

Hydro EN

Grundfos firefighting systems

Compliant with the EN 12845 standards

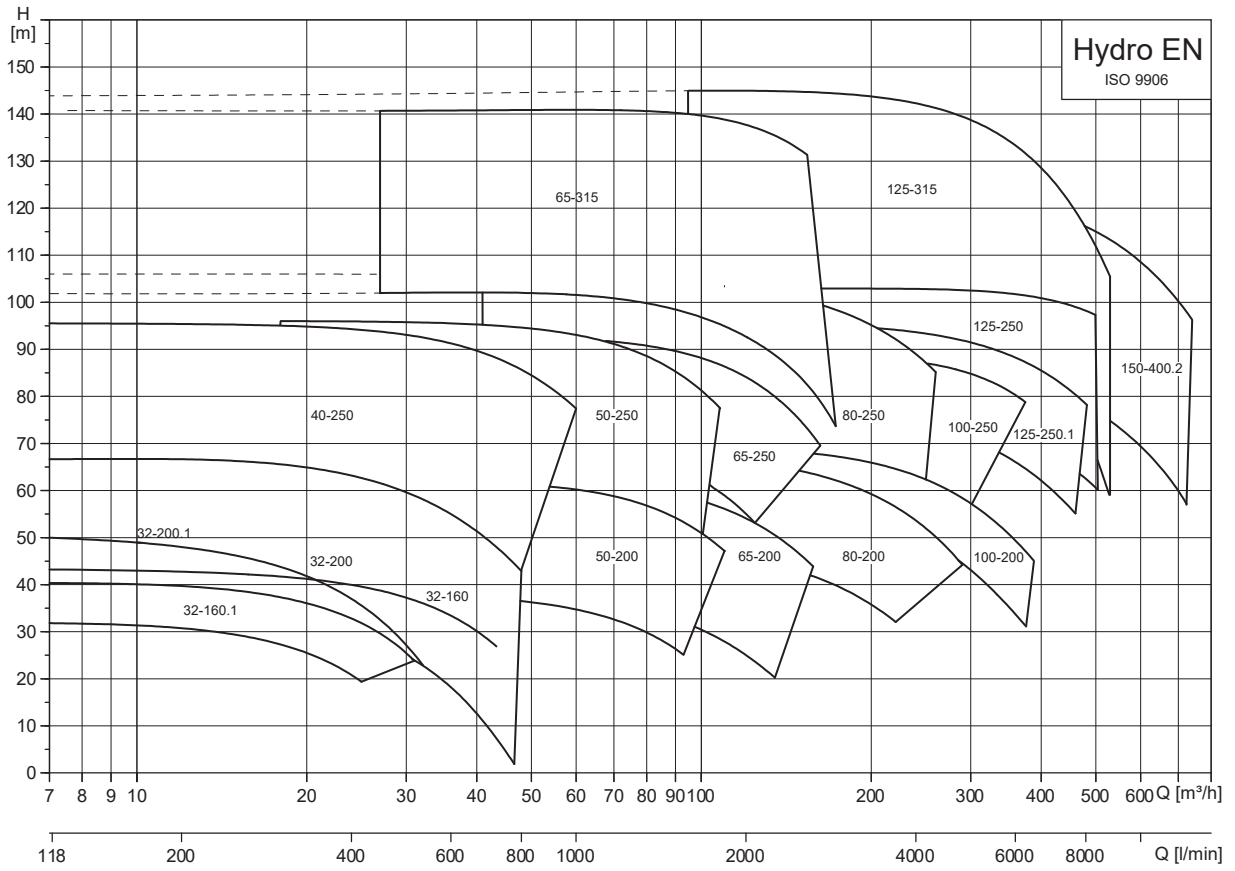


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1. Performance range



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2. Application

The Hydro EN pump sets for automatic sprinkler systems are in compliance with the following standard:

- **EN 12845** - Fixed firefighting systems - Automatic sprinkler systems - Design, installation and maintenance.

The pump sets cover the following performance range: flow rate up to 650 m³/h and head up to 140 m for each duty pump. Contact Grundfos for performance values in excess of the range described in this data booklet.

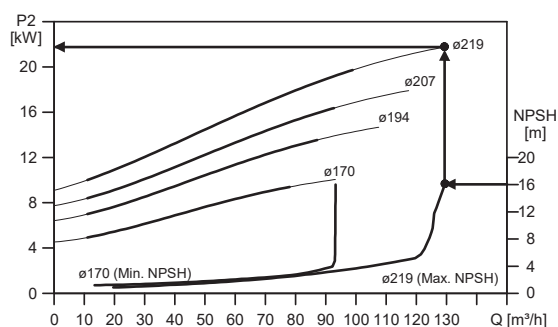
General introduction

The pump set is designed for operation with clean water and for automatic sprinkler systems such as single, superior single, duplicate or combined water supply sources.

The pump set is compact, robust, modular and supplied in pre-assembled blocks to make transport, handling and installation easier.

The pumps are of the back pull-out design, enabling removal of the motor, coupling, bearing bracket and impeller without disturbing the pump housing or pipes.

The shape of the QH curve is stable. The motors or engines deliver, as minimum, the required power up to the flow rate corresponding to the NPSHr value which is 16 m.



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Size criteria for the motor and engine

The diesel engine makes it possible to operate continuously at full load with a continuous power rating in compliance with the ISO 3046 standard.

The diesel pump is cooled in one of the following ways:

- With direct air.
- With water/water heat exchanger. This solution provides adequate operation that is as unrestricted as possible by the heat elimination conditions of the technical control room.

The fuel tank is sized to ensure at least 6 hours of continuous operation and is equipped with a containment basin and vent connection.

All pump sets are supplied as factory-tested units. In addition, the diesel pumps are supplied with a factory test report as required by the EN 12845 standard.

The range consists of the following types:

- S version: One or two duty pumps operated by an electric motor.
- Y version: Two duty pumps. One pump is operated by an electric motor and the other pump is operated by a diesel engine.
- T version: One or two duty pumps operated by a diesel engine.

The systems described above include the following:

- One jockey electric pump which is controlled by a control panel. The jockey pump has a 24-litre tank to restore the system pressure in case of small leaks.
- An independent control panel for each duty pump with operating and control buttons. Two pressure switches for each duty pump which are hydraulically connected to each other with a manifold of 15 mm in diameter.
- A pressure switch on each duty pump to detect the actual pressure supplied.
- Connection for the priming circuit and connection for the recirculation circuit to prevent overheating of the pump when running against closed valves.

As required by the EN 12845 standard, the periodic pump set performance check must be carried out by the installer of the firefighting system or by qualified persons. The activities performed must be documented in a dedicated register kept in the building.

The pump sets are equipped with the necessary instrumentation to simplify these operations during tests and commissioning.

The following accessories can be provided:

- A suction kit dedicated for installation in suction lift or in positive head conditions, including an eccentric divergent pipe with a controlled taper, a vacuum pressure gauge and an isolating valve (not included in the version for installation in suction lift conditions). All accessories are sized according to the prescriptions of the standard.
- A testing kit including a flowmeter, valves and straight pipe sections to get the optimum flow rate reading.

An industrial silencer is supplied as standard for diesel pump sets.

3. Type key

Example	Hydro EN	50-250/263	-Y	JS	A	SD	-U3	-B	-X
Pos.	1	2	3	4	5	6	7	8	9

Pos.	Description
1	Pump set type: Hydro EN
2	Pump type: 50-250/263 (Example: NKF 50-250 impeller Ø263)
3	Configuration: S1: One duty electric pump (100 %) S2: One duty electric pump and one standby electric pump (100 % + 100 %) S3: Two duty electric pumps and one standby electric pump (50 % + 50 % + 50 %) T1: One duty diesel pump (100 %) T2: One duty diesel pump and one standby diesel pump (100 % + 100 %) T3: Two duty diesel pumps and one standby diesel pump (50 % + 50 % + 50 %) Y: One duty electric pump and one standby diesel pump (100 % + 100 %) Y1: Two duty electric pumps and one standby diesel pump (50 % + 50 % + 50 %) Y2: One duty electric pump, one duty diesel pump and one standby diesel pump (50 % + 50 % + 50 %)
4	Jockey pump: JS : With a standard jockey pump JV : With a customised jockey pump (upon request) NJ : Without a jockey pump (upon request)
5	Control panel: A : Standard B : IP55 N : Without control panel X : Special execution control panel
6	Starting method: DL : Direct-on-line SD : Star-delta
7	Main supply: U1 : 3 x 400 V, 50 Hz duty electric pump (or standby pump) - 3 x 400 V, 50 Hz jockey electric pump U2 : 1 x 220 V, 50 Hz duty diesel pump (or standby pump) - 3 x 400 V, 50 Hz jockey electric pump U3 : 3 x 400 V, 50 Hz duty electric pump (or standby pump) - 1 x 220 V, 50 Hz duty diesel pump (or standby pump) - 3 x 400 V, 50 Hz jockey electric pump
8	Diesel engine cooling, if present: A : Direct air with fan B : Water/water heat exchanger
9	Other versions: X : Other versions based on customer specifications (upon request)

4. Operating conditions

Installation	Indoors, waterproof room, protected against freezing
Installation level	Electric pumps: up to 1000 m above sea level Diesel pumps: up to 300 m above sea level
Performance	See the specific curve of the model. Performance according to ISO 9906.
Nominal pressure	Components and materials PN 16
Fluid pumped	Solid- and fibre-free water
Water temperature	0-40 °C
Ambient temperature	4-40 °C Minimum 10 °C for diesel-driven pumps
Suction capacity	According to specific performance of the model chosen
Maximum inlet pressure	The maximum inlet pressure is linked to the maximum shut-off pressure delivered by the pump, meaning that the sum of the inlet pressure with the shut-off pressure must be less than the nominal pressure of the pump.
Electric power	According to specific performance of the model chosen
Starting method	Direct-on-line up to 30 kW Star-delta starting from 37 kW
Power supply	3 x 400 V, 50 Hz for electric pumps 1 x 230 V, 50 Hz. I _{max} = 4 A for diesel pumps

Operation mode

The jockey pump starts and stops automatically, ensuring pressurisation of the firefighting system in case of leaks and preventing unjustified starting of the duty pumps.

When the network pressure drops, the first duty pump is started automatically by the pressure switches (two redundant). If present on the pump set, the second duty pump is activated automatically if the network pressure drops further.

You can only stop the duty pumps manually by pressing the button on the front door of the control panel.

The standard scope of supply always includes an adjustable timer to automatically shut down the duty pump that permits operation. You can activate the function during commissioning if necessary and if the relevant norm in place allows to do so.

Specific selectors allow you to start and stop every single pump at any time. This is useful also for the commissioning and the periodic operation check.

Starting the motors and engines

The starting of the electric motors is available as standard in the following configurations:

- direct-on-line, DL, for powers up to 30 kW
- star-delta, SD, for powers from 37 kW and higher.

You start the diesel engines with two direct-current batteries, which are constantly charged.

An electronic circuit allows alternate use of the two batteries alternating at every startup and automatic cut-out of the battery if it is inefficient.

Remote signals

According to the requirements of the EN 12845 standard, you must connect a remote alarm unit to the control panels of the duty pumps in order to monitor the status of the pump set. The alarm unit must be complete with visual and acoustic signal and installed in a permanently attended room.

For this reason, the panels of the duty pumps have the following outputs available on the terminal block.

Control panel of the electric pump:

- electric motor powered
- pump starting request
- pump running (two outputs)
- start failure
- mains power not available
- automatic mode off.

Control panel of the diesel pump:

- automatic mode off
- diesel engine start failure
- pump running (two outputs)
- control panel failure
- general alarm (see the paragraph dedicated to the control panel).

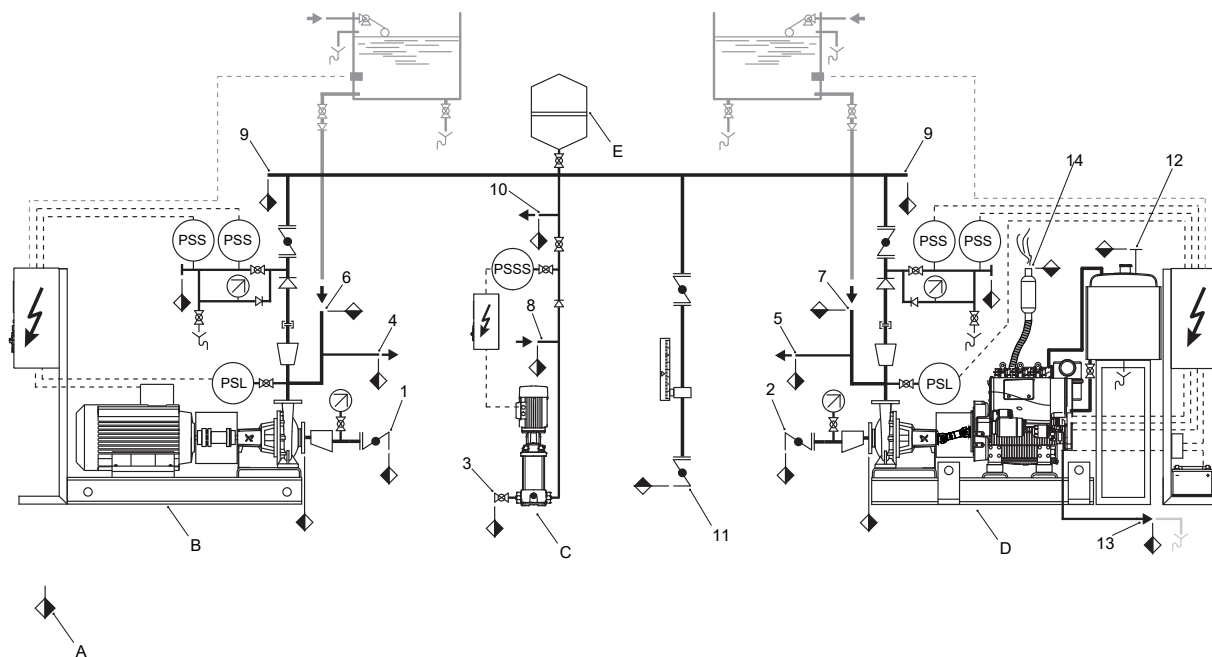
Control panel of the jockey pump:

- pump running
- general alarm (see the paragraph dedicated to the control panel).

Modbus interface

All control panels, thanks to a communication interface for Modbus RTU networks, can be easily integrated into a supervision system. Through an appropriate configuration it is possible to remotely view all the information available in the panel, including the status of the LEDs and all the alarms.

5. Functional diagram



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Functional diagram

Pos.	Connection/description
1	Independent inlet connection for the duty electric pump
2	Independent inlet connection for the standby diesel pump
3	Inlet connection for the jockey pump
4	Recirculation circuit connection for the duty or standby electric pump
5	Recirculation circuit connection for the duty or standby diesel pump with direct air cooling
6	Priming circuit connection for the duty or standby electric pump
7	Priming circuit connection for the duty or standby diesel pump
8	Priming circuit connection for the jockey pump
9	System outlet connection
10	Connection for technical room sprinkler
11	Test circuit outlet
12	Diesel tank vent
13	Cooling circuit outlet with water/water heat exchanger, if present
14	Diesel engine exhaust gas outlet
A	Scope of supply limits
B	Duty electric pump
C	Jockey pump
D	Standby diesel pump
E	Diaphragm pressure tank

Symbol	Description
	Check valve

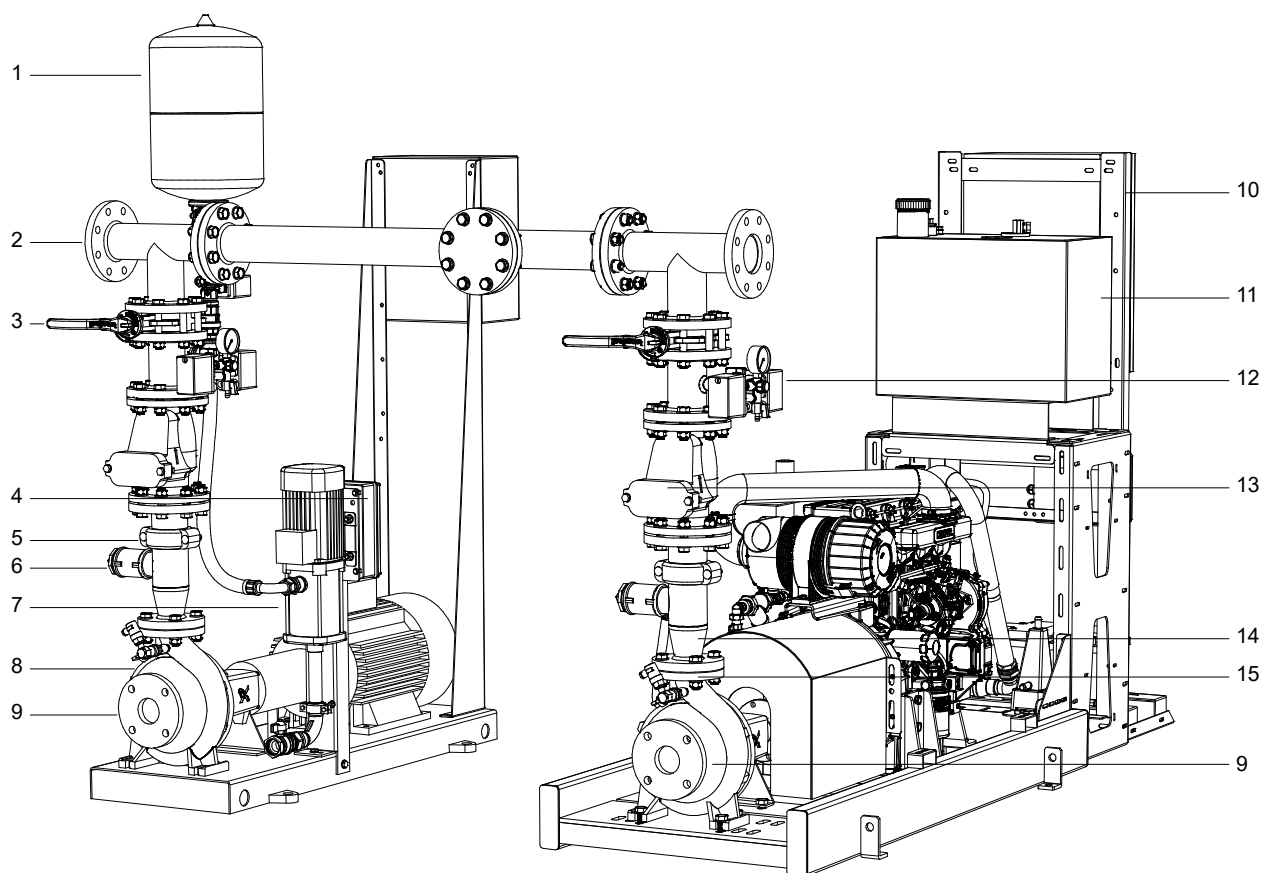
Symbol	Description
	Ball valve
	Butterfly valve
	Concentric divergent
	Eccentric divergent
[=]	Grooved coupling
	Flowmeter
	Pressure switch
	Pressure gauge
	Diaphragm pressure tank
	Control panel
	Drain connection

Symbol	Description
-----	Power and signal connections
———	Main and auxiliary flow pipes

6. Mechanical and hydraulic configuration

The following drawing shows the standard configuration of the pump sets.

In the order, you can define any changes or adaptations to specific needs and any integration of optional components and/or accessories not listed in our standard equipment described in this data booklet.



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Example of Hydro EN -Y configuration

Pos.	Description
1	Diaphragm pressure tank, 24 litre (included)
2	Outlet manifold
3	Isolating valve
4	Control panel of the jockey pump
5	Grooved coupling
6	Connection to priming circuit
7	Jockey pump
8	Duty electric pump with spacer coupling
9	Inlet for independent pumps
10	Control panel of the standby diesel pump
11	Fuel tank sized to ensure at least 6 hours of continuous operation, complete with containment basin
12	Starting circuit complete with two pressure switches and a pressure gauge according to the EN12845 standard.
13	Check valve
14	Pressure switch to detect pump operation
15	Standby diesel pump with cardan shaft coupling

The modular construction concept of the Hydro EN range makes transport, handling and positioning at the place of installation easier. All pump sets are supplied in blocks which are usually split as below:

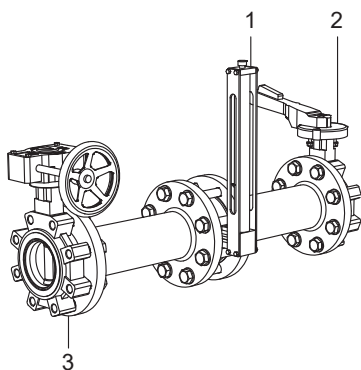
- a base plate for the duty pump, the jockey pump and the relevant control panels with brackets and hydraulic components, in the case of pump sets with two duty pumps
- a second base plate for the second standby pump and the control panel with brackets and hydraulic components.

