

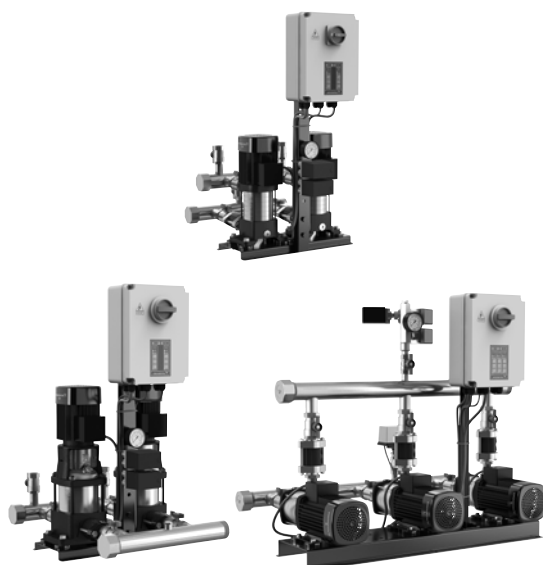
Hydro Multi-S

Grundfos booster systems with two or three CM, CMV or CR pumps
60 Hz



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1. Product introduction



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Fig. 1 Hydro Multi-S booster systems

Grundfos Hydro Multi-S booster systems are designed for pressure boosting of clean water.

Examples:

- blocks of flats
- hotels
- schools.

Grundfos Hydro Multi-S booster systems consist of two or three identical Grundfos CM, CMV or CR pumps connected in parallel and mounted on a common base frame and a control cabinet with motor-protective circuit breaker and integrated controller.

Hydro Multi-S booster systems are supplied as complete, pre-assembled and tested systems including suction and discharge manifolds, isolating valves, non-return valves, pressure gauge and pressure switches.

To ensure reliable operation, the booster system must be fitted with a suitable diaphragm tank. The size of the diaphragm tank can be found on page [20](#).

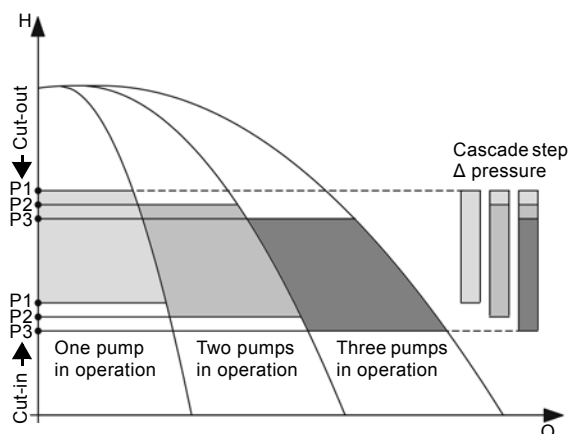
Automatic pump operation is based on system demand and controlled by pressure switches (one for each pump).

How does Hydro Multi-S work?

When a tap is opened, water will be drawn from the diaphragm tank. The pressure will drop to the first cut-in pressure, and the first pump will cut in.

As the consumption rises, more pumps will cut in until the performance of the pumps in operation corresponds to the demand.

When the water consumption falls, the discharge pressure will rise to the cut-out pressure and the pressure switch will cut out one pump and as the consumption falls, more pumps will be cut out.

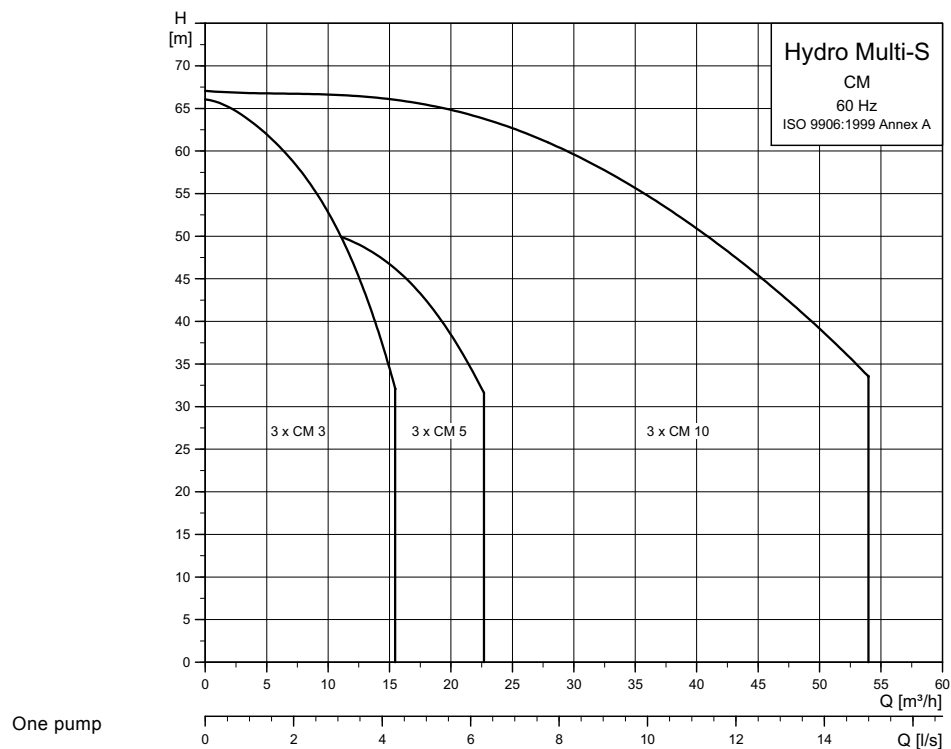


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Fig. 2 Operation with cut-in and cut-out

