

CombiWell

Submersion pump

CW/EN (1606) 5.4

Original instructions

Read and understand this manual prior to operating or servicing this product



EC Declaration of conformity

(Directive 2006/42/EC, appendix II-A)

Manufacturer

SPX Flow Technology Assen B.V.
Dr. A.F. Philipsweg 51
9403 AD Assen
The Netherlands

hereby declares that all pumps member of productfamilies CombiBloc, CombiBlocHorti, CombiChem, CombiDirt, CombiFlex(U)(B), CombiPrime H, CombiLine, CombiLineBloc, CombiMag, CombiMagBloc, CombiNorm, CombiPro(L)(M)(V), CombiPrime V, CombiSump, CombiTherm, CombiWell, FRE, FRES, FREF, FREM, KGE(L), KGEF, HCR, MCH(W)(S), MCHZ(W)(S), MCV(S), PHA, MDR whether delivered without drive (last position of serial number = B), or delivered as an assembly with drive (last position of serial number = A), are in conformity with the provisions of Directive 2006/42/EC (as altered most recently) and where applicable the following directives and standards:

- EC directive 2014/35/EU, "Electric equipment for use within certain voltage limits"
- standards EN-ISO 12100 part 1 & 2, EN 809

The pumps to which this declaration refers may only be put into operation after they have been installed in the way prescribed by the manufacturer, and, as the case may be, after the complete system of which these pumps form part, has been made to fulfil the requirements of Directive 2006/42/EC (as altered most recently).

Declaration of incorporation

(Directive 2006/42/EC, appendix II-B)

Manufacturer

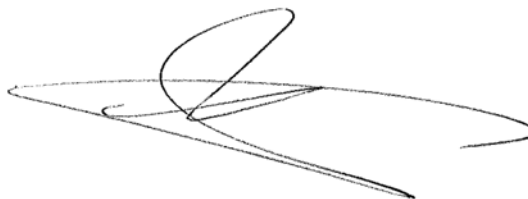
SPX Flow Technology Assen B.V.
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hereby declares that the partly completed pump (Back-Pull-Out unit), member of productfamilies CombiBloc, CombiBlocHorti, CombiChem, CombiDirt, CombiFlex(U)(B), CombiPrime H, CombiLine, CombiLineBloc, CombiMag, CombiMagBloc, CombiNorm, CombiPro(L)(M)(V), CombiTherm, CombiPrime V, FRE, FRES, FREF, FREM, KGE(L), KGEF, HCR, PHA, MDR is in conformity with the following standards:

- EN-ISO 12100 parts 1 & 2, EN 809

and that this partly completed pump is meant to be incorporated into the specified pump unit and may only be put into use after the complete machine of which the pump under consideration forms part has been made and declared to comply with that directive.

Assen, April 1st 2016



G. Santema,
Ad Interim statutory director

Instruction manual

All technical and technological information in this manual as well as possible drawings made available by us remain our property and shall not be used (otherwise than for the operation of this pump), copied, duplicated, made available to or brought to the notice of third parties without our prior written consent.

SPXFLOW is a global multi-industry manufacturing leader. The company's highly-specialized, engineered products and innovative technologies are helping to meet rising global demand for electricity and processed foods and beverages, particularly in emerging markets.

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1 Introduction

1.1 Preface

This manual is intended for technicians and maintenance staff and for those who are in charge of ordering spare parts.

This manual contains important and useful information for the proper operation and maintenance of this pump. It also contains important instructions to prevent potential accidents and damage, and to ensure safe and fault-free operation of this pump.



Read this manual carefully before commissioning the pump, familiarize yourself with the operation of the pump and strictly obey the instructions!

The data published here comply with the most recent information at the time of going to press. However they may be subject to later modifications.

SPXFLOW reserves the right to change the construction and design of the products at any time without being obliged to change earlier deliveries accordingly.

1.2 Safety

This manual contains instructions for working safely with the pump. Operators and maintenance staff must be familiar with these instructions.

Installation, operation and maintenance has to be done by qualified and well prepared personnel.

Below is a list of the symbols used for those instructions and their meaning:



Personal danger for the user. Strict and prompt observance of the corresponding instruction is imperative!



Risk of damage or poor operation of the pump. Follow the corresponding instruction to avoid this risk.



Useful instruction or tip for the user.

Items which require extra attention are shown in bold print.

This manual has been compiled by SPXFLOW with the utmost care. Nevertheless SPXFLOW cannot guarantee the completeness of this information and therefore assumes no liability for possible deficiencies in this manual. The buyer/user shall at all times be responsible for testing the information and for taking any additional and/or deviating safety measures. SPXFLOW reserves the right to change safety instructions.

1.3 Guarantee

SPXFLOW shall not be bound to any guarantee other than the guarantee accepted by SPXFLOW. In particular, SPXFLOW will not assume any liability for explicit and/or implicit guarantees such as but not limited to the marketability and/or suitability of the products supplied.

The guarantee will be cancelled immediately and legally if:

- Service and/or maintenance is not undertaken in strict accordance with the instructions.
- The pump is not installed and operated in accordance with the instructions.
- Necessary repairs are not undertaken by our personnel or are undertaken without our prior written permission.
- Modifications are made to the products supplied without our prior written permission.
- The spare parts used are not original SPXFLOW parts.
- Additives or lubricants used are other than those prescribed.
- The products supplied are not used in accordance with their nature and/or purpose.
- The products supplied have been used amateurishly, carelessly, improperly and/or negligently.
- The products supplied become defective due to external circumstances beyond our control.

All parts which are liable to wear are excluded from guarantee. Furthermore, all deliveries are subject to our "General conditions of delivery and payment", which will be forwarded to you free of charge on request.

