COOX

SMV

立式多级不锈钢离心泵

GB Installation and operating instructions

中 安装及操作维护说明书

克奥兹泵业（深圳）有限公司

SMV 1，2，3，4，5，10，15，20

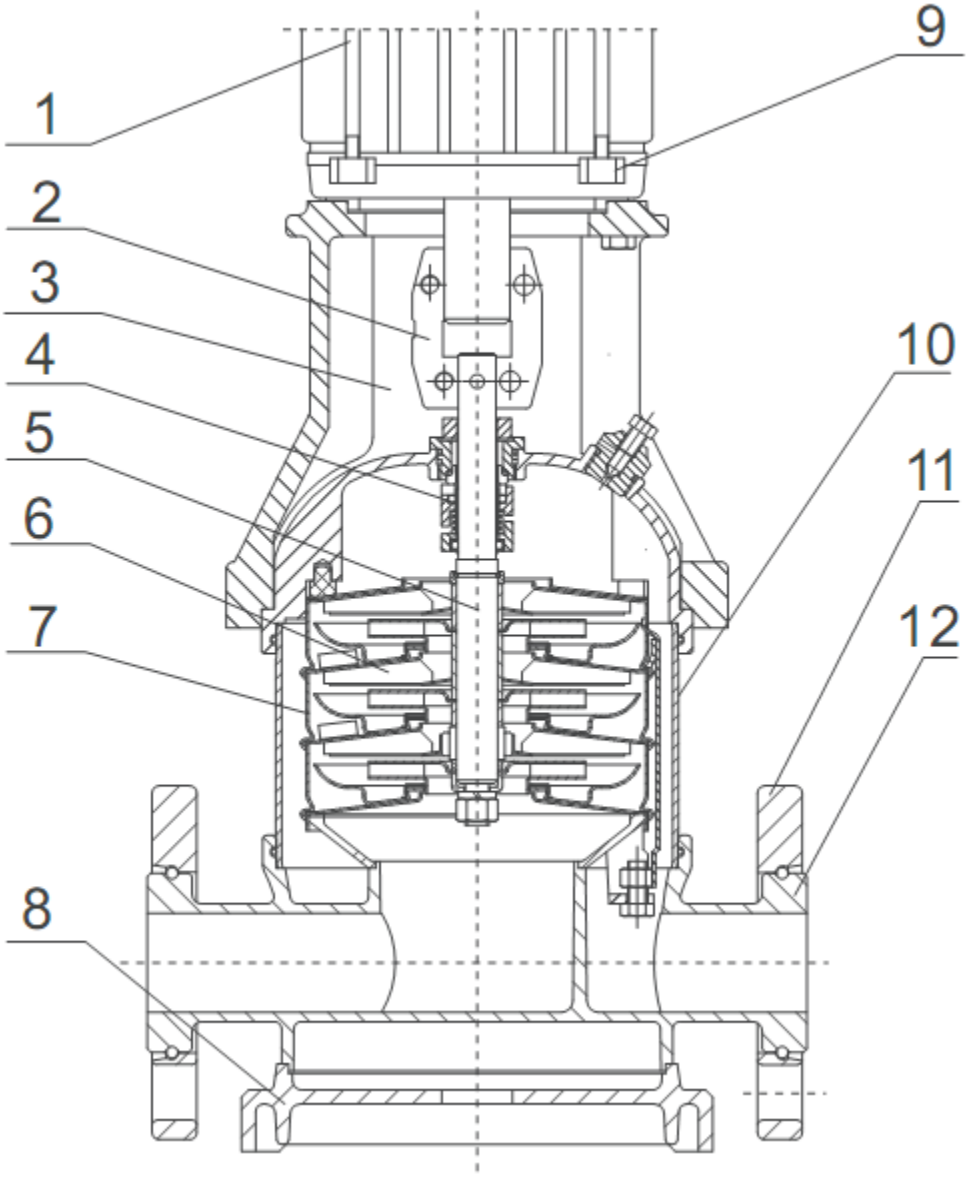


Fig.1

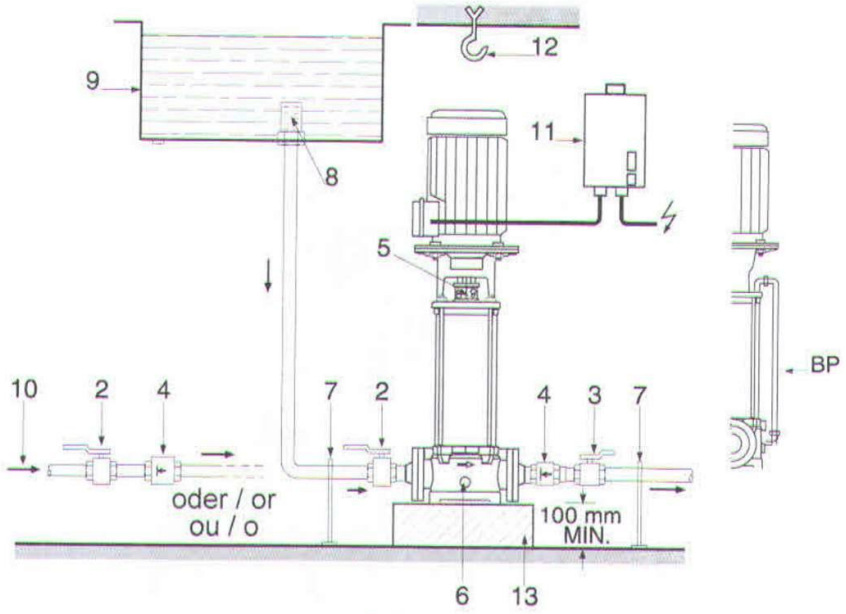


Fig. 2

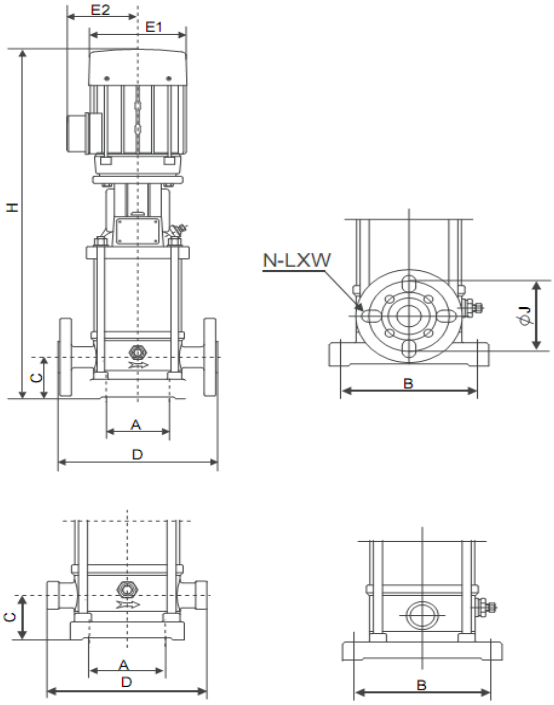


Fig. 3

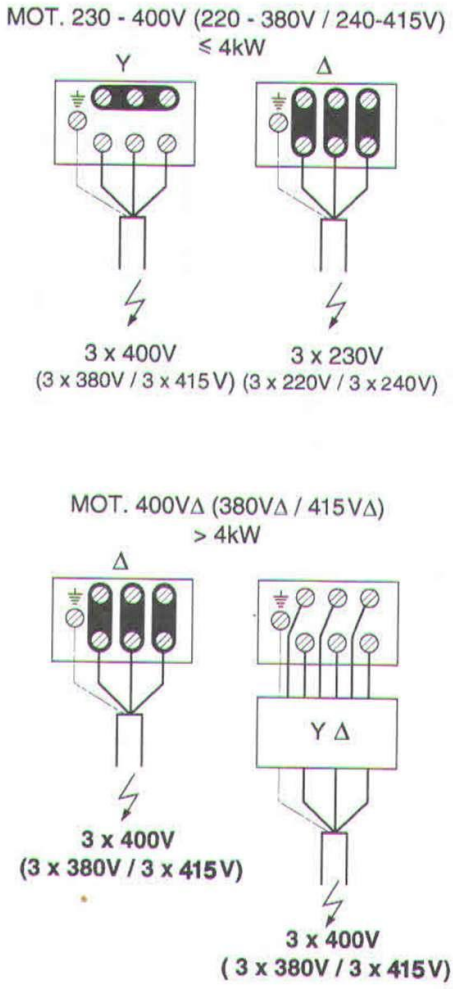


Fig. 4

SMV 32，45，64，90

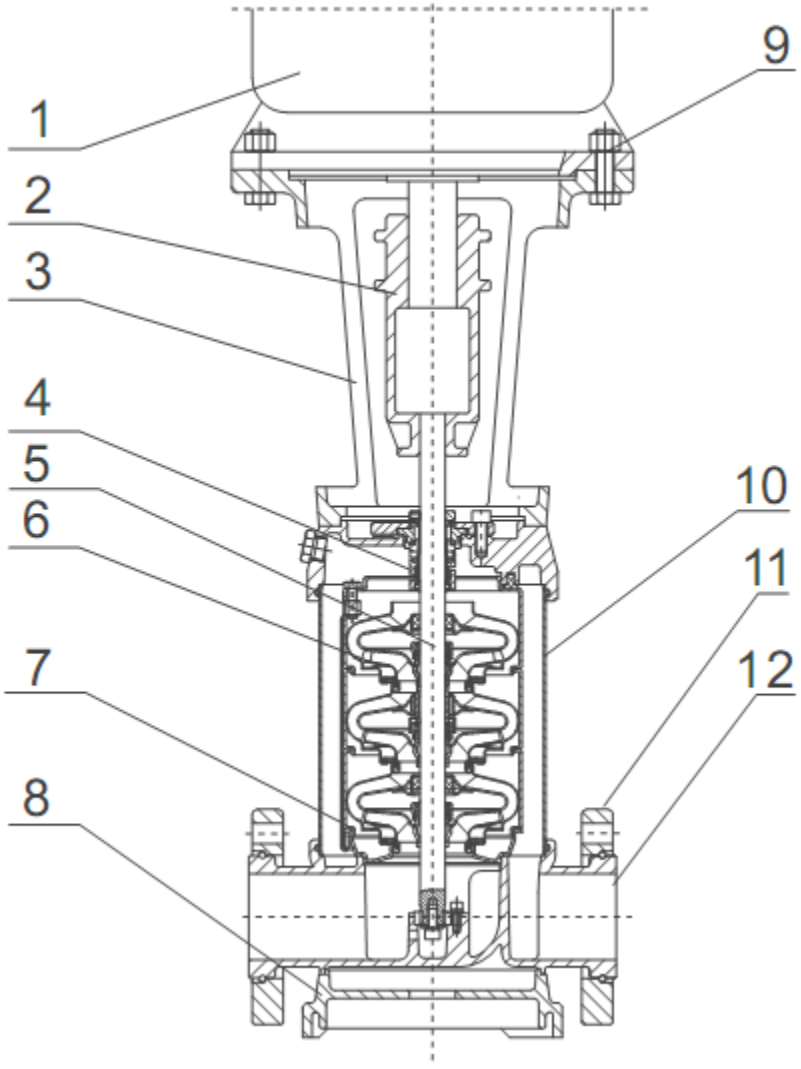


Fig.1

GB

中

1 General Information

Installation and commissioning only by qualified personnel

1.1 Uses

The pump is suitable for hot and cold water and other fluids free from mineral oil and without abrasives or long-fibred substances. The main areas of use are in water supply installations, as a booster pump, as a boiler feeder pump, in industrial circulation systems, in process technology, in cooling water systems, In fire extinguishers and in washing and sprinkler installations.

1.2 Product data

1.2.1 Connection and electrical data (Table 1)

Pumping medium allowed		Drinking water in acc. with Drinking Water Order Heating water / service water Condensate Water/glycol mixture[1)] Other liquid media[2)]
Permissible media temperature		-15°C to +120°C (Follow catalogue instructions)
Maximum ambient temperature		+40 °C
Maximum permissible working pressure: at the inlet (inlet pressure see paragraph 5.3) at the outlet, for a 2 pole motor at the outlet, for a 2 pole motor		10 bar 16/25 bar 16 bar
Mains voltages	DM: for P_2 < 4 kW: for P_2 > 5.5 kW:	3 ~ 230/400 V± 10%, 50 Hz 3 ~ 400 V ±10%, 50 Hz
Standard motor	for P_2 < 5.5 kW: for P_2 > 7.5 kW:	18 standard motor 1 standard motor
Speed	2 pole version 4 pole version	2900 RPM 1450 RPM
Mains fuse protection		see motor rating plate