The arrangement of the parts provides immediate reading of the measurement instruments and signals, making the operations during commissioning and periodic checks of the pumping unit easier.

Accessories

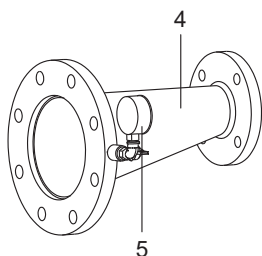
The following accessories are available on request:

Test kit



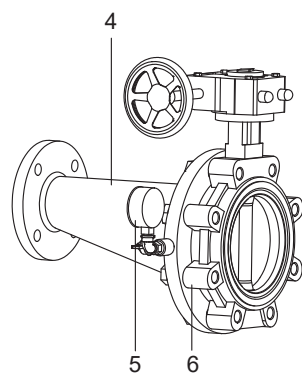
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Suction kit, suction lift installation



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Suction kit, positive head installation



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Pos.	Description
1	Flowmeter
2	Isolating valve
3	Adjustment valve
4	Eccentric cone with controlled taper
5	Vacuum pressure gauge
6	Isolating valve

7. Hydraulic components

The hydraulic components are selected and sized in order to minimise pressure losses and water speed in compliance with the requirements of the EN 12845 standard, at any flow rate value stated on the performance curve.

The following components are placed on the outlet side of each duty and standby pump:

- A concentric divergent pipe with controlled taper mounted on the outlet side of the pump inclusive connection for the recirculation circuit in order to prevent overheating of the pump when operated against closed valves.
- A grooved coupling of the flexible type that allows not to transfer any tensions deriving from misalignments of the outlet pipes to the pump.
- A check valve.
- An isolating valve of the butterfly type with a lockable handle and status indicator. Operation is by a handwheel with gearbox for sizes higher than DN 100.
- A 1/2" drain valve on the outlet side of the pump according to the EN 12845 standard. See illustration in section Control panel for the duty electric pump.
- A starting device complete with two starting pressure switches, a glycerine bath manometer with 16 bar full scale, an isolating valve and a bypass with a check and drain valve. The operating mode requires two pressure switches for each pump that are connected so that each one can provide automatic start, while stopping is manual.
- A 1" connection for the sprinkler circuit of the technical control room.
- A pressure switch on the outlet side to detect that the pump is delivering pressure.
- A flanged outlet manifold for the connection to the system and the testing kit.

The jockey pump is equipped with the following components:

- a connection for priming
- a 1" check valve on the outlet side
- two isolating valves of the ball type with lever operation, one on the outlet side (1") and one on inlet side (1 1/4")
- a pressure switch for starting and stopping the pump
- a diaphragm tank pre-charged at the factory for optimal jockey pump operation.

Accessories can be provided to complete the supply, including the following:

- A suction kit for positive head or suction head installation including an eccentric divergent pipe with controlled taper, a vacuum pressure gauge, an isolating valve on the pipe connection side. All accessories are sized according to the requirements

stated in the EN 12845 standard. You can choose the suction kit that is best suited for the type of installation that you want.

- A testing kit including a flowmeter, adjustment valves and spacers to get optimum flow rate reading.

Related information

[Control panel for the duty electric pump](#)

8. Pump description

Grundfos, world leader in the development and manufacturing of pumping solutions, has designed and produced a range of pumps for firefighting applications in full compliance with the EN 12845 and EN 12259-12 standards.

The duty pumps are of the flanged single impeller, centrifugal NKF type with horizontal axis and volute casing, axial inlet port and radial delivery port with flanges compliant with the EN 1092-2 standard.

All pumps are dynamically balanced to prevent unbalancing of the rotating masses and to ensure their reliability and durability.

The duty pumps are made in class PN 16 and therefore for a pressure of 1.6 MPa (16 bar).

The maximum inlet pressure allowed is equal to the difference between 16 bar and the maximum head of the specific model.

The pumps are suitable for operation with clean, non-dense, non-explosive liquids that contain neither solids nor fibres and are mechanically or chemically non-aggressive for the pump.

The mechanical seal has standard dimensions compliant with the DIN 24960 standard and is of the Grundfos BAQE type.

These pumps have proven their high level of reliability and durability over time - fundamentally important features for this type of application - thanks to the carefully chosen materials, high-precision manufacturing techniques, PN 16 construction, cataphoresis treatment and the dynamic balancing of the rotating masses.

Jockey pumps

The jockey pumps are either a Grundfos CM or Grundfos CR series.

The jockey pumps are multistage centrifugal pumps, not self-priming, with direct-start motors.

Install the jockey pump to avoid unnecessary starting of the duty pump and to maintain the system pressure in case of small leakages.

The performance of the jockey pump does not contribute to the calculation of the nominal flow of the system.

According to the standard description, the performance of the jockey pump must not be sufficient to supply a single sprinkler.

Duty electric pumps

The duty electric pumps are built as back pull-out and are driven by an electric motor capable of delivering at least the power required for the flow rate corresponding to the NPSHr value equal to 16 m.

The pump is coupled to the motor via a spacer coupling so that the pump and motor can be removed independently in order for you to perform maintenance on the parts inside the pump without having to remove the inlet or outlet pipes.

Pump performance is compliant with the ISO 9906:2012 - Grade 3B standard. The characteristic curve QH is stable.

Duty diesel pumps

The duty diesel pumps are driven by a diesel engine capable of delivering at least the power required for the flow rate corresponding to the NPSHr value equal to 16 m.

The diesel engines are able to operate continuously at full load. The delivered power is chosen from the continuous power curve (ICN, ICFN, ICXN or NA) according to the ISO 3046 standard and can supply, as minimum, the power required by the pump at the flow rate corresponding to the NPSHr value of 16 m.

The pump is coupled to the diesel engine via a cardan shaft so that the pump and the engine can be removed independently in order for you to perform maintenance on the parts inside the pump without having to remove the inlet or outlet pipes.

The fuel tank complete with containment basin and connection for the vent pipe is sized to ensure at least 6 hours of operation.

The starting of the diesel engine is guaranteed by two 12 V DC batteries that are constantly charged by two battery chargers.

The battery charger is electronically controlled to achieve consistent and calibrated performance to ensure maximum effectiveness and extended battery life.

The automatic and manual starting systems are independent and use four separate power relays.

The starting of the diesel engines requires an automatic sequence of six alternating attempts, each lasting from 5 to 10 seconds with a maximum pause of 10 seconds, on the two batteries.

Automatic battery changeover is made at every starting attempt and an automatic cut-out of the inefficient battery improves system reliability.

The exhaust silencer is included in the scope of supply, either integrated or loose for mounting during installation. In the latter case, a flexible pipe is supplied to ease the connection between the silencer and the exhaust manifold of the diesel engine.

In compliance with the requirements of the standard, all diesel pumps are factory-tested and accompanied by a test report.

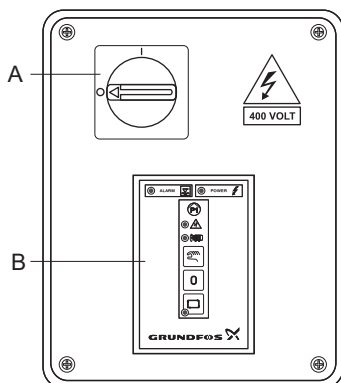
9. Control panel

Control panel for the jockey pump

The jockey pump is controlled by a dedicated panel that automatically manages the operation of the pump based on the state in a low-voltage powered pressure switch, isolated from the network by a transformer.

The starting method of the electric motor is direct-on-line (DL).

A lockable general door-lock disconnecter (pos. A) allows safe maintenance.



Control panel for the jockey pump

The panel includes the following components and functions available in the door:

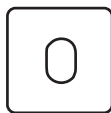
Pos.	Component
A	Door-lock disconnecter (lockable)
B	Control interface

The control interface (pos. B) has the following luminous indications and actuation keys:

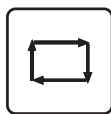
- LED - power supply present
- LED - pump running
- LED - automatic operating mode active
- LED - intervention of thermal protection
- LED - Intervention of protection against dry running.



Manual START button (unstable condition)



STOP button



Button to enable automatic operation
By pressing this button, the pump starts and stops according to the pressure switch setting.

Signalling outputs (potential-free contacts) for jockey pump

For the supervision of the jockey pump, the outputs listed below are provided:

Signalling	Description
Pump in operation	Start of the jockey pump Closed contact indicates that the pump is running.
General alarm (cumulative)	Thermal protection tripping, protection against dry-running, power supply failure, non-automatic mode of operation, an excessive number of close start-ups, prolonged operation. Closed contact indicates an alarm.

Contact type: AC1, potential-free relay contacts.

Max. voltage: 115 V.

Max. current: 2 A.

Modbus communication

The control panel is equipped with a communication interface for Modbus RTU networks, therefore it can be integrated into a supervision system. Through an appropriate configuration, it is possible to remotely view all the information available in the panel, including the status of the LEDs and all the alarms.

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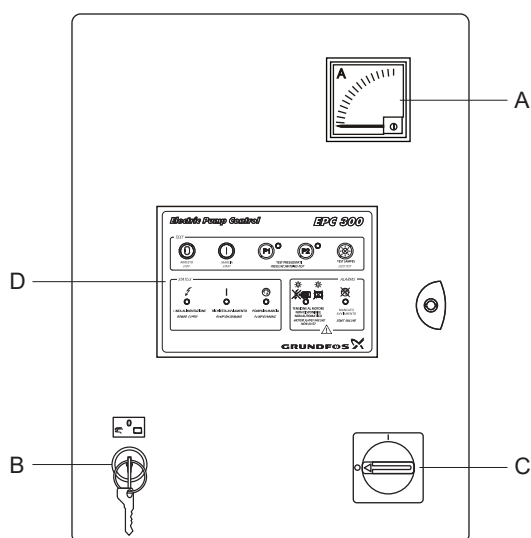
Control panel for the duty electric pump

The duty electric pumps are controlled by an independent control panel which provides easy reading of the measurement instruments and signals from a single observation point.

The starting of the electric motors is available as standard in the following configurations:

- direct-on-line, DL, for powers up to 30 kW
- star-delta, SD, for powers from 37 kW and higher.

To ensure greater safety for operators, the control pressure switch is powered by low voltage isolated from the mains by a transformer.



Control panel for the electric pump

The panel includes the following components and functions available in the door:

Pos.	Component
A	Ammeter
B	TEST-0-AUT operating mode selector with a removable key in AUT position
C	Main switch, padlockable
D	EPC 300 control unit with buttons and warning lights

The user interface of the EPC 300 control unit (D) shows the following signal lights and operating buttons:



Manual START button



Manual STOP button



TEST LEDs button

When pressed, all the LEDs light up and a dedicated signalling output is activated.



P1 and P2 buttons

For starting the test of the independent pressure switches



Additionally, the control unit also shows the following signals:

- power not available or wrong sequence phase connection, LED
- pump on demand, LED
- pump running, LED
- no voltage to the motor (permanently-on light), automatic operating mode disabled (flashing light), LED
- start failure, LED.

Related information

[7. Hydraulic components](#)

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Signalling outputs (potential-free contacts) for duty electric pump

The outputs listed below in accordance with the EN 12845 standard are provided for supervising the pump set from a control room:

Signalling	Description
Electric mains	Mains voltage is missing.
Motor voltage, or non-automatic operating mode	These outputs can indicate one of the following conditions: <ul style="list-style-type: none"> There is no voltage to the motor when the pump is requested to start. The operating mode selector is positioned on TEST or 0 (the group is not ready to start if requested).
Starting request	Request for starting the electric pump.
Pump in operation	The electric pump is in operation (two outputs are available, one used to start up the fan of the room ventilation system when the pump is in operation.)
Failure to start	The pump did not start on request.

Contact type: AC1, potential-free relay contacts.

Maximum voltage: 115 V.

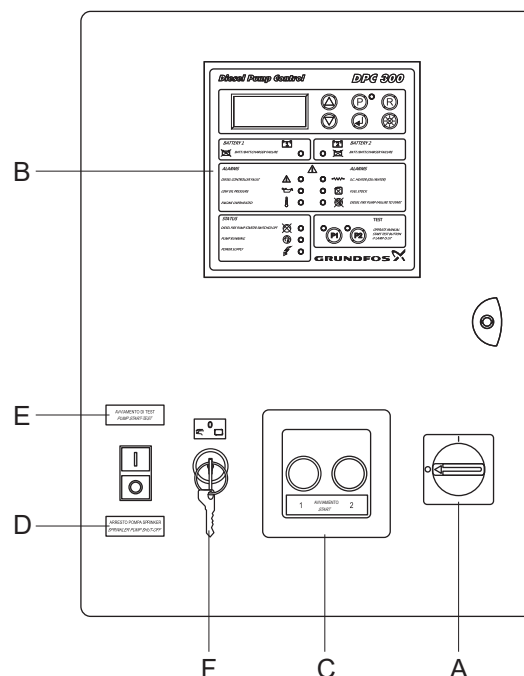
Maximum current: 2 A.

Modbus communication

The control panel is equipped with a communication interface for Modbus RTU networks, therefore it can be integrated into a supervision system. Through an appropriate configuration, it is possible to remotely view all the information available in the panel, including the status of the LEDs and all the alarms.

Control panel for the duty diesel pump

The duty diesel pump is controlled by an independent control panel which provides easy reading of the measurement instruments and signals from a single observation point.



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Control panel for the diesel pump

The panel includes the following components and functions available in the door:

Pos.	Component
A	Main switch, padlockable
B	DPC 300 control unit with buttons, warning lights and LCD multifunction display
C	Manual engine start button using battery 1 or 2, protected by breakable glass
D	Manual engine stop button
E	Engine test start button
F	TEST-0-AUT operating mode selector, with removable key in AUT position

The user interface has a backlit LCD display, so you can read it even when the room lighting is poor. By means of the light signals, the pump set status is always under control.

The indications and their functions are divided as follows. The LCD display has eight parameters in simultaneous reading:

- engine status or speed with the engine running
- status of the operating mode selector (F)
- operation hour counter
- engine temperature
- oil pressure
- diesel fuel level
- battery 1 voltage
- battery 2 voltage.

Note: In the case of an alarm, the description of the alarm is displayed instead of the battery voltage.

Programming area

- Parameter selection button
- programming button
- confirmation button
- reset button
- LED operation check button.

Battery 1:

- battery charger failure (flashing LED) or battery failure (LED is permanently on).

Battery 2:

- battery charger failure (flashing LED) or battery failure (LED is permanently on).

Alarm indication area

- Control panel failure
- low oil pressure
- high engine temperature
- short circuit of oil or water pre-heating system
- diesel reserve
- engine start failure.

Status area

- Automatic start disabled
- pump in operation
- mains present.

Test area

- Button for pressure switch 1: test and operation check of the emergency starting circuit
- button for pressure switch 2: test and operation check of the emergency starting circuit.

Two independent battery chargers and all the electromechanical components needed are housed inside the panel.

Signalling outputs (potential-free contacts) for duty diesel pump

The control panel of the diesel pump can be connected with remote devices such as, for example, the Grundfos remote acoustic-visual alarm.

The control panel has the following relay outputs available on the terminal board. For detailed information, refer to the wiring diagram of the control panel.

Technical characteristics of the contacts:

- Voltage: 115 V
- Current: 2 A
- Class: AC1.

Relay outputs	Description
Pump in operation	The closing of the contact indicates the actual start of the diesel pump. Two outputs are available: one can be used to start the fan of the room ventilation system when the pump is in operation.
General alarm (cumulative)	The closing of the contact indicates the intervention of one of the following alarm conditions: battery charger failure, over- or under-voltage batteries, mains power failure, low oil pressure, high engine temperature, start failure, operating mode selector not in automatic position, fuel reserve, oil/water heater.
Failure to start	The closing of the contact indicates the engine start failure after six unsuccessful attempts.
Operating mode not in automatic	The closing of the contact indicates the alarm generated by the operating mode selector set in "0" or "TEST" position. The diesel pump is not ready to start in case of request.
Control panel failure	The closing of the contact indicates that the DPC 300 control unit does not work properly.
AUX ¹ Programmable contact	This output contact can be set to indicate one of the following three conditions (not cumulative): <ul style="list-style-type: none"> • fuel reserve • battery charger failure, over-voltage or under-voltage • power failure • pre-heating system protection alarm

¹ This contact is not available on the terminal board, but must be connected on the DPC 300. Refer to the wiring diagram for cabling.

Contact type: AC1, potential-free relay contacts.

Maximum voltage: 115 V.

Maximum current: 2 A.

Modbus communication

The control panel is equipped with a communication interface for Modbus RTU networks, therefore it can be integrated into a supervision system. Through an appropriate configuration, it is possible to remotely view all the information available in the panel, including the status of the LEDs and all the alarms.

10. Versions on request and accessories





The following versions are available upon request:




- 1 electric pump, 2 duty diesel pumps and 1 jockey electric pump
- 3 duty electric pumps and 1 jockey electric pump
- 3 duty diesel pumps and 1 jockey electric pump
- with performance values in excess of the range described in this data booklet

- IP55 panels.

Contact Grundfos to define versions not listed above or for accessories not listed in the equipment described in this data booklet.

Option	Description
Suction kit	<p>To make sure that an installation complies with the guidelines in the EN 12845 standard, you need an installation kit including an eccentric divergent pipe with a controlled taper, a vacuum pressure gauge, an isolating valve and a compensation joint on the side where the pipe is connected. The components are sized in accordance with the requirements of the standard regarding the minimum diameter and the maximum water velocity prescribed at the maximum flow rate stated on the performance curve:</p> <ul style="list-style-type: none"> • positive head installation: a minimum permissible diameter of DN 65 and a maximum water speed of 1.8 m/s • suction lift installation: a minimum permissible diameter of DN 80 and a maximum water speed of 1.5 m/s.
Test kit	<p>A complete flow rate test circuit is available as an option. The test circuit includes a flowmeter, spacers and an adjustment valve. With this configuration you can measure the flow rate with adequate accuracy.</p> <p>This accessory is essential in order to verify the performance as required by the standard when carrying out inspections and periodic verifications.</p>
Acoustic and visual alarm signalling panel	<p>The panel allows you to monitor the operation of the pumps from a permanently attended room. The panel provides a visual and acoustic indication of the alarms from the duty pump panels:</p> <ul style="list-style-type: none"> • seven digital alarm inputs • a yellow control lamp and acoustic alarm, 85 dB • a buffer battery with 30 hours of continuous operation and battery charger • a mains control lamp • a lamp and acoustic signal test button • an acoustic alarm silencing button.
MultiLed alarm signalling panel	<p>The panel meets the requirements of the EN 12845 standard Annex I for electric and diesel pump sets.</p> <p>There are 12 yellow LEDs for alarm type B and four red LEDs for alarm type A available. The purpose of the LEDs is to monitor the system components as well as the pump set alarms.</p> <p>A label system allows the user to customise the description of each LED alarm. Due to a buffer battery, the panel ensures the display of the alarms, individually selectable NO or NC, even in the absence of mains voltage.</p> <p>When an alarm is activated, the LED lights up on the panel and a buzzer and a yellow control lamp are activated.</p> <p>A type A alarm relay and type B alarm relay are activated at the same time. You can decide to store the alarm. In that case, the LED remains on even if the alarm disappears. In this case, use the R button to turn off the LED.</p> <p>You can use a button that mutes the buzzer with time recovery. If you press this button for more than three seconds, it tests the LEDs and buzzer.</p> <p>There is also an RS 485 port with Modbus RTU protocol that allows various information to be communicated.</p>

Option	Description	
Priming tank		A 500-litre water priming tank suitable for suction lift installation and complete with accessories is available on request.
Switches for main valves		<p>According to the EN 12845 standard, you must monitor the status of each isolating valve remotely.</p> <p>Upon request, the following isolating valves can be equipped with a micro-switch:</p> <ul style="list-style-type: none"> • inlet valve* • outlet valve • test circuit valve*. <p>* If the relevant kit is included.</p> <p>The use and connection of the monitoring system is the responsibility of the installer.</p>
Set of diesel engine spare parts		<p>To meet the requirements of the EN 12845 standard, you can request a set of diesel engine spare parts:</p> <ul style="list-style-type: none"> • two series of fuel filters with seals • two series of oil filters with seals • two series of belts, if used on the engine • a full set of connections, seals and hoses for the engine • two injector nozzles.
Residential type silencer		<p>The residential silencer is either integrated or loose for mounting during installation. In case of the latter, a flexible pipe is delivered to ease the connection between the silencer and the exhaust manifold of the diesel engine.</p> <p>A diesel engine equipped with a residential silencer for further reduction of the noise generated by the engine exhaust is available on request.</p>

Option	Description
<p data-bbox="145 275 327 322">Manual pump for fuel tank filling</p> 	<p data-bbox="740 264 1417 331">A manual pump for diesel tank filling is available on request. The manual pump makes it easy to refill the diesel tank as you can build a fixed filling system on the outside of the technical control room.</p>
<p data-bbox="145 640 300 707">Emergency power supply unit for drainage pump</p> 	<p data-bbox="740 495 1433 562">The emergency power supply unit, SE 2000, is ideal in case of electricity blackouts as the unit automatically goes into operation and generates electricity from a series of buffer batteries.</p> <p data-bbox="740 568 1385 613">Combined with a single-phase Grundfos drainage pump, it allows the latter to remain operational even in the event of a temporary interruption of electricity.</p> <p data-bbox="740 620 874 642">Characteristics:</p> <ul data-bbox="740 647 1444 853" style="list-style-type: none"> • Output voltage: single-phase 230 VAC, 50 Hz • input voltage, batteries: 48 V • nominal power rating: 2000 VA • metal enclosure IP20 • warning lights indicating the operating status of the emergency power supply unit • protection against reversing the battery connection • thermal protection of the panel • protection fuses for output.
<p data-bbox="145 1137 277 1160">Drainage pump</p> 	<p data-bbox="740 1088 1401 1155">Where it is not possible to create a gravity connection to the sewer network (for example in underground rooms), a system with two suitably sized pumps is required.</p> <p data-bbox="740 1162 1394 1207">Contact Grundfos for more information about drainage pumps that are suitable to combine with the emergency power supply unit described above.</p>
<p data-bbox="145 1559 338 1603">Control panel interface in local languages</p>	<p data-bbox="740 1352 1267 1375">The control interface is provided as standard in two languages:</p> <ul data-bbox="740 1379 839 1429" style="list-style-type: none"> • Italian • English. <p data-bbox="740 1435 1426 1480">If needed, it is possible, on request, to have the captions on the control panel door and the texts on the display in the following languages:</p> <ul data-bbox="740 1485 871 1800" style="list-style-type: none"> • Bulgarian • Danish • Estonian • French • Latvian • Lithuanian • Polish • Portuguese • Romanian • Serbian • Spanish • Hungarian.

