1. Introduction

Grundfos Hydro Multi-E booster systems are designed for the transfer and pressure boosting of clean water in places such as

- blocks of flats
- hotels
- industry
- hospitals
- schools.

Grundfos Hydro Multi-E booster systems consist of two to four Grundfos CRE, CRIE pumps or two or three CME-A, CME-I pumps connected in parallel and mounted on a common base frame provided with all necessary fittings.

As standard, the Hydro Multi-E is supplied with the following:

- base frame
- pumps
- suction and discharge manifolds
- pressure switch as dry-running protection
- one or two discharge-pressure sensors, depending on pump size
- non-return valves, one per pump
- isolating valves, two per pump
- pressure gauge
- diaphragm tank
- breaker box.

On delivery, the Grundfos Hydro Multi-E booster system is factory-tested and ready for operation.

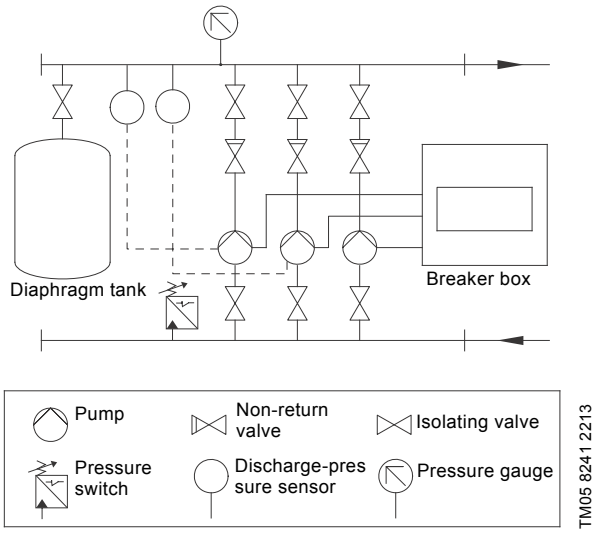


Fig. 1 Hydro Multi-E with three single-phase pumps

The Hydro Multi-E is available in two versions, depending on pump size.

Hydro Multi-E, 0.37 to 2.2 kW

The pumps incorporated in this Hydro Multi-E system are fitted with the new-generation MGE motors which are permanent-magnet motors with a high-efficiency frequency converter. The motors ensure an even higher efficiency than the previous version of the booster system. The MGE motors have a total efficiency which exceeds the IE4 Super Premium Efficiency level defined for fixed-speed motors.

The Hydro Multi-E with pumps in this range offers additional functions:

- multi-master function
- pipe-filling function
- predefined setpoint
- external setpoint influence
- limit-exceeded function.

Hydro Multi-E, 3.0 to 7.5 kW

The Hydro Multi-E with pumps in this range is fitted with MGE motors which are asynchronous motors with built-in frequency converter. These motors are IE3-compliant as standard.

Benefits

Plug-and-pump solution

The Hydro Multi-E is supplied as a complete preassembled system mounted on a base frame. The only task left is to connect the pipes and the power supply.

User-friendliness

The Hydro Multi-E is a highly intelligent booster system which is capable of controlling two to four speed-controlled pumps in cascade. The Hydro Multi-E is one of our most simple booster systems to start up and operate. It has only two buttons for complete control of the system. Alternatively, you can use Grundfos GO Remote for setup and control.

Perfect constant-pressure control

The speed-controlled pumps are perfectly controlled and adjusted by the PI controller of the Hydro Multi-E to deliver the correct pressure at the required flow.

Reliability

The Grundfos CRE, CRIE and CME pumps are known for their reliability and long life. The PI controller is protected inside the pump and this has proven to be a very reliable solution.

Multi-master function (0.37 to 2.2 kW)

All pumps that have a discharge-pressure sensor connected are capable of taking control of the entire booster system. This means that the system will continue to operate as a booster system even if one or more of the pumps or sensors are unavailable. Compared to systems with only one sensor, this makes the Hydro Multi-E an extremely reliable solution.

Redundant sensor (0.37 to 2.2 kW)

No system is more reliable than the weakest component. In connection with booster systems, it is common to rely on only one pressure measurement. However, that makes the operation extremely dependent on one single sensor. On the Hydro Multi-E, we do not depend on one sensor (single point of failure) as the booster system is supplied with two discharge-pressure sensors as standard.

Tested and ready to use

Before delivery, all Hydro Multi-E systems are carefully tested to Grundfos standard, i.e. pressure-tested and tested for full functionality.

Low energy consumption

The Hydro Multi-E ensures low energy consumption through speed-controlled pumps, automatic cascade control of the pumps and highly efficient low-flow operation. The highly efficient motors and pumps also contribute to the overall high efficiency of the Hydro Multi-E system.

Operating conditions

Liquid temperature: 0 to +60 °C.

Ambient temperature:

Power range [kW]	Permissible ambient temperature [°C]
0.37 to 2.2	0 to +50
3.0 to 7.5	0 to +40

Minimum inlet pressure

Hydro Multi-E with CRE pumps

The minimum inlet pressure H in metres head required to avoid cavitation in the pump is calculated as follows:

$H = p_b \times 10.2 - NPSH - H_f - H_v - H_s$

p_b = Barometric pressure in bar.
(Barometric pressure can be set to 1 bar.)
In closed systems, p_b indicates the system pressure in bar.

NPSH = Net Positive Suction Head in metres head
The NPSH value can be read from the NPSH curve at the highest flow which the individual pump will be delivering.

H_f = Friction loss in suction manifold in metres head at the highest flow the individual pump will be delivering.

H_v = Vapour pressure in metres head.

H_s = Safety margin of min. 0.5 metres head.

Hydro Multi-E with CME pumps

Hydro Multi-E systems with CME pumps always require a positive inlet pressure, both during startup and operation.

Note: In some regions, the booster system is available with a low suction manifold which makes it more suitable for suction lift operation. Contact Grundfos for further information.

Maximum inlet pressure

8 bar	10 bar	15 bar
CR(I)E 10-1	CR(I)E 1-4	CR(I)E 3-17
CR(I)E 10-3	CR(I)E 1-6	CR(I)E 5-12
CR(I)E 10-5	CR(I)E 1-9	CR(I)E 5-16
CR(I)E 15-1	CR(I)E 3-2	
CR(I)E 15-2	CR(I)E 3-4	
CR(I)E 20-1	CR(I)E 3-5	
	CR(I)E 3-8	
	CR(I)E 3-11	
	CR(I)E 5-2	
	CR(I)E 5-4	
	CR(I)E 5-5	
	CR(I)E 5-9	
	CR(I)E 10-6	
	CR(I)E 10-9	
	CR(I)E 15-3	
	CR(I)E 15-4	
	CR(I)E 15-5	
	CR(I)E 20-2	
	CR(I)E 20-3	
	CR(I)E 20-4	

Maximum operating pressure

10 bar	16 bar
CME-A 3-3	CME-I 3-7
CME-I 3-3	CME-I 3-9
CME-A 3-5	CME-A 5-6
CME-I 3-5	CME-I 5-6
CME-A 5-3	CME-I 5-8
CME-I 5-3	CME-I 10-4
CME-A 5-4	CME-I 10-5
CME-I 5-4	CR(I)E 3-11
CME-A 5-5	CR(I)E 3-17
CME-I 5-5	CR(I)E 5-9
CME-A 10-2	CR(I)E 5-12
CME-I 10-2	CR(I)E 5-16
CME-A 10-3	CR(I)E 10-6
CME-I 10-3	CR(I)E 10-9
CME-A 15-1	CR(I)E 15-5
CME-A 15-2	CR(I)E 20-4
CME-I 15-2	
CME-A 15-3	
CME-I 15-3	
CR(I)E 1-4	
CR(I)E 1-6	
CR(I)E 1-9	
CR(I)E 3-2	
CR(I)E 3-4	
CR(I)E 3-5	
CR(I)E 3-8	
CR(I)E 5-2	
CR(I)E 5-4	
CR(I)E 5-5	
CR(I)E 5-9	
CR(I)E 10-1	
CR(I)E 10-3	
CR(I)E 10-5	
CR(I)E 15-1	
CR(I)E 15-2	
CR(I)E 20-1	
CR(I)E 20-2	
CR(I)E 20-3	

Note: The total inlet pressure and the pressure when the pump is running against a closed valve must not exceed the maximum system pressure.