Insulation class		F
System of protection		IP 55 better protective systems available

[1)] When using a water-gtycol mixture containing up to 40 % glycol (or media with a viscosity different to that of pure water, the flow data for the pump must be adjusted according to the higher viscosity of the flow media, regardless of the percentage of the viscous matter. Only use branded goods with corrosion protection-inhibitors, follow manufacturer's instructions.

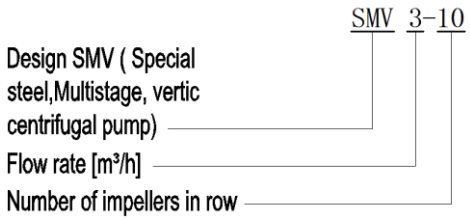
[2)] If other and also aggressive chemical fluids are to be pumped, be sure to follow catalogue instructions and first obtain the approval of COOX.

Principal dimensions and connection dimensions (Table 2, see also Fig. 3):

Type	mm											
SMV	A	B	C		D		E1	E2	H	J		N-LXW
			Cutting ferrule pipe join	Flange join	Cutting ferrule pipe join	Flange join				PN16	PN25	
1-2→1-36	100	180	50	75	210	250	133→177	102→144.5	464→1178	φ 89		4-27x18
2-2→2-26	100	180	50	75	210	250	133→177	102→144.5	464→1002	φ 89		4-27x18
3-2→3-36	100	180	50	75	210	250	133→177	102→116	464→1178	φ 89		4-27x18
4-2→4-22	100	180	50	75	210	250	133→197	102→148	464→958	φ 89		4-27x18
5-2→5-36	100	180	50	75	210	250	133→275	102→210	482→1644	φ 89		4-27x18
10-1→10-22	130	215	80	80	261	280	133→275	102→210	524→1364	φ 105		4-23.5x18.5
15-1→15-17	130	215	90	90	261	300	154→330	111→255	591→1640	φ 120.5		8-22x18
20-1→20-17	130	215	90	90	261	300	154→330	111→255	591→1699	φ 120.5		8-22x18
32-1-1→32-14	170	240	—	105	—	320	154→420	111→305	696→2185	φ 145		8-φ 18
45-1-1→45-13-2	190	266	—	140	—	365	197→470	165→345	876→2326	φ 160		8-φ 18
64-1-1→64-8-1	190	266	—	140	—	365	230→470	188→345	896→1948	φ 180	φ 190	8-φ 18