After-sales service

Grundfos offers after-sales service with competent persons and original spare parts. This service can be extended with a maintenance contract or check and inspection agreements depending on your needs.

11. Installation

The criteria for installing firefighting pump sets are described in the EN 12845 and UNI 11292 standards. Refer to these standards for all the necessary guidelines.

In order for the pump set to perform efficiently, it is important that the inlet pipes comply with the criteria listed in the EN 12845 standard regarding the water speed in the pipes:

- 1.8 m/s for positive head installation
- 1.5 m/s for suction lift installation.

We recommend that you select a suction kit according to the type of installation. The suction kit is available on request.

The requirements of the EN 12845 standard regarding the installation type are summarised below.

Positive head installation

To be in accordance with the EN 12845 standard, you must install the firefighting pump sets in positive head and according to the following conditions:

- At least two-thirds of the water reserve must be above the level of the duty pump axis.
- The minimum water level in the inlet tank is no more than 2 metres below the level of the pump axis.
- You must install a foot valve if the axis of the duty pump is above the minimum level of the water to be sucked.

Suction lift installation

You can install the firefighting pump sets in the suction lift as long as the following conditions are met:

- The minimum water level in the inlet tank must be no more than 3.2 metres below the level of the pump axis.
- You must install a foot valve in the lowest point of the inlet pipe.

12. Choosing a pump set

Before choosing the pump set, check the requirements and specifications of the equipment designer, the prescriptions of the authorities and local regulations, the implications regarding the place and method of installation, etc.

To assess the effect of the installation conditions on the performance provided, proceed as follows when selecting the pump model for the pump set.

1. Use the above-mentioned values to choose the pump set.
2. Use a part of the generated flow as a continuous flow to prevent overheating when the pump operates against a closed valve or to feed the heat exchanger to cool the diesel engine, if available.
3. Add this flow rate to the design flow rate in order to make the selection.
4. The outlet pressure is influenced by the installation conditions:
 - Suction lift installation: Deduct the height in metres between the level of the pump axis and the minimum water level in the inlet tank from the head values specified in the tables.
 - Positive head installation: Add the height in metres between the level of the pump axis and the minimum water level in the inlet tank to the head values specified in the tables.
1. Deduct the friction losses in the inlet line (foot valve, pipes, curves, etc.), calculated at the design flow rate, from the head value.
2. Respect the minimum condition $NPSH_d \geq NPSH_r + 1$ [m] including the suction head and the suction head losses that has to be evaluated by the designer. You find the $NPSH_r$ value in the performance curve section.

Cooling flow

As specified in the EN 12845 standard, you must install a device on the pump set that meets the following purposes:

- prevents overheating when the pump operates against closed valves
- supplies the water/water heat exchanger for diesel engine cooling, if available.

See the performance curves and technical data for more information about the minimum flow rate values which are necessary to meet the purposes listed above.

Motors and types of starting

The motors deliver, as minimum, the required power up to the flow rate corresponding to the NPSH value which is 16 m.

The electrical data refer to single duty electric pumps.

In the standard version, the starting method of the electric motor is direct, DL, for powers up to 30 kW, and star-delta, SD, for powers from 37 kW and higher.

Type of water supply

The pump sets are designed for water supplies where each duty pump must deliver the following:

- 100 % of the specified performance if there are one or two pumps installed. The second duty pump is considered as a standby pump.
- 50 % of the specified performance if there are three pumps installed. The third duty pump is considered as a standby pump. The three-pump version is available on request.

According to the EN 12845 standard, when more than one pump is installed in a superior or duplicate water supply, only one pump must be driven by an electric motor.

13. Performance curves and data

How to read the data and curves

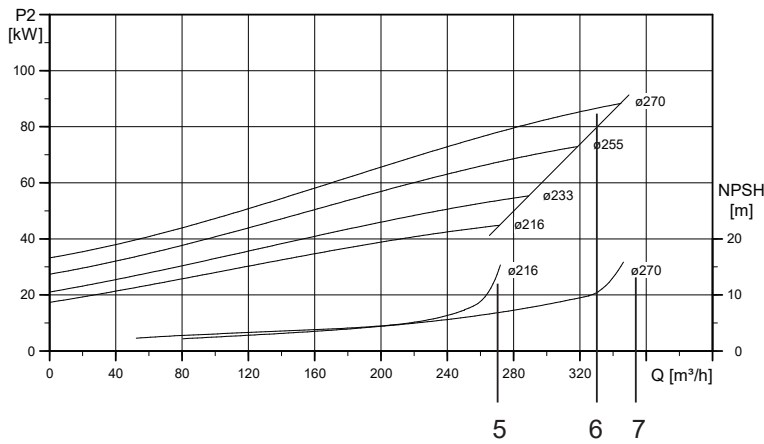
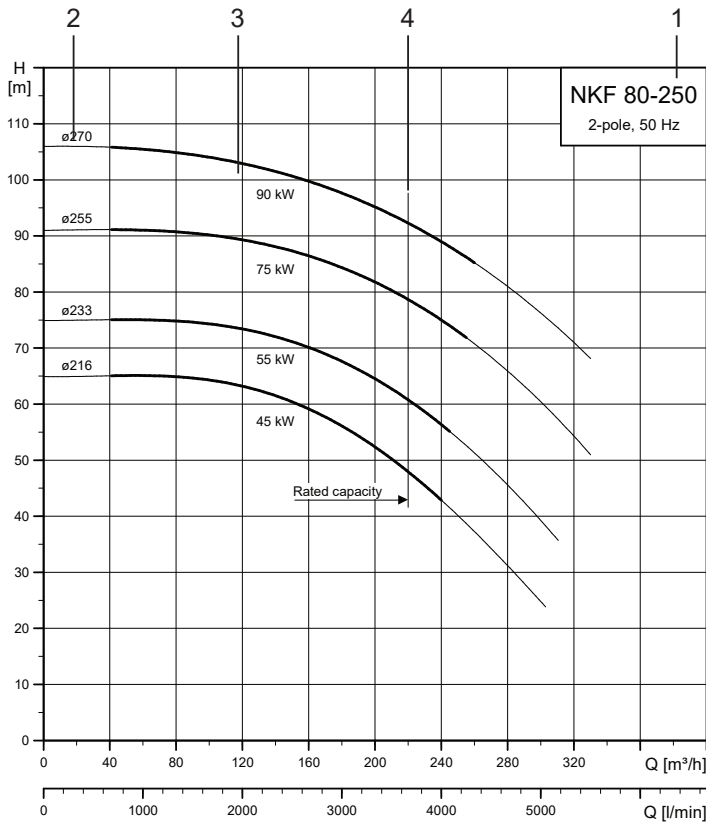
The complete performance curves and the technical data for each pump are shown in the specific charts below the curves for easy selection.

The values shown can be used entirely, and the last point is not the end of the curve.

- In any case, check that the standard condition is met when choosing the pump for the actual installation:

$NPSH_d \geq NPSH_r + 1$ [m].

Performance curve tables



Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m³/h]	Na (Nb) [kW]	Q _{min} [m³/h]		P [kW]	I _{1/1} [A]
80-250/216	45	80.5	4	48.2 (53)	4	•	CM 3-10	1.5 3.15
80-250/233	55	99.5	4	66.4 (73)	6	•	CM 3-12	1.5 3.15
80-250/255	75	134	4	99 (109)	6	•	CM 3-13	2.2 4.3
80-250/270	90	160	4	99 (109)	6	•	CM 3-14	2.2 4.3

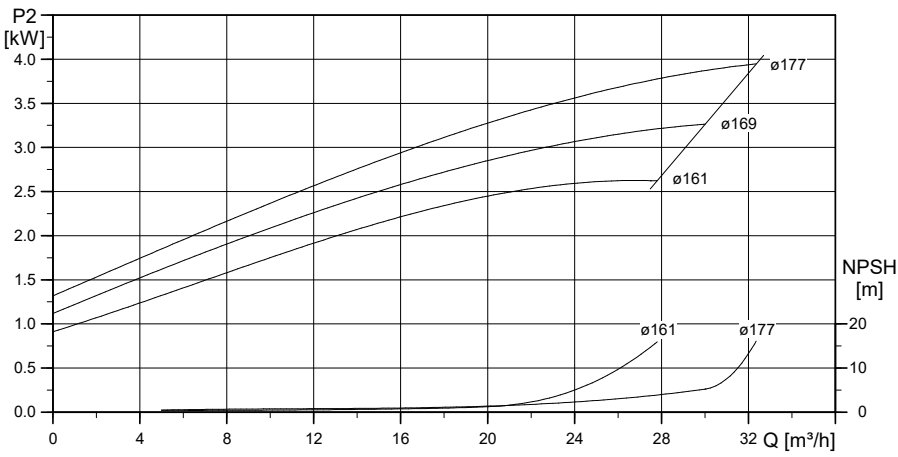
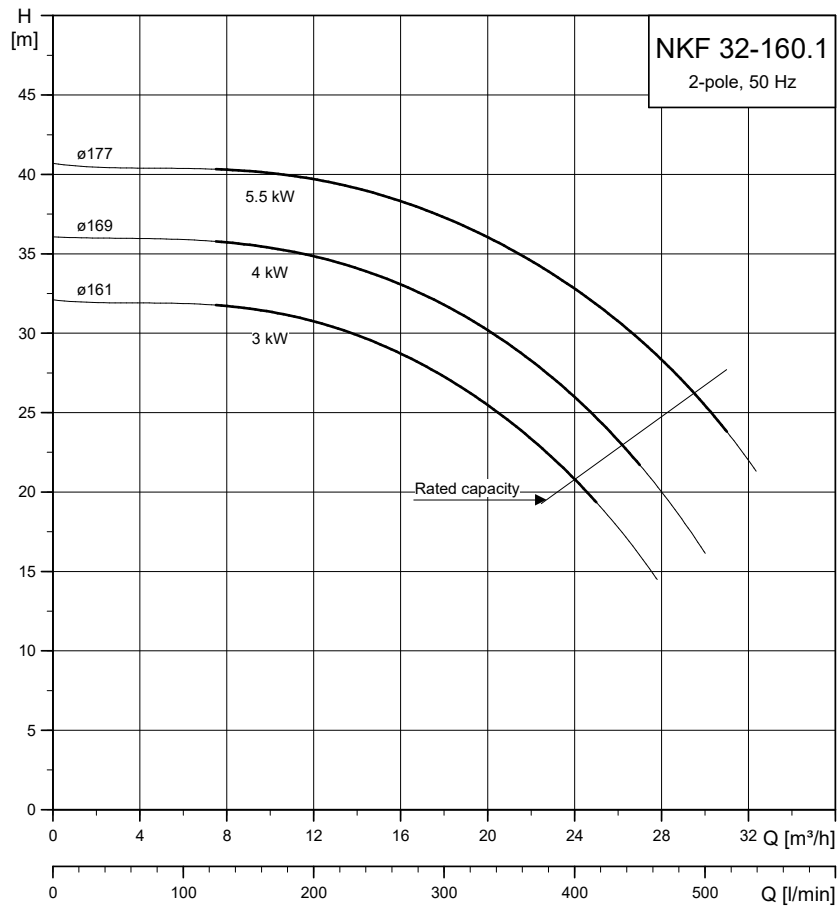
Hydro EN model	Q _{min} [m³/h]										
	0	50	100	120	160	180	200	220	240	250	260
80-250/216	65	65	64	62	58	55	51	47	42	-	-
80-250/233	75	75	74	73	69	66	63	59	55	53	-
80-250/255	91	91	90	89	86	84	81	78	74	72	70
80-250/270	106	106	104	103	100	98	95	92	89	87	85

TM066104

Pos.	Description
1	Indicates the size of the pump.
2	Indicates the diameter in mm of the impeller installed in the duty pumps.
3	The bold part of the curve indicates the performance, QH, where you have to select the pump set. Contact Grundfos for information regarding performance outside the bold part of the curve.
4	Indicates the limit of 5 m of NPSHr.
5	NPSHr curve extended up to 16 m regarding the minimum impeller diameter in this pump.
6	NPSHr curve extended up to 16 m regarding the maximum impeller diameter in this pump.
7	Power curve [P2].
8	Firefighting pump set
9	Power of the electric motor installed on the duty electric pump, if available.
10	Rated current of the electric motor installed on the duty electric pump, if available.
11	Flow rate of the recirculation circuit installed on the duty electric pump.

Pos.	Description
12	Cooling system used by the diesel engine, if available: ○: direct air-cooled engine ●: liquid-cooled engine by a water/water heat exchanger.
13	Rated power of the diesel engine compliant with the ISO 3046 standard. Na: continuous nominal power (Nb: discontinuous nominal power)
14	In the case of pump sets equipped with air-cooled engines, it indicates the flow rate of the recirculation circuit on the duty diesel pump. In the case of liquid-cooled engines, the number indicates the cooling flow rate of the diesel engine. It also acts as recirculation for the pump coupled to the diesel engine.
15	The version of the installed jockey pump.
16	Power of the electric motor installed on the jockey electric pump.
17	Rated current of the electric motor installed on the jockey electric pump.

Hydro EN 32-160.1

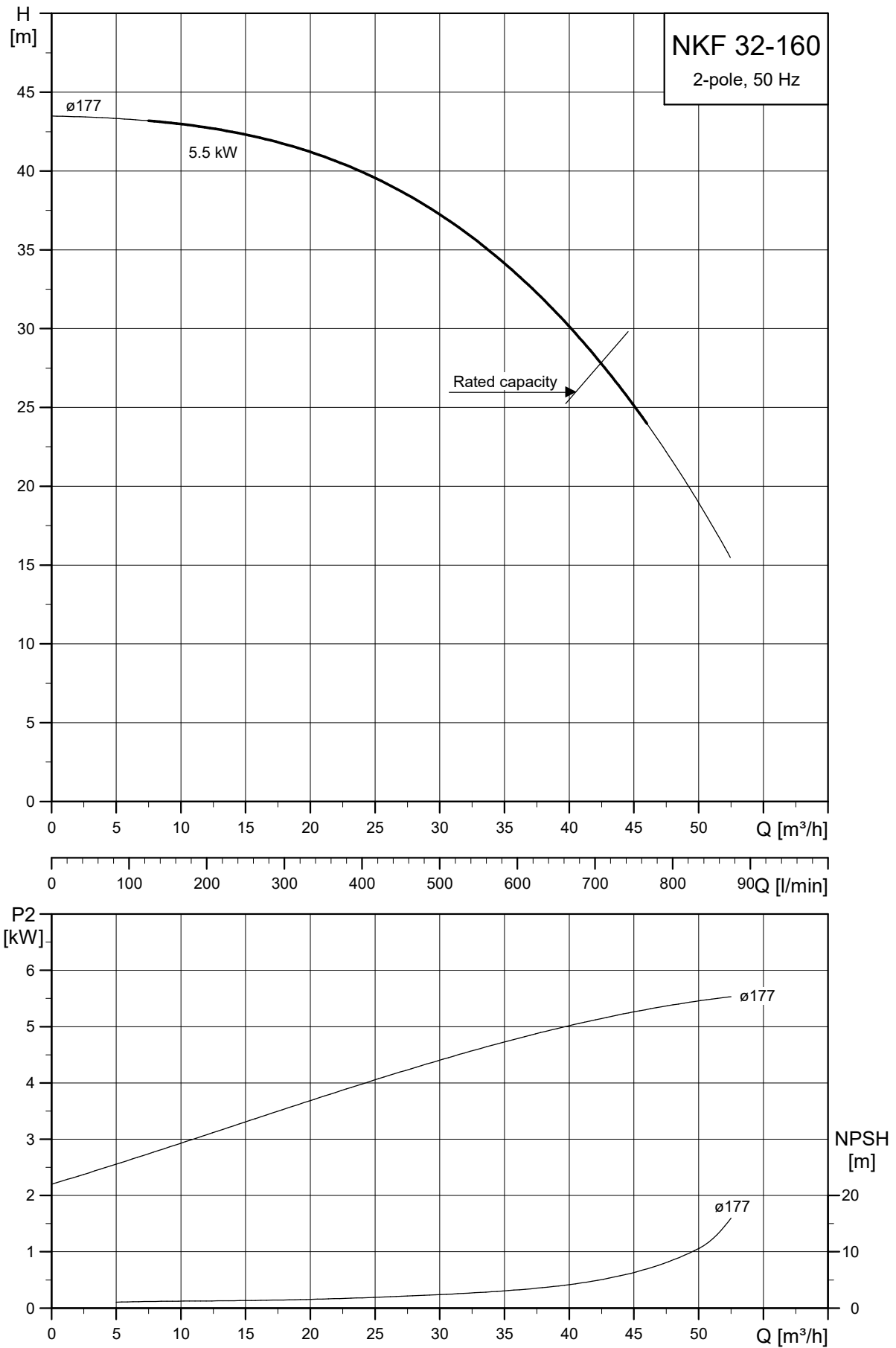


TM074394

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na(Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
32-160.1/161	3	5.6	0.5	4.1 (4.5)	0.5	○ CM 3-6	0.65	1.8
32-160.1/169	4	7	0.5	4.1 (4.5)	0.5	○ CM 3-7	1.1	2.72
32-160.1/177	5.5	10	0.5	4.1 (4.5)	0.5	○ CM 3-7	1.1	2.72

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	9	12	15	18	21	23	25	27	29	31
32-160.1/161		32	32	31	29	27	24	22	19	16	-	-
32-160.1/169		36	36	35	34	32	29	27	25	22	18	-
32-160.1/177		41	40	40	39	37	35	34	32	30	27	24

