Hydro Multi-B, ASEAN range

Booster systems with two to four CR pumps

50/60 Hz

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1. Introduction

The Grundfos Hydro Multi-B is a booster system designed to maintain a constant pressure, regardless of flow fluctuations.

The system can be installed in buildings where the mains water supply does not deliver a sufficient pressure or is unstable.

The system is ideal for any clean-water pressure-boosting application where adaptability and user comfort are in focus.

Examples:

- office buildings
- blocks of flats
- hotels
- shopping centres
- hospitals
- schools.

As standard, the booster systems consist of two or four CR pumps coupled in parallel and mounted on a common base frame with all the necessary fittings and a control cabinet.

The booster system comes in two control variants with at least one CR pump connected with an external frequency drive. This ensures perfect adaptation to the demand, high efficiency and protection against pressure surges in the installation.

The pumps are controlled in automatic cascade via the control cabinet mounted on the base frame.
The CU 323 controller controls the speed of the CR pump(s) and starts and stops the required number of pumps in order to adapt perfectly to the water demand of the application.

Benefits

Pressure boosting made simple

The booster system is developed with focus on user-friendliness and ease of operation.

The pumps are controlled via the CU 323 controller which features a simple interface that makes it easy to control and monitor the system.

When the system has been set up, the controller takes care of the daily operation.

TM05 0444 1211

Fig. 1 CU 323 controller

Compact and designed to last

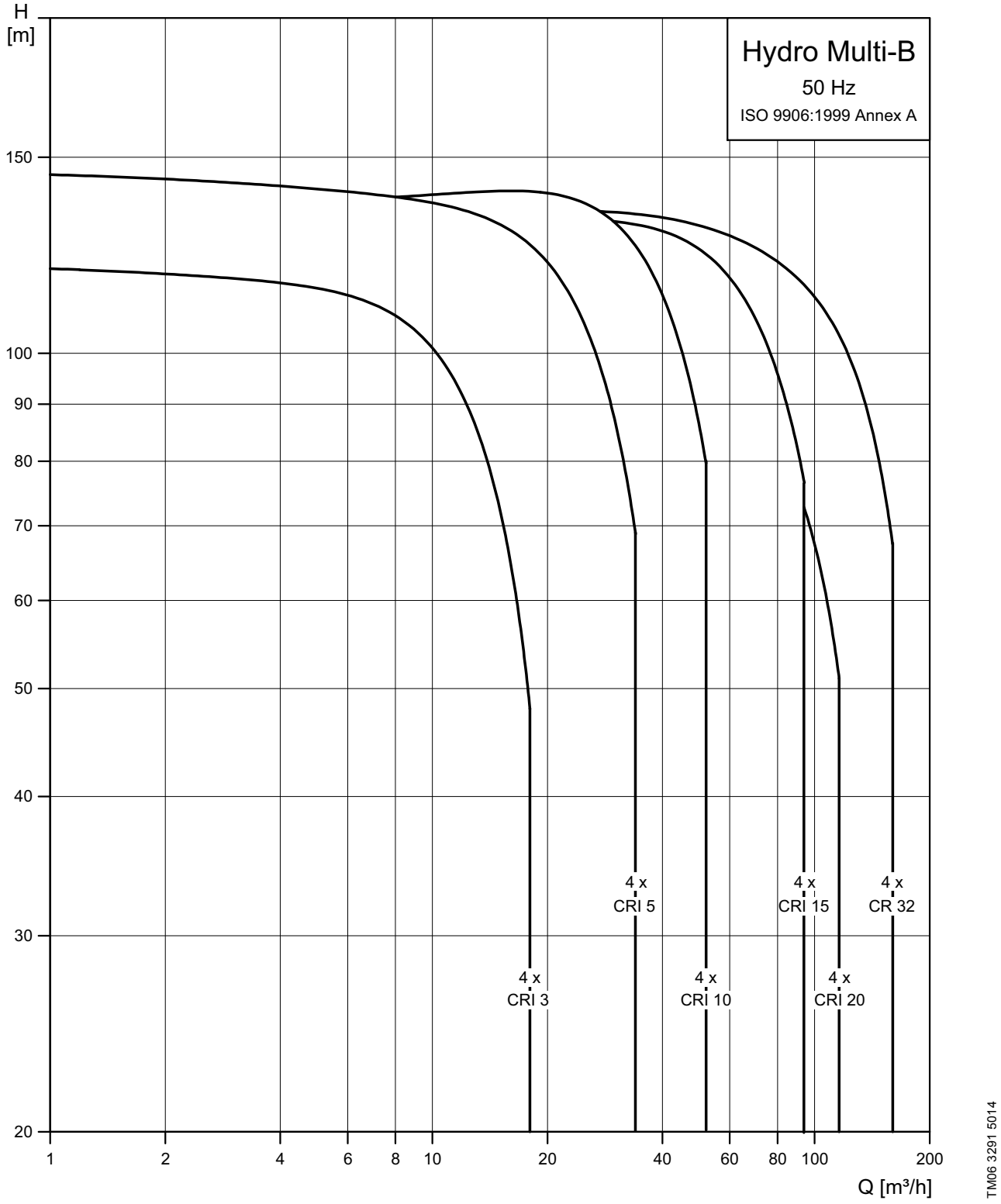
The components and design of the booster system have been chosen with focus on robustness and compactness. The booster system offers the user all the benefits of a complete solution with a single supplier who takes the responsibility for the complete system.

Ready, set, pump

Grundfos does not compromise when it comes to quality. Therefore, every system is thoroughly tested before is leaves the factory. On delivery, the system is assembled, tested and ready to pump as soon as it is connected to the water and power supplies.

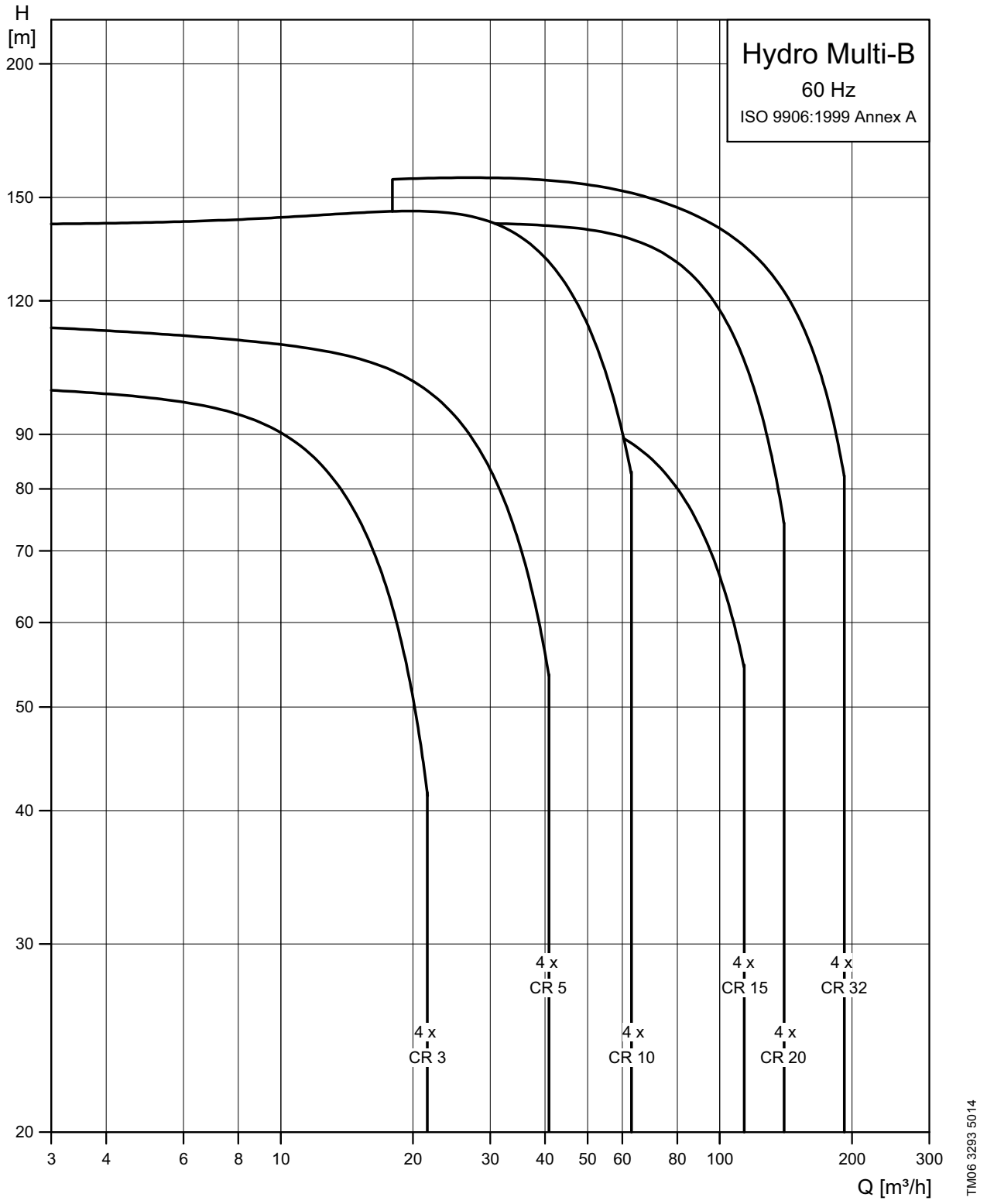
2. Product data

Performance range, 50 Hz



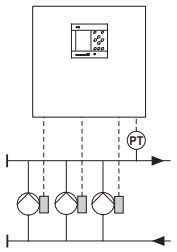
Note: The performance range is based on the standard range of the CR pumps.

Performance range, 60 Hz



Note: The performance range is based on the standard range of the CR pumps.

Product range



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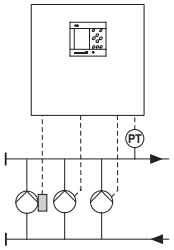

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Control variant	Hydro Multi-B, CR E	Hydro Multi-B, CR ES[1)]
Hydraulic data		
Maximum head [m]	146	146
Flow rate [m^3/h]	0 to 192	0 to 192
Liquid temperature [°C]	0 to 60	0 to 60
Maximum operating pressure [bar]	16	16
Pump and motor data		
Number of pumps	2 or 3	2 or 3
Motor power [kW]	0.55 to 15	0.55 to 15
Shaft seal		
HQQE (SiC/SiC/EPDM)	•	•
Materials		
CR 3 to CR 32: Cast iron and stainless steel EN/DIN 1.4301/AISI 304	•	•
CRI, CRN 3 to CRI, CRN 32: Stainless steel EN/DIN 1.4301/AISI 304[3)]	❑	❑
Manifold: stainless steel	❍	❍
Manifold: galvanised steel	•	•
Pipework connection		
Union	R 2 to R 2 1/2	R 2 to R 2 1/2
DIN flange	DN 80 to DN 150	DN 80 to DN 150
Functions		
Constant-pressure control	•	•
Pump cascade control	•	•
Automatic pump changeover	•	•
Proportional-pressure control[2)]	❍	-
Stop function	•	•
Speed-controlled pump	•	❍ [4)]
Water shortage protection	❍	❍
Bus communication	❍	❍
Redundant primary sensor	❍	❍
Standby pumps	❍	❍
Tank-filling software	❍	❍

• Available as standard.
❍ Optional.
❑ On request.
- Not available.

1) ES only available on request.
2) Only available for constant-pressure applications.
3) CRN: EN/DIN 1.4401/AISI 316
4) Only one pump with speed control

Type key

Example	Hydro Multi-B	ES	4	CME 0-8	U1	G-	E-z	U-	G-

Type range

System variants
E: All pumps E-motor or all fixed-speed pumps with CUE/VFD
ES: Fixed-speed pumps, one E-motor or fixed-speed pump with CUE/VFD

Number of pumps*

Pump type**

Voltage code
U1: 3 x 380-415, N, PE, 50/60 Hz
U2: 3 x 380-415, PE, 50/60 Hz
U3: 3 x 380-415, N, PE, 50 Hz
U4: 3 x 380-415, PE, 50 Hz
U5: 3 x 380-415, N, PE, 60 Hz
U6: 3 x 380-415, PE, 60 Hz
U7: 1 x 200-240, PE, 50/60 Hz
U8: 1 x 200-240, N, PE, 50/60 Hz
U9: 3 x 220-240, PE, 60 Hz
UA: 3 x 440-480, PE, 60 Hz
UB: 1 x 220-240, N, PE, 50/60 Hz
UC: 1 x 220-240, N, PE, 50 Hz

Pump material
A: Cast iron (EN-GJL-200)
I: Stainless steel (EN 1.4301/AISI 304)
G: Stainless steel (EN 1.4401/AISI 316)

Design
E: ASEAN design and systems with the control cabinet mounted on the same base frame as the pumps.
F: ASEAN design and systems with the control cabinet centred on the base frame.
G: ASEAN design and systems with the control cabinet mounted on its own base for floor mounting. The control cabinet can be placed up to 2 metres from the pumps.
H: ASEAN design and systems with the control cabinet mounted on its own base for floor mounting. The control cabinet can be placed up to 2 metres from the pumps.
I: ASEAN design and systems with the control cabinet prepared for wall mounting. The control cabinet can be placed up to 2 metres from the pumps.

Application mode
[-]: Constant-pressure boosting
U: Tank filling

Manifold/base fame material
[-]: Stainless steel (EN 1.4301, AISI 304) / black painted mild steel (Q235)
G: Galvanised steel / black painted mild steel (Q235)
X: Other materials

Maximum operating pressure

As standard, the maximum operating pressure is 16 bar for stainless-steel versions and 10 bar for cast-iron versions.

Temperatures

Liquid temperature: 0 to 60 °C.

Ambient temperature: 0 to 40 °C.

Relative air humidity

Maximum 95 %.

3. Construction

Pump

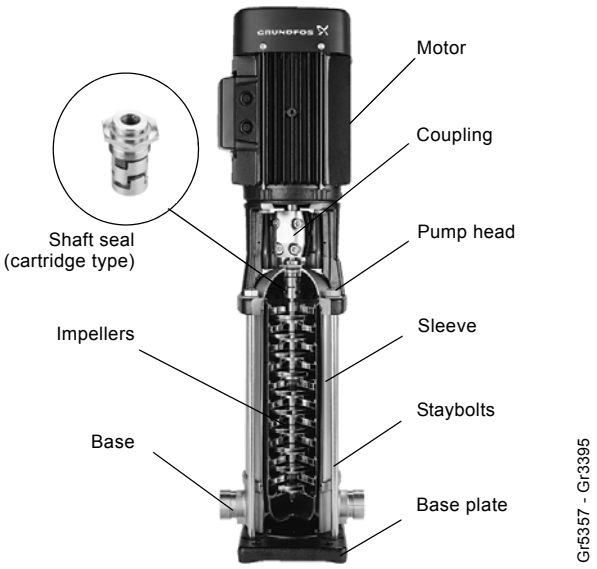


Fig. 2 CR pump

CR pumps are non-self-priming, vertical multistage centrifugal pumps.

Each pump consists of a base and a pump head. The chamber stack and outer sleeve are secured between the pump head and the base by means of staybolts. The base has suction and discharge ports on the same level (in-line) and of the same port size.

CR and CRE pumps have pump head and base of cast iron while CRI and CRN pumps have pump head and base of stainless steel.

All hydraulic parts are made of stainless steel.

For further information, see the following data booklets:

Title	Publication number
CR, CRI, CRN, CRE, CRIE, CRNE	V7023751
CR, CRI, CRN, CRT, CRE, CRIE, CRNE, CRTE custom-built pumps	96486346

The data booklets are available in Grundfos Product Center on www.grundfos.com. See page 44.

For information about the pump's position in the booster system, see fig. 4 on page 9.

Shaft seal

All pumps have a maintenance-free mechanical HQQE shaft seal of the cartridge type. Seal faces are silicon carbide/silicon carbide. Rubber parts are of EPDM.

Note: Other shaft seal variants are available on request.