3. Construction

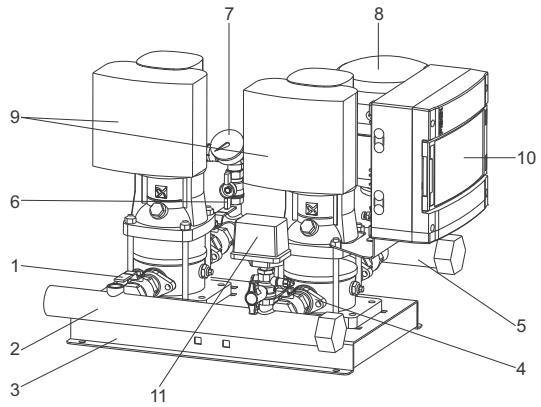


Fig. 4 Hydro Multi-E with two CRE, CRIE pumps

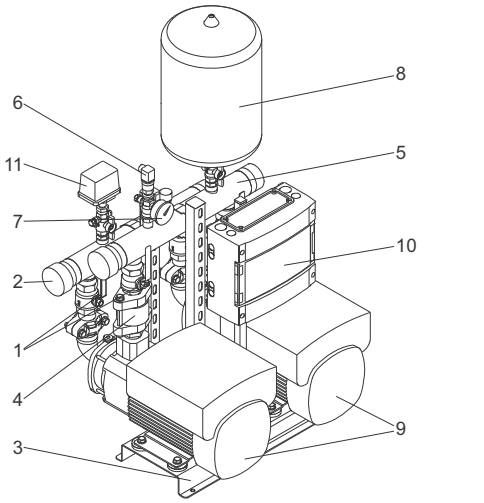


Fig. 5 Hydro Multi-E with two CME pumps

Pos.	Description	Quantity	
		Hydro Multi-E 0.37 to 2.2 kW	Hydro Multi-E 3.0 to 7.5 kW
1	Isolating valve	2 per pump	2 per pump
2	Suction manifold	1	1
3	Base frame	1	1
4	Non-return valve	1 per pump	1 per pump
5	Discharge manifold	1	1
6	Discharge-pressure sensor	2	1
7	Pressure gauge	1	1
8	Diaphragm tank	1	1
9	Pump	2 to 4*	2 to 4*
10	Breaker box	1	1
11	Pressure switch as dry-running protection	1	1

* Only systems with CRE, CRIE pumps are available with four pumps.

System components

The Hydro Multi-E has a base frame fitted with the following components:

Components fitted on suction side

- a suction manifold
- an isolating valve per pump
- a pressure switch for dry-running protection.

Components fitted on discharge side

- a discharge manifold
- a non-return valve per pump
- an isolating valve per pump
- a pressure gauge
- one or two discharge-pressure sensors, depending on pump size
- a diaphragm tank.

The Hydro Multi-E is fitted with a breaker box for switching the power supply on and off.

Materials

The Hydro Multi-E incorporates the well-known high-quality Grundfos CRE, CRIE or CME pumps. However, the quality extends beyond the pumps. As standard, the Hydro Multi-E is supplied with stainless-steel manifolds (EN 1.4301) manufactured using an extrusion method that creates a smooth surface from the connecting pipe to the manifold. This minimises the risk of stagnant water and reduces noise and friction loss.

Note: In some regions, galvanised-steel manifolds are also available. Contact Grundfos for further information.

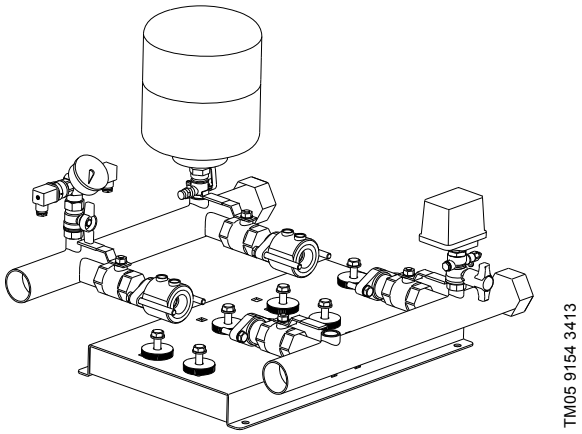


Fig. 6 Base frame, manifolds and valves

Pump type	Material specification for base frame and manifold	
Hydro Multi-E CRE	Stainless steel	EN 1.4301/AISI304
Hydro Multi-E CRIE	Stainless steel	
Hydro Multi-E CME-I	Stainless steel	
Hydro Multi-E CME-A	Galvanised steel	-

4. Installation

Mechanical installation

A Hydro Multi-E booster system must be installed in a well-ventilated room to ensure sufficient cooling of the pumps. Hydro Multi-E is not suitable for outdoor installation.

Place the booster system in such a way that there is sufficient clearance around it for the operator to be able to work freely.

Enclosure class: IP54.

Insulation class: F.

Motor cooling

To ensure adequate cooling of motor and electronics, the following must be observed:

- Place the Hydro Multi-E in a well-ventilated room.
- The temperature of the cooling air must not exceed 40 °C.
- Motor cooling fins, holes in fan cover and fan blades must be kept clean.

Pipework

The pipes connected to the booster system must be of adequate size. Fit expansion joints in the suction and discharge manifolds to avoid resonance. The pipes are to be connected to the suction and discharge manifolds.

The booster system should be tightened up prior to startup.

We recommend to fit pipe supports both on the suction and the discharge side.

The booster system should be positioned on an even and solid surface, for example a concrete floor or foundation. If the booster system is not fitted with vibration dampers, it must be bolted to the floor or foundation.

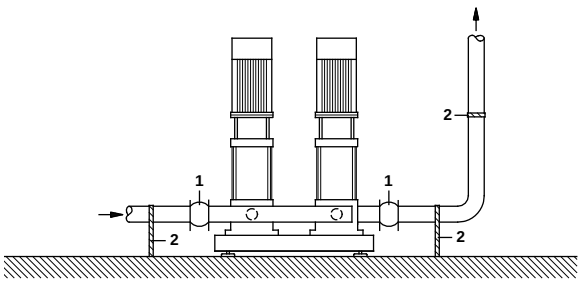


Fig. 8 Pipework

Pos.	Description
1	Expansion joint
2	Pipe support

Expansion joints and pipe supports are not included in a standard booster system.

Electrical installation

The electrical connection and protection should be carried out in accordance with local regulations.

- The Hydro Multi-E must be correctly earthed.
  Note: 4.0 to 5.5 kW motors must be connected to especially reliable/sturdy earth connections due to an earth leakage current above 3.5 mA.
- The pumps require no external motor protection. The motors incorporate thermal protection against slow overloading and blocking (IEC 34-11: TP 211).
- When the pumps are switched on via the power supply, they will start after approx. 5 seconds.

Note: The number of starts and stops via the power supply must not exceed four times per hour.

If the system is supplied with a breaker box for wall mounting, the cabinet must be mounted in accordance with local regulations.

5. Control of Hydro Multi-E

Control options

Communication with Hydro Multi-E is possible by means of the following:

- the control panel on the pumps
- Grundfos GO Remote
- a building management system.

Control panels

The control panel on the pump terminal box enables the operator to change the setpoint and speed and to reset alarms.

The design and functionality of the control panel depend on pump size.

Hydro Multi-E, 0.37 to 2.2 kW

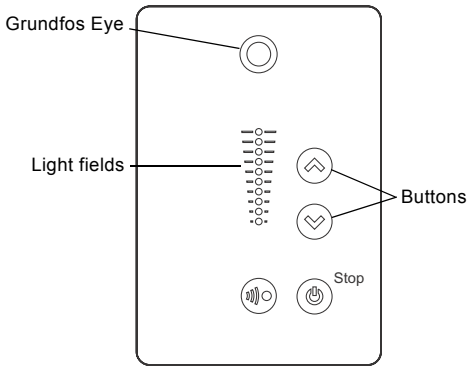
The pump control panel enables infrared and radio communication.

Light fields indicate the setpoint and the buttons can be used for setpoint setting.

The Grundfos Eye is an indicator light that shows the operating status of the pump.

The indicator light will flash in different sequences and provide information about the following:

- power on/off
- pump warnings
- pump alarms
- remote control.



TM05 5362 3612

Fig. 9 Standard control panel, 0.37 to 2.2 kW pumps

Hydro Multi-E, 3.0 to 7.5 kW

The control panel on the pump terminal box enables infrared communication.

An indicator light shows the operating status of the pump.

Light fields indicate the setpoint and the buttons can be used for setpoint setting.

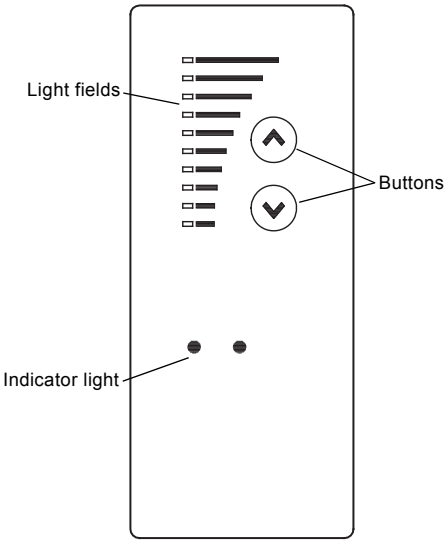


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Fig. 10 Standard control panel, 3.0 to 7.5 kW pumps

Grundfos GO remote

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Fig. 11 Grundfos GO Remote

With the Grundfos GO Remote, the operator can remotely monitor and change settings of the Hydro Multi-E.