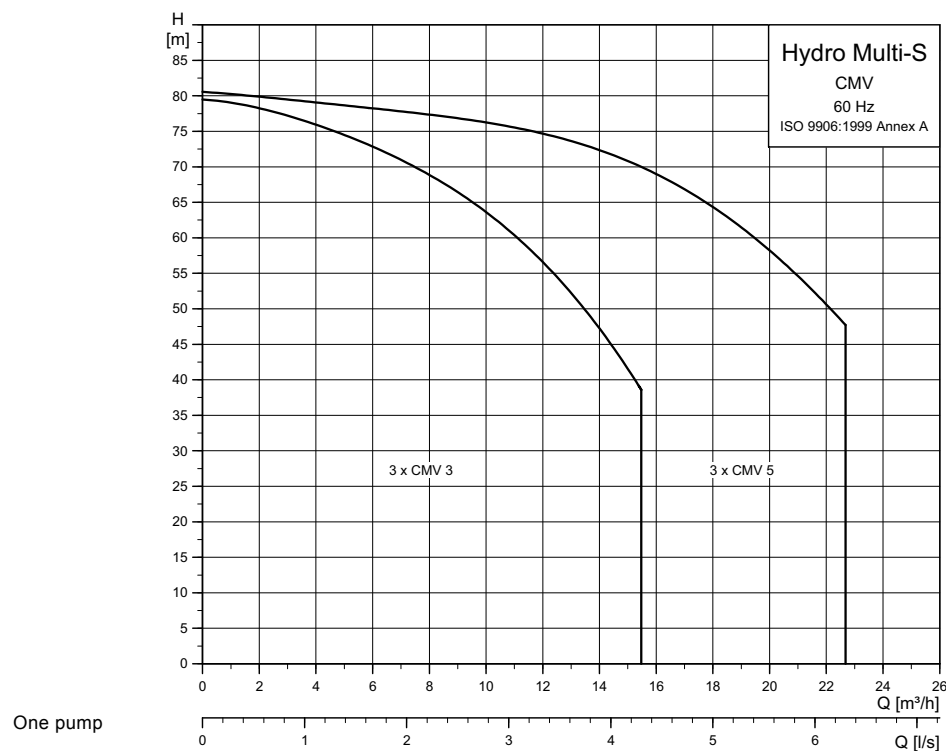
2. Performance range

Hydro Multi-S with CM pumps



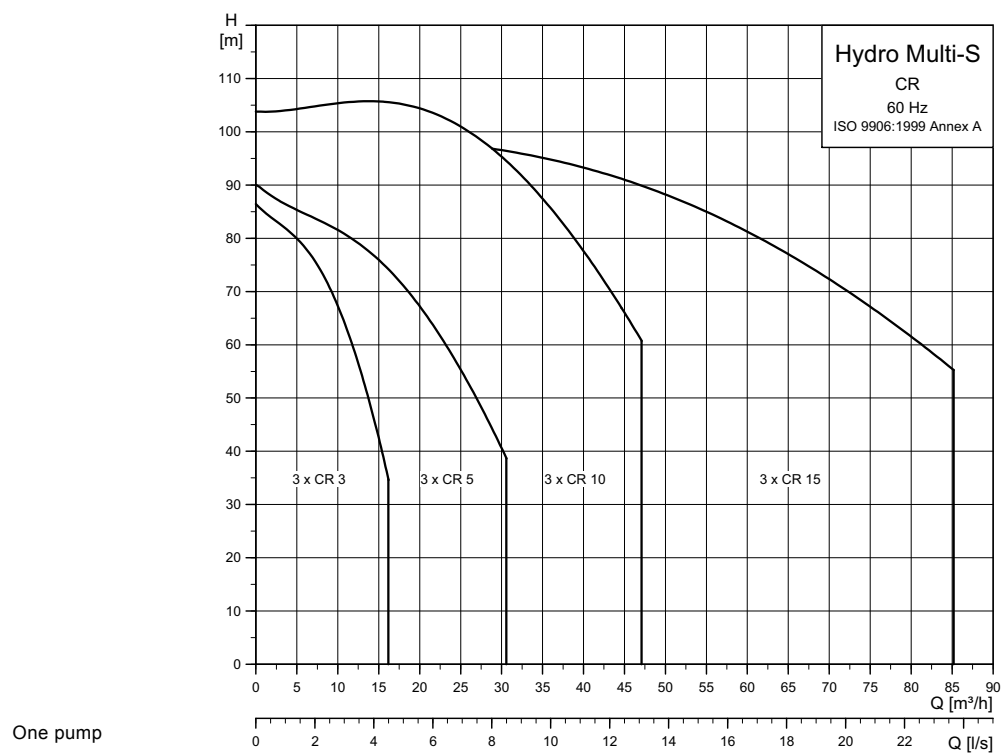
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Hydro Multi-S with CMV pumps



