



Hydro Multi-E

Grundfos Hydro Multi-E booster systems
with 2 or 3 CR(I)E or CME pumps



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1. Introduction

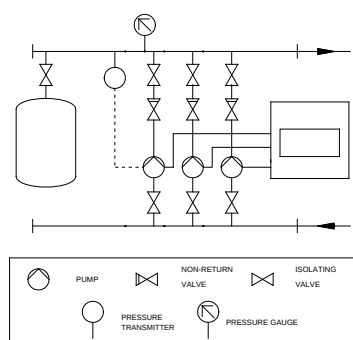
Grundfos Hydro Multi-E booster systems are designed for the transfer and pressure boosting of clean water in places such as

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

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

As standard, the Hydro Multi-E is supplied with a pressure switch as dry-running protection. A level switch is available on request.

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



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

Benefits

Plug-and-pump solution

On delivery, the Hydro Multi-E is assembled, tested and ready to pump as soon as it is connected to the water and power supplies and the pumps have been primed.

Perfect constant-pressure control

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

User-friendliness

The numerical interface of the Hydro Multi-E makes it one of our most simple booster systems to control and operate.

Reliability

The Grundfos CR(I)E pumps are known for their reliability and long life. The controller is protected inside the CR(I)E pump, and this has proven to be a very reliable solution.

Low energy consumption and reduced noise level

All three-phase motors are efficiency class IE2 or better.

CRE and CRIE pumps with three-phase motors are all IE3-compliant.

The IEC 60034-30 standard defines and harmonises worldwide the efficiency classes IE1, IE2 and IE3 for low-voltage, three-phase motors from 0.75 to 375 kW.

IE1: standard efficiency (comparable to EFF2)

IE2: high efficiency (comparable to EFF1)

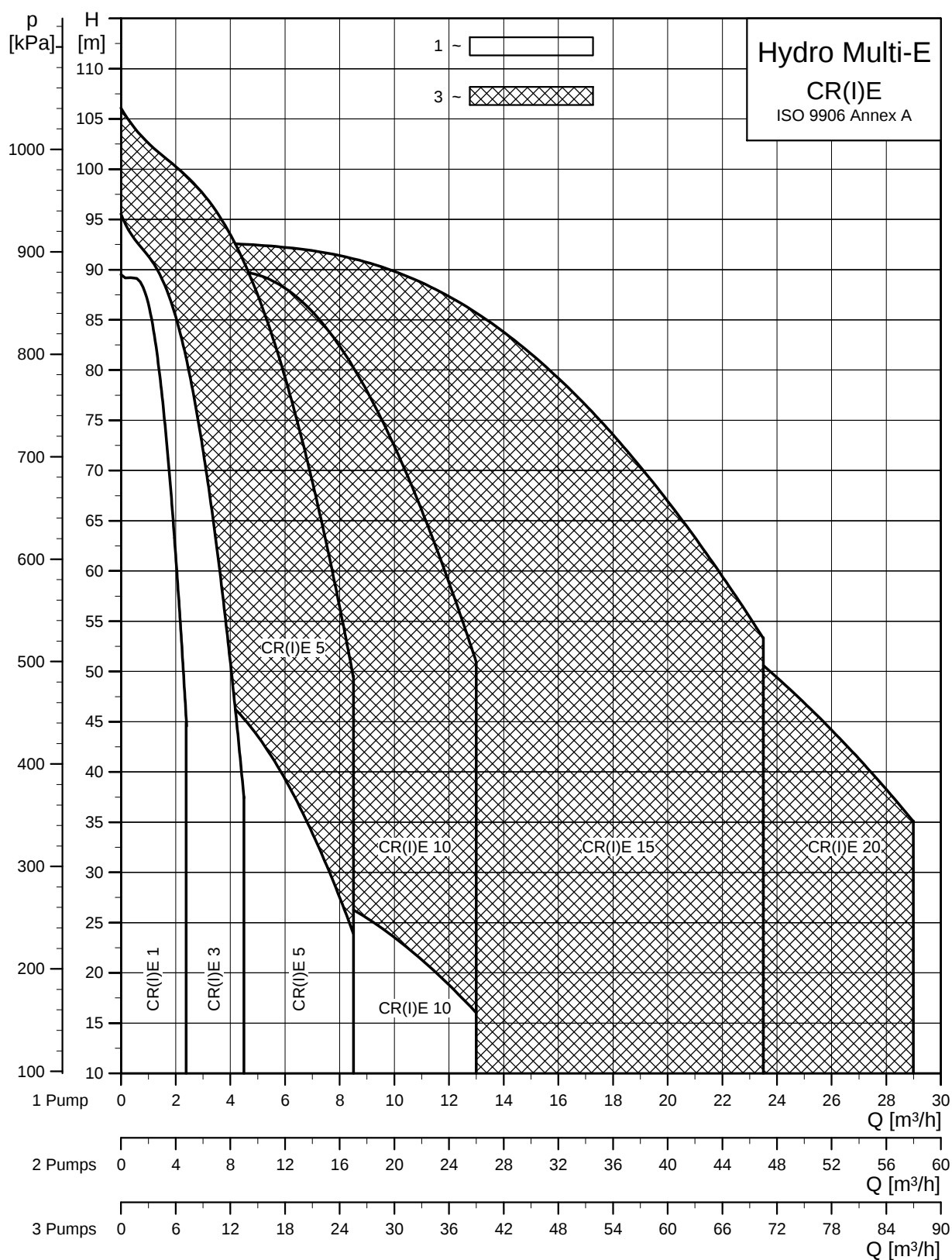
IE3: premium efficiency.

Grundfos IE3 motors comply with the EISA2007 legislation in the USA and are ahead of the EC requirements laid down by the EuP Directive.

This also affects the noise level of the motors. In electric motors, the cooling fan is normally the main source of noise. Thanks to their higher efficiency, IE3 motors require less cooling air to maintain the motor temperature. This allows for a smaller cooling fan and consequently less noise.

2. Product data

Performance range



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Fig. 2 Performance range

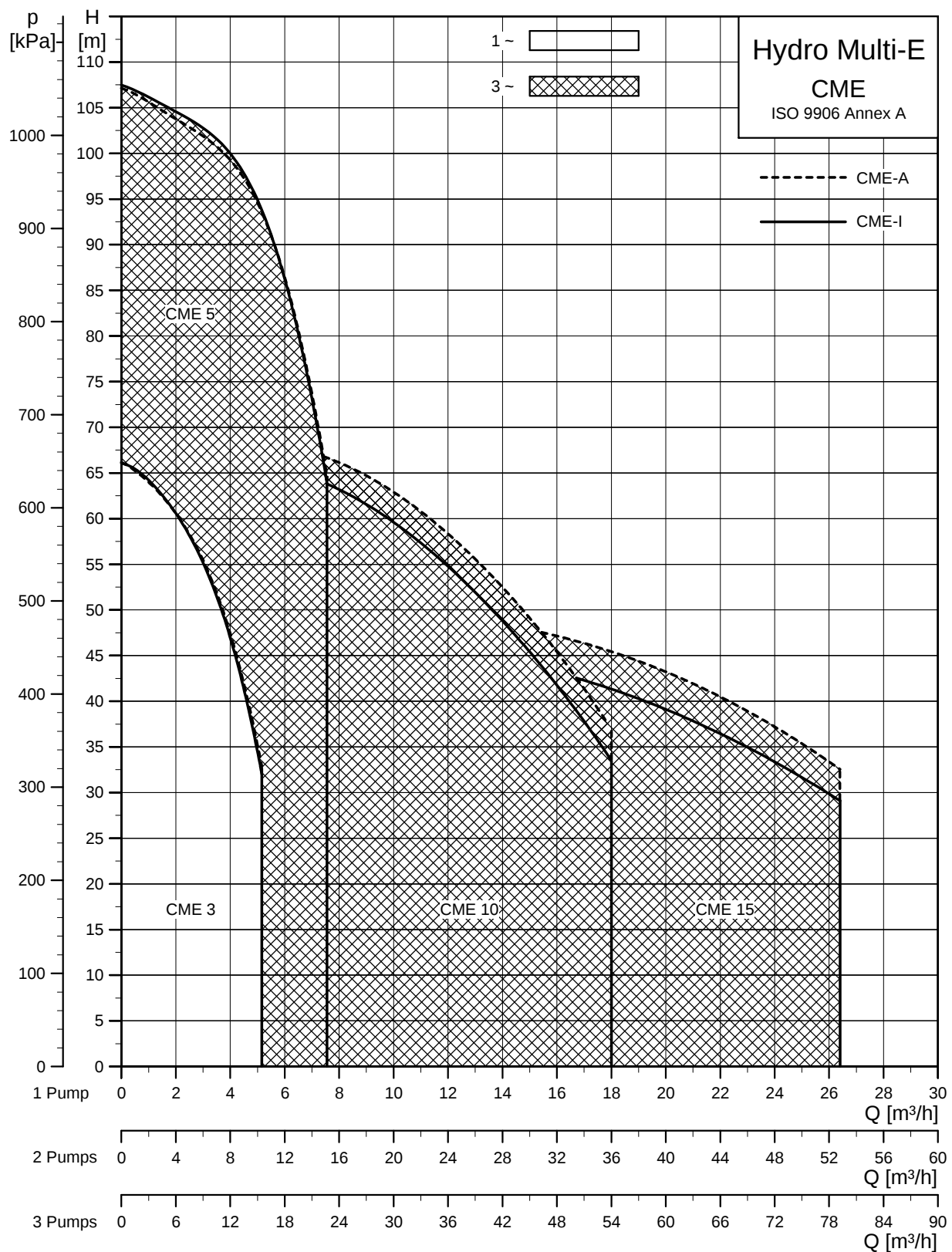


Fig. 3 Performance range

Note: CME-A are cast-iron pumps for Hydro Multi-E/G-versions.

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Type key

Example	Hydro Multi-E /G 2 CRE 1-7 3 x 400/230 V			
Type range				
Subgroup				
Manifold material: []: Stainless steel /G: Galvanised steel				
Number of pumps: 2 or 3				
Pump type				
Supply voltage				

Operating conditions

Liquid temperature: 0 °C to +60 °C.

Ambient temperature: 0 °C to +40 °C.

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:

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

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 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 start-up and operation.

Maximum inlet pressure

All pumps, with the exception of those mentioned below, are constructed to handle an inlet pressure corresponding to the maximum operating pressure.

Maximum 8 bar	Maximum 10 bar
CR(I)E 10-3	CR(I)E 3-15
CR(I)E 10-4	CR(I)E 5-16
CR(I)E 10-6	CR(I)E 10-9
CR(I)E 15-2	CR(I)E 15-7
CR(I)E 15-3	
CR(I)E 20-2	
CR(I)E 20-3	

Maximum operating pressure

The maximum operating pressure of Hydro Multi-E is 10 bar. For systems with the pumps mentioned below, however, the maximum operating pressure is 16 bar.

CME-I 5-6
CME-I 5-8
CR(I)E 1-15
CR(I)E 3-15
CR(I)E 5-16
CR(I)E 10-9
CR(I)E 15-7

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

3. Construction

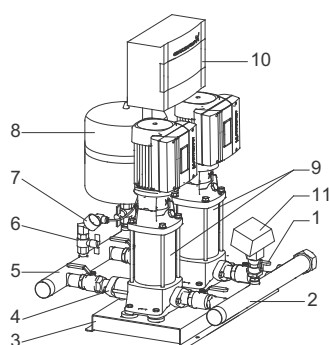


Fig. 4 Hydro Multi-E with 2 CRE pumps

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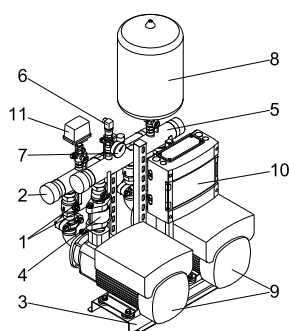


Fig. 5 Hydro Multi-E with 2 CME pumps

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Pos.	Description	Quantity
1	Isolating valve	2 per pump
2	Suction manifold	1
3	Base frame	1
4	Non-return valve	1 per pump
5	Discharge manifold	1
6	Pressure transmitter	1
7	Pressure gauge	1
8	Diaphragm tank	1
9	Pump	2 or 3
10	Breaker cabinet	1
11	Dry-running protection	

The Hydro Multi-E is mounted on a common base frame.

The following is fitted on the suction side:

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

The following is fitted on the discharge side:

- a non-return valve.
- an isolating valve.
- a pressure gauge.
- a pressure transmitter.
- a diaphragm tank.
- a stainless-steel discharge manifold.

The manifolds of systems with CRE, CRIE or CME-I pumps are made of stainless steel (EN/DIN 1.4401 or EN/DIN 1.4571).

The manifolds of systems with CME-A are made of electro-galvanised steel.

The Hydro Multi-E is fitted with an on/off switch for the mains supply.

Diaphragm tank

To ensure optimum operation the tank needs to be precharged with pressure. Calculation of precharge pressure:

Precharge pressure = 0.7 x setpoint

The diaphragm tank precharge pressure must be measured in a pressureless system.

We recommend to refill the tank with nitrogen.

Environmental considerations

Grundfos manufactures its motors and other products with a high degree of consideration for the environment in respect of materials, production methods, energy-saving operation and recycling of as many materials as possible.

The Grundfos A/S manufacturing company

- is certified as environmentally friendly in accordance with ISO 14001.
- is approved in accordance with European certification standard EMAS.
- holds an ISO 9001 certificate.

CE marking

Hydro Multi-E booster systems on the European market are CE-marked.



Fig. 6 CE-marking

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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 start-up.

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.

