

# Fire NKF

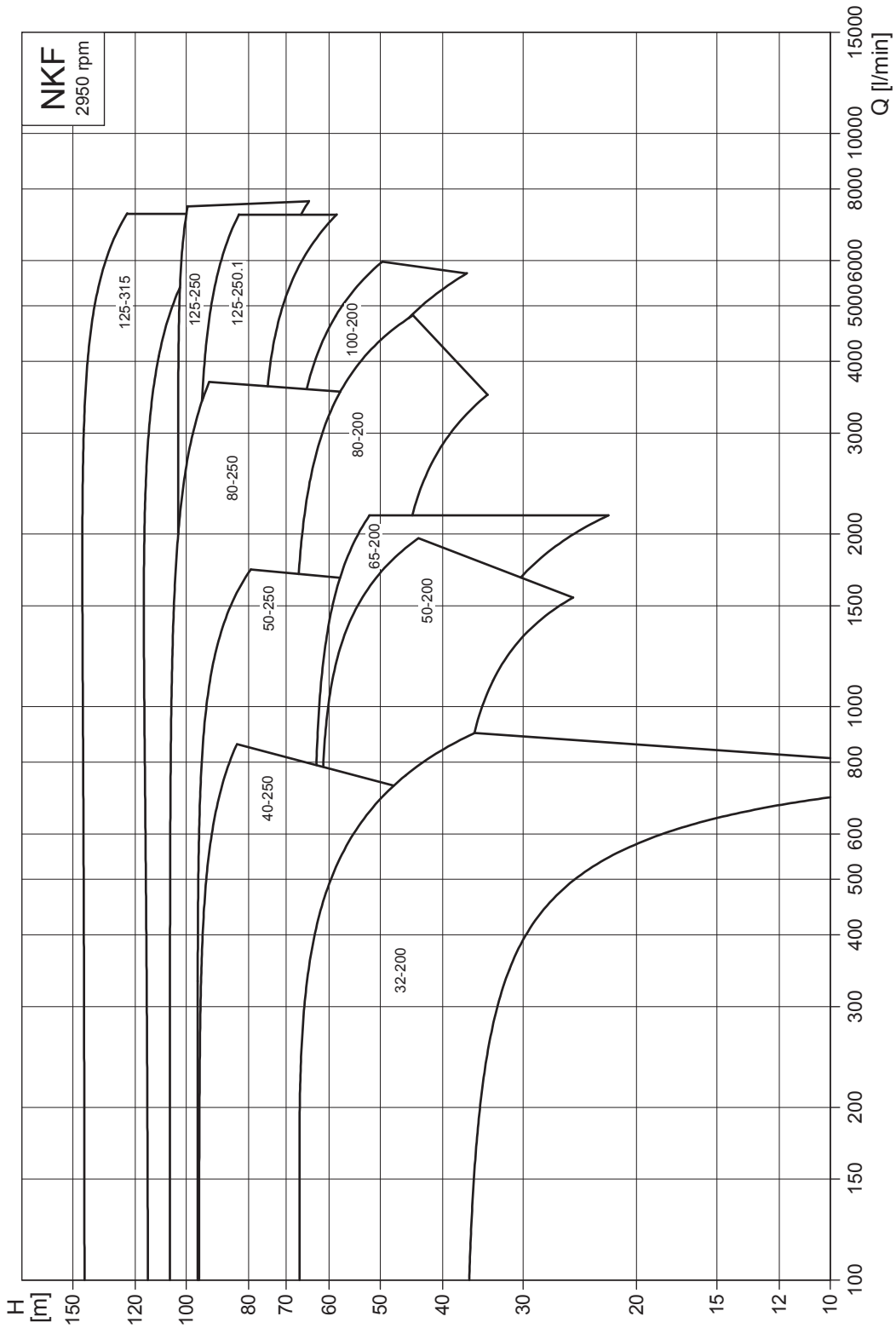
Grundfos fire systems

Fire pump sets according to  
EN 12845 and prEN 12259-12



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# 1. Performance range



TM05 2173 4511

## 2. Product description

### Introduction

Grundfos Fire NKF pump sets are typically used in firefighting applications for supplying water to fire hose reels, fire hydrants or sprinkler systems.

This data booklet covers pump sets with electrically and diesel-powered NKF end-suction pumps.

### Designations

Fire NKF is an NKF end-suction pump with coupling and motor or engine mounted on a common base frame.

The pump set can be incorporated into a firefighting system.

### EN standards

The products in this data booklet have been built to comply with EN standards on water-based firefighting systems described in the following documents:

- EN 12845: Fixed firefighting systems. Automatic sprinkler systems. Design, installation and maintenance.
- prEN 12259-12: Fixed firefighting systems. Pumps for sprinkler and water spray systems.

### Fire NKF pumps

Grundfos NKF pumps according to EN 12845 and prEN 12259-12 are designed for the distribution of water in stationary sprinkler systems using water spray. They are operated in case of fire and during tests.

### Materials

Requirements to pump materials according to EN 12845 and prEN 12259-12:

- Impeller and wear rings must be made of bronze.
- Wet parts such as shaft, washers and nuts must be made of stainless steel.
- Cast parts must be made of cast iron.

## Identification

### Pump set

Type:	Fire NKF 80-250/270-E-F-X-D-B-A-B		
part No.	96157421		
serial No.	123456789		
Main Supply:	3X400V 50Hz		
impeller diameter:	270		
Q:	150 m <sup>3</sup> /h	H:	112 m
P2:	55 kW	n:	2940 min <sup>-1</sup>
IP	55	G:	346 kg
Made in Germany P1	0640	CE	



GRUNDFOS

Fig. 1 Example of nameplate

### Type key

Example	Fire	NK	F	80	-250	/270	E	F	X	D	B	A	B
Grundfos fire systems													
<b>Pump type</b>													
Pump for firefighting													
<b>Nominal diameter of discharge port</b>													
80 mm													
<b>Pump housing size</b>													
250 mm													
<b>Actual impeller diameter</b>													
270 mm													
<b>Driver</b>													
D: Diesel engine													
E: Electric motor, 50 Hz													
<b>Approval of pump</b>													
F: VdS													
<b>Approval of pump set</b>													
No approval													
<b>Pipe connection</b>													
DIN flange													
<b>Version of fire pump set</b>													
<b>With diesel engine:</b>													
B: Compact (all components on a common base frame)													
S: Flex (controller and tank delivered separately)													
C: Flex B (tank delivered separately)													
<b>With electric motor:</b>													
X: Basic (without controller)													
B: Compact (all components on a common base frame)													
S: Flex (controller delivered separately)													
<b>Shaft seal</b>													
BAQE													
<b>Coupling</b>													
A: Standard													
B: Spacer													
F: Flexible coupling (Centaflex)													

### Bare shaft pump

Type	NKF 65 - 200/219/AH-F-B-BAQE-G		
P/N	XXXXXXXXXX		
EN pump app. no.	XXXXXXXXXX	Year of construction	2010
Q <sub>rated</sub>	1900 l/min	n	2960 min <sup>-1</sup>
H	60 m	P <sub>v</sub>	37 kW
D <sub>imp</sub>	219 mm	p	16 bar
Made in	HUNGARY		Material of pump housing
			GG25

GRUNDFOS (DENMARK) Fixed firefighting pump EN 12259-12 CE

Fig. 2 Example of nameplate

### Type key

Example	NKF 65 -200 /219 AH -F -B -BAQE -G
NK pump for firefighting	
<b>Nominal diameter of discharge port</b>	65 mm
<b>Nominal impeller diameter</b>	200 mm
<b>Actual impeller diameter</b>	219 mm
<b>Pump version</b>	AH: NKF bare shaft pump A2: NKF basic version with spacer coupling
<b>Pipe connection</b>	DIN flange
<b>Materials</b>	EN-GJL-250 with bronze impeller
<b>Shaft seal</b>	
<b>Approval</b>	According to prEN 12259-12

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TM04 6442 0310

## Pump characteristics

EN 12845 and prEN 12259-12 require stable QH characteristics. The total head declines with increasing flow rate.