90-1-1→90-6	199	280	—	140	—	380	260→470	208→345	1001→1841	φ 180	φ 190	8-φ 18

When ordering spare parts, please give all the information on the pump/motor rating plate.

1.2.2 Type key



2 Safety

These instructions contain important information which must be followed when installing and operating the pump. These operating instructions must therefore be read before assembly and commissioning by the installer and the responsible operator. Both the general safety instructions in the "Safety precautions" section and those in subsequent sections indicated by danger symbols should be carefully observed.

2.1 Danger symbols used in these operating Instructions

Safety precautions in these operating instructions which, if not followed, could cause personal injury are indicated by the symbol:

when warning of electrical voltage with

The following symbol is used to indicate that by ignoring the relevant safety instructions, damage could be caused to the pump/machinery and its functions:

WARNING!

2.2 Staff training

The personnel installing the pump must have the appropriate qualifications for this work.

2.3 Risks incurred by failure to comply with the safety precautions

Failure to comply with the safety precautions could result in personal injury or damage to the pump or installation. Failure to comply with the safety precautions could also invalidate any claim for damages. In particular, failure to comply with these safety precautions could give rise, for example, to the following risks:

- Failure of important pump or machinery functions,
- Personal injury due to electrical, mechanical and bacteriological causes.
- Damage to property.