TM06 3295 5014

Hydro Multi-S with CR pumps



TM06 3296 5014

3. Product range

Hydro Multi-S with CM pumps

Pump type	CM 3			CM 5			CM 10			
	-4	-4	-5	-2	-3	-4	-1	-2	-3	
Hydraulic data										
Maximum head [m]	39.4	52.8	66.2	26.4	39.8	53.3	23.6	46	68.5	
Maximum flow rate [m³/h]	15.6			22.8			54			
Liquid temperature [°C]	5-40			5-40			5-40			
Maximum operating pressure [bar]	10			10			10			
Maximum inlet pressure [bar]	The inlet pressure plus the pressure when the pumps are operating against a closed valve must always be lower than the maximum operating pressure.									
Motor data										
Number of pumps	2 or 3			2 or 3			2 or 3			
Motor power [kW]	Single-phase motor	0.6	0.8	1.05	0.8	1.05	1.05	-	-	
	Three-phase motor	0.74	0.74	1.05	0.74	1.04	1.7	1.28	2.5	4.0
Supply voltage	3 x 208-230/440-480V, PE, 60 Hz	●	●	-	●	●	●	●	-	-
	1 x 220-240, PE, 60 Hz	●	●	-	●	●	●	●	●	●
Shaft seal										
AQQE	●	●	-	●	●	●	●	●	●	
Materials										
Stainless-steel manifolds, stainless-steel base frame, standard valves				-	-	-	-	-	-	
Galvanized-steel manifolds, galvanized-steel base frame, standard valves (CME-A pumps only)				-	-	-	-	-	-	
Galvanized-steel manifolds, galvanized-steel base frame painted black, standard valves				A	A	A	A	A	A	
Pipework connections										
Rp 2	●	●	-	-	-	-	-	-	-	
Rp 2 1/2	-	-	-	●	●	●	-	-	-	
Rp 3	-	-	-	-	-	-	●	●	●	
Functions										
Automatic cascade control	●	●	●	●	●	●	●	●	●	
Automatic pump changeover	●	●	●	●	●	●	●	●	●	
Dry-running protection	●	●	●	●	●	●	●	●	●	
Emergency operation	●	●	●	●	●	●	●	●	●	
Automatic resetting of dry-running fault	●	●	●	●	●	●	●	●	●	
Startup delay between pumps	●	●	●	●	●	●	●	●	●	
Motor protection by means of a thermal overload relay	●	●	●	●	●	●	●	●	●	
Short-circuit protection by means of fuses	●	●	●	●	●	●	●	●	●	

• Available as standard.

A Only available in the ASEAN countries.

Hydro Multi-S with CMV pumps



GrB2186 - GrB2184

Pump type		CMV 3				CMV 5			
		-3	-4	-5	-6	-2	-3	-4	-6
Hydraulic data									
Maximum head [m]		39.4	52.8	66.2	79.6	26.4	39.8	53.3	80.2
Maximum flow rate [m³/h]		15.6				22.8			
Liquid temperature [°C]		5-40				5-40			
Maximum operating pressure [bar]		10				10			
Maximum inlet pressure [bar]		The inlet pressure plus the pressure when the pumps are operating against a closed valve must always be lower than the maximum operating pressure.							
Motor data									
Number of pumps		2 or 3				2 or 3			
Motor power [kW]	Single-phase motor	0.6	0.84	1.14	1.54	0.84	1.14	1.5	-
	Three-phase motor	0.74	0.74	1.04	1.28	0.74	1.04	1.7	2.5
Supply voltage	3 x 208-230/440-480V, PE, 60 Hz	•	•	•	•	•	•	•	•
	1 x 220-240, PE, 60 Hz	•	•	•	•	•	•	•	-
Shaft seal									
AQQE		•	•	•	•	•	•	•	•
Materials									
Galvanized-steel manifolds, galvanized-steel base frame, standard valves		-	-	-	-	-	-	-	-
Galvanized-steel manifolds, galvanized-steel base frame painted black, standard valves		A	A	A	A	A	A	A	A
Pipework connections									
Rp 2		•	•	•	•	•	•	•	•
Rp 2 1/2		-	-	-	-	-	-	-	-
Rp 3		-	-	-	-	-	-	-	-
Functions									
Automatic cascade control		•	•	•	•	•	•	•	•
Automatic pump changeover		•	•	•	•	•	•	•	•
Dry-running protection		-	-	-	-	-	-	-	-
Emergency operation		•	•	•	•	•	•	•	•
Automatic resetting of dry-running fault		•	•	•	•	•	•	•	•
Startup delay between pumps		•	•	•	•	•	•	•	•
Motor protection by means of a thermal overload relay		•	•	•	•	•	•	•	•
Short-circuit protection by means of fuses		•	•	•	•	•	•	•	•

• Available as standard.

A Only available in the ASEAN countries.

Hydro Multi-S with CR pumps



GrA5737 - GrA5736

Pump type	CR 3				CR 5				CR 10				CR 15			
	-4	-5	8	-9	-4	-5	-7	-9	-3	-5	-6	-7	-2	-3	-4	-5
Hydraulic data																
Maximum head [m]	36	45	72	82	38	48	69	89	44	74	89	105	38	58	78	97
Maximum flow rate [m³/h]	16.2				30.6				47.1				85.2			
Liquid temperature [°C]	5-50				5-50				5-50				5-50			
Maximum operating pressure [bar]	16	16	16	16	16	16	16	16	16	16	16	16	10	10	10	10
Maximum inlet pressure [bar]	12.4	11.5	8.8	7.8	12.2	11.2	9.1	7.1	11.6	8.6	7.1	5.5	6.2	4.2	2.2	0.3
Motor data																
Number of pumps	2 or 3				2 or 3				2 or 3				2 or 3			
Motor power [kW]	0.55	0.75	1.10	1.5	1.1	1.5	2.2	2.2	2.25	3.0	4.0	5.5	3.0	4.0	5.5	7.5
Supply voltage	3 x 208-230/440-480V, PE, 60 Hz				•	•	•	•	•	-	-	-	-	-	-	
	1 x 220-240, PE, 60 Hz				•	•	•	•	•	•	•	•	•	•	•	
Shaft seal																
HQQE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Materials																
Stainless-steel manifolds, stainless-steel base frame, standard valves	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Galvanized-steel manifolds, galvanized-steel base frame painted black, standard valves	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Pipework connections																
Rp 2	•	•	•	•	•	•	•	•	•	•	•	•	-	-	-	
Rp 2 1/2	-	-	-	-	-	-	-	-	•	•	•	•	-	-	-	
Rp 3	-	-	-	-	-	-	-	-	-	-	-	-	•	•	•	
Functions																
Automatic cascade control	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Automatic pump changeover	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Dry-running protection	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Emergency operation	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Automatic resetting of dry-running fault	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Startup delay between pumps	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Motor protection by means of a thermal overload relay	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Short-circuit protection by means of fuses	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

• Available as standard.