The Grundfos GO Remote communicates with the pump via wireless infrared or radio communication, depending on pump size.

Communication interface	Hydro Multi-E 0.37 to 2.2 kW	Hydro Multi-E 3.0 to 7.5 kW
Infrared	•	•
Radio	•	-

The Grundfos GO Remote can be used for the following functions:

- reading of operating data
- reading of warning and alarm indications
- setting of control mode
- setting of setpoint
- selection of external setpoint signal.*
- allocation of pump number making it possible to distinguish between pumps that are connected via Grundfos GENIbus
- selection of function for digital input
- generation of reports (PDF)
- multi-pump setup*
- displaying relevant documentation
- adjusting stop function
- pipe filling*
- PI controller
- analog inputs
- setting of function of relays*
- adjusting limits.*

* Only 0.37 to 2.2 kW systems.

The Grundfos GO Remote offers three different mobile interfaces (MI). See fig. 12.

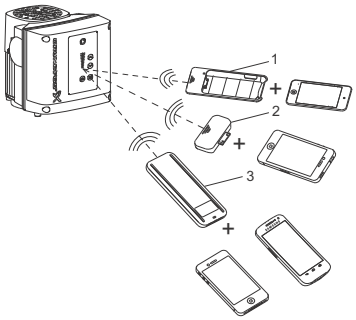

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Fig. 12 Grundfos GO Remote

Pos.	Description
1	Grundfos MI 201: Consists of an Apple iPod touch 4G and a Grundfos cover.
2	Grundfos MI 202: Add-on module which can be used in conjunction with Apple iPod touch 4, iPhone 4G or later.
	Grundfos MI 204: Add-on module which can be used in conjunction with Apple iPod touch 5G or iPhone 5.
3	Grundfos MI 301: Separate module enabling radio or infrared communication. The module can be used in conjunction with an Android or iOS-based Smartphone with Bluetooth connection.

The Grundfos GO Remote is available as an accessory. See page 44.

Building management system (BMS)

Communication with the Hydro Multi-E is possible even though the operator is not present near the Hydro Multi-E. Communication is enabled by having connected the Hydro Multi-E to a building management system allowing the operator to monitor and change control modes and setpoint settings of the Hydro Multi-E.

The communication interface between the Hydro Multi-E system and a central building management system varies, depending on pump size.

Hydro Multi-E, 0.37 to 2.2 kW

These booster systems can communicate with external systems via a Grundfos communication interface module (CIM) that can be fitted in the pumps.
This means that no external communication interface is required.

Hydro Multi-E, 3.0 to 7.5 kW

These booster systems can communicate with external systems via an external Grundfos communication interface unit (CIU).

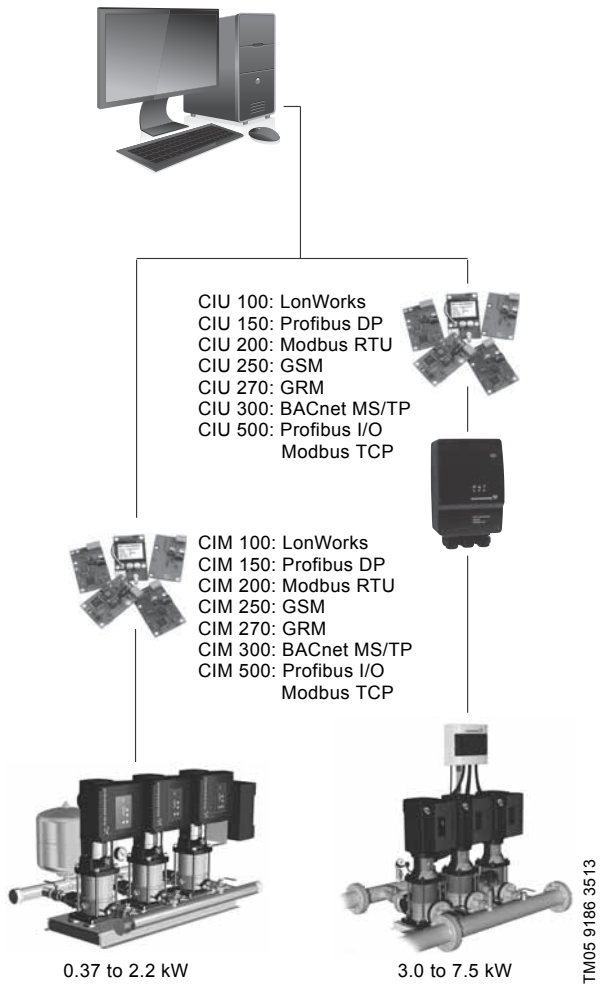


Fig. 13 Structure of a building management system

Control modes

Constant-pressure mode

Hydro Multi-E is suitable for applications where you want to control the pressure on the discharge side of the booster system, irrespective of the flow.

Signals of pressure changes in the piping system are transmitted continuously from the sensor to the Hydro Multi-E. The pump responds to the signals by adjusting its performance up or down to compensate for the pressure difference between the actual and the desired pressures. As this adjustment is a continuous process, a constant pressure is maintained in the piping system.

In constant-pressure mode, the Hydro Multi-E maintains a preset pressure on the discharge side of the booster system, irrespective of the flow.

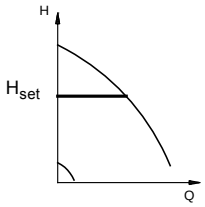


Fig. 14 Constant-pressure mode

To meet the flow requirements of the system, the Hydro Multi-E continuously adjusts the number of running pumps.

Description of functions

Automatic cascade control

Cascade control ensures that the performance of the Hydro Multi-E is automatically adapted to the consumption by switching pumps on or off. The system thus runs as energy-efficiently as possible with a constant pressure and only the number of pumps required.

Dry-running protection

This function is very important as dry running may damage bearings and shaft seals.

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

Level switches, pressure switches or analog sensors signalling water shortage at a set level can be used.
Note: Analog sensors are only available for 0.37 to 2.2 kW systems.

Pump alternation

This function ensures that the operating hours are distributed evenly on the pumps over time.

Limit exceeded 1 and 2

Hydro Multi-E, 0.37 to 2.2 kW

The limit-exceeded function is used for monitoring one or two values/inputs. The function enables different inputs to activate various outputs and alarms/warnings when the signal input has exceeded predetermined limits. The purpose of this function is to monitor parameters which are central for the application. This will enable the pumps to react to possible abnormal operating conditions.

The function can for instance be used for monitoring the following:

- the inlet pressure if an inlet pressure sensor is connected
- the drinking water temperature if a temperature sensor is connected.

Multi-master function

Hydro Multi-E, 0.37 to 2.2 kW

All pumps that have a discharge-pressure sensor connected can function as master pump and control the system. As standard, the Hydro Multi-E is supplied with two discharge-pressure sensors.

As standard, the pump with the lowest number will be the master pump. From factory, the master pump is marked with number 1.

If the master pump is switched off or stopped due to an alarm, one of the other pumps will automatically take over the control of the system. Thereby, the reliability is increased and stop of operation is prevented.

As an option, the system can be supplied with only one discharge-pressure sensor. In that case, the system will stop if the pump or sensor fails.

The system can also be fitted with sensors on all pumps for maximum reliability.

Number of starts per hour

This function limits the number of pump starts and stops per hour.

Each time a pump starts or stops, the system will calculate when the next pump is allowed to start or stop in order not to exceed the permissible number of starts per hour.

This function always allows pumps to be started to meet the requirement, but pump stops will be delayed, if necessary, in order not to exceed the permissible number of starts/stops per hour.

Stop function

The stop function checks the flow regularly by reducing the speed for a short time, thus checking the change in pressure. If there is no or a small change in pressure, the pump will detect a low flow.

When the pump detects a low flow, the speed will be increased until the stop pressure
(actual setpoint + 0.5 x ΔH) is reached and the pump stops. When the pressure has fallen to the start pressure (actual setpoint - 0.5 x ΔH), the pump will restart.

ΔH indicates the difference between start and stop pressures.

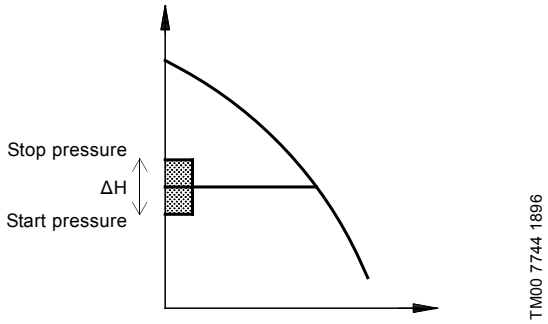


Fig. 15 Start and stop pressures

ΔH is factory-set to 10 % of actual setpoint. ΔH can be set within the range from 5 to 30 % of actual setpoint.

The Hydro Multi-E is fitted with a diaphragm tank of an appropriate size to accommodate the operation in low flow. The precharge pressure must be 0.7 x actual setpoint.

