

# Fire Protection Systems That You Can Rely On





# Staying Calm Under Pressure



Possible harms and damages can be kept in minimum, thanks to a properly-operating fire protection system in case of a fire. You can rely on your fire protection system much more than before since Grundfos pumps are exactly located at the heart of your fire protection systems. Knowing that you have a system which is always ready to meet a possible water demand you can ease your mind.

All the Grundfos fire protection systems are already suitable according to a number of standards that are necessary for the water-based systems. Our global presence enables us to remain in close contact with both our customers and the authorities. When it comes to the fire protection, the priority is given to the crucial and necessary actions that need to be carried out as quickly as possible.



Electric motor



Control panel for the main fire pump



Control panel for jockey pump

# Reliable, Effective and Powerful Fire Protection System

Grundfos fire protection systems are based on our experiences and expertise as one of the leading pump and pump systems manufacturers of the world and Grundfos name has been synonymous with reliability, quality and effectiveness for nearly 60 years.

By offering flexibility to a large extent pumps in our wide range of products allow the system capacity to reach 1,100 m<sup>3</sup>/h/4,000 gpm at maximum and the system pressure to reach 190 mSS/280 psi at maximum. Safe jockey pumps and integrated control panels make Grundfos fire protection systems reliable solutions in each and every aspect.

## A Wide Range of Approvals

Grundfos fire protection systems possess a wide range of approvals that are valid in the systems' application areas. FM, UL, NFPA and VDS are among these approvals.

We offer our expertise and experience regarding the subject and make it sure that our systems comply with the necessary standards. When stricter standards are conditioned we immediately adapt our products in such a way that they meet the demands of these new standards. For more detailed information about the approvals within your local market please contact the Grundfos Office in your country.

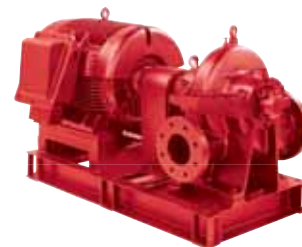




End Suction



In-line



Split-case

## The Difference Is In The Details...

Water-based fire protection system can be no better than the components that form the whole system. Sufficient pipeline, sprinkler system and valves require that correct pumps are located at the other side to transfer the right amount of water. For this process going on without problem you can rely on Grundfos pumps and control systems.

Fire pump: Grundfos offer a wide range of pump selections to meet your specific demands. Our comprehensive production programme allows us to meet your requirements including necessary flow and pressure, available square meter, standards for fire production and the specific application demands.

Customer-oriented solutions: Carrying out activities in parallel with the approval standards can be both advantageous and difficult. What you must do is certain but it can be somehow difficult to realize this in the area in question. At Grundfos we solve this dilemma by means of mutual dialog and the technical expertise.

All the Grundfos fire production systems are produced by means of a close cooperation with each customer. We diligently and meticulously cooperate and work together with you to make it sure that your solution comply with all the local approvals and also with the rest of the system.



All the control panels, in compliance with the system requirements and specifications, are produced with a customer-oriented approach.



Grundfos offer complete solutions comprising of diesel-electric pumps, control panels, gauges and the other accessories.



## About Grundfos

Grundfos is one of the leading pump and pump systems manufacturers of the world. We provide solutions from fire protection, heating and air-conditioning to water supply, wastewater, dosing and industrial processes. The whole Grundfos family with its more than 13,000 members in 66 companies locating in 39 different countries work with a great effort to make it sure that you are satisfied with the performance of our products.



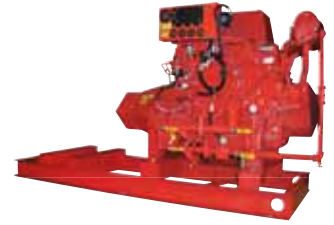
CR (Jockey Pump)



SP (Submersible Pump)



Fire-protection water booster in package type (domestic type)

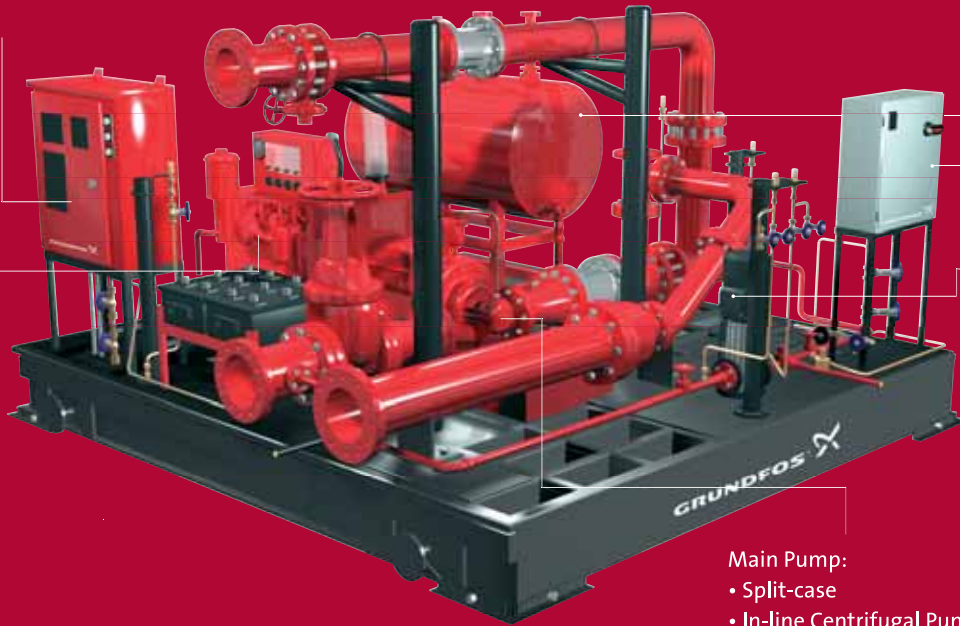


Diesel motor

Fire Pump Controller

Fire Pump Driver Type:

- Diesel Driven
- Electrical Motor



Fuel Tank

Jockey Pump Controller

Grundfos CR Jockey Pump

Main Pump:

- Split-case
- In-line Centrifugal Pump
- Submersible Pump
- End-suction

The Figure Describes The System Components Basically. For Details Contact Grundfos.