A Only available in the ASEAN countries.

4. Identification

Type key

Example	Hydro Multi	-S	2	CR 15-3	U3	A-	A-	A
System name								
System type S: Fixed-speed pumps								
Number of pumps								
Pump type								
Supply voltage code U3: 3 x 380-415 V, N, PE, 50 Hz U4: 3 x 380-415 V, PE, 50 Hz U5: 3 x 380-415 V, N, PE, 60 Hz U6: 3 x 380-415 V, PE, 60 Hz U9: 3 x 220-240 V, PE, 60 Hz UA: 3 x 440-480 V, PE, 60 Hz UC: 1 x 220-240 V, N, PE, 50 Hz UD: 1 x 220-240 V, N, PE, 60 Hz UE: 1 x 220-240 V, PE, 60 Hz UF: 3 x 208-230/440-480 V, N, PE, 60 Hz UG: 3 x 208-230/440-480 V, PE, 60 Hz								
Design type A: System with the breaker cabinet mounted on the system. B: System with wall-mounted breaker cabinet and 5 m wires.								
Starting method B: Direct on line (DOL) C: Star-delta (SD)								
Material code A: Stainless-steel manifolds, stainless-steel base frame, standard valves B: Stainless-steel manifolds, stainless-steel base frame, stainless-steel valves C: Galvanized-steel manifolds, galvanized-steel base frame, standard valves (CME-A pumps only) G: Galvanized-steel manifolds, galvanized-steel base frame, standard valves H: Galvanized-steel manifolds, galvanized-steel base frame painted black, standard valves I: Stainless-steel manifolds, stainless-steel base frame painted black, standard valves P: Stainless-steel manifolds, galvanized-steel base frame, standard valves								

5. Operating conditions

Data	Pump type	
	CM and CMV	CR
Maximum flow rate	Up to 54 m ³ /h	Up to 85 m ³ /h
Maximum operating pressure	10 bar	10/16 bar
Liquid temperature	5-40 °C	5-50 °C
Ambient temperature	5-60 °C	5-40 °C ¹⁾ 5-60 °C ²⁾
Power	Up to 4.0 kW	Up to 7.5 kW
Starting method	Direct on line Star-delta	
Supply voltage	3 x 208-230/440-480V, PE, 60 Hz 1 x 220-240, PE, 60 Hz	
Voltage tolerance	- 10 %/+ 10 %	
Relative air humidity	Max. 95 %	
Enclosure class	IP54	

¹⁾ Applies to motor sizes of 0.37 kW and up to and including 0.75 kW.

²⁾ Applies to motor sizes of 1.1 kW and up to and including 7.5 kW.

6. Construction

Hydro Multi-S booster systems consist of two or three identical CM, CMV or CR pumps connected in parallel and mounted on a common base frame provided with a control cabinet and all the necessary fittings.

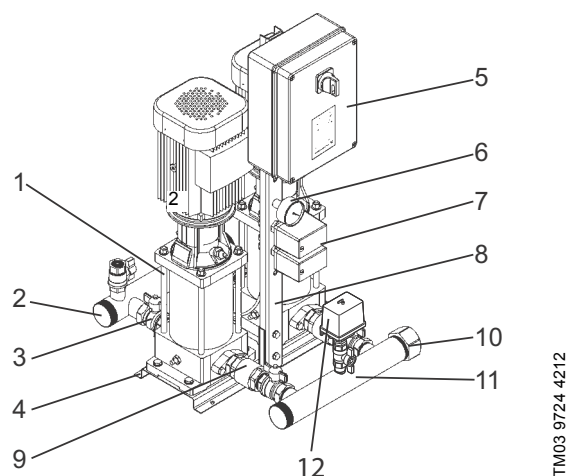


Fig. 3 Hydro Multi-S with CR 5 pumps

Pos.	Components	Number
1	Pump	2 or 3
2	Discharge manifold	1
3	Isolating valve	2 per pump
4	Base frame	1
5	Control cabinet	1
6	Pressure gauge	1
7	Pressure switch	1 per pump
8	Stand	1
9	Non-return valve ¹⁾	1 per pump
10	Screw cap	2
11	Suction manifold	1
12	Pressure switch ²⁾	1

¹⁾ Non-return valve installed on the suction side of Hydro Multi-S CMV.

²⁾ Optional on Hydro Multi-S CMV.

CM, CMV pumps

The Grundfos CM and CMV pumps are non-self-priming, multistage, end-suction centrifugal pumps. The pumps are of the close-coupled type.

The CM pump is horizontally mounted and the CMV pump is vertically mounted.

All pumps incorporate a maintenance-free mechanical O-ring shaft seal with fixed driver.