Pipe-filling function

Hydro Multi-E, 0.37 to 2.2 kW

This function ensures a soft start of systems with empty pipework.

The function has two phases:

1. The pipework is slowly filled with water.
2. When the pressure sensor of the system detects that the pipework has been filled with water, the pressure is increased until it reaches the setpoint. See fig. 16.

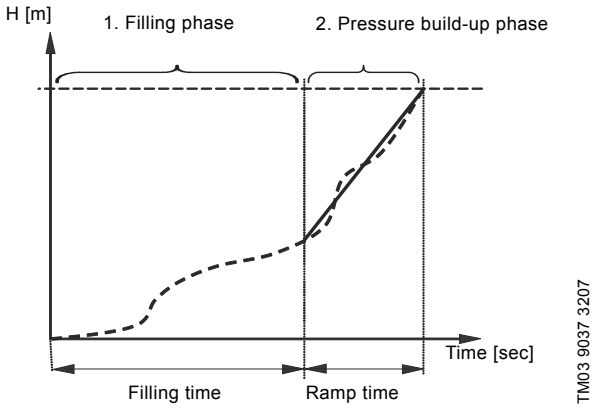


Fig. 16 Filling and pressure build-up phases

The function can be used to prevent water hammer in high-rise buildings with unstable power supply or in irrigation systems.

External setpoint influence

Hydro Multi-E, 0.37 to 2.2 kW

This function is used for influencing the setpoint via an external setpoint signal. The value of the external setpoint signal is used in a formula calculating a "new" setpoint, i.e the actual setpoint. The function is often used for adjusting the setpoint depending on an external input from a Grundfos VSF flowmeter.

Predefined setpoint

Hydro Multi-E, 0.37 to 2.2 kW

This function is used for changing between predefined setpoints via digital input signals. This means that the operator can easily change setpoint by pressing a button. Due to the combination of digital inputs, up to three predefined setpoints can be configured.

Overview of inputs/outputs

Terminals	Hydro Multi-E	
	0.37 to 2.2 kW	3.0 to 7.5 kW
Digital inputs	2 inputs	1 input
Analog inputs	2 inputs	1 input
Digital outputs	2 outputs	1 output

Usage of the inputs and outputs

Hydro Multi-E, 0.37 to 2.2 kW

- Two digital inputs
  The digital inputs can be used for remote control of the following functions:
  – external stop
  – setting the pumps to operation on the max. curve
  – setting the pumps to operation on the min. curve
  – dry-running protection, pulse flow, flow switch.
- Two analog inputs
  The analog inputs can be used for feedback sensors, setting of setpoint influence or monitoring of analog values with the limit-exceeded function.
- Two digital outputs
  The digital outputs can be used for sending a signal regarding pump operating status:
  – ready
  – fault
  – operating
  – running
  – limit exceeded.

Hydro Multi-E, 3.0 to 7.5 kW

- One digital input
  The digital input can be used for remote control of the following functions:
  – external stop
  – dry-running protection.
- One analog input
  The analog input can be used for feedback sensor.
- One digital output
  The digital output can be used for sending a signal regarding pump operating status:
  – ready
  – fault
  – operating.

7. Sizing

To ensure that the system is operating as efficiently as possible, it is important that the system is sized so that the performance meets the requirements of the application.

Note: Local legislation must always be taken into account.

Flow

The total consumption and the required maximum flow rate depend on the application in question. The required maximum flow can be calculated by means of the table below which is based on statistical data.

Consumer	Unit [n]	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	Residents (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

* fd: Maximum consumption factor per day.
** ft:Maximum consumption factor per hour.

Example: Hotel with 540 beds

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

Calculation

n = 540 beds.
Q_{year} x n = 180 x 540 = 97,200 m^3/year.
d = 365 days/year.
(Q_{year} x n)/d = 97,200/365 = 266.3 m^3/day.
$Q(m)_{day}$ = fd x Q_{day} = 1.5 x 266.3 = 399.4 m^3/day.
Q_{max} = Max. flow rate/hour x number of beds = 0.125 x 540 = 67.5 m^3/h.

Head

The required discharge pressure, p_{set}, of Hydro Multi-E can be calculated from the following formula:

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

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

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].

p_{fm} = Friction loss in manifolds, isolating valves and non-return valves.

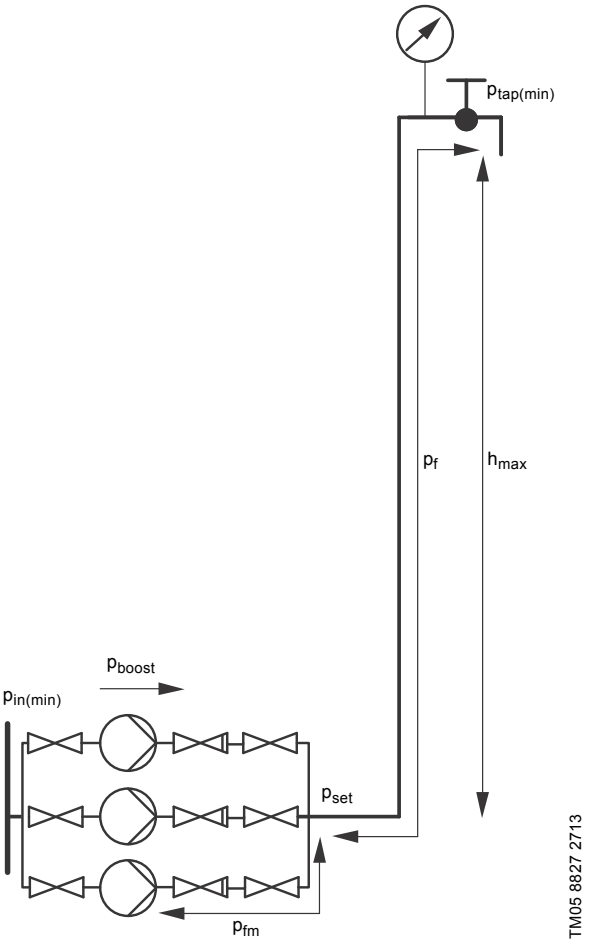


Fig. 17 Calculation of required discharge pressure

Example

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

p_f = 1.2 bar

h_{max} = 41.5 metres

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

p_{set} = 2 + 1.2 + (41.5/10.2) = 7.3 bar

p_{boost} = 7.3 - 2 = 5.3 bar

p_{fm} = 0.2 bar.

Inlet pressure

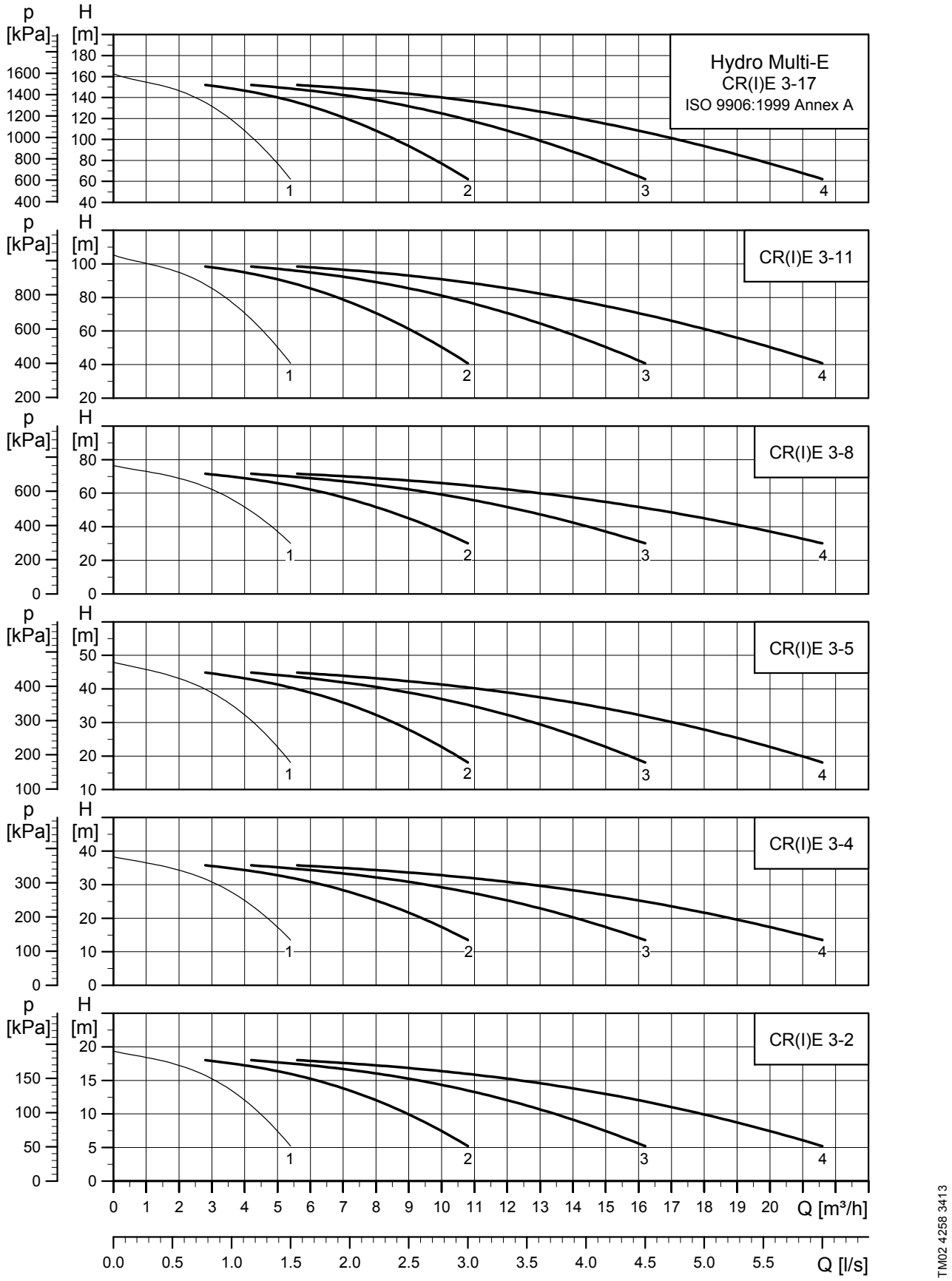
If the system has a positive inlet pressure, it must be taken into consideration to ensure that the total pressure in the system does not exceed the maximum operating pressure of the system.

