


Sondex Pumps

# Installation guide




Submersible wastewater pumps  
PX1 and PX2

## Identification plate


### Standard nameplate

Sondex Pumps A/S Jernet 9 DK-6000 Kolding 			
Type			
No.			
Q		H	
1/min		P2	
V	PH	A	Hz
Kg	Class H	IP 68	$\nabla$ 20m
<small>- THERMALLY PROTECTED - SEE MANUAL FOR CORD REPLACEMENT - WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT</small>			

### ATEX nameplate

Sondex Pumps A/S Jernet 9 DK-6000 Kolding 			
Type			
No.			
Q		H	
1/min		P2	
V	PH	A	Hz
Kg	Class H	IP 68	$\nabla$ 20m
<small>- THERMALLY PROTECTED - SEE MANUAL FOR CORD REPLACEMENT - WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT</small>			
 			

### FM nameplate

Sondex Pumps A/S Jernet 9 DK-6000 Kolding			
Type			
No.			
Q		H	
1/min		P2	
V	PH	A	Hz
Kg	Class H	IP 68	$\nabla$ 20m
<small>THERMALLY PROTECTED / PROTECTION THERMIQUE - SEE MANUAL FOR CORD REPLACEMENT / SE REFERER AU MANUEL POUR LE REMPLACEMENT DE CÂBLE ÉLECTRIQUE - WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT / ATTENTION - NE PAS OUVRIR DANS UNE ATMOSPHERE EXPLOSIVE</small>			
 Class I, Division 1, Group C and D T3C Ta = -20°C to +40°C			

## Applications

This installation, operation and service manual is applicable to the pump types PX1 and PX2. They are submersible pumps in degree of protection IP68. They are all designed for pumping water, wastewater with contaminants, as well as low-viscosity types of sludge. The pumps can also be used as drainage pumps where sand and gravel occurs.



**WARNING:** The machines must never be used in flammable or explosive media. If there are local restrictions concerning fire risks they must be obeyed.

The pumps meet EU's machine directive, see declaration of conformity at the back of this manual. Sondex Pumps guarantees that the pumps' airborne noise level does not exceed 70 dbA at normal operation in submerged installation. At dry installation the noise level is 74 dbA (at normal operation).



**WARNING:** If people can get physical contact with the pump or the fluid that is being pumped at e.g. open excavations, building sites or the like, a fault circuit-breaker (HFI) must be mounted in the electrical installation. If the pump is used in oceans, lakes etc. there must be a minimum safety

distance of 20 meters between the pump and any persons in the water.  
**NOTE** that in pools there are special safety restrictions.

## Product specification

A code system determines the type of pump model as stated here:

**Example:** PX2-150-V2-265-54-0400-0110

Pump model ————  
Standard discharge size in mm ————  
Impeller type  
V = Vortex type  
C = Channel type  
CV = B-tween type  
Impeller subcode: 1, 2, 3 ————  
Impeller diameter in mm ————  
Frequency: 5 = 50Hz, 6 = 60Hz ————  
Number of poles: 2, 4 or 6 ————  
Voltage in Volt: 230, 400, 460, 575 ————  
Power in kW × 10 ————

### Motor

Shorted asynchronous motor in 3-phased version for 50 or 60 Hz, degree of protection IP68  
Insulation class H

### Motor protection

All stators are equipped with 3 built-in thermal switches connected in series. The thermal switches open at 135°C and close again at 90°C.  
The wires for the switches are marked "F0" & "F1" and the method of installation can be found in the installation diagram for the pump.



**TO MAINTAIN WARRANTY ON THE PUMP, THE THERMAL SENSORS MUST BE CONNECTED PROPERLY**

### Moisture indicator

The pump is mounted with a moisture sensor as standard. It detects moisture in the stator compartment as well as the oil compartment simultaneously. The sensor is connected with the wire marked "D" coming out of the pump. This conductor shall be connected to a moisture relay, which is built into the electric board. The relay will cut off or signal (depending on connection) that the pump has moisture or water penetration. The normal alarm level is 100 kΩ for submersed and for dry installation, both at a voltage of 24V DC.