Materials

The CM and CMV pumps are available in the following material variants:

Variants	Components	Materials
CM-A	Suction and discharge parts	EN-GJL-200
	Pump shaft	EN 1.4301/AISI 304
	Impellers/chambers	EN 1.4301/AISI 304
CM-I	Suction and discharge parts	EN 1.4301/AISI 304
	Pump shaft	EN 1.4301/AISI 304
	Impellers/chambers	EN 1.4301/AISI 304
CMV	Suction and discharge parts	EN-GJL-200
	Pump shaft	EN 1.4301/AISI 304
	Impellers/chambers	EN 1.4301/AISI 304



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Fig. 4 CM pumps



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Fig. 5 CMV pump

Shaft seal

The shaft seal for the CM and CMV pumps is of the O-ring type, which makes it very flexible when different types of O-ring and seal face material are needed.

The shaft seal has a fixed seal driver which ensures a reliable rotation of all parts, even under the most extreme operating conditions.

Due to the special design of the shaft seal and the interfaces to the rest of the pump, the dry-running capabilities are significantly better compared to most other similar shaft seals and pump types. Furthermore, improvements have been made to reduce the risk and effect of seizing up.



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Fig. 6 Exploded view of shaft seal

Note: The available shaft seals for CM and CMV pumps are very robust and durable, but dry running must always be avoided.

Motor

CM pumps are fitted with totally enclosed, fan-cooled, 2-pole motors with principal dimensions to EN 50347. Electrical tolerances comply with EN 60034.

Electrical data

Enclosure class: IP55

Insulation class: F

Supply voltages: 3 x 208-230/440-480V, PE, 60 Hz
1 x 220-240, PE, 60 Hz

A motor-protective circuit breaker is incorporated in the control cabinet.

Single-phase motors have a built-in thermal relay to IEC 34-11, TP 211 (slow overload and locked rotor).

CR pump

The Grundfos CR pump is a non-self-priming, vertical, multistage centrifugal pump.

The pump consists of a base and a pump head. The chamber stack and the sleeve are secured between the pump head and the base with staybolts. The base has suction and discharge ports on the same level (in line).



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Fig. 7 CR pump

Materials

Components	Materials	EN	AISI/ASTM
Pump head	Cast iron	EN-JL1030	ASTM 25B
Shaft	Stainless steel	1.4401 ¹⁾ 1.4057 ²⁾	AISI 316 AISI 431
Impeller	Stainless steel	1.4301	AISI 304
Chamber	Stainless steel	1.4301	AISI 304
Sleeve	Stainless steel	1.4301	AISI 304
Base	Cast iron	EN-JL1030	ASTM 25B
Neck ring	PTFE		
Rubber parts	EPDM		

¹⁾ CR 3, 5.

²⁾ CR 10, 15.

Shaft seal

All pumps have a maintenance-free mechanical HQQE shaft seal of the cartridge type.

Motor

The CR pump is fitted with a totally enclosed, fan-cooled, 2-pole Grundfos standard motor with principal dimensions to EN standards.

Electrical tolerances comply with EN 60034.

Electrical data

Enclosure class: IP55

Insulation class: F

Supply voltages: 3 x 208-230/440-480V, PE, 60 Hz
1 x 220-240, PE, 60 Hz

A motor-protective circuit breaker is incorporated in the control cabinet.

Single-phase motors have a built-in thermal relay to IEC 34-11, TP 211 (slow overload and locked rotor).

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

7. Functions

Description of functions

Hydro Multi-S offers the following features:

- Automatic cascade control of pumps by means of two or three pressure switches.
- Automatic pump changeover at any start or stop cycle.
- If a pump is in fault status, it is automatically taken out of operation.
- Automatic resetting of dry-running fault.
- Manual resetting of overload trip.
- Possibility of emergency operation.
- Pump and system protection:
 - Short-circuit protection by means of fuses.
 - Motor protection by means of a thermal overload relay.
 - Dry-running protection by means of a pressure switch or level switch (optional on Hydro Multi-S CMV).
 - Startup delay between two pumps: Prevents simultaneous startup of pumps.

8. Mechanical installation

Installation

A Hydro Multi-S booster system must be installed in a well-ventilated room to ensure sufficient cooling of the pumps. Hydro Multi-S 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.

Motor cooling

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

- Place Hydro Multi-S in a well-ventilated room.
- Motor cooling fins, holes in fan cover and fan blades must be kept clean.

Maximum ambient temperature

Hydro Multi-S with CM and CMV pumps

All motor sizes: Max. 60 °C.

Hydro Multi-S with CR pumps

0.37 to 0.75 kW: Max. 40 °C.

1.1 to 5.5 kW: Max. 60 °C.

Pipework

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

The booster system must be tightened up prior to startup.

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

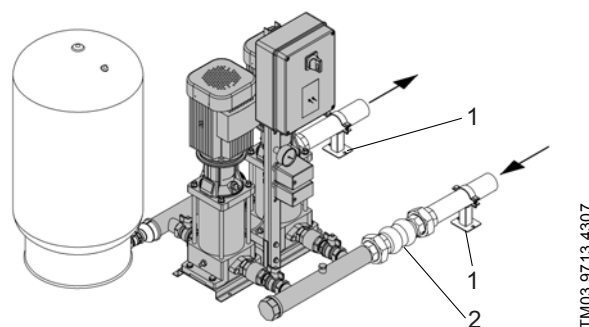


Fig. 8 Example of installation with expansion joints and pipe supports (Grundfos standard scope of supply in grey colour)

Pos.	Description
1	Pipe support
2	Expansion joint

Foundation

Position the booster system on an even and solid surface.

Hydro Multi-S systems with CM pumps must always be bolted to the floor.

Hydro Multi-S systems with CMV or CR pumps must either be bolted to the floor or fitted with machine shoes.