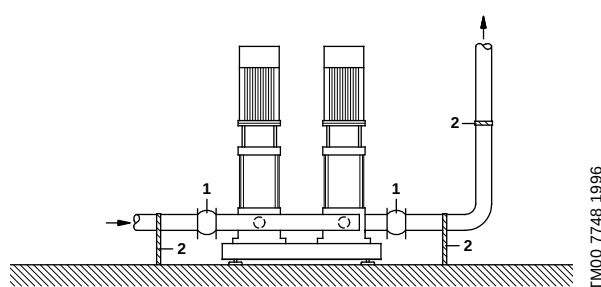


Fig. 7 Pipework

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 pump requires no external motor protection. The motor incorporates thermal protection against slow overloading and blocking (IEC 34-11: TP 211).
- When the pump is switched on via the mains, the pump will start after approx. 5 seconds.

Note: The number of starts and stops via the mains supply must not exceed 4 times per hour.

5. Control of Hydro Multi-E

Control options

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

- a building management system
- a remote control (Grundfos R100)
- a control panel
- external control systems, GSM or GRM.

Building management system

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.

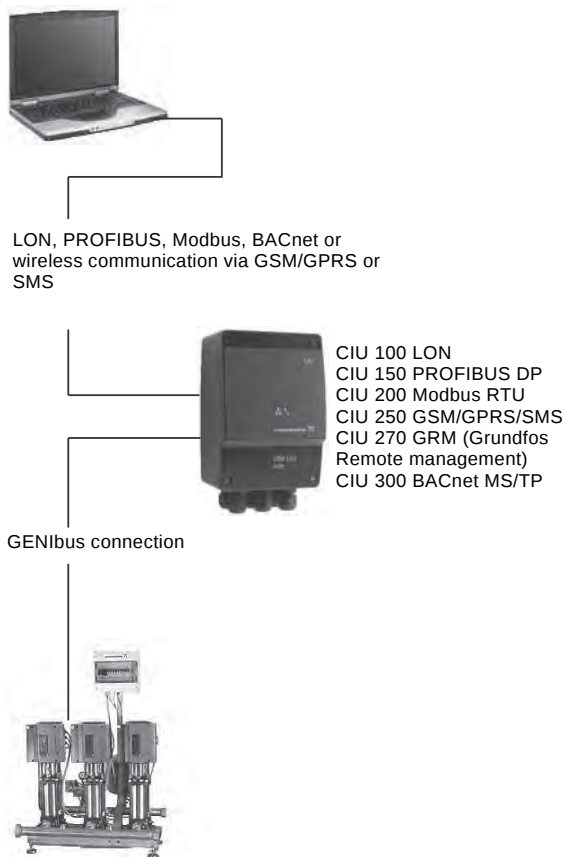


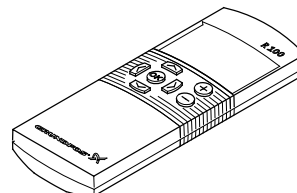
Fig. 8 Structure of a building management system

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R100 remote control

The Grundfos R100 remote control is available as an accessory.

The R100 communicates with the first pump of the Hydro Multi-E via infrared light. During communication, the R100 must be pointed at the control panel on the pump terminal box.



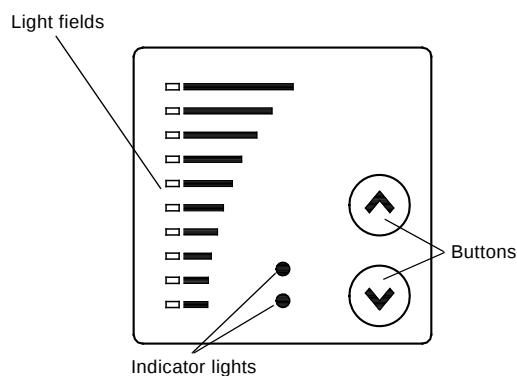
TM00 4498 2802

Fig. 9 R100 remote control

On the R100 control panel, it is possible to monitor and change control modes and settings of the Hydro Multi-E.

Control panel

The control panel on the Hydro Multi-E terminal box makes it possible to change the setpoint settings manually.



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Fig. 10 Control panel on pump

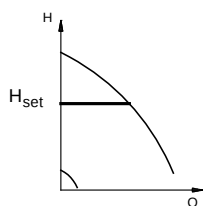
For further information about control options of Hydro Multi-E, please see the "Grundfos E-pumps" data booklet available on www.grundfos.com (WebCAPS).

Control modes

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



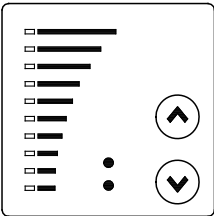
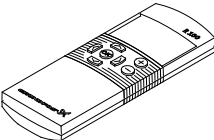
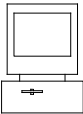
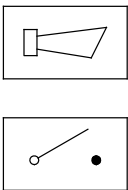
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Fig. 11 Constant-pressure mode

To meet the flow requirements of the system in the most efficient way, the Hydro Multi-E automatically calculates the optimum number of running pumps and cuts pumps in or out accordingly.

6. Functions

Overview of functions

Functions		Hydro Multi-E
	TM00 7600 1596	Setting via control panel
		Setpoint •
		Start/stop •
		Max. curve •
		Reading via control panel
		Setpoint •
		Operating indication •
		Fault indication •
	TM00 4498 3494	Setting via the R100
		Setpoint •
		Start/stop •
		Max. curve •
		Control mode •
		PI-controller •
		Stop function •
		Reading via the R100
		Setpoint •
	TM01 0929 2797	Connection to building management system
		The Hydro Multi-E has inputs for bus communication. The system can be controlled and monitored via these inputs from a building management system or other external control systems.
	TM00 4533 3593	External signals
		Inputs
		Sensor Fitted
		External fault •
		Outputs
		Signal relay •

Low-flow detection

The "low-flow detector" 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 $+0.5 \times \Delta H$) is reached and the pump stops. When the pressure has fallen to the start pressure (actual setpoint $-0.5 \times \Delta H$), the pump will restart.

ΔH indicates the difference between start and stop pressures.

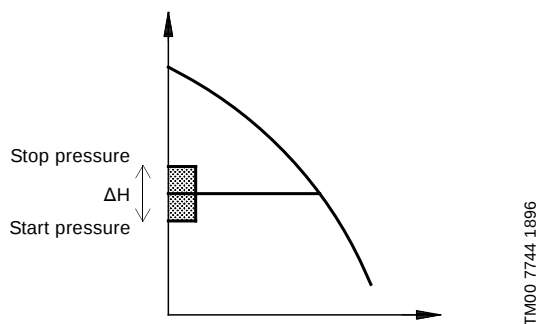


Fig. 12 Start and stop pressures

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 $0.7 \times$ actual setpoint.

External fault signal

The system has a digital input for external fault signals.

The digital input has been factory-set to external fault and will be active in closed condition.

The digital function is used for dry-running protection.

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.

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	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

* 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} × n.

Consumption period: d.

Average consumption per day: (Q_{year} × n)/d.

Daily maximum consumption: Q(m)_{day} = fd × Q_{day}.

Required maximum flow per hour: Q_{max} = Max. flow rate/hour × number of beds.

Calculation

n = 540 beds.

Q_{year} × n = 180 × 540 = 97,200 m³/year.

d = 365 days/year.

(Q_{year} × n)/d = 97,200/365 = 266.3 m³/day.

Q(m)_{day} = fd × Q_{day} = 1.5 × 266.3 = 399.4 m³/day.

Q_{max} = Max. flow rate/hour × number of beds = 0.125 × 540 = 67.5 m³/h.

Head

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

$$p_{\text{set}} = p_{\text{tap}(\text{min})} + p_f + (h_0/10.2)$$

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

Key

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

$p_{\text{tap}(\text{min})}$ = 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].

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

p_{boost} = Required boost [bar].

Example

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

$$p_f = 1.2 \text{ bar}$$

$$h_{\text{max}} = 41.5 \text{ metres}$$

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

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

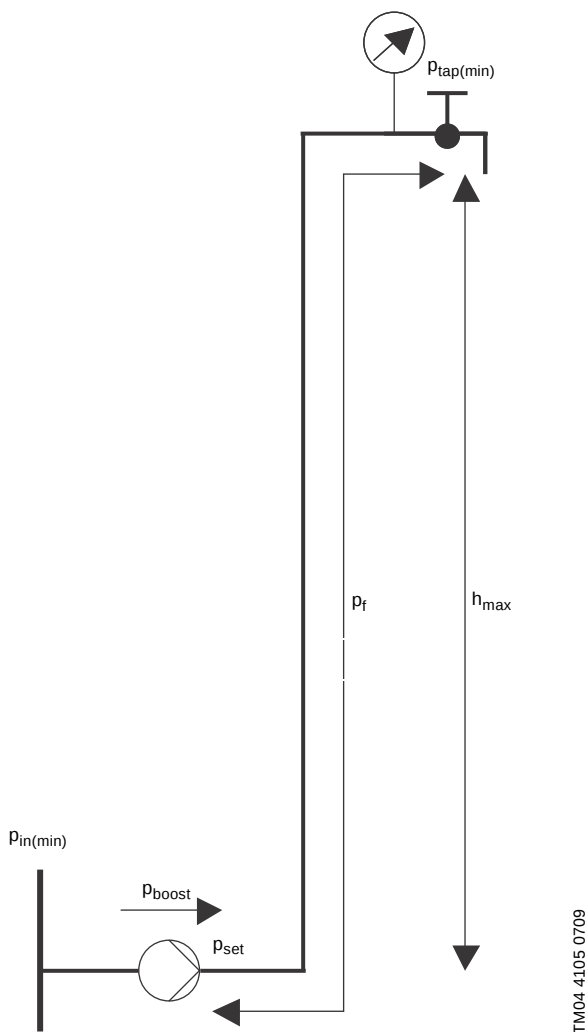
$$p_{\text{boost}} = 7.3 - 2 = 5.3 \text{ bar.}$$

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 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 9. *Optional equipment*, page 38, and 10. *Accessories*, page 39, for more details.

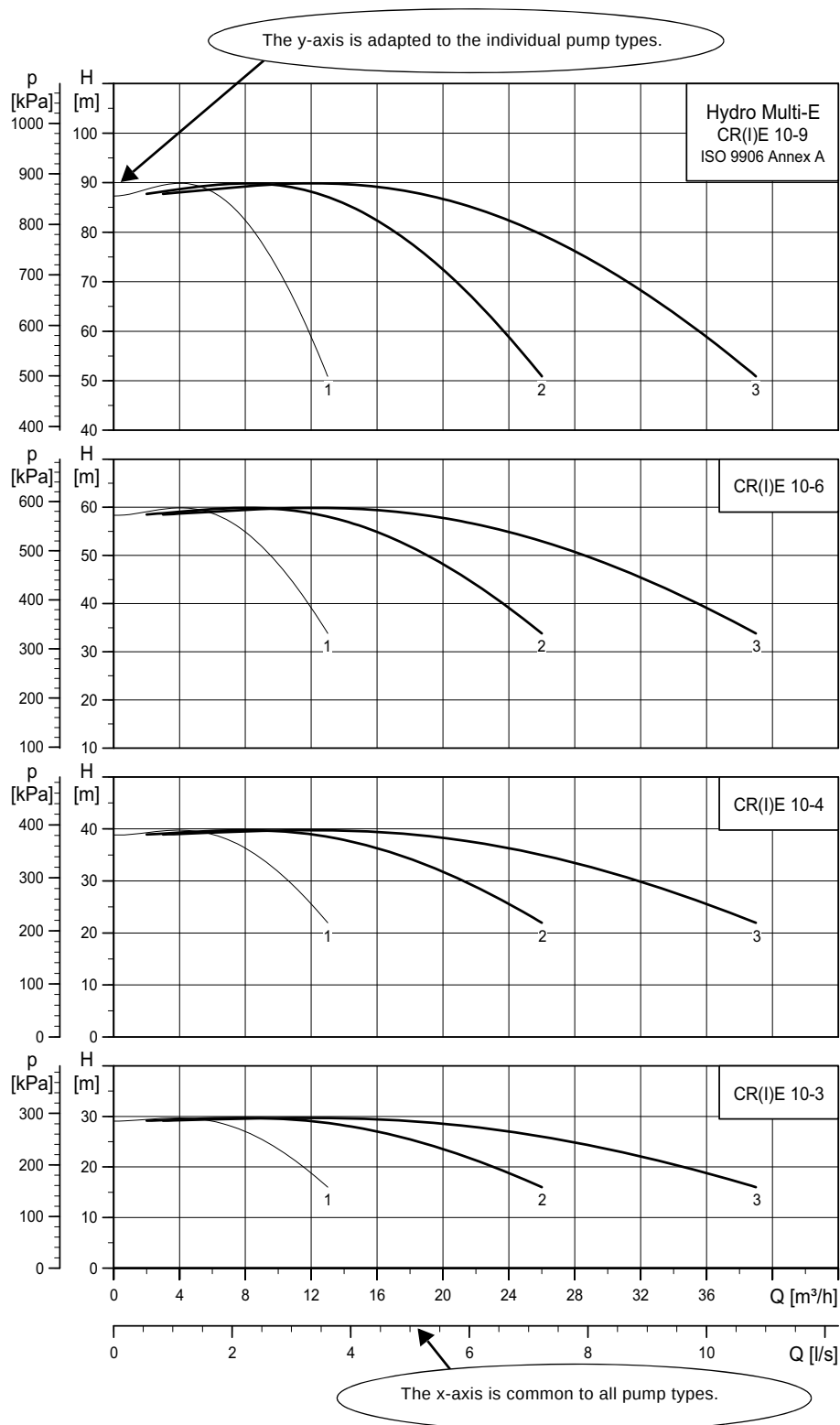


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Fig. 13 Calculation of required discharge pressure

Understanding the curve charts

The x-axis, showing the flow rate (Q) in m³/h, is common to all the curves, whereas the y-axis, showing the head (H) in metres, has been adapted to the individual pump type. Three curves are shown on the charts. The systems are only available as 2- or 3-pump systems. The first curve shows the performance of the individual pump types.