## Competent Head Quarters Working For You

Competent head quarters for Grundfos Fire Production Systems are under every situation close by. These head quarters all over the world offer consultancy and supporting service according to your requirements. In these head quarters one-to-one solutions are a rule rather than an exception.

As a complete-system-solutions manufacturer we at Grundfos are thoroughly aware of our responsibility. You can be sure that our experts will always stand by you. They will support you regarding various subjects like production, operation, education, service and maintenance.

After Sales; immediate care for your systems, spare parts, technical support and appropriate maintenance services for your system are carried out by our service team.



## General Information

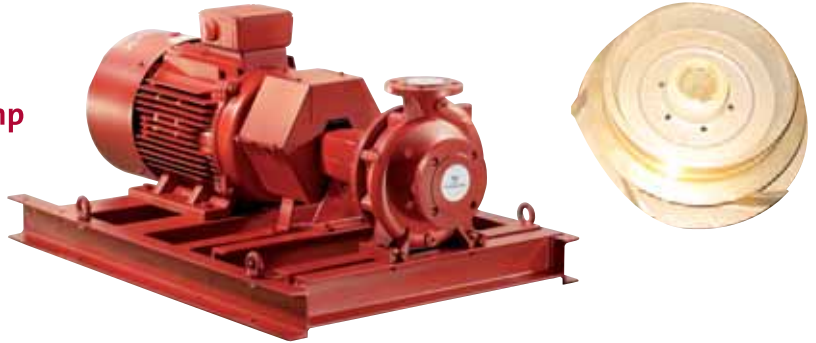
Fire pumps are used in fire-cabinet, fire hydrant and sprinkler systems. Fire pumps are designed according to NFPA 20 performance criteria and they can be designed according to the conditions of pump rooms. The pump types used in the groups are end-suction pumps with horizontal shafts.

Main pumps (diesel and electric motors with drives) support each other % 100 and in case of damage in the duty pump the stand-by pump starts automatically. The aim of using jockey pump is to save energy by preventing the main pump to switch on. This is because the main pump provides much more than necessary water in small amounts of flow demand and in the leakages of pipeline. The capacity of jockey pump must be lower than the supply capacity of one sprinkler in the system.

Separate control panels are available for each pump.

## Constructional Features of the Main Pump

Pump housing	: GG-25 cast iron
Pump impeller	: Bronze
Pump shaft	: Stainless steel
Seal	: Stuffing box
Bearing	: Ball bearing



## Main Pump Features

As non-self priming and single-stage these pumps feature axial suction, radial discharge port and horizontal shaft. Suction and discharge flanges are according to PN 10 or PN 16. All the pumps are balanced dynamically according to ISO 1940 class 6.3 and the impellers are balanced hydraulically. The electric motor is totally enclosed, fan-cooled and squirrel-cage type. It complies with IEC and DIN standards. The main pump is also available with diesel motor driven.

## Hydro Fire Control Panels

### Electrical Pump Controller

- The panels are produced out of galvanize with electrostatic powder paint in the colour of polyurethane RAL 3000.
- The enclosure class: IP55
- The panel is locked type.
- Pumps can be operated both manually and automatically.
- Automatic test system is added optionally. Valve system with motor are also added to the automatic test system.
- The main pumps do not have thermal protection.
- The jockey pump has thermal protection in its panel.
- When they automatically work the main pumps require manually stopping for safety however they have minimum run-period timer stopping function if wanted.
- The panel can provide some information like pump's working, phase and supply error, dry contact.



Electrical Pump Controller

### Diesel Pump Controller

- It belongs to enclosure class IP55 with electrostatic powder paint in RAL 3000 colour.
- The panel is locked type.
- The panel possesses locked button that prevents manual position for safety.
- Emergency buttons that will be used under emergency regardless of the conditions are available.
- Two-lined liquid crystal display indicating the status of the diesel pump is available.
- Panel of the diesel motor features six times intermittent starting which can be set via the both batteries.
- When the voltage in any battery is lower than 9 V the other battery is activated and the recharge stage begins.
- The panel can provide some information like general alarm, belt and pulley fault, low oil level, high heat alarm, faults of A or B battery recharge.
- Some other information is also provided. These are: low fuel alarm (the rate is indicated in the display in %), pump is running, pump is ready, network energy available.
- In addition to these features, general fault and dry contact information can also be received.



Diesel Pump Controller

## Grundfos Fire Set Components

- There is no collector in the suction line. Each pump must be connected to the tank separately.
- 0-6 bar vacuum meter is available in the suction flange of the pump.
- All the pumps are equipped with casing relief valve for cooling.
- 0-16 bar manometer is available in the discharge port of the pump
- The group is completely painted in red RAL 3000.
- Dual pressure switch is used for the pump with diesel motor drive.
- The sizes of the all equipment comply with NFPA 20.

Grundfos fire pumps have a wide range of accessories. In addition to these, manual/automatic diesel motor control panels and batteries, fuel systems as well as coupling casings are available.







### Hydro Test Fire-Protection Water Boosters

- A booster solution that offers domestic fire-protection water up to 180 m<sup>3</sup>/h with vertical type pumps.
- Jockey pump solution in case of low flow demand and leakage.
- Standard audible and lighted alarm in any fault.
- It can be used both as fire-protection water booster and domestic water booster.
- Pneumatic pressure system equipped with sensitive pressure switches.
- In the suction line original Grundfos non-return valve suitable to the connection diameter. Giacomini globe valve or Ebro butterfly valve galvanized steel collector.
- In the suction line Giacomini globe valve or Ebro butterfly valve, galvanized collector suitable to the connection diameter. Solenoid valve with low voltage used during the automatic test. .
- Pumps with electrical motors belonging to high-efficient Eff 1 class within our standard scope.
- Lockable switches on the panel suitable to usage of fire protection system.
- 24 V low control voltage inside the panel.