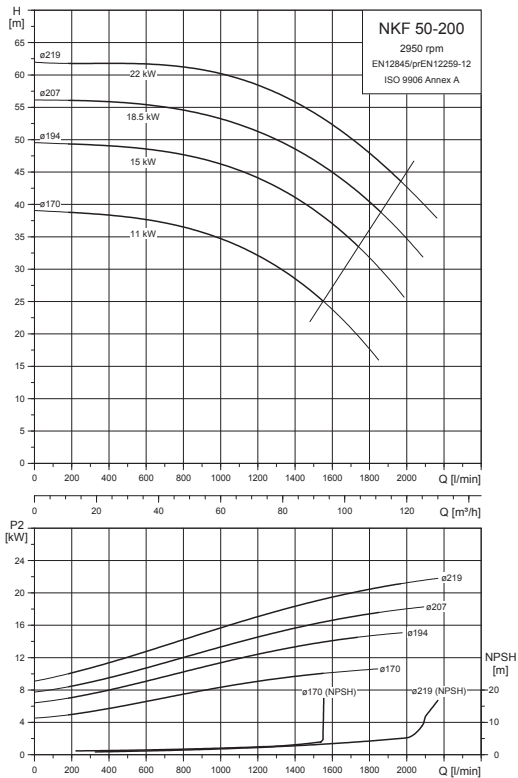


Fig. 3 Example of curve charts

## Specific duty requirements

An orifice plate can be included where the maximum flow from the pump is critical (for determining the stored water capacities). The effect of an orifice plate is to throttle the pump curve and provide a steeper fall-off in performance. This does, however, result in power losses through loss of pump efficiency.

Impellers can be trimmed to provide a tailor-made pump curve. This means that the closed-valve pressure, power demand and potential maximum flow rate from the pump are optimised to suit specific duty requirements.

## Electric motor

The electric motor is a 2-pole MMG motor complying with local standards for electric motors. As from 16 July 2011, the motors used in Europe will be IE2 = EFF 1 motors.



Fig. 4 NKF end-suction pump with electric motor and controller mounted on a base frame

Insulation class: F.

Enclosure class: IP55.

## Diesel engine

The diesel engine can operate continuously at full load at site elevation with rated output in accordance with ISO 3046-1:1986. The pump is at full operational speed within 15 seconds; the engine is capable of starting at a room temperature of 5 °C.

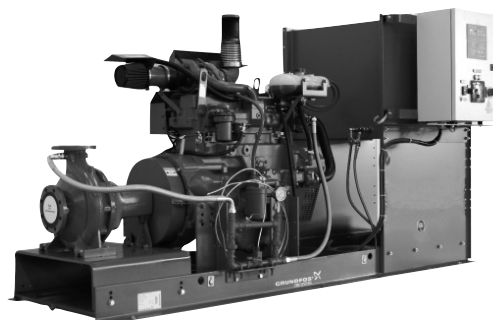


Fig. 5 NKF end-suction pump with diesel engine and controller mounted on a base frame

Each complete engine and pump unit is tested on the manufacturer's test bed for at least 1.5 hours at rated flow rate, and the result is recorded on the test certificate.

## Power rating

To ensure that the motor (electric motor or diesel engine) is capable of operating the pump at any time to ensure water supply, EN 12845 and prEN 12259-12 stipulate an excess capacity of motor power.

According to EN 12845 and prEN 12259-12, the motor power is found at 16 m NPSH. The example below shows a required motor size of 22 kW.

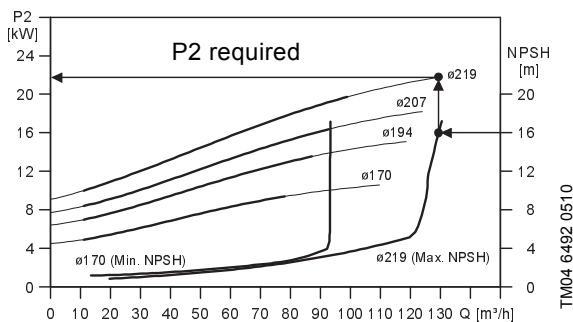


Fig. 6 Required and stipulated power

## Controller

Grundfos offers a complete, factory-assembled controller in a steel-plate cabinet, suitable for wall mounting or free-standing installation.

The controller complies with the standard EN 12845.

The controller for pumps with electric motor can be mounted on the wall or on the base frame.

The controller for diesel-powered pumps is always mounted on the base frame.

## Functions

The starting signal for the pump is given via two redundant pressure switches. The pump can only be switched off manually.

Motor failures, for example due to overheating, will not cause the pump to stop, but a fault indication will be given and/or a potential-free signal will be sent to a main control system.

## Other system components

### Jockey pumps

Grundfos CR pumps are used as jockey pumps, maintaining the water level in the pressure tank. Under normal conditions, the jockey pump is activated by the low-level switch in the pressure tank as a result of small leakages in the water-filled pipes. The jockey pump will run until it is stopped by the high-level switch. The jockey pump can also be activated to maintain the water level in the pressure tank if one or more sprinklers are open.

## Compressor

The compressor can be set to manual or automatic operation by means of the selector switch.

During automatic operation, the compressor is controlled by an external pressure switch, for example connected to the pressure tank.

The compressor can be switched on and off manually.

## Scope of delivery

A complete Fire NKF pump set assembled and supplied from factory normally consists of these elements:

- a pump and motor mounted on a common base frame
  - a standard coupling protected by a coupling guard.
- Electrically driven pump sets are available with or without a controller according to EN 12845.

## Commissioning

The installer should commission the complete firefighting system before handing it over to the plant manager on site. Many potential issues of the complete system must be tested to ensure a satisfactory system performance and identify any damage during installation.

Key components should be checked according to the descriptions in the respective installation and operating instructions. In addition, EN 12845 stipulates that tests such as these should be carried out:

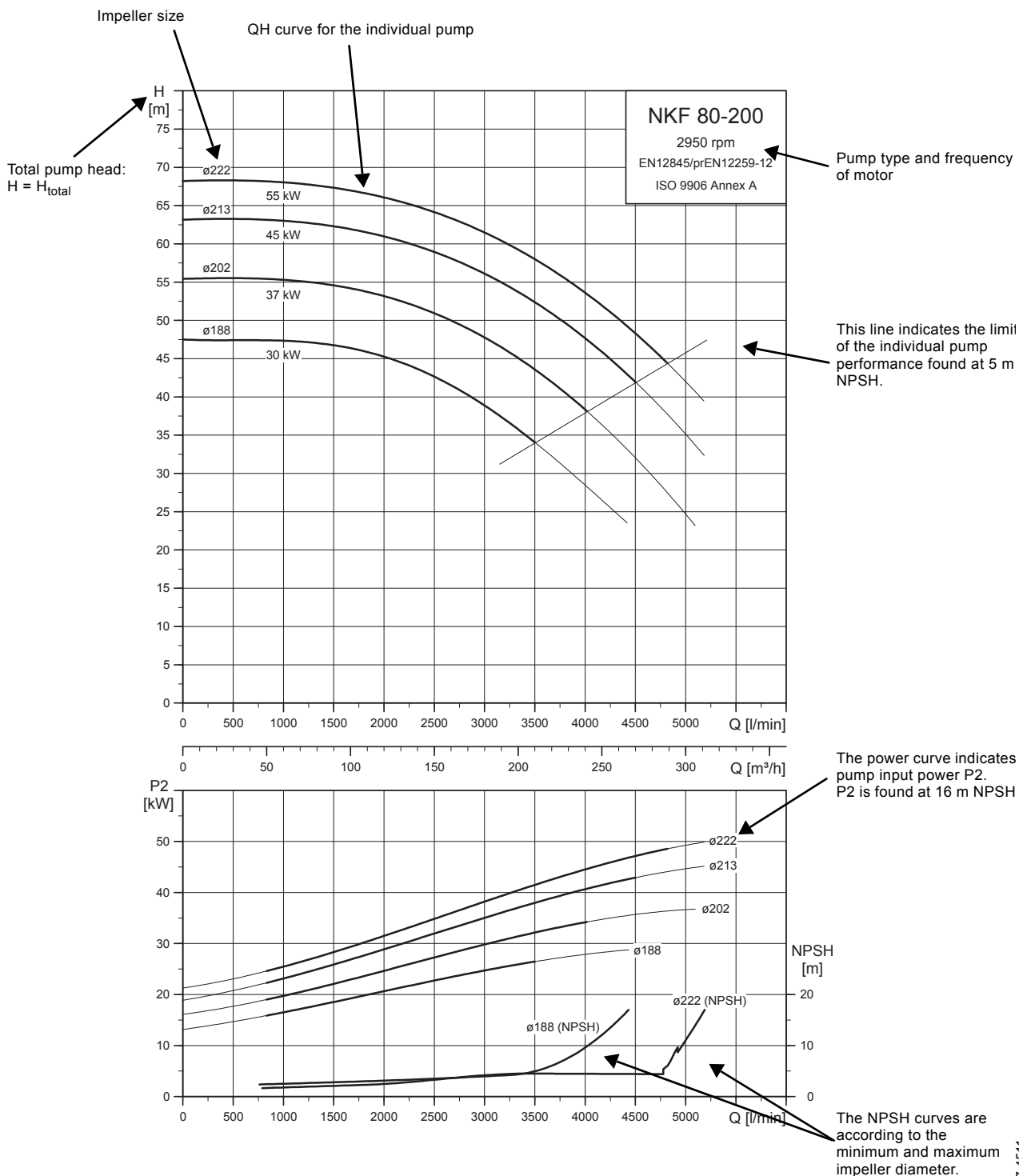
- pressure test of sprinkler circuits
- values of all measuring devices (air pressure, water level, etc.) to the system
- water flow to fire pumps
- test of alarm system and interface to municipal fire department.