**TO MAINTAIN WARRANTY ON THE PUMP, THE MOISTURE SENSOR MUST BE CONNECTED PROPERLY**

### Motor cable

All standard and ATEX pumps are delivered with 10 metre cable of the type H07RN-F, FM approved pumps are as standard delivered with 10 metre extra hard usage rubber cables type SOOW which is an oil resistant nitrile cable. For installation of a longer cable please contact your local Sondex Pumps dealer, who can advise you about volt drop and dimensions. Also note that cable type and number of cables can vary depending on voltage, start method and country.

### Technical specifications

Please see the technical data supplied with the pump for weight, amount of oil and coolant, rpm, nominal power etc.

### Cooling system

The pumps can optionally be equipped with an internal cooling system for cooling the motor and critical parts. The cooling system is a closed circuit system, which means the system will not be clogged or lose its function due to polluted water. Amount of cooling fluid and type is stated in the technical specifications supplied with the pump.

## Handling

The pump must be packaged properly during transport to avoid damage to the pump or surroundings. It can be transported and/or stored in vertical or horizontal position. Check that the cables are packaged securely. The cable ends are sensitive towards moisture and water, which could seep into the coupling room and the motor.



**WARNING:** Always place the pump on a stable surface, so it cannot tip over during service, transport, testing and installation. Never lift the pump in the cables, always use its original lifting handles, which are designed in accordance with the machine's weight. Furthermore, check before lifting that the screws, which hold the lifting handles, are securely fastened.

For storage for long periods of time the pump must be serviced and checked again before use. Before electrical connection the impeller shall be turned by hand to ensure the correct friction of the mechanical seal. Also check the cable for breaks and assess whether the cable is flexible and smooth enough.

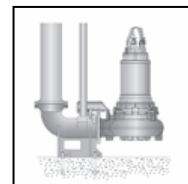
## Installation

The immersion depth for pumps covered by this manual is max 20 meters. The temperature of the pumped media must not continuously exceed 45°C.

Accidents in relation to installation can be minimised by taking special care. Be especially careful with the pump's weight and the risk of electrical accidents. When lifting with hoisting equipment, these must always be of the correct dimensions with regard to the lifted weight. Never walk under hanging loads.

### Installation with submerged pump on coupling foot

Cables for the pump have to be installed in such a way that they avoid any sharp bends or getting squeezed. Never let the cables hang in a way that they might get sucked into the pump.



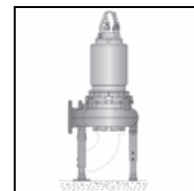
Mount the coupling foot at the bottom of the well with expanding bolts or glue-anchors of a size as stated on the dimension drawing. When mounting the upper guide brackets, the guide tubes must be vertical and parallel. Connect the discharge pipe to the coupling foot's flange and attach a possible automatic non-return valve followed by a check valve in the mentioned order.

The hoisting device must be installed directly above the pump's centre of gravity. The pump will then automatically connect at bottom position and loosen again when lifted. Now connect the cables to the electrical board and the pump is ready for operation.

Check that the pipe dimensions are correct according to the required capacity. Contact your local Sondex Pumps dealer, who can advise you.

### Dry pit installation

The pump unit is delivered with support legs. If the legs are adjustable, the height is regulated by loosening the two bolts on each leg, and tightens them again at the desired height. Then mount the inlet and discharge pipes.

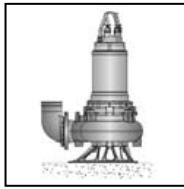


To make mounting and demounting of the motor part during service easier, we recommend mounting a valve on the suction side. This will also ease the adjustment or changing of the wear ring. The discharge side can also be equipped with a pressure gauge to easily check the pumps performance.