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Fig. 14 Understanding the curve charts

Example: How to select a system

- A head of 45 m is required.
The pump type best meeting this specification is found by means of the y-axis (e.g. CR(I)E 10-6). Draw a rightward, horizontal line from the head required.
- A flow rate of 18 m³/h is required.
Now draw an upward, vertical line from the specified flow. The intersection of the two lines gives the number of pumps required for the system (two CR(I)E 10-6).

Only systems whose operating ranges lie within the hatched area of the example should be selected.

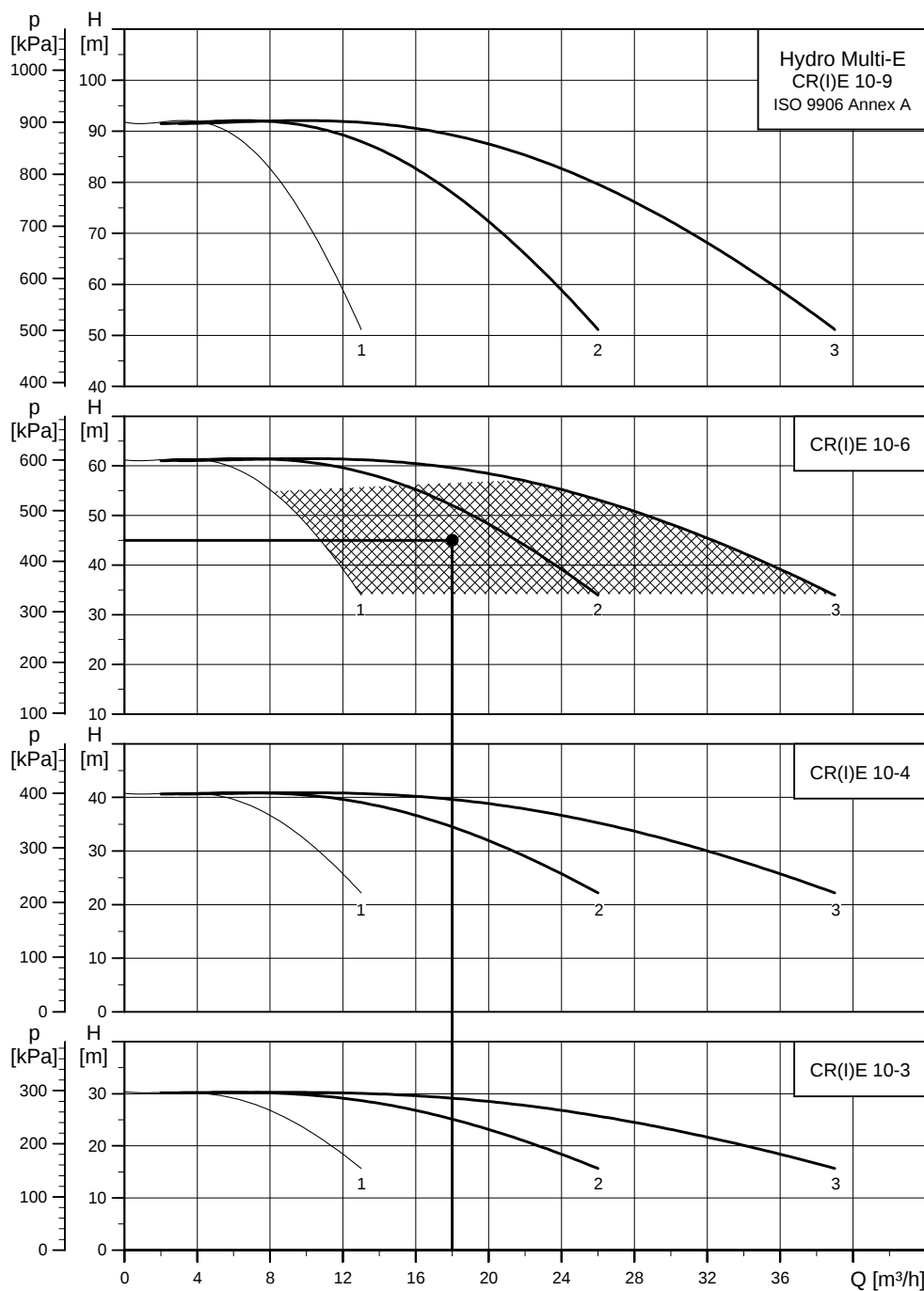


Fig. 15 Example of how to select a system

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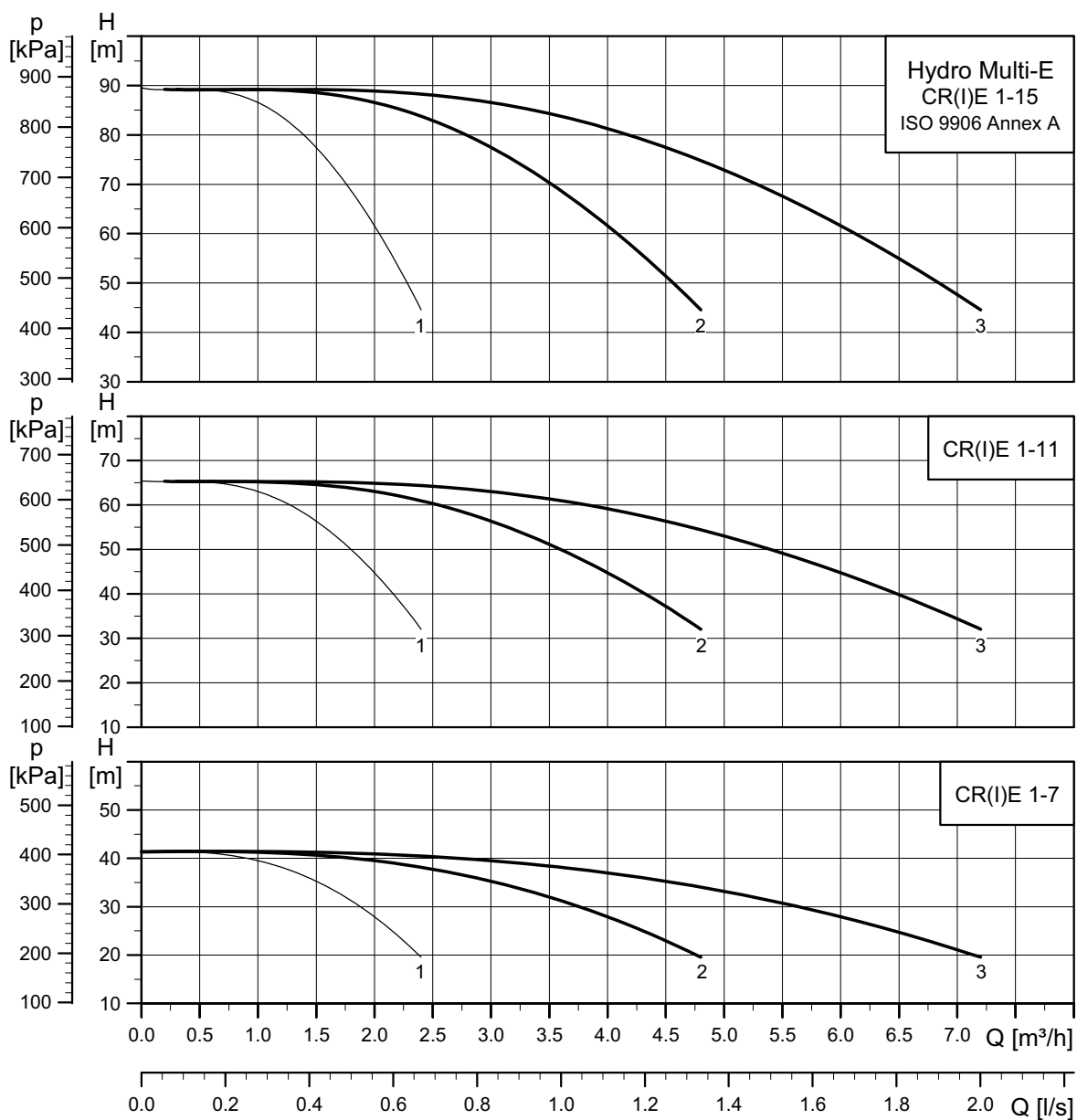
8. Performance curves and technical data

Curve conditions

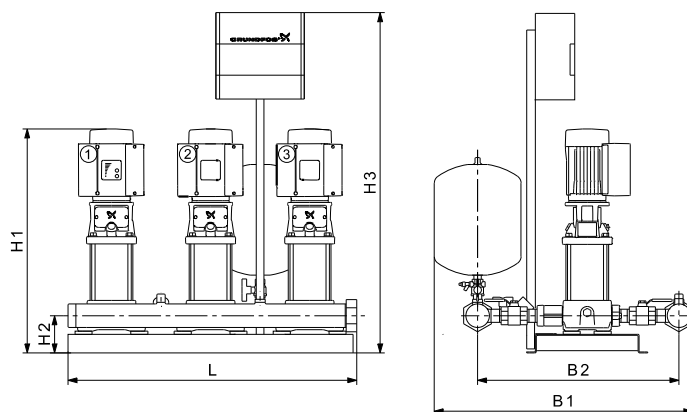
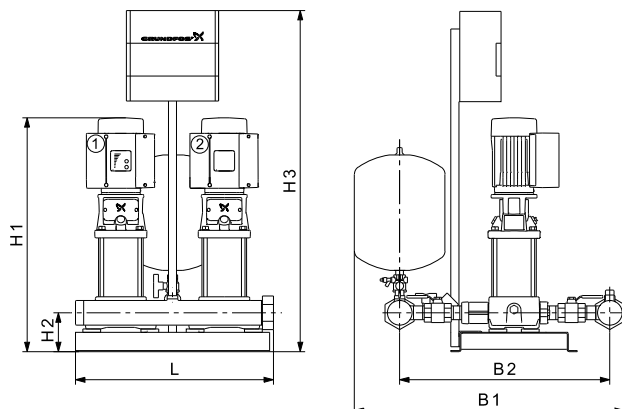
The curves on pages 18 to 36 are subject to these guidelines:

- Performance measurement is made at a water temperature of 20 °C.
- Test liquid: Pure water.
- The curves describe the pump mean values.
- The curves should not be used as guarantee curves.
- Curve tolerance: ISO 9906, Annex A.
- The curves apply to a kinematic viscosity of 1 mm²/s (1 cSt).
- The conversion between head H (m) and pressure p (kPa) has been made for water with a density of $\rho = 1000 \text{ kg/m}^3$.

Hydro Multi-E with CR(I)E 1-X



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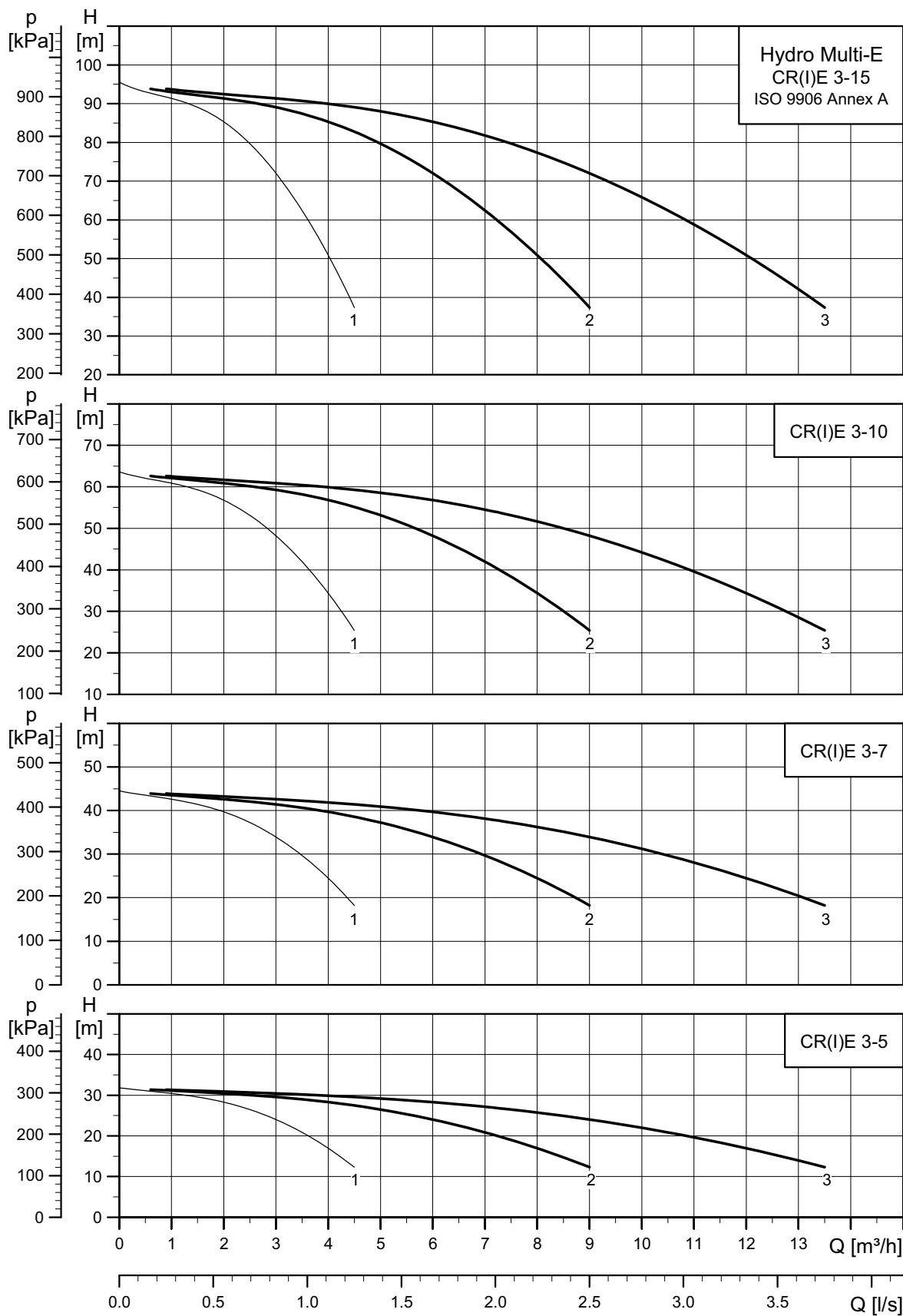
Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m³]
					Single-phase motor 3 x 400 V, PE, N	Three-phase motor 3 x 400 V, PE	Stainless steel	Galvanised										
2	CR(I)E 1-7	0.37	3.7	2.6	•	-	•	-	8	R 2	790	650	600	590	120	1170	84	0.28
3		0.37	4.6	2.6	•	-	•	-	8	R 2	790	650	920	590	120	1170	121	0.429
2	CR(I)E 1-11	0.55	5.3	3.8	•	-	•	-	8	R 2	790	650	600	660	120	1170	89	0.314
3		0.55	6.5	3.8	•	-	•	-	8	R 2	790	650	920	660	120	1170	127	0.481
2	CR(I)E 1-15	0.75	7	4.9	•	-	•	-	12	R 2	830	650	600	780	120	1370	99	0.388
3		0.75	8.5	4.9	•	-	•	-	12	R 2	830	650	920	780	120	1370	141	0.596

1) Motor [kW] is the power per pump.