The installer should supply the plant manager with the following documents:

- Installation certificate stating that the firefighting system has been installed according to EN 12845 requirements.
- A complete set of installation and operating instructions and system drawings with specification of all components for the plant manager and the owner of the system.

### 3. Curve charts

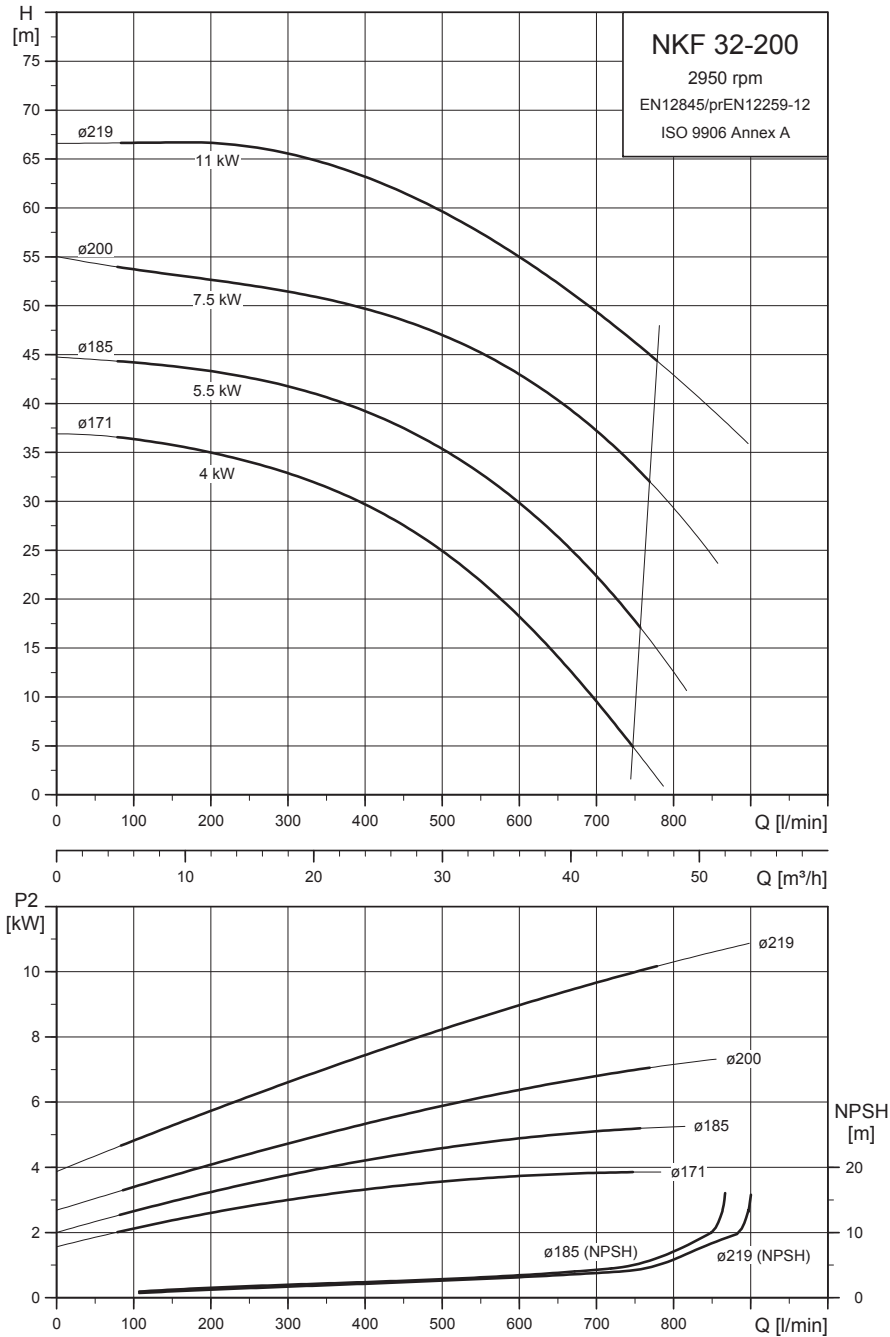
#### How to read the curve charts



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# 4. Performance curves

## NKF 32-200



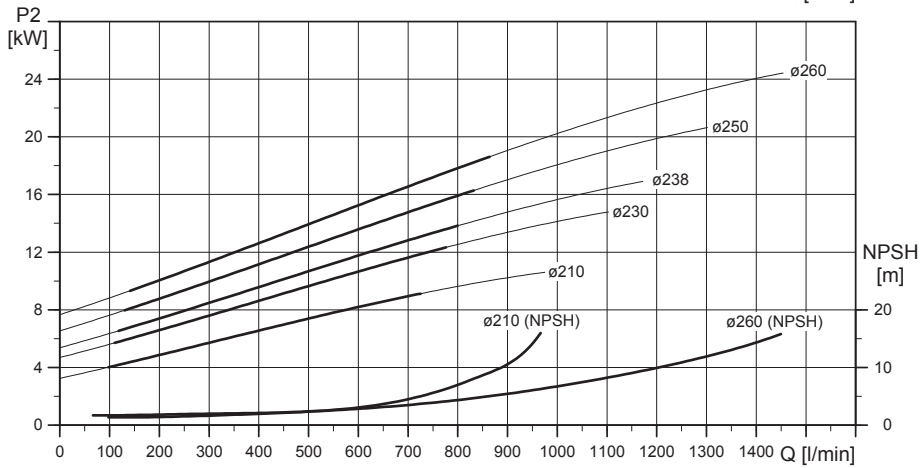
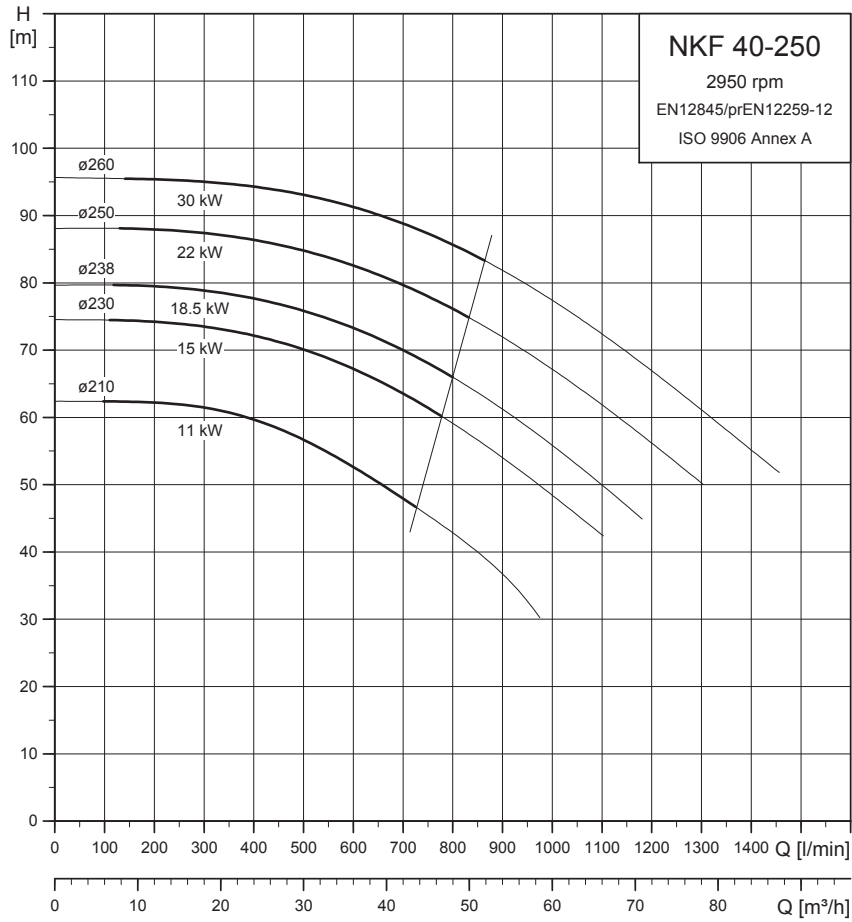
TM05 2162 4511