Optional equipment and accessories

The Hydro Multi-E can be fitted with equipment for communication, dry-running protection, emergency operation, etc.

See sections *Optional equipment*, page 42, and *Accessories*, page 44, for more details.

Hydro Multi-E with CRE, CRIE 3-X



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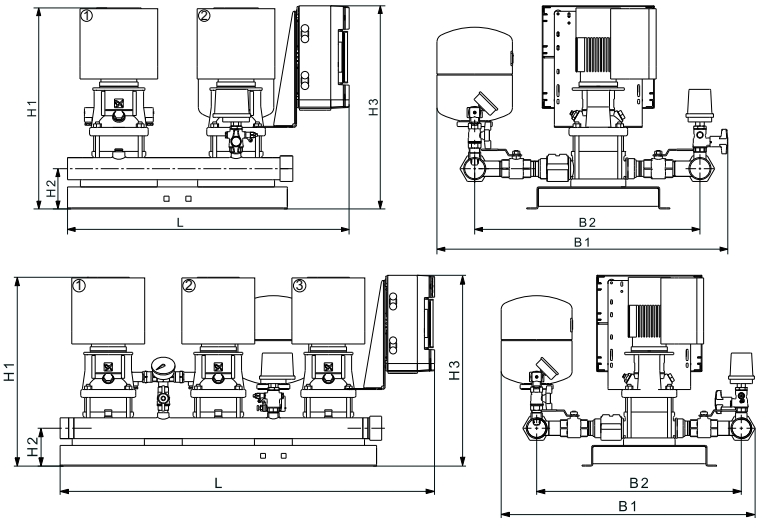
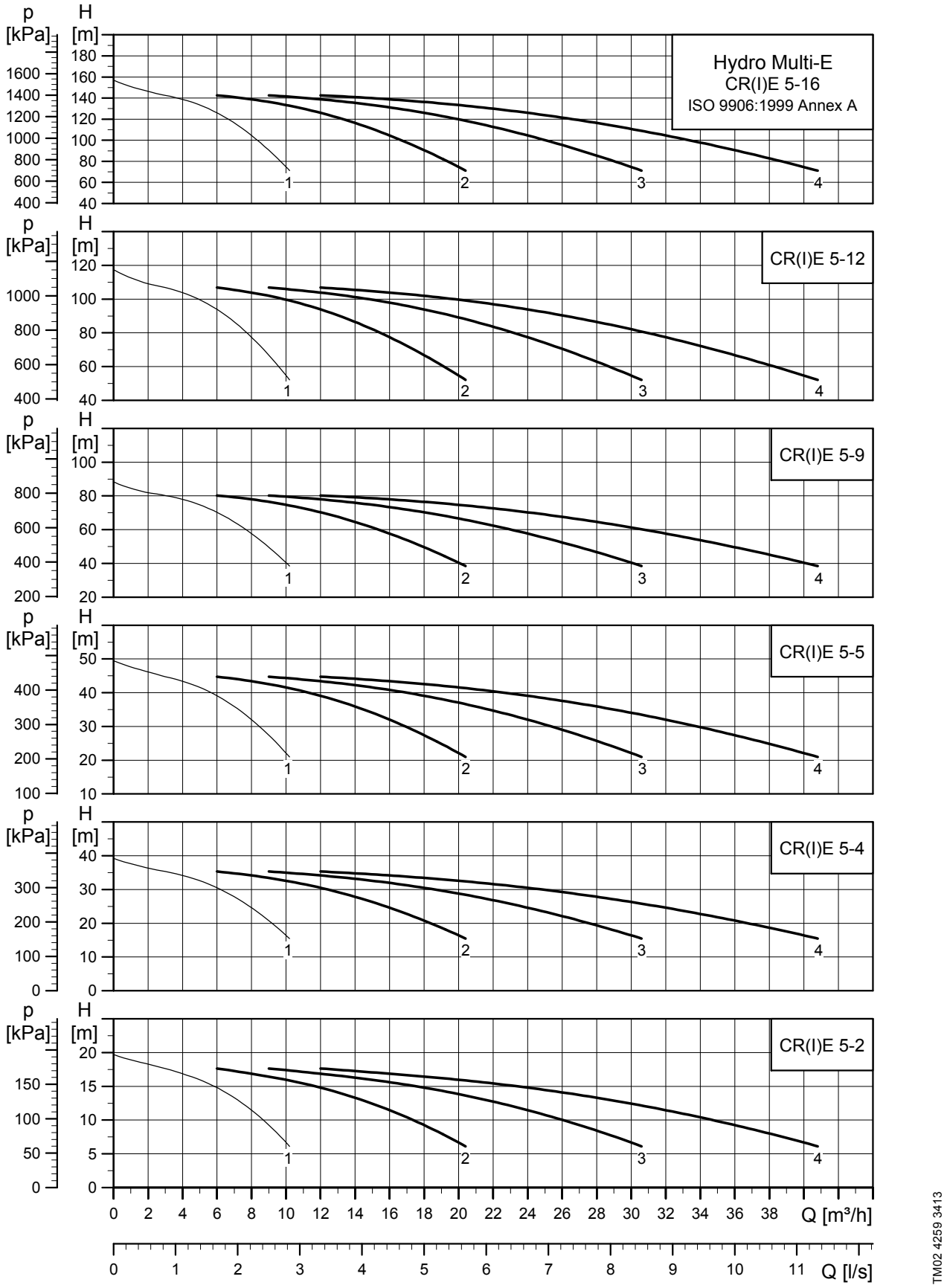


