

NS, PF

Installation and operating instructions



NS, PF

English (GB)
Installation and operating instructions. 3

Dansk (DK)
Monterings- og driftsinstruktion. 13

English (GB) Installation and operating instructions

Original installation and operating instructions

These installation and operating instructions describe Grundfos NS and PF.

Sections 1-3 give the information necessary to be able to unpack, install and start up the product in a safe way.

Sections 4-9 give important information about the product, as well as information on service, fault finding and disposal of the product.



Make sure that the system in which the pump is incorporated is designed for the maximum pump pressure.



This pump has been evaluated for use with water only.

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1. General information

1.1 Target group

These installation and operating instructions are intended for professional installers.

1.2 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

DANGER



Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

WARNING



Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

CAUTION



Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:

SIGNAL WORD



Description of hazard

Consequence of ignoring the warning.
- Action to avoid the hazard.



Read this document before installing the product. Installation and operation must comply with local regulations and accepted codes of good practice.



This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

1.3 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.

2. Installing the product



Observe local regulations concerning limits for manual lifting or handling.

CAUTION



Crushing of feet

Minor or moderate personal injury
- Use safety shoes when handling the pump.

2.1 Pump location

Install the pump in a dry well-ventilated location. Protect the pump from rain, frost and direct sunlight. We recommend that you place the pump as close as possible to the liquid to be pumped.

2.2 Mechanical installation

2.2.1 Foundation

Fasten the pump to a solid horizontal foundation by means of screws through the holes in the base plate.

NS pumps can be installed in horizontal or vertical position. If the pump is installed in vertical position, the motor must be above the pump.

PF pumps must only be installed in horizontal position.

2.2.2 Pipework

Make sure that the pump is not stressed by the pipework.

Fit rigid pipes with pipe hangers.

Use sealing tape on the inlet and outlet ports of the pump.

2.3 Electrical connection

DANGER

Electric shock

Death or serious personal injury

- Before starting any work on the product, make sure that the power supply has been switched off and that it cannot be accidentally switched on.



DANGER

Electric shock

Death or serious personal injury

- The protective earth of the socket outlet must be connected to the protective earth of the pump. The plug must therefore have the same PE connection system as that of the socket outlet. If not, use a suitable adapter.



We recommend that you fit the permanent installation with a residual-current circuit breaker, RCCB, with a tripping current less than 30 mA.

DANGER

Electric shock

Death or serious personal injury

- If the pump is used for cleaning or other maintenance of swimming pools, garden ponds or similar places, make sure that the pump is supplied through a residual-current circuit breaker, RCCB, with a tripping current of 30 mA.



DANGER

Electric shock

Death or serious personal injury

- Power supply cables without a plug must be connected to a supply disconnecting device incorporated in the fixed wiring according to the local wiring rules.



DANGER

Electric shock

Death or serious personal injury

- The pump must be earthed.