1.4 Inspection of delivered items

Check the consignment immediately on arrival for damage and conformity with the advice note. In case of damage and/or missing parts, have a report drawn up by the carrier at once.

1.5 Instructions for transport and storage

1.5.1 Weight

A pump or a pump unit is generally too heavy to be moved by hand. Therefore, use the correct transport and lifting equipment. Weight of the pump or pump unit are shown on the label on the cover of this manual.

1.5.2 Use of pallets

Usually a pump or pump unit is shipped on a pallet. Leave it on the pallet as long as possible to avoid damages and to facilitate possible internal transport.



When using a forklift always set the forks as far apart as possible and lift the package with both forks to prevent it from toppling over! Avoid jolting the pump when moving it!

1.5.3 Hoisting

When hoisting a pump or complete pump units the straps must be fixed in accordance with figure 1.



When fitting the straps make sure not to foul any lubrication pipes!



Never go underneath a hoisted pump!

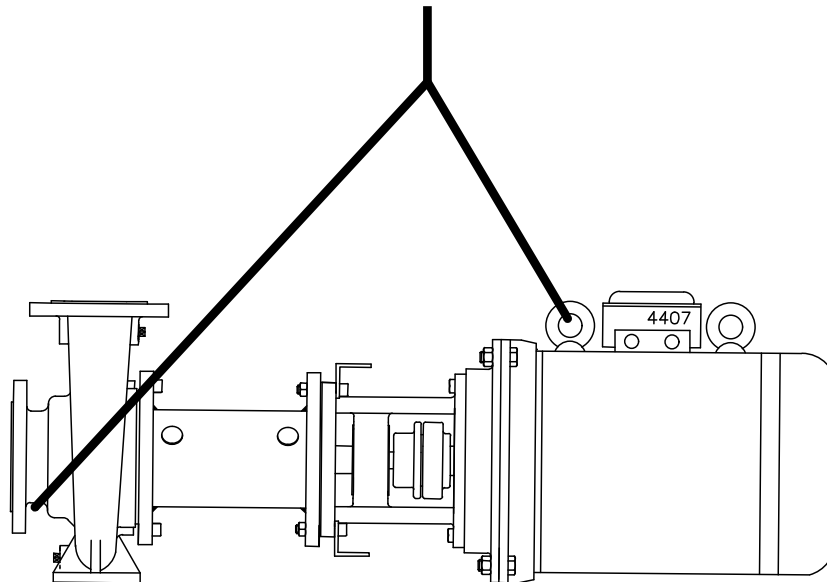


Figure 1: Lifting instructions.

1.6 Storage

If the pump is not to be used immediately the pump shaft must be turned by hand twice per week.

1.7 Ordering parts

This manual contains a survey of the spare parts recommended by SPXFLOW as well as the instructions for ordering them. A fax-order form is included in this manual.

You should always state all data stamped on the type plate when ordering parts and in any other correspondence regarding the pump.

➤ *This data is also printed on the label on the front of this manual.*

If you have any questions or require further information with regard to specific subjects, then do not hesitate to contact SPXFLOW.

2 General

2.1 Pump description

The CombiWell is a special series of submersion pumps which has been developed for use in paint spraying systems with water curtains and cleaning lines with solvents.

2.2 Type code

Pumps are available in various designs. The main characteristics of the pump are shown in the type code.

Example: **CW 100-160 G1 L1**

Pump family			
CW	CombiWell		
Pump size			
100	diameter discharge connection [mm]		
160	nominal impeller diameter [mm]		
Pump casing material			
G	cast iron		
R	stainless steel		
Impeller material			
1	cast iron		
6	stainless steel		
Lantern piece/stand pipe material			
L1	Lantern piece: cast iron	Stand pipe: steel	Slide bearing: Feroform F363
L6	Lantern piece: cast iron	Stand pipe: stainless steel	Slide bearing: Eriflon with 25% carbon

2.3 Serial number

Serial number of the pump or pump unit are shown on the name plate off the pump and on the label on the cover of this manual.

Example: **01-1000675A**

01	year of manufacture
100067	unique number
5	number of pumps
A	pump with motor
B	pump with free shaft end

2.4 Areas of application

- Paint spraying systems with water curtains.
- Cleaning lines with solvents.



It is not advised to use the pump for uses other than that for which it was originally supplied without first consulting your supplier! Using a pump in a system or under system conditions (liquid, system pressure, temperature, etc.) for which it has not been designed can create danger for the user!

2.5 Pump casing/impeller

2.5.1 Paint spraying systems

The pumps for paint spraying systems are made from cast iron. The impellers for these pumps are designed with 0,3 mm additional play on the hub of the impeller.

The parts from the CombiNorm pump type are used for the pump casing. The hydraulic usability of the CombiWell is therefore the same as the corresponding CombiNorm types.

2.5.2 Cleaning lines

The pumps for cleaning lines are made from stainless steel. This means that the pump section, stand pipe and pump shaft are made from stainless steel. The lantern piece is cast iron.

The parts of the CombiChem pump type in material R6 are used for the pump casing. The hydraulic usability of the CombiWell is therefore the same as the corresponding CombiChem types.

2.6 Bearing construction

The bearing arrangement of the pump consists of 1 ball bearing and 1 slide bearing. The ball bearing is located in the lantern piece. The slide bearing is located in the pump cover, the pump shaft is provided with a shaft sleeve at this location. The paint spraying system version has a slide bearing is asbestos-free Feroform F363, the cleaning street version has a slide bearing in Eriflon with 25% carbon.

2.7 Drive

The pump is driven by a standard IEC flange motor. The power is transmitted through a flexible coupling. Reducing flanges are used for assembling the lantern piece and the electric motor together. As a result of this it is possible to fit a wide range of electric motors.

