Maschine einzelstaatlichen Stellen auf Verlangen elektronisch zu übermitteln.

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the directive 2008 No. 1597.
Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Richtlinie 2008 No. 1597.

Aschheim, 2022-07-12


Axel Schwerdtfeger, CTO


Dogan Basöz, Product Manager

10.2.2 Declaration of conformity



Solutions for a World under Pressure

EU- Konformitätserklärung - Original EU Declaration of conformity - original

Hersteller:
Manufacturer: HAWE Hydraulik SE
Einsteinring 17
DE-85609 Aschheim/München

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Produkt:
Product: Typ KA(W) nach unserer Dokumentation D 8010
Type KA(W) acc. to our documentation D 8010

Gegenstand der Erklärung:
Object of the declaration: Unterölmotor des Hydraulikaggregates
Immersed Motor of hydraulic power pack

Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der EU:
The object of the declaration described above is in conformity with the relevant European Union harmonization legislation:

2014/35/EU

Es wurden folgende harmonisierte Normen oder andere technische Spezifikationen zugrunde gelegt:
The following harmonized standards or other technical specifications have been applied:

DIN EN 60204-1 VDE0113-1:2019-06

Aschheim, 2022-07-12

Axel Schwerdtfeger, CTO
Dogan Basöz, Product Manager

UKCA-Declaration of conformity - original
UKCA Konformitätserklärung - Original

Manufacturer:
Hersteller: HAWE Hydraulik SE
Einsteinring 17
DE-85609 Aschheim/München

This declaration of conformity is issued under the sole responsibility of the manufacturer.
Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Product:
Produkt: Type KA(W) acc. to our documentation D 8010
Typ KA(W) nach unserer Dokumentation D 8010

Object of the declaration:
Gegenstand der Erklärung Immersed Motor of hydraulic power pack
Unterölmotor des Hydraulikaggregates

The object of the declaration described above complies with the relevant designated standards of the United Kingdom:
Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften des UK: Electrical Equipment (Safety) Regulations 2016 No. 1101

The following designated standards or other technical specifications have been applied:
Es wurden folgende harmonisierte Normen oder andere technische Spezifikationen zugrunde gelegt: EN 60204-1:2018

Person authorised to compile the technical file:
Dokumentationsbevollmächtigter: Koppen & Lethem Ltd
3 Glenholm Park, Brunel Drive
Newark | Nottinghamshire | NG24 2EG
United Kingdom

Aschheim, 2022-07-12


Axel Schwerdtfeger, CTO


Dogan Basöz, Product Manager

11 Contact details

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e-mail spareparts@hawe.de
service@hawe.de

Further information

HAWE Hydraulik SE is a responsible development partner with application expertise and experience in more than 70 areas of mechanical and plant engineering. The product range includes hydraulic power packs, constant and variable pumps, valves, sensors and accessories. Electronic components, ideally matched to hydraulic components, complement modular systems and facilitate control, signal evaluation and error detection. The intelligent system solutions reduce energy consumption and operating costs. Compact drives save space and permit innovative machine design.

The company is certified to ISO 9001, ISO 14001, ISO 45001, ISO 50001.



■ HAWE subsidiaries and service repair shops

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- Denmark
- Austria
- Switzerland
- Italy
- France
- Spain

● HAWE sales partners

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- Sweden
- Slovenia
- Canada
- USA
- Brazil
- China
- India
- Japan
- Korea
- Singapore
- Taiwan
- Australia

You can find further information on HAWE Hydraulik, your local contact and the range of hydraulics training sessions offered at: www.hawe.com.