### Hydro Fire Selection Table

	50 mSS	60 mSS	70 mSS	80 mSS	90 mSS	100 mSS	110 mSS	120 mSS
50 m3/h	NK 50-200/15	NK 50-200/18,5	NK 50-250/22	NK 50-250/22	NK 50-250/30	NK 65-250/37	NK 65-315/55	NK 50-315/55
60 m3/h				NK 50-250/30	NK 50-250/37			NK 65-315/55
70 m3/h	NK 65-200/18,5	NK 50-200/22	NK 50-250/30	NK 65-250/37	NK 50-250/37	NK 65-250/45	NK 65-315/55	NK 65-315/55
80 m3/h	NK 65-200/22	NK 65-200/30	NK 65-250/30					NK 65-250/45
90 m3/h			NK 65-250/37	NK 80-250/45	NK 65-250/55	NK 65-315/75		
100 m3/h	NK 80-200/30	NK 80-200/37	NK 80-250/45	NK 80-250/55	NK 80-250/55	NK 80-250/90	NK 80-315/90	NK 80-315/90
110 m3/h								NK 80-250/75
120 m3/h	NK 80-200/37	NK 80-200/45	NK 80-250/55	NK 80-250/75	NK 80-250/75	NK 80-250/90	NK 80-315/110	NK 80-315/110
130 m3/h								NK 80-250/75
140 m3/h	NK 80-200/37	NK 80-200/45	NK 80-250/55	NK 80-250/75	NK 80-250/75	NK 80-250/90	NK 80-315/110	NK 80-315/110
150 m3/h								NK 100-250/75
160 m3/h	NK 100-200/45	NK 80-200/55	NK 100-250/75	NK 100-250/75	NK 100-250/90	NK 100-250/90	NK 100-315/110	NK 100-315/110
170 m3/h								NK 100-250/75
180 m3/h	NK 100-200/45	NK 100-200/55	NK 100-250/75	NK 100-250/90	NK 100-250/90	NK 100-250/90	NK 100-315/110	NK 100-315/132
190 m3/h								NK 100-250/90
200 m3/h	NK 100-200/55	NK 100-200/75	NK 100-250/75	NK 100-250/90	NK 100-250/90	NK 100-250/110	NK 100-315/132	NK 100-315/132
210 m3/h								NK 100-250/110
220 m3/h	NK 100-200/55	NK 100-200/75	NK 100-250/75	NK 100-250/90	NK 100-250/110	NK 100-250/110	NK 100-315/132	NK 100-315/160
230 m3/h								NK 100-250/132
240 m3/h	NK 100-200/55	NK 100-200/75	NK 100-250/75	NK 100-250/90	NK 100-250/110	NK 100-250/132	NK 100-315/132	NK 100-315/160
250 m3/h								NK 100-250/90

Note: The flow and pressure values in the table indicate the capacity of the only main pump. The model names above indicate only the main pump type.

### Hydro Test Selection Table

	50 mSS	60 mSS	70 mSS	80 mSS	90 mSS	100 mSS	110 mSS
10 m3/h	CR 10-7	CR 10-8	CR 10-9	CR 10-10	CR 10-12	CR 10-14	CR 10-14
20 m3/h	CR 20-5	CR 20-5	CR 20-6	CR 20-7	CR 20-8	CR 20-10	CR 20-10
30 m3/h	CR 32-4	CR 32-5	CR 32-5	CR 32-6	CR 32-6	CR 32-7	CR 32-8
40 m3/h	CR 45-3	CR 45-3	CR 45-4	CR 45-4	CR 45-5	CR 45-5	CR 45-6
50 m3/h	CR 45-3	CR 45-4	CR 45-4	CR 45-5	CR 45-5	CR 45-6	CR 45-6

Note: The flow and pressure values in the table indicate the capacity of only one pump located in the fire-protection water booster. The model names above indicate only one pump type in the booster.

### Selection of Jockey Pump Capacity

Q Jockey m <sup>3</sup> /h	H <sub>m</sub> Jockey mSS	Product Number	Pump Type	kW
3,4 (15 GPM)	50	96516659	CR 3-12	1,1
	55	96516661	CR 3-15	1,1
	60	96516661	CR 3-15	1,1
	65	96516662	CR 3-17	1,5
	70	96516662	CR 3-17	1,5
	75	96516663	CR 3-19	1,5
	80	96516663	CR 3-19	1,5
	85	96513345	CR 3-21	2,2
	90	96513345	CR 3-21	2,2
	95	96513346	CR 3-23	2,2
	100	96513346	CR 3-23	2,2
	105	96513347	CR 3-25	2,2
	110	96513348	CR 3-27	2,2
	115	96513348	CR 3-27	2,2
	120	96513349	CR 3-29	2,2
125	96513349	CR 3-29	2,2	

Note: The types in the table are the Grundfos Jockey Pump types that are recommended for Fire Series according to NFPA 20.