2.8 Re-use

The pump may only be used for other applications after prior consultation with SPXFLOW or your supplier. Because the medium which was pumped last is not always known, the following instructions should be observed:

- 1 Flush the pump properly
- 2 Make sure the flushing liquid is discharged safely (environment!)



Take adequate safety measures (collection trough) and use the correct personal protection equipment (rubber gloves, goggles)!

2.9 Scrapping

If it is decided to scrap a pump, then the same steps as for paragraph 2.8 "Re-use" must be followed first.

3 Installation

3.1 Safety

- Read this manual carefully prior to installation and commissioning. Non-observance of these instructions can result in serious damage to the pump and this will not be covered under the terms of our guarantee. Follow the instructions given step by step.
- Ensure that the pump can not be started if work has to be undertaken to the pump during installation and the rotating parts are insufficiently guarded.
- Depending on the design the pumps are suitable for liquids with a temperature of up to 80°C. When installing the pump unit to work at 65°C and above the user should ensure that appropriate protection measures and warnings are fitted to prevent contact with the hot pump parts.
- If there is danger of static electricity, the entire pump unit must be earthed.
- If the pumped liquid is harmful to men or the environment, take appropriate measures to drain the pump safely. Possible leakage liquid from the shaft seal should also be discharged safely.

3.2 Environment

- The foundation must be hard, level and flat.
- The area in which the pump is installed must be sufficiently ventilated. An ambient temperature or air humidity which is too high, or a dusty environment, can have a detrimental effect on the operation of the electric motor.
- There should be sufficient space around the pump unit to operate and if necessary repair it.
- Over the cooling air inlet of the motor there must be a free area of at least ¼ of the electric motor diameter, to ensure unobstructed air supply.

3.3 Installation



Ensure that the pump can not be started if work has to be undertaken to the pump during installation and the rotating parts are insufficiently guarded.

- The pump has to be installed vertically. The pump unit can be suspended in the installation, for example by fitting angle sections to the ridges of the lantern piece.
- The outlet pipe must fit perfectly and remain stress-free during operation.
- Assemble any loose components.

3.4 Connecting the electric motor



The electric motor must be connected to the mains by an approved electrician, according to the locally prevailing regulations of the electricity company.

- Refer to the instruction manual belonging to the electric motor.
- If possible, mount a working switch as close as possible to the pump.

4 Commissioning

4.1 Check

- Check whether the pump shaft turns freely. Do this by turning the shaft end at the coupling a few times by hand.
- Check whether the fuses have been mounted.
- Ensure that the pump is adequately submerged in the liquid. A sufficiently high liquid level is required for correct operation of the pump. The liquid level should be such that the slide bearing is fully submerged in the liquid.

4.2 Preparing the pump unit for commissioning

Proceed as follows, both when the unit is put into operation for the first time and after the pump has been overhauled:

4.2.1 Checking the sense of rotation



When checking the direction of rotation look out for any unguarded rotating parts!

- 1 Ensure that the pump is submerged in the liquid, such that the slide bearing is also submerged.
- 2 Uncouple the pump from the electric motor by slackening the coupling half on the motor side, sliding it up the motor shaft and re-securing it.
- 3 The direction of rotation of the pump is shown by an arrow. Check if the direction of rotation of the motor corresponds with that of the pump.
- 4 Let the motor run for only short time and check the sense of rotation.
- 5 Refit the coupling half back onto the motor side at the correct position.
- 6 Rotate the pump shaft a few times by hand. This must go easily.

4.2.2 Start-up



Ensure that during operation the rotating parts are always adequately protected by a protective guard.

- 1 Close the outlet valve and switch on the pump.
- 2 Once the pump is up to pressure, slowly open the outlet valve until the working pressure is reached.

! The pump should never run dry.

4.3 Noise

The noise generated by a pump depends to a large extent on the operating conditions. The values stated in paragraph 10.3 "Noise data" are based on normal use of the pump, driven by an electric motor. For use outside of normal area of use or in the event of cavitation, the noise level can become higher than 85 dB(A). In this case precautionary measures have to be taken, such as fitting sound absorbing cladding to the pump unit or the wearing of ear protectors.

5 Maintenance



If the pump chamber is sprayed clean, water must not enter the terminal box of the electric motor!



Flawed maintenance will result in shorter lifespan, possible break down and in any event loss of warranty.

5.1 Lubrication of the bearings

- The grease packed deep-groove ball bearing is sealed for life (2RS1) and does not therefore require any maintenance.
- The slide bearing must always be submerged in the liquid.

5.2 Environmental influences

- Regularly clean the inlet strainer, if fitted to the bottom of the inlet flange, because once dirty the inlet pressure can become too low.
- If the unit is out of operation and there is the danger that the pumped liquid will expand as a result of solidifying or freezing, it should be drained and if necessary be flushed.
- If the pump is put out of operation for a longer period it should be treated with a preserving agent and be stored on a vibration-free base. The pump shaft should be rotated a number of times periodically.
- Check motor for accumulation of dust or dirt, which might influence motor temperature.

5.3 Noise

If, after some time, the pump starts making a noise this may indicate that something is wrong with the pump. A crackling noise in the pump may indicate cavitation or excessive motor noise can be an indication of decreasing bearing quality.

5.4 Motor

Check motor specifications for start-stop frequency.

5.5 Faults



The pump, of which you want to determine the fault, may be hot or under pressure. Take the appropriate precautions first and protect yourself with the proper safety devices (safety goggles, gloves, protective clothing)!

To determine the source of the malfunctioning of the pump, proceed as follows:

- 1 Switch off the power supply to the pump unit. Lock the working switch with a padlock or remove the fuse.
- 2 Close the stop valves.
- 3 Determine the nature of the fault.
- 4 Try to determine the cause of the fault with chapter 6 "Problem solving" and take the appropriate measures or contact your installer.