2.4 Safety precautions for the operator

Existing regulations for the prevention of accidents must be followed. Dangers caused by electrical energy are to be excluded. Directives issued by the VDE [German Association of Electrical Engineers] and the local electricity supply companies are to be observed.

2.5 Safety information for inspection and assembly

The operator is responsible for ensuring that inspection and assembly are carried out by authorised and qualified personnel who have studied the operating instructions closely.

Work on the pump/machinery should only be carried out when the machine has been brought to a standstill.

2.6 Unauthorized modification and manufacture of spare parts

Changes to the pump/machinery may only be made in agreement with the manufacturer. The use of original spare parts and accessories authorised by the manufacturer will ensure safety. The use of any other parts may invalidate claims invoking the liability of the manufacturer for any consequences.

2.7 Improper use

The operating safety of the pump or installation supplied can only be guaranteed if it is used in accordance with paragraph 1 of the operating instructions. The limiting values given in the catalogue or data sheet must neither be exceeded nor allowed to fail below those specified.

3 Transport and storage

WARNING! During transport and in storage the pump must be protected against moisture, frost and mechanical damage. The pump unit is to be transported with the shaft horizontal. When storing, ensure that the pump unit cannot overturn as a result of top-heaviness.

4 Product and accessory description

4.1 The pumps

The pump is a multistage (1-16 stages) normal suction vertical high pressure centrifugal pump with an in-line design, i.e. the inlet and outlet pressure glands are in a line. The pump is available in 3 pressure versions, PN16 , PN25 and PN40 with integrally cast circular flanges. The pump (Fig. 1) stands on a grey cast iron pump footplate which serves as a fixing base (8). The stage casings (7) are in a multiple modular construction. The impellers (6) are fitted on a single shaft (5), The pressure casing (10) guarantees a fail-safe seal. All parts that come into contact with the medium, such as stage housings, impellers and pressure casings are made of chromium nickel steel, the pump footplate (Pos. 12) with flanges (Pos. 11) of coated GG 25 (up to 85 °C) or of chromium nickel steel (on request). The shaft hole through the pump casing is sealed with an axial face seal (4).

SMV32C, SMV45C, SMV64 and SMV90 are equipped with a cartridge system in order to ease standard mechanical seal replacement without disassembling the hydraulic parts.

"Spacer" feature allows not to disassemble motor on SMV32C, SMV45C, SMV64 and SMV90 when removing mechanical seal cartridge. The pump and motor shafts are linked together by a clutch (2). All parts of the drinking water version (version E) which are in contact with the fluid have been cleared by KTW and WRAS and are therefore suitable for use with drinking water.

The speed of the pump can be controlled when connected to a frequency converter (see paragraph 5.3).

4.2 Products delivered

- high pressure centrifugal pump
- Installation and operating instructions

4.3 Accessories

see catalogue or data sheet

5 Assembly/Installation

- See the rating plate of the pump and the rating plate of the motor

5.1 Assembly

WARNING! Assembly should only take place once all welding and soldering work and the rinsing of the pipe network has been completed. Dirt will damage the pump.

- Install the pump in a dry place free of frost.
- Install in a horizontal and flat position. If the pump is positioned on an incline the bearing will wear more quickly.
- Install the pump in an easily accessible place to facilitate inspection and disassembly. Always install the pump exactly perpendicular on a sufficiently heavy concrete base (Fig. 2, 3). Fit a vibration absorber between the base and the floor.
- Dimensions for installation and connections are given in Paragraph 1.2.1, Table 2 and in Fig. 3.
- In the case of heavy pumps fit a hook (Fig. 2, Pos. 12) or eye with a suitable load-bearing capacity (total weight of pump: see catalogue/ data sheet) vertically above the pump, to which a hoist or similar device can be attached when maintaining or repairing the pump. Allow for a free size when completed of min. 200 mm.
- The arrow on the pump casing indicates the direction of flow.
- Fit the inlet and outlet pipes without stress. Install below expansion joints of restricted length to absorb vibrations. Tne pipes must be attached (Fig. 2, 7) in such a way that the pump does not bear the weight of the pipes.
- Isolation mechanisms (Fig. 2, 2 & 3) must in principle be installed in front of and behind the pump to avoid having to empty and refill the whole installation when inspecting or changing the pump.
- To avoid pressure loss it is recommended that you choose as short an inlet pipe as possible, choose a nominal width for the suction pipe which is larger by a nominal width than the pump connection and avoid constrictions caused by bends and valves.
- A backflow preventer (Fig. 2, 4) should be fitted in the outlet pipe.
- For differential pressures > 6 bar the backflow preventer (Fig. 2, Pos. 4) is to be fitted in the suction pipe. It is not required at the outlet.
- The axial face seal should be protected against dry running. An inlet pressure gauge or level gauge should be installed by the customer.
- If the pump is to be connected indirectly via a reservoir, a suction strainer (Fig. 2, 8) must be provided in the inlet pipe by the customer to prevent coarse impurities entering the pump.
- With limited nominal pressure PN, ensure that this pressure is produced from the inlet pressure and the zero flow level:

$$P_{inlet} \leqslant PN\text{-}P_{max\ pump}$$

- For gaseous or hot pumping media a bypass pipe is to be fitted to the pump (Fig. 2, Pos. BP), (accessory).

5.2 Electrical connection

Electrical connection should be made by a qualified electrician. Current national regulations must be observed.