9. Sizing

General

When sizing a booster system, you must ensure the following:

- The performance of the booster system must be able to meet the maximum duty demand, both in flow rate and pressure.
- The booster system must not be oversized as this will affect installation and operating costs.
- The size and number of pumps must be appropriate related to their performance. This also applies to the standby pump, if any.
- The number and size of the diaphragm tanks must be adequate.
- Dry-running protection must be installed.

Pump size

The booster system must be capable of meeting the maximum duty demand. But as this will occur for a comparatively short part of the day only, you must select a type of pump which can meet the varying demand throughout the duty period.

We do not recommend that you select a pump type with a performance lower than the lowest possible consumption, nor that you select a pump type with a performance higher than the highest possible consumption.

Number of pumps

In most applications, constant water supply is a major factor. Often it is not acceptable if the system does not maintain its maximum flow rate even during pump maintenance or repairs. In order to prevent any disruption of the supply in such a situation, the system is sized with a standby pump, i.e. Hydro Multi-S with two or three pumps in installations where the demand can be met just by one or two pumps, respectively.

NPSH

In order to avoid cavitation, in the case of operation with a suction lift, long or winding suction line, always check the NPSH value of the pump at the highest duty flow rate (see the pump performance curve in the specific technical literature).

Maximum flow requirement

Total consumption and maximum flow rate depend on the application. 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	Q_{day}	fd*	$Q(m)_{\text{day}}$	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: $Q_{\text{year}} \times n$
 Consumption period: d
 Average consumption per day: $(Q_{\text{year}} \times n)/d$
 Maximum consumption per day: $Q(m)_{\text{day}} = fd \times Q_{\text{day}}$
 Maximum flow requirement per hour: $Q_{\text{max}} = \text{max. flow rate/hour} \times \text{number of beds.}$

Calculation

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

Required discharge pressure

You can calculate the required discharge pressure, p_{set} , of Hydro Multi-S with the following equation:

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

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

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 [m].

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

p_{boost} = Required boost [bar].

Calculation

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

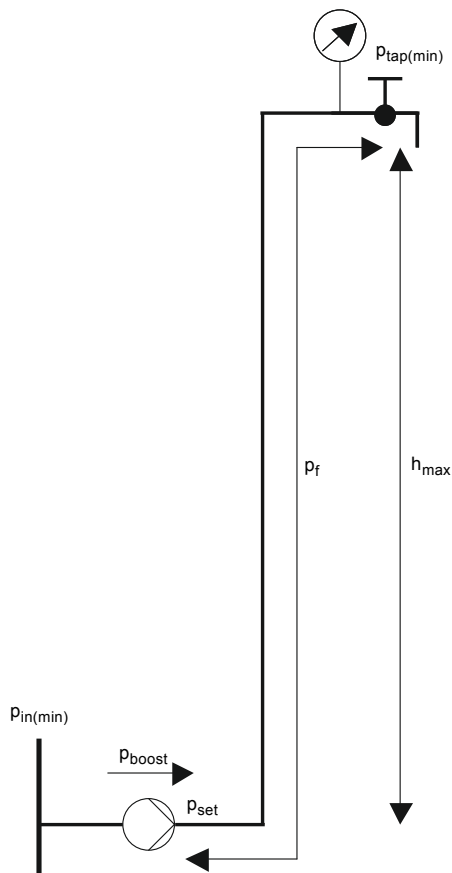
$$p_f = 1.2 \text{ bar}$$

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

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

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

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



TM04 4105 0709

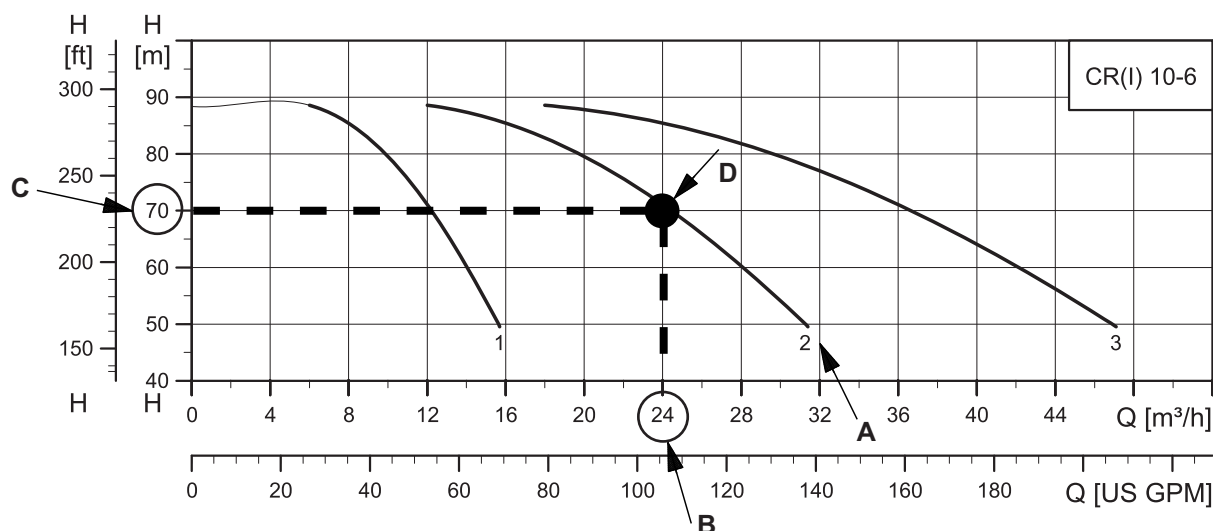
Fig. 9 Calculation of required discharge pressure

How to select a Hydro Multi-S

The required flow rate (Q), pressure (H) and number of pumps in the booster system can be provided by the system designer or determined by following the procedure as described on page 16.