6 Problem solving

Faults in a pump installation can have various causes. The fault may not be in the pump, it may also be caused by the pipe system or the operating conditions. Firstly, always check that installation has been executed in accordance with the instructions in this manual and that the operating conditions still correspond with the specifications for which the pump was purchased.

In general, breakdowns in a pump installation are attributable to the following causes:

- Faults with the pump.
- Breakdowns or faults in the pipe system.
- Faults due to incorrect installation or commissioning.
- Faults due to incorrect choice of pump.

A number of the most frequently occurring failures as well as their possible causes are shown in the table below.

Table 1: Most frequently occurring failures.

Most common faults	Possible causes, see Table 2.
Pump delivers no liquid	1 2 5 9 10 11 13 14 17 19 20 21 29
Pump has insufficient volume flow	1 2 5 9 10 11 13 14 15 17 19 20 21 28 29
Pump has insufficient head	2 5 13 14 17 19 28 29
Pump stops after start up	1 2 5 9 10 11
Pump has higher power consumption than normal	12 15 16 17 18 22 23 24 25 26 27 38 44
Pump has lower power consumption than normal	3 14 15 16 17 18 20 21 28 29
Pump vibrates or is noisy	1 9 10 11 15 18 19 20 22 23 24 25 26 27 29 37 38 44
Bearings wear too much or become hot	23 24 25 26 27 37 38 44
Pump running rough, hot or seizes	20 23 24 25 26 27 37 38 44
Slide bearings wearing excessively	5 26 27 38
Slide bearing seized	25 26 27 38

Table 2: Possible causes of pump failures.

	Possible causes
1	Pump casing is insufficiently submerged
2	Gas or air coming from the liquid
5	Pump is drawing in air via the lower slide bearing
9	Inlet pipe or inlet strainer is blocked
10	Pump casing is not sufficiently submerged during operation
11	NPSH available too low
12	Speed too high
13	Speed too low
14	Wrong sense of rotation
15	Pump does not operate at the right duty point
16	Liquid density differs from the calculated liquid density
17	Liquid viscosity differs from the calculated liquid viscosity
18	Pump operates when the liquid flow is too low
19	Wrong pump selection
20	Obstruction in impeller or pump casing
21	Obstruction in the piping
22	Wrong installation of the pump unit
23	Pump and motor not correctly aligned
24	Rotating part running out of true
25	Imbalance in rotating parts (for instance: impeller pump shaft)
26	Pump shaft is running out of true
27	Bearings faulty or worn out
29	Damaged impeller
37	Axial retaining of impeller or pump shaft is defective
38	The bearings have been fitted incorrectly
44	Outlet pipe has not been fitted stress-free

7 Disassembly and assembly

7.1 Precautionary measures



Take adequate measures to avoid that the motor is started while you are working on the pump. This is especially important for electric motors with remote control:

- Switch the operating switch near the pump (if available) to "OFF".
- Switch off the pump switch on the switchboard.
- If necessary remove the fuses.
- Hang a danger board near the switchboard cabinet.

7.2 Disconnecting the pump unit



Submersion pumps are usually used for pumping polluted liquids. Therefore, wear gloves and possibly protective clothing and safety goggles!

- 1 Close the valve in the outlet pipe.
- 2 Open the cover on the terminal box on the motor. Disconnect the electrical wiring. Mark the wires and the associated terminals, this will make reconnection easier.
- 3 If fitted, disconnect the outlet pipe connection and base plate (0570) and lift the pump from the well. Allow the pump to empty completely.
- 4 Properly flush the pump. Thoroughly spray clean the outside of the submersion section.



Ensure that no liquid enters the environment.

7.3 Disassembly

The position numbers used refer to the cross-sectional drawing and the parts list see paragraph 9.2.1 "Sectional drawing" and paragraph 9.2.2 "Parts list".

7.3.1 Disassembling the electric motor

- 1 Remove the guard (0270).
- 2 Unscrew the bolts (0850) and remove the electric motor.
- 3 **Not for electric motors IEC 110 and 112:** Disassemble the reducing flange (0260) by unscrewing the bolts (0240).
- 4 Disassemble both coupling halves (0200) and (0220) and remove the keys (2210)

7.3.2 Disassembling the pump casing/impeller

- 1 Place the lantern piece on the motor mounting flange.
- 2 Unscrew the bolts (0800) and remove the pump casing (0100) and the packing (0300).
- 3 Lock the impeller (0120) using a large screwdriver and unscrew the cap nut (1820).
Sometimes it is necessary to heat up the nut first in order to break the Loctite joint.
- 4 Remove the impeller and the key (1860) from the pump shaft (2200) and remove the gland cover (0110) and the stand pipe (2290).
- 5 Unscrew the bolts (1840) and remove the seal cover from the gland cover. Inspect the oil baffle.
- 6 Remove the bearing bush (1160).

7.3.3 Disassembling the lantern piece/stand pipe

- 1 Via the assembly holes in the stand pipe (2290) unscrew the adjustment screws (2280) from the splash ring (2220).
- 2 Remove the stand pipe (2290) by unscrewing the bolts (0830) and the nuts (0900).
- 3 Slacken the lower bearing cover (0180). Remove the lower internal circlip (2360) and remove the shaft with the ball bearing from the lantern piece (0290).
- 4 Remove the internal circlip (2360). Remove the upper bearing cover (0180).
- 5 Remove the front external circlip (2300) and the adjustment ring (2340) from the shaft. Remove the ball bearing (2240) using a suitable ball bearing puller. Remove the other adjustment ring (2340) and remove the rear external circlip (2300).
- 6 Remove the shaft sleeve(s) (1100).