## A Template Certificate

 <b>BUREAU VERITAS</b>		
<b>Energy &amp; Process</b>		
<b>CERTIFICATE OF INSPECTION</b>		
B.V. Job Ref: IDD.424.04.J30	Project/Installation: FIRE FIGHTING PUMP PERFORMANCE TEST ACCORDING TO NFPA 20	
B.V. Certificate No: TUR_1329_06	Ref. of the Order to B.V. : IDD.424.04.J30	
Inspection ordered to B.V. by (1) : Grundfos Pompa San.ve Tic Ltd.Şti.		
Supplier: Grundfos Pompa San.ve Tic Ltd.Şti		
Copies to : Grundfos Pompa San.ve Tic Ltd.Şti		
Sub-supplier, if any: Non		
(1) the addressee of the original of this certificate :		
<b>Description of the Supply / Subject of inspection :</b>		
Diesel Fire Fighting Pump Performance Test Attestation According to NFPA 20 rules.		
This certificate covers the whole of the supply: <input type="checkbox"/> YES (no more inspection planned) <input type="checkbox"/> NO (part of the supply still to be inspected)		
<b>Scope of the B.V. Survey :</b>		
Attestation of Conformity With Review of Documents and Witnessed of Application Test (Performance and Hydrostatic Tests ) 1 Piece Diesel Engine Fire Pump		
<b>This supply complies with the following applicable document (s) : (2)</b>		
BV Rules NFPA 20		
(2) and only for parts of the document(s) which concern the certification or the relevant service provided by Bureau Veritas.		
<b>List of enclosures:</b>		
Reviewed Mechanical Test Reports Pump Acceptance Test Report		
The certificate is valid together with enclosures (if listed). Only pages of enclosures (or parts of pages) which are stamped, are considered as part of this certificate.		
<b>Marking and Stamping on the items: NONE</b>		
<b>Particulars or comments:</b>		
The undersigned certifies that the here above-mentioned supply was tested in conformity with the applicable requirement of NFPA 20 1999 Edition and contractual requirements governing mission entrusted to BUREAU VERITAS without any remarks .		
Date of Issuance : 25/12/2006	Issued by	Validated by
Date of Inspection : 14/11/2006	Name: Cem ÇELİKÖRSLÜ	Name: Şenol TUNALI
Sign: 	Sign: 	
Location of inspection : Grundfos Pompa San.ve Tic Ltd.Şti		
<small>This certificate is delivered within the Scope of the General Conditions of Services of Bureau Veritas Ce Certificat est délivré dans le cadre des Conditions Générales de Service du Bureau Veritas</small>		
<small>This certificate is issued further to an inspection whose duration and scope were limited by the terms and conditions of the contract with BV principal. This certificate is NOT an indication that the item(s) is (are) fit for any specific purpose and does not release the manufacturer, supplier and any party from their respective duty, guarantee, obligation and/or indemnity relating to, without limitation, patents, workmanship, materials, safety, performance in operation and/or reliability.</small>		
Ad ME 9613b		

Note: The certificate is provided optionally on the request of the customer.

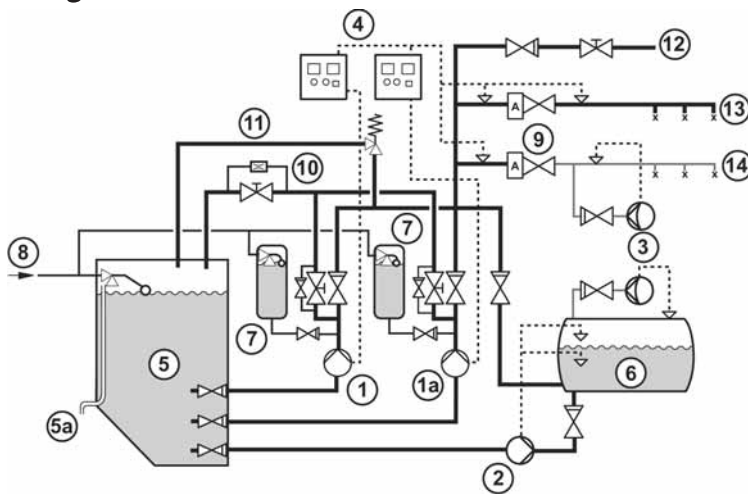
## VdS (German Insurance Association):

It is an international and independent corporation that is authorized for testing and certifying fire protection and safety technologies. VdS is authorized according to EN 45000 series of Europe standards and a member of the European Fire and Safety Group (EFIG). VdS tests and certifies the quality of products and services available within protection and safety market.

## Grundfos VdS-approved fire systems are produced according to the VdS standards indicated below:

- VdS CEA 4001:2005-09 (02): Planning and Installation
- VdS 2100: The standard of water-based fire protection systems
- VdS 2344: The procedure of equipment testing and certification

## The Overview of Fire-Protection Water Pump System according to VdS standards



Pos	Description	Pos	Description	Pos	Description
1	Electrical Pump	5a	Overflow	11	Overpressure Return Valve
1a	Diesel Pump	6	Pressure Tank	12	Fire Hydrant
2	Jockey Pump	7	Priming Tank	13	Wet Pipe System
3	Compressor	8	Water Supply	14	Dry Pipe System
4	Control Panel	9	Alarm Valve		
5	Water Tank	10	Test-running Relief Valve		

## Grundfos Fire Pumps

VdS-approved Grundfos fire pumps within NKF series were designed to deliver water to a stable sprinkler system used for water pressuring. Pumps of Fire NKF Series can be ordered with a VdS-approved panel or without panel.

## VdS-approved Grundfos pump types

Pump Type	VdS Approval No:	Motor, P2[kW]	Electric Motor Speed ( rpm )
NKF 50 - 200	P 4050056	15 - 30	2900
NKF 65 - 200	P 4050057	18,5 - 37	2900
NKF 80 - 200	P 4050058	30 - 55	2900
NKF 80 - 250	P 4050059	40 - 90	2900
NKF 150 - 400	P4060069	45 - 110	1450
NKF 150 - 500	P4070013	110 - 250	1450
NKF 200 - 500	P 4050089	132 - 250	1450

## Pump Material According to VdS Standards

Impellers and wear rings are made of bronze. Parts that are in contact with water such as shaft and nut washer are stainless steel. The material of pump housing is EN-GJL-250 cast iron. According to VdS standards the maximum head permitted for EN-GJL-250 is 110 mSS (H) and the flow is 600 m<sup>3</sup>/h (Q).