2.3.1 Wiring diagram

Wiring diagram A

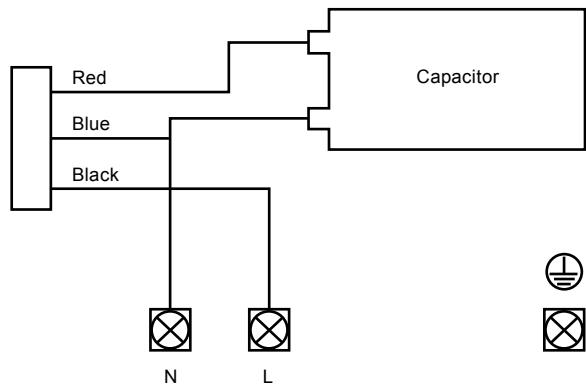


Fig. 1 Wiring diagram A for single-phase pumps

Wiring diagram B

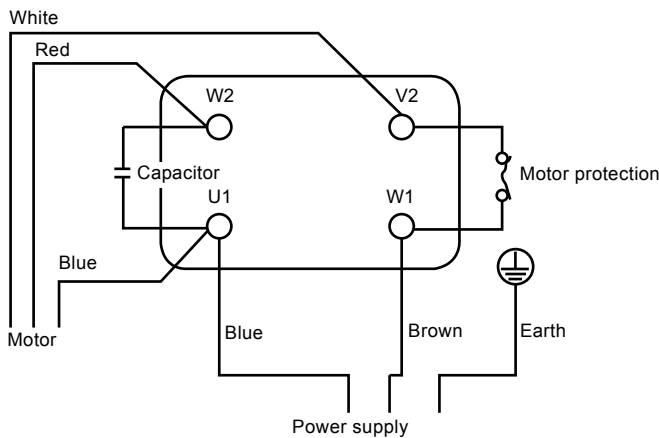


Fig. 2 Wiring diagram B for single-phase pumps

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Wiring diagram C

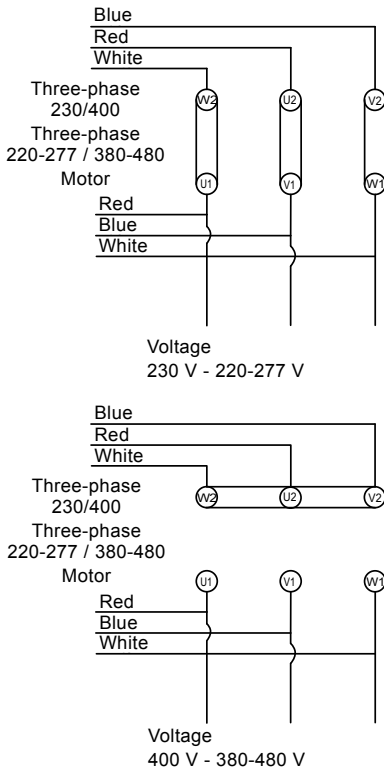


Fig. 3 Wiring diagram C for three-phase pumps

Pump	Voltage [V]	Wiring diagram
PF 1-30	220-240	A
PF 2-50		
NS 4-23		
NS 5-33		
NS 13-18		
NS 3-40	220-240	B
NS 5-50		
NS 5-60		
NS 6-30		
NS 6-40		
NS 30-18	3 x 400	C
NS 30-18		
NS 30-30		
NS 30-36		

3. Starting up the product

WARNING**Flammable material**

- Death or serious personal injury
- Do not use the pump for flammable liquids, such as diesel oil, petrol or similar liquids.

**DANGER****Electric shock**

- Death or serious personal injury
- Do not use the pump in swimming pools, garden ponds or similar places if there are people in the water.

**CAUTION****Hot surface**

- Minor or moderate personal injury
- Do not run pump continuously with a closed inlet or outlet valve.

**CAUTION****Hot or cold liquid**

- Minor or moderate personal injury
- Make sure that the escaping hot or cold liquid does not cause injury to persons or damage to the equipment.

**WARNING****Corrosive substance**

- Death or serious personal injury
- Do not use the pump for aggressive liquids.

**CAUTION****Hot surface**

- Minor or moderate personal injury
- Use protective gloves if the liquid or ambient temperature is higher than 40 °C.

**CAUTION****Impurities in water**

- Minor or moderate personal injury
- Flush the system with clean water to remove all impurities before you start the pump.



3.1 Priming

1. Remove the priming plug. Use a flat-blade screwdriver if the priming plug is tight.
2. Fill the pump housing with water.
3. Fit the priming plug and screw it tight by hand only.

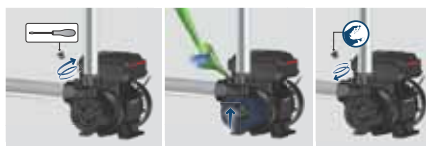


Always tighten plastic plugs by hand to avoid damage to the threads.



TM06 7290 3716

Fig. 4 Priming the NS pump



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Fig. 5 Priming the PF pump

4. Handling and storing the product

4.1 Handling the product



Use lifting equipment when handling the product.

Do not drop or shake the product.

4.2 Storing the product

Store the product indoors in a dry and dust-free environment. Protect the product from vibrations.

Storage temperature: -10 to +40 °C.