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 32-200 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø200 ≤ Ø219	11	
> Ø185 ≤ Ø200	7.5	19
> Ø171 ≤ Ø185	5.5	
≤ Ø171	4	

NKF 40-250



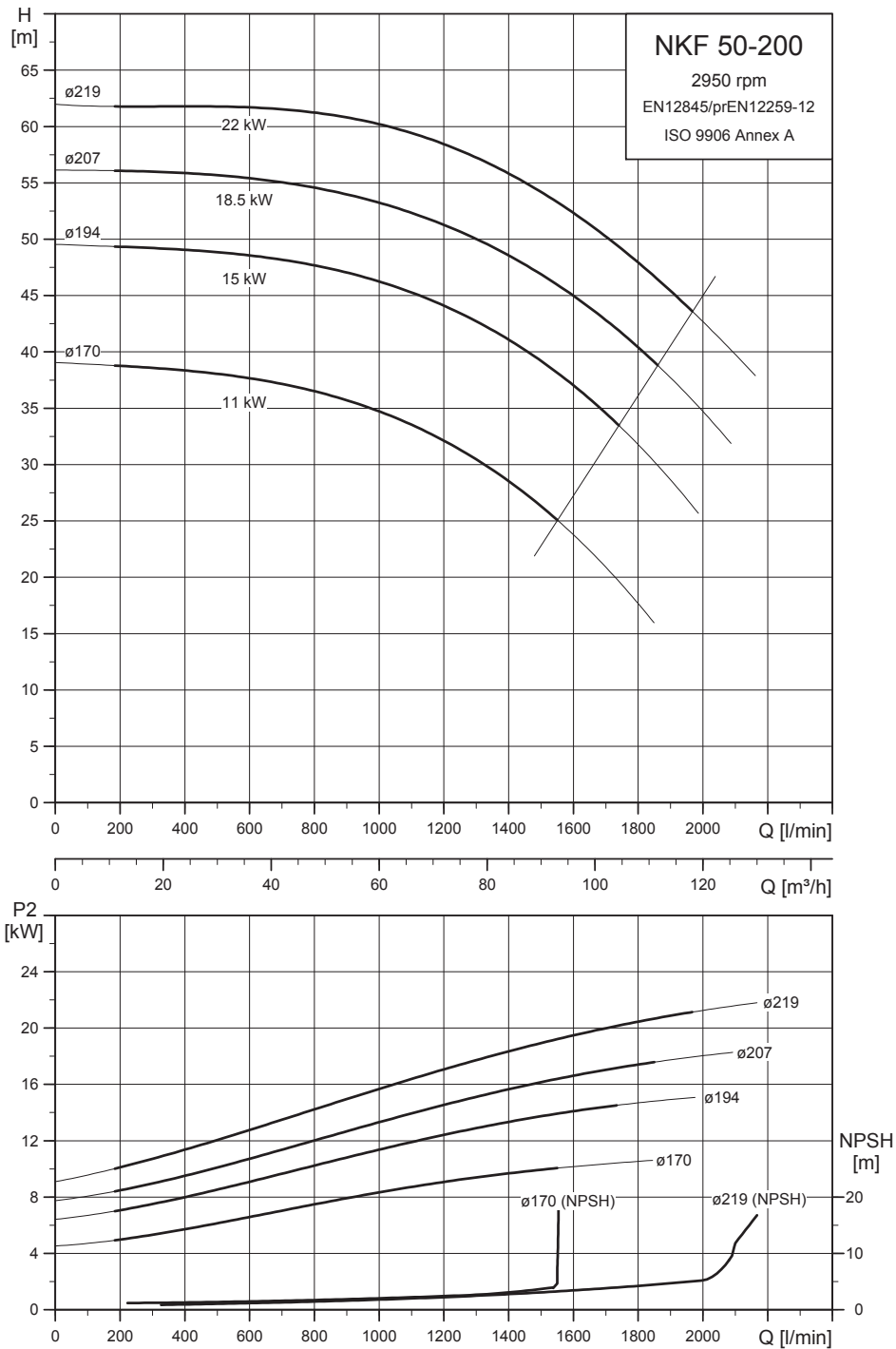
TM05 2163 4511

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 40-250 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø250 ≤ Ø260	30	26
> Ø238 ≤ Ø250	22	
> Ø230 ≤ Ø238	18.5	19
> Ø210 ≤ Ø230	15	
≤ Ø210	11	