Fig. 3 Cartridge shaft seal

The shaft seal can be replaced without dismantling the pump. The shaft seal of pumps with motors of 11 kW and up can be replaced without removing the motor.

For further information, see the data booklet on shaft seals, publication number 96519875. The data booklet is available in Grundfos Product Center on www.grundfos.com. See page 44.

Motors

CR and CRI pumps

CR and CRI pumps are fitted with a totally enclosed, fan-cooled, 2-pole Grundfos standard motor.

Principal dimensions are in accordance with the EN standards.

Electrical tolerances to EN 60034.

	Standard motor
Mounting designation	Up to 4 kW: V18 From 5.5 kW: V1
Insulation class	F
Efficiency class	IE3
Enclosure class	IP55[1)]
Supply voltage, 50 Hz Tolerance: ± 10 %	P2: 0.37 to 1.5 kW: 3 x 220-240/380-415 V, 50 Hz P2: 2.2 to 11 kW: 3 x 380-415 V, 50 Hz P2: 15 to 55 kW: 3 x 380-415/660-690 V, 50 Hz
Supply voltage, 60 Hz Tolerance: ± 10 %	P2: 0.55 to 75 kW: 3 x 220-277/380-480 V, 60 Hz

[1)] IP65 available on request.

Three-phase Grundfos motors from 3 kW and up have a built-in thermistor (PTC) according to DIN 44082 (IEC 34-11: TP 211).

Manifold

A galvanised steel suction manifold is fitted on the suction side of the pumps.

A galvanised steel discharge manifold is fitted on the discharge side of the pumps.

An isolating valve and a non-return valve are fitted between the discharge manifold and the individual pumps. The non-return valve can be fitted on the suction side on request.

As an alternative, Hydro Multi-B, CR is available with stainless-steel manifolds. For further information, contact Grundfos.

Control cabinet and CU 323

The control cabinet contains all the necessary electrical components to control the pumps. The CU 323 is located in the cabinet front.

The CU 323 is the control panel of the booster system and features two digital displays, two system indicator lights and three additional indicator lights per pump in the system. Furthermore, it has indicator lights for water shortage and sensor fault. The CU 323 has four buttons plus one button per pump in the system.

The control panel enables manual setting and change of parameters such as setpoint, start or stop of system or individual pumps, resetting of alarms and monitoring of system performance. The CU 323 comes with software for constant-pressure boosting as standard, but tank-filling software is available on request.

Base frame

The booster system has a common base frame. The pumps are secured to the base frame by bolts. The control cabinet is secured to the base frame by means of a stand.

System components

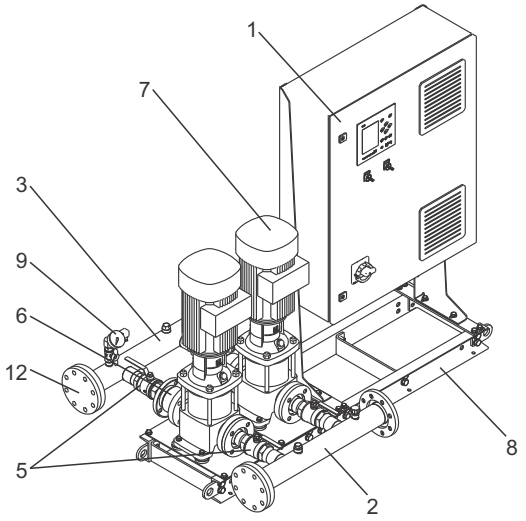


Fig. 4 Front view of Hydro Multi-B, CR booster system

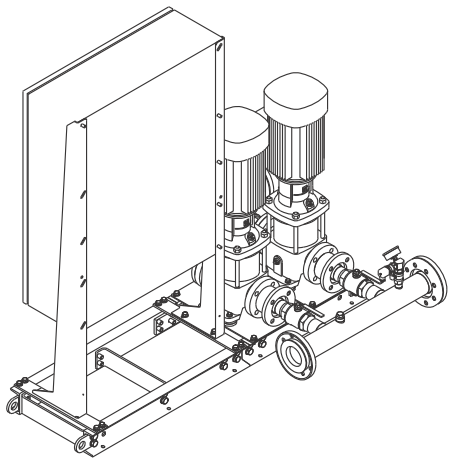
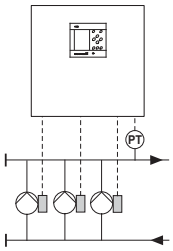
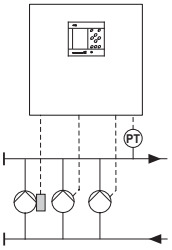
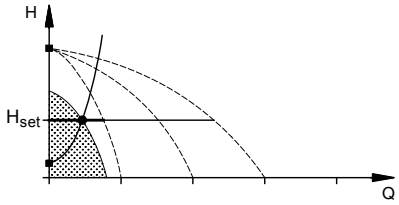
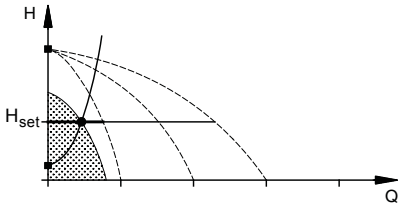
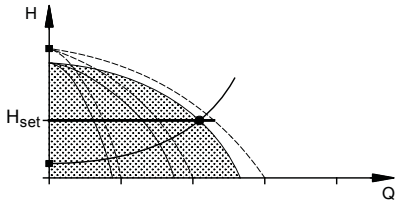
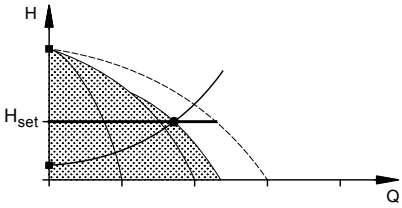


Fig. 5 Rear view of Hydro Multi-B, CR booster system

Pos.	Description	Quantity
1	Control cabinet	1
2	Suction manifold	1
3	Discharge manifold	1
5	Isolating valve	two per pump
6	Non-return valve	one per pump
7	Pump	2-4
8	Base frame	1
9	Pressure transmitter and pressure gauge	1
12	Screw cap or blanking flange	2

4. Functions

Control variants

Control variant E	Control variant ES
Two or three speed-controlled pumps	One speed-controlled pump and one or two mains-operated pumps
 TM03 0993 0905	 TM03 0996 0905
One speed-controlled pump in operation.	One speed-controlled pump in operation.
 TM00 7995 2296	 TM00 7995 2296
Three speed-controlled pumps in operation.	One speed-controlled pump and two mains-operated pumps in operation.
 TM00 7996 2296	 TM00 7998 2296
• Control variant E for constant-pressure applications maintains a constant pressure through continuous adjustment of the speed of the pumps. • The system performance is adjusted to the demand by cutting the required number of pumps in and out and through parallel speed control of the pumps in operation. • Changeover among the pumps is automatic and depends on load, time and fault.	• Control variant ES for constant-pressure applications maintains a constant pressure through continuous adjustment of the speed of the speed-controlled pump. The other pumps are cut in or out according to demand and to achieve a performance corresponding to the consumption. • The speed-controlled pump always starts first and will be the last to stop. If the pressure cannot be maintained by the pump, one or both mains-operated pumps will be cut in. • Changeover among the mains-operated pumps is automatic and depends on load, time and fault.

Overview of functions

	Constant-pressure boosting		Tank filling	
Control variants	**E**	**ES**	**E**	**ES**
Functions via the CU 323 control panel				
Pump cascade control	●	●	-	-
Proportional-pressure control	❍	-	-	-
Automatic pump changeover	●	●	●	●
Standby pumps	❍	❍	❍[1)]	❍[1)]
Redundant primary sensor	❍	❍	❍	❍
Digital input for external start/stop relay	●	●	●	●
Water shortage protection	❍	❍	❍	❍
Alarm and operation outputs	●	●	●	●
Motor protection	●	●	●	●
Maximum pressure protection	●	●	-	-
Protection in case of sensor fault	●	●	●	●
Protection in case of high tank level	-	-	●	●
Button lock function	●	●	●	●
Communication				
CIM module (CIM = Communication Interface Module)	❍	❍	❍	❍
External GENIbus connection (option)	❍	❍	❍	❍

● Standard.
❍ On request.
- Not available.
1) In systems with more than two pumps, one is standby pump as standard.

Description of selected functions

Pump cascade control

The booster system automatically ensures that the required number of pumps are running so that the system demand is met in the most efficient way. Furthermore, the speed-controlled pumps in the system are ramped up and down according to the demand, thus offering perfect constant-pressure control.

Water shortage protection

The inlet pressure of the booster system or the level in a tank, if any, on the inlet side is monitored. If the inlet pressure or the water level is too low, all pumps will be stopped.

You can monitor the pressure or level by one of the following:

- float switch
- analog sensor
- external electrode relay
- pressure transmitter
- pressure switch.

Furthermore, the system can be set to be reset and restarted manually or automatically after a water shortage situation.

Stop function and low-flow mode

The stop function makes it possible to stop the last pump in operation if there is no or a very small consumption. This function also prevents heating of the pumped liquid.

The operation of the booster system is continuously monitored to detect a low flow rate. If the CU 323 detects no or a low flow rate ($Q < Q_{min}$), it will change from normal constant-pressure operation to on/off control of the last pump in operation. As long as the flow rate is lower than Q_{min}, the pump will run in on/off operation. If the flow rate is increased to more than Q_{min}, the system will return to normal constant-pressure operation.

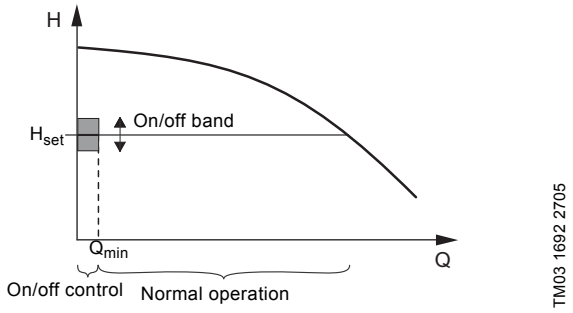


Fig. 6 On/off band

Automatic pump changeover

The CU 323 automatically ensures an equal number of operating hours of the pumps by always cutting in the pump with the lowest number of operating hours. This function also ensures that, if a running pump fails, the next available pump will be started.

Standby pumps

With this function you can limit the maximum performance of the booster system by selecting one or more pumps as standby pumps.

If a three-pump system has one standby pump, maximum two pumps are allowed to operate at a time.

If one of the two pumps in operation has a fault and is stopped, the standby pump will be started. The performance of the booster system is thus not reduced.

The status as standby pump alternates between all pumps.

This function is optional and available on request.

Note: This function must be configured by a Grundfos service engineer.

Tank filling

If the booster system is ordered for tank filling, the CU 323 automatically controls the pumps in sequence so that the tank is filled in a safe and controlled manner.

Note: Tank filling is not standard, but special software is available on request.

Proportional pressure

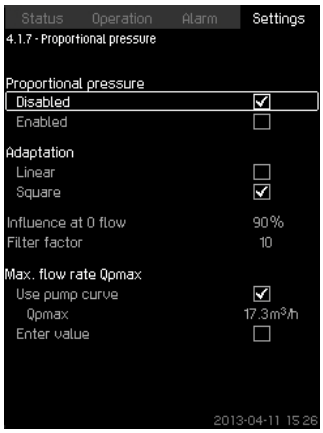


Fig. 7 Proportional pressure

You can use this function in applications with a large pipe system, for instance a village supplied with water from a pumping station or waterworks.

Purpose:

- to deliver the required water at all times
- to compensate for friction loss
- to keep energy consumption at a minimum
- to ensure the highest comfort level at tapping points, etc.
- to minimise water loss from leaks
- to reduce wear and tear on pipes.

In situations with high flow rates, the pressure loss in the pipe system is relatively high. In order to deliver a system pressure of 5 bar in such a situation, the discharge pressure of the system must be set to 6 bar if the pressure loss in the pipe system is 1 bar.

In a low-flow situation, the pressure loss in the pipe system may only be 0.2 bar. Here the system pressure would be 5.8 bar if the setpoint was fixed to 6 bar. That is 0.8 bar too high compared with the peak situation above.

To compensate for this excessive system pressure, the proportional-pressure function of the CU 352 automatically adapts the setpoint to the actual flow rate. The adaptation can be linear or square. Such an automatic adaptation offers you large energy savings and optimum comfort at the tapping point!

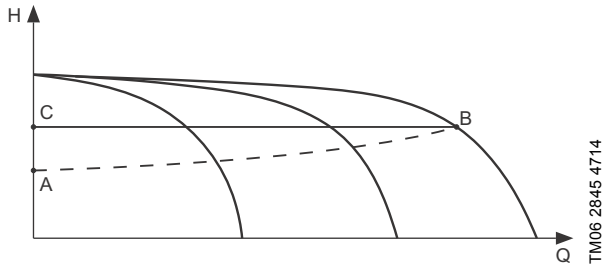


Fig. 8 Proportional pressure

Pos.	Description
A	Pressure at zero flow. Starting point of proportional-pressure control (influence at 0 flow = x % of setpoint)
B	Qnom
C	Setpoint

Note: This function must be configured by a Grundfos service engineer.

Example

Influence at 0 flow (Q0) = pressure loss in supply pipe x 100 / setpoint.

Influence at 0 flow (Q0) = 1 bar x 100 / 6 bar = 16.67 %.

Setpoint at Q_{min} with proportional-pressure control:
6 bar - (6 bar x 0.1667) = 5 bar.

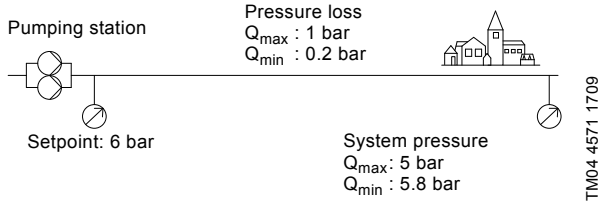


Fig. 9 Without proportional-pressure control

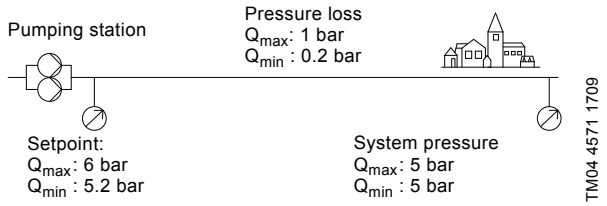


Fig. 10 With proportional-pressure control

Protection functions

- Maximum number of starts and stops per hour
- minimum time between start and stop
- water shortage protection
- protection in case of sensor fault
- maximum-pressure alarms
- motor protection.

Communication options

As an option, the booster system can be fitted with a communication module that enables it to communicate with a SCADA system or a mobile phone.

5. Installation

Mechanical installation

Location

The booster system must be installed in a well ventilated room to ensure sufficient cooling of the pumps and the control cabinet.

Note: The booster system is not designed for outdoor installation and must not be exposed to direct sunlight.

The booster system should have a 1-metre clearance on all sides for inspection and removal.

Pipework

Arrows on the pump base show the direction of flow of water through the pump.

Note: The pipework connected to the booster system must be of adequate size.

Connect the pipes to the manifolds of the booster system. Either end can be used. Apply sealing compound to the unused end of the manifold, and fit the screw cap. For manifolds with flanges, fit a blanking flange with gasket.

We recommend that you install pipe supports for the suction and discharge pipes. See fig. 11.

To achieve optimum operation and minimise noise and vibration, it may be necessary to consider vibration dampening of the booster system.

Noise and vibration are generated by the rotations in the motor and pump and by the flow in pipework and fittings. The effect on the environment is subjective and depends on correct installation and the state of the other parts of the system.

If booster systems are installed in blocks of flats or the first consumer on the line is close to the booster system, we recommend that you fit expansion joints on the suction and discharge pipes to prevent vibration being transmitted through the pipework.