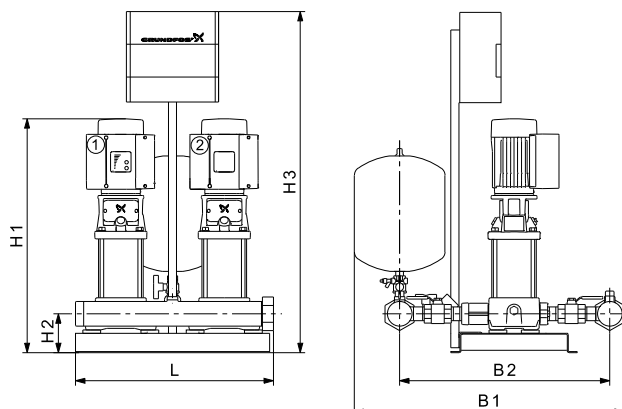
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).

3) Max. IO [A] applies to single-phase MGE motors. The value of max. IO [A] never exceeds the value of max. IN [A].

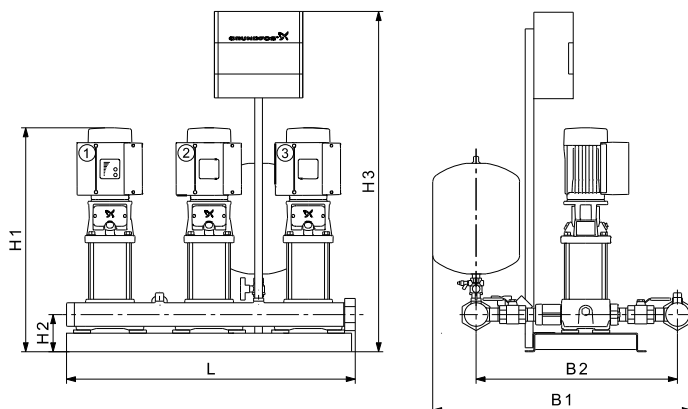
Hydro Multi-E with CR(I)E 3-X



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TM03 0922 0805

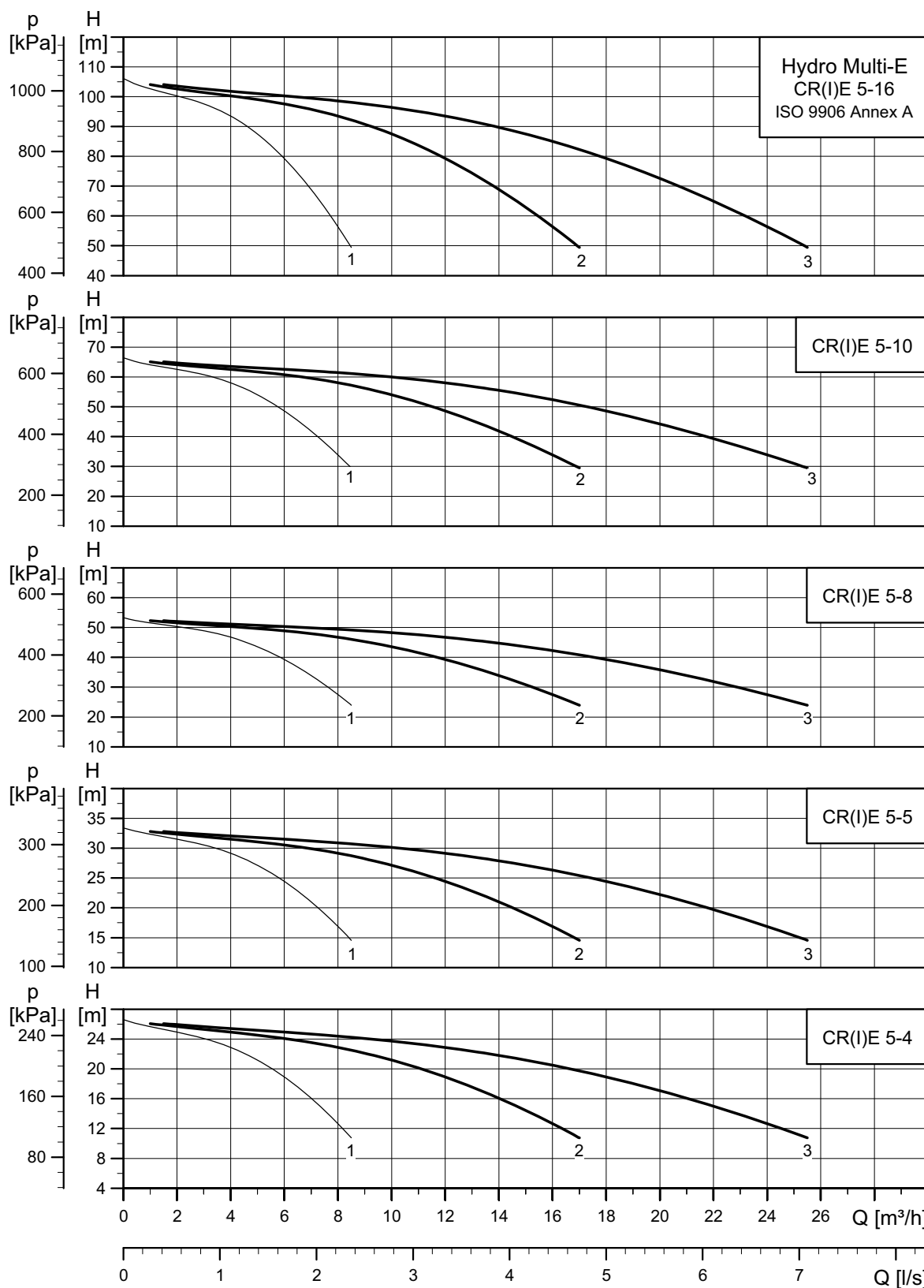
Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m ³]
					Single-phase motor 3 x 400 V, PE, N	Three-phase motor 3 x 400 V, PE	Stainless steel	Galvanised										
2	CR(I)E3-5	0.37	3.7	2.6	•	-	•	-	8	R 2	790	650	600	550	120	1170	83	0.263
3		0.37	4.6	2.6	•	-	•	-	8	R 2	790	650	920	550	120	1170	119	0.403
2	CR(I)E3-7	0.55	5.3	3.8	•	-	•	-	8	R 2	790	650	600	590	120	1170	86	0.28
3		0.55	6.5	3.8	•	-	•	-	8	R 2	790	650	920	590	120	1170	123	0.429
2	CR(I)E3-10	0.75	7	4.9	•	-	•	-	8	R 2	790	650	600	690	120	1170	94	0.327
3		0.75	8.8	4.9	•	-	•	-	8	R 2	790	650	920	690	120	1170	134	0.501
2	CR(I)E3-15	1.1	10.1	7.2	•	-	•	-	12	R 2	830	650	600	780	120	1370	102	0.388
3		1.1	12.4	7.2	•	-	•	-	12	R 2	830	650	920	780	120	1370	146	0.596

1) Motor [kW] is the power per pump.

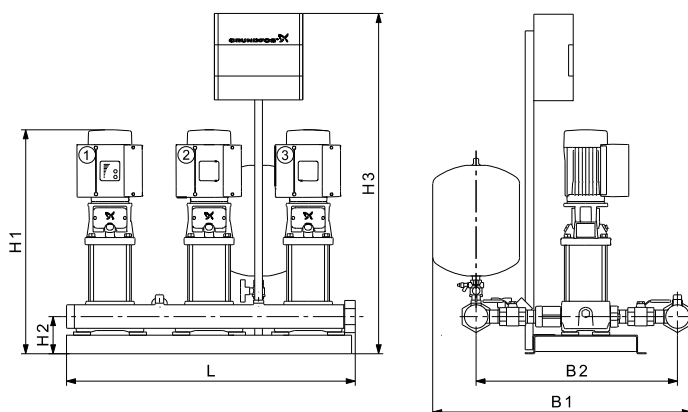
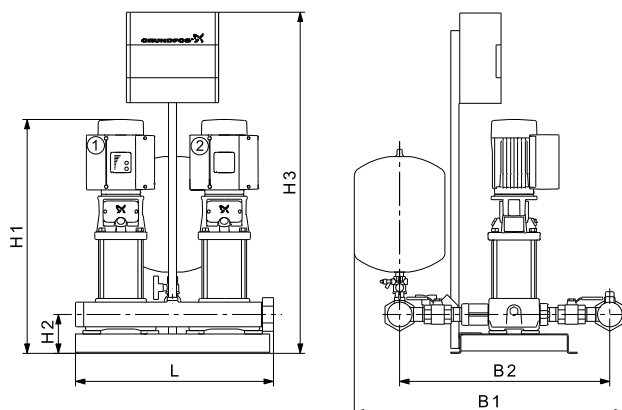
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).

3) Max. IO [A] applies to single-phase MGE motors. The value of max. IO [A] never exceeds the value of max. IN [A].

Hydro Multi-E with CR(I)E 5-X



TM02 4259 3803



TM03 0921 0805

TM03 0922 0805

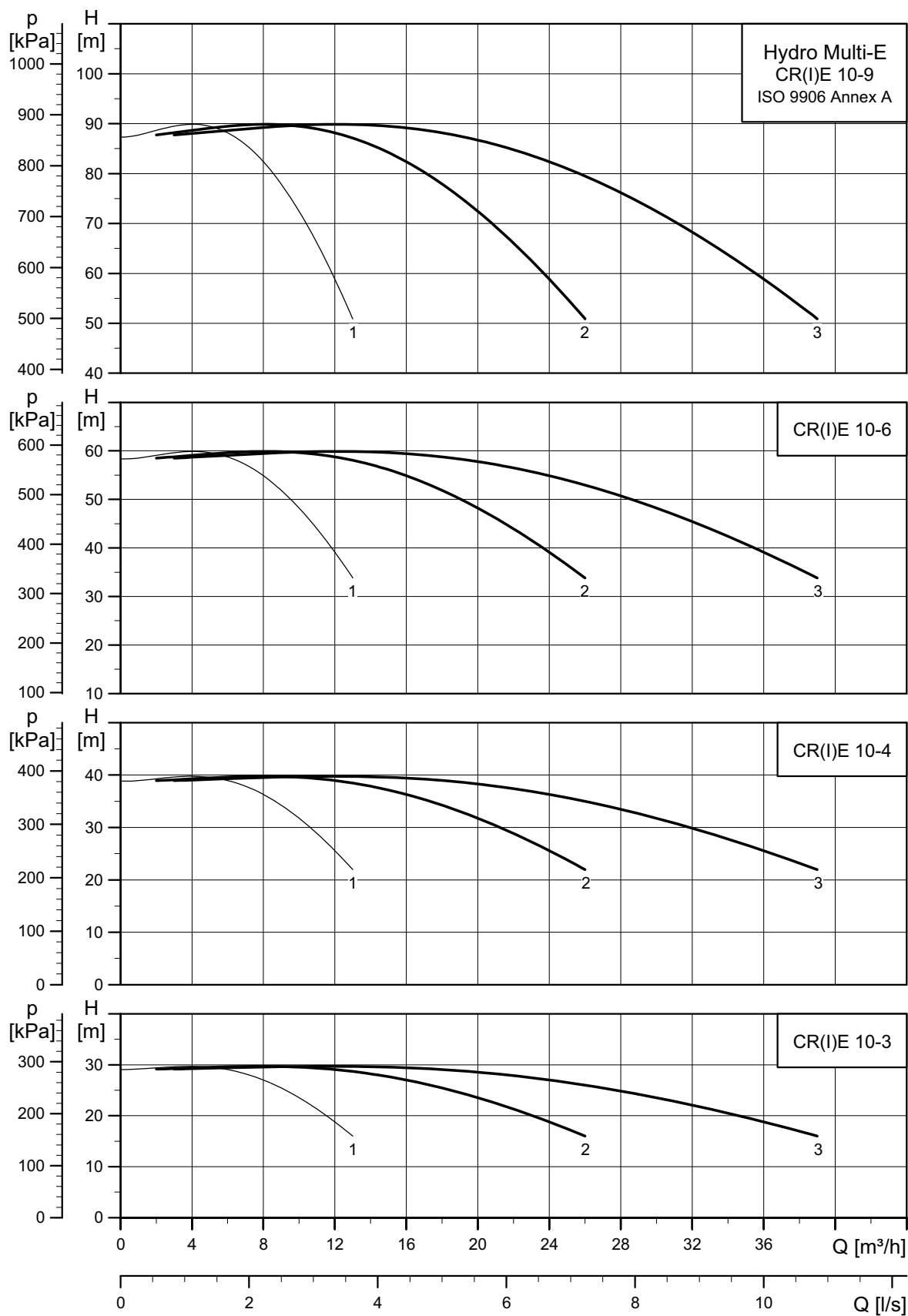
Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m ³]
					Single-phase motor 3 x 400 V, PE, N	Three-phase motor 3 x 400 V, PE	Stainless steel	Galvanised										
2	CR(I)E 5-4	0.55	5.3	3.8	•	-	•	-	18	R 2	830	650	600	570	120	1170	79	0.285
3		0.55	6.5	3.8	•	-	•	-	18	R 2	830	650	920	570	120	1170	142	0.437
2	CR(I)E 5-5	0.75	7	4.9	•	-	•	-	18	R 2	830	650	600	645	120	1170	85	0.321
3		0.75	8.5	4.9	•	-	•	-	18	R 2	830	650	920	645	120	1170	151	0.36
2	CR(I)E 5-8	1.1	10.1	7.2	•	-	•	-	18	R 2	830	650	600	725	120	1170	102	0.362
3		1.1	12.4	7.2	•	-	•	-	18	R 2	830	650	920	725	120	1170	144	0.554
2	CR(I)E 5-10	1.5	6.4	-	-	•	•	-	18	R 2	830	650	600	845	120	1370	125	0.422
3		1.5	9.5	-	-	•	•	-	18	R 2	830	650	920	845	120	1370	180	0.648
2	CR(I)E 5-16	2.2	8.9	-	-	•	•	-	12	R 2	830	650	600	1045	120	1570	140	0.522
3		2.2	13.3	-	-	•	•	-	12	R 2	830	650	920	1045	120	1570	203	0.8