TM05 9150 3413 - TM05 9148 3413

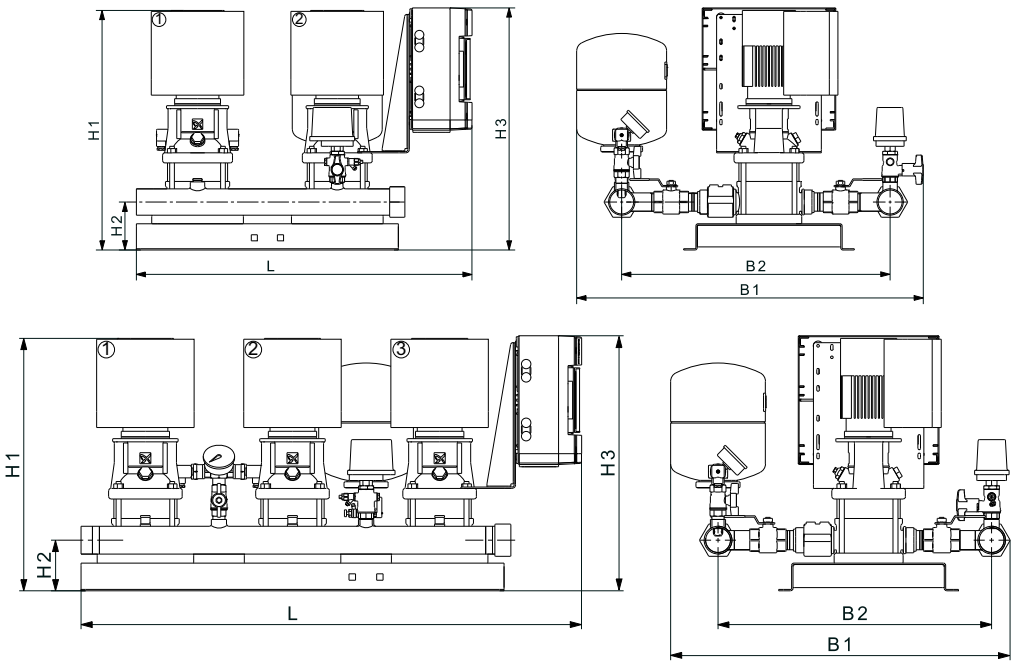
Number of pumps	Pump type	Motor [1] [kW]	Max. IN [2] [A]	Max. I0 [3] [A]	Supply voltage: Single-phase motor 3 x 400 V. PE. N	Supply voltage: Three-phase motor 3 x 400 V. PE	Manifold: Stainless steel	Manifold: Galvanised	Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m^3]
2	CR(I)E 3-2	0.37	3.1	2.2	•	-	•	-	8	R 2	790	650	760	537	120	537	59	0.27
			2.0	-	-	•	•	-	8	R 2	790	650	760	537	120	537	59	0.27
3		0.37	3.8	2.2	•	-	•	-	8	R 2	790	650	1080	537	120	537	86	0.41
			2.9	-	-	•	•	-	8	R 2	790	650	1080	537	120	537	86	0.41
4		0.37	4.3	4.3	•	-	•	-	8	R 2 1/2	790	645	1400	537	120	537	118	0.6
			3.9	-	-	•	•	-	8	R 2 1/2	790	645	1400	537	120	537	118	0.6
2	CR(I)E 3-4	0.55	4.3	3.0	•	-	•	-	8	R 2	790	650	760	555	120	555	57	0.27
			2.5	-	-	•	•	-	8	R 2	790	650	760	555	120	555	57	0.27
3		0.55	5.2	3.0	•	-	•	-	8	R 2	790	650	1080	555	120	555	67	0.41
			3.8	-	-	•	•	-	8	R 2	790	650	1080	555	120	555	67	0.41
4		0.55	6.0	6.0	•	-	•	-	8	R 2 1/2	790	645	1400	555	120	555	117	0.6
			5.1	-	-	•	•	-	8	R 2 1/2	790	645	1400	555	120	555	117	0.6
2	CR(I)E 3-5	0.75	5.7	4.0	•	-	•	-	8	R 2	790	650	760	579	120	579	63	0.27
			3.0	-	-	•	•	-	8	R 2	790	650	760	579	120	579	63	0.27
3		0.75	6.9	4.0	•	-	•	-	8	R 2	790	650	1080	579	120	579	92	0.41
			4.5	-	-	•	•	-	8	R 2	790	650	1080	579	120	579	92	0.41
4		0.75	8.0	8.0	•	-	•	-	8	R 2 1/2	790	645	1400	579	120	579	128	0.6
			6.0	-	-	•	•	-	8	R 2 1/2	790	645	1400	579	120	579	128	0.6
2	CR(I)E 3-8	1.1	8.1	5.7	•	-	•	-	8	R 2	790	650	760	633	120	633	67	0.28
			4.2	-	-	•	•	-	8	R 2	790	650	760	633	120	633	67	0.28
3		1.1	9.9	5.7	•	-	•	-	8	R 2	790	650	1080	633	120	633	98	0.43
			6.3	-	-	•	•	-	8	R 2	790	650	1080	633	120	633	98	0.43
4		1.1	11.4	11.4	•	-	•	-	8	R 2 1/2	790	645	1400	633	120	633	134	0.6
			8.4	-	-	•	•	-	8	R 2 1/2	790	645	1400	633	120	633	134	0.6
2	CR(I)E 3-11	1.5	11.0	7.8	•	-	•	-	12	R 2	790	650	760	763	120	763	79	0.33
			5.6	-	-	•	•	-	12	R 2	790	650	760	763	120	763	79	0.33
3		1.5	13.5	7.8	•	-	•	-	12	R 2	790	650	1080	763	120	763	116	0.51
			8.5	-	-	•	•	-	12	R 2	790	650	1080	763	120	763	116	0.51
4		1.5	15.6	15.6	•	-	•	-	12	R 2 1/2	790	645	1400	763	120	763	158	0.6
			11.3	-	-	•	•	-	12	R 2 1/2	790	645	1400	763	120	763	158	0.6
2	CR(I)E 3-17	2.2	8.1	-	-	•	•	-	12	R 2	830	650	760	896	120	896	95	0.39
3		2.2	12.1	-	-	•	•	-	12	R 2	830	650	1080	896	120	896	140	0.6
4		2.2	16.1	-	-	•	•	-	12	R 2 1/2	790	645	1400	896	120	896	190	0.6

1) Motor [kW] is the power per pump.
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).
3) Max. I0 [A] applies to single-phase MGE motors. The value of max. I0 [A] never exceeds the value of max. IN [A].