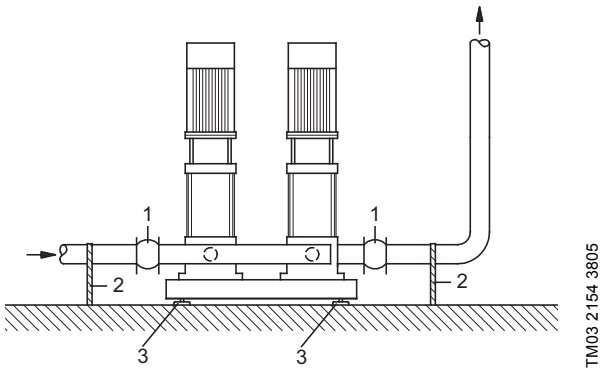


Fig. 11 Example showing the position of expansion joints, pipe supports and machine shoes

Pos.	Description
1	Expansion joint
2	Pipe support
3	Mounting bolts

Note: Expansion joints, pipe supports and mounting bolts shown in fig. 11 above are not supplied with a standard booster system.

The pipes must be fastened to parts of the building to ensure that they cannot move or be twisted.

Foundation

The booster system must be positioned on an even and solid surface, such as a concrete floor or foundation. The booster system must be bolted to the floor or foundation.

Note: As a rule of thumb, the weight of a concrete foundation should be 1.5 x the weight of the booster system.

Expansion joints

Expansion joints provide these advantages:

- absorption of thermal expansion and contraction of pipework caused by variations in liquid temperature.
- reduction of mechanical influences in connection with pressure surges in the pipework.
- isolation of structure-borne noise in the pipework (only rubber bellows expansion joints).

Note: Expansion joints must not be installed to compensate for inaccuracies in the pipework, such as centre displacement of flanges.

Fit expansion joints at a distance of minimum 1 to 1.5 times the nominal flange diameter from the manifold on the suction as well as on the discharge side. This prevents the development of turbulence in the expansion joints, resulting in better suction conditions and a minimum pressure loss on the discharge side.

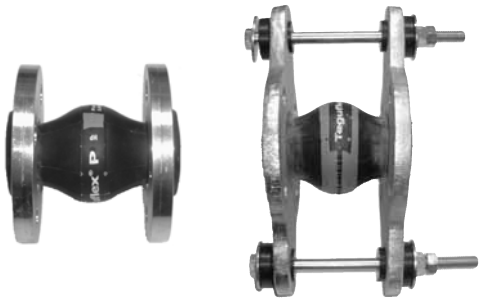


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Fig. 12 Examples of rubber bellows expansion joints with and without limiting rods

Expansion joints with limiting rods can be used to minimise the forces caused by the expansion joints. We always recommend expansion joints with limiting rods for flanges larger than DN 100.

The pipes must be anchored so that they do not stress the expansion joints, manifolds and the pump. Follow the supplier's instructions and pass them on to advisers or pipe installers.

Electrical installation

The electrical installation must be carried out by an authorised person in accordance with local regulations and the relevant wiring diagram.

- The electrical installation of the booster system must be carried out in accordance with enclosure class IP54.
- Make sure that the booster system is suitable for the power supply to which it is to be connected. Contact Grundfos if you have special voltage requirements.
- Make sure that the wire cross-section corresponds to the specifications in the wiring diagram.
- ES systems must be protected against phase failure.

6. Sizing

When sizing a booster system, you must take the following into account:

- The performance of the booster system must meet the highest possible demand, both in terms of flow rate and pressure.
- The booster system must not be oversized. This is important in relation to installation and operating costs.

You can size the booster systems via Grundfos Product Center or this data booklet.

Sizing in Grundfos Product Center

We recommend that you size your booster system in Grundfos Product Center, which is selection programs offered by Grundfos. For further information, see page 44.

Grundfos Product Center features a user-friendly and easy-to-use virtual guide, which leads you through the selection of the optimum booster system for the application in question.

Sizing via this data booklet

There are seven steps and you find more information about each step on the following pages:

1. maximum flow requirement
2. required discharge pressure
3. system layout
4. consumption profile and load profile
5. inlet pressure
6. selection of booster system
7. accessories.

Maximum flow requirement

Total consumption and maximum flow rate depend on the application in question. You can calculate the maximum flow requirement by means of the table below which is based on statistical data.

Consumer	Unit	Q_{year}	Consumption period d	Q_{day}	fd	$Q(m)_{day}$	ft	Max. flow rate
		m^3/year	days/year	m^3/day		m^3/day		m^3/h
Residence building	Residence (2.5 persons)	183	365	0.5	1.3	0.65	1.7	0.046
Office building	Employee	25	250	0.1	1.2	0.12	3.6	0.018
Shopping centre	Employee	25	300	0.08	1.2	0.1	4.3	0.018
Supermarket	Employee	80	300	0.27	1.5	0.4	3.0	0.05
Hotel	Bed	180	365	0.5	1.5	0.75	4.0	0.125
Hospital	Bed	300	365	0.8	1.2	1.0	3.0	0.12
School	Pupil	8	200	0.04	1.3	0.065	2.5	0.007

Example: Hotel with 300 beds

Number of beds: n.
Total annual consumption: Q_{year} x n.
Consumption period: d.
Average consumption per day: (Q_{year} x n)/d.
Yearly maximum consumption: $Q(m)_{day}$ = fd x Q_{day}.
Maximum flow requirement per hour: Q_{max} = max. flow rate/hour x number of beds.

Calculation

n = 300 beds.
Q_{year} x n = 180 x 300 = 54,000 m^3/year.
d = 365 days/year.
(Q_{year} x n)/d = 54,000/365 = 148 m^3/day.
$Q(m)_{day}$ = fd x Q_{day} = 1.5 x 148 = 222 m^3/day.
Q_{max} = Max. flow rate/hour x number of beds = 0.125 x 300 = 37.5 m^3/h.

Required discharge pressure

You can calculate the required discharge pressure, p_{set}, of the booster system from the following formula:

$p_{set} = p_{tap(min)} + p_f + (h_{max}/10.2)$

$p_{boost} = p_{set} - p_{in(min)}$

Key

p_{set} = Required discharge pressure [bar].

$p_{tap(min)}$ = Required minimum pressure at the highest tapping point [bar].

p_f = Total pipe friction loss [bar].

h_{max} = Height from booster discharge port to highest tapping point [metres].

$p_{in(min)}$ = Minimum inlet pressure [bar].

p_{boost} = Required boost [bar].

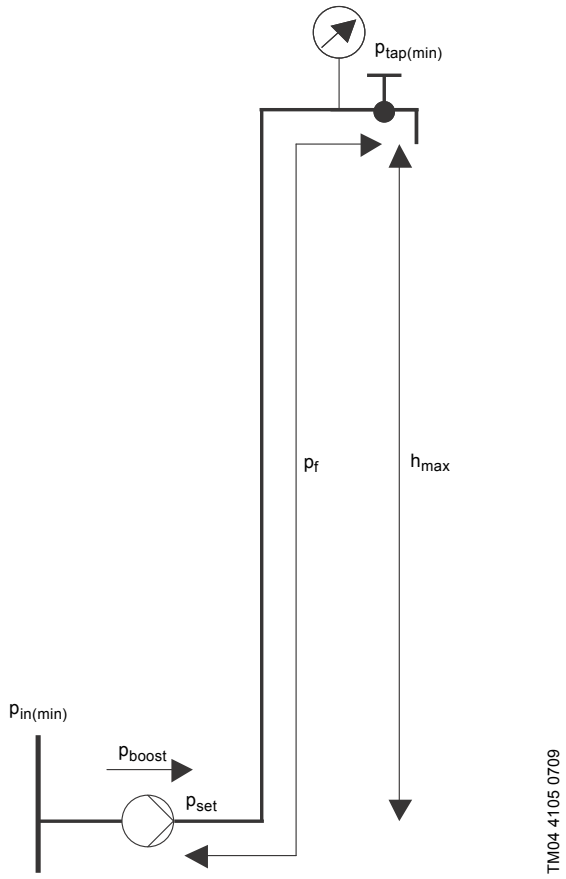


Fig. 13 Calculation of required discharge pressure

Calculation

$p_{tap(min)}$ = 2 bar

p_f = 1.2 bar

h_{max} = 12.5 metres

$p_{in(min)}$ = 2 bar

p_{set} = 2 + 1.2 + (12.5/10.2) = 4.4 bar

p_{boost} = 4.4 - 2 = 2.4 bar.

System layout

Not relevant for this booster system.

Consumption profile and load profile

Not relevant for this booster system.

Inlet pressure

The inlet pressure must be taken into consideration to ensure safe operation.

Do not consider the values for inlet pressure and operating pressure individually, but always compare them.

Selection of booster system

Select the booster system on the basis of these factors: maximum flow requirement, required discharge pressure, load profile, number of pumps required, possible standby pumps, etc.

Accessories

When the optimum booster system has been selected, consider whether accessories are required.

Example

Water shortage protection

Any booster system must be protected against water shortage.

The inlet conditions determine the type of water shortage protection to be used:

- If the system draws water from a tank or well, select a float switch, analog sensor or external electrode relay.
- If the system has an inlet pressure, select a pressure transmitter or a pressure switch.

Understanding the curve charts

The x-axis showing the flow rate (Q) in m^3/h is common to all the curves; the y-axis showing the head (H) in metres has been adapted to the individual pump type.

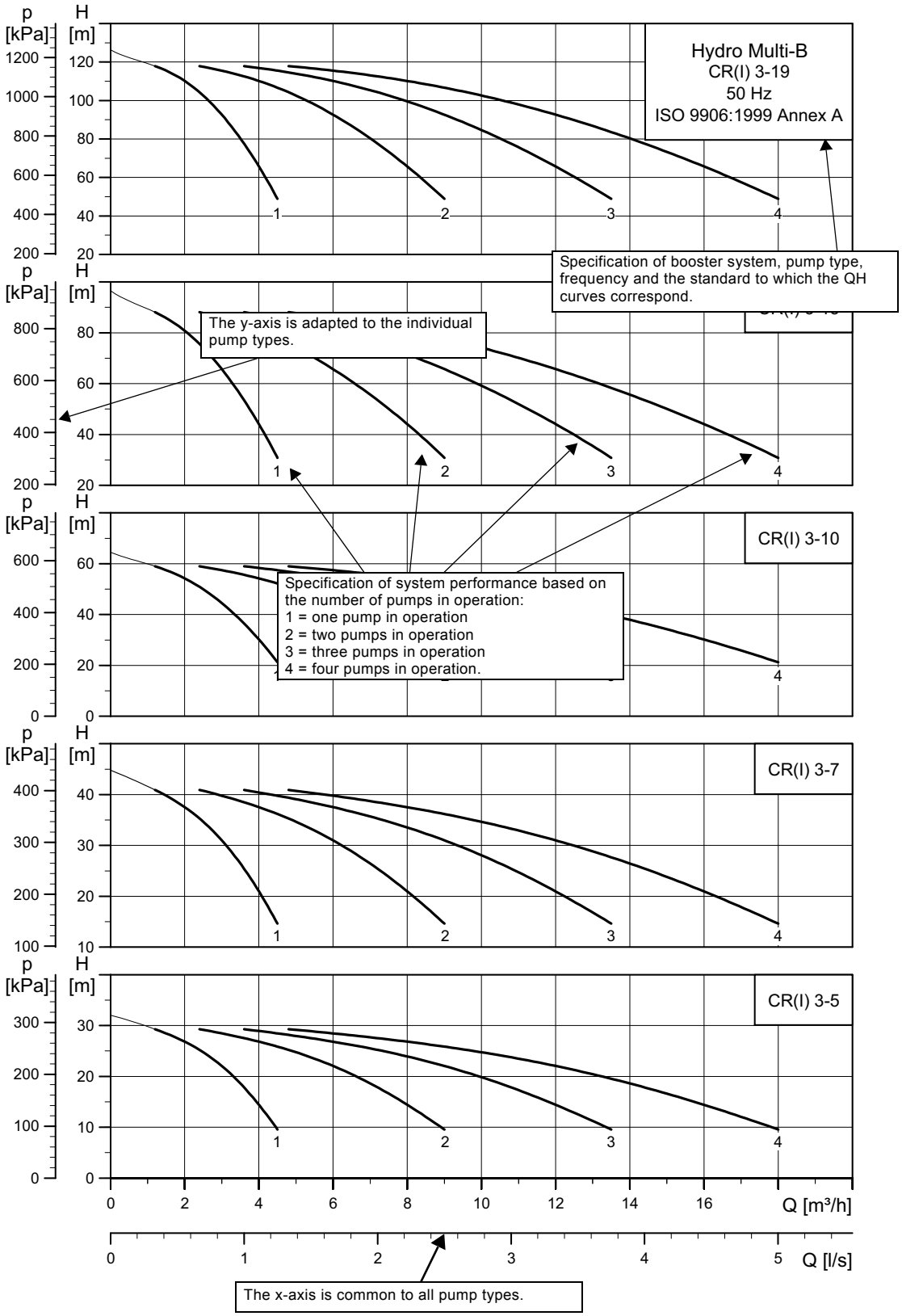


Fig. 14 Understanding the curve charts

How to select a system, example

- A flow rate of 70 m^3/h is required.
- A head of 20 metres is required.

Draw a vertical line from the specified flow rate.

Draw a horizontal line from the head required.

The intersection of the two lines gives the number of pumps required for the system, i.e. four CR 15-2 pumps.

The pump type best meeting this specification is found by means of the y-axis, for instance four CR 15-2 pumps.

Only booster systems with performance ranges within the hatched area in the example must be selected.