- Check that the mains current and voltage comply with the data on the rating plate.
- Pump/installation must be earthed in compliance with regulations.
- All motors must be fitted with a motor safety switch by the customer to prevent the motor from overheating.

Adjusting the motor safety switch:

Direct starting current: Adjust to nominal current of the motor in accordance with the data on the motor rating plate. **Y-△-start:** if the motor safety switch is connected as a star or triangular safety circuit combination at the supply line it can be adjusted in the same way units operating on direct starting current. If the motor safety switch is connected to the motor supply line in phase (U1/V1/W/1 or U2A/2/W2), then the motor safety switch should be adjusted to the value of 0.58 of the nominal motor current.

- The mains cable can be inserted to the left or the right of the terminal box. Open the appropriate hole by removing the moulded cover, unscrew the PG connector and push the cable through the PG connector.
- The supply cable must be protected against the effects of heat and vibrations which may come from the motor or the pump.
- When using the pump in machinery where the water temperature exceeds 90 °C, a connecting pipe with corresponding heat resistance must be used.
- Connections to the mains must be carried out in accordance with the plan of terminal connections for rotary or alternating current in the terminal box of the pump (Fig. 4).
- The terminal box can be better positioned by rotating the motor through steps of 90°. To this end the connecting screws (Fig. 1, Pos. 9) of the lantern and motor flange are to be loosened.
- In the case of internal connecting screws the clutch guard (Fig. 1, Pos. 3) is to be removed beforehand. When assembling the clutch guard, do not forget to tighten the safety screw.

5.3 Operation with frequency converter

The speed of the pump can be controlled when connected to a frequency converter.

See Installation and Operating Instructions of the frequency converter for connection and operation.

The frequency converter may not generate a speed due to increased voltage greater than 2500 V/µ s and voltage peaks u> 1000 V, as otherwise the motor coil will be destroyed. If such speeds due to the increased voltage are possible, an LC filter (motor filter) should be installed between the frequency converter and the motor.

6 Commissioning

WARNING! In order to protect the axial face seal, the pump must not run dry.

- Close both isolating valves and open the vent screw (Fig. 2, 5) by one and a half or two turns.
- Slowly open the isolating valve (Fig. 2. 2) at the inlet until the air has escaped from the vent screw and the fluid to be pumped comes out. The escaping air will be clearly heard hissing. Tighten the vent screw.
- Slowly open the isolating valve at the outlet (Fig. 2, 3). The manometer installed at the outlet should be checked for any possible pressure instabilities, indicated by a flickering manometer pointer, if the pressure is unstable, allow more air to escape.

When the temperature of the liquid being pumped is high and the system is pressurised, any flow escaping from the vent screw can cause scalding and injuries. The vent ' screw should therefore be loosen only slightly.

- When used for the first time, if it is to be used to pump drinking water the system must be flushed through, so that any dirty water present will not contaminate the drinking water supply.
- **Checking the direction of rotation** (only for rotary current motors): Check that the pump rotates in the same direction indicated by the arrow on the pump casing by switching on for a short time. If this is not the case, interchange 2 phases in the terminal box.

  For pumps with a star or triangular circuit starting current, the connections of two coils must be interchanged, e.g. U1 with V1 and U2 with V2.
- If the fluid temperature is too high, steam may form which may damage the pump The pump must therefore not run with the valve closed for longer than 10 minutes when pumping cold water or for longer than five minutes when pumping fluid where > 60 °C.

  We recommend that the flow rate does not drop to below 10 % of the nominal flow rate so as to avoid a build up of steam in the pump.

- If there is a build up of steam, this should be allowed to escape by carefully opening the vent screw.

Both pump and motor can reach operating temperatures > 100°C. Therefore exercise caution when touching the pump.

7 Maintenance

Before carrying out any maintenance work, switch off the pump and ensure that it cannot be switched on again by unauthorised people. Never carry out work on a running pump.

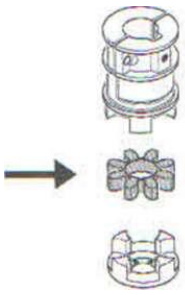
- During the running-in period, there may be some dripping from the axial face seal. In the event of a serious leak as a result of heavy wear have the mechanical seal replaced by a specialist.
- Increased bearing noise and unusual vibrations indicate a worn bearing. In this case, have the bearing replaced by a specialist.
- If the pump is exposed to frost, the pump and pipe work must be emptied in the cold season. Close the isolating valve and open the drain valve (Fig. 2, 6) and the vent screw (Fig. 2. 5) of the pump.

The isolating valve must be closed before the drain valve is opened.

- If placed in a frost-free location, the pump does not have to be emptied, even if it is out of service for a long period.

On pumps equipped with greaser under bearing box (table below), see greasing instructions written on sticker put on it:

Type					
	<22kW	22 kW	30 kW	37 kW	45 kW
SMV 15					
SMV32			✓		
SMV 45			✓	✓	✓
SMV 64		✓	✓	✓	✓
SMV 90		✓	✓	✓	✓



For pumps equipped with coupling bush, check it before reassembling.

8 Problems, Causes and Solutions

Problem	Cause	Solutions
Pump does not run	no power motor safety switch activated	check fuses, cables and connections Eliminate motor overload
Pump runs but does not pump	Incorrect direction of rotation	check direction of rotation and correct if necessary
	pipe or pump components blocked by foreign body	Check and clean pipe and pump
	air in inlet pipe	Seal inlet pipe
	inlet pipe too narrow	fit a larger inlet pipe
	valve not sufficiently open	open valve
Pump does not pump evenly	air in the pump	bleed the pump
Pump vibrates and is noisy	foreign body in the pump	remove foreign body
	pump not properly fixed to the base	tighten anchor bolts
	bearing damaged	consult customer services
Motor overheats motor cut-out activates	one phase interrupted	check fuses, cables and connections
	pump sluggish: foreign body bearing damaged	 clean pump have pump repaired by customer services
	ambient temperature too high	provide cooling

If the fault cannot be remedied, please contact your plumbing and heating specialist or your nearest COOX customer services or representative.