Hydro EN 32-160

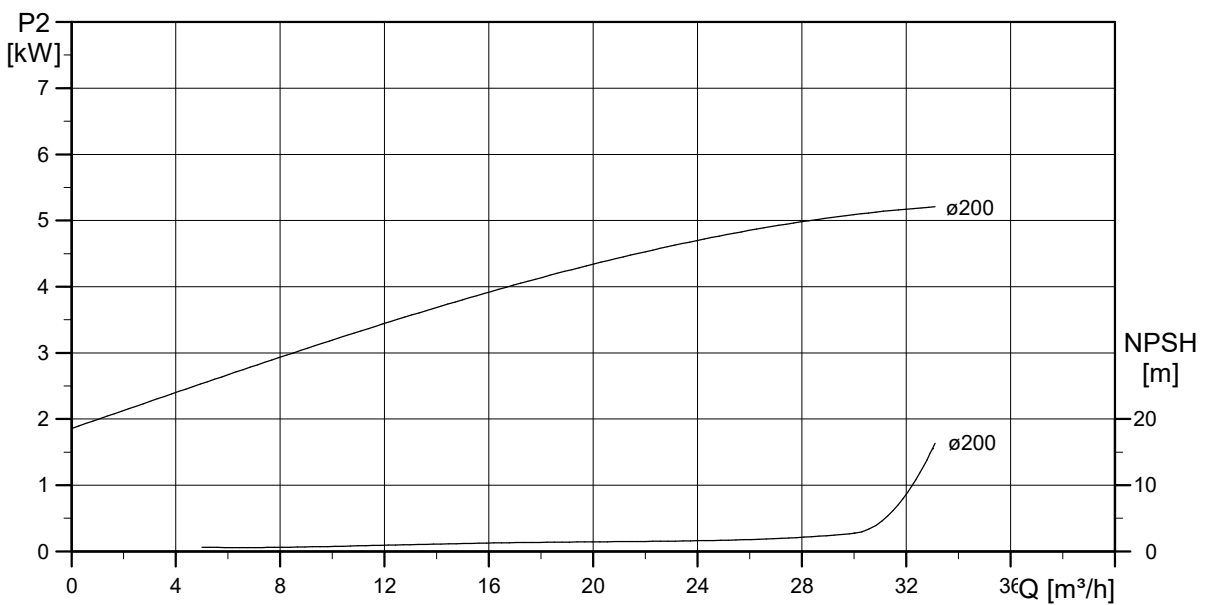
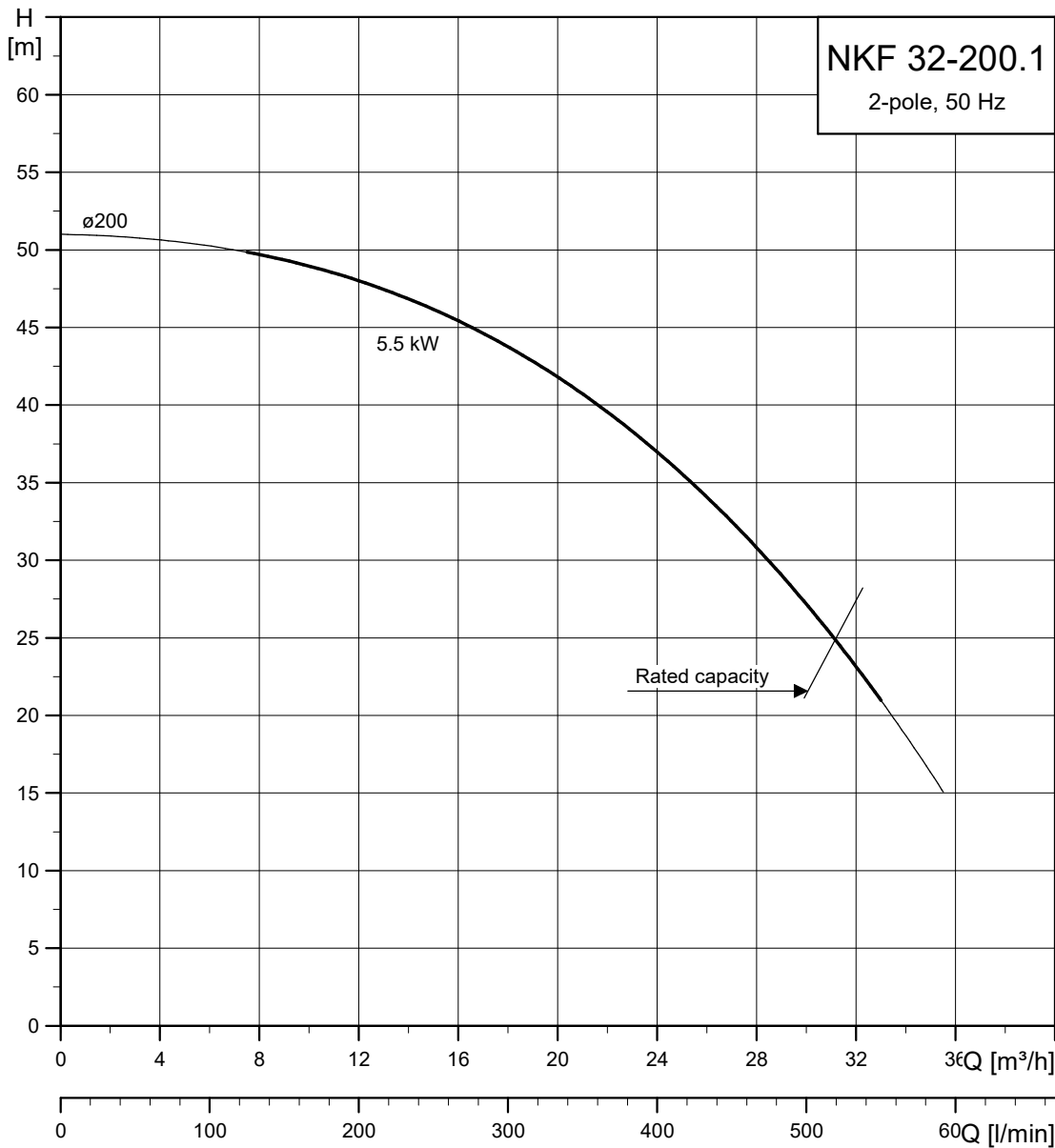


TM074395

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{m_min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
32-160/177	5.5	10	0.5	5.9 (6.6)	0.5	○ CM 3-7	1.1	2.72

Hydro EN model	Q _{min} [m ³ /h]											
		0	10	14	18	22	26	30	34	38	42	46
32-160/177	H [m]	43	43	42	42	41	39	37	35	32	28	24

Hydro EN 32-200.1

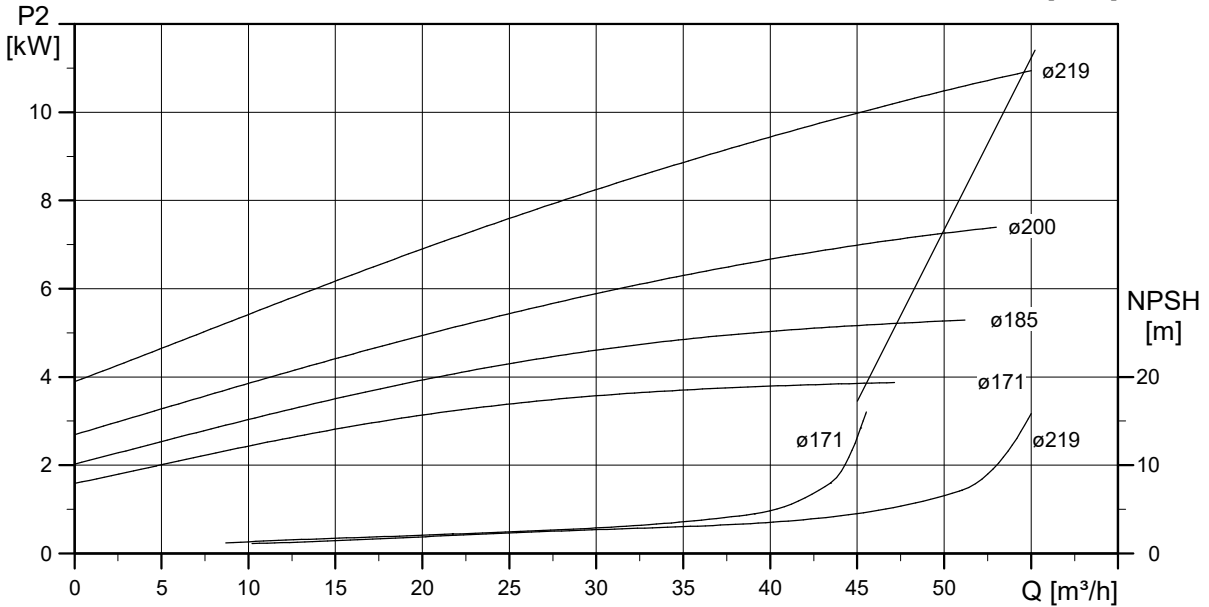
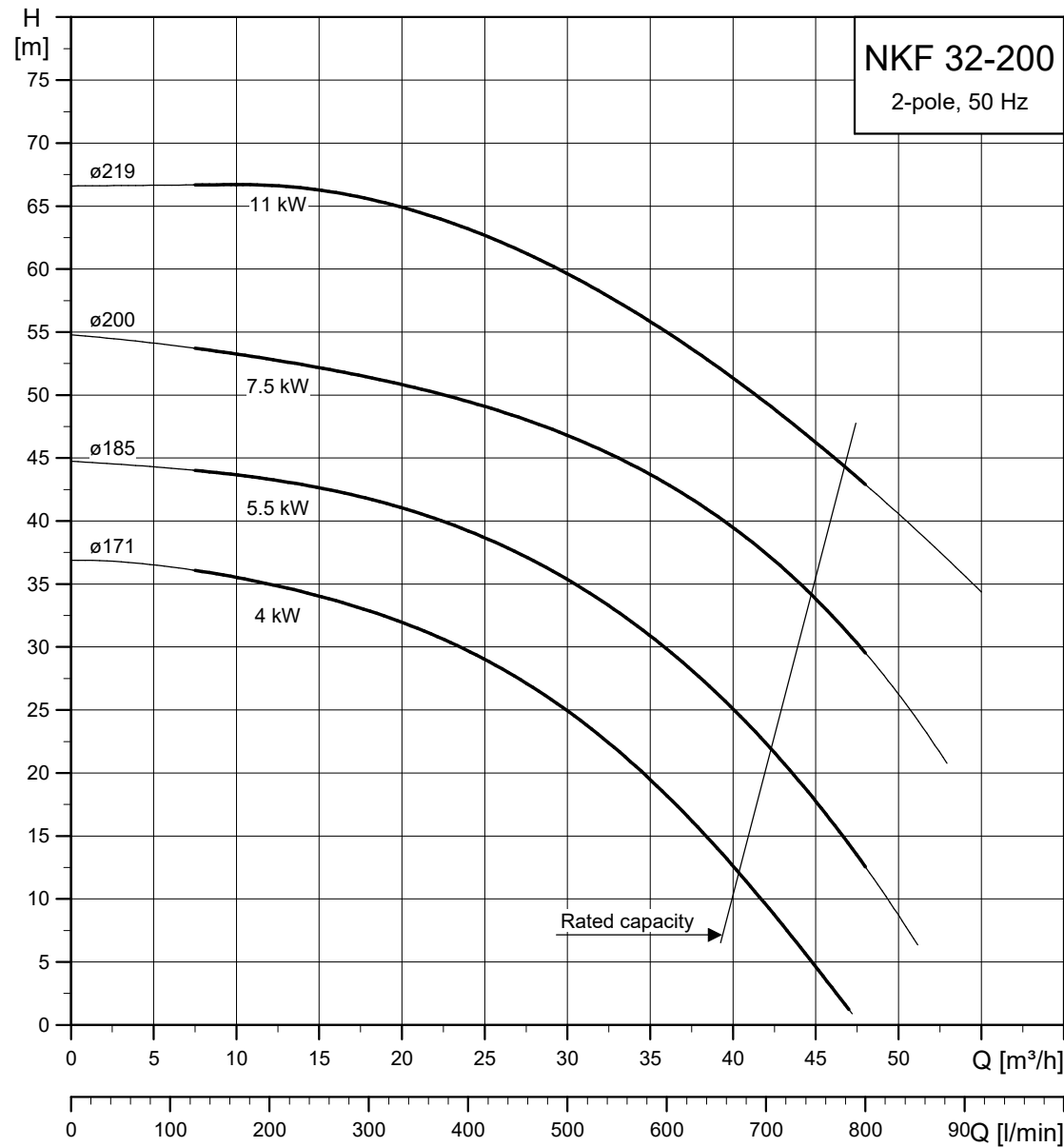


TM074396

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
32-200.1/200	5.5	10	0.5	5.9 (6.6)	0.5	○ CM 3-8	1.1	2.72

Hydro EN model	Q _{min} [m ³ /h]											
		0	10	13	16	19	22	25	27	29	31	33
32-200.1/200	H [m]	51	49	47	45	43	40	36	32	29	25	21

Hydro EN 32-200



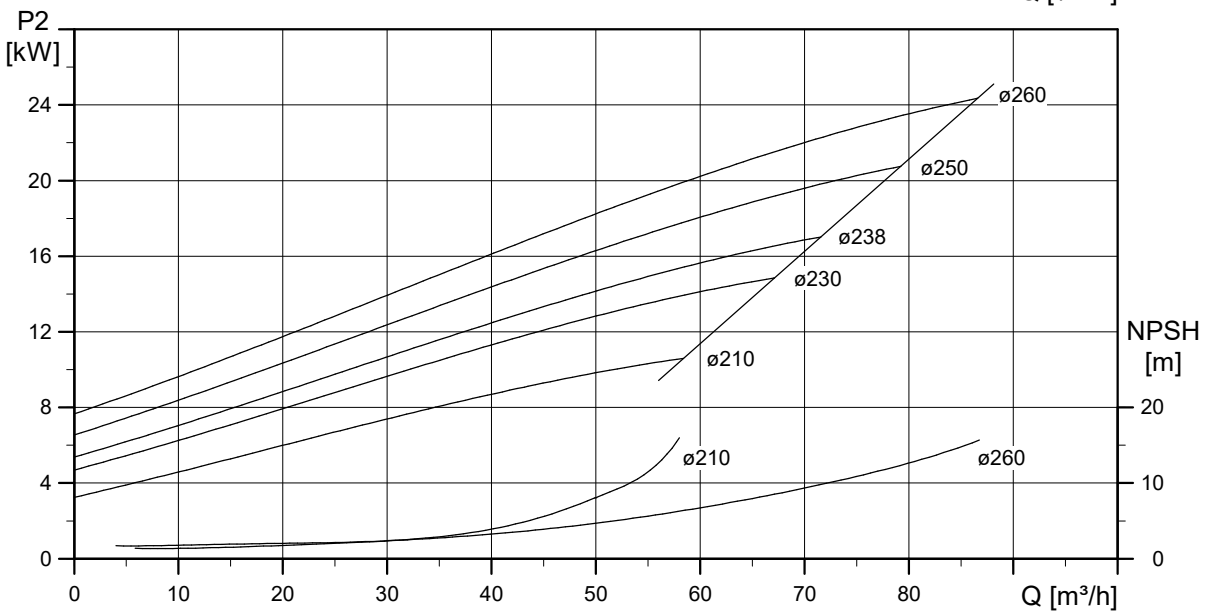
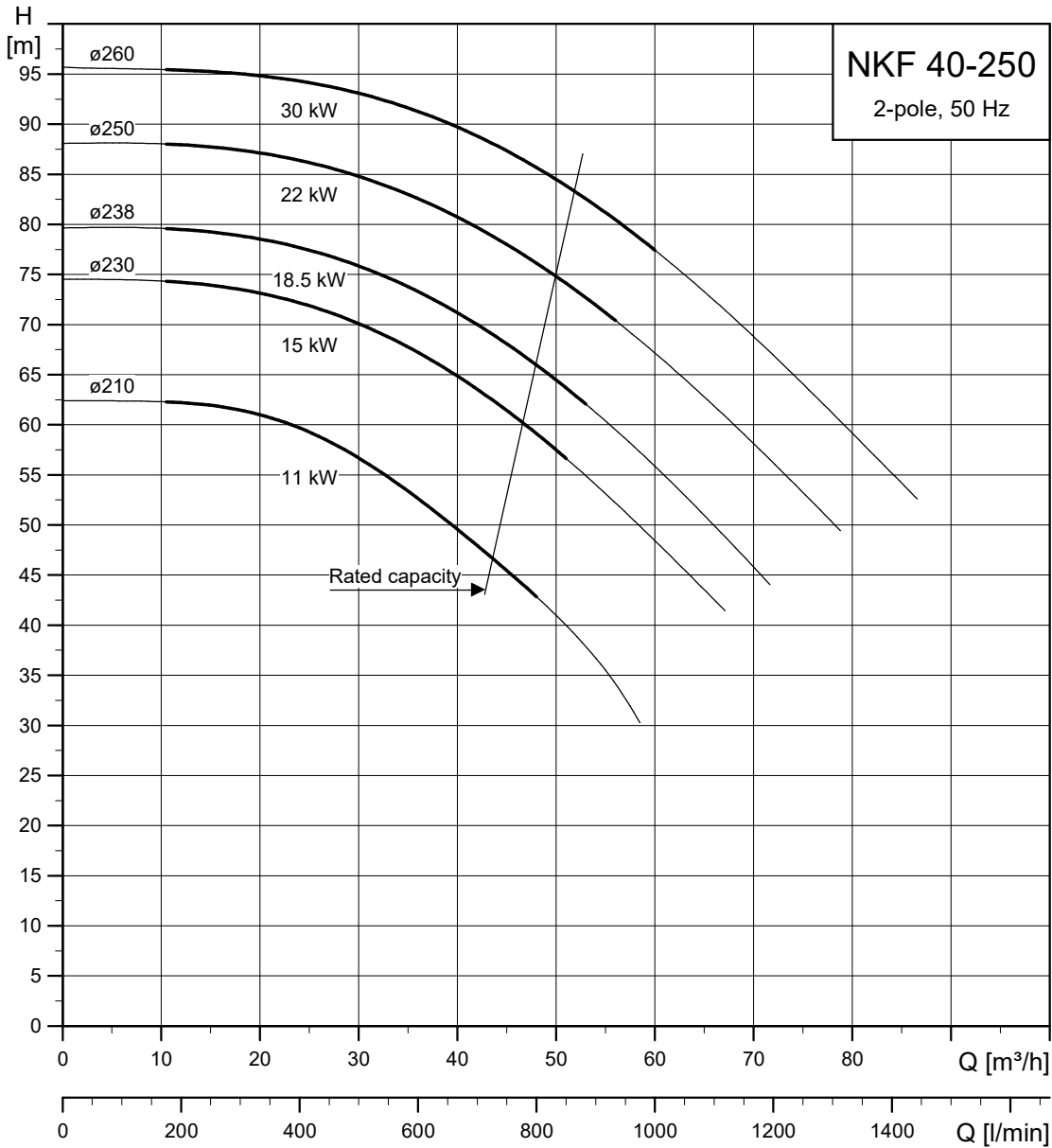
Performance curves and data

TM052162

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
32-200/171	4	7.4	0.5	4.1 (4.5)	0.5	○ CM 3-7	1.1	2.72
32-200/185	5.5	9.9	0.5	5.9 (6.6)	0.5	○ CM 3-8	1.1	2.72
32-200/200	7.5	13.2	0.5	10.2 (11.2)	0.5	○ CM 3-8	1.1	2.72
32-200/219	11	20	0.5	13.5 (14.8)	0.5	○ CM 3-10	1.5	3.3

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	10	15	20	25	30	33	35	40	45	48
32-200/171		37	36	34	32	29	25	22	19	13	5	-
32-200/185		45	44	43	41	39	35	33	31	25	18	13
32-200/200		55	53	52	51	49	47	45	44	39	34	29
32-200/219		67	67	66	65	63	60	57	56	51	46	43