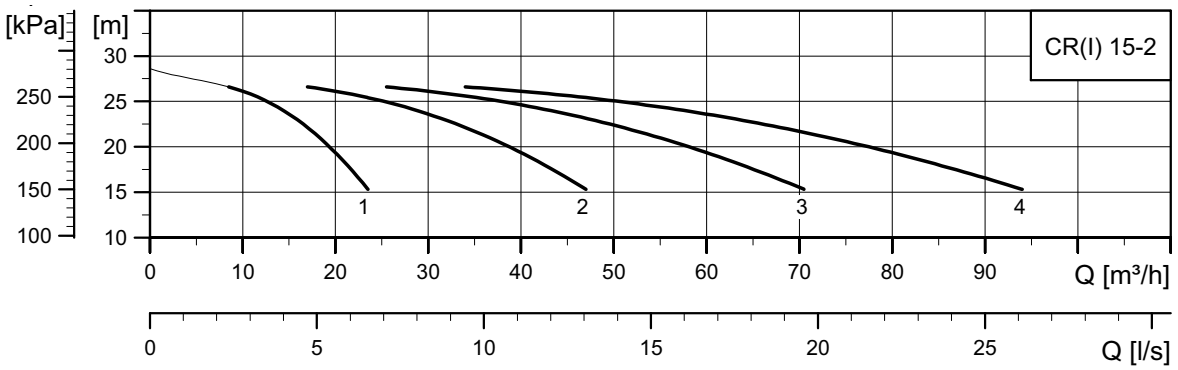


Fig. 15 Example of selection of system

7. Curve conditions

How to read the curve charts

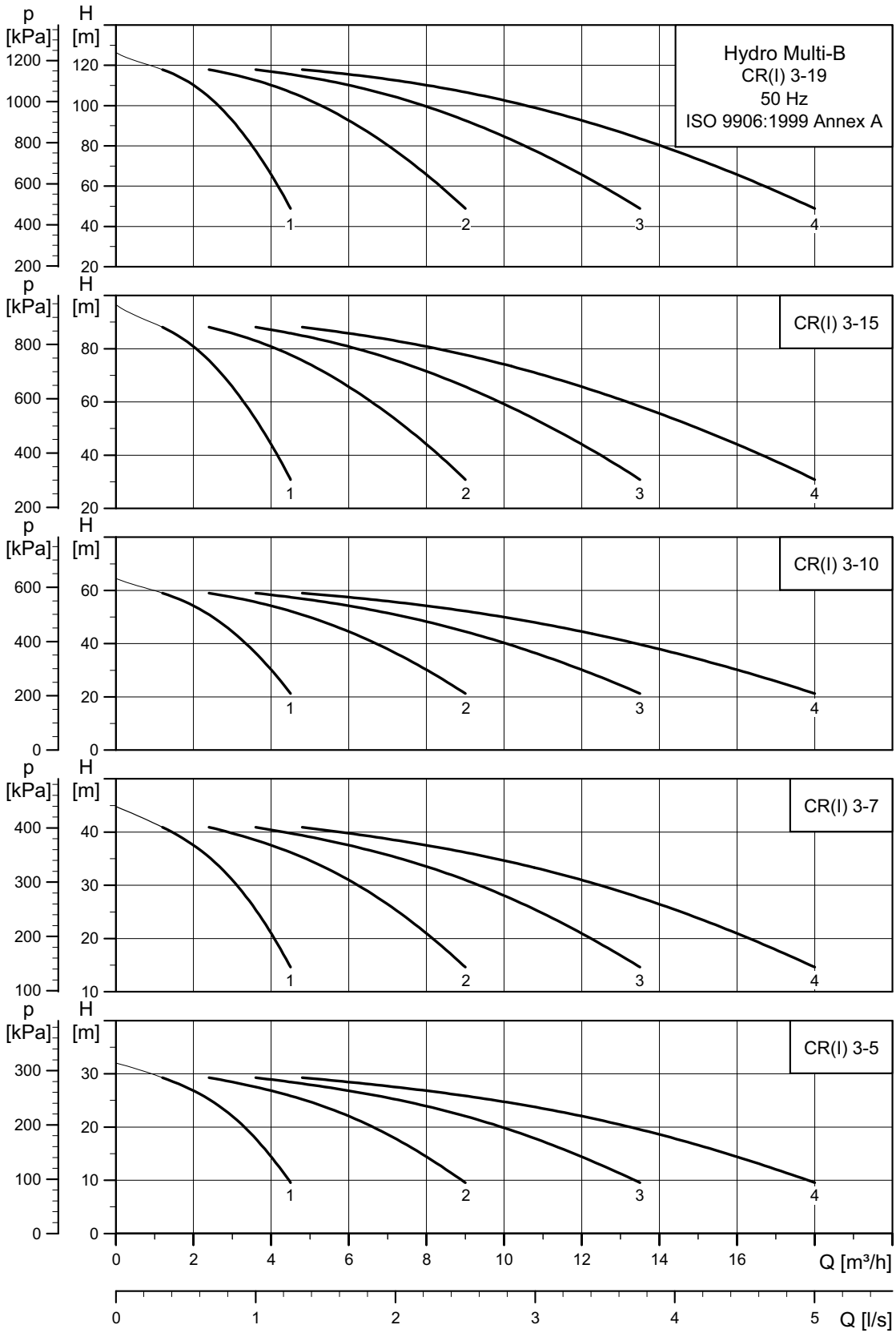
The guidelines below apply to the curves shown on the following pages:

- Tolerances to ISO 9906, Annex A, if indicated.
- Measurements have been made with airless water at a temperature of 20 °C.
- The curves apply to the following kinematic viscosity: υ = 1 mm^2/s (1 cSt).
- The QH curves apply to fixed speeds of 2900 min^{-1} (50 Hz) and 3480 min^{-1} (60 Hz).
  Note: Please refer to Grundfos Product Center for pump curves which include the characteristic of the selected motor. In Grundfos Product Center, you can also adjust the curves, depending on the density and viscosity.

The conversion between head H (m) and pressure p (kPa) applies to a water density of ρ = 1000 kg/m^3.