1) Motor [kW] is the power per pump.

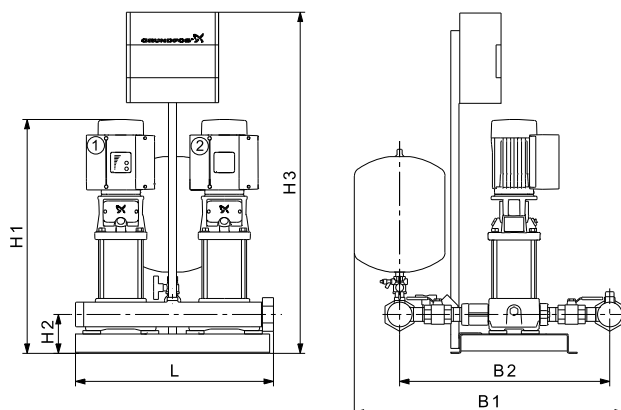
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).

3) Max. IO [A] applies to single-phase MGE motors. The value of max. IO [A] never exceeds the value of max. IN [A].

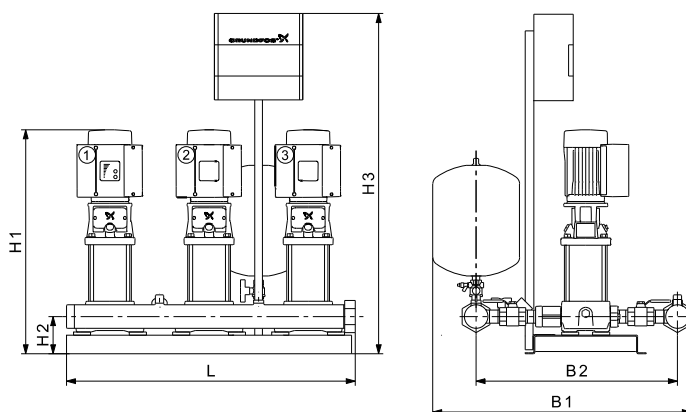
Hydro Multi-E with CR(I)E 10-X



TM02 7559 3803



TM03 0921 4811



TM03 0922 4811

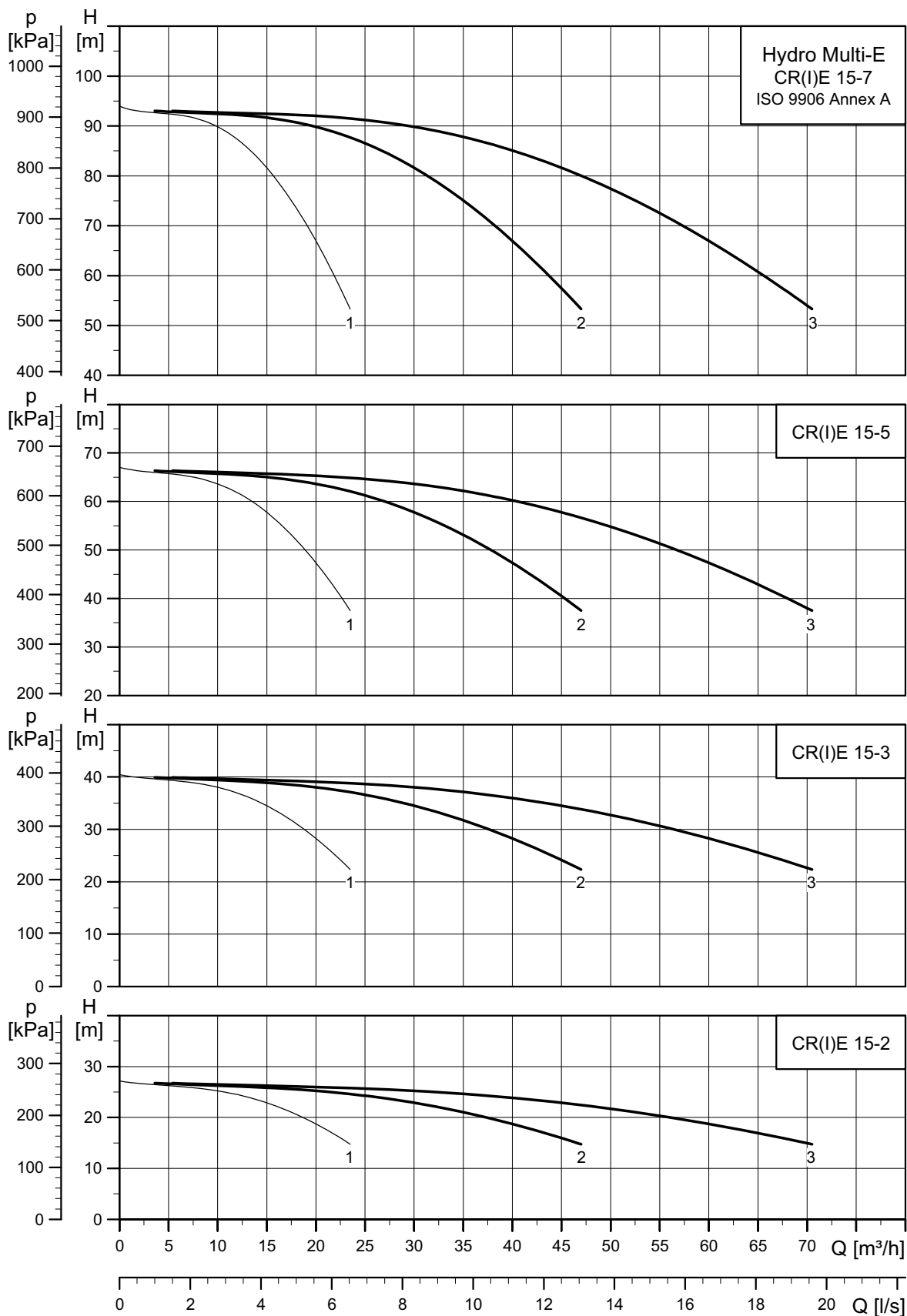
Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m ³]
					Single-phase motor 3 x 400 V, PE, N	Three-phase motor 3 x 400 V, PE	Stainless steel	Galvanised										
2	CR(I)E 10-3	1.1	10.1	7.2	•	-	•	-	25	R 2 1/2	985	800	660	690	150	1170	140	0.447
3		1.1	12.4	7.2	•	-	•	-	25	R 2 1/2	985	800	980	690	150	1170	187	0.663
2	CR(I)E 10-4	1.5	6.4	-	-	•	•	-	25	R 2 1/2	985	800	660	785	150	1370	163	0.509
3		1.5	9.5	-	-	•	•	-	25	R 2 1/2	985	800	980	785	150	1370	222	0.756
2	CR(I)E 10-6	2.2	8.9	-	-	•	•	-	25	R 2 1/2	985	800	660	885	150	1370	177	0.574
3		2.2	13.3	-	-	•	•	-	25	R 2 1/2	985	800	980	885	150	1370	243	0.852
2	CR(I)E 10-9	3	11.9	-	-	•	•	-	12	R 2 1/2	985	800	660	995	150	1570	193	0.646
3		3	17.9	-	-	•	•	-	12	R 2 1/2	985	800	980	995	150	1570	266	0.959

1) Motor [kW] is the power per pump.

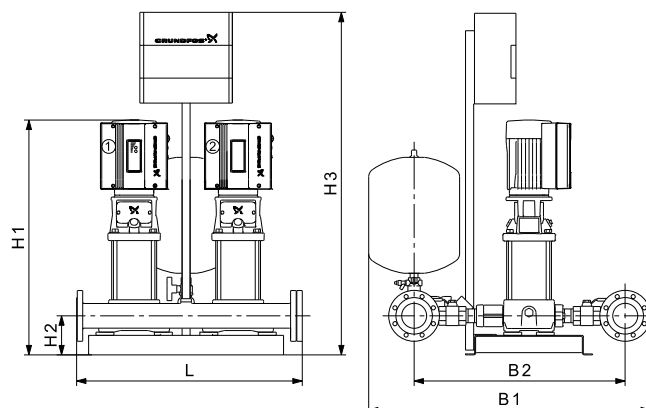
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).

3) Max. IO [A] applies to single-phase MGE motors. The value of max. IO [A] never exceeds the value of max. IN [A].