Check that the pipe dimensions are correct according to the required capacity. Contact your local Sondex Pumps dealer, who can advise you.

## Portable installation

When mounting this installation type, it is very important that the cables are installed in such a way so they do not bend, get damaged by vehicles etc. It is also important that there is no pulling in the cables or the hose.



The pump must be mounted on a solid surface and in a vertical position so it does not tip over or "dig" into the sand, sludge etc.



The pump can also be mounted lying down, but note that the pump's inlet is exposed whereby all physical contact must be avoided. Keep a minimum safety distance of 5 metres from a pump in operation. The pump is able to give a very powerful suction under water. Never underestimate this and also mount a plate that can be screwed onto the pump's frame to avoid large objects being sucked into the pump.



NOTE that the loss of pressure in a hose is much greater than in a tube. Contact your local Sondex Pumps dealer for determining hose loss and dimensions.

## Electrical installation

The pumps electrical equipment are made according to EN60204-1.



An authorised electrician must perform all electrical connections.

The pump must be mounted with a motor guard and a fault circuit breaker.

The pump should be grounded according to local regulations. The grounding wire are marked with a grounding symbol  $\perp$

Check that the pump's identification plate is in accordance with network voltage, frequency, fuse size and start form.

The network voltage must not fluctuate more than  $\pm 5\%$  of the pump voltage marking. If more, the motor's life will be reduced and the motor itself could short-circuit.

## Motor connection

Connection of the stator wires has to be done according to the connection diagram supplied with the pump. The proper connection of the motor depends on knowing the number of conductors as well as sensor cables.

The electric board must be equipped with a motor guard that fits the motor size. This relay must be set as follows:

### Direct start

The motor guard is set to the current (measured in ampere) that is stated on the identification plate. When the thermal surveillance is connected, the motor guard's setting is increased by 10 percent.

### Star-delta start

The motor guard is set to the current (measured in ampere) that is stated on the identification plate multiplied by 0.58. When the thermal overload switches are connected add 8 percent to the calculated value.

The grid must be secured with ordinary safety cutouts.

### Thermal protection:

All pumps, are equipped with thermal overload switches built into the stator. These are marked F0 & F1. The thermal protection conductors must be connected in series with the motor guard in the electric board according to the connection diagram supplied with the pump. If this protection is not connected the guarantee will be void in case of damage.

### Moisture sensor:

The conductor marked "D" is connected to a moisture sensor, which is placed between the oil housing and the motor housing. This sensor must be connected to a relay

F079999400011

in the electric board. The relay must be connected to the safety circuit and sound the alarm and at the same time stop the pump when moisture is registered in oil or stator housing. For further information on connection, see the connection diagram supplied with the pump. Your local Sondex Pumps dealer can supply you with the correct relay as an accessory.

## Changing the Cable

Note that a damaged cable always has to be replaced. Connecting the pump with a defective cable can be life endangering. Never try to lengthen the cable, only use cables in complete length, as water would be able to get into the motor and damage it.

Check the following to avoid water getting into the pump when changing the cable:

- Cable packing of rubber as well as cable washers must fit the cable dimension perfectly.
- The cable's outer diameter must not be deformed. Always cut off a piece so it will seal in a new place in case of a reused cable.
- Use grease before connecting.



NOTE that the earth conductor must be longer in the pump, and in a connector at the opposite end. If the motor cable is torn accidentally, the earth wire will therefore be the last to be torn.

## EMC – Electromagnetic compatibility

The pump does not give out electromagnetic radiation. The pump does not have elements that generate electromagnetic radiation or that are sensitive to electromagnetic radiation. The pumps are seen to live up to directive 89/336/EEC – concerning electromagnetic compatibility with later amendments. Electromagnetic radiation can occur during frequency control of the pump. Hence, the pump can be ordered with a shielded cable.