## NKF Electrical Pump Electric Motors

They are Grundfos motors produced according to IEC 60034 standards. (Isolation class: F, enclosure class: IP 55, efficiency class: EFF2)

## Features of Electrical Pump Controller

VdS control panels are used in Grundfos fire systems. These panels incorporate the features of optional phase monitoring, RAL 3000 (red colour) paint and IP 54 enclosure class. It can be mounted on a wall or base plate of the fire unit according to the request of the customer.

CONTROL FS 1 is a control panel used together with Fire NKF series with electric motor. Mounting cast is 3 mm galvanise-coated steel.

## Standard Panel Control Elements and Indicator Lamps

- Audible alarm
- Indicator Lamps: Pump is running- Pump is stopped manually- Fault
- Switch: Voltmeter- phase changing
- Buttons: Operation of pump- Stopping the pump- Closing the audible alarm- Test for the indicator lamps
- Note: Control elements and indicator lamps on the panel are designed according to the selected option.

### Options:

- Together with watching module (WM) the feature of watching the pressure switch and short-circuit faults
- Without watching module (WO/M).

## Types of NKF Pump Units with Electric Motors



**Basic Unit**

### Basic Unit:

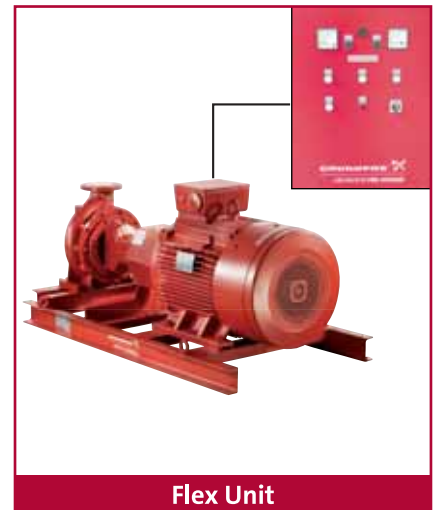
Pump and motor unit are mounted on the same base plate. Control panel is not within the delivery scope.



**Compact Unit**

### Compact Unit:

Control panel, pump and motor unit are mounted on the same base plate.



**Flex Unit**

### Flex Unit:

Pump and the motor unit are mounted on the same base plate. The control panel is suitable to wall-mounting

## NKF Pump Unit with Diesel Motor

Fire pump, base plate, diesel motor, fuel tank, batteries (2), control panel and industrial silencer are within the delivery scope.

### NKF Pump Unit with Diesel Motors - Features

- VdS-approved fire pump
- Diesel motor with water-cooled (painted in RAL 3000)
- Manual speed control
- Three-phase current dynamo 24 V
- The opportunity of watching lubricating pressure and the temperature of cooling water
- Diesel pre-pressure pump and filter
- Hand-operated pump for lubricating
- Waste gas pipe with flange
- Thermostat
- Compensation tank for cooling water – air link
- Fuel tank (for 6 hour operation)
- 2 battery (together with connecting cable)



NKF Diesel Pump

### The Features of Diesel Pump Controller

Control of the diesel motor both manually and automatically

VdS-approved

Painted in the Colour of RAL 7035, Galvanised-steel Cast,

Supply Voltage: 230 V, 50 Hz.

Control Voltage: 12 V or 24 V/DC

Enclosure Class: IP 54

#### Panel Features

- Indicators showing running status
- Performance monitoring
- Motor speed, lubricant temperature and pressure
- Voltage and current of the battery
- Counter of operation hour
- Ammeter
- Voltmeter
- Reverse counter
- Time counter
- Indicator of the cooling water temperature
- Audible alarm
- Lamp test
- Visual and audible alarms in case of faults
- Alarm contacts



Diesel Pump Controller

#### Control panel options

- Jockey pump control
- Compressor control
- Level monitoring with electrode
- Level monitoring with floater
- Motor valve
- Energy supply with fuse (for 230 or 400 V)

#### Jockey Pump

It is among Grundfos' products within CR range. It is vertical type, multi-stage and stainless steel.