Hydro EN 40-250

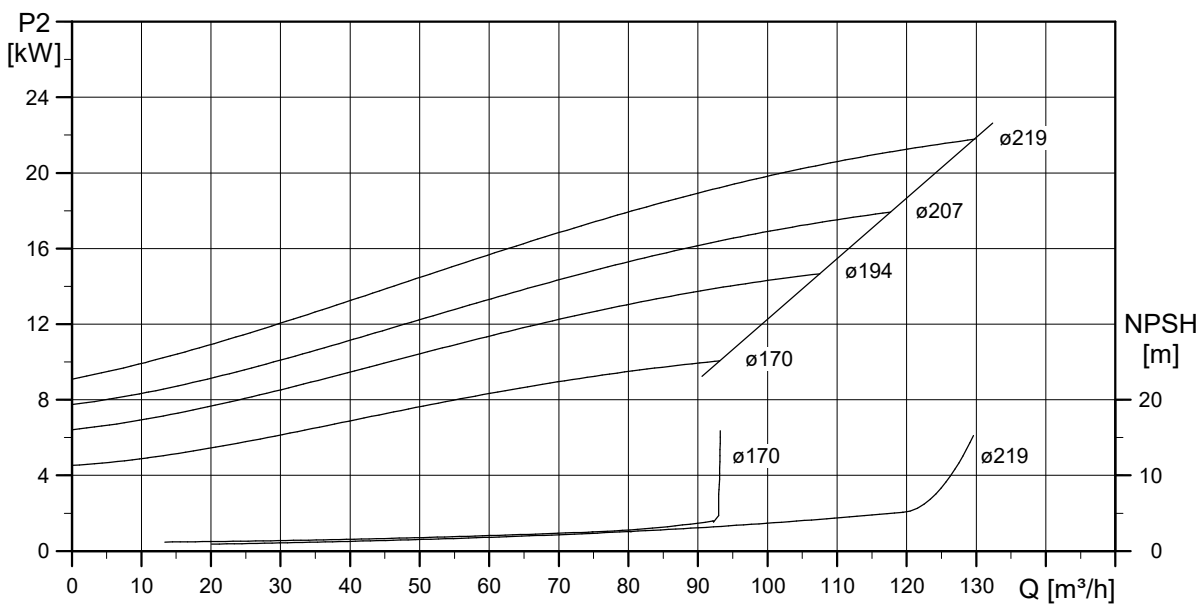
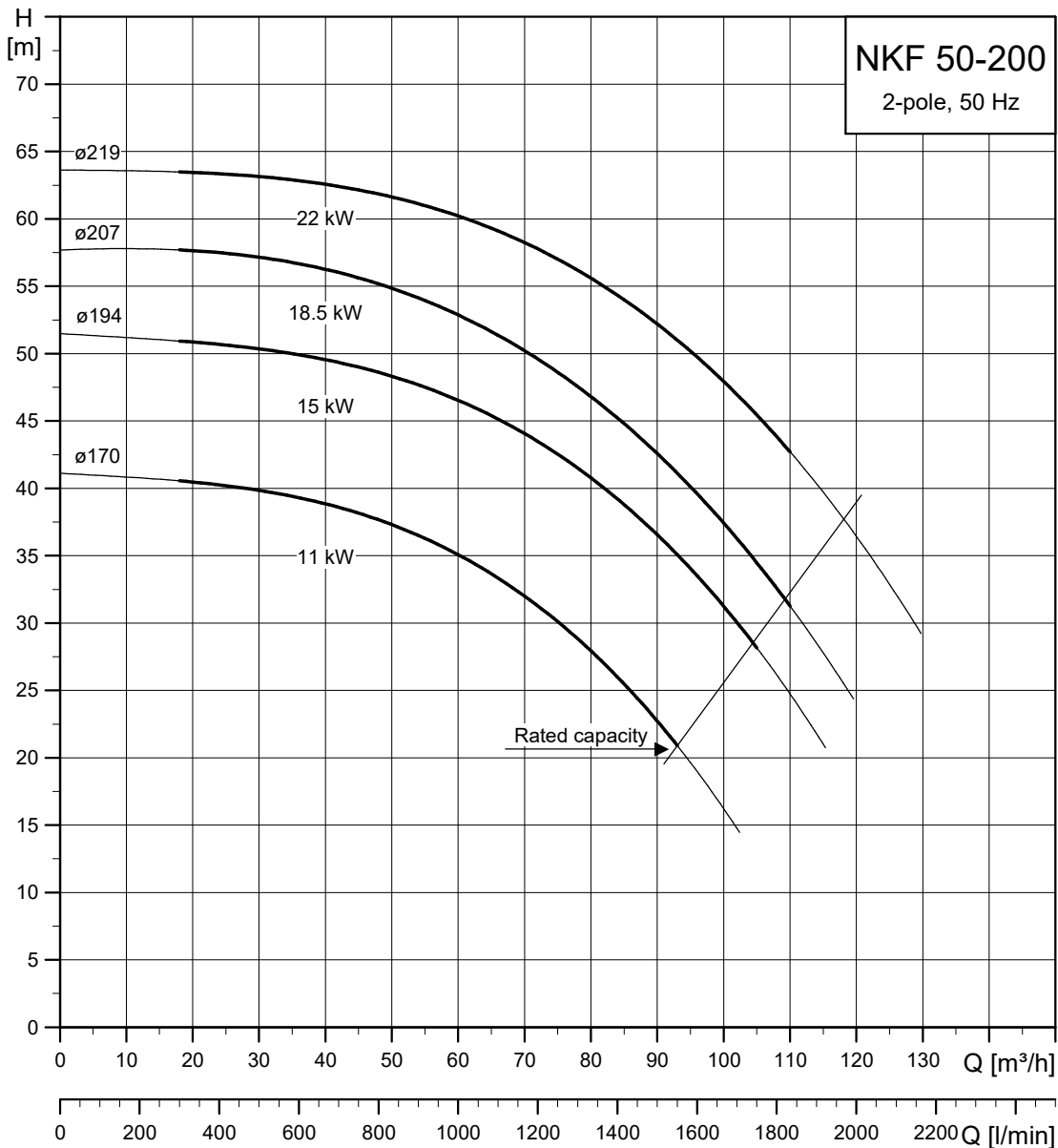


TM052163

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
40-250/210	11	20	1	13.5 (14.8)	1	○ CM 3-10	1.5	3.3
40-250/230	15	27.5	1	17 (18.7)	1	○ CM 3-11	1.5	3.3
40-250/238	18.5	32	1	17 (18.7)	1	○ CM 3-12	1.5	3.3
40-250/250	22	38.5	1	25.2 (28)	1.5	● CM 3-13	2.2	4.6
				26.1 (28.5)	1	○		
40-250/260	30	54	1	25.2 (28)	1.5	● CM 3-13	2.2	4.6
				26.1 (28.5)	1	○		

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	10	20	30	35	40	43	45	50	55	60
40-250/210		62	62	61	57	53	50	47	45	-	-	-
40-250/230		75	74	73	70	68	65	63	61	57	-	-
40-250/238		80	80	79	76	74	71	69	68	64	60	-
40-250/250		88	88	87	85	83	81	79	78	75	71	67
40-250/260		96	95	95	93	92	90	88	87	84	81	77

Hydro EN 50-200

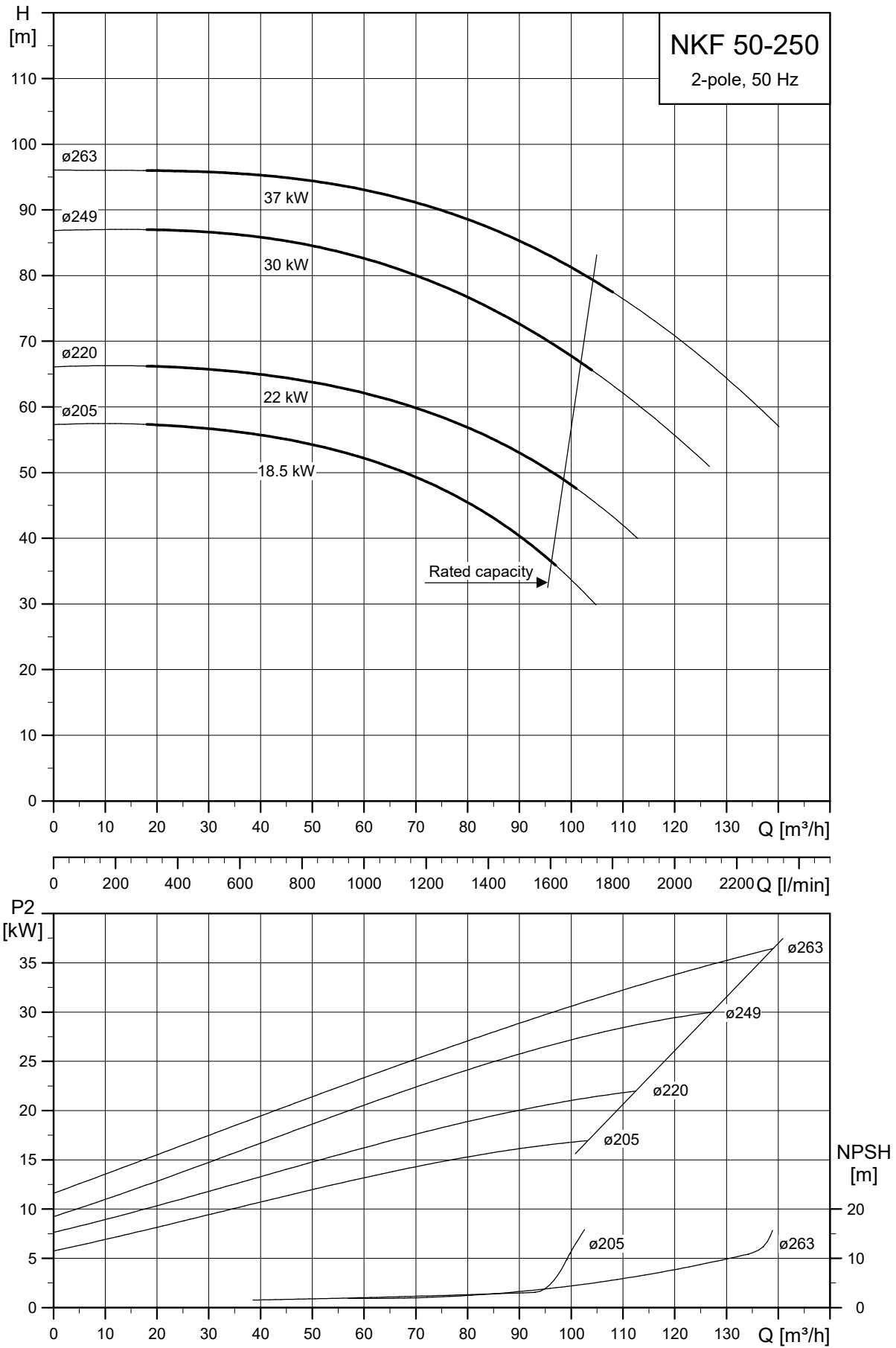


TM038655

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
50-200/170	11	20	2	13.5 (14.8)	2	○ CM 3-7	1.1	2.72
50-200/194	15	27.5	2	17 (18.7)	2	○ CM 3-8	1.1	2.72
50-200/207	18.5	32	2	25.5 (28) 26.1 (28.5)	2	● ○ CM 3-9	1.1	2.72
50-200/219	22	38.5	2	25.2 (28) 26.1 (28.5)	2	● ○ CM 3-10	1.5	3.3

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	40	50	60	70	80	90	93	100	105	110
50-200/170		41	39	37	35	32	28	23	-	-	-	-
50-200/194		51	50	48	47	44	41	37	35	31	28	-
50-200/207		58	56	55	53	50	47	43	41	37	34	31
50-200/219		64	63	62	60	58	56	52	51	48	45	43

Hydro EN 50-250

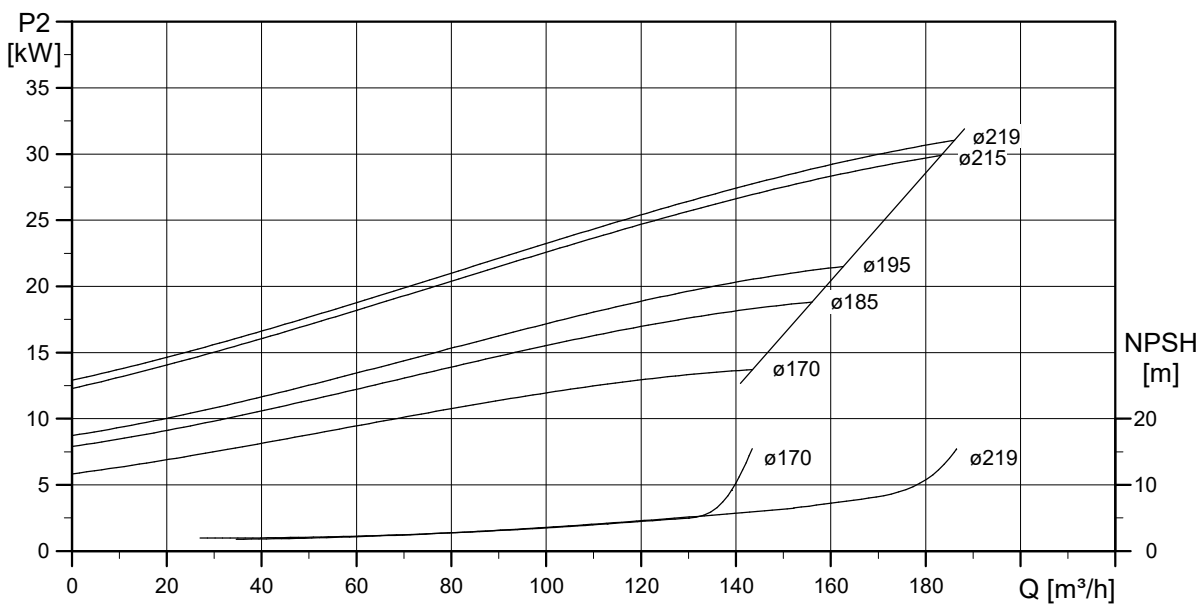
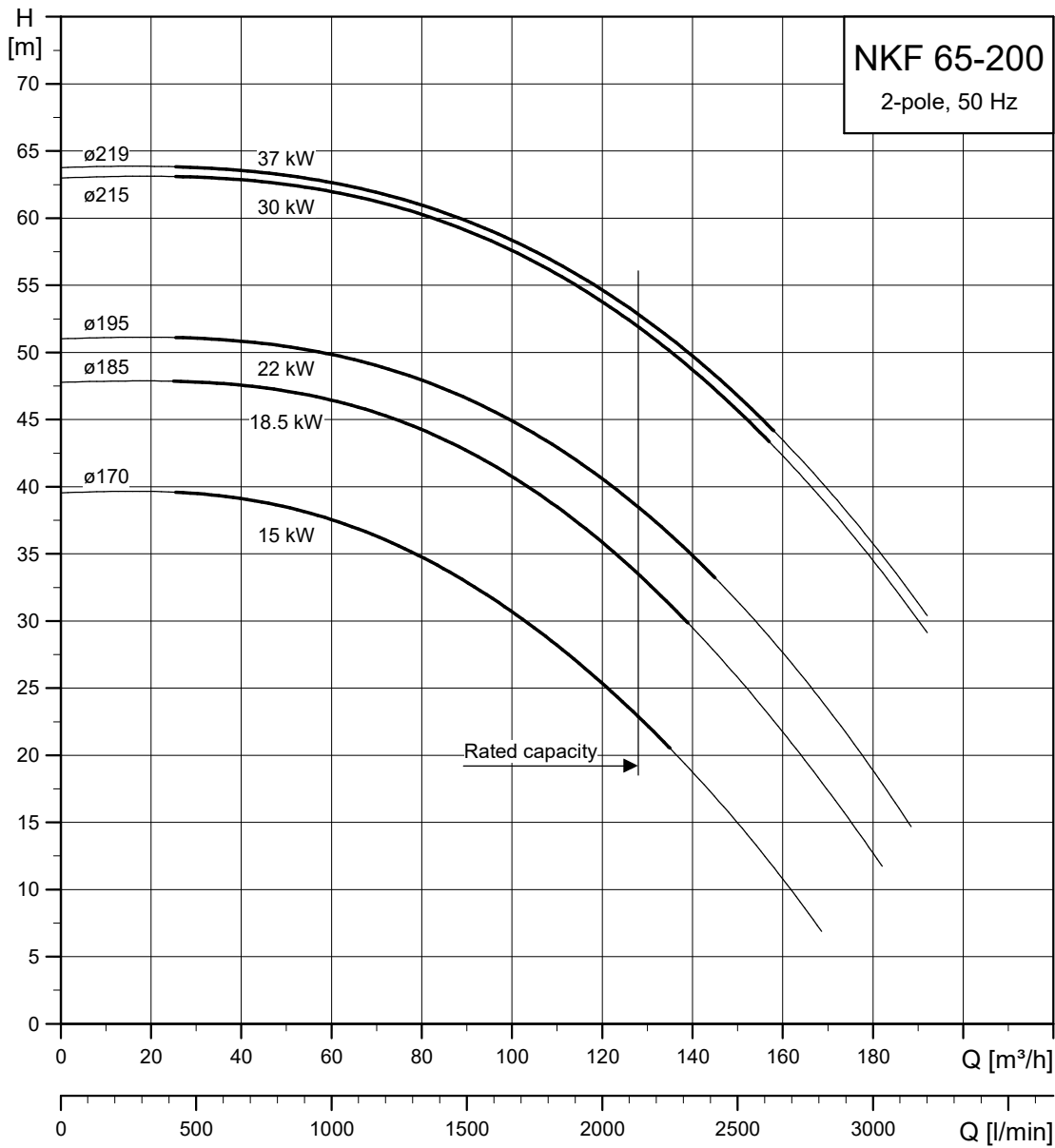


TM052165

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
50-250/205	18.5	32	2	17 (18.7)	2	○ CM 3-9	1.1	2.72
50-250/220	22	38.5	2	25.2 (28)	2	● CM 3-10	1.5	3.3
				26.1 (28.5)		○		
50-250/249	30	54	2	36.9 (41)	2	● CM 3-13	2.2	4.6
50-250/263	37	66	2	36.9 (41)	2	● CM 3-13	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	40	50	60	70	80	90	96	98	100	105
50-250/205		57	56	54	52	49	45	40	37	35	-	-
50-250/220		66	65	64	62	60	57	53	50	49	48	-
50-250/249		87	86	85	83	80	77	73	70	69	68	65
50-250/263		96	95	94	93	91	89	85	83	82	81	79

Hydro EN 65-200

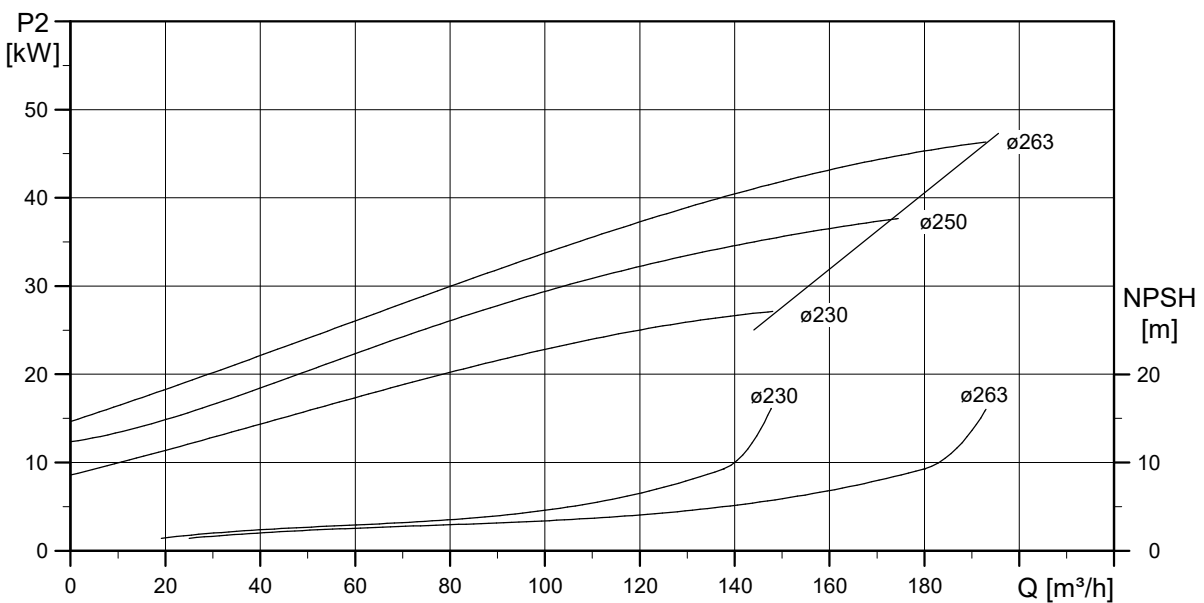
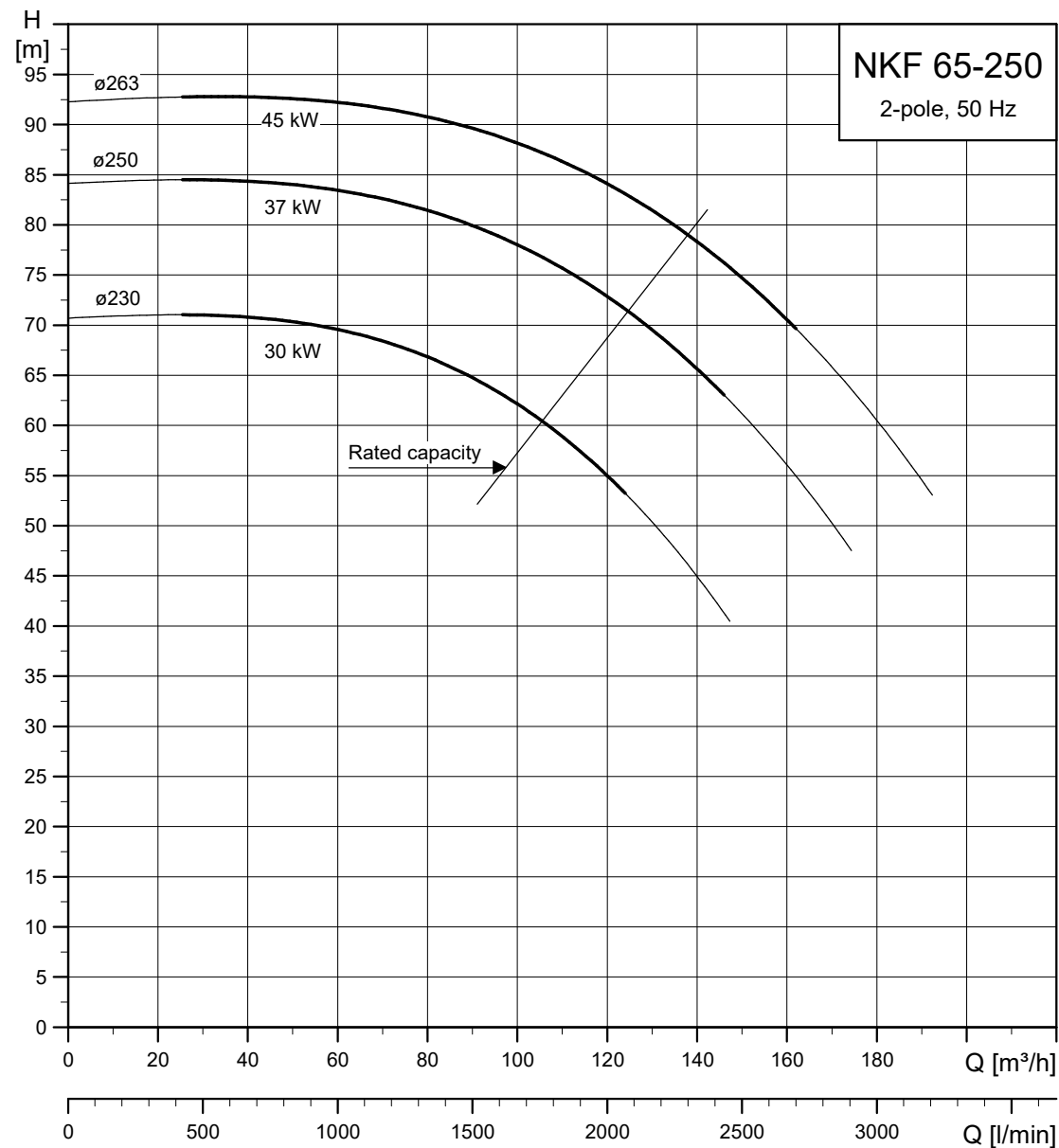