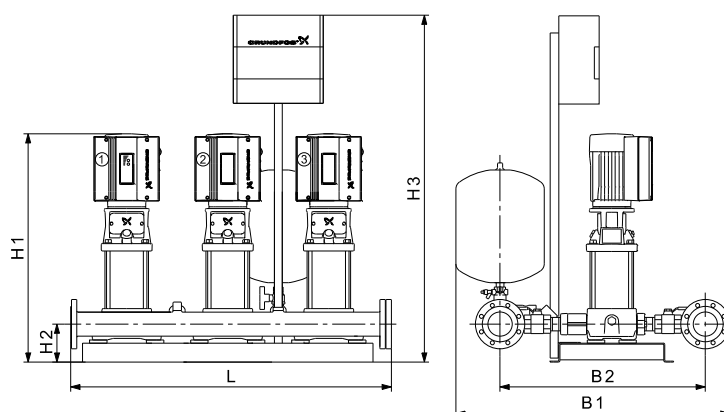
Hydro Multi-E with CR(I)E 15-X



TM02 7560 3803



TM03 0923 0805



TM03 0924 0805

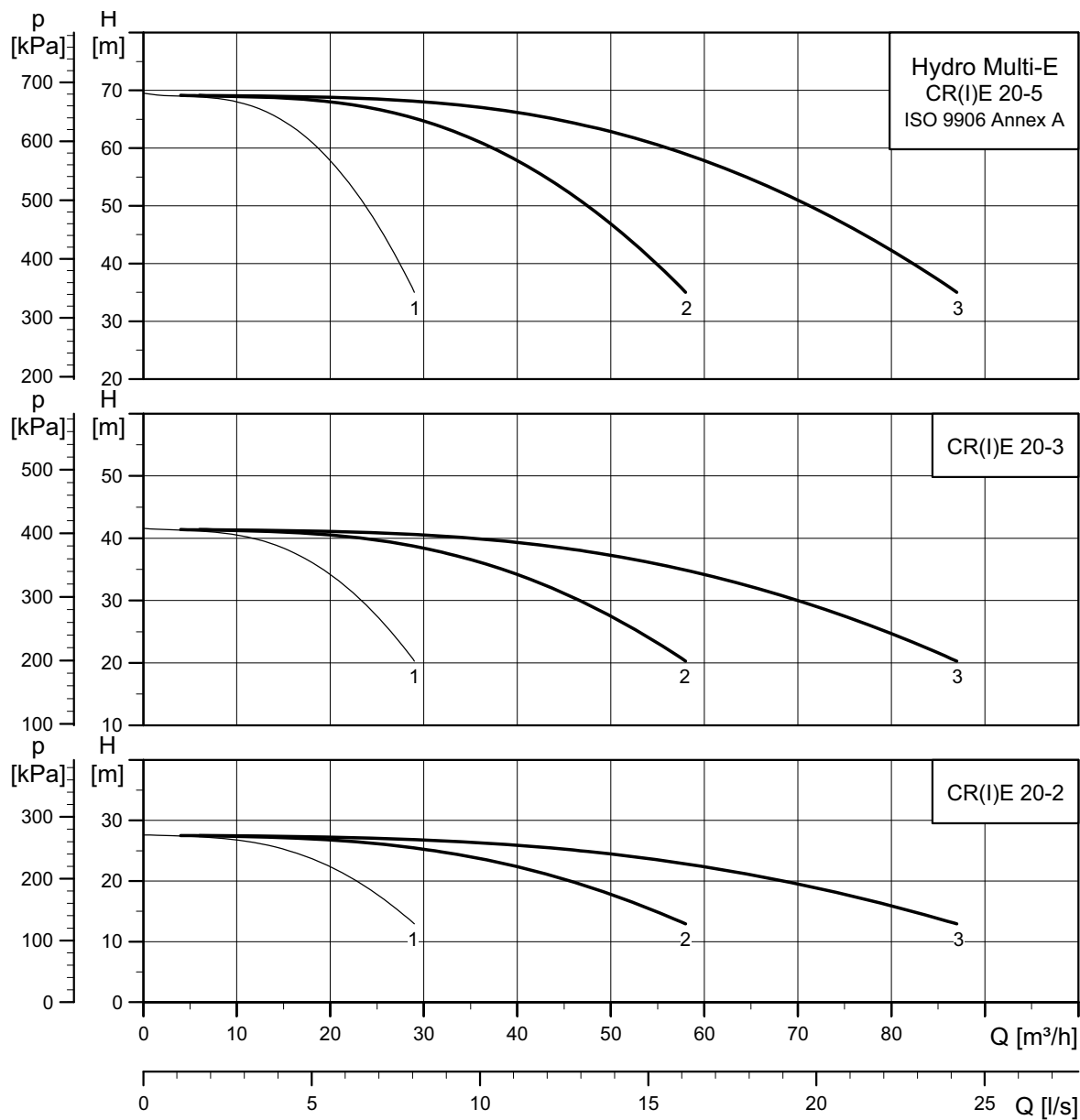
Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m ³]
					Single-phase motor 3 x 400 V, PE, N	Three-phase motor 3 x 400 V, PE	Stainless steel	Galvanised										
2	CR(I)E 15-2	2.2	8.9	-	-	•	•	-	33	DN 80	1225	950	720	810	160	1370	189	0.691
3		2.2	13.3	-	-	•	•	-	33	DN 100	1240	950	1040	810	160	1370	274	0.998
2	CR(I)E 15-3	3	11.9	-	-	•	•	-	33	DN 80	1225	950	720	870	160	1370	200	0.767
3		3	17.9	-	-	•	•	-	33	DN 100	1240	950	1040	870	160	1370	290	1.108
2	CR(I)E 15-5	4	15.6	-	-	•	•	-	33	DN 80	1225	950	720	1000	160	1570	237	0.879
3		4	23.4	-	-	•	•	-	33	DN 100	1240	950	1040	1000	160	1570	334	1.27
2	CR(I)E 15-7	5.5	21.1	-	-	•	•	-	12	DN 80	1200	950	720	1140	160	1570	268	0.975
3		5.5	31.7	-	-	•	•	-	12	DN 100	1200	950	1040	1140	160	1570	393	1.408

1) Motor [kW] is the power per pump.

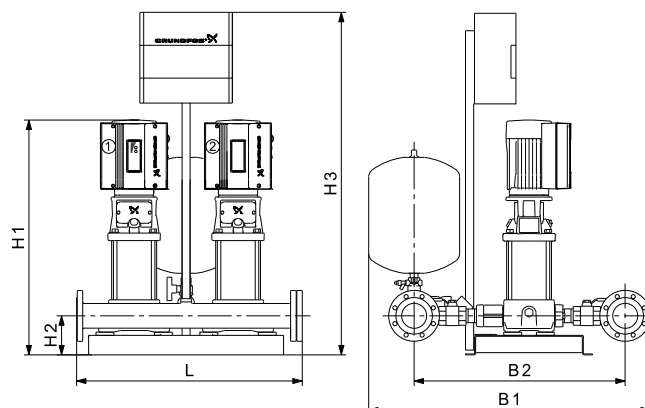
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).

3) Max. IO [A] applies to single-phase MGE motors. The value of max. IO [A] never exceeds the value of max. IN [A].

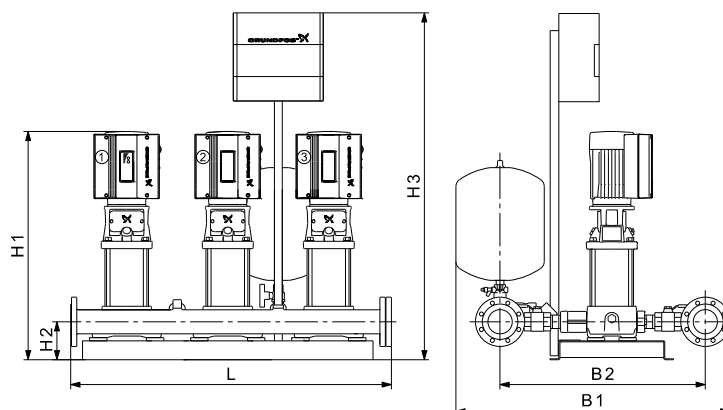
Hydro Multi-E with CR(I)E 20-X



TM02 7561 3803



TM03 0923 0805



TM03 0924 0805

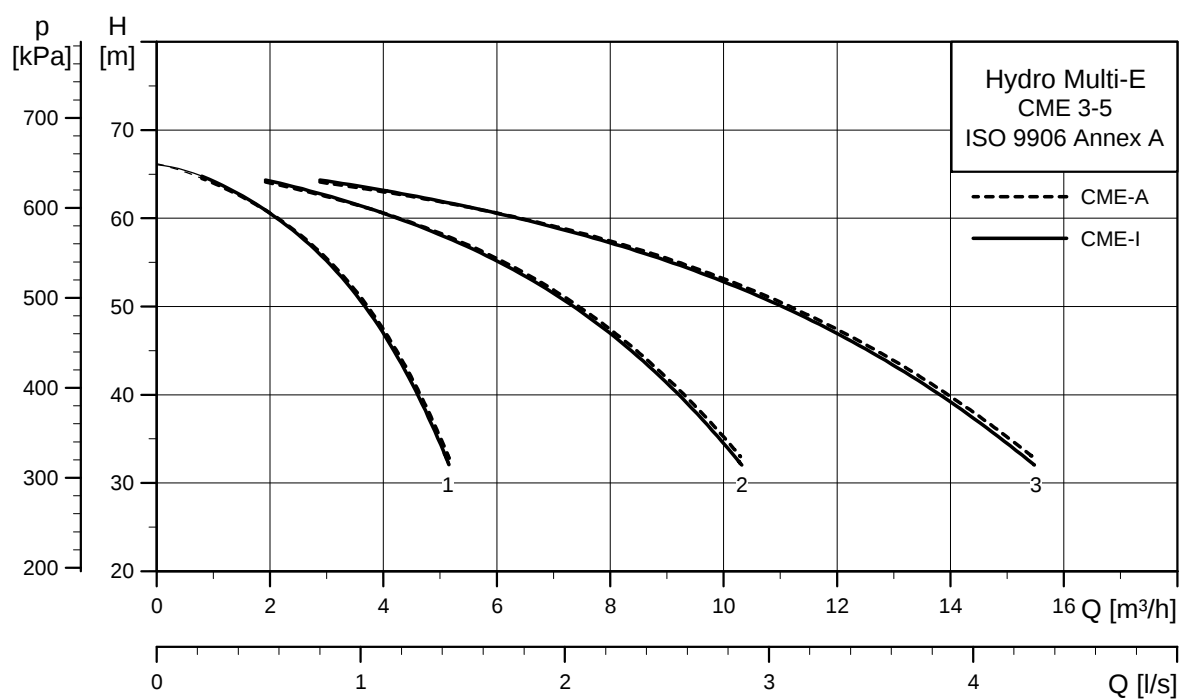
Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m ³]
					Single-phase motor 3 x 400 V, PE, N	Three-phase motor 3 x 400 V, PE	Stainless steel	Galvanised										
2	CR(I)E20-2	2.2	8.9	-	-	•	•	-	33	DN 80	1225	950	720	805	160	1370	187	0.689
3		2.2	13.3	-	-	•	•	-	33	DN 100	1240	950	1040	805	160	1370	274	0.995
2	CR(I)E20-3	4	15.6	-	-	•	•	-	33	DN 80	1225	950	720	910	160	1370	221	0.798
3		4	23.4	-	-	•	•	-	33	DN 100	1240	950	1040	910	160	1370	323	1.153
2	CR(I)E20-5	5.5	21.1	-	-	•	•	-	33	DN 80	1225	950	720	1050	160	1570	263	0.923
3		5.5	31.7	-	-	•	•	-	33	DN 100	1240	950	1040	1050	160	1570	385	1.333

1) Motor [kW] is the power per pump.

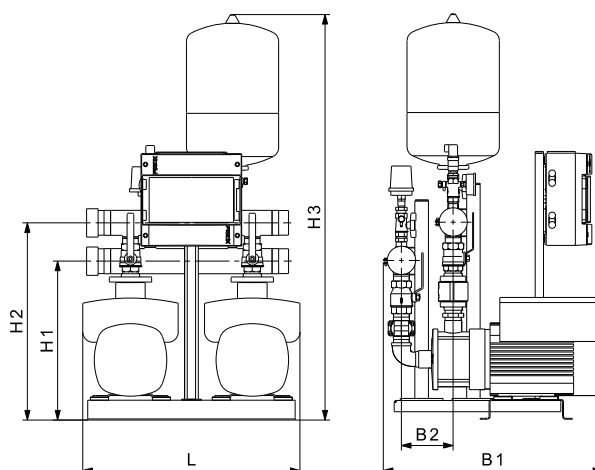
2) Max. IN [A] applies to the current for the specific Hydro Multi-E at a specific voltage (230 or 400 V).

3) Max. IO [A] applies to single-phase MGE motors. The value of max. IO [A] never exceeds the value of max. IN [A].