### NKF Series Selection Table

Flow (Q) m <sup>3</sup> /h					
Pressure(bar)	40	75	115	160	200
2,6			NKF 65-200/170 15kW		
2,9			NKF 65-200/185 18,5kW		
3,4		NKF 50-200/194 15kW	NKF 65-200/185 18,5kW		NKF 150-400/318 55 kW
3,9	NKF 50-200/170 11 kW	NKF 50-200/194 15kW	NKF 65-200/195 22kW	NKF 150-400/318 45 kW	NKF 150-400/335 75 kW
4,4	NKF 50-200/194 15 kW	NKF 50-200/207 18,5kW	NKF 65-200/215 30kW	NKF 80-200/202 37 kW	NKF 150-400/335 75 kW
4,9	NKF 50-200/207 18,5 kW	NKF 50-200/207 18,5kW	NKF 65-200/215 30kW	NKF 80-200/202 37 kW	NKF 150-400/368 90 kW
5,4	NKF 50-200/207 18,5 kW	NKF 50-200/219 22kW	NKF 65-200/215 30kW	NKF 80-200/213 45 kW	NKF 150-400/368 90 kW
5,9	NKF 50-200/219 22 kW	NKF 65-200/215 30kW	NKF 80-200/213 45kW	NKF 80-200/222 55 kW	NKF 150-400/368 90 kW
6,4		NKF 80-200/222 55kW	NKF 80-200/222 55kW	NKF 80-250/233 22 kW	NKF 150-500/415 110 kW
6,9		NKF 80-250/233 55kW	NKF 80-250/233 55kW	NKF 80-250/233 22 kW	NKF 150-500/441 132 kW
7,6		NKF 80-250/255 75kW	NKF 80-250/255 75kW	NKF 80-250/255 75 kW	NKF 150-500/476 160 kW
8,4		NKF 80-250/255 75kW	NKF 80-250/255 75kW	NKF 80-250/255 75 kW	NKF 150-500/518 200 kW
9,3		NKF 80-250/270 90kW	NKF 80-250/270 90kW	NKF 80-250/270 90 kW	NKF 150-500/518 200 kW
10,2		NKF 80-250/270 90kW		NKF 200-500/530 250 kW	NKF 150-500/538 250 kW
	240	280	320	360	400
2,9				NKF 150-400/318 45 kW	NKF 150-400/318 45 kW
3,4	NKF 150-400/318 45 kW	NKF 150-400/318 45 kW	NKF 150-400/318 45 kW	NKF 150-400/335 55 kW	NKF 150-400/335 55 kW
3,9	NKF 150-400/335 55 kW	NKF 150-400/335 55 kW	NKF 150-400/335 55 kW	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW
4,4	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW
4,9	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW	NKF 150-400/389 90 kW	NKF 150-400/389 90 kW
5,4	NKF 150-400/389 90 kW	NKF 150-400/389 90 kW	NKF 150-400/389 90 kW	NKF 150-400/389 90 kW	NKF 150-400/389 90 kW
5,9	NKF 150-400/389 90 kW	NKF 150-400/389 90 kW	NKF 150-400/389 90 kW	NKF 150-500/415 110 kW	NKF 150-500/415 110 kW
6,4	NKF 150-500/415 110 kW	NKF 150-500/415 110 kW	NKF 150-500/415 110 kW	NKF 150-500/441 132 kW	NKF 150-500/441 132 kW
6,9	NKF 150-500/441 132 kW	NKF 150-500/441 132 kW	NKF 150-500/441 132 kW	NKF 150-500/441 132 kW	NKF 150-500/441 132 kW
7,6	NKF 150-500/441 132 kW	NKF 150-500/441 132 kW	NKF 150-500/441 132 kW	NKF 150-500/476 160 kW	NKF 150-500/476 160 kW
8,4	NKF 150-500/476 160 kW	NKF 150-500/476 160 kW	NKF 150-500/476 160 kW	NKF 150-500/476 160 kW	NKF 150-500/476 160 kW
9,3	NKF 150-500/476 160 kW	NKF 150-500/476 160 kW	NKF 150-500/476 160 kW	NKF 150-500/518 200 kW	NKF 150-500/518 200 kW
10,2	NKF 150-500/518 200 kW	NKF 150-500/518 200 kW	NKF 150-500/518 200 kW	NKF 150-500/538 250 kW	NKF 150-500/538 250 kW
	400	480	520	560	600
2,9	NKF 150-400/318 45 kW				
3,4	NKF 150-400/335 55 kW				
3,9	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW			
4,4	NKF 150-400/368 75 kW	NKF 150-400/368 75 kW	NKF 150-400/410 110 kW		
4,9	NKF 150-400/389 90 kW	NKF 150-400/389 90 kW	NKF 150-400/410 110 kW		
5,4	NKF 150-400/389 90 kW	NKF 150-400/410 110 kW			
5,9	NKF 150-500/415 110 kW	NKF 200-500/446 132 kW			
6,4	NKF 150-500/441 132 kW	NKF 200-500/471 160 kW	NKF 200-500/471 160 kW		
6,9	NKF 150-500/441 132 kW	NKF 200-500/471 160 kW	NKF 200-500/471 160 kW		
7,6	NKF 150-500/476 160 kW	NKF 200-500/512 200 kW	NKF 200-500/512 200 kW	NKF 200-500/512 200 kW	
8,4	NKF 150-500/476 160 kW	NKF 200-500/512 200 kW	NKF 200-500/530 250 kW	NKF 200-500/530 250 kW	
9,3	NKF 150-500/518 200 kW	NKF 200-500/530 250 kW			
10,2	NKF 150-500/538 250 kW				

Note: The flow and pressure values in the table indicate the capacity of the only main pump located. The model names above indicate only the main pump type.

### VdS-approved Grundfos Fire Protection System

The figure describes the system components basically. For details contact Grundfos.



# UL-listed/FM-approved Grundfos Fire Protection Systems

## Fire DNF/HSF Series

### NFPA:

National Fire Protection Association

NFPA 13: determines the installation standards of sprinkler systems.

NFPA 20: determines the installation and selection standards of fire pumps used fire protection systems.

NFPA 25: determines the approval, test and maintenance standards of water-based fire protection systems.

NFPA 70: National Electrical Code.

### UL: Underwriters Laboratories Inc.

It is an independent and non-profit organization that tests and certifies the safety of products. It tests product samples and permits the products which are accepted as suitable have UL mark as long as they comply with the UL standards.

### FM: Factory Mutual

This corporation deals with risk management and insurance of commercial and industrial property. FM tests and approves commercial and industrial products according to the available standards as well as standards that it determines itself.

Grundfos DNF and HSF type hydraulic pump units which are produced in compliance with NFPA standards have been tested and approved by FM Global (FM) and Underwriters Laboratories Inc. (UL).



You can have Access to UL lists by visiting following website:  
[www.ul.com](http://www.ul.com) > Online Certifications Directory.

### Performance Conditions of Pumps

UL-listed and FM-approved pumps must meet the conditions stated below.

#### • Flow and Pressure:

The pressure value of pump's % 150 rated flow must not be lesser than % 65 of rated pressure value.

#### Example:

A pump whose rated flow and head are 100 m<sup>3</sup>/h – 100 mSS must meet at minimum 100 x 1,5 = 150 m<sup>3</sup>/h flow value and this must be able to enable at minimum 100 x 0,65 = 65 mSS head value in flow.

#### • Pressure of Closed Valve:

Pressure value of closed valve must not exceed the % 140 of rated pressure value.

#### Example:

Closed valve pressure of a pump whose rated pressure is 100 mSS must be no lesser than 100 x 1,4 = 140 mSS head value.