Subject to technical alterations!

1 概述

水泵的安装和调试只能由相应的专业人员来完成。

1.1 应用

该泵适用于冷、热水和不含矿物油且不含磨粒及长纤维的其它流体。

该泵主要用作供水系统增压泵、锅炉给水泵、工业循环水泵、工艺过程循环泵、冷却水系统循环泵、消防用水泵、冲洗和喷洒用水泵.

1.2 技术说明

1.2.1 接口和电气数据（表 1）

允许泵送介质	符合饮用条件的饮用水 热水/生活用水 凝结水 水-乙二醇混合液 1) 其它液态介质 2)
介质温度	-15℃~+120℃
最高环境温度	+40℃
最高工作压力： 进口 (进口压力参见章节 5.3) 出口（2 极电机） 出口（4 极电机）	10bar 16/25bar 16bar
电压 DM：P_2≤4 KW P_2≥5.5KW	3~230/400V±10%，50Hz 3~400 V±10%，50Hz
电机 P_2≤5.5KW P_2≥7.5KW	V18 接口 标准电机 V1 接口 标准电机
转速 2 极 4 极	2900 RPM 1450 RPM
主回路保险	参见电机铭牌
绝缘等级	F
防护等级	IP55 可用更高防护等级的电机

1)当泵送乙二醇(含量可达 40%)—水混合液或其它黏度与纯水差别较大的介质时，不管大黏度成分含量多少，水泵特性曲线都要根据泵送介质的黏度作相应的修正。只能使用品牌缓蚀剂并严格遵守其产品说明。

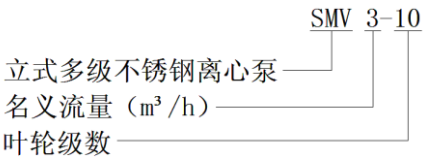
2)如泵送其它腐蚀性化学介质时，请遵守本说明书以下的规定并首先征得克奥兹公司的许可。

主要外形及连接尺寸（表 2，参见图 3）

型号	mm										
SMV	A	B	C		D		E1	E2	H	J		N-LXW
			卡箍、螺纹联接	法兰联接	卡箍、螺纹联接	法兰联接				PN16	PN25	
1-2→1-36	100	180	50	75	210	250	133→177	102→144.5	464→1178	φ 89		4-27x18
2-2→2-26	100	180	50	75	210	250	133→177	102→144.5	464→1002	φ 89		4-27x18
3-2→3-36	100	180	50	75	210	250	133→177	102→116	464→1178	φ 89		4-27x18
4-2→4-22	100	180	50	75	210	250	133→197	102→148	464→958	φ 89		4-27x18
5-2→5-36	100	180	50	75	210	250	133→275	102→210	482→1644	φ 89		4-27x18
10-1→10-22	130	215	80	80	261	280	133→275	102→210	524→1364	φ 105		4-23.5x18.5
15-1→15-17	130	215	90	90	261	300	154→330	111→255	591→1640	φ 120.5		8-22x18
20-1→20-17	130	215	90	90	261	300	154→330	111→255	591→1699	φ 120.5		8-22x18
32-1-1→32-14	170	240	—	105	—	320	154→420	111→305	696→2185	φ 145		8-φ 18
45-1-1→45-13-2	190	266	—	140	—	365	197→470	165→345	876→2326	φ 160		8-φ 18
64-1-1→64-8-1	190	266	—	140	—	365	230→470	188→345	896→1948	φ 180	φ 190	8-φ 18
90-1-1→90-6	199	280	—	140	—	380	260→470	208→345	1001→1841	φ 180	φ 190	8-φ 18

订购备品配件时，请务必给出水泵及电机铭牌上的所有参数。

1.2.2 型号说明



2 安全

本说明书包含了有关本水泵安装、使用所必须遵守的重要内容，因此安装、调试及使用水泵前各有关人员必须认真阅读。本说明书中的安全事项章节和后面用危险符号标注的有关内容都必须严格遵守！