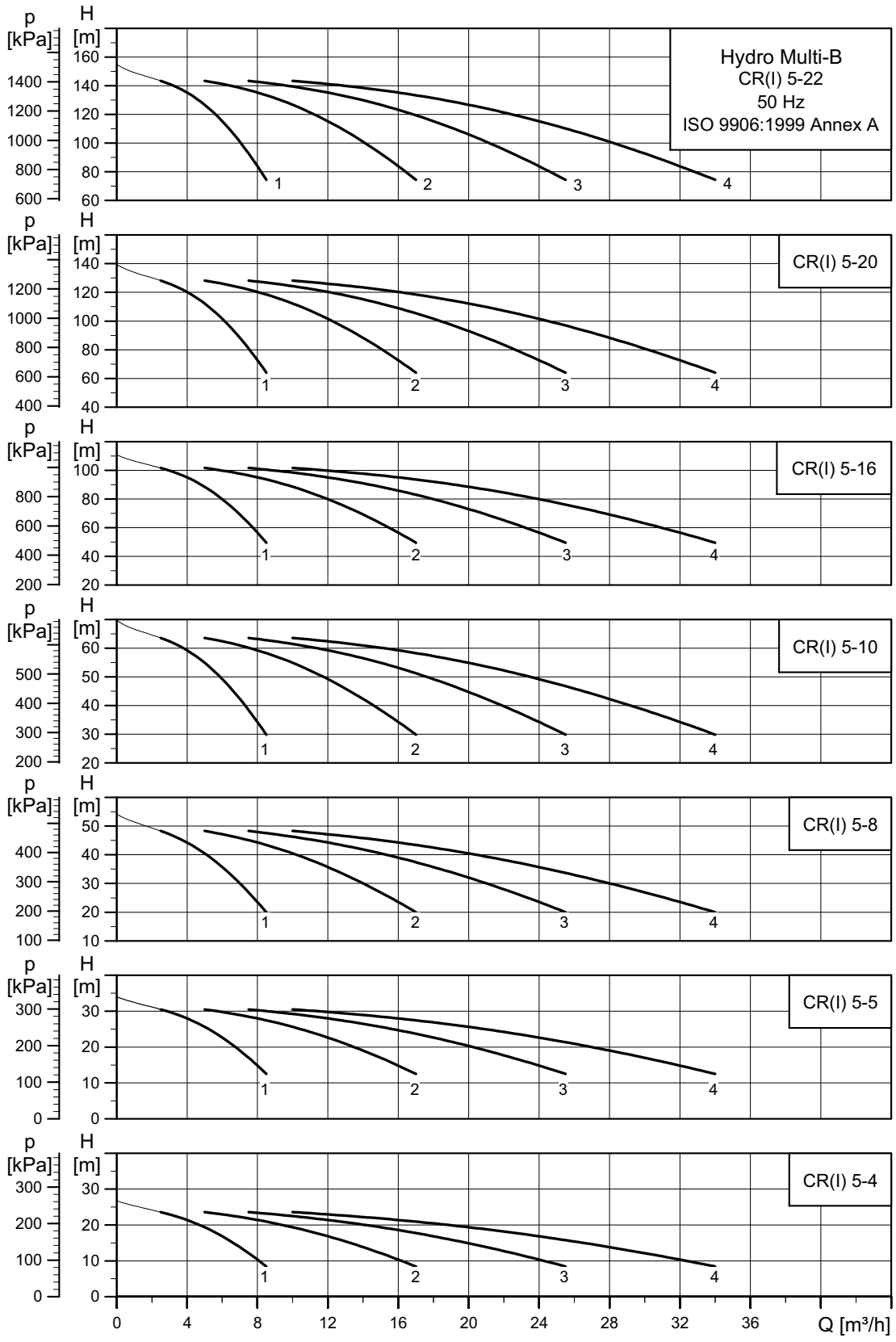
8. Performance curves

Hydro Multi-B E with CR 3, 50 Hz



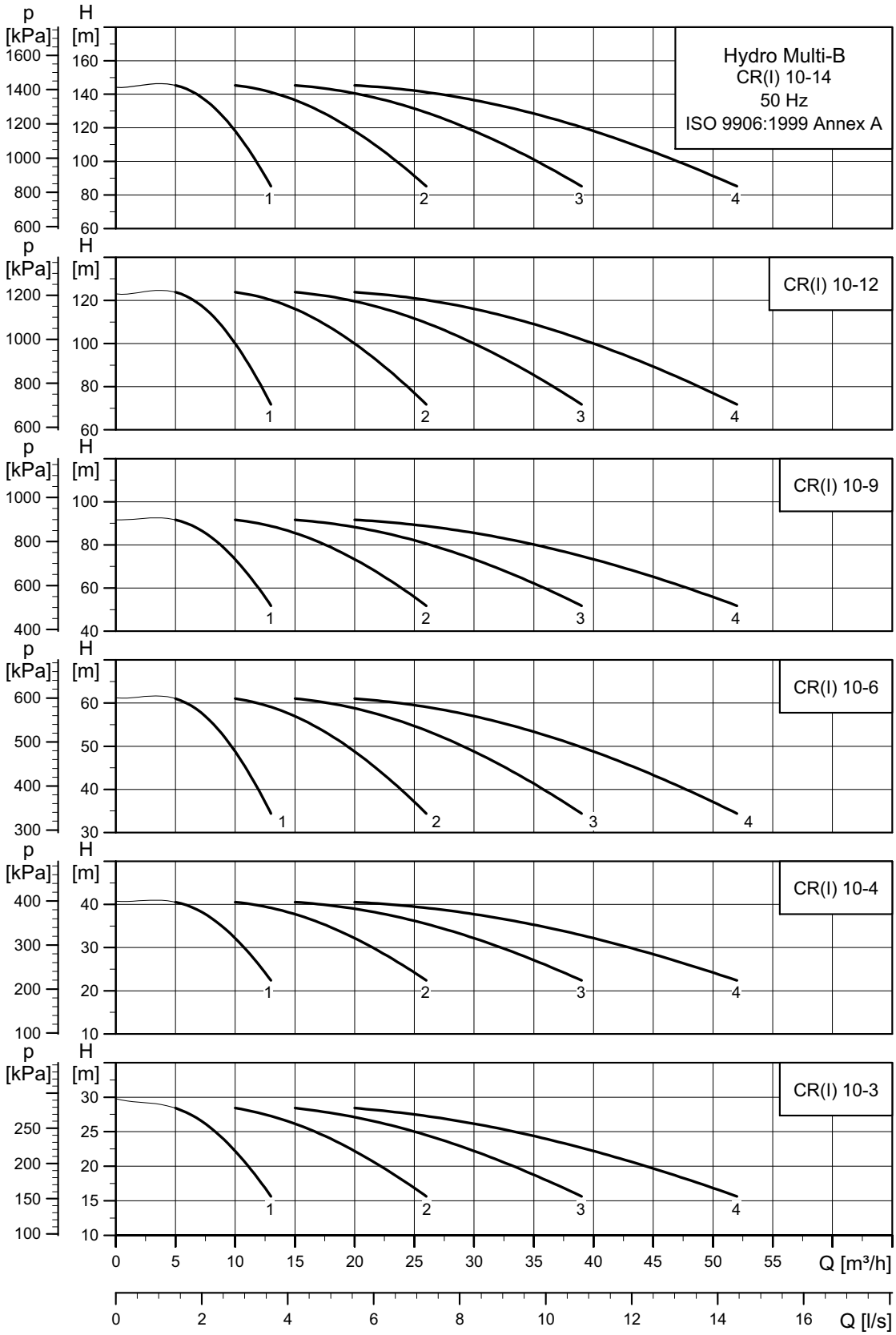
TM06 3258 5014

Hydro Multi-B E with CR 5, 50 Hz



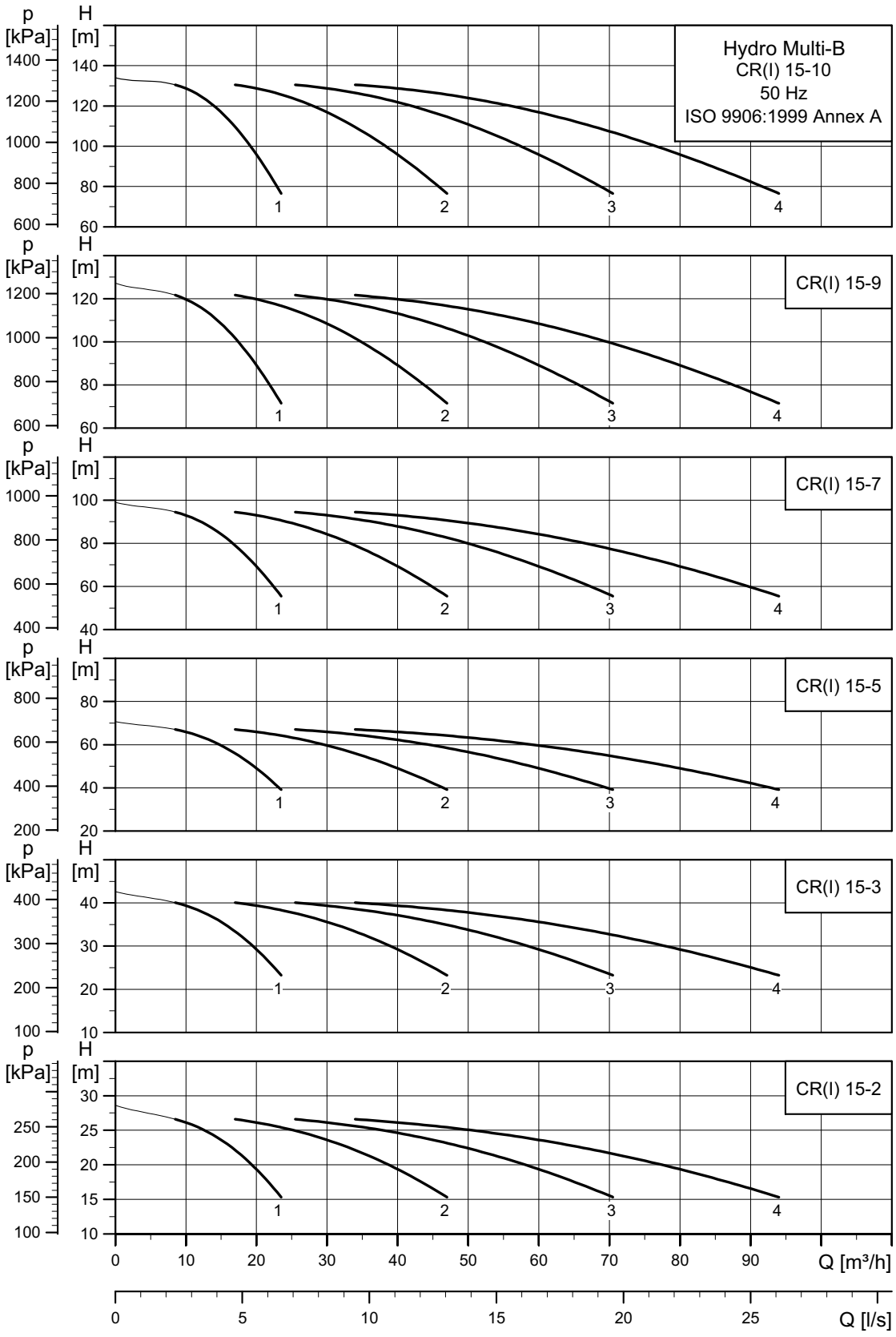
TM06 3259 5014

Hydro Multi-B E with CR 10, 50 Hz



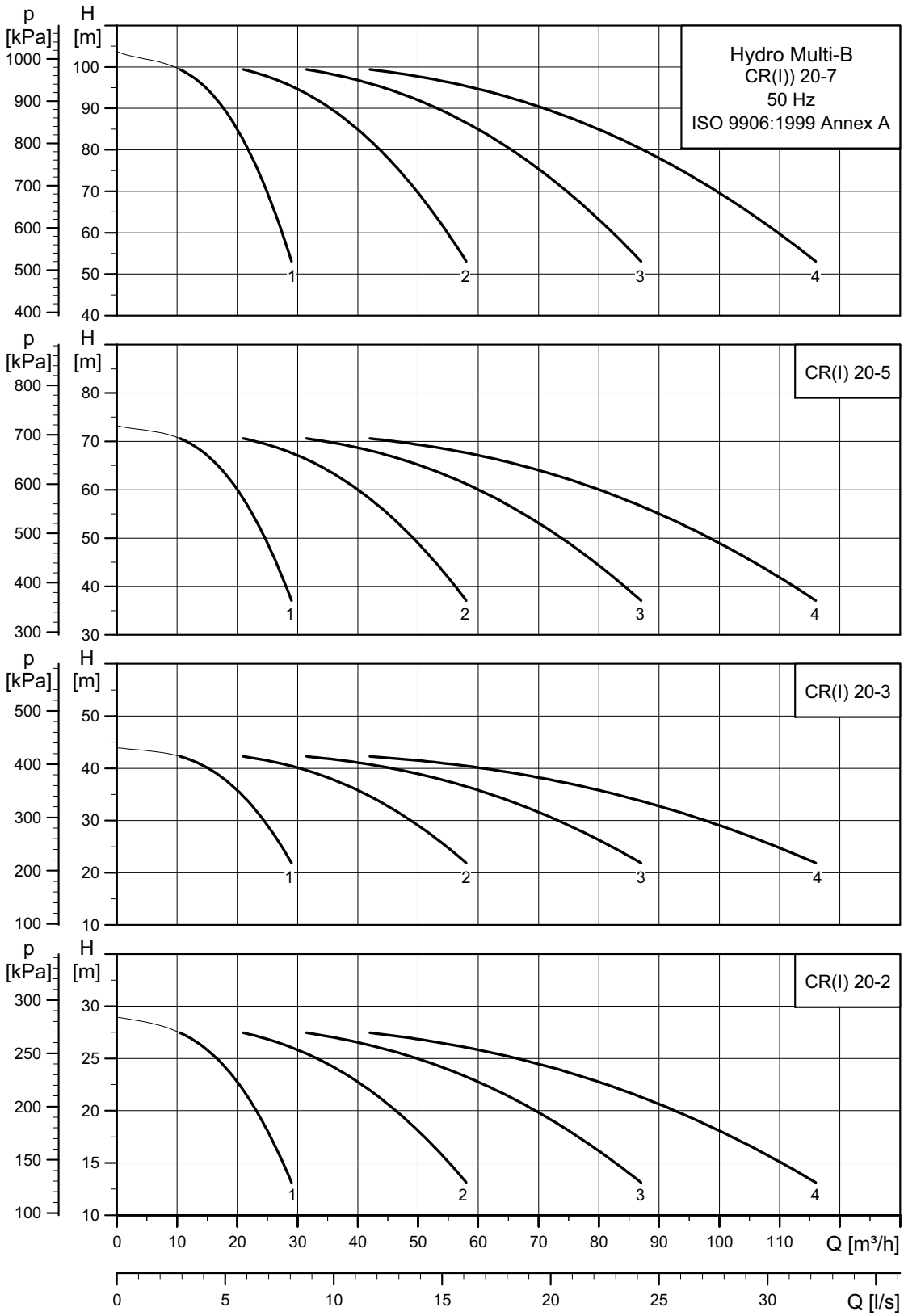
TM06 3260 5014

Hydro Multi-B E with CR 15, 50 Hz



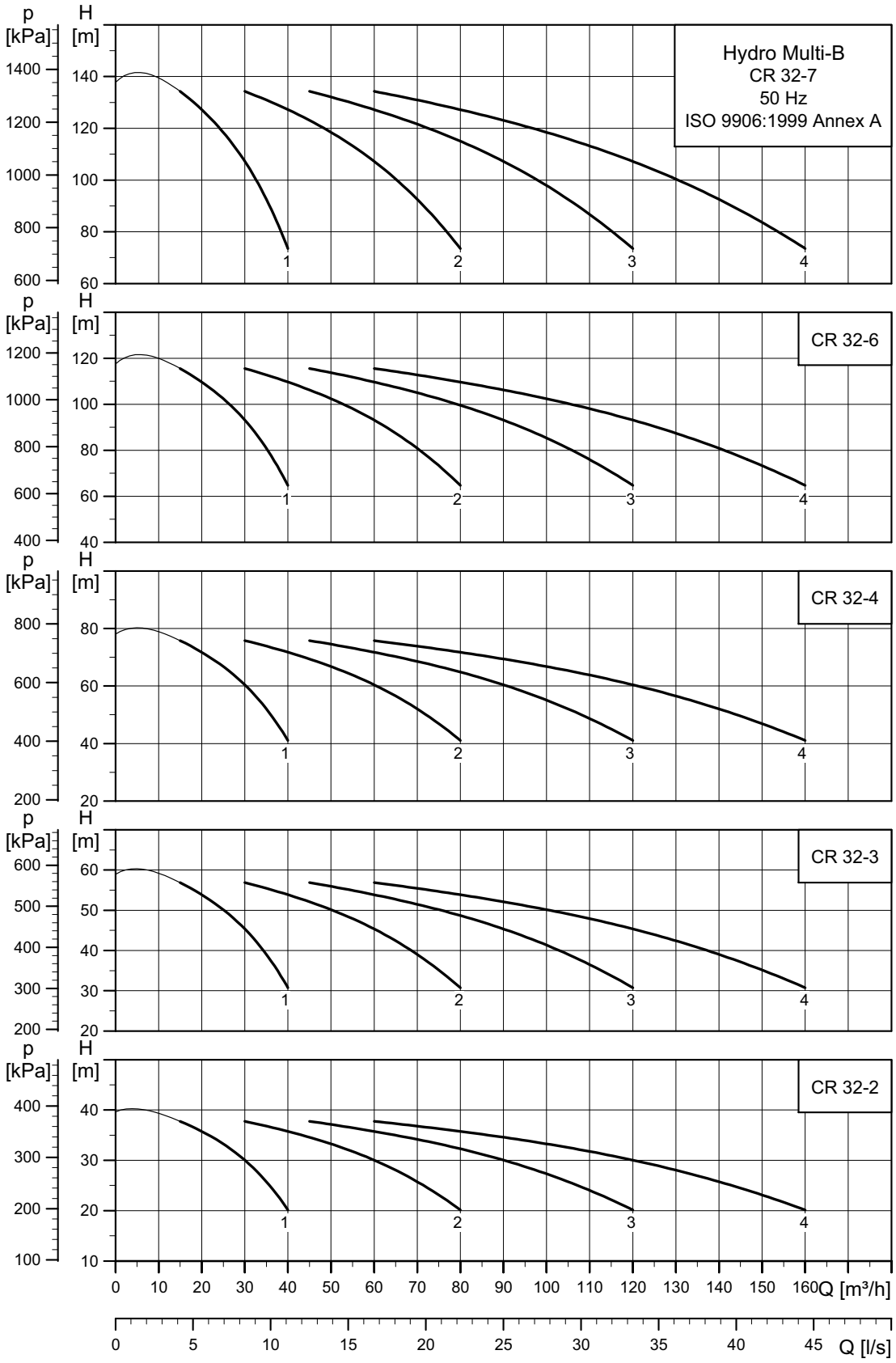
TM06 3261 5014

Hydro Multi-B E with CR 25, 50 Hz



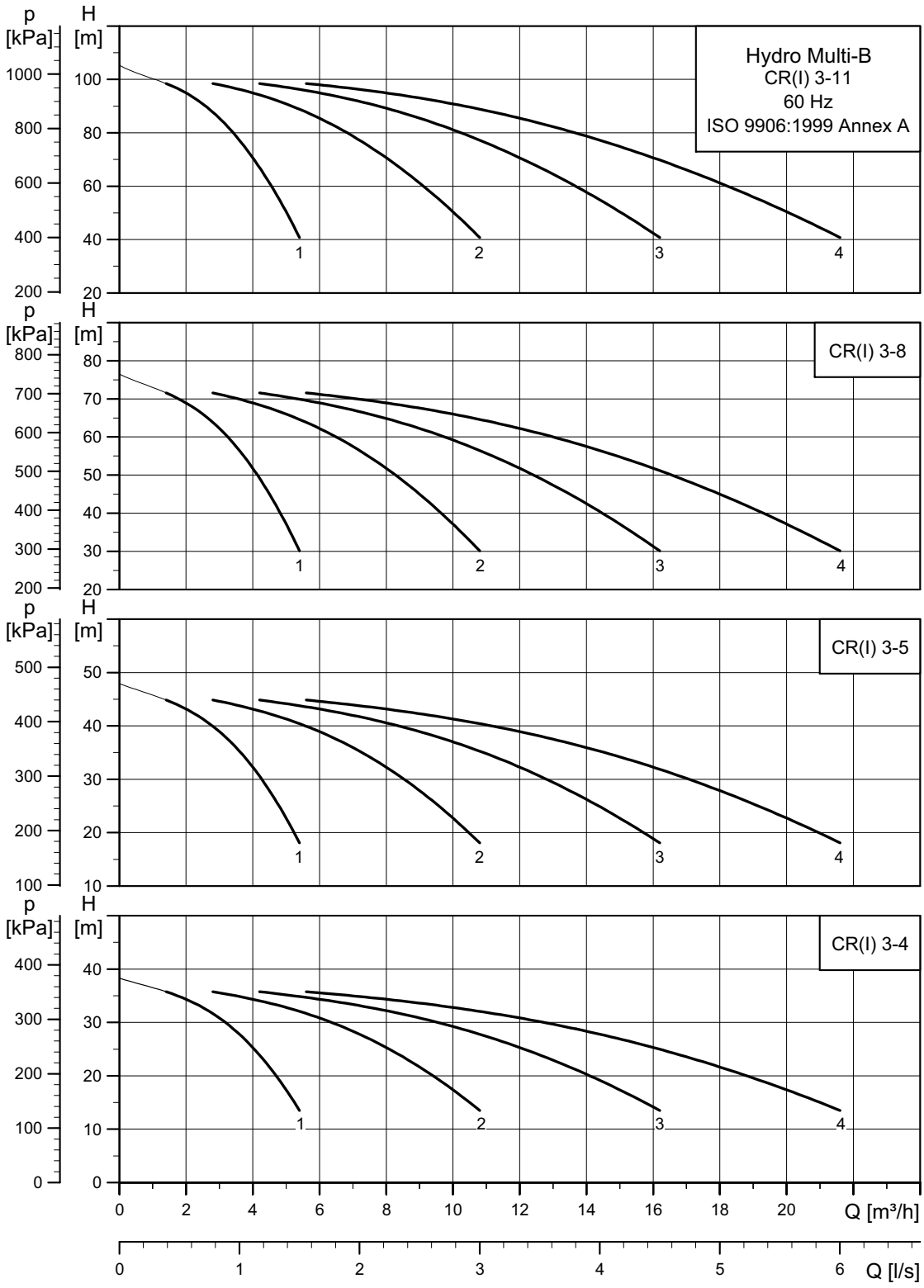
TM06 3262 5014

Hydro Multi-B E with CR 32, 50 Hz



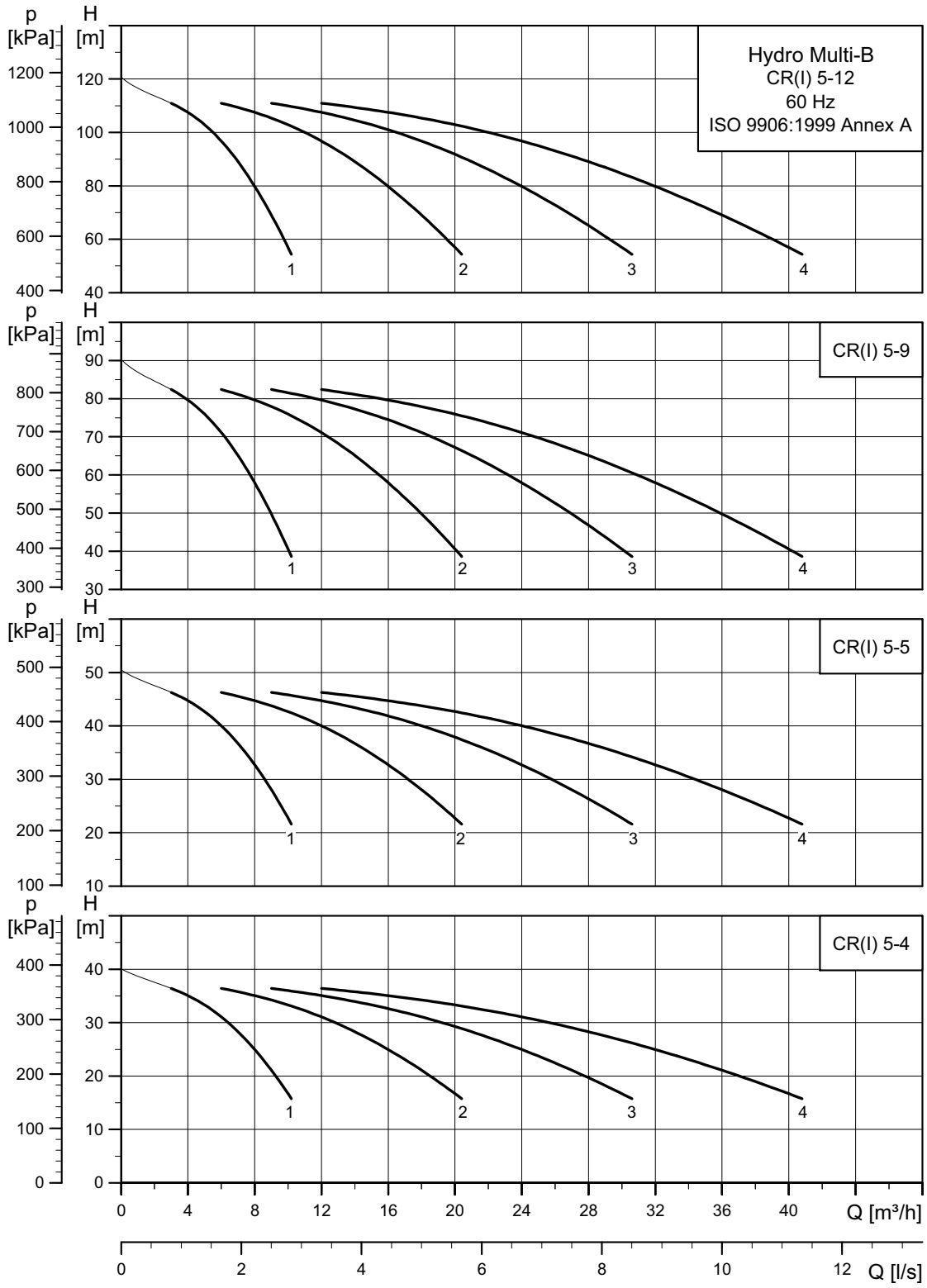
TM06 3263 5014

Hydro Multi-B E with CR, CRI 3, 60 Hz



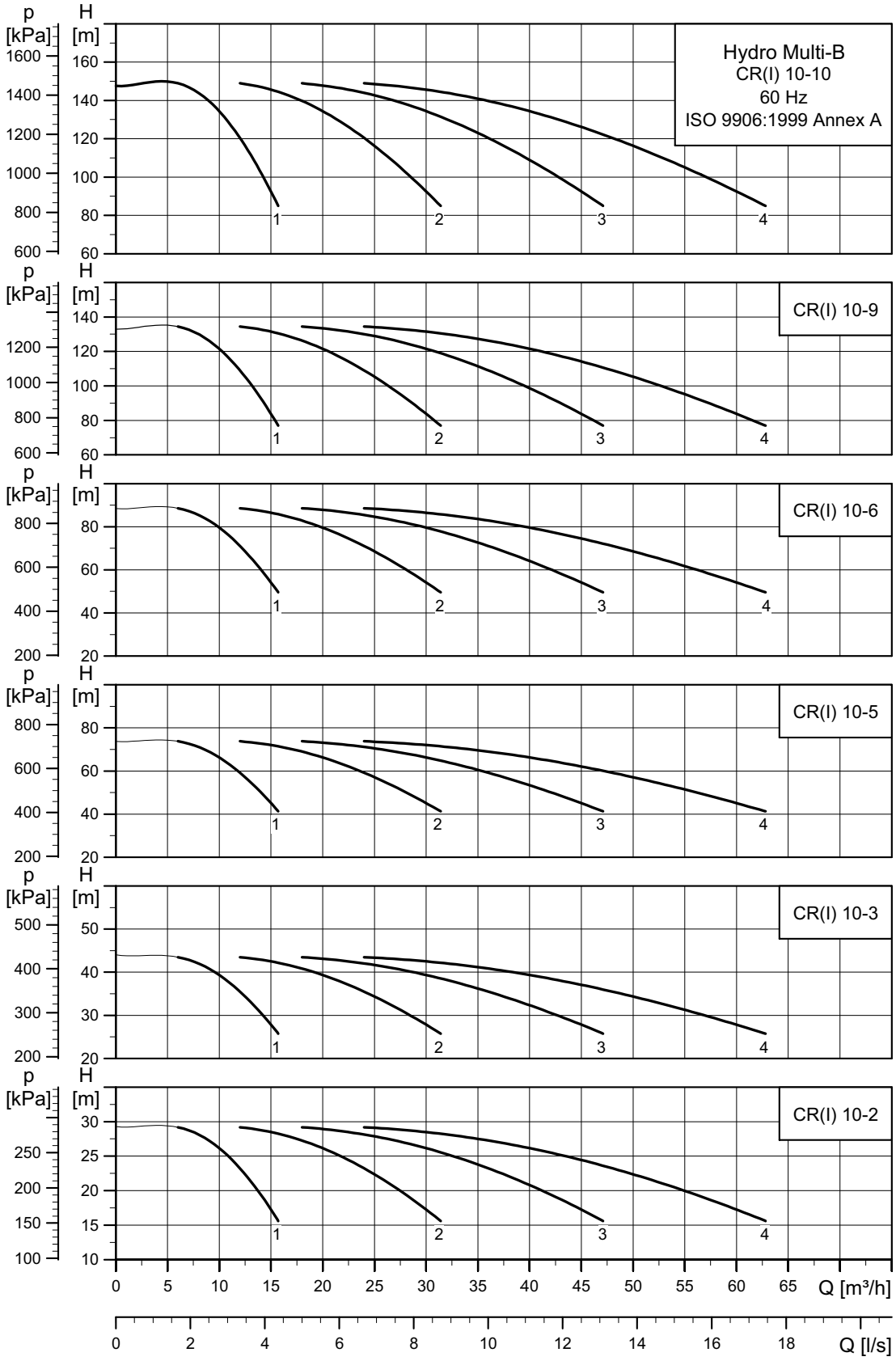
TM06 3264 5014

Hydro Multi-B E with CR(I) 5, 60 Hz