7.4 Assembly

The position numbers used refer to the cross-sectional drawing and the parts list see paragraph 9.2.1 "Sectional drawing" and paragraph 9.2.2 "Parts list".

7.4.1 Assembling the lantern piece/stand pipe

- 1 Heat up the ball bearing (2240) and the shaft sleeve(s) (1100) first at 90°C.
- 2 Remove the lower bearing cover (0180) first and then an internal circlip (2360) from the shaft until just passed both grooves (motor side shaft end) (2200). **Watch out for the correct position of the bearing cover!**
- 3 Fit the lower external circlip (2300) into the groove of the shaft and fit the adjustment ring (2340) against this external circlip.
- 4 Fit the ball bearing over the end of the shaft and push this against the adjustment ring until the entire unit has cooled down.
- 5 Fit the other adjustment ring (2340) and external circlip (2300).
- 6 Fit the shaft sleeve(s) (1100) onto the other shaft end. Push this (these) shaft sleeve(s) on until the entire unit is sufficiently cooled down.
- 7 Fit the upper bearing cover (0180) and the upper internal circlip (2360) into the lantern piece (0290).
- 8 Fit the lantern piece onto the motor mounting flange and fit the shaft with the ball bearing into the bearing piece. Secure the lower internal circlip (2360). **Make sure that this is seated correctly in the groove.** Knock the lower bearing cover (0180) home.
- 9 Fit the stand pipe (2290) to the lantern piece using the bolts (0830) and nuts (0900).
- 10 Fit the splash ring (2220) around the shaft and allow this to sink into the stand pipe. Secure the adjustment screws (2280) via the assembly holes in the stand pipe, such that the splash ring does not run up against the lantern piece.

7.4.2 Assembly of the pump casing/impeller

- 1 Apply some liquid locking agent to the bearing bush (1160). See paragraph 10.2 "Recommended locking liquids" for recommended locking agent. Fit the bearing bush (1160) into the gland cover (0110).
- 2 Fit the oil baffle (1170) into the seal cover (1180) and fit the seal cover, using bolts (1840) against the gland cover.
- 3 Slide the gland cover over the shaft until the fitting edge of the cover is resting on the flange of the stand pipe.
- 4 Fit the key (1860) into the end of the shaft and fit the impeller (0120). Apply liquid locking agent to the cap nut (1820) and tighten this to secure the impeller.
- 5 Fit the packing (0300) around the edge of the gland cover and fit the pump casing (0100) to the stand pipe with bolts (0800).

7.4.3 Assembling the electric motor

- 1 **Not for electric motors IEC 110 and 112:** Fit the reducing flange (0260) with bolts (0240).
- 2 Fit a key (2210) into the end of the pump shaft and fit coupling half (0200). Keep the face of the end of the shaft and the coupling half the same. Secure the coupling half.
- 3 Fit a key (2210) to the end of the motor shaft and fit coupling half (0220). Do not secure the coupling half yet.
- 4 Fit the electric motor using the bolts (0850). **For electric motors IEC 110, 112 and 200:** with bolts (0850) and nuts (0870).
- 5 Secure the coupling half (0220). **There must be a gap of 3 mm between both coupling halves.**
- 6 Fit the guard (0270).

8 Dimensions

8.1 Dimension drawings

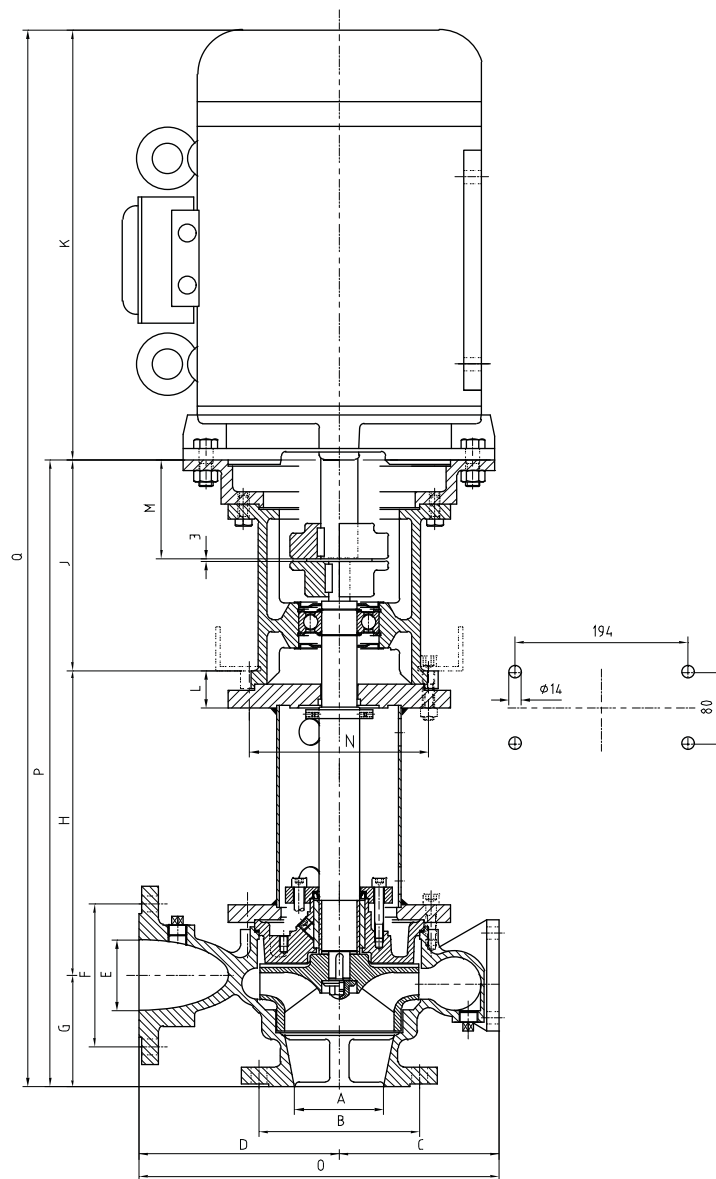


Figure 2: Pump dimensions.