The y-axes to the left of the chart give the head in metres and in ft.

The x-axis gives the flow (Q) in m³/h and US GPM.



TM06 3960 13/15

Fig. 10 Hydro Multi-S performance range

Example

To select the booster system, follow the procedures below and use the performance curves on page 4.

- A Two pumps are required in the booster system.
- B A flow rate of 24 m³/h is required.
Draw a vertical line from the required flow starting from the middle scale of the x-axis.
- C A head of 70 m is required.
Draw a horizontal line from the required head. The intersection point of the two lines gives the best pump type meeting the specifications.
- D The booster system to be selected is: Hydro Multi-S 2 CR 10-6.
Choose the Hydro Multi-S with three pumps if a standby pump is required as backup.
- E Complete the sizing by selecting a diaphragm tank and dry-running protection.
See the following section [Diaphragm tank sizing](#) and section [Diaphragm tank](#) on page 25.

Diaphragm tank sizing

To ensure reliable automatic operation, the booster system must be fitted with a diaphragm tank. The tank must be connected to the discharge manifold or pipeline to meet the system requirement.

The following table shows the minimum calculated total tank volume required for effective operation of the booster system. The size of the vessel is the next available standard tank size above this volume:

Pump type	Recommended tank size	
	Two-pump system	Three-pump system
	[l]	[l]
CM 3-4	33	60
CM 3-6	33	33
CM 3-8	33	33
CM 5-4	60	
CM 5-7	60	80
CM 5-9	60	60
CM 10-3	130	170
CM 10-4	130	170
CM 10-5	130	130
CMV 3-5	33	33
CMV 3-6	33	33
CMV 3-7	33	33
CMV 3-9	33	33
CMV 5-5	50	
CMV 5-6	50	50
CMV 5-7	50	50
CMV 5-9	50	50
CR 3-7	33	33
CR 3-10	33	33
CR 3-12	33	33
CR 3-15	50	50
CR 5-8	50	50
CR 5-10	60	60
CR 5-13	80	80
CR 5-15	80	80
CR 10-4	100	100
CR 10-6	130	130
CR 10-8	130	130
CR 10-10	130	130
CR 15-3	170	170
CR 15-5	170	170
CR 15-7	200	200
CR 20-3	200	200
CR 20-5	200	200
CR 20-7	200	200

The recommended tank size is calculated on the basis of factory default settings of pressure switches.

10. Curve conditions

How to read the cure charts

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

- Tolerances to ISO 9906:1999, 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: $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt).
- The QH curves apply to fixed speeds of 2900 min^{-1} (50 Hz) and 3480 min^{-1} (60 Hz).

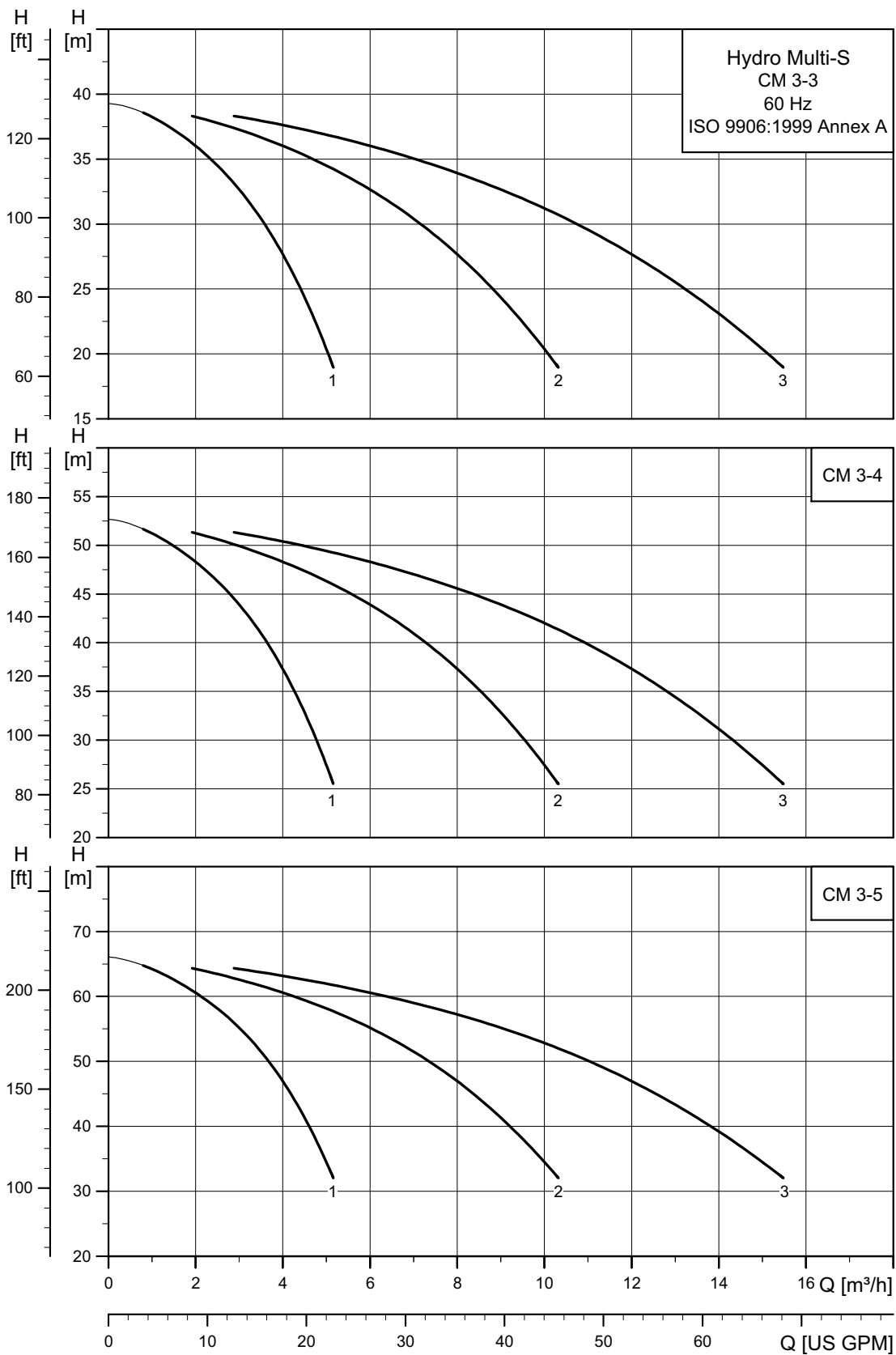
Note: The actual speed will in most cases deviate from the above-mentioned speeds. So for realistic curves, please refer to Grundfos Product Center where the pump curves include the characteristics of the selected motor and therefore show curves at actual speeds.