2.1 本说明书中所使用的标志说明

如果不遵守说明书中的安全防范措施，可能会造成人身伤害，表示符号：

有电危险，表示符号：

忽视相关的安全防范措施将会对水泵和机械部分及其功能造成损坏，表示符号：

注意！

2.2 人员资质

安装水泵的人员必需具备相应的资质。

2.3 不遵守安全防范措施导致的危险

不遵守安全防范措施将引起人身伤害或水泵损坏，厂方不负任何责任，也不承担任何索赔。

不遵守安全防范措施将导致：

- 水泵或设备将失去其主要或重要功能
- 对人员造成因电气及机械伤害或细菌感染
- 物质损失。

2.4 操作者的安全防范措施

必须遵守本说明书中的预防事故发生的重要规范，排除可能引起的伤害。必须遵守当地的电气规程。

2.5 检查和安装的安全规范

操作者有责任确保检查和安装水泵必须由有资质的、接受过培训的专业人员进行。原则上讲，只有在水泵停止运行时，才能进行检查、检修。

2.6 自行改装设备和自制备件

自行改装设备必须经过制造商同意，使用原始备件和制造商授权的产品将确保安全。使用其他零件，制造商将不承担由此引起的任何后果和责任。

2.7 使用

厂方仅保证在说明书第一节所述的范围内使用该水泵的可靠性，产品样本及说明书中的极限值不允许逾越。

3 运输和存放

注意！ 在运输和存放水泵过程中，要避免水泵处于潮湿或霜冻的环境中，严禁受到机械性伤害。水泵在运输过程中应保持泵轴水平摆放，存放时不得泵头朝下。

4 水泵和附件说明

4.1 水泵

此系列水泵是一种立式多级离心泵，其水泵的进、出口法兰等径且同轴。水泵工作压力分三种：PN16、PN25 和 PN40。

水泵（见图 1）装配在灰铸铁泵座上，泵座同时又是用来安装水泵的底座（8）水泵的蜗壳（7）是一种多级结构，所有的叶轮（6）都安装在一根轴（5）上。水泵的压力外壳（10）保持完全密封。

所有与介质接触的部件，如各级蜗壳、叶轮、泵壳等均由铬镍不锈钢制成。根据不同需要，带法兰（11）的水泵底座（12）分为涂有防腐层的 CG25 灰铸铁（介质温度 85℃以下）或铬镍不锈钢等不同材质。泵轴穿过泵腔外壳中央孔的地方使用一套机械密封（4）。

SMV32C，SMV45C，SMV64 和 SMV90 安装有如左图所示的组合机械密封，便于更换标准机封，而无需拆开水力部件。

SMV32C，SMV45C，SMV64 和 SMV90 拥有“定位器”优点，在取出组合式机封时，无需卸下电机。

水泵轴和电机轴同一套联轴节（2）联接在一起，用于泵送饮用水的水泵通过 KTW 和 WRAS 认证，因而适于泵送饮用水。

水泵可通过与变频器联接改变其转速（见 5.3 章节）。

4.2 产品包装交货

- 水泵一台
- 《安装及操作维护说明书》一份

4.3 附件

见订货合同或设备清单

5 安装

- 参见相关的水泵与电机铭牌

5.1 就位与安装

注意！ 只有在所有管道的连接、支撑固定工作全部结束、管路系统彻底清洗之后才能进行水泵的安装。

- 水泵应安装于干燥、无霜冻的地方。
- 水泵应安装有一个水平、平整的平面上。水泵安装如不竖直将会加速轴承的磨损。
- 水泵应安装在易于拆卸和检修的地方，以便日后 对水泵进行检查或解体检修。而且一般都应竖直地安装在足够重的混凝土基础上（见图 2，位置 13），在基础和楼板之间必要时可加一层橡胶减震垫。
- 安装和连接尺寸在 1.2.1 节表 2 及图 3 给出。
- 对于较重的水泵，应在水泵安装位置的正上方增设一个吊钩（见图 2，位置 13）或吊环，其能力应与整台水泵的重量（见铭牌或样本）相匹配。水泵与吊钩之间应保持 200mm 的自由

空间，当水泵在需要维护或检修时可以利用倒链或类似设备将水泵吊起。

- 流动方向用箭头标在水泵底部的泵体上。
- 安装水泵进、出水管道不应对水泵施加应力，水泵进、出口处应安装软连接弯头以吸收振动。敷设进、出水管道不应让水泵承担管道的重量（见图 2，位置 7）。
- 水泵进、出水管道上应安装隔断阀（见图 2，位置 2 和 3）。这样在水泵进行检查或更换时无需把整个管路的水放空。
- 为避免压力损失建议尽量缩短进水管道，进水管道应比水泵进口名义尺寸粗，应避免由弯头、阀门等引起过大的节流。
- 出水管道侧应安装止回阀（见图 2，位置 4）。
- 当吸入压力大于 6 巴时，止回阀应安装于吸入管道上（见图 2，位置 4），出水管道上则不需要。
- 水泵使用的机械密封严禁水泵无水干转，用户应在进水管道上安装压力表或水位计。
- 如果水泵进水侧接一个蓄水池，则用户应在进水管路上安装一个过滤器（见图 2，位置 8），防止颗粒、杂质等进入水泵。
- 最高工作压力 PN 是水泵的极限压力，它是指进水压加上水泵在零流量条件下的扬程。即

$$P_{进} \leq PN - P_{最高扬程} \text{ 或 } P_{进} + P_{最高扬程} \leq PN$$

- 泵送汽态或热液体时应给水泵安装旁路通管（见图 2，位置 BP），旁通管属于可选购附件。

5.2 电气连接

电气接线必须由持证的电工进行，当地有关电气规定必须遵守。

- 检查电源电流、电压应满足水泵及电机铭牌上有关参数。
- 水泵应按照规定可靠接地。
- 用户应给所有水泵电机安装过载保护装置。

调整电机安全保护开关：

直接启动：跳闸电流应根据电机铭牌上额定电流来设定。

Y-△启动：如果电机安全保护开关安装在主电源一侧,则应按直接启动方式设定过载保护电流；

如果电机安全保护开关安装在电机一侧（U1/V1/W1 或 U2/V2/W2），则应按电机额定电流的 0.58 倍设定跳闸电流。

- 电机主电缆可从电机接线盒的左边或右边接入。打开接线盒盖，拧下电缆密封接头，将电缆插入其中的孔。
- 主电缆应能耐受电机或水泵高温、振动所带来的影响。
- 当水泵安装在温度超过 90℃的设备上时，必须使用适宜的耐热套管。
- 主回路应按照电机接线盒盖里面给出的接线图以及水泵铭牌上给出的电流、转向进行接线(见图 4)。
- 接线盒位置可以通过卸下电机法兰和水泵灯笼架之间的连接螺栓(见图 1，位置 9)，旋转电机 90 度以达到更佳的位置。有时卸下电机联接螺钉时要取下联轴节防护罩（见图 1，位置 3），不要忘记拧紧安全螺丝，装好联轴节防护罩。
- 接线盒位置可以通过卸下电机法兰和水泵灯笼架之间的连接螺栓(见图 1，位置 9)，旋转电机 90°以达到更佳的位置，有时卸下电机联接螺钉时要取下联轴防护罩（见图 1，位置 3），不要忘记拧紧安全螺丝，装好联轴节防护罩。