TM038656

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
65-200/170	15	27.5	2.5	13.5 (14.8)	2.5	○ CM 3-6	0.65	1.8
65-200/185	18.5	32	2.5	25.2 (28)	2.5	● CM 3-7	1.1	2.72
				26.1 (28.5)		○		
65-200/195	22	38.5	2.5	25.2 (28)	2.5	● CM 3-8	1.1	2.72
				26.1 (28.5)		○		
65-200/215	30	54	2.5	36.9 (41)	2.5	● CM 3-10	1.5	3.3
65-200/219	37	66	2.5	36.9 (41)	2.5	● CM 3-10	1.5	3.3

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	80	85	90	95	100	110	120	125	135	150
65-200/170		40	35	34	33	32	30	28	25	23	20	-
65-200/185		48	44	43	42	41	40	38	35	34	31	-
65-200/195		51	47	47	46	45	44	42	40	39	36	
65-200/215		63	60	59	59	58	57	55	53	52	50	45
65-200/219		64	62	61	60	59	58	57	55	53	51	47

Hydro EN 65-250

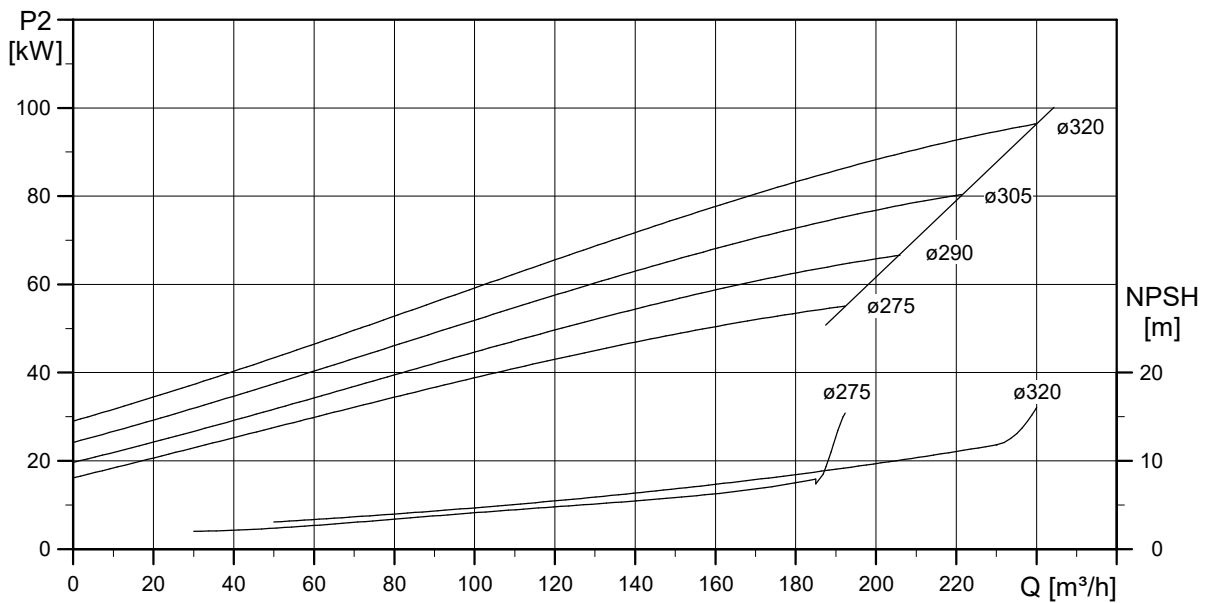
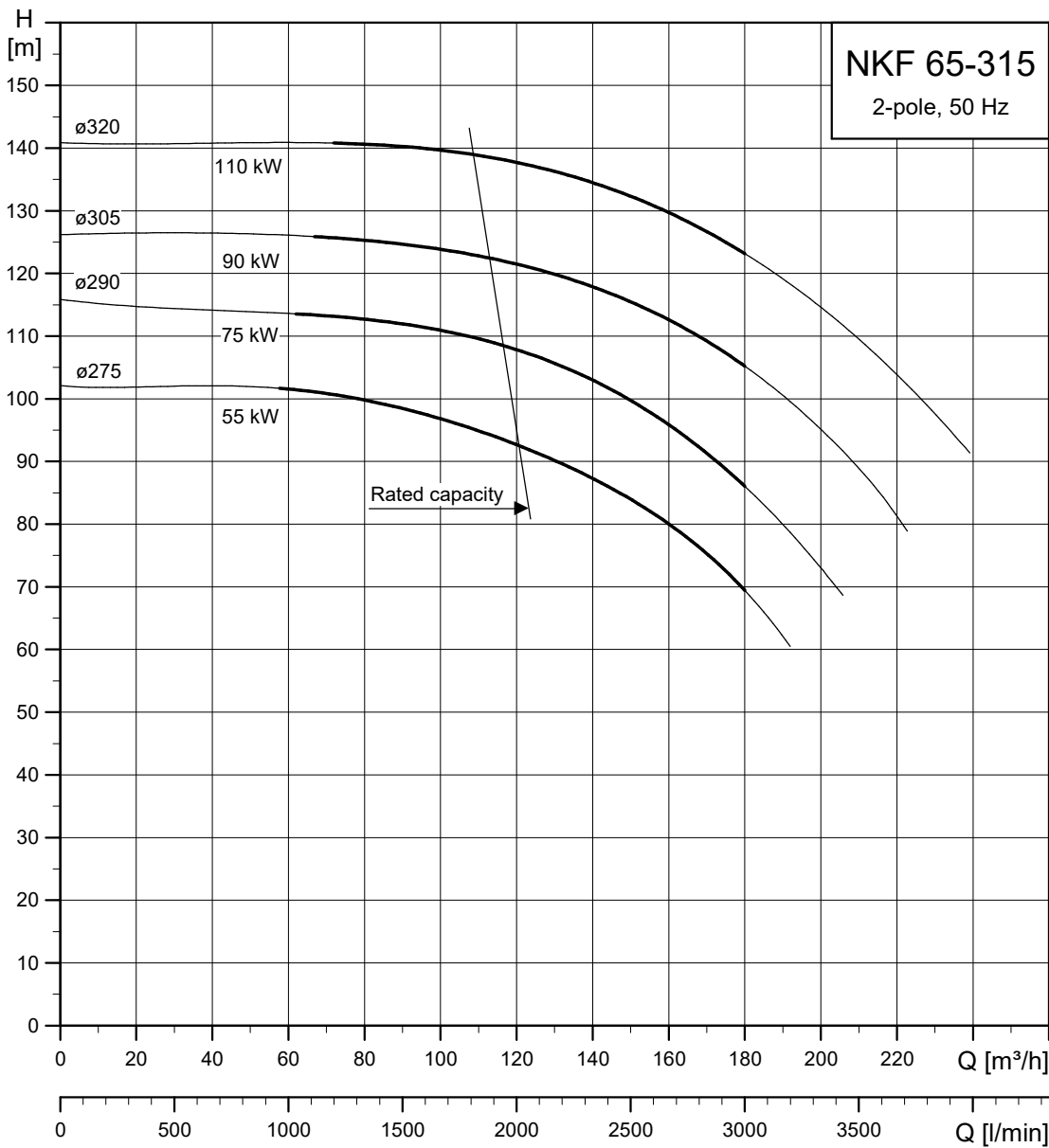


TM074402

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
65-250/230	30	52.7	2.5	36.9 (41)	2.5	● CM 3-11	1.5	3.3
65-250/250	37	63.3	2.5	48.2 (53)	3	● CM 3-12	1.5	3.3
65-250/263	45	78.5	2.5	48.2 (53)	3	● CM 3-13	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	85	95	105	115	125	135	140	145	150	155
65-250/230		71	66	64	61	57	53	-	-	-	-	-
65-250/250		84	81	79	77	74	71	68	66	63	-	-
65-250/263		92	90	89	87	85	83	80	78	77	75	73

Hydro EN 65-315

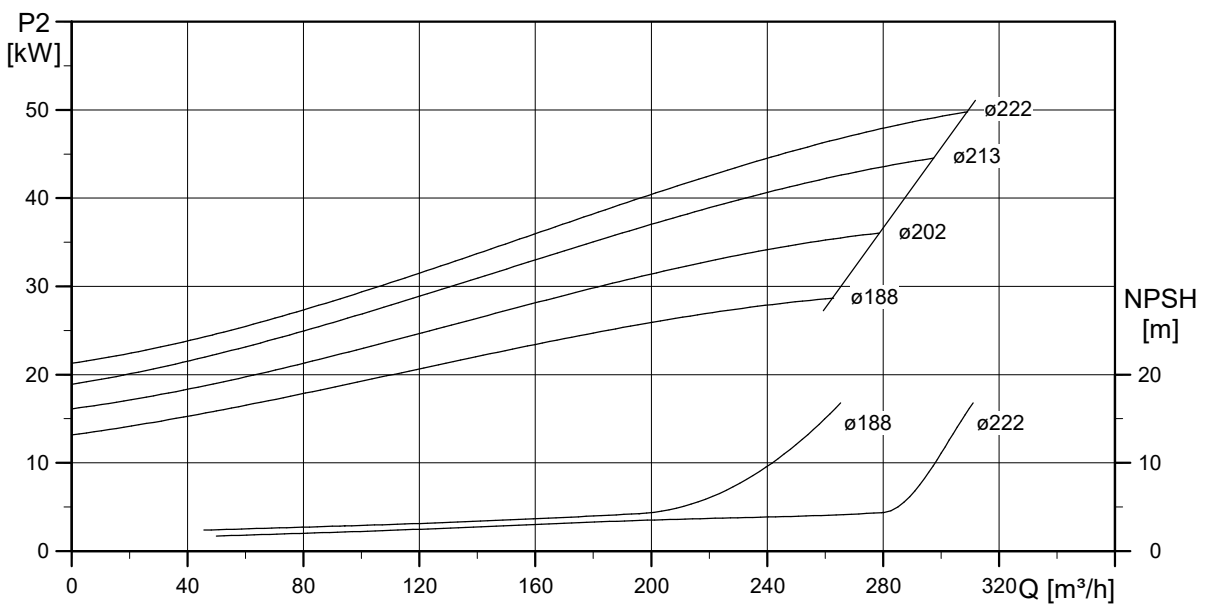
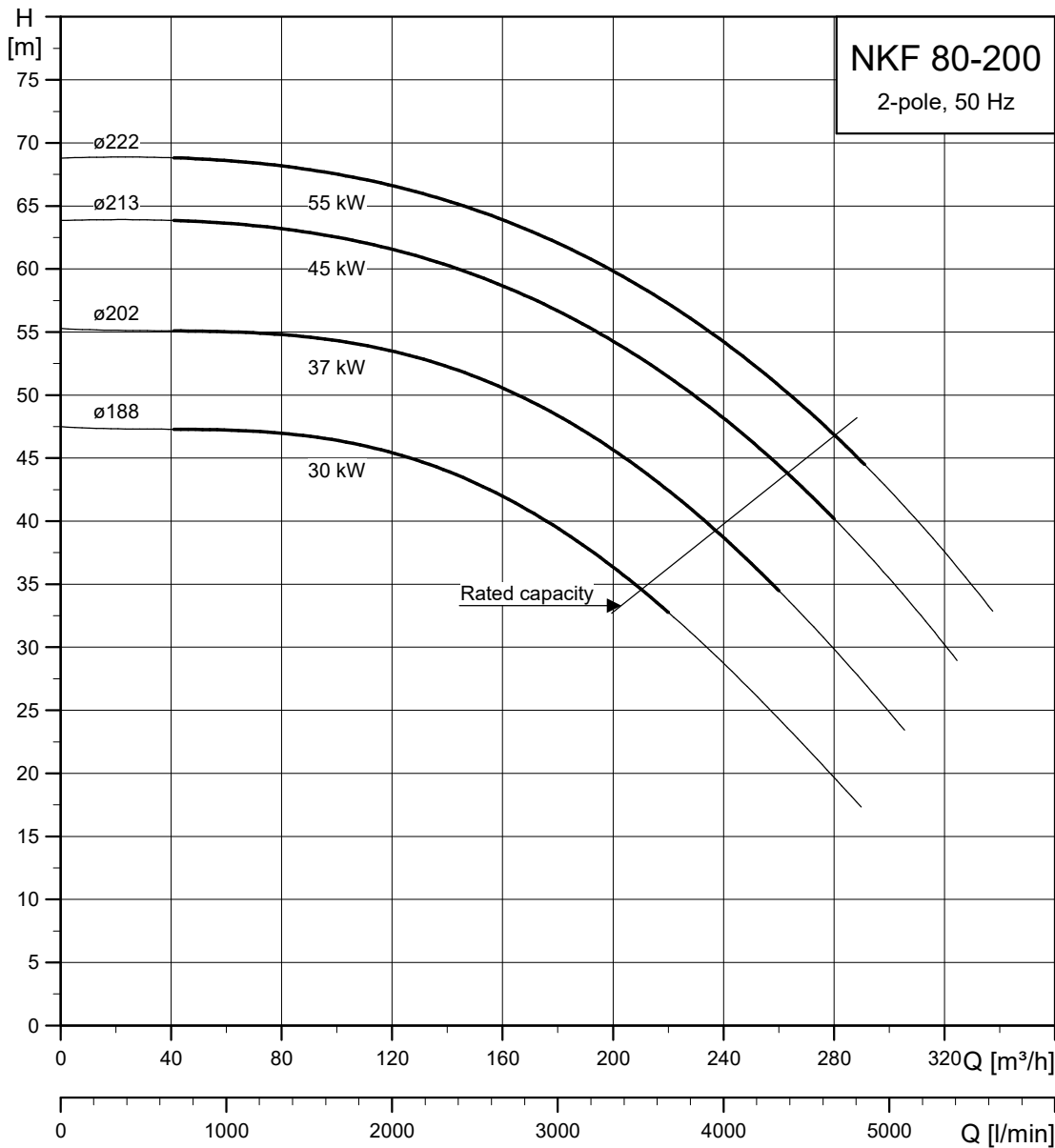


TM074403

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
65-315/275	55	95.7	3.5	66.4 (73)	6	● CM 3-14	2.2	4.6
65-315/290	75	124.3	3.5	66.4 (73)	6	● CR 3-14	2.2	4.6
65-315/305	90	148.6	3.5	99 (109)	6	● CR 3-23	2.2	4.6
65-315/320	110	185.3	3.5	99 (109)	6	● CR 3-23	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	80	90	100	110	120	130	140	150	165	180
65-315/275		102	100	98	97	95	93	90	87	84	78	69
65-315/290		116	113	112	111	110	108	106	103	100	94	86
65-315/305		126	125	125	124	123	121	120	118	115	112	105
65-315/320		141	141	140	140	139	138	136	134	132	128	123

Hydro EN 80-200

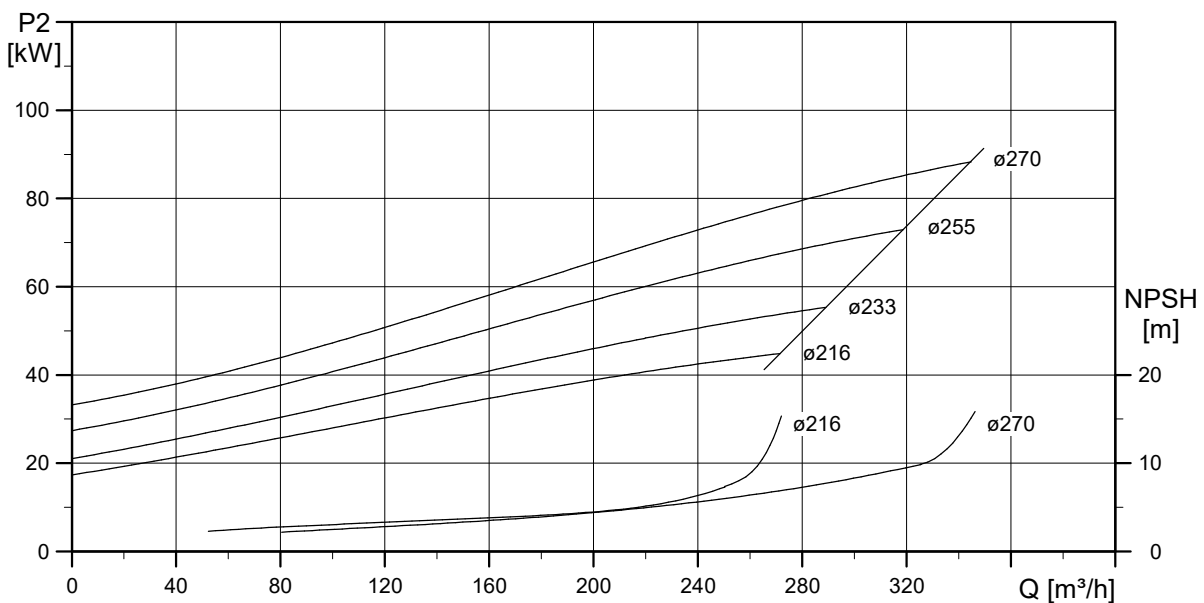
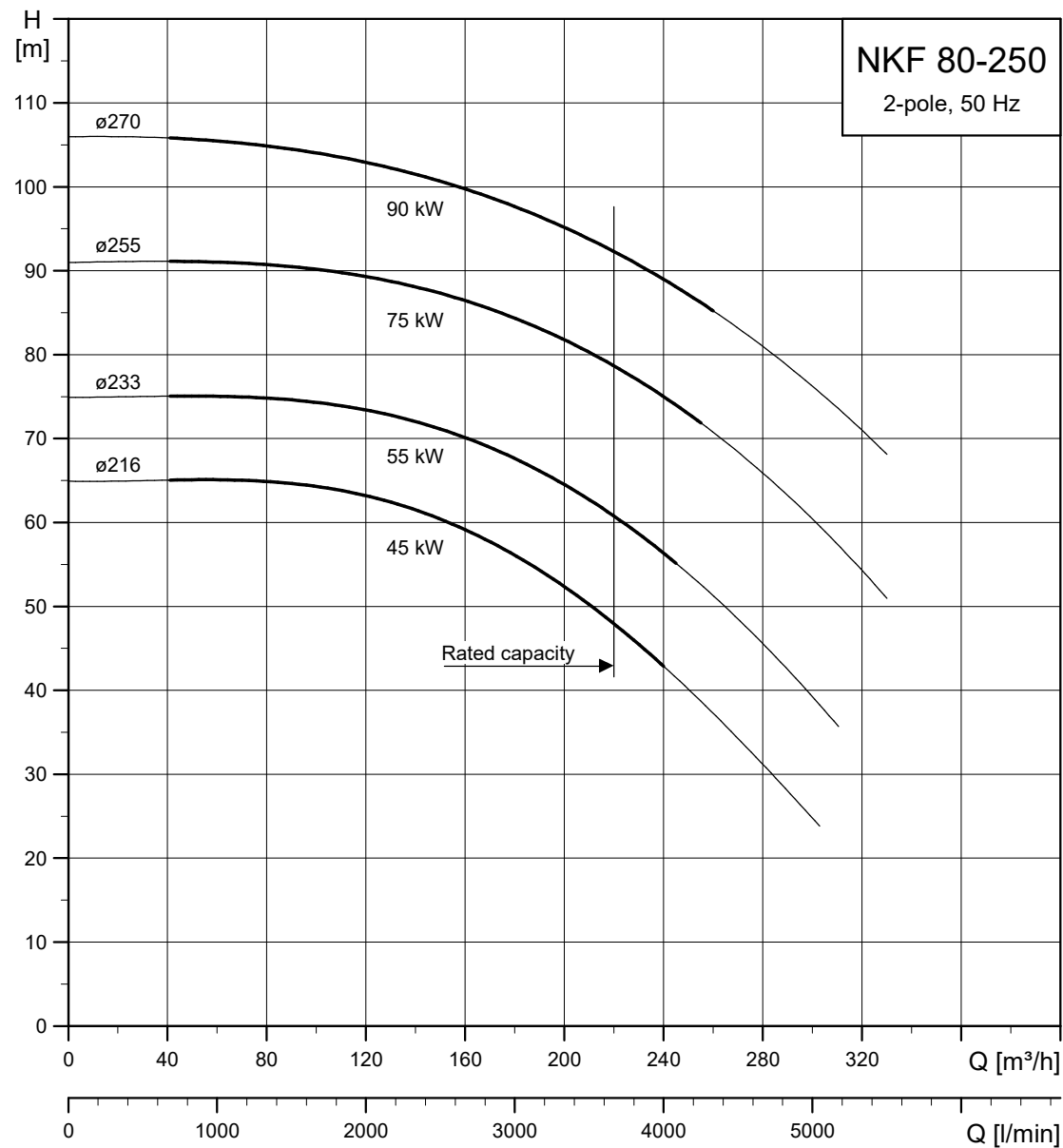