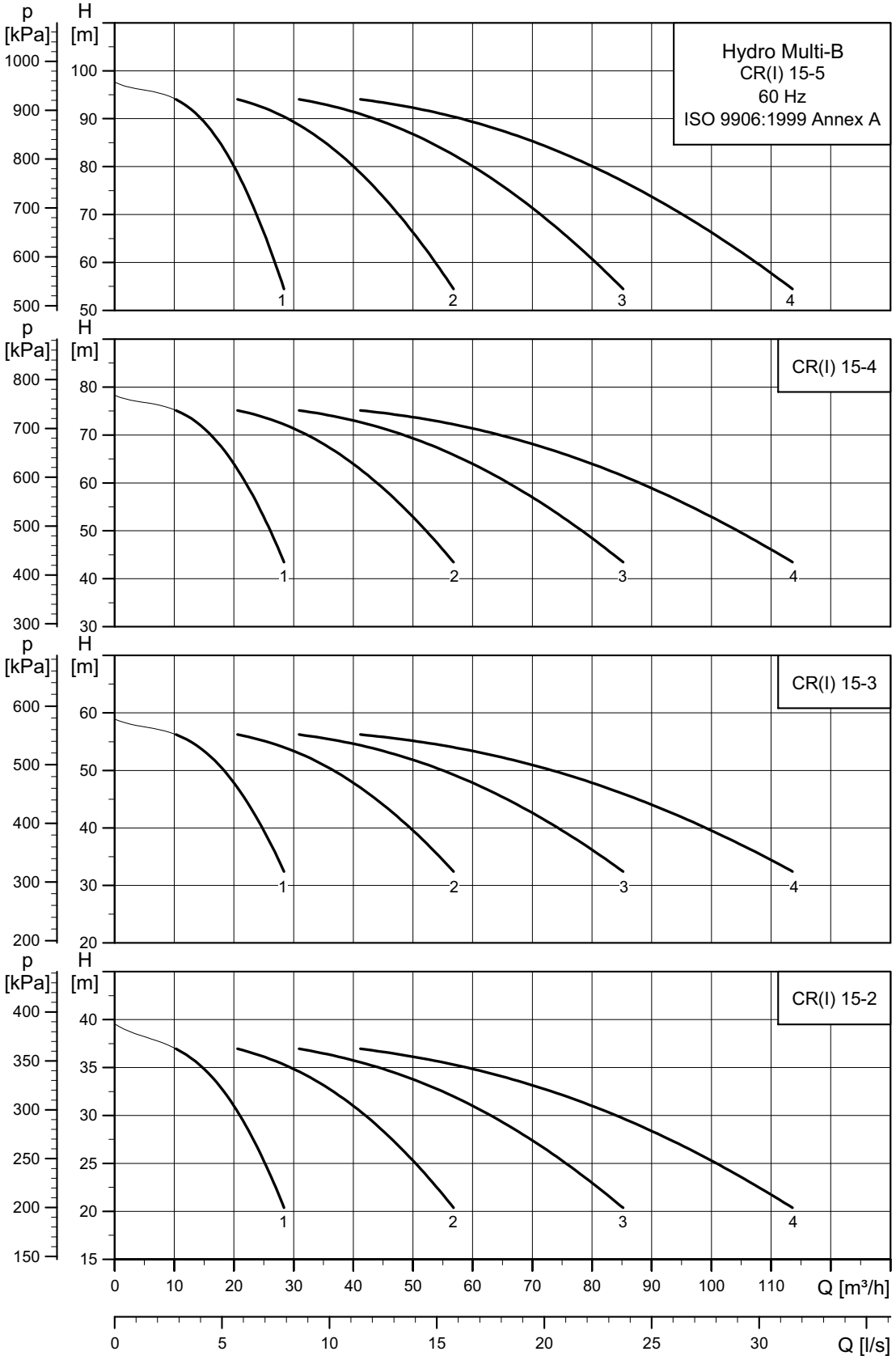
TM06 3265 5014

Hydro Multi-B E with CR(I) 10, 60 Hz



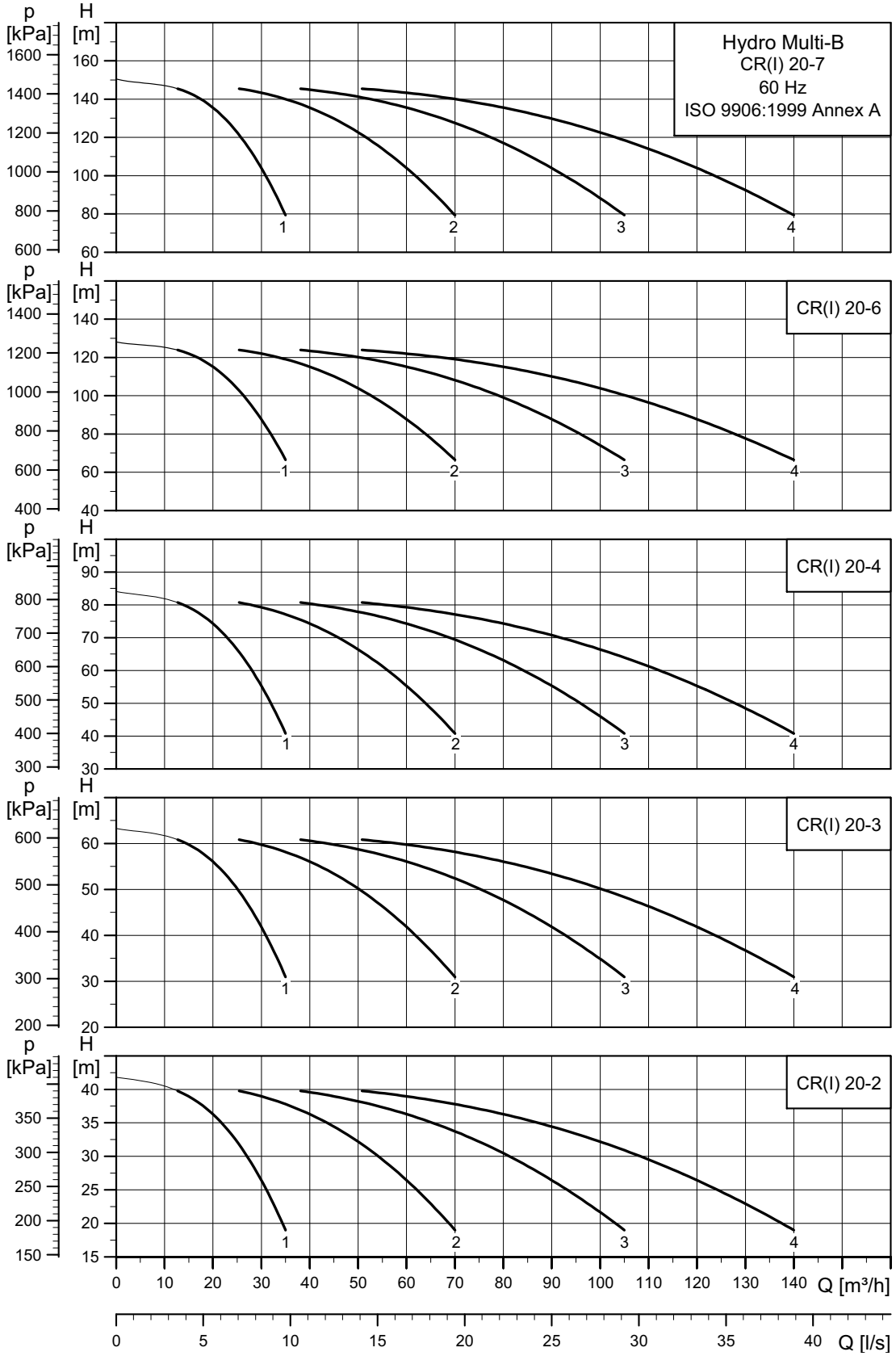
TM06 3266 5014

Hydro Multi-B E with CR(I) 15, 60 Hz



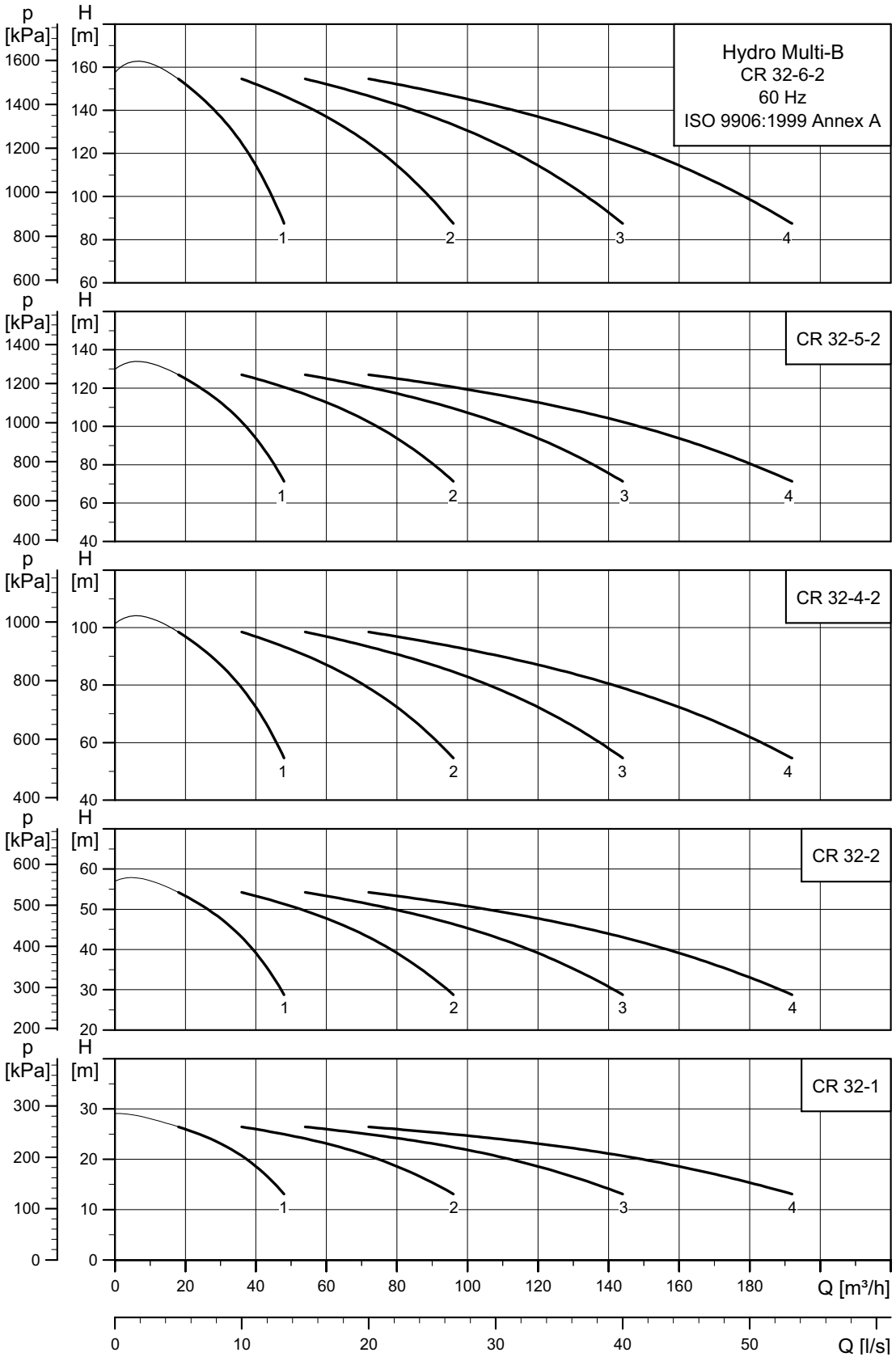
TM06 3267 5014

Hydro Multi-B E with CR, CRI 20, 60 Hz



TM06 3268 5014

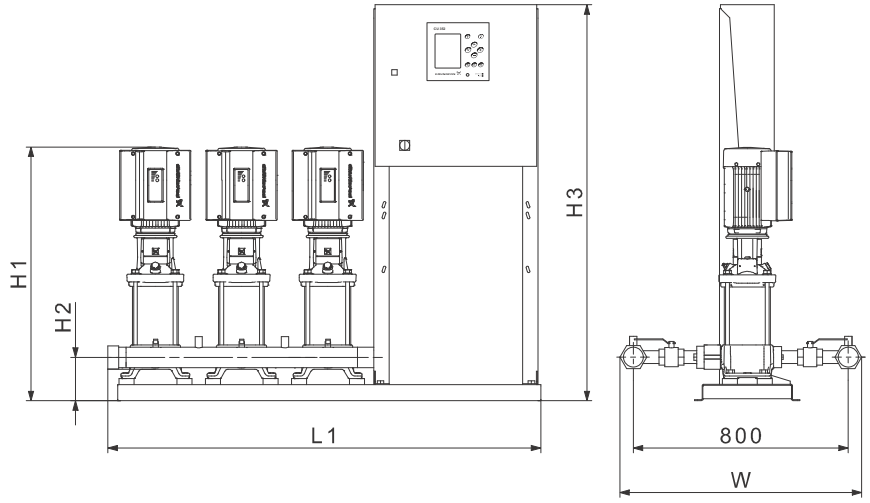
Hydro Multi-B E with CR, CRI 32, 60 Hz



TM06 3269 5014

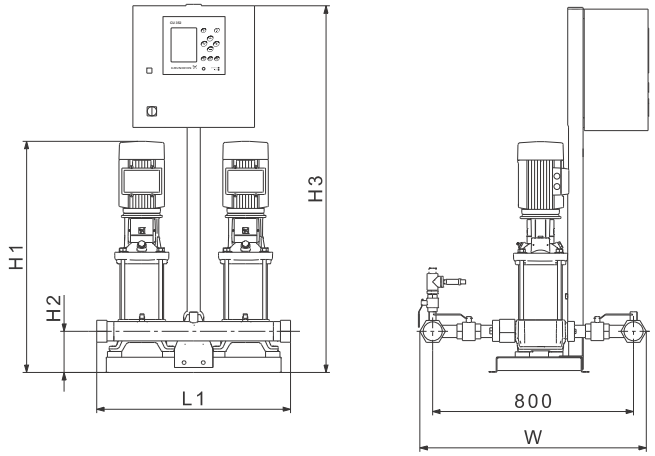
9. Technical data

Dimensional sketches



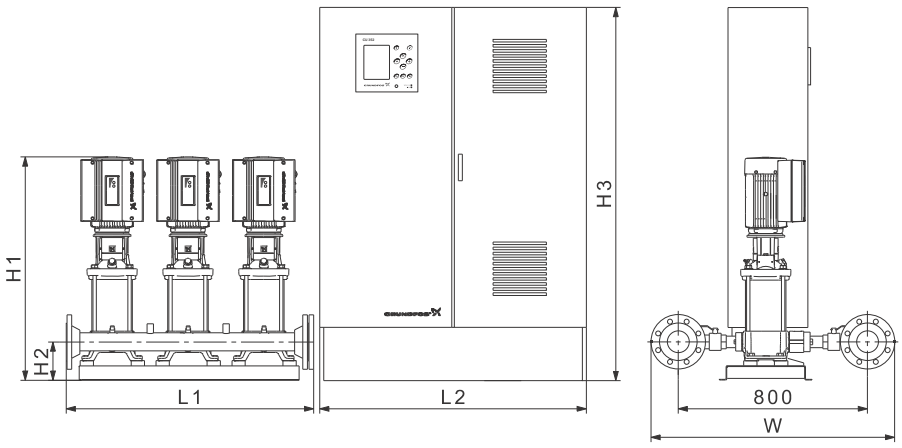
TM03 1182 2310

Fig. 16 Dimensional sketch of a booster system with a control cabinet mounted on the same base frame as the pumps (design E). The booster system is shown as an example. The pumps supplied may differ from the sketch.