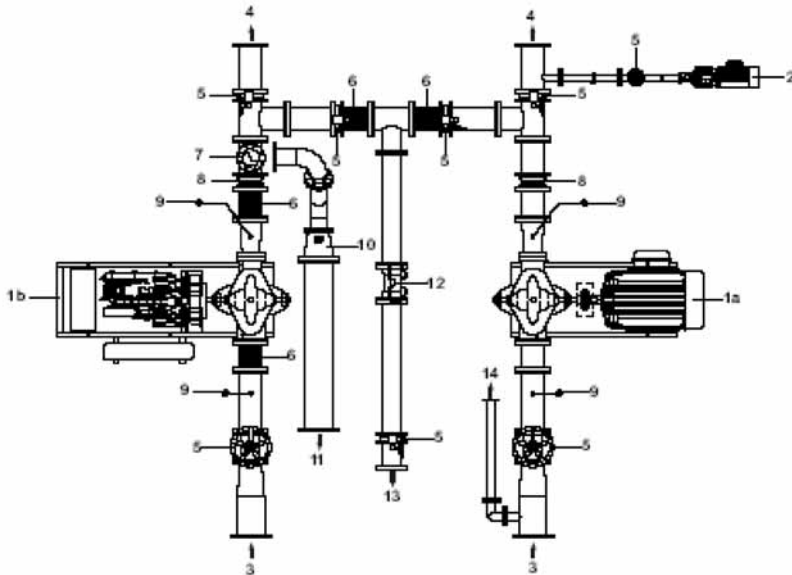
#### • Motor output:

Rated motor output must be no greater than the value needed in the pump's % 150 rated flow.





### The Overview of Fire-protection Water Pump System According to NFPA Standards



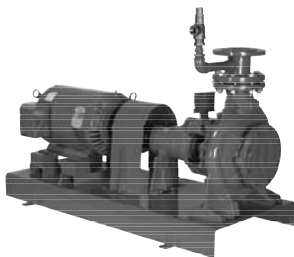
Pos.	Description
1a	Electrical Pump (duty pump)
1b	Diesel Pump (stand-by pump)
2	Jockey pump
3	From supply tank
4	To the system
5	Valve
6	Expansion joint
7	Main relief valve
8	Non-return valve
9	Manometer
10	Enclosed over flow cone
11	Discharge from the relief valve
12	Flowmeter
13	Discharge from test line
14	Jockey pump supply

#### UL File Numbers

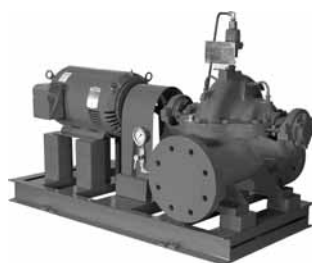
DNF pumps: EX6922  
 HSF pumps: EX6873

DNF: End-suction pump (without motor)  
 HSF: Split-case pump (without motor)

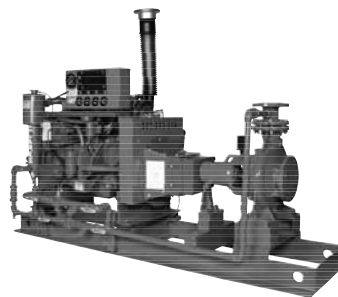
Fire DNF and Fire HSF: the pump unit produced with electric or diesel motor to be used in fire systems. (It has cast housing, bronze impeller, stainless steel shaft and stuffing box. HSF types are equipped with casing relief valve.)



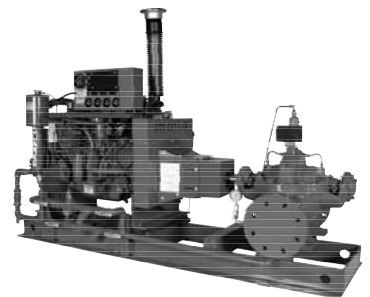
**Fire DNF**  
(with electric motor)



**Fire HSF**  
(with electric motor)



**Fire DNF**  
(with diesel driven)



**Fire HSF**  
(with diesel driven)

#### The Delivery Scope of Fire DNF and Fire HSF Units with Electric Motors

- Pump and electric motor units are mounted on the same base plate.
- Standard coupling and coupling case
- Pressure gauges
- Circulation relief valve

Note: The control panel must be ordered separately.

#### The Delivery Scope of Fire DNF and Fire HSF Units with Diesel Drivers:

- Cooling system
- Pump and electric motor units are mounted on the same base plate.
- Standard coupling and coupling case
- Pressure gauges
- Flexible and bendable exhaust
- Industrial silencer
- Two battery units
- Heat exchanger (with valves)

Note: The control panel must be ordered separately.

#### Accessories:

- Fuel tank (between 200-250 lt)
- Main relief valve
- Flowmeter



# UL-listed/FM-approved Grundfos Fire Protection Systems

## Fire DNF/HSF Series

### Electric Motor

Electric motors (it can be EMERSON or WEG according to the duty point and customer demand) and control panels are UL-listed and FM-approved. A special NFPA Standard for jockey pumps is not available.