8.2 Pump dimensions

Cast iron																	
Pump type	Motor type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q
40C-125	90 S	65	145	112	140	40	110	80	417	212	242	42	50	210	252	709	951
50C-125	100 L	65	145	132	160	50	125	100	417	202	331	42	60	210	292	719	1050
50C-125	132 S	65	145	132	160	50	125	100	417	222	403	42	80	210	292	739	1142
65C-125	132 S	80	160	160	180	65	145	100	417	222	403	42	80	210	340	739	1142
80C-160	100 L	100	180	180	225	80	160	125	417	252	484	42	110	210	405	794	1278
80C-160	160 M	100	180	180	225	80	160	125	417	252	484	42	110	210	405	794	1278
100-160	160 L	125	210	200	315	100	180	125	430	252	534	42	110	210	515	807	1341
100-160	200 L	125	210	200	315	100	180	125	430	252	694	42	110	210	515	807	1501

Stainless steel																	
Pump type	Motor type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q
40C-125	90 S	65	145	112	140	40	110	80	417	212	242	42	50	210	252	709	951
50C-125	100 L	80	160	132	160	50	125	100	417	202	331	42	60	210	292	719	1050
50C-125	132 S	80	160	132	160	50	125	100	417	222	403	42	80	210	292	739	1142
65C-125	132 S	100	180	160	180	65	145	100	417	202	403	42	80	210	340	739	1142
80C-160	100 L	125	210	180	225	80	160	125	417	222	331	42	60	210	405	744	1075
80C-160	160 M	125	210	180	225	80	160	125	417	252	484	42	110	210	405	794	1278

9 Parts

9.1 Ordering parts

9.1.1 Order form

You can use the order form included in this manual for ordering parts.

When ordering parts always quote the following data:

- 1 Your **address**.
- 2 The **quantity, the item number and the description** of the part.
- 3 The **pump number**. The pump number is stated on the label on the cover of this manual and on the type plate of the pump.
- 4 In the event of different electric motor voltage you should state the correct voltage.

9.1.2 Recommended spare parts

Parts marked with a * are recommended spare parts.

9.2 Pump

9.2.1 Sectional drawing

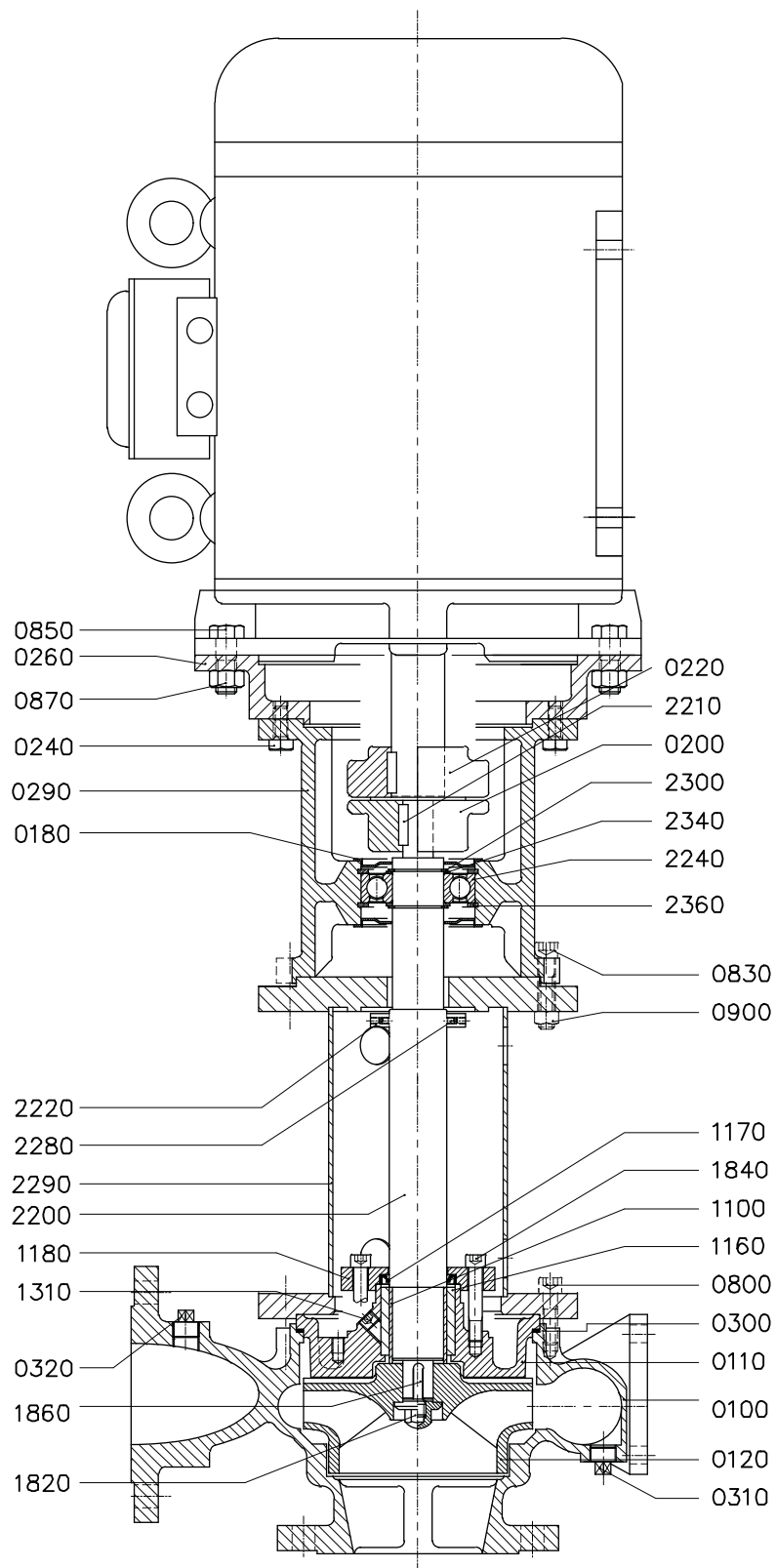


Figure 3: Sectional drawing.