In Grundfos Product Center, you can 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 $\rho = 1000 \text{ kg/m}^3$.

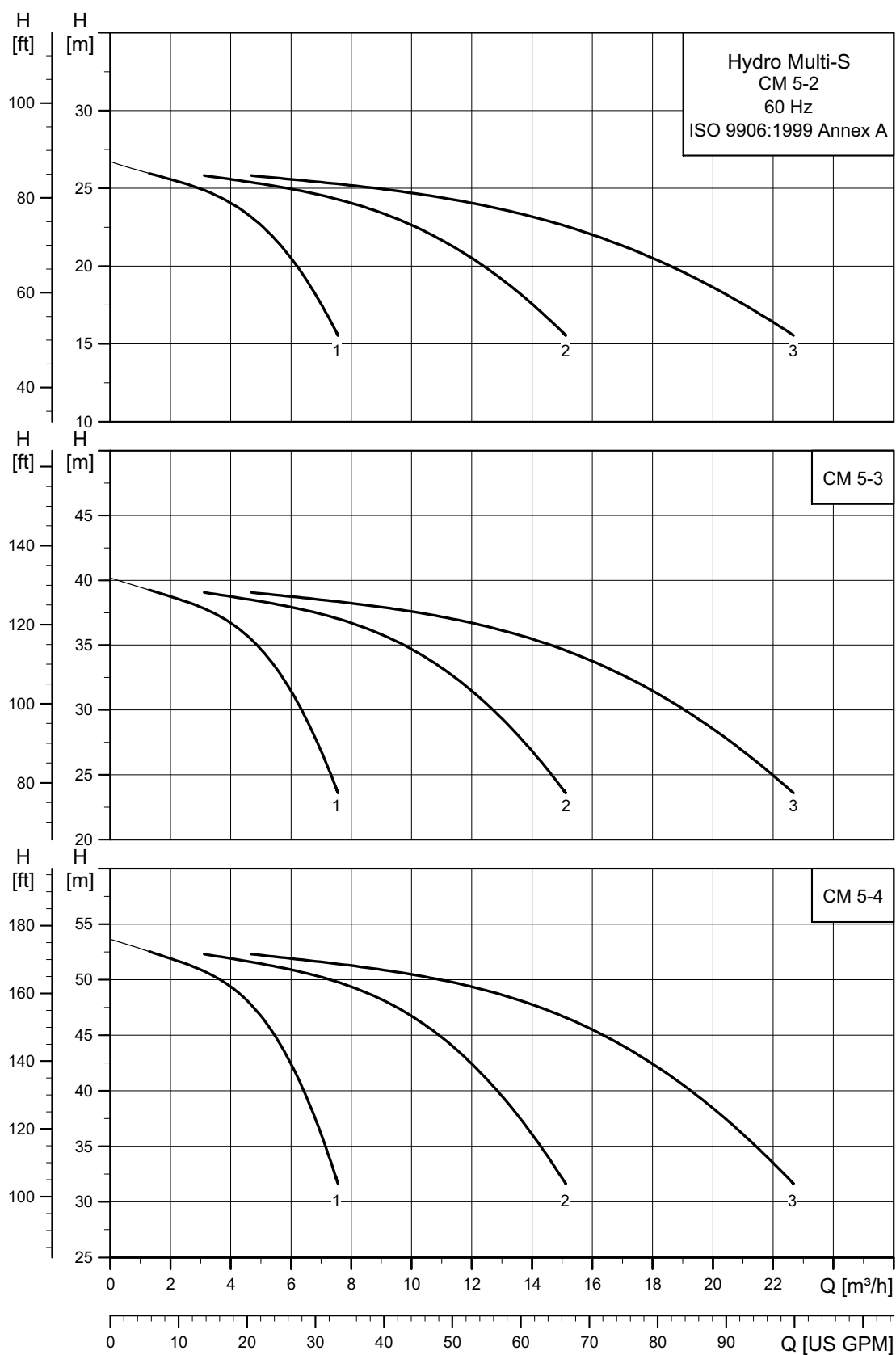
11. Curve charts, Hydro Multi-S (60 Hz)

Hydro Multi-S with CM 3