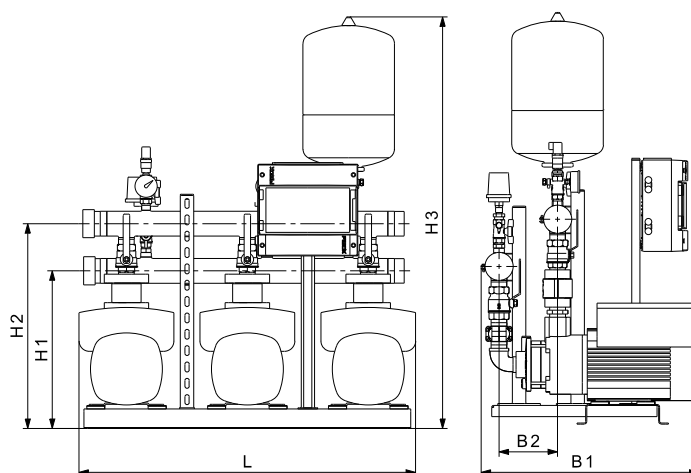
Hydro Multi-E with CME 3-5



TM05 2297 4811



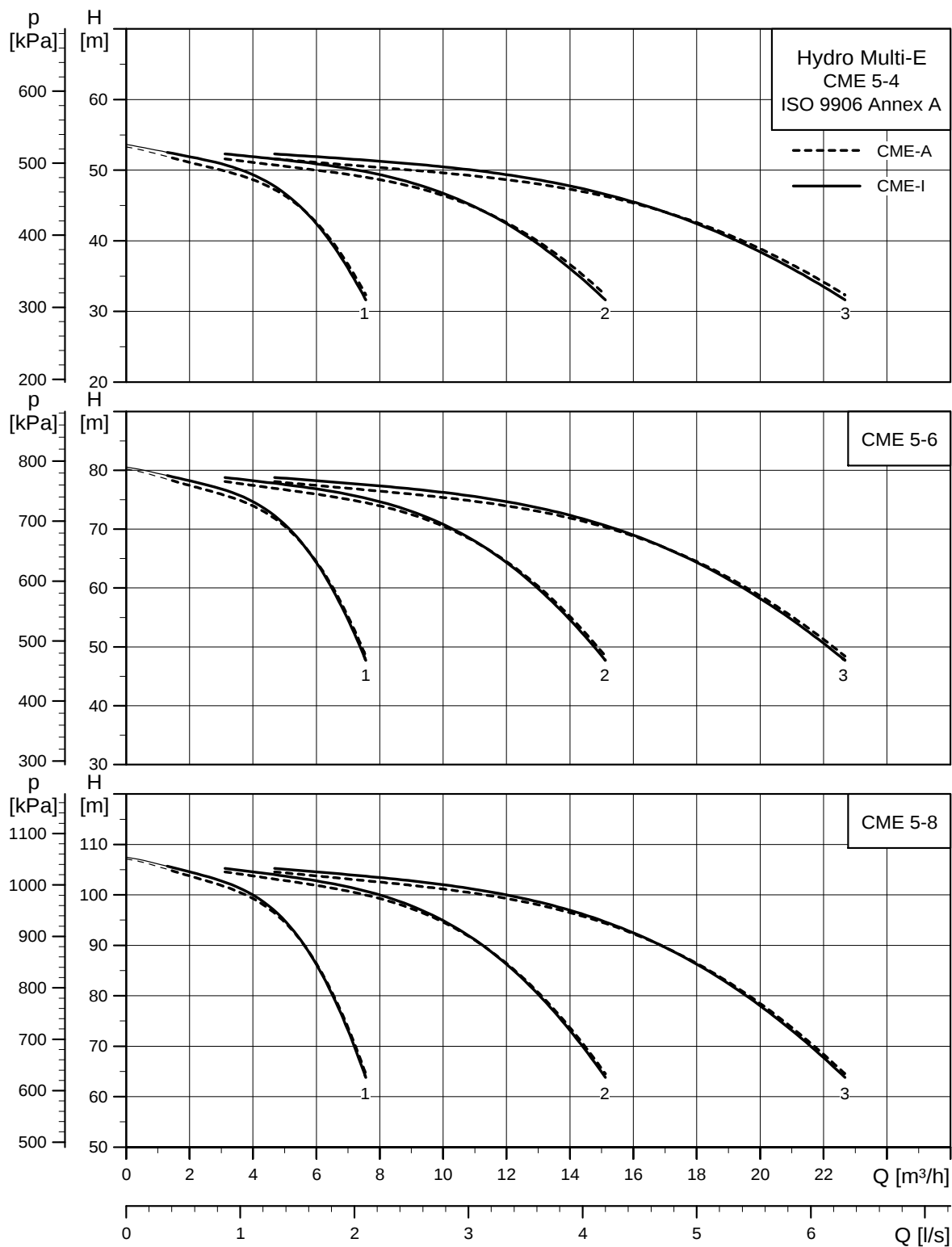
TM03 0923 0805



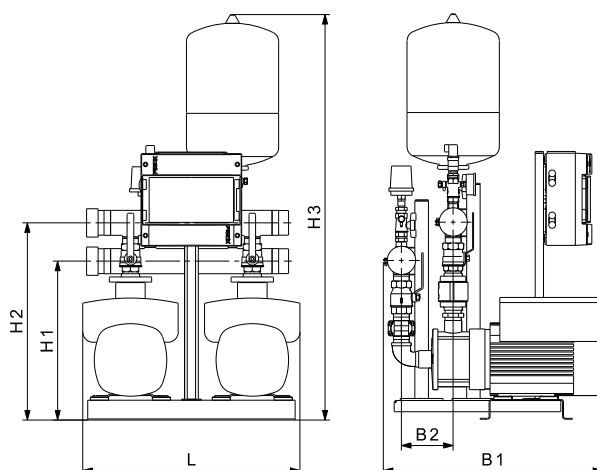
TM03 0924 0805

Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m³]
					Single-phase motor 3 x 400 V, PE, N	Three-phase motor 3 x 400 V, PE	Stainless steel	Galvanised										
2	CME-A 3-5	1.1	10.1	7.2	●	-	-	●	8	R 1 1/2	600	190	590	345	510	890	63	0.315
3		1.1	12.4	7.2	●	-	-	●	8	R 1 1/2	600	190	960	345	510	890	96	0.513
2	CME-I 3-5	1.1	10.1	7.2	●	-	●	-	8	R 1 1/2	600	155	590	345	530	910	77	0.322
3		1.1	12.4	7.2	●	-	●	-	8	R 1 1/2	600	155	960	345	530	910	108	0.524

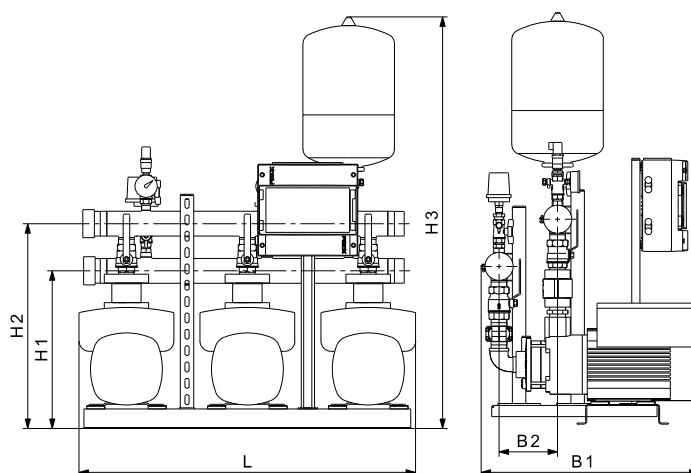
Hydro Multi-E with CME 5-X



TM05 2298 4811



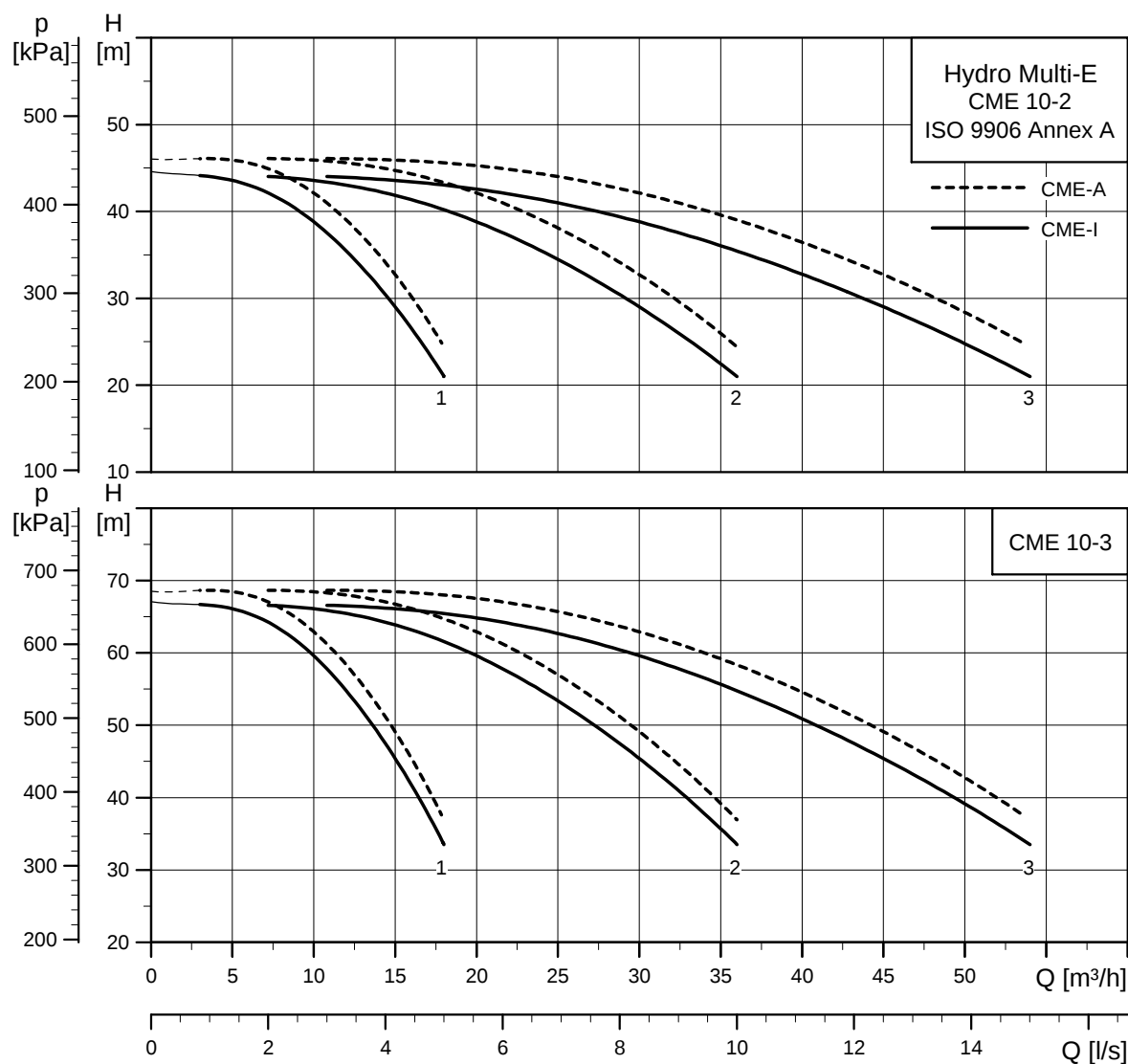
TM03 0923 0805



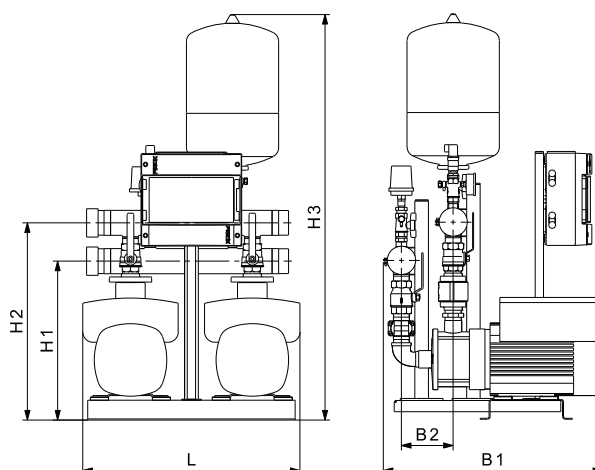
TM03 0924 0805

Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m ³]
					Single-phase motor 3 x 400 V, PE, N	Three-phase motor 3 x 400 V, PE	Stainless steel	Galvanised										
2	CME-A 5-4	1.5	6.6	-	-	•	-	•	18	R 2	605	150	640	390	605	1080	65	0.418
3		1.5	9.9	-	-	•	-	•	18	R 2	605	150	1010	390	605	1080	99	0.660
2	CME-I 5-4	1.5	6.6	-	-	•	•	-	18	R 2	605	130	635	390	585	1055	79	0.405
3		1.5	9.9	-	-	•	•	-	18	R 2	605	130	1005	390	585	1055	111	0.641
2	CME-A 5-6	2.2	9.2	-	-	•	-	•	18	R 2	605	185	640	390	605	1080	69	0.418
3		2.2	13.8	-	-	•	-	•	18	R 2	605	185	1010	390	605	1080	105	0.660
2	CME-I 5-6	2.2	9.2	-	-	•	•	-	12	R 2	610	180	635	390	585	975	83	0.378
3		2.2	13.8	-	-	•	•	-	12	R 2	610	180	1005	390	585	975	116	0.598
2	CME-I 5-8	3	12.4	-	-	•	•	-	12	R 2	650	220	635	400	595	985	95	0.407
3		3	18.6	-	-	•	•	-	12	R 2	650	220	1005	400	595	985	136	0.643