### Control Panel for Electrical Fire-Protection Water Pump

#### Panel Types:

- Direct
- Star-delta
- Auto-Transformer
- Soft starter

#### General Characteristics

- Microprocessor controlled
- Alarm and status indicators
- Monitoring information messages on the LCD display
- Integrated printer
- Depicting the last 2048 messages
- Time that has passed
- Counter of operating hours
- Voltage and ampere indicators
- Consecutive running timer
- Pressure sensor (0-600 psi)
- Protection of NEMA 2
- NEMA-approved conductors
- Emergency handle
- Phase sequence and phase fault contacts
- Operation period timer
- Additional output relays
- Common alarms, relays and contacts



Control panel for electrical fire pump

Emergency handle



#### Status Indicators

- Energy Available
- RPT Timer
- Timer
- Local Operation
- Remote Operation
- Excessive-water Valve
- Interworking
- Low Pressure



#### Alarm Indicators

- Phase Sequence Fault
- Phase Fault
- Operation Fault
- Low Voltage
- High Voltage
- Relief Valve Running
- Fault of Rotor Squeeze
- Low Suction Pressure
- Running Under Emergency

Automatic Transfer Switch



**Options:** Automatic transfer switch, Extra contacts, Heater/thermostat/moisture meter

### Diesel Pump Controller

#### General Characteristics:

- Microprocessor controlled
- Pressure sensor (0-600 psi)
- Operation period timer
- Depicting the last 2048 messages
- Additional output relays
- AC energy fault
- 12 V and 24 VDC battery voltage
- Protection of NEMA 2
- 10 Ampere dual battery recharge unit
- Weekly test timer
- Manual stopping
- Consecutive running timer
- Indicator activated by relay
- Integrated printer
- Remote operation
- Excessive-water valve
- Monitoring information messages on the LCD display



#### Indicators of Alarm Status

- Automatic Mode
- Running Fault
- Low Oil Pressure
- Excessive Speed of The Motor
- Motor Running
- Battery Fault
- Recharge Unit Fault
- Low Level of Fuel
- High Level of Fuel
- High Motor Temperature
- High Ambient Temperature



### Jockey Pump Controller

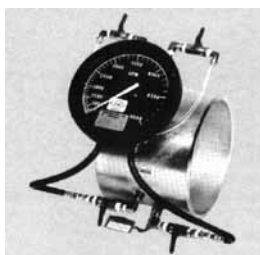
#### General Characteristics

- Protection of NEMA 2
- Control Transformer
- Circuit-breaker Switch
- Pressure Switch

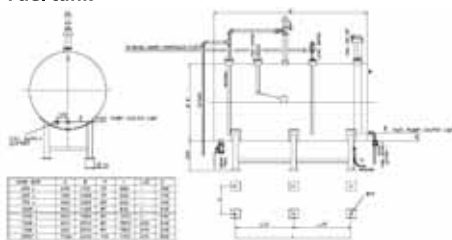


### Accessories

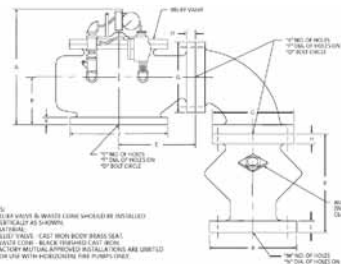
UL-listed/  
FM-approved  
flowmeter



Fuel tank



UL-listed/  
FM-approved  
Casing Relief  
Valve



## Fire DNF/HSF Series Selection Table

### GRUNDFOS UL-listed/FM-approved Fire-Protection Water Pumps (end-suction pumps)

Capacity (GPM)	Size (") (Suction-Discharge)	Pump Model	Net Pressure Range (psi)	Speed (RPM)	Maximum Operation Pressure (psi)
250	4x2-1/2	DNF 65-25	120-130	2900	200
300	4x2-1/2	DNF 65-25	119-129	2900	200
500	5x3	DNF 80-20	67-75	2900	200
500	5x3	DNF 80-25	106-125	2900	200

**Note:** The flow and pressure values in the table indicate the capacity of the only main pump located in the fire-protection water booster. The model names above indicate only the main pump type.

### GRUNDFOS UL-listed/FM-approved Fire-Protection Water Pumps (split-case pumps)

Capacity (GPM)	Size (") (Suction-Discharge)	Pump Model	Net Pressure Range (psi)	Speed (RPM)	Maximum Operation Pressure (psi)
500	8x6	HSF 6-12	40-49	1450	408
750	6x5	HSF 5-11	67-127	2900	296
750	6x5	HSF 5-11	107-191	3500	296
750	8x6	HSF 6-12	44	1450	408
750	8x6	HSF 6-12	44-69	1750	408
750	8x6	HSF 6-16	47-88	1450	200
750	8x6	HSF 6-18	60-104	1450	200
1000	8x6	HSF 6-12	112-194	2900	408
1000	8x6	HSF 6-12	168-285	3500	408
1000	8x6	HSF 6-16	50-86	1450	200
1000	8x6	HSF 6-16	102-130	1760	200
1000	8x6	HSF 6-18	59-103	1450	200
1000	8x6	HSF 6-18	132-150	1765	200
1250	8x6	HSF 6-12	106-186	2900	408
1250	8x6	HSF 6-12	160-280	3500	408
1250	8x6	HSF 6-16	95-126	1760	200
1250	8x6	HSF 6-18	80-98	1450	200
1250	8x6	HSF 6-18	130-149	1765	200
1250	8x6	HSF 6-18	162-189	2000	200
1500	8x6	HSF 6-12	115-179	2900	408
1500	8x6	HSF 6-12	153-273	3500	408
1500	8x6	HSF 6-18	109-142	1765	200
1500	8x6	HSF 6-18	190	2000	200
1500	10x6	HSF 8-20	76-101	1450	200
1500	10x6	HSF 8-20 G	79-123	1450	200
1500	12x10	HSF 10-20	95-117	1450	200
2000	10x6	HSF 8-17	57-86	1450	200
2000	10x6	HSF 8-20	108-141	1770	200
2000	10x6	HSF 8-20 G	94-119	1450	200
2000	10x6	HSF 8-20 G	131-148	1750	200
2000	12x10	HSF 10-20	94-116	1450	200
2500	12x10	HSF 10-16	50-81	1450	200
2500	12x10	HSF 10-20	89-111	1450	200
2500	10x6	HSF 8-20 G	124-138	1780	200
3000	12x10	HSF 10-16	63-79	1450	200
3500	12x10	HSF 10-16	59-76	1450	200

**Note:** The flow and pressure values in the table indicate the capacity of the only main pump located in the fire-protection water booster. The model names above indicate only the main pump type.



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