9.2.2 Parts list

Item	Quantity		Description	Material	
	L1	L6		G1=L1	R6=L6
0100	1	1	pump casing	cast iron	stainless steel
0110	1	1	stuffing box cover	cast iron	stainless steel
0120*	1	1	impeller	cast iron	stainless steel
0180	2	2	bearing cover	steel	
0200	1	1	coupling half, pump side	-----	
0220	1	1	coupling half, motor side	-----	
0240	4	4	bolt	steel	
0260	1	1	reducing flange	cast iron	
0290	1	1	lantern piece	cast iron	
0300*	1	1	gasket	-----	
0310	1	1	plug	cast iron	stainless steel
0320	1	1	plug	cast iron	stainless steel
0800 ¹⁾	4	4	Allen screw	steel	stainless steel
0830	8	8	Allen screw	steel	stainless steel
0850	4	4	bolt	steel	
0870 ²⁾	4	4	nut	steel	
0900	8	8	nut	steel	stainless steel
1100*	3	1	shaft sleeve	steel	stainless steel
1160*	1	1	slide bearing	feroform	eriflon
1170	1	1	oil seal	nbr	viton
1180	1	1	mechanical seal cover	steel	stainless steel
1310	1	1	plug	steel	stainless steel
1820	1	1	cap nut	stainless steel	
1840	2	2	Allen screw	steel	stainless steel
1860*	1	1	key	stainless steel	
2200*	1	1	pump shaft	stainless steel	
2210*	1	1	key	steel	
2220	1	1	deflector	stainless steel	
2240*	1	1	ball bearing	-----	
2280	2	2	set screw	steel	stainless steel
2290	1	1	riser	steel	stainless steel
2340	3	3	adjusting ring	steel	
2360	2	2	inner circlip	spring steel	

¹⁾ item 0800, pump types with impeller diameter 160 number of 8.

²⁾ item 0870, only used for electric motor IEC 200L.

10 Technical data

10.1 Tightening moments

10.1.1 Tightening moments for bolts and nuts

Table 3: Tightening moments for bolts and nuts.

Materials	8.8	A2, A4
Thread	Tightening moment [Nm]	
M6	9	6
M8	20	14
M10	40	25
M12	69	43
M16	168	105

10.1.2 Tightening moments for cap nut

Table 4: Tightening moments for cap nut (1820).

Size	Tightening moment [Nm]
M12 (bearing bracket 1)	43
M16 (bearing bracket 2)	105

10.2 Recommended locking liquids

Table 5: Recommended locking liquids.

Description	Locking liquid
cap nut (1820)	Loctite 243
bearing sleeve (1160)	Loctite 641

10.3 Noise data

10.3.1 Pump noise as a function of pump power

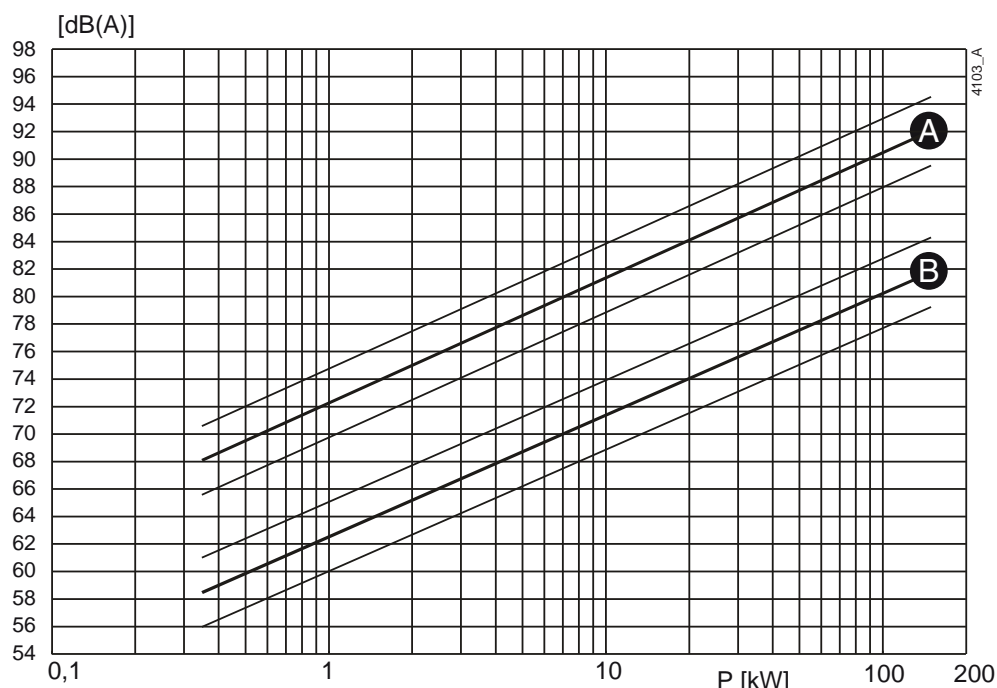


Figure 4: Noise level as function of pump power [kW] at 1450 min^{-1}
A = sound power level, B = sound pressure level.