Hydro Multi-E with CRE, CRIE 5-X



TM02 4259 3413

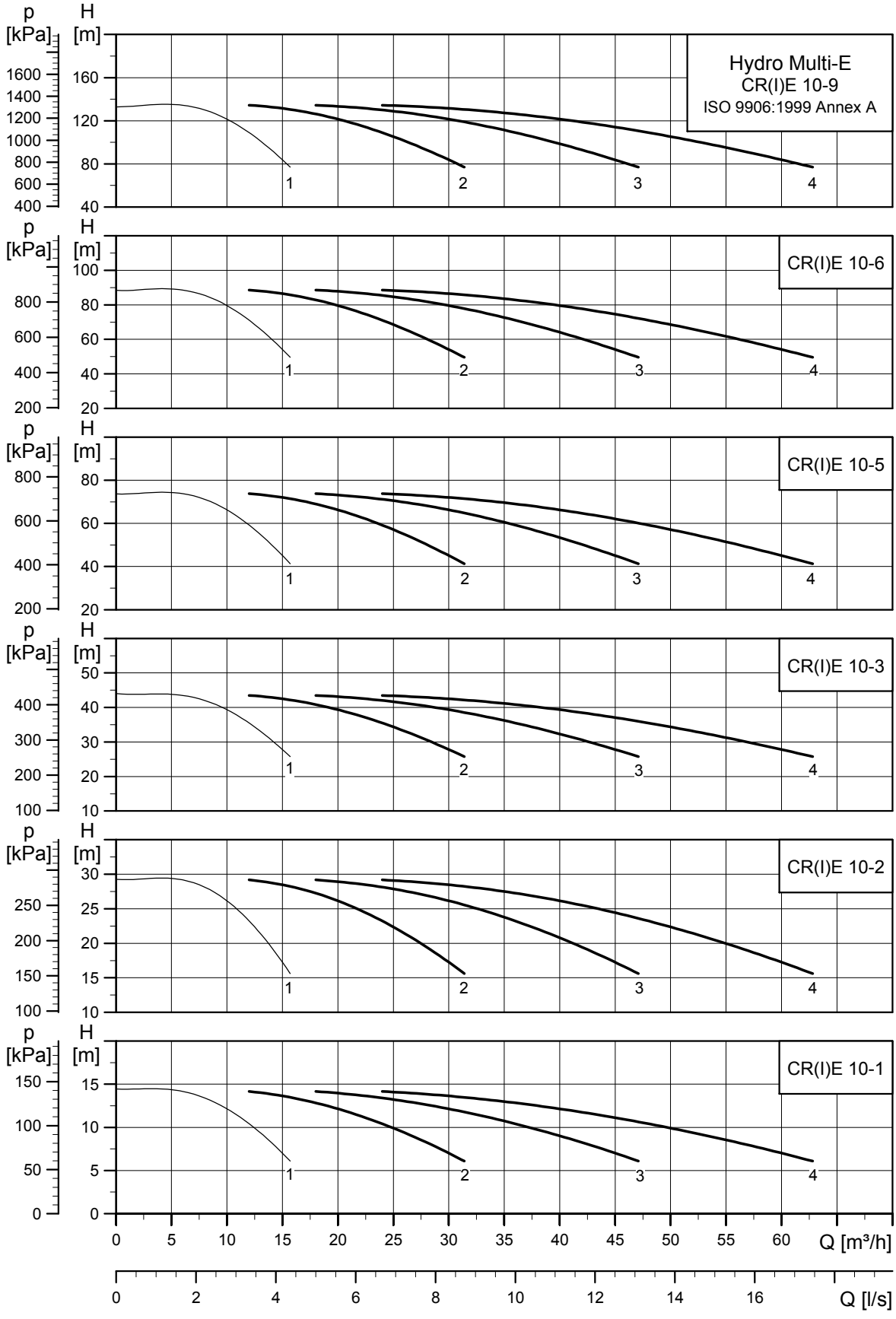


TM05 9150 3413 - TM05 9148 3413

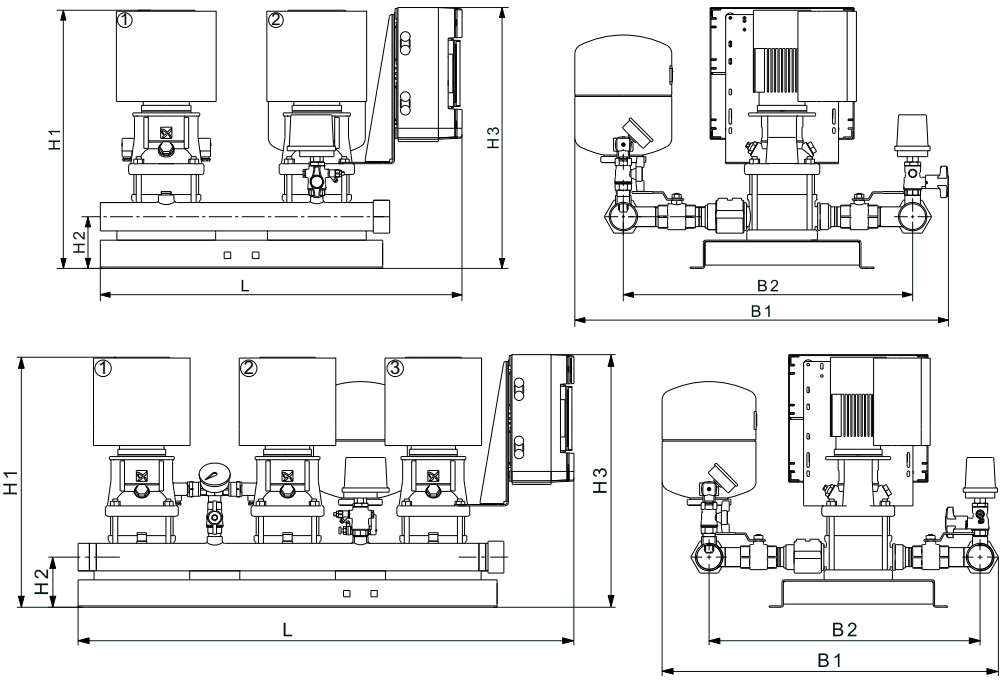
Number of pumps	Pump type	Motor [1] [kW]	Max. IN [2] [A]	Max. I0 [3] [A]	Supply voltage: Single-phase motor 3 x 400 V. PE. N	Supply voltage: Three-phase motor 3 x 400 V. PE	Manifold: Stainless steel	Manifold: Galvanised	Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m^3]
2	CR(I)E 5-2	0.55	4.3	3.0	•	-	•	-	18	R 2	830	650	760	539	120	539	59	0.29
			2.5	-	-	•	•	-	18	R 2	830	650	760	539	120	539	59	0.29
3		0.55	5.2	3.0	•	-	•	-	18	R 2	830	650	1080	570	120	570	86	0.44
			3.8	-	-	•	•	-	18	R 2	830	650	1080	570	120	570	86	0.44
4		0.55	6.0	6.0	•	-	•	-	18	R 2 1/2	830	645	1400	601	120	601	118	0.6
			5.1	-	-	•	•	-	18	R 2 1/2	830	645	1400	601	120	601	118	0.6
2	CR(I)E 5-4	1.1	8.1	5.7	•	-	•	-	18	R 2	830	650	760	599	120	599	65	0.29
			4.2	-	-	•	•	-	18	R 2	830	650	760	599	120	599	65	0.29
3		1.1	9.9	5.7	•	-	•	-	18	R 2	830	650	1080	599	120	599	95	0.44
		1.1	6.3	-	-	•	•	-	18	R 2	830	650	1080	599	120	599	95	0.44
4		1.1	11.4	11.4	•	-	•	-	18	R 2 1/2	830	645	1400	599	120	599	130	0.6
			8.4	-	-	•	•	-	18	R 2 1/2	830	645	1400	599	120	599	130	0.6
2	CR(I)E 5-5	1.5	11.0	7.8	•	-	•	-	18	R 2	830	650	760	704	120	704	75	0.33
			5.6	-	-	•	•	-	18	R 2	830	650	760	704	120	704	75	0.33
3		1.5	13.5	7.8	•	-	•	-	18	R 2	830	650	1080	704	120	704	110	0.36
			8.5	-	-	•	•	-	18	R 2	830	650	1080	704	120	704	110	0.36
4		1.5	15.6	15.6	•	-	•	-	18	R 2 1/2	830	645	1400	629	120	629	150	0.6
			11.3	-	-	•	•	-	18	R 2 1/2	830	645	1400	629	120	629	150	0.6
2	CR(I)E 5-9	2.2	8.1	-	-	•	•	-	12	R 2	830	650	760	810	120	810	83	0.43
3		2.2	12.1	-	-	•	•	-	12	R 2	830	650	1080	810	120	810	122	0.65
4		2.2	16.1	-	-	•	•	-	12	R 2 1/2	830	645	1400	810	120	810	166	0.6
2	CR(I)E 5-12	3	11.0	-	-	•	•	-	12	R 2	830	650	760	956	120	956	117	0.53
3		3	16.4	-	-	•	•	-	12	R 2	830	650	1080	956	120	956	173	0.8
4		3	21.9	-	-	•	•	-	12	R 2	830	645	1400	956	120	956	225	0.6
2	CR(I)E 5-16	4	14.4	-	-	•	•	-	12	R 2	830	650	760	1045	120	1045	140	0.53
3		4	21.6	-	-	•	•	-	12	R 2	830	650	1080	1045	120	1045	203	0.8
4		4	28.8	-	-	•	•	-	12	R 2 1/2	830	650	1400	1045	120	1045	278	1.08

1) Motor [kW] is the power per pump.
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).
3) Max. I0 [A] applies to single-phase MGE motors. The value of max. I0 [A] never exceeds the value of max. IN [A].