NKF 50-200



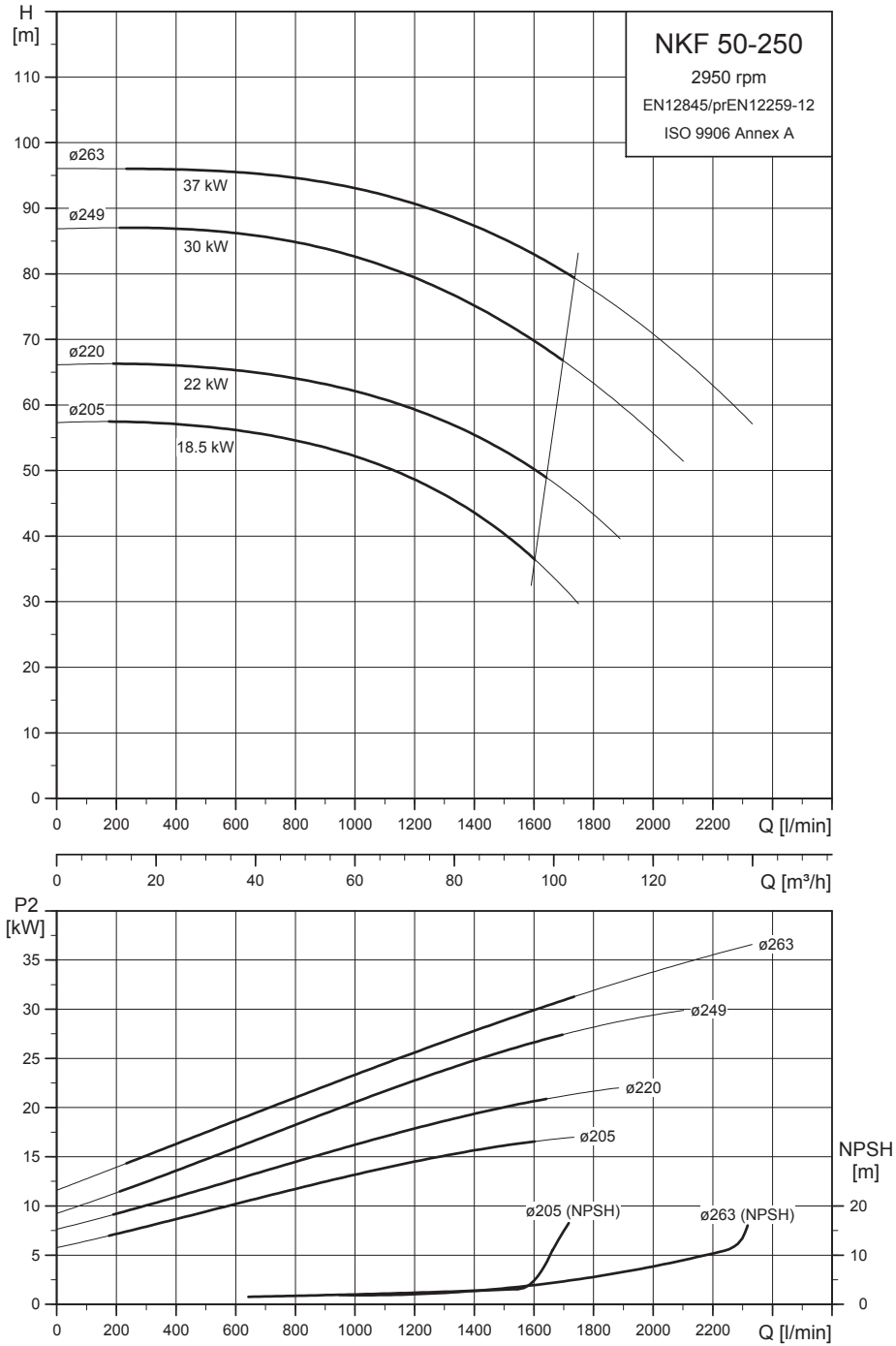
TM05 2.164 4511

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 50-200 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø207 ≤ Ø219	22	26
> Ø194 ≤ Ø207	18.5	
> Ø170 ≤ Ø194	15	19
≤ Ø170	11	

## NKF 50-250



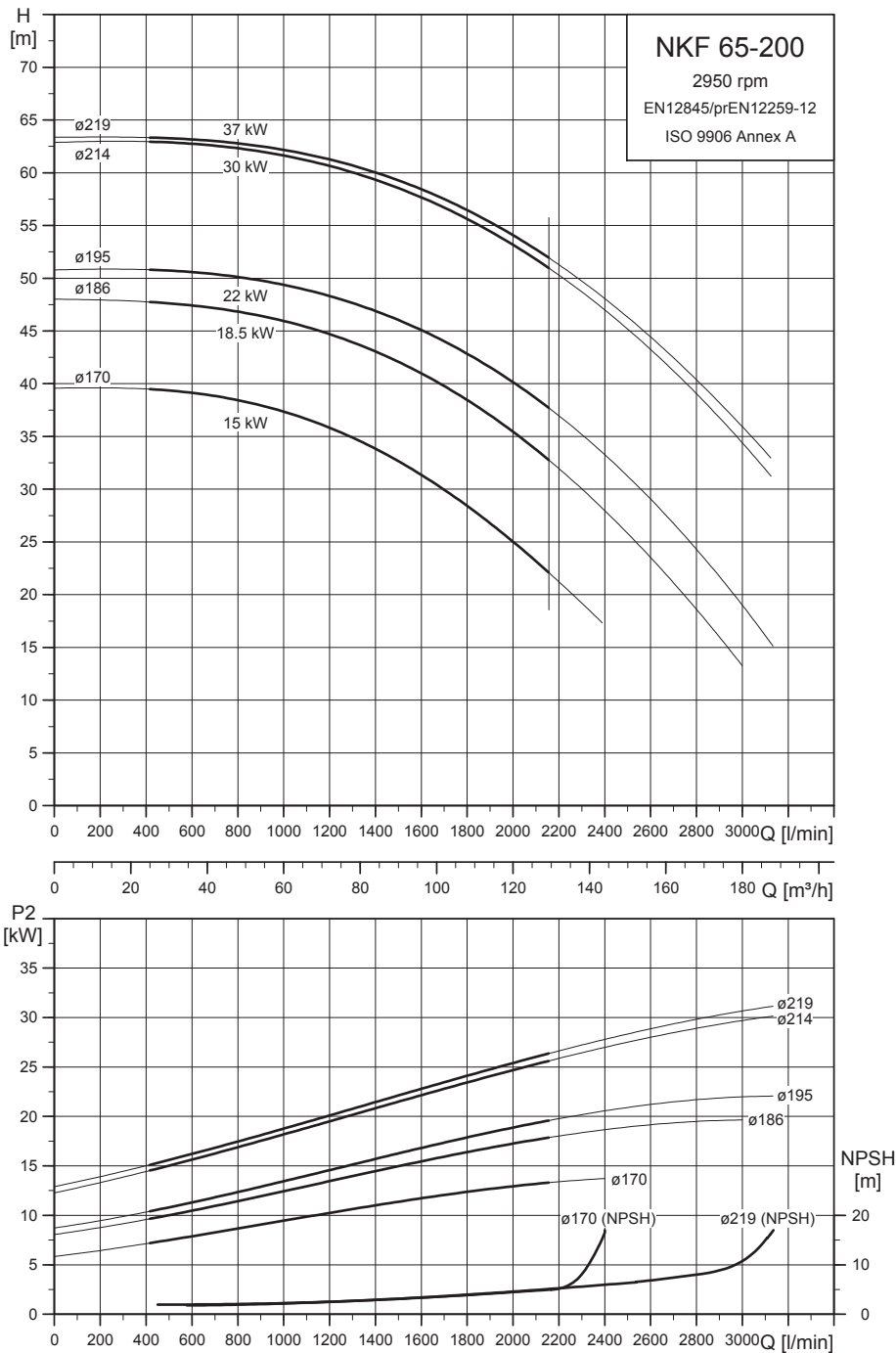
TM05 2.165 4511

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 50-250 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø249 ≤ Ø263	37	58
> Ø220 ≤ Ø249	30	26
> Ø205 ≤ Ø220	22	19
≤ Ø205	18.5	19