5. Product introduction

5.1 Product description

Grundfos NS pumps are centrifugal pumps designed for lifting water in domestic, industrial and agricultural installations.

The pumps come in two versions:

- single-impeller pumps
- twin-impeller pumps.

Grundfos PF pumps are compact peripheral centrifugal pumps that can generate high heads.

5.2 Product identification

5.2.1 Nameplate

1

Type: NS x-xx

2

U: 1x230 V~

3

31.5 µF / 450 V~

4

Q: 2.4-9.6 m³/h

5

n: 3400 min⁻¹

6

pmax: 0.6/6 Mpa/bar

7

CE

8

GRUNDFOS

DK - 8850 Bjerringbro Denmark

No: 99xxxxxx

P5 17.08

I1/I: 7 A 50Hz

P1: 1.5 kW

Class:F

HP:44

H: 36-22.5 m

Hmin: 22.5 m

Serial nr.00001

Hmax: 38 m

TliqMax: 60°C

TambMax: 55°C

Made in Italy by Grundfos

9

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TM06 8383 0816

1. Pump nameplate explanation

Pos.	Description
1	Type designation
2	Supply voltage
3	Capacitor data
4	Nominal flow range
5	Speed
6	Maximum system pressure
7	Approval markings
8	Product number
9	Full load current an frequency
10	Motor insulation class and enclosure class
11	Nominal head
12	Serial number
13	Maximum liquid temperature
14	Production date [year/week]
15	Motor power input
16	Pump power output
17	Minimum head
18	Maximum head
19	Maximum ambient temperature

5.3 Applications

Application	Grundfos NS	Grundfos PF
Domestic applications	•	
Industrial applications	•	
Agricultural applications	•	
Light industrial applications, such as feeding pressurised boilers (anticondensation)		•
Light gardening applications		•
Water supply		•
Draining and filling of cisterns		•

6. Maintaining the product

In normal operation, the pump does not require any specific maintenance.

DANGER

Electric shock



Death or serious personal injury

- If the power supply cable is damaged, it must be replaced by the manufacturer, his service agent or similarly qualified persons in order to avoid hazard.

7. Fault finding

DANGER

Electric shock

- Death or serious personal injury
- Before starting any work on the product, make sure that the power supply has been switched off and that it cannot be accidentally switched on.



CAUTION

Chemical hazard

- Minor or moderate personal injury
- Make sure that the product has only been used for water. If the product has been used for pumping aggressive liquids, flush the system with clean water before you start work on the product.



Fault	Cause	Remedy
1. The pump does not start.	a) Supply failure.	Cut in the circuit breaker or replace the fuses. If the new fuses also blow, check the electrical installation.
	b) The pump is blocked by impurities.	Clean the pump. Check or replace the strainer in the inlet pipe.
	c) The motor is defective.	Replace the pump.
2. The pump runs, but gives no or just a little water.	a) The pump is not filled with water.	Prime the pump. See section 3.1 Priming .
	b) The inlet pipe is blocked by impurities.	Clean the pump. Check or replace the strainer in the inlet pipe.
	c) The pump is blocked by impurities.	Clean the pump. Check or replace the strainer in the inlet pipe.
	d) The suction lift is too high, that is higher than 7 metres.	Change the position of the pump.
	e) The inlet pipe is too long.	Change the position of the pump.
	f) The diameter of the inlet pipe is too small.	Replace the inlet pipe.
	g) The inlet pipe is not immersed deeply enough.	Make sure that the inlet pipe is immersed sufficiently.
	h) The inlet pipe is leaking.	Repair or replace the pipe.
3. The pump runs, but gives no water or delivers a reduced quantity of water at high pressure.	a) The outlet pipe is blocked.	Clean the pipe or open the isolating valves, if any. Check that no additional work is being carried out in the system.
4. The pump stops during operation.	a) Single-phase motors: The thermal switch in the motor has tripped due to overheating.	The thermal switch cuts in automatically when the motor has cooled sufficiently. If the problem still persists, check these two possible causes: • The impeller is stuck. Clean the pump. • The motor is defective. Replace the pump.