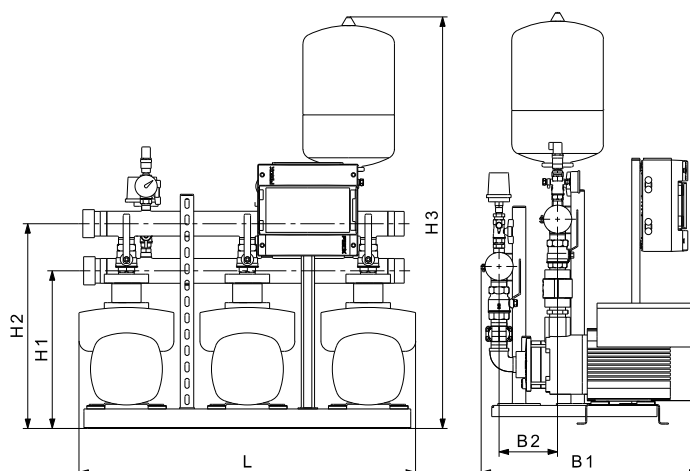
Hydro Multi-E with CME 10-X



TM05 2299 4811



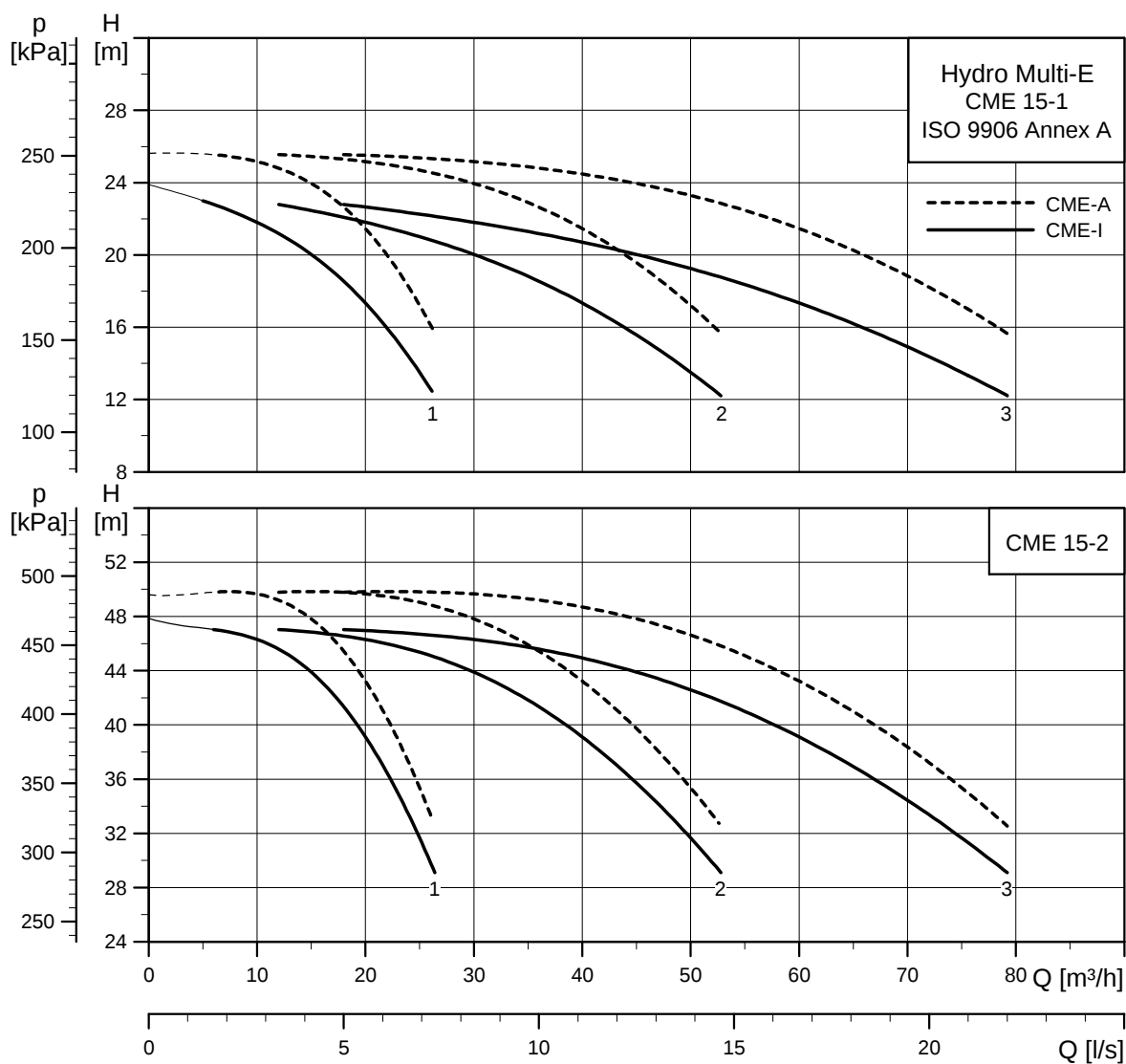
TM03 0923 0805



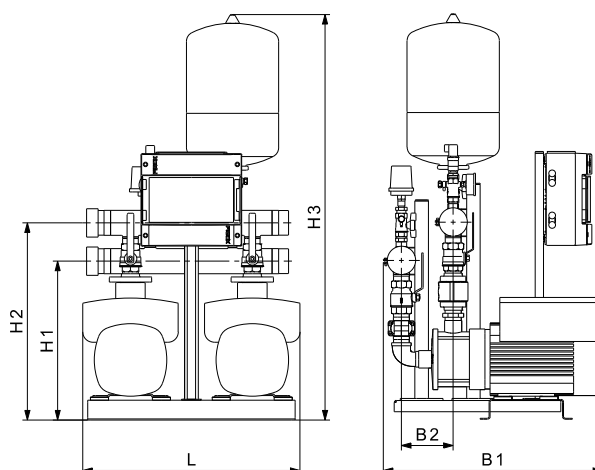
TM03 0924 0805

Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m ³]
					Single-phase motor 3 x 400 V. PE. N	Three-phase motor 3 x 400 V. PE	Stainless steel	Galvanised										
2	CME-A 10-2	2.2	9.2	-	-	•	-	•	25	R 2 1/2	605	150	640	465	610	1205	91	0.467
3		2.2	13.8	-	-	•	-	•	25	R 2 1/2	605	150	1005	465	610	1205	137	0.733
2	CME-I 10-2	2.2	9.2	-	-	•	•	-	25	R 2 1/2	600	160	640	465	580	1180	104	0.453
3		2.2	13.8	-	-	•	•	-	25	R 2 1/2	600	160	1005	465	580	1180	149	0.712
2	CME-A 10-3	4	16.2	-	-	•	-	•	25	R 2 1/2	670	180	660	475	620	1220	108	0.539
3		4	24.3	-	-	•	-	•	25	R 2 1/2	670	180	1030	475	620	1220	163	0.842
2	CME-I 10-3	4	16.2	-	-	•	•	-	25	R 2 1/2	665	160	660	475	590	1190	121	0.522
3		4	24.3	-	-	•	•	-	25	R 2 1/2	665	160	1030	475	590	1190	174	0.815

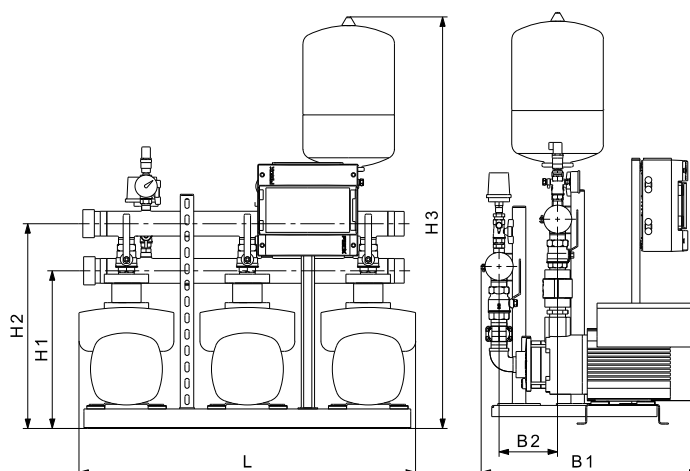
Hydro Multi-E with CME 15-X



TM05 2300 4811



TM03 0923 0805



TM03 0924 0805

Number of pumps	Pump type	Motor ¹⁾ [kW]	Max. IN ²⁾ [A]	Max. IO ³⁾ [A]	Supply voltage		Manifold		Diaphragm tank [litres]	Connections	B1 [mm]	B2 [mm]	L [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Net weight [kg]	Ship. vol. [m ³]
					Single-phase motor 3 x 400 V. PE. N	Three-phase motor 3 x 400 V. PE	Stainless steel	Galvanised										
2	CME-A 15-1	2.2	9.2	-	-	•	-	•	33	DN 80	630	165	720	500	650	1210	90	0.549
3		2.2	13.8	-	-	•	-	•	33	DN 100	640	165	1070	510	710	1290	136	0.883
2	CME-I 15-1	2.2	9.2	-	-	•	•	-	33	DN 80	660	175	720	500	660	1230	104	0.584
3		2.2	13.8	-	-	•	•	-	33	DN 100	670	175	1070	515	675	1255	148	0.900
2	CME-A 15-2	4	16.2	-	-	•	-	•	33	DN 80	700	165	720	510	660	1270	107	0.640
3		4	24.3	-	-	•	-	•	33	DN 100	710	165	1070	520	720	1300	161	0.988
2	CME-I 15-2	4	16.2	-	-	•	•	-	33	DN 80	730	175	720	510	670	1240	120	0.652
3		4	24.3	-	-	•	•	-	33	DN 100	740	175	1070	525	685	1265	173	1.002

9. Optional equipment

All optional equipment, if required, must be specified when ordering the Hydro Multi-E booster system, as it must be fitted from factory prior to delivery.

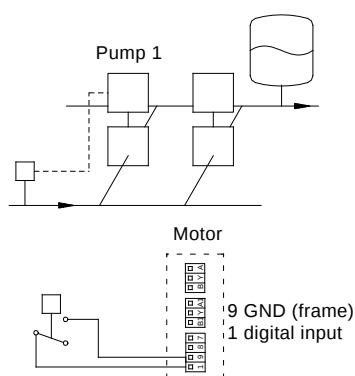
Dry-running protection

Dry-running protection must be installed.

The type of dry-running protection to choose is determined by the inlet conditions:

- If the system has an inlet pressure, a pressure switch should be used.
- If the system draws water from a tank, a level switch should be used.

As standard, the Hydro Multi-E is supplied with a pressure switch as dry-running protection.



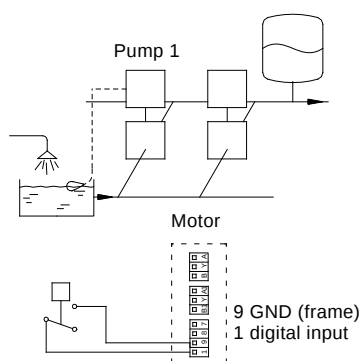
TM02 4288 0402

Fig. 16 Example of system with pressure switch

If instead, a level switch is preferred as dry-running protection, this must be stated when ordering. Then the level switch will be supplied with the booster system.

Level switch

Product	Product number
Level switch incl. 5 m cable	010749



TM02 4287 0402

Fig. 17 Example of system with level switch

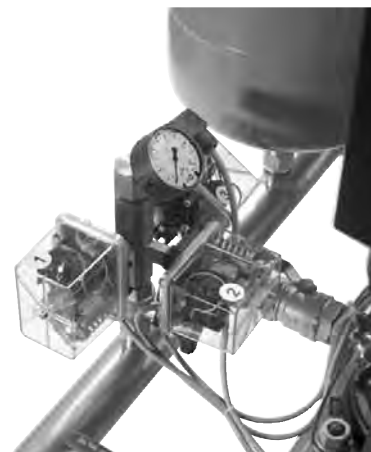
Emergency operation

The emergency operation feature ensures supply of water in these cases:

- sensor fault
- controller fault (pump 1).

If emergency operation is required, this must be stated when ordering.

Then two or three pressure switches will be fitted to the discharge manifold prior to delivery.



GrA0763

Fig. 18 Pressure switches fitted to the manifold

Emergency operation for	Product number
Hydro Multi-E with two pumps	96551260
Hydro Multi-E with three pumps	96551261

10. Accessories

The following accessories can be ordered separately and fitted or replaced at any time.

Level switch

Product	Product number
Level switch incl. 5 m cable	010184

R100 remote control

The R100 is used for wireless communication. The communication takes place via infrared light.

Product	Product number
R100	96615297

CIU communication interface units



GrA6118

Fig. 19 Grundfos CIU communication interface unit

The CIU units enable communication of operating data, such as measured values and setpoints, between CR(I)E pumps and a building management system. The CIU unit incorporates a 24-240 VAC/VDC power supply module and a CIM module. It can either be mounted on a DIN rail or on a wall.

We offer the following CIU units:

CIU 100

For communication via LON.

CIU 150

For communication via Profibus DP.

CIU 200

For communication via Modbus RTU.

CIU 250

For wireless communication via GSM, GPRS or SMS.

CIU 271

For communication via Grundfos Remote Management (GRM).

CIU 300

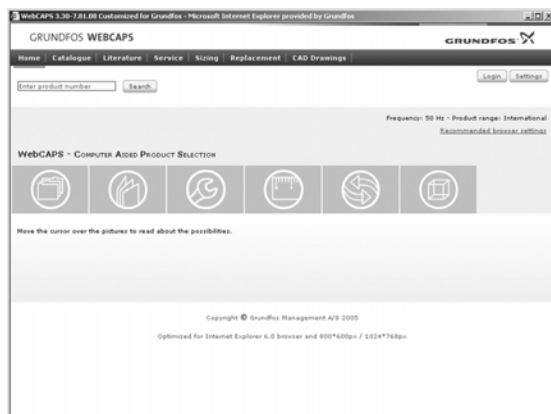
For communication via BACnet MS/TP.

Unit type	Fieldbus protocol	Product number
CIU 100	LON	96753735
CIU 150	Profibus DP	96753081
CIU 200	Modbus RTU	96753082
CIU 250	GSM/GPRS	96787106
CIU 271	GRM	Contact Grundfos.
CIU 300	BACnet MS/TP	96893769

For further information about data communication via CIU units and fieldbus protocols, see the CIU documentation available on www.grundfos.com (WebCAPS).

11. Further product documentation

WebCAPS

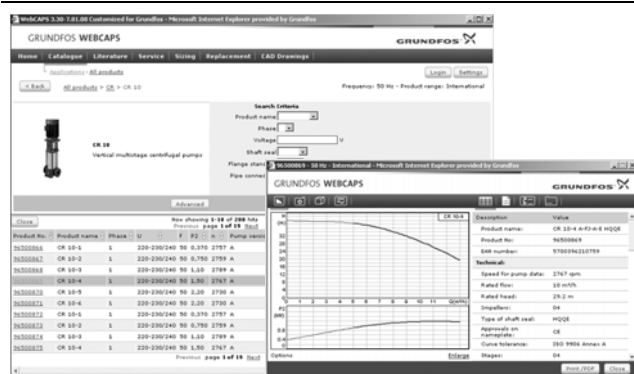


WebCAPS is a **Web-based Computer Aided Product Selection** program available on www.grundfos.com.

WebCAPS contains detailed information on more than 220,000 Grundfos products in more than 30 languages.

Information in WebCAPS is divided into six sections:

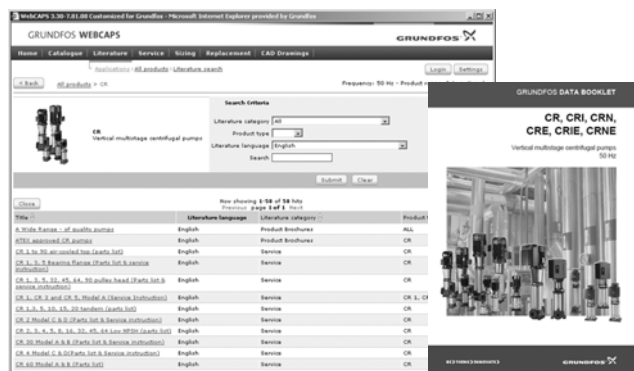
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalogue

Based on fields of application and pump types, this section contains the following:

- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

This section contains all the latest documents of a given pump, such as

- data booklets
- installation and operating instructions
- service documentation, such as Service kit catalogue and Service kit instructions
- quick guides
- product brochures.



Service

This section contains an easy-to-use interactive service catalogue. Here you can find and identify service parts of both existing and discontinued Grundfos pumps. Furthermore, the section contains service videos showing you how to replace service parts.



Sizing

This section is based on different fields of application and installation examples and gives easy step-by-step instructions in how to size a product:

- Select the most suitable and efficient pump for your installation
- Carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- Analyse your selected pump via the built-in life cycle cost tool
- Determine the flow velocity in wastewater applications, etc.



Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump. The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.



CAD drawings

In this section, it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

2-dimensional drawings:

- .dxf, wireframe drawings
- .dwg, wireframe drawings.

3-dimensional drawings:

- .dwg, wireframe drawings (without surfaces)
- .stp, solid drawings (with surfaces)
- .eprt, E-drawings.



WinCAPS



Fig. 20 WinCAPS CD-ROM

WinCAPS is a **Windows-based Computer Aided Product Selection** program containing detailed information on more than 220,000 Grundfos products in more than 30 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no internet connection is available.

WinCAPS is available on CD-ROM and updated once a year.

Subject to alterations.



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ECM: 1088471

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