NKF 65-200



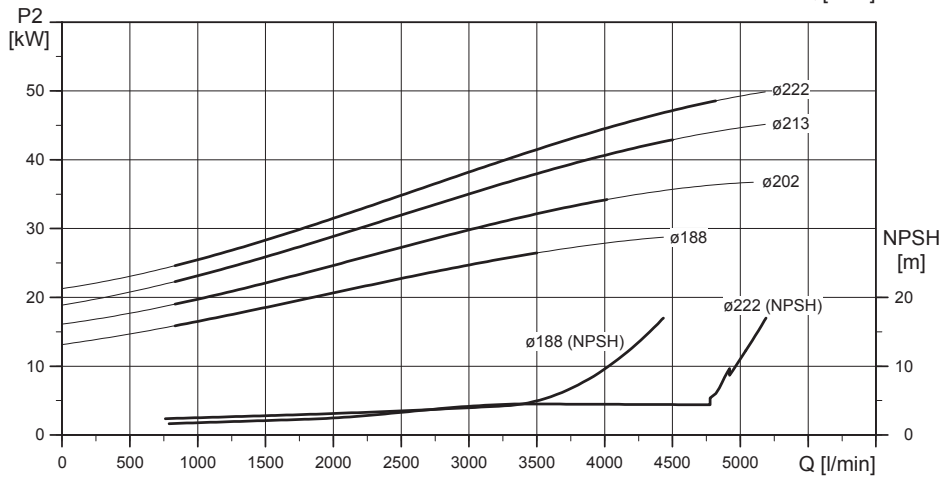
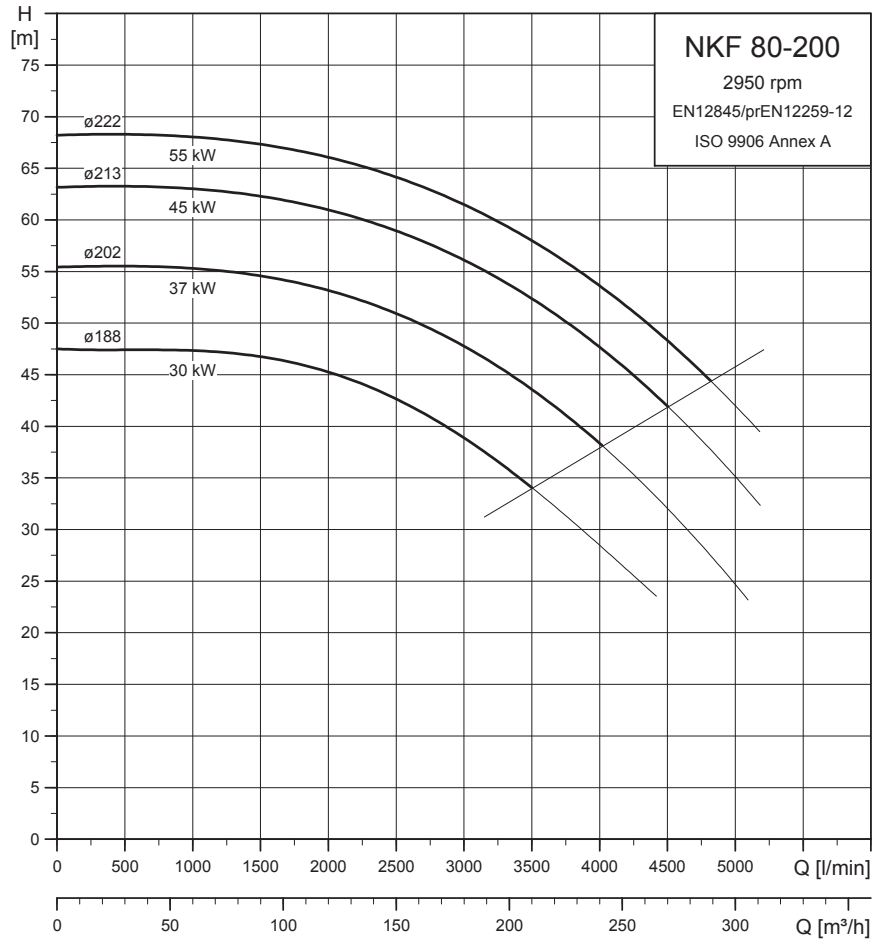
TM05 2166 4511

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 65-200 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø214 ≤ Ø219	37	58
> Ø195 ≤ Ø214	30	26
> Ø186 ≤ Ø195	22	19
> Ø170 ≤ Ø186	18.5	
≤ Ø170	15	

## NKF 80-200



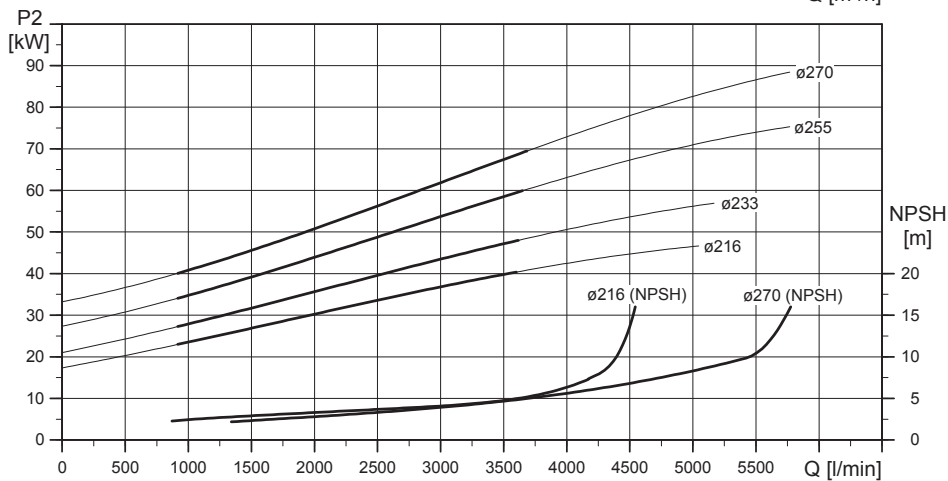
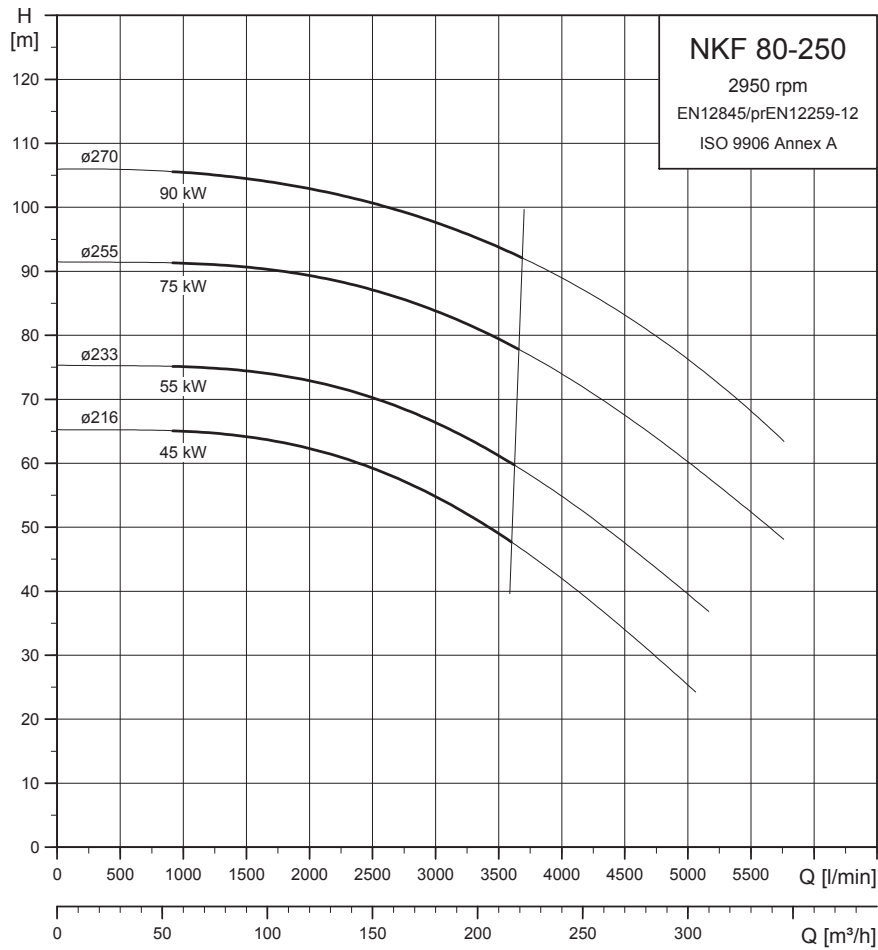
TM05 2167 4511

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 80-200 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> ø213 ≤ ø222	55	
> ø202 ≤ ø213	45	
> ø188 ≤ ø202	37	58
≤ ø188	30	