8. Technical data

8.1 Operating conditions

Operating range

Single-impeller pumps: 4-30 m³/h and head up to 40 metres.

Twin-impeller pumps: 3-5 m³/h and head up to 60 metres.

Pumped liquids

Thin, clean, non-aggressive and non-explosive liquids, not containing solid particles or fibres.

8.1.1 NS

Ambient temperature

40 °C.

Liquid temperature

All NS pumps	0 to 35 °C for domestic use
NS 3-40, NS 4-23, NS 5-33, NS 5-50, NS 6-30, NS 6-40, NS 13-18	-10 to +50 °C for other uses
NS 5-60, NS 30-18, NS 30-30, NS 30-36	-15 to +110 °C for other uses

Maximum flow rate

Pump type	[m³/h]
NS 3-40	3
NS 4-23	4
NS 5-33	5
NS 5-50	5
NS 5-60	5
NS 6-30	6
NS 6-40	6
NS 13-18	13
NS 30-18	30
NS 30-30	30
NS 30-36	30

Maximum head

Pump type	[m]
NS 3-40	40
NS 4-23	23
NS 5-33	33
NS 5-50	50
NS 5-60	60
NS 6-30	30
NS 6-40	40
NS 13-18	18
NS 30-18	18
NS 30-30	30
NS 30-36	36

Maximum operating pressure

Pump type	[bar]	[MPa]
NS 3-40, NS 4-23, NS 5-33, NS 6-30, NS 6-40, NS 13-18, NS 30-18	6	0.6
NS 5-50, NS 5-60, NS 30-30, NS 30-36	8	0.8

Maximum inlet pressure

Pump type	[bar]	[MPa]
NS 3-40	2	0.2
NS 4-23	3.7	0.37
NS 5-33	2.7	0.27
NS 5-50	3	0.3
NS 5-60	2	0.2
NS 6-30	3	0.3
NS 6-40	2	0.2
NS 13-18	4.2	0.42
NS 30-18	4.2	0.42
NS 30-30	3	0.3
NS 30-36	2.4	0.24

On request

Other voltages and/or frequencies.

8.1.2 PF

Ambient temperature

Maximum 40 °C.

Liquid temperature

All PF pumps	0 to 35 °C for household use
	-10 to +50 °C for other uses

Maximum flow rate

Pump type	[m ³ /h]
PF 1-30	1
PF 2-50	2

Maximum head

Pump type	[m]
PF 1-30	30
PF 2-50	50

Maximum operating pressure

Pump type	[bar]	[MPa]
PF 1-30	6	0.6
PF 2-50	10	1

Maximum inlet pressure

Pump type	[bar]	[MPa]
PF 1-30	3	0.3
PF 2-50	5	0.5

8.2 Mechanical data

8.2.1 NS and PF

Enclosure class:	Motor: IP44. Terminal box: IP55.
Insulation class:	F.

8.3 Electrical data

Pump type	Voltage		P1	I _{1/1}	Capacitor	
	1 x 220-240 V 50 Hz	3 x 380-415 V 50 Hz	Maximum [kW]	[A]	[μF]	[Vc]
NS 3-40	•		1.2	5.5	20	450
NS 4-23	•		0.65	3	10	
NS 5-33	•		1.3	6	20	
NS 5-50	•		1.9	8.3	31.5	
NS 5-60	•		2.7	12.8	40	
NS 6-30	•		1.56	7.1	25	
NS 6-40	•		2	9	40	
NS 13-18	•		1.1	9.5	20	
NS 30-18	•		1.85	9.5	20	
NS 30-18		•	2.1	3.6		-
NS 30-30		•	3.8	14.7	-	
NS 30-36		•	4.55	10.2		
PF 1-30	•		0.47	2	8	450
PF 2-50	•		0.86	3.8	12.5	

9. Disposal

This product or parts of it must be disposed of in an environmentally sound way:

- 1. Use the public or private waste collection service.
- 2. If this is not possible, contact the nearest Grundfos company or service workshop.



The crossed-out wheellie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.