Hydro Multi-E with CRE, CRIE 10-X



TM02 7559 3413

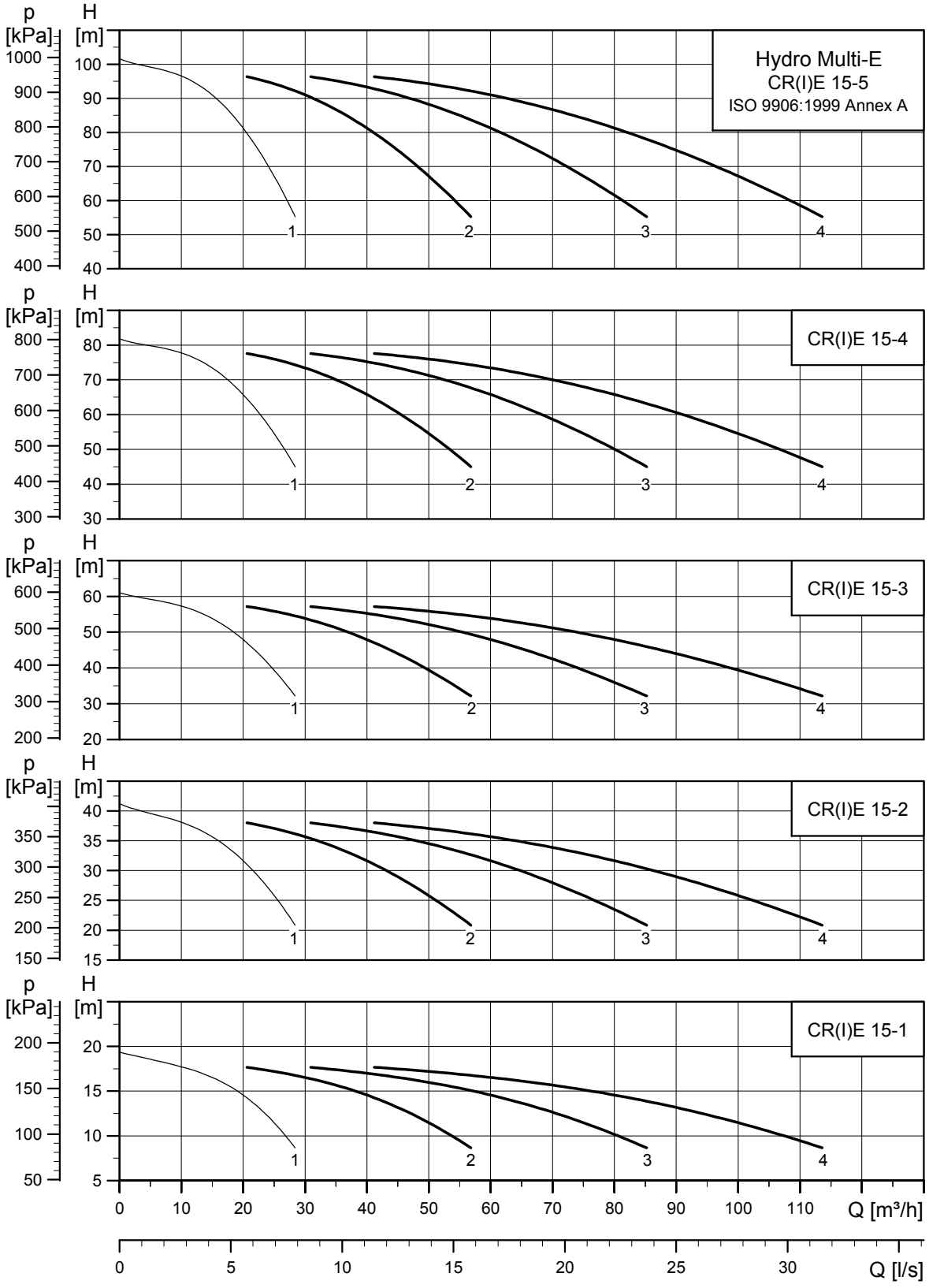


TM05 9150 3413 - TM05 9148 3413

Number of pumps	Pump type	Motor [kW] 1)	Max. IN [A] 2)	Max. I0 [A] 3)	Supply voltage: Single-phase motor 3 x 400 V. PE. N	Supply voltage: Three-phase motor 3 x 400 V. PE	Manifold: Stainless steel	Manifold: Galvanised	Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m^3]
2	CR(I)E 10-1	0.75	5.7	4.0	•	-	•	-	25	R 2 1/2	985	800	820	623	150	623	87	0.45
			3.0	-	-	•	•	-	25	R 2 1/2	985	800	820	623	150	623	87	0.45
3		0.75	6.9	4.0	•	-	•	-	25	R 2 1/2	985	800	1090	623	150	623	128	0.67
			4.5	-	-	•	•	-	25	R 2 1/2	985	800	1090	623	150	623	128	0.67
4		0.75	8.0	8.0	•	-	•	-	25	DN 80	1045	800	1410	623	150	623	174	0.8
			6.0	-	-	•	•	-	25	DN 80	1045	800	1410	623	150	623	174	0.8
2	CR(I)E 10-1	1.5	11.0	7.8	•	-	•	-	25	R 2 1/2	985	800	820	699	150	699	97	0.45
			5.6	-	-	•	•	-	25	R 2 1/2	985	800	820	699	150	699	97	0.45
3		1.5	13.5	7.8	•	-	•	-	25	R 2 1/2	985	800	1090	699	150	699	143	0.67
			8.5	-	-	•	•	-	25	R 2 1/2	985	800	1090	699	150	699	143	0.67
4		1.5	15.6	15.6	•	-	•	-	25	DN 80	1045	800	1410	699	150	699	194	0.8
			11.3	-	-	•	•	-	25	DN 80	1045	800	1410	699	150	699	194	0.8
2	CR(I)E 10-3	2.2	8.1	-	-	•	•	-	25	R 2 1/2	985	800	820	651	150	651	103	0.48
3		2.2	12.1	-	-	•	•	-	25	R 2 1/2	985	800	1090	651	150	651	152	0.67
4		2.2	16.1	-	-	•	•	-	25	DN 80	1045	800	1410	729	150	729	206	0.8
2	CR(I)E 10-5	3	11.0	-	-	•	•	-	25	R 2 1/2	985	800	820	855	150	855	137	0.58
3		3	16.4	-	-	•	•	-	25	R 2 1/2	985	800	1090	855	150	855	143	0.86
4		3	21.9	-	-	•	•	-	25	DN 80	1045	800	1410	855	150	855	274	0.8
2	CR(I)E 10-6	4	14.4	-	-	•	•	-	12	R 2 1/2	985	800	820	885	150	885	177	0.58
3		4	21.6	-	-	•	•	-	12	R 2 1/2	985	800	1090	885	150	885	243	0.86
4		4	28.8	-	-	•	•	-	12	DN 80	984	800	1410	884	150	884	310	1.14
2	CR(I)E 10-9	5.5	19.4	-	-	•	•	-	12	R 2 1/2	985	800	820	995	150	995	193	0.65
3		5.5	29.0	-	-	•	•	-	12	R 2 1/2	800	995	1090	150	1570	150	266	#VALUE!
4		5.5	38.7	-	-	•	•	-	12	DN 80	985	800	1410	993	150	993	340	1.28

1) Motor [kW] is the power per pump.
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).
3) Max. I0 [A] applies to single-phase MGE motors. The value of max. I0 [A] never exceeds the value of max. IN [A].

Hydro Multi-E with CRE, CRIE 15-X



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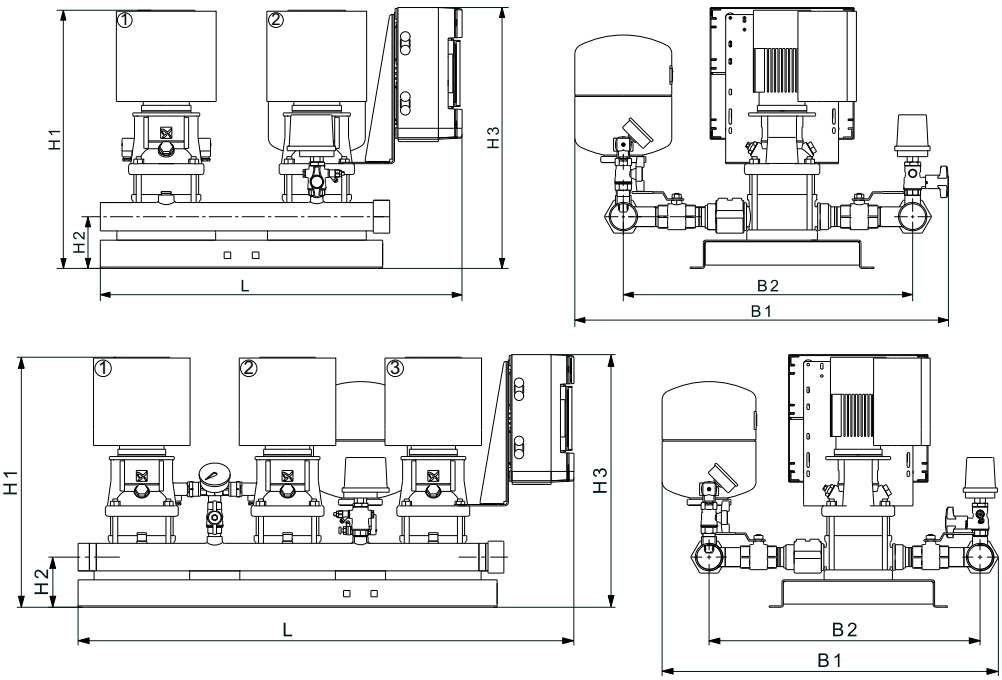

TM05 9150 3413 - TM05 9148 3413

Number of pumps	Pump type	Motor [1] [kW]	Max. IN [2] [A]	Max. I0 [3] [A]	Supply voltage: Single-phase motor 3 x 400 V. PE. N	Supply voltage: Three-phase motor 3 x 400 V. PE	Manifold: Stainless steel	Manifold: Galvanised	Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m^3]
2	CR(I)E 15-1	1.5	11.0	7.8	•	-	•	-	33	DN 80	1225	950	830	763	160	763	109	0.7
			5.6	-	-	•	•	-	33	DN 80	1225	950	830	763	160	763	109	0.7
3		1.5	13.5	7.8	•	-	•	-	33	DN 100	1240	950	1150	763	160	763	161	1
			8.5	-	-	•	•	-	33	DN 100	1240	950	1150	763	160	763	161	1
4		1.5	15.6	15.6	•	-	•	-	33	DN 100	1240	950	1470	763	160	763	218	1.2
			11.3	-	-	•	•	-	33	DN 100	1240	950	1470	763	160	763	218	1.2
2	CR(I)E 15-2	3	11.0	-	-	•	•	-	33	DN 80	1225	950	830	810	160	810	189	0.7
3		3	16.4	-	-	•	•	-	33	DN 100	1240	950	1150	810	160	810	274	1
4		3	21.9	-	-	•	•	-	33	DN 100	1240	950	1470	810	160	810	413	1.2
2	CR(I)E 15-3	4	14.4	-	-	•	•	-	33	DN 80	1225	950	830	870	160	870	200	0.77
3		4	21.6	-	-	•	•	-	33	DN 100	1240	950	1150	870	160	870	290	1.11
4		4	28.8	-	-	•	•	-	33	DN 100	1240	950	1470	870	160	870	454	1.2
2	CR(I)E 15-4	5.5	19.4	-	-	•	•	-	12	DN 80	1225	950	830	1007	160	1007	222	0.88
3		5.5	29.0	-	-	•	•	-	12	DN 100	1240	950	1150	1007	160	1007	312	1.27
4		5.5	38.7	-	-	•	•	-	12	DN 100	1240	950	1470	1007	160	1007	476	1.2
2	CR(I)E 15-5	7.5	25.8	-	-	•	•	-	12	DN 80	1225	950	830	1000	160	1000	237	0.88
3		7.5	38.6	-	-	•	•	-	12	DN 100	1240	950	1150	1000	160	1000	334	1.27
4		7.5	51.5	-	-	•	•	-	12	DN 100	1240	950	1470	1000	160	1000	603	1.2

1) Motor [kW] is the power per pump.
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).
3) Max. I0 [A] applies to single-phase MGE motors. The value of max. I0 [A] never exceeds the value of max. IN [A].