NKF 80-250



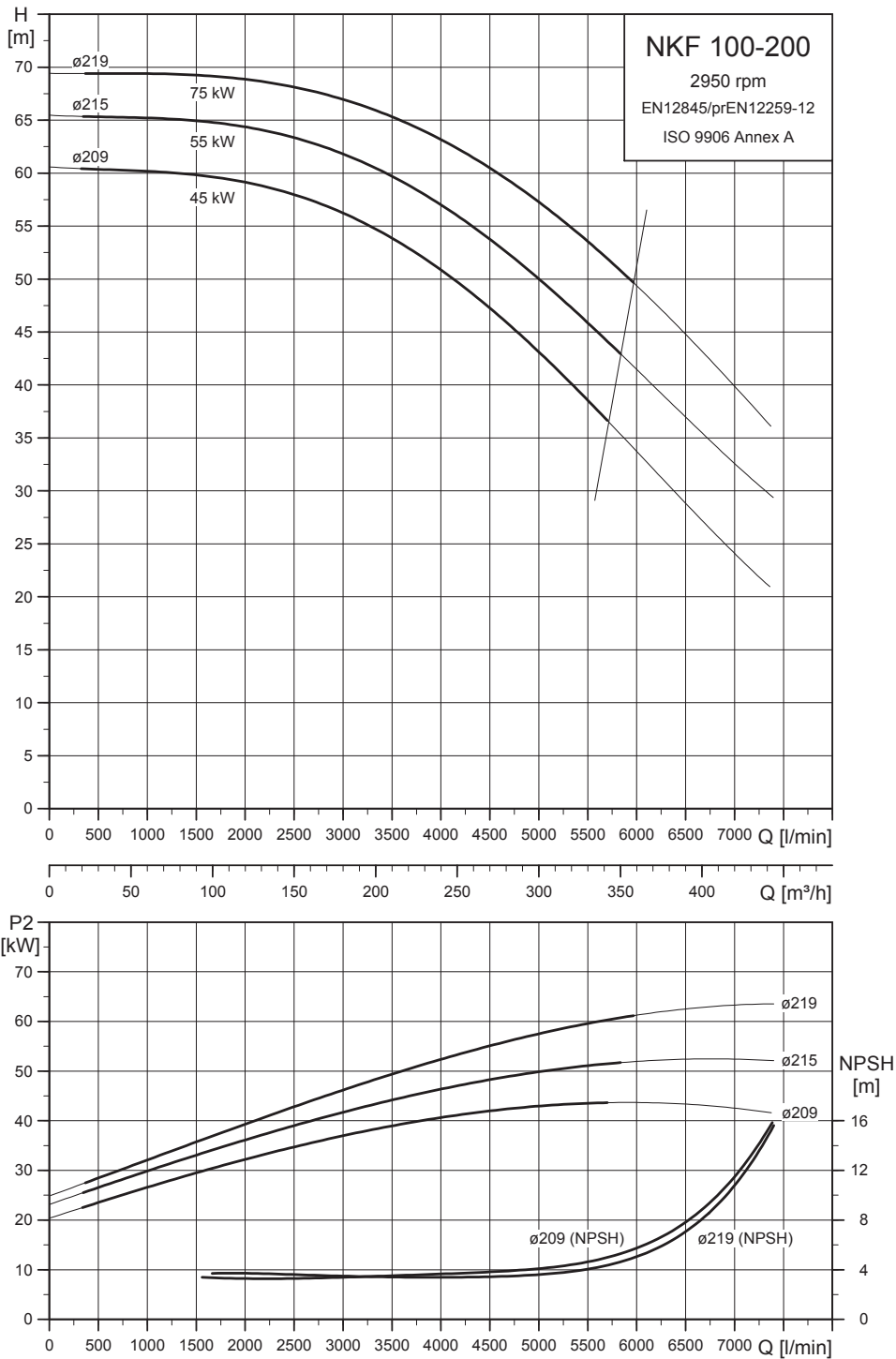
TM05 2168 4511

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 80-250 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø255 ≤ Ø270	90	94
> Ø233 ≤ Ø255	75	58
> Ø216 ≤ Ø233	55	
≤ Ø216	45	

NKF 100-200



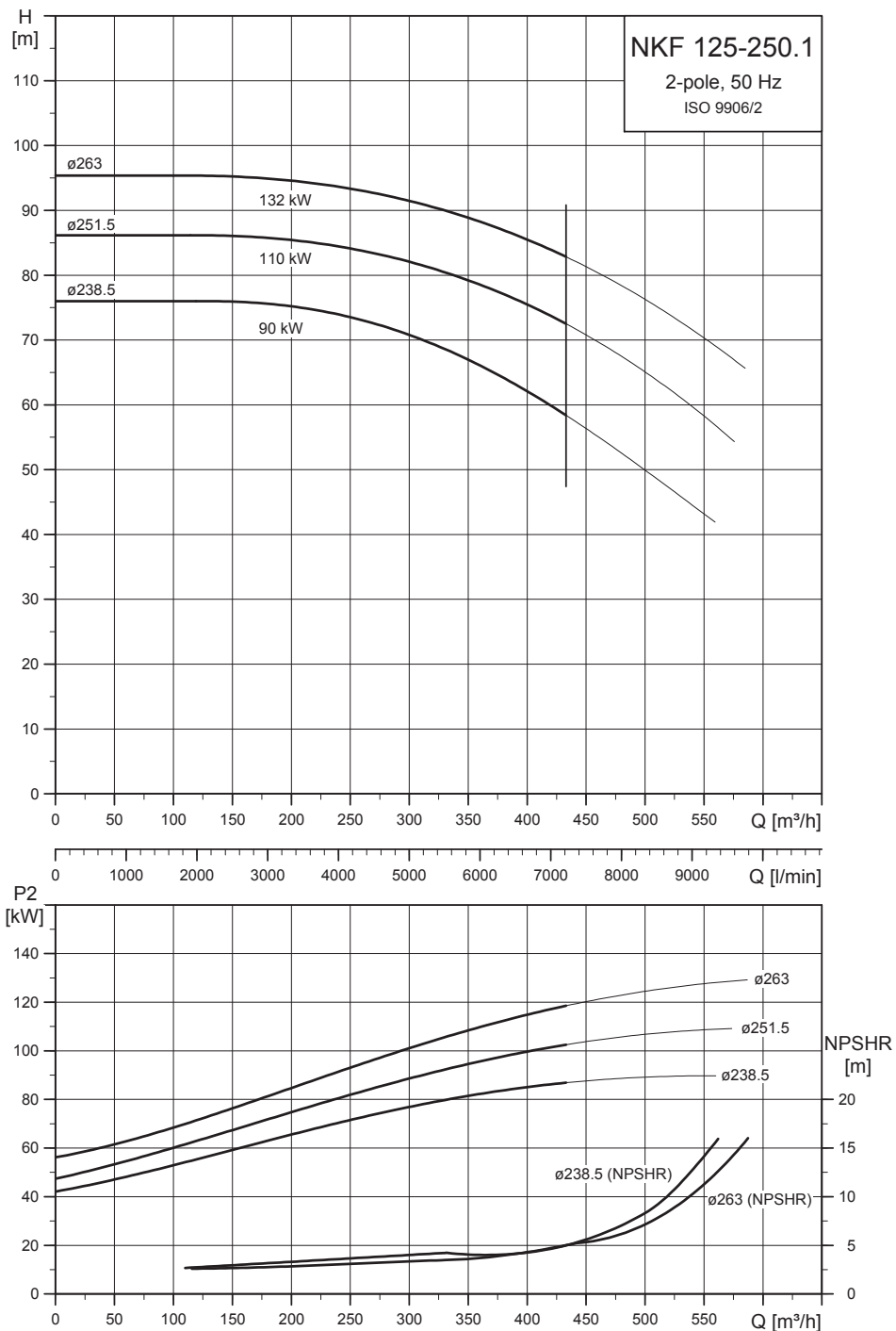
TM05 2169 4511

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 100-200 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> ø215 ≤ ø219	75	68
> ø209 ≤ ø215	55	58
≤ ø209	45	