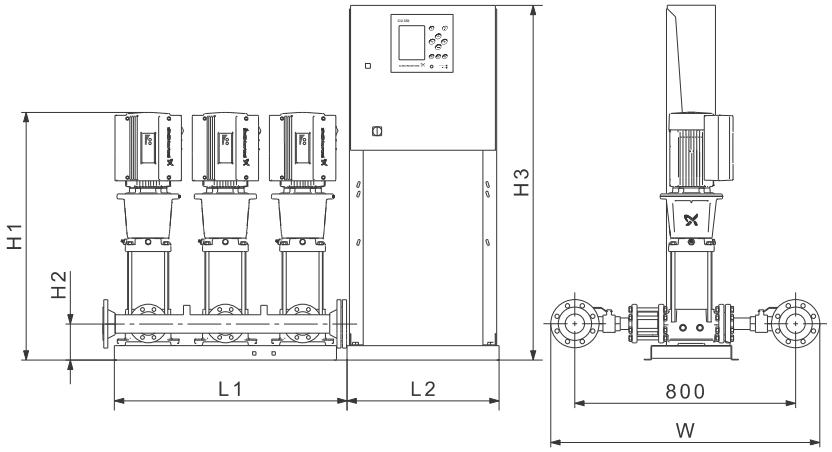
TM03 1183 2310

Fig. 17 Dimensional sketch of a booster system with a control cabinet centred on the base frame (design F). The booster system is shown as an example. The pumps supplied may differ from the sketch.



TM04 7829 2410

Fig. 18 Dimensional sketch of a booster system with a floor-mounted control cabinet (design G). The booster system is shown as an example. The pumps supplied may differ from the sketch.



TM04 7830 2410

Fig. 19 Dimensional sketch of a booster system with a control cabinet mounted on a separate base frame (design H). The booster system is shown as an example. The pumps supplied may differ from the sketch.

Electrical data, dimensions and weights

Hydro Multi-B E with CR, 50 Hz

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 3-7	U4	0.55	1.4	R 2	714	1490	850	621	154	1505	170	E
	CR 3-10	U4	0.75	1.9	R 2	714	1490	850	721	154	1505	179	E
	CR 3-15	U4	1.1	2.5	R 2	714	1490	850	831	154	1505	188	E
	CR 3-19	U4	1.5	3.2	R 2	714	1490	850	949	154	1505	206	E
3	CR 3-7	U4	0.55	1.4	R 2	714	1810	850	621	154	1505	209	E
	CR 3-10	U4	0.75	1.9	R 2	714	1810	850	721	154	1505	229	E
	CR 3-15	U4	1.1	2.5	R 2	714	1810	850	831	154	1505	235	E
	CR 3-19	U4	1.5	3.2	R 2	714	1810	850	949	154	1505	263	E
4	CR 3-7	U4	0.55	1.4	R 2½	730	1390	850	621	154	1505	257	H
	CR 3-10	U4	0.75	1.9	R 2½	730	1390	850	721	154	1505	276	H
	CR 3-15	U4	1.1	2.5	R 2½	730	1390	850	831	154	1505	289	H
	CR 3-19	U4	1.5	3.2	R 2½	730	1390	850	949	154	1505	324	H

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 5-4	U4	0.55	1.4	R 2	714	1490	850	603	154	1505	169	E
	CR 5-5	U4	0.75	1.9	R 2	714	1490	850	676	154	1505	177	E
	CR 5-8	U4	1.1	2.5	R 2	714	1490	850	777	154	1505	185	E
	CR 5-10	U4	1.5	3.2	R 2	714	1490	850	877	154	1505	203	E
	CR 5-16	U4	2.2	4.5	R 2	714	1490	850	1079	154	1505	226	E
	CR 5-20	U4	3	6.3	R 2	714	1490	850	1205	154	1505	232	E
3	CR 5-4	U4	0.55	1.4	R 2	714	1810	850	603	154	1505	207	E
	CR 5-5	U4	0.75	1.9	R 2	714	1810	850	676	154	1505	219	E
	CR 5-8	U4	1.1	2.5	R 2	714	1810	850	777	154	1505	230	E
	CR 5-10	U4	1.5	3.2	R 2	714	1810	850	877	154	1505	256	E
	CR 5-16	U4	2.2	4.5	R 2	714	1810	850	1079	154	1505	277	E
	CR 5-20	U4	3	6.3	R 2	714	1810	850	1205	154	1505	303	E
4	CR 5-4	U4	0.55	1.4	R 2½	730	1390	850	603	154	1505	249	H
	CR 5-5	U4	0.75	1.9	R 2½	730	1390	850	676	154	1505	265	H
	CR 5-8	U4	1.1	2.5	R 2½	730	1390	850	777	154	1505	283	H
	CR 5-10	U4	1.5	3.2	R 2½	730	1390	850	877	154	1505	318	H
	CR 5-16	U4	2.2	4.5	R 2½	730	1390	850	1079	154	1505	345	H
	CR 5-20	U4	3	6.3	R 2½	730	1390	850	1205	154	1505	375	H

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 10-3	U4	1.1	2.5	R 2½	880	1810	850	732	184	1505	221	E
	CR 10-4	U4	1.5	3.2	R 2½	880	1490	850	808	184	1505	233	E
	CR 10-6	U4	2.2	4.5	R 2½	880	1810	850	908	184	1505	270	E
	CR 10-9	U4	3	6.3	R 2½	880	1490	850	1017	184	1505	260	E
	CR 10-1	U4	4	7.9	R 2½	880	1490	850	1144	184	1505	312	E
	CR 10-14	U4	4	7.9	R 2½	880	640	850	1255	184	1505	284	E
3	CR 10-3	U4	1.1	2.5	DN80	1000	1810	850	732	184	1505	274	E
	CR 10-4	U4	1.5	3.2	DN80	1000	1810	850	808	184	1505	301	E
	CR 10-6	U4	2.2	4.5	DN80	1000	1810	850	908	184	1505	316	E
	CR 10-9	U4	3	6.3	DN80	1000	1810	850	1017	184	1505	345	E
	CR 10-1	U4	4	7.9	R 2½	880	1810	850	1144	184	1505	388	E
	CR 10-14	U4	4	7.9	R 2½	880	1810	850	1255	184	1505	389	E
4	CR 10-3	U4	1.1	2.5	DN100	1020	1390	850	732	184	1505	355	H
	CR 10-4	U4	1.5	3.2	DN100	1020	1390	850	808	184	1505	391	H
	CR 10-6	U4	2.2	4.5	DN100	1020	1390	850	908	184	1505	411	H
	CR 10-9	U4	3	6.3	DN100	1020	1390	850	1017	184	1505	445	H
	CR 10-1	U4	4	7.9	DN100	1020	1390	850	1144	184	1505	506	H
	CR 10-14	U4	4	7.9	DN100	1020	1390	850	1255	184	1505	506	H

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 15-2	U4	2.2	4.5	DN80	1150	1490	850	840	194	1505	284	E
	CR 15-3	U4	3	6.3	DN80	1150	1490	850	904	194	1505	277	E
	CR 15-5	U4	4	7.9	DN80	1150	1490	850	1031	194	1505	318	E
	CR 15-7	U4	5.5	11.0	DN80	1150	1490	850	1172	194	1505	352	E
	CR 15-9	U4	7.5	14.2	DN80	1150	1490	850	1250	194	1505	380	E
	CR 15-1	U4	7.5	14.2	DN80	1150	750	1000	1464	194	1800	509	G
3	CR 15-2	U4	2.2	4.5	DN100	1170	1810	850	840	194	1505	345	E
	CR 15-3	U4	3	6.3	DN100	1170	1810	850	904	194	1505	368	E
	CR 15-5	U4	4	7.9	DN100	1170	1810	850	1031	194	1505	411	E
	CR 15-7	U4	5.5	11.0	DN100	1170	1810	850	1172	194	1505	523	E
	CR 15-9	U4	7.5	14.2	DN100	1170	1810	850	1250	194	1505	562	E
	CR 15-10	U4	7.5	14.2	DN100	1170	1070	1000	1464	194	1800	699	G
4	CR 15-2	U4	2.2	4.5	DN100	1170	1390	850	840	194	1505	424	H
	CR 15-3	U4	3	6.3	DN100	1170	1390	850	904	194	1505	453	H
	CR 15-5	U4	4	7.9	DN100	1170	1390	850	1031	194	1505	516	H
	CR 15-7	U4	5.5	11.0	DN100	1170	1390	850	1172	194	1505	626	H
	CR 15-9	U4	7.5	14.2	DN100	1170	1390	850	1250	194	1505	682	H
	CR 15-10	U4	7.5	14.2	DN100	1170	1390	1000	1464	194	1800	823	G

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 20-2	U4	2.2	4.5	DN80	1150	1490	850	840	194	1505	284	E
	CR 20-3	U4	4	7.9	DN80	1150	1490	850	992	194	1505	312	E
	CR 20-5	U4	5.5	11.0	DN80	1150	1490	850	1082	194	1505	345	E
	CR 20-7	U4	7.5	14.2	DN80	1150	1490	850	1160	194	1505	374	E
3	CR 20-2	U4	2.2	4.5	DN100	1170	1810	850	840	194	1505	345	E
	CR 20-3	U4	4	7.9	DN100	1170	1810	850	992	194	1505	402	E
	CR 20-5	U4	5.5	11.0	DN100	1170	1810	850	1082	194	1505	514	E
	CR 20-7	U4	7.5	14.2	DN100	1170	1810	850	1160	194	1505	553	E
4	CR 20-2	U4	2.2	4.5	DN100	1170	1390	850	840	194	1505	424	H
	CR 20-3	U4	4	7.9	DN100	1170	1390	850	992	194	1505	504	H
	CR 20-5	U4	5.5	11.0	DN100	1170	1390	850	1082	194	1505	614	H
	CR 20-7	U4	7.5	14.2	DN100	1170	1390	850	1160	194	1505	666	H

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 32-2	U4	4	7.9	DN100	1170	1850	850	1051	209	1505	386	E
	CR 32-3	U4	5.5	11.0	DN100	1170	1850	850	1140	209	1505	398	E
	CR 32-4	U4	7.5	14.2	DN100	1170	1850	850	1198	209	1505	1294	E
	CR 32-6	U4	11	20.2	DN100	1170	1110	1000	1540	209	1800	703	G
	CR 32-7	U4	15	26.9	DN100	1170	1110	1000	1610	209	1800	654	G
3	CR 32-2	U4	4	7.9	DN150	1235	1610	850	1051	209	1505	555	H
	CR 32-3	U4	5.5	11.0	DN150	1235	1610	850	1140	209	1505	593	H
	CR 32-4	U4	7.5	14.2	DN150	1235	1610	850	1198	209	1505	652	H
	CR 32-6	U4	11	20.2	DN150	1235	1610	1000	1540	209	1800	923	G
	CR 32-7	U4	15	26.9	DN150	1235	1610	1000	1610	209	1800	915	G
4	CR 32-2	U4	4	7.9	DN150	1235	2110	850	1051	209	1505	694	H
	CR 32-3	U4	5.5	11.0	DN150	1235	2110	850	1140	209	1505	741	H
	CR 32-4	U4	7.5	14.2	DN150	1235	2110	850	1198	209	1505	789	H
	CR 32-6	U4	11	20.2	DN150	1235	2110	1000	1540	209	1800	1142	G
	CR 32-7	U4	15	26.9	DN150	1235	2110	1000	1610	209	1800	1193	G

E system with two to four CR pumps and Danfoss FC51 VFD.
Supply voltage U4:3 x 380-415, PE, 50 Hz.
Supply voltage U6:3 x 380-415, PE, 60 Hz.
Supply voltage UA:3 x 440-480, PE, 60 Hz
Design E: Booster system with the control cabinet mounted on the same base frame as the pumps.
Design F: Booster system with the control cabinet centred on the base frame.
Design G: Booster system with the control cabinet mounted on its own base for floor mounting. The control cabinet can be placed up to 2 metres from the pumps.
Design H: ASEAN design and systems with the control cabinet mounted on its own base for floor mounting. The control cabinet can be placed up to 2 metres from the pumps.
Dimensions may vary by ± 10 mm.