## Operation



Never start up a pump with incompletely connected cables or non-operational overload switches and leakage sensor

Before the pump is started, the rotation direction must be checked. At start the motors starting torque will cause the pump to jerk. The start reaction will be counter clockwise, seen from the top of the motor.



The starting torque can be very powerful even with small pumps. Never hold on to the pump and do not start the pump when hanging in free air. Place the pump solidly so it cannot rotate or tip over before starting.

Never start the pump without impeller, the pump must be fully assembled and ready for operation.

At wrong start reaction two phases must be switched. See the connection diagram.



NOTE that the pump at dry running or wrong rotation can get very hot and make a loud noise.



Before any inspection, service or repair of the pump, it has to be physically disconnected from the power supply. Remove connectors or dismantle the wires in the electric board. An emergency stop can be released or be defective and start the pump by mistake. Observe this before the motor part is removed from the motor housing and before any contact with the impeller.

## Service & maintenance

The pump is disconnected from the power supply before the work is started (as described in "Operation"). All pumps require regular control and preventive maintenance to operate economically and reliably. The pump should be checked every 6 months and during possible extreme operating conditions more often. Your local Sondex Pumps dealer can advise you about preventive maintenance. For complete overhaul of the

pump contact an authorised Sondex Pumps workshop or your local Sondex Pumps dealer.

For service on and around the pump a high hygiene must be practiced. Use gloves. Clean the pump carefully before dismantling it. Follow local and national safety instructions.

## Oil change

Oil change is performed if the oil is not clean and clear. The oil chamber is filled with clean, new oil (Mobil Hydraulic oil DTE24, or similar). Amount of oil shall be in compliance with the technical specification.



Note that the oil can be under pressure due to heat or defect. Hold a piece of cloth over the oil screw when it is loosened to avoid an accident.



NOTE that the oil must be handed in for destruction in accordance with local rules and regulations.

## ATEX approved pumps

Atex pumps are evaluated according to the requirements of EN 60079-0:2009 and EN 60079-1:2007



II 2 G Ex d IIB T3 Gb  
Ta = -20°C to +40°C

- Consult the manufacturer if dimensional information on the flameproof joints is necessary
- Consult the manufacturer for genuine replacement cable entry and enclosure fasteners, M8x30 (cable entry), M10x50 (PX1 enclosure) or M12x45 (PX2 enclosure) hexagon socket cap screws of A2-70 grade stainless steel or better with a minimum yield strength of 450 N/mm<sup>2</sup> (65,000 psi) are acceptable alternatives.
- See manual for cord replacement.

# Overensstemmelseserklæring / EC declaration of conformity / Konformitätserklärung



## Producent / Manufacturer / Hersteller

Sondex Pumps A/S  
Jernet 9  
DK-6000 Kolding  
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Sondex Pumps A/S  
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## Repræsentant / Representative / Repräsentative

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Acc.No.: 7040 0001415313  
Swift: SYBKDK22  
IBAN No.:  
DK2870400001415313

**Erklærer på eget ansvar, at følgende produkter /  
Declare under our sole responsibility that the products /  
Erklärt eigenverantwortlich, daß die Produkte**

Spildevandspumpe / Wastewater pump / Abwasserpumpe  
Series: PX series  
Models: PX1 and PX2

**Som er omfattet af denne erklæring, er i overensstemmelse med følgende standarder /  
To which this declaration relates are in conformity with the following standards /  
Auf die sich diese Erklärung bezieht, den folgenden normativen Dokumenten entsprechen**

Direktiv / Directive / Richtlinie  
Maskindirektivet / Machinery directive / Maschinenrichtlinie  
EMC-Direktivet / EMC-Directive / EMV-Richtlinie  
Lavspændingsdirektivet / Low Voltage Directive / Niederspannungsrichtlinie

94/9/EC  
2006/42/EU Appendix II A  
EMC 2004/108/EU  
LVD 2006/95/EU

The pumps are rated according to 94/9/EC

 II 2 G Ex d IIB T3 Gb IP68

10-04-2013

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