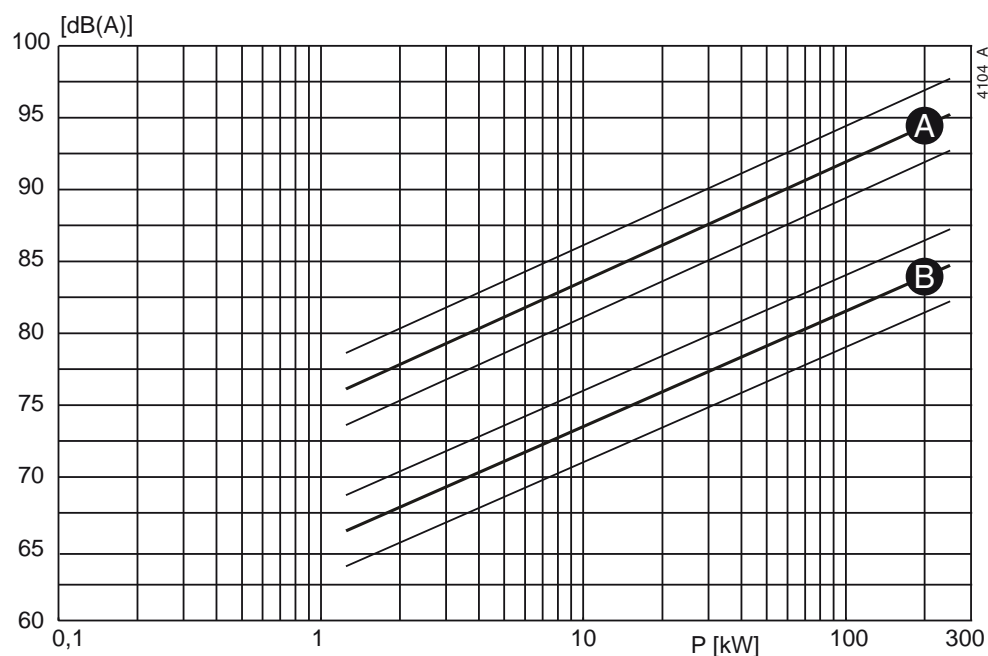


Figure 5: Noise level as function of pump power [kW] at 2900 min^{-1}
A = sound power level, B = sound pressure level.

10.3.2 Noise level of entire pump unit

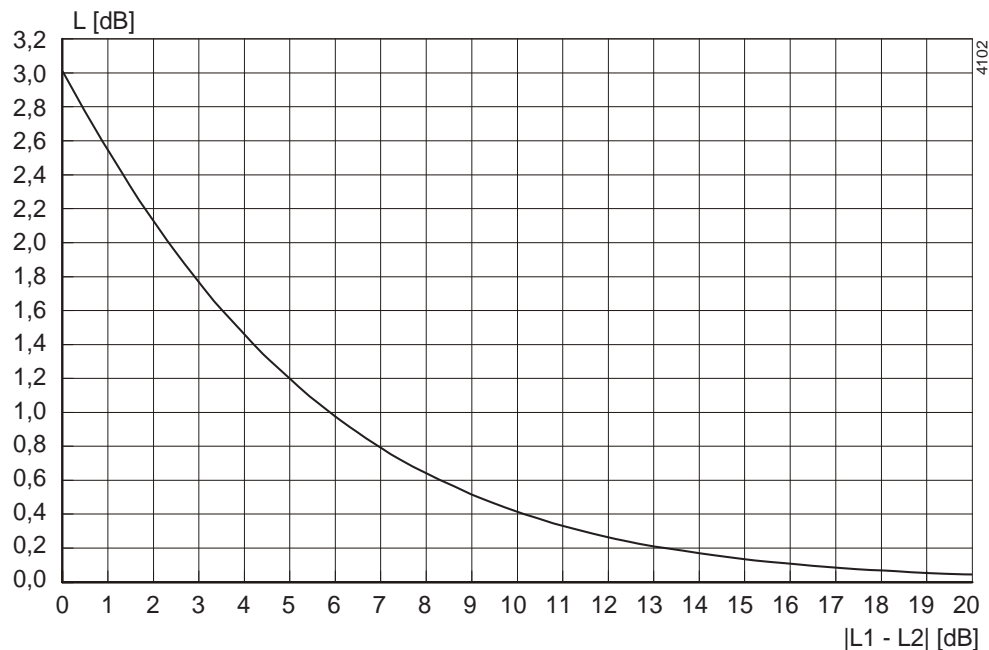


Figure 6: Noise level of entire pump unit.

In order to determine the total noise level of the entire pump unit, the noise level of the motor must be added to that of the pump. This can be easily done by using the graph above.

- 1 Determine the noise level (L_1) of the pump, see figure 4 or figure 5.
- 2 Determine the noise level (L_2) of the motor, see documentation of the motor.
- 3 Determine the difference between both levels $|L_1 - L_2|$.
- 4 Find the differential value on the $|L_1 - L_2|$ -axis and go up to the curve.
- 5 From the curve go left to the L [dB]-axis and read out the value.
- 6 Add this value to the highest value of both noise levels (L_1 or L_2).

Example:

- 1 Pump 75 dB; motor 78 dB.
- 2 $|75 - 78| = 3$ dB.
- 3 3 dB on the X-axis = 1,75 dB on the Y-axis.
- 4 Highest noise level + 1,75 dB = $78 + 1,75 = 79,75$ dB.

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Order form for spare parts

FAX Nr.	
ADDRESS	

Your order will only be dealt with if this order form has been correctly completed and signed.

Order date:	
Your order number:	
Pump type:	
Execution:	

Quantity	Item. No.	Part	Article number pump

Delivery address:	Invoicing address:

Ordered by:	Signature:	Telephone:

CombiWell

Submersion pump

SPXFLOW

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