Hydro Multi-B E with CR, 60 Hz

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 3-5	U6	0.37	1.0	R 2	714	1490	850	631	154	1505	182	E
2	CR 3-8	U6	0.55	1.4	R 2	714	1490	850	705	154	1505	233	E
2	CR 3-11	UA	0.75	1.9	R 2	714	1490	850	805	154	1505	626	E
3	CR 3-5	U6	0.37	1.0	R 2	714	1810	850	631	154	1505	239	E
3	CR 3-8	U6	0.55	1.4	R 2	714	1810	850	705	154	1505	254	E
3	CR 3-11	UA	0.75	1.9	R 2	714	1810	850	805	154	1505	273	E
4	CR 3-5	U6	0.37	1.0	R 2½	730	1390	850	631	154	1505	188	H
4	CR 3-8	U6	0.55	1.4	R 2½	730	1390	850	705	154	1505	195	H
4	CR 3-11	UA	0.75	1.9	R 2½	730	1390	850	805	154	1505	236	H

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 5-4	U6	0.55	1.4	R 2	714	1490	850	669	154	1505	688	E
2	CR 5-5	UA	0.75	1.9	R 2	714	1490	850	742	154	1505	222	E
2	CR 5-9	UA	1.1	2.5	R 2	714	1490	850	890	154	1505	234	E
2	CR 5-12	UA	1.5	3.2	R 2	714	2980	850	989	154	1505	682	E
3	CR 5-4	U6	0.55	1.4	R 2	714	1810	850	669	154	1505	292	E
3	CR 5-5	UA	0.75	1.9	R 2	714	1810	850	742	154	1505	312	E
3	CR 5-9	UA	1.1	2.5	R 2	714	1810	850	890	154	1505	544	E
3	CR 5-12	UA	1.5	3.2	R 2	714	2770	850	989	154	1505	501	E
4	CR 5-4	U6	0.55	1.4	R 2½	730	1390	850	669	154	1505	259	H
4	CR 5-5	UA	0.75	1.9	R 2½	730	1390	850	742	154	1505	276	H
4	CR 5-9	UA	1.1	2.5	R 2½	730	1390	850	890	154	1505	300	H
4	CR 5-12	UA	1.5	3.2	R 2½	730	1390	850	989	154	1505	341	H

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 10-2	UA	1.1	2.5	R 2½	880	1490	850	748	184	1505	317	E
2	CR 10-3	UA	1.5	3.2	R 2½	880	1490	850	818	184	1505	346	E
2	CR 10-5	UA	2.2	4.5	R 2½	880	1490	850	897	184	1505	400	E
2	CR 10-6	UA	3	6.3	R 2½	880	1490	850	964	184	1505	387	E
2	CR 10-9	UA	4	7.9	R 2½	880	1490	850	1105	184	1505	246	E
3	CR 10-2	UA	1.1	2.5	DN80	1000	1810	850	748	184	1505	613	E
3	CR 10-3	UA	1.5	3.2	DN80	1000	1810	850	818	184	1505	235	E
3	CR 10-5	UA	2.2	4.5	DN80	1000	1810	850	897	184	1505	639	E
3	CR 10-6	UA	3	6.3	DN80	1000	1810	850	964	184	1505	265	E
3	CR 10-9	UA	4	7.9	R 2½	880	1810	850	1105	184	1505	315	E
4	CR 10-2	UA	1.1	2.5	DN100	1020	1390	850	748	184	1505	328	H
4	CR 10-3	UA	1.5	3.2	DN100	1020	1390	850	818	184	1505	333	H
4	CR 10-5	UA	2.2	4.5	DN100	1020	1390	850	897	184	1505	333	H
4	CR 10-6	UA	3	6.3	DN100	1020	1390	850	964	184	1505	413	H
4	CR 10-9	UA	4	7.9	DN100	1020	1390	850	1105	184	1505	410	H

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 15-2	UA	2.2	4.5	DN80	1150	1490	850	859	194	1505	368	E
2	CR 15-3	UA	3	6.3	DN80	1150	1490	850	941	194	1505	405	E
2	CR 15-4	UA	4	7.9	DN80	1150	1490	850	1037	194	1505	425	E
2	CR 15-5	U6	5.5	11.0	DN80	1150	1490	850	1070	194	1505	435	E
3	CR 15-2	UA	2.2	4.5	DN100	1170	1810	850	859	194	1505	503	E
3	CR 15-3	UA	3	6.3	DN100	1170	1810	850	941	194	1505	506	E
3	CR 15-4	UA	4	7.9	DN100	1170	1810	850	1037	194	1505	291	E
3	CR 15-5	U6	5.5	11.0	DN100	1170	1810	850	1070	194	1505	294	E
4	CR 15-2	UA	2.2	4.5	DN100	1170	1390	850	859	194	1505	327	H
4	CR 15-3	UA	3	6.3	DN100	1170	1390	850	941	194	1505	386	H
4	CR 15-4	UA	4	7.9	DN100	1170	1390	850	1037	194	1505	412	H
4	CR 15-5	U6	5.5	11.0	DN100	1170	1390	850	1070	194	1505	405	H

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 20-2	U6	2.2	4.5	DN80	1150	1490	850	896	194	1505	263	E
2	CR 20-3	U6	4	7.9	DN80	1150	1490	850	992	194	1505	374	E
2	CR 20-4	U6	5.5	11.0	DN80	1150	1490	850	1025	194	1505	407	E
2	CR 20-6	U6	7.5	14.2	DN80	1150	750	1000	1284	194	1800	570	G
3	CR 20-2	U6	2.2	4.5	DN100	1170	1810	850	896	194	1505	292	E
3	CR 20-3	U6	4	7.9	DN100	1170	1810	850	992	194	1505	424	E
3	CR 20-4	U6	5.5	11.0	DN100	1170	1810	850	1025	194	1505	1330	E
3	CR 20-6	U6	7.5	14.2	DN100	1170	1070	1000	1284	194	1800	665	G
4	CR 20-2	U6	2.2	4.5	DN100	1170	1390	850	896	194	1505	195	H
4	CR 20-3	U6	4	7.9	DN100	1170	1390	850	992	194	1505	569	H
4	CR 20-4	U6	5.5	11.0	DN100	1170	1390	850	1025	194	1505	562	H
4	CR 20-6	U6	7.5	14.2	DN100	1170	1390	1000	1284	194	1800	569	G

No. of pumps	Pump type	Supply voltage [V]	Motor [kW]	Max. I_N [A]	Connection	W [mm]	L1 [mm]	L2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]	Design
2	CR 32-1	U6	4	7.9	DN100	1170	1850	850	944	209	1505	174	E
2	CR 32-2	UA	5.5	11.0	DN100	1170	1850	850	1058	209	1505	256	E
2	CR 32-4-2	UA	7.5	14.2	DN100	1170	1110	1000	1400	209	1800	562	G
2	CR 32-5-2	UA	11	20.2	DN100	1170	1110	1000	1470	209	1800	400	G
3	CR 32-1	U6	4	7.9	DN150	1235	1610	850	944	209	1505	226	H
3	CR 32-2	UA	5.5	11.0	DN150	1235	1610	850	1058	209	1505	364	H
3	CR 32-4-2	UA	7.5	14.2	DN150	1235	1610	1000	1400	209	1800	922	G
3	CR 32-5-2	UA	11	20.2	DN150	1235	1610	1000	1470	209	1800	411	G
4	CR 32-1	U6	4	7.9	DN150	1235	2110	850	944	209	1505	259	H
4	CR 32-2	UA	5.5	11.0	DN150	1235	2110	850	1058	209	1505	265	H
4	CR 32-4-2	UA	7.5	14.2	DN150	1235	2110	1000	1400	209	1800	659	G
4	CR 32-5-2	UA	11	20.2	DN150	1235	2110	1000	1470	209	1800	487	G

E system with two to four CR pumps and Danfoss FC51 VFD.
Supply voltage U4:3 x 380-415, PE, 50 Hz.
Supply voltage U6:3 x 380-415, PE, 60 Hz.
Supply voltage UA:3 x 440-480, PE, 60 Hz
Design E: Booster system with the control cabinet mounted on the same base frame as the pumps.
Design F: Booster system with the control cabinet centred on the base frame.
Design G: Booster system with the control cabinet mounted on its own base for floor mounting. The control cabinet can be placed up to 2 metres from the pumps.
Design H: ASEAN design and systems with the control cabinet mounted on its own base for floor mounting. The control cabinet can be placed up to 2 metres from the pumps.
Dimensions may vary by ± 10 mm.

10. Optional equipment

All optional equipment must be specified when ordering the booster system as it must be fitted from factory prior to delivery.

Redundant primary sensor

TM04 4125 0809

Fig. 20 Redundant primary sensor

In order to increase the reliability, a redundant primary sensor can be connected as backup sensor for the primary sensor.

Note: The redundant primary sensor must be of the same type as the primary sensor.

Description	Range [bar]	Product number
Redundant primary sensor	10	97747435
	16	97747434

Water shortage protection

The booster system must be protected against water shortage.

The inlet conditions determine the type of water shortage protection to be used:

- If the system draws water from a tank or well, select a float switch, analog sensor or external electrode relay.
- If the system has an inlet pressure, select a pressure transmitter or a pressure switch.

Description	Parameter	Product number
Float switch	5 m[1)]	96020142
	10 m[1)]	96819727
Pressure transmitter	0 ~ 4 bar	96020074
	0 ~ 6 bar	96020066
Pressure switch	0 ~ 6 bar	96433641

1) Cable length.

Non-return valve

As standard, non-return valves are fitted on the discharge side of the pumps of the booster system.

In systems with a suction lift, we recommend that you install non-return valves on the suction side of the pumps to prevent water shortage.

Description	Product number
Non-return valve on suction side	97896859

Note: If you install a non-return valve on the suction side, the height (H1) of the suction manifold will differ from the values stated in section *9. Technical data*, pages 37 to 40.

CIM communication module

GrA6121

Fig. 21 Grundfos CIM communication interface module

You can connect the CU 323 to an external communication network via an add-on fieldbus CIM module.

Module	Fieldbus protocol
CIM 050	GENIbus
CIM 110	LonWorks
CIM 150	PROFIBUS DP
CIM 200	Modbus RTU
CIM 250	GSM
CIM 270	Grundfos Remote Management
CIM 300	BACnet MS/TP
CIM 500	PROFIBUS I/O / Modbus TCP

For further information about communication via CIM modules, data transfer and fieldbus protocols, see the CIM documentation available in Grundfos Product Center on www.grundfos.com.

Phase failure monitoring

The booster system must be protected against phase failure.

Description	Location	Product number
Phase failure monitoring	In control panel	91767242

Beacon

The beacon illuminates in case of a system alarm.

Description	Location	Product number
Beacon	On top of the control cabinet	91763002
	External[1)]	

1) Cable not included.

Acoustic alarm

The acoustic alarm sounds in case of a system alarm.

Description	Location	Product number
Acoustic alarm	In control cabinet	91763001

External transformer

An external transformer can provide isolated power supply for the CU 323 and relay in both tank-filling and pressure-boosting systems.

Description	Location	Product number
External transformer	In control panel	91073191

High-level lamp

The pilot lamp in the cabinet front illuminates if the pressure or level becomes too high.

Description	Product number
Pilot lamp (red)	91767281

Pilot lamp indicating alarm

A pilot lamp in the cabinet front illuminates in case of a system alarm.

Description	Product number
Pilot lamp (red)	91767281

Pilot lamp indicating operation

A pilot lamp in the cabinet front is on when the system is in operation.

Description	Product number
Pilot lamp (green)	91767280

11. Accessories

All accessories can be retrofitted to the booster system.

Foot valve

TM04 4128 0809

Fig. 22 Foot valves

The booster system must be protected against dry running.

Foot valves are typically used in minor booster systems with a suction lift. For example when the booster system draws water from a break tank placed at a lower geodetic height than the booster system.

Foot valves are designed to ensure optimum suction conditions.

Description	Connection	Product number
Foot valve	Rp 2	956120
	Rp 3	956130
	Rp 4	956449

Float switch

In tank-filling systems, the float switches are installed in the tank to indicate the hydrostatic level of empty or full.

Description	Cable length [m]	Product number
Float switch	5	96020142
	10	96819727

Analog sensor

In tank-filling systems, the analog sensor is installed at the bottom of the tank to monitor the hydrostatic level.

Description	Level [m]	Product number
Analog sensor	1	97949405
	5	97949406

Additional documentation

The publication numbers below refer to the printed documentation for the booster system (group versions).

Document	Publication number
Installation and operating instructions	97822771
Quick guide	97850363

In addition to the printed documentation, Grundfos offers product information in Grundfos Product Center on www.grundfos.com. See also page 44.

Diaphragm tank

TM02 9097 1904

Fig. 23 Diaphragm tanks

A diaphragm tank must always be installed on the discharge side of the booster system.

Note: The diaphragm tanks are separate tanks without valve, fittings and pipes.

Diaphragm tank, 10 bar

Capacity [litres]	Connection	Product number
8	G 3/4	96528335
12	G 3/4	96528336
18	G 3/4	96528337
24	G 1	96528339
33	G 1	96528340
60	G 1	96528341
80	G 1	96528342
100	G 1	96528343
130	G 1	96528344
170	G 1	96528345
240	G 1	96528346
300	G 1	96528347
450	G 1	96528348
600	G 1 1/2	96603451
800	G 1 1/2	96603452
1000	G 1 1/2	96603453
1500	DN 65	96573283
2000	DN 65	96573284
3000	DN 65	96573285

Diaphragm tank, 16 bar

Capacity [litres]	Connection	Product number
8	G 3/4	96573347
12	G 3/4	96573348
25	G 3/4	96573349
80	G 1	96603420
100	G 1	96603421
200	G 1 1/4	96603422
300	G 1 1/2	96603423
400	G 1 1/2	96603424
500	G 1 1/2	96603425
600	G 1 1/2	96603426
800	G 1 1/2	96603427
1000	G 1 1/2	96603428

12. Grundfos Product Center

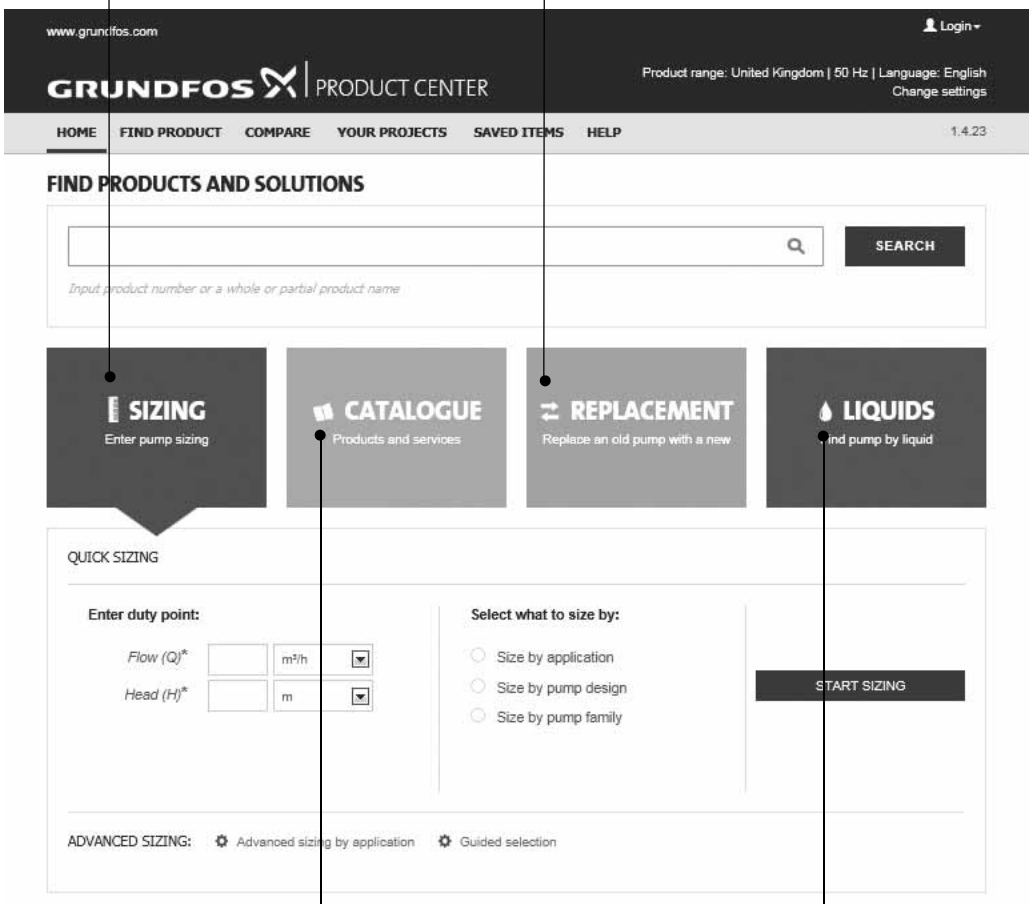
Online search and sizing tool to help you make the right choice.

http://product-selection.grundfos.com

SIZING enables you to size a pump based on entered data and selection choices.

REPLACEMENT enables you to find a replacement product.
Search results will include information on

- the lowest purchase price
- the lowest energy consumption
- the lowest total life cycle cost.



CATALOGUE gives you access to the Grundfos product catalogue.

LIQUIDS enables you to find pumps designed for aggressive, flammable or other special liquids.

All the information you need in one place

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

Downloads

On the product pages, you can download installation and operating instructions, data booklets, service instructions, etc. in PDF format.

Subject to alterations.

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