5.3 配置变频器的运行

水泵可通过与变频器联接改变其转速。

有关变频器的接线和运行，请参见变频控制器的安装使用说明书进行。

变频器升压速度不得大于 2500V/μ S，而且峰值不得大于 1000V。否则电机线圈就有烧毁的可能。如果做不到，则应在变频器与电机之间加设 LC 滤波器(电机滤波器)。

6 调试

注意！ 为了保护机械密封的摩擦面，该类水泵严禁干转！

- 关闭进、出水阀门，拧松一圈半或两圈放气螺塞（见图 2，位置 5）进行放气。
- 缓慢打开进水阀（见图 2，位置 2），直到液体从排气孔冒出。放气时可以很清楚地听到嘶嘶声。放完气后拧紧放气螺塞。
- 缓慢打开出口阀(见图 2，位置 3)。对安装在出口侧的压力表必须检查其稳定性，可以通过压力表指针的不停摆动看出。如果压力不稳应继续进行放气。

当泵送的液体温度较高而且有压力，从放气螺塞逸出的任何流体都可能会烫伤人员。因此在拧松放气螺塞时必须缓慢和小心。

- 当水泵再次投入使用时，如果泵送饮用水，其管路系统必须彻底冲洗，以免任何一点脏水污染饮水供应系统。
- 确认转向（仅对三相交流电机而言）：可用点动水泵的方式检查电机转向与泵体上箭头指示的转向是否一致，如果不同，交换电机接线盒内任意两相接线。

对于星-三角启动的电机，电机两组线圈接头必须交换：譬如 U1 与 V1 和 U2 与 V2。

- 如果泵送的流体温度太高，可能会产生对泵有害的蒸汽。所以当介质温度高于 60℃时水泵关闭出口阀运转时间不得大于 15 分钟，冷水则不得大于 10 分钟。

我们建议水泵的流量始终不低于额定流量的 10%，以免泵内产生蒸汽。

- 如果泵内已产生蒸汽，就一定要小心翼翼地通过放气螺塞将蒸汽放掉。

水泵和电机都有能在高于 100℃的温度下运行，所以触摸它们时要格外当心。

7 维护

在进行维修工作前应关停水泵，切断电源并确保无关人员不会随意合上电源开关。任何时候都不要对正在运转的水泵进行维修。

- 水泵运行初始，在机械密封的摩擦面上可能会出现些许水滴属于正常现象。如果运行一段时间后出现严重泄漏，说明磨损严重则需要由专业人员进行更换。
- 当轴承出现噪音和不正常的振动时，说明电机的轴承磨损严

重需由专业人员进行更换。

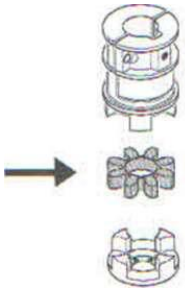
- 如果水泵安装于露天地里，当寒冷季节到来时必须把水泵和管道内的水放空。关闭进、出口阀门（见图 2，位置 6）和水泵放气螺塞（见图 2，位置 5）。

在水泵进行检修或更换而需要放水时，一定要先关闭进、出口阀门再打开放空阀。

- 如果水泵安装在无霜冻的环境里，水泵里的水不必放空，即便水泵要停用很长一段时期。

对于水泵轴承座下方安装有一个注油嘴的水泵（见下表），注油请见贴在灯笼架上的说明标签。

类型					
	<22kW	22 kW	30 kW	37 kW	45 kW
SMV 15					
SMV32			✓		
SMV 45			✓	✓	✓
SMV 64		✓	✓	✓	✓
SMV 90		✓	✓	✓	✓



对于如图所示的半弹性块联轴节重新安装时，请检查橡胶块的完好程度。

8 故障、原因及排除

故障	原因	排除
水泵不转	无电 电机安全保护开关动作	检查保险丝、电缆及连接状况 消除电机过载原因
水泵虽运转，但不出水	水泵转向错误	检查转向，必要时纠正
	管道或水泵被异物堵塞	检查并清洗管道或水泵
	进水管进入空气	拧紧进水管连接部分使之密封
	进水管太细	更换更粗的进水管
	阀门没有完全打开	打开阀门
水泵工作不稳定	水泵内有气	对水泵进行放气
水泵振动且有噪音	泵内进入异物	取出异物
	水泵未在基础上正确固定	拧紧地脚螺栓
	轴承损坏	更换或与售后服务联系
电机过热 电机频繁跳闸	缺 1 相	检查保险丝、电缆及连接点
	水泵运转吃力： 异物堵塞 轴承损坏	 清洗水泵 更换轴承或与售后服务联系
	环境温度过高	采取降温措施

如果故障仍不能排除，请与克奥兹公司联系。

若有变更恕不另行通知！

COOX

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