TM038657

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
80-200/188	30	54	4	36.9 (41)	4	● CM 3-7	1.1	2.72
80-200/202	37	66	4	36.9 (41)	4	● CM 3-8	1.1	2.72
80-200/213	45	78	4	48.2 (53)	4	● CM 3-10	1.5	3.3
80-200/222	55	95	4	66.4 (73)	6	● CM 3-10	1.5	3.3

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	100	120	140	160	180	200	220	240	270	290
80-200/188		48	46	45	44	42	39	36	32	-	-	-
80-200/202		55	54	53	52	50	48	45	42	38	32	-
80-200/213		63	62	61	60	58	56	54	51	48	42	38
80-200/222		68	67	66	65	63	61	59	57	54	48	44

Hydro EN 80-250

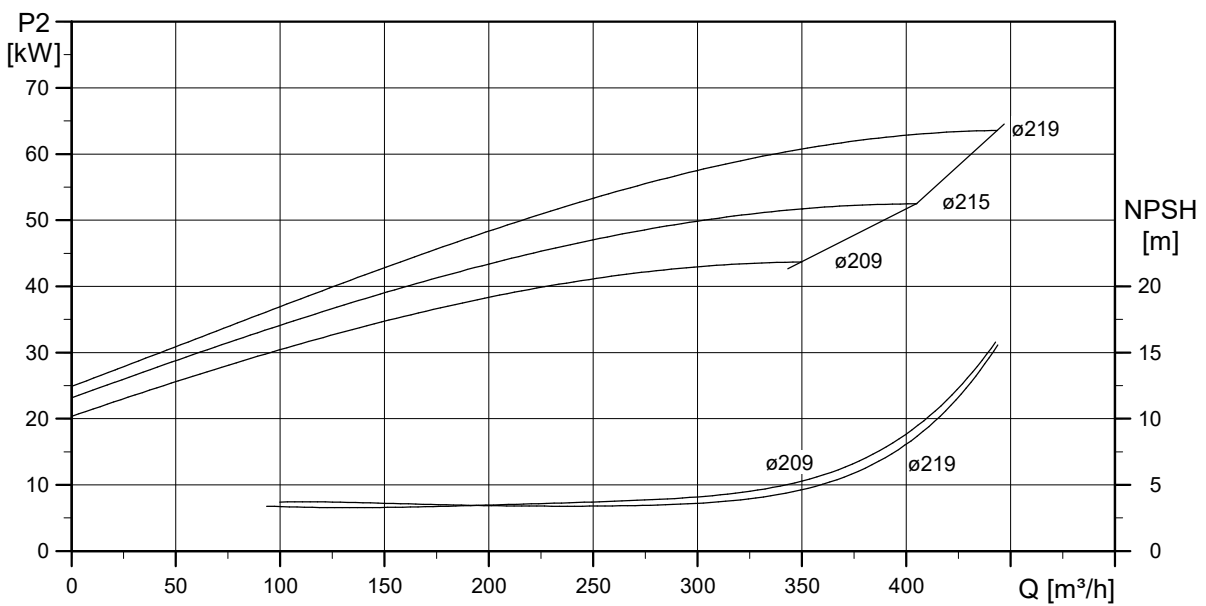
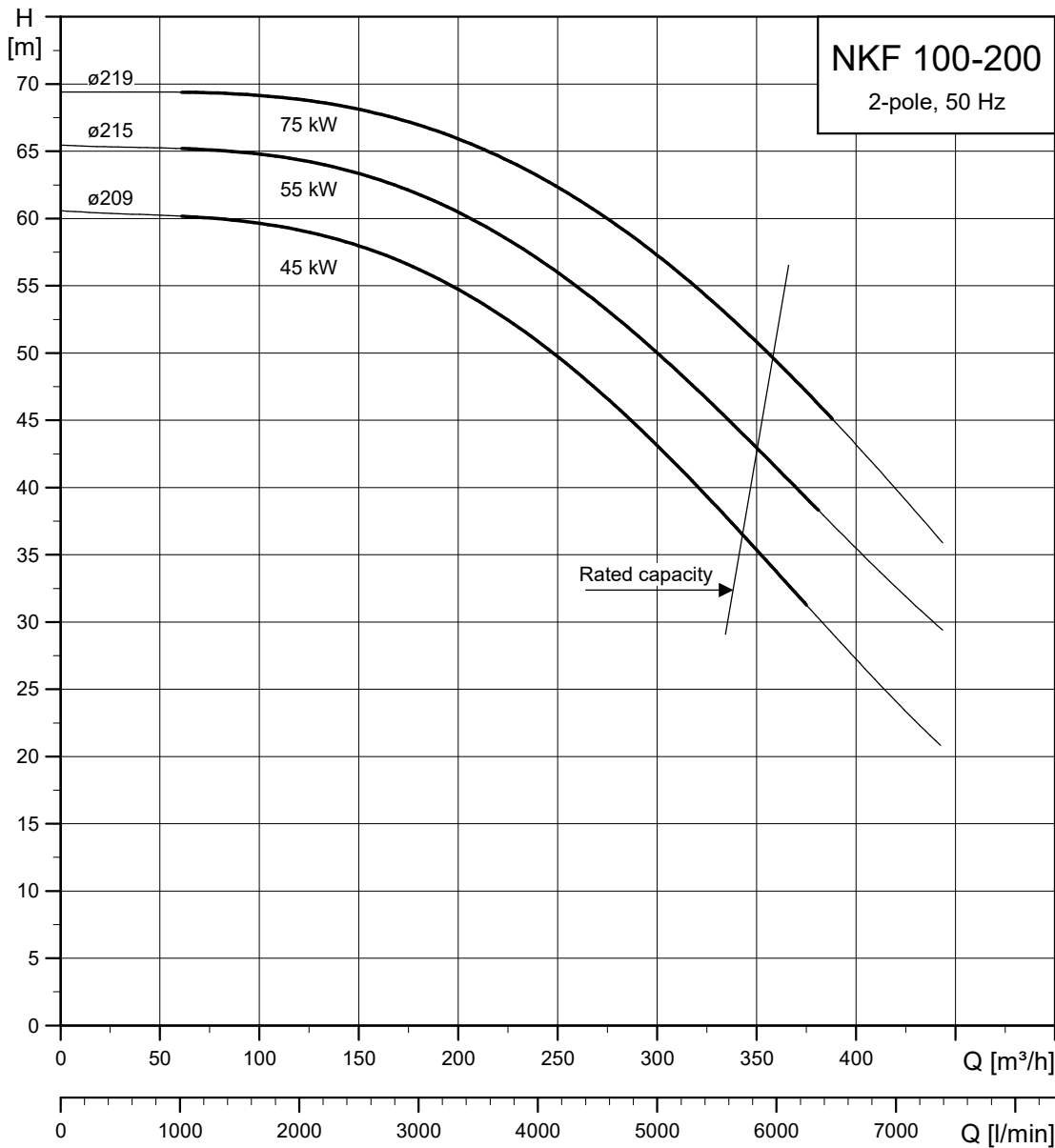


TM038658

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
80-250/216	45	78	4	48.2 (53)	4	● CM 3-10	1.5	3.3
80-250/233	55	95	4	66.4 (73)	6	● CM 3-12	1.5	3.3
80-250/255	75	128	4	99 (109)	6	● CM 3-13	2.2	4.6
80-250/270	90	152	4	99 (109)	6	● CM 3-14	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	50	100	120	160	180	200	220	240	250	260
80-250/216		65	65	64	62	58	55	51	47	42	-	-
80-250/233		75	75	74	73	69	66	63	59	55	53	-
80-250/255		91	91	90	89	86	84	81	78	74	72	70
80-250/270		106	106	104	103	100	98	95	92	89	87	85

Hydro EN 100-200

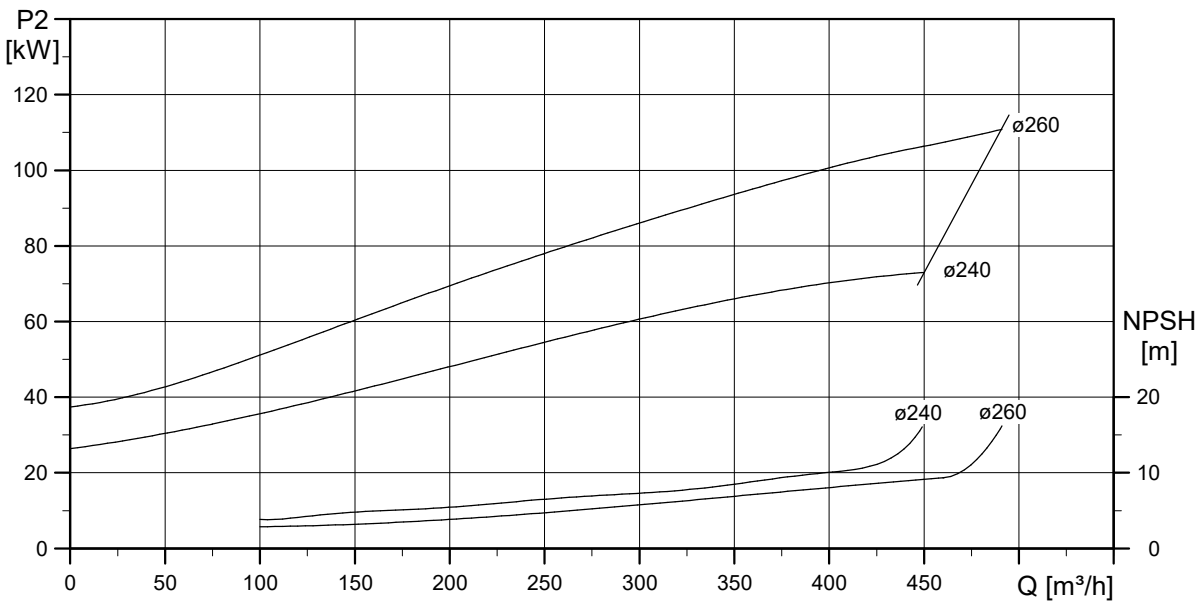
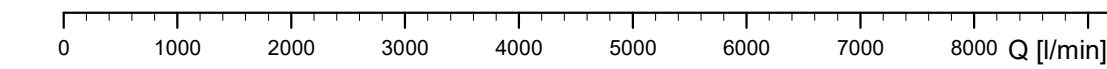
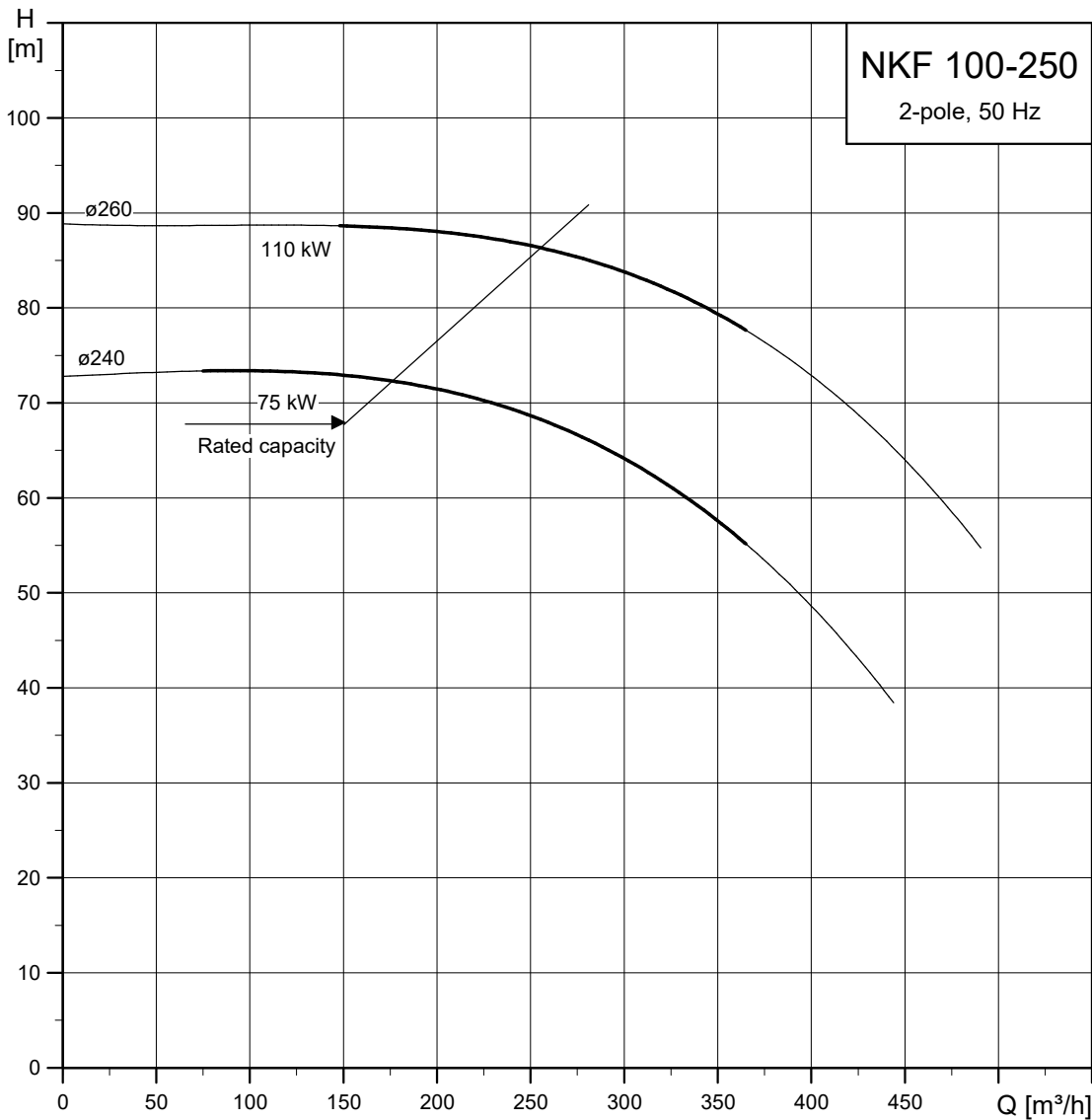


TM046069

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
100-200/209	45	78	5	48.2 (53)	5	● CM 3-10	1.5	3.3
100-200/215	55	95	5	66.4 (73)	6	● CM 3-10	1.5	3.3
100-200/219	75	128	5	66.4 (73)	6	● CM 3-10	1.5	3.3

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	200	220	240	260	300	310	330	350	370	390
100-200/209		61	55	53	51	49	43	42	39	35	32	-
100-200/215		65	60	59	57	55	50	49	46	43	40	37
100-200/219		69	66	65	63	61	57	56	54	51	48	45

Hydro EN 100-250

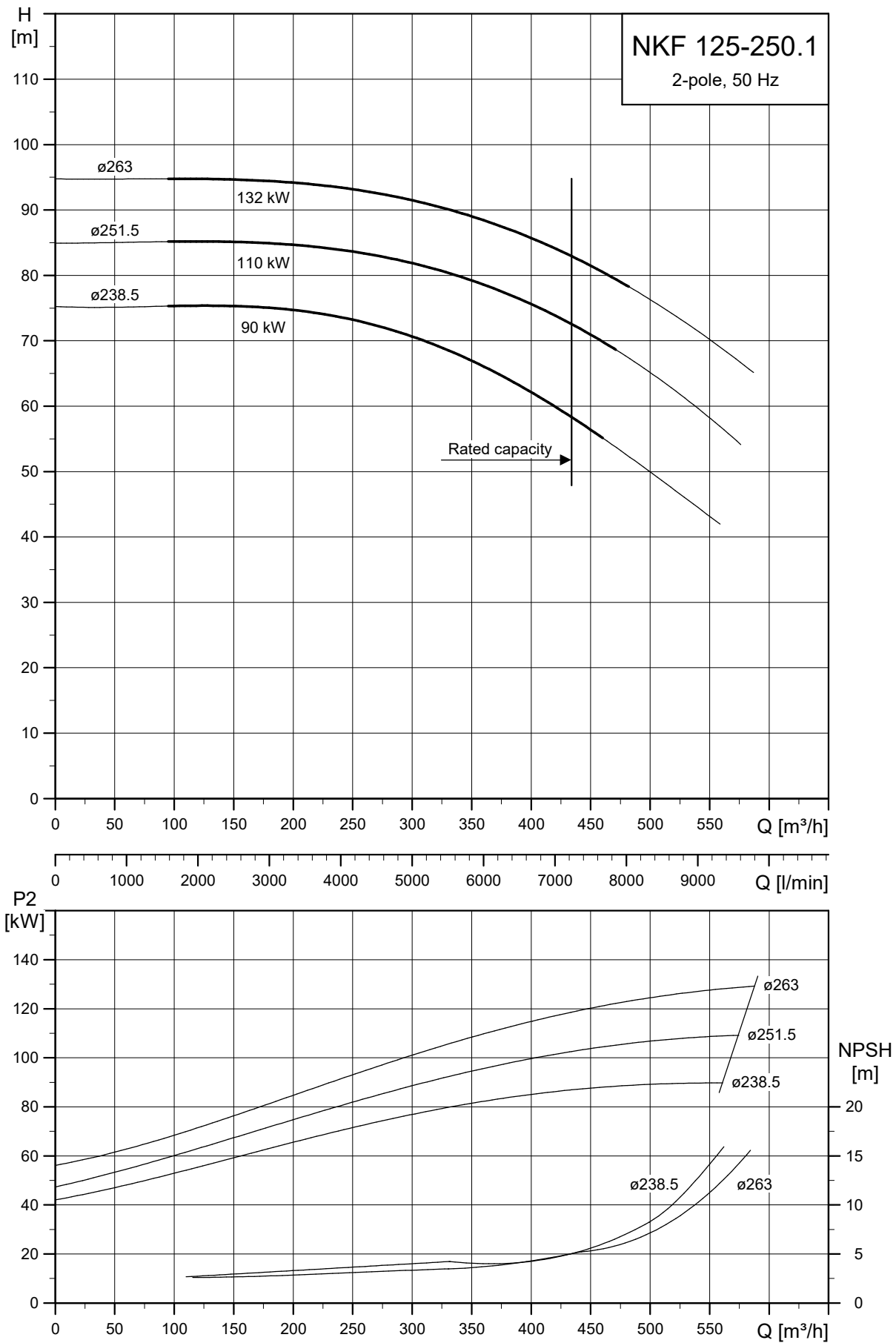


TM074406

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
100-250/240	90	148.6	5	99 (109)	6	• CM 3-11	1.5	3.3
100-250/260	110	185.3	5	132 (145)	6	• CM 3-13	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	210	220	230	240	250	270	290	310	330	350
100-250/240		73	71	71	70	69	68	67	65	63	60	57
100-250/260		89	88	88	87	87	87	86	84	83	81	79