NKF 125-250.1



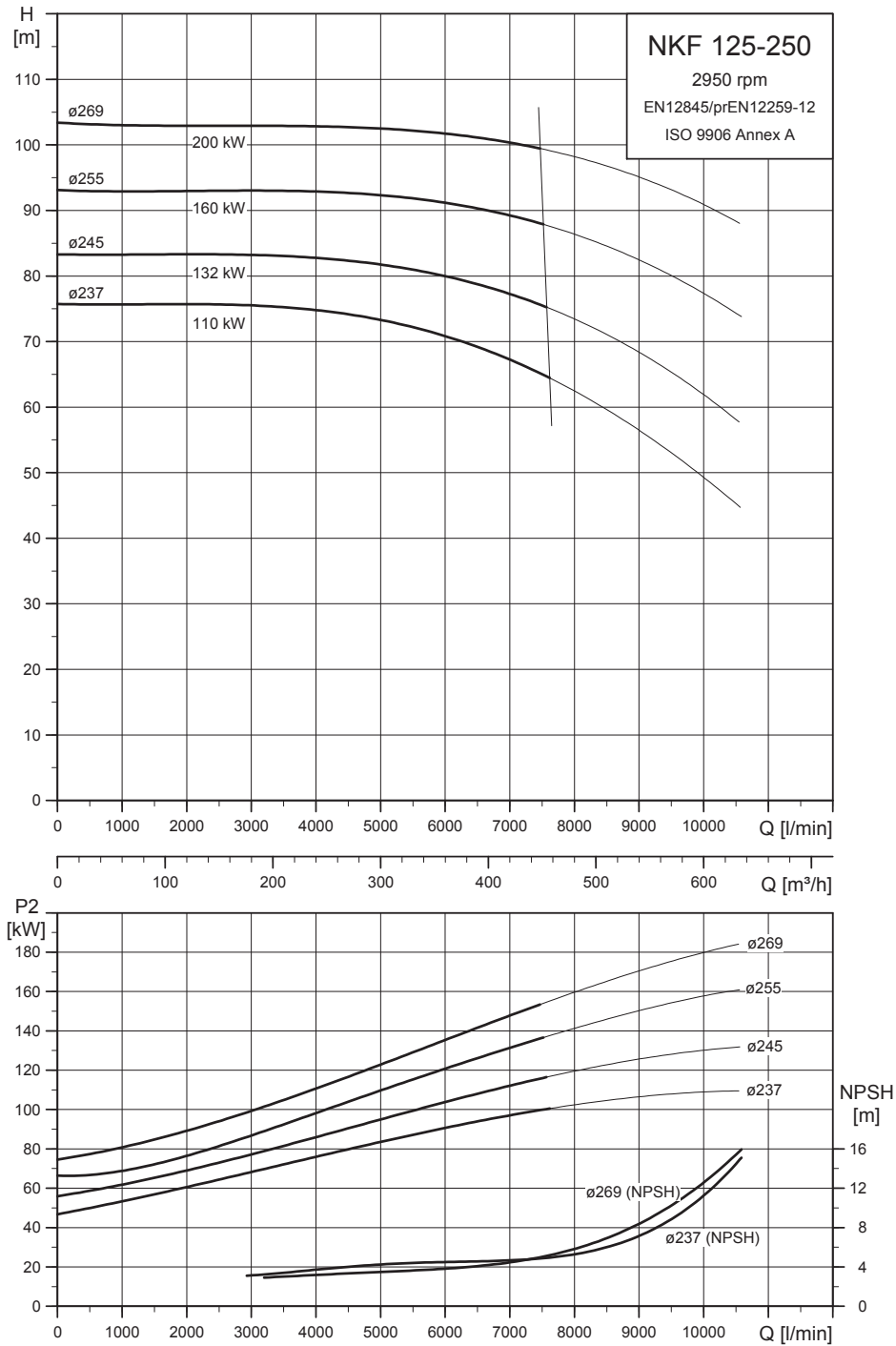
TM05 2707 0412

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 125-250.1 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø251.5 ≤ Ø263	132	131
> Ø238.5 ≤ Ø251.5	110	109
≤ Ø238.5	90	94

## NKF 125-250



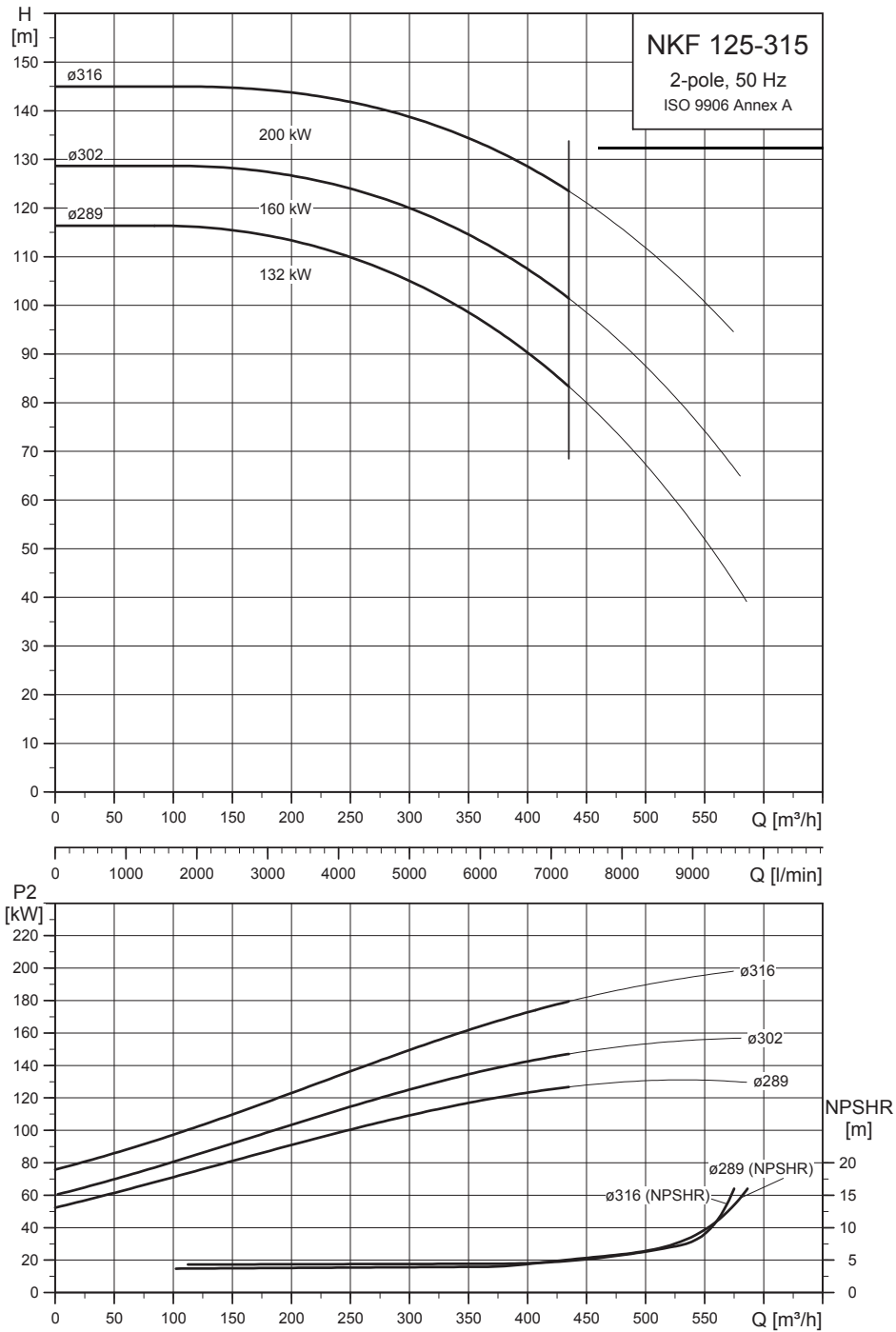
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Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 125-250 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø255 ≤ Ø269	200	184
> Ø245 ≤ Ø255	160	178
> Ø237 ≤ Ø245	132	147
≤ Ø237	110	119

NKF 125-315



TM05 2708 0412

Circulation flow for diesel-powered pumps = maximum 2 % of rated flow rate.

The performance curves of electrically and diesel-powered pumps are approximately similar and based on the values in table below.

NKF 125-315 Impeller sizes	P2 [kW]	
	Electric motor	Diesel engine
> Ø302 ≤ Ø316	200	197
> Ø289 ≤ Ø302	160	164
≤ Ø289	132	131

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