Hydro EN 125-200.1

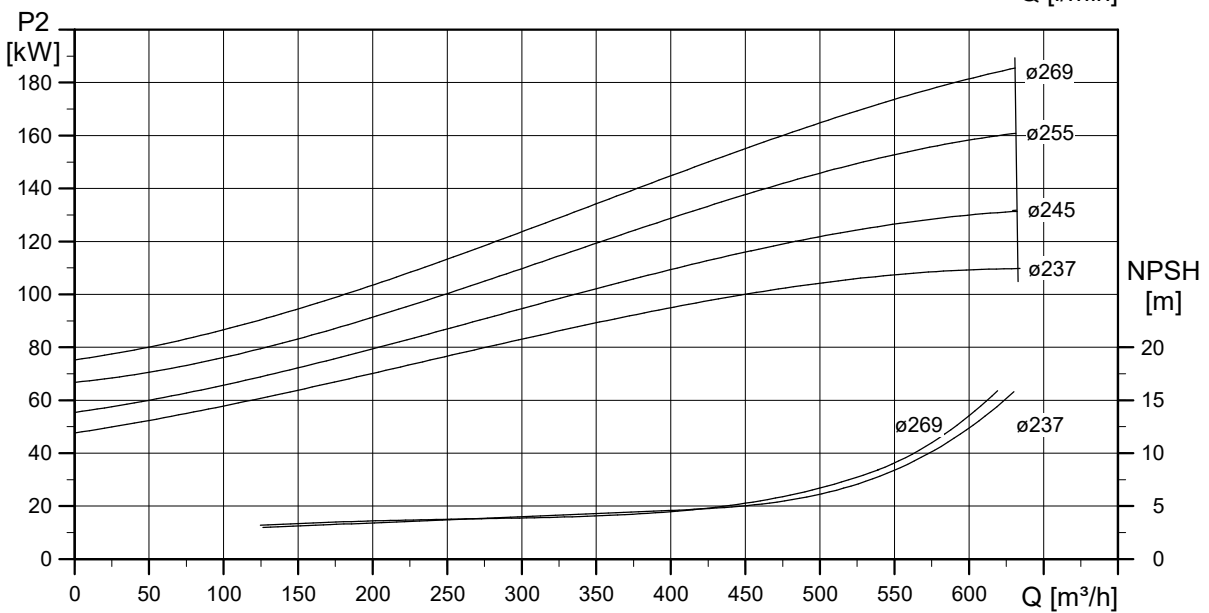
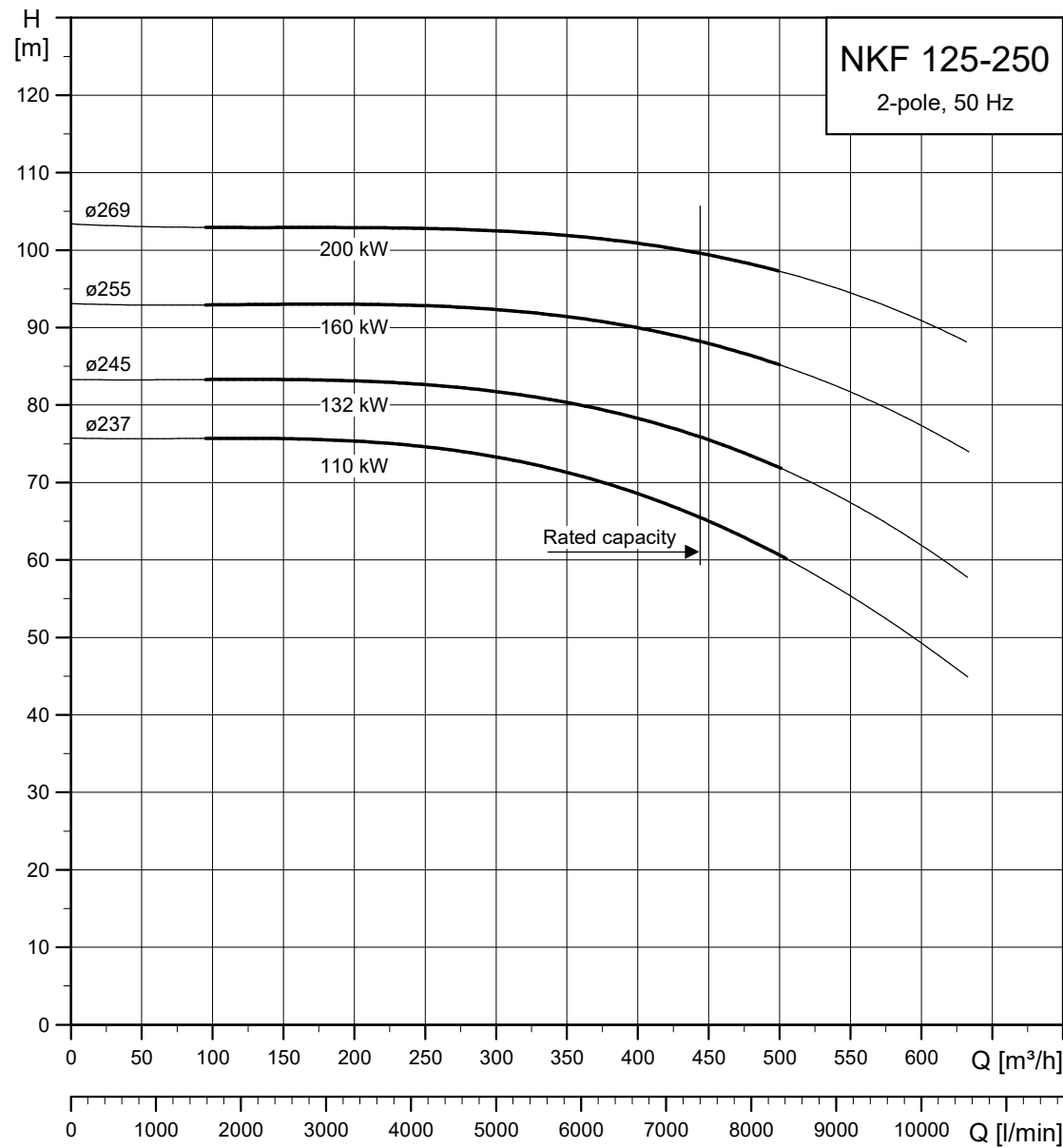


TM051161

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
125-250.1/238	90	152	9	99 (109)	9	• CM 3-12	1.5	3.3
125-250.1/251	110	184	9	132 (145)	9	• CM 3-12	1.5	3.3
125-250.1/263	132	220	9	132 (145)	9	• CM 3-13	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	150	200	250	300	350	375	400	425	450	475
125-250.1/238		75	76	75	74	71	67	65	62	59	56	-
125-250.1/251		85	86	85	84	82	79	77	75	73	71	68
125-250.1/263		95	95	95	93	91	89	87	86	84	81	79

Hydro EN 125-250

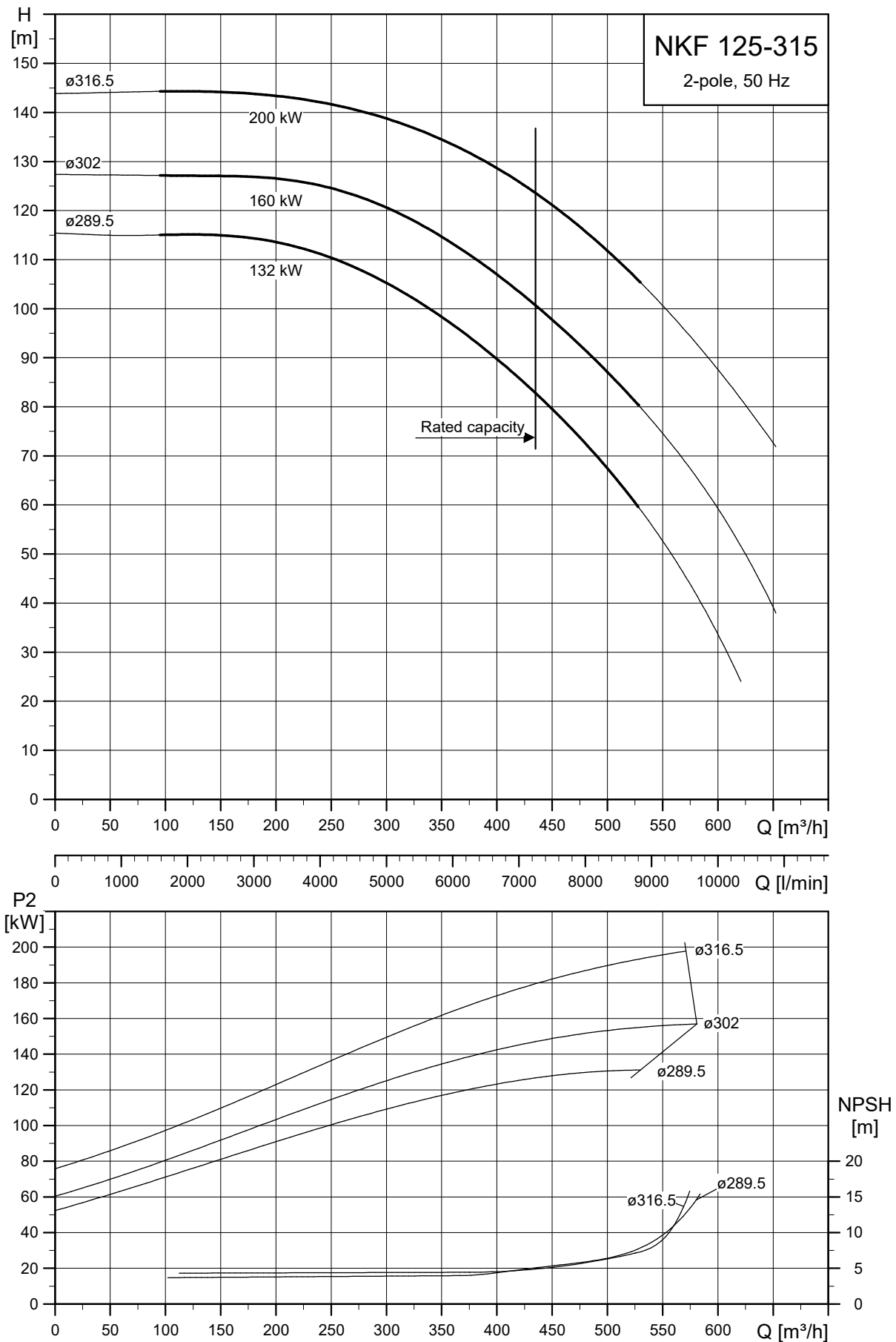


TM046070

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
125-250/237	110	184	9	132 (145)	9	● CM 3-12	1.5	3.3
125-250/245	132	220	9	132 (145)	9	● CM 3-12	1.5	3.3
125-250/255	160	265	9	179 (197)	9	● CM 3-13	2.2	4.6
125-250/269	200	330	9	202 (222)	9	● CM 3-14	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	150	200	250	300	350	375	400	425	450	500
125-250/237		76	76	75	75	73	71	70	69	67	65	61
125-250/245		83	83	83	83	82	80	79	78	77	76	72
125-250/255		93	93	93	93	92	91	91	90	89	88	85
125-250/269		103	103	103	103	103	102	101	101	100	99	97

Hydro EN 125-315

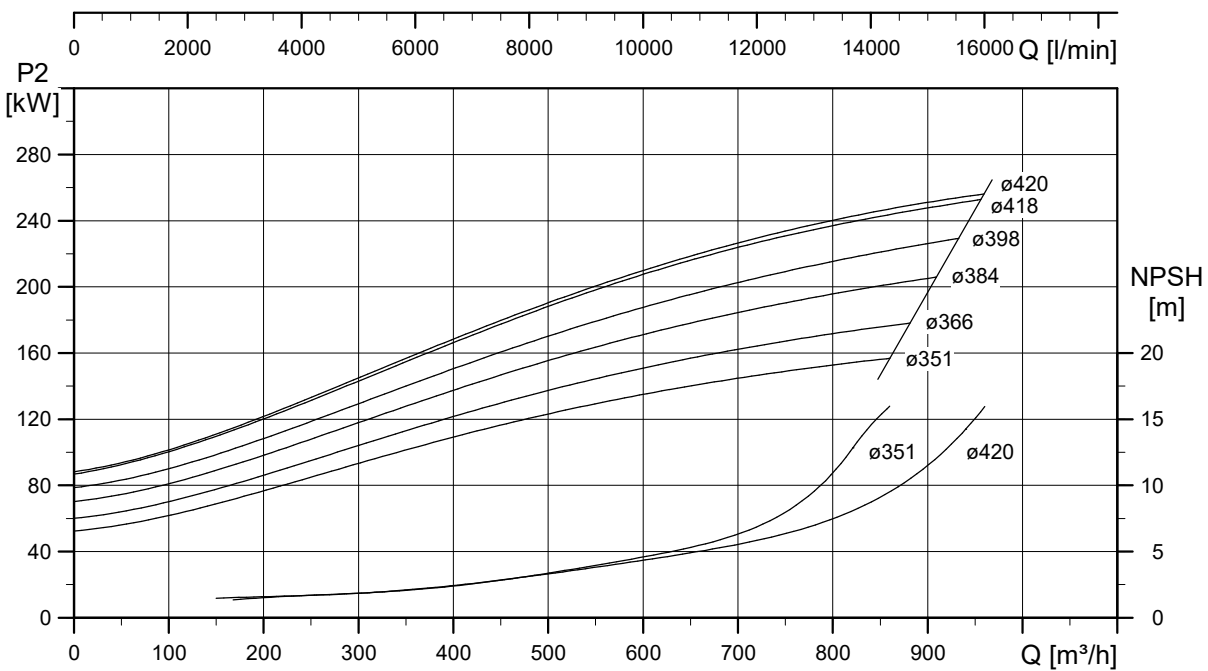
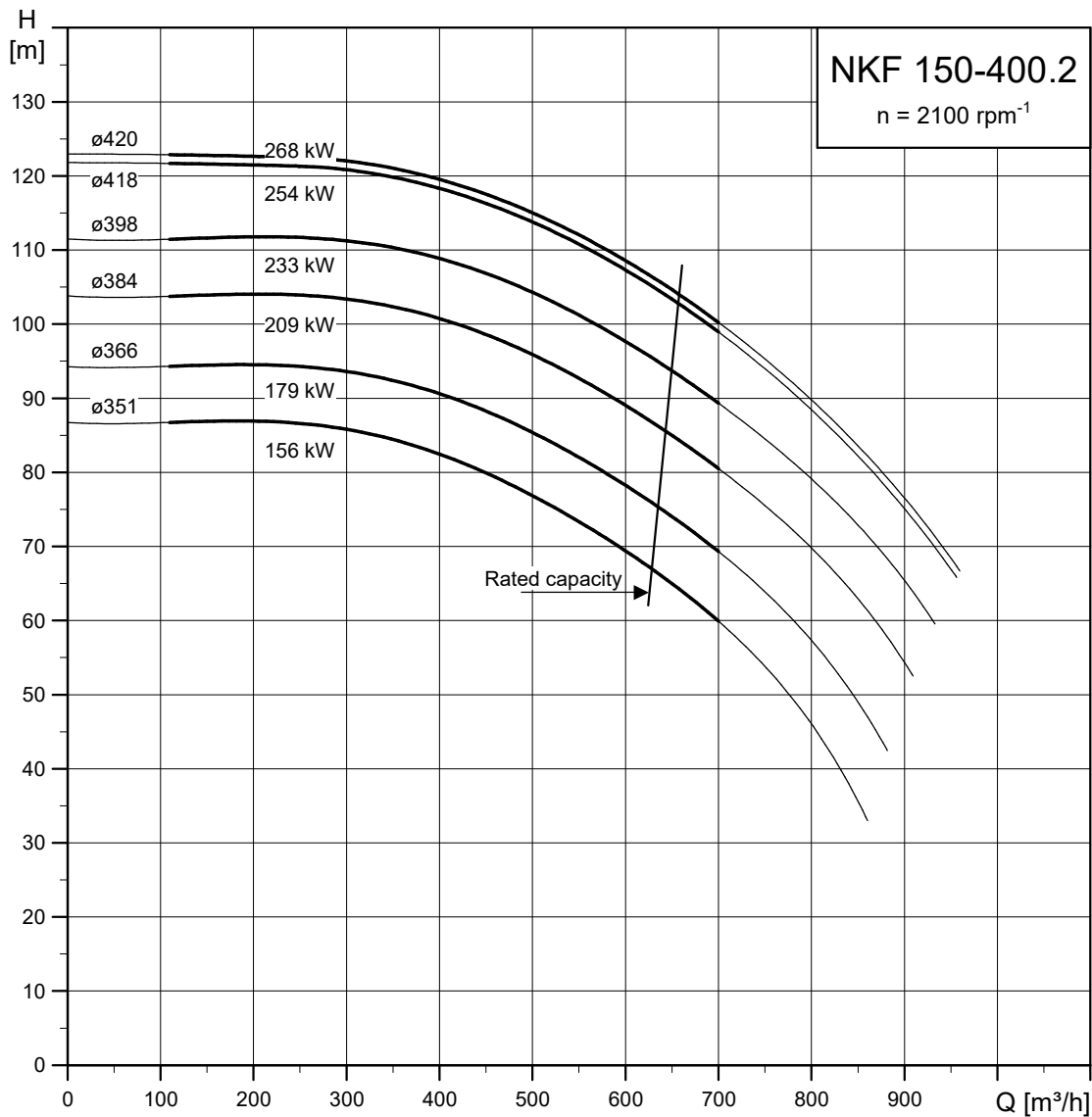


TM049639

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
125-315/289	132	220	9	132 (145)	9	• CR 3-21	2.2	4.6
125-315/302	160	265	9	179 (197)	9	• CR 3-23	2.2	4.6
125-315/316	200	330	9	202 (222)	9	• CR 3-23	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	100	150	200	250	300	350	400	425	475	525
125-315/289		116	116	115	113	110	105	99	90	85	74	60
125-315/302		129	129	128	127	124	120	115	107	103	93	81
125-315/316		145	145	145	144	142	139	134	129	125	117	107

Hydro EN 150-400.2



TM060625

Hydro EN model	Electric pump			Diesel pump			Jockey pump	
	P [kW]	I _{1/1} [A]	Q _{min} [m ³ /h]	Na (Nb) [kW]	Q _{min} [m ³ /h]		P [kW]	I _{1/1} [A]
150-400.2/351				164 (180)	7	● CM 3-13	2.2	4.6
150-400.2/366				187 (206)	7	● CM 3-13	2.2	4.6
150-400.2/384				263.6 (290)	18	● CM 3-14	2.2	4.6
150-400.2/398			Electric pump is not available	263.6 (290)	18	● CM 3-14	2.2	4.6
150-400.2/418				263.6 (290)	18	● CM 3-14	2.2	4.6
150-400.2/420				263.6 (290)	18	● CR 3-21	2.2	4.6

Hydro EN model	H [m]	Q _{min} [m ³ /h]										
		0	250	300	350	400	450	500	550	600	650	700
150-400.2/351		87	86	86	84	82	80	77	73	69	65	60
150-400.2/366		94	94	94	92	91	88	85	82	78	74	69
150-400.2/384		104	103	103	102	101	99	96	93	89	85	81
150-400.2/398		111	111	111	110	109	107	104	101	98	94	89
150-400.2/418		122	121	121	120	118	116	114	111	107	103	99
150-400.2/420		123	122	122	121	120	118	115	112	109	105	100

14. Documentation

All pump sets are delivered with the following documents in digital format:

- installation and operating instructions for the pump set with EC declaration of conformity
- installation and operating instructions for the duty electric pumps
- installation and operating instructions for the jockey electric pumps
- installation and operating instructions for the pressure switches
- electrical diagrams of the control panels
- assembling and setting verification
- two copies of the nameplate of the pump set in addition to the one on the base frame of the pump set
- pump performance curves.

If available, the kit for measuring the flow rate is supplied with the installation and operating instructions of the flowmeter.

If a diesel pump is available, the following documents are also delivered:

- installation and operating instructions for the diesel engine
- safety data sheet for the batteries
- factory test report for the diesel pump as described in the EN 12845 standard.

If you need specific documents or any additional hard or digital copies of the documents listed above, please request these during the bidding process.

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8	Sizing enables you to size a product based on your application and operating conditions.

Revision Info

Last revised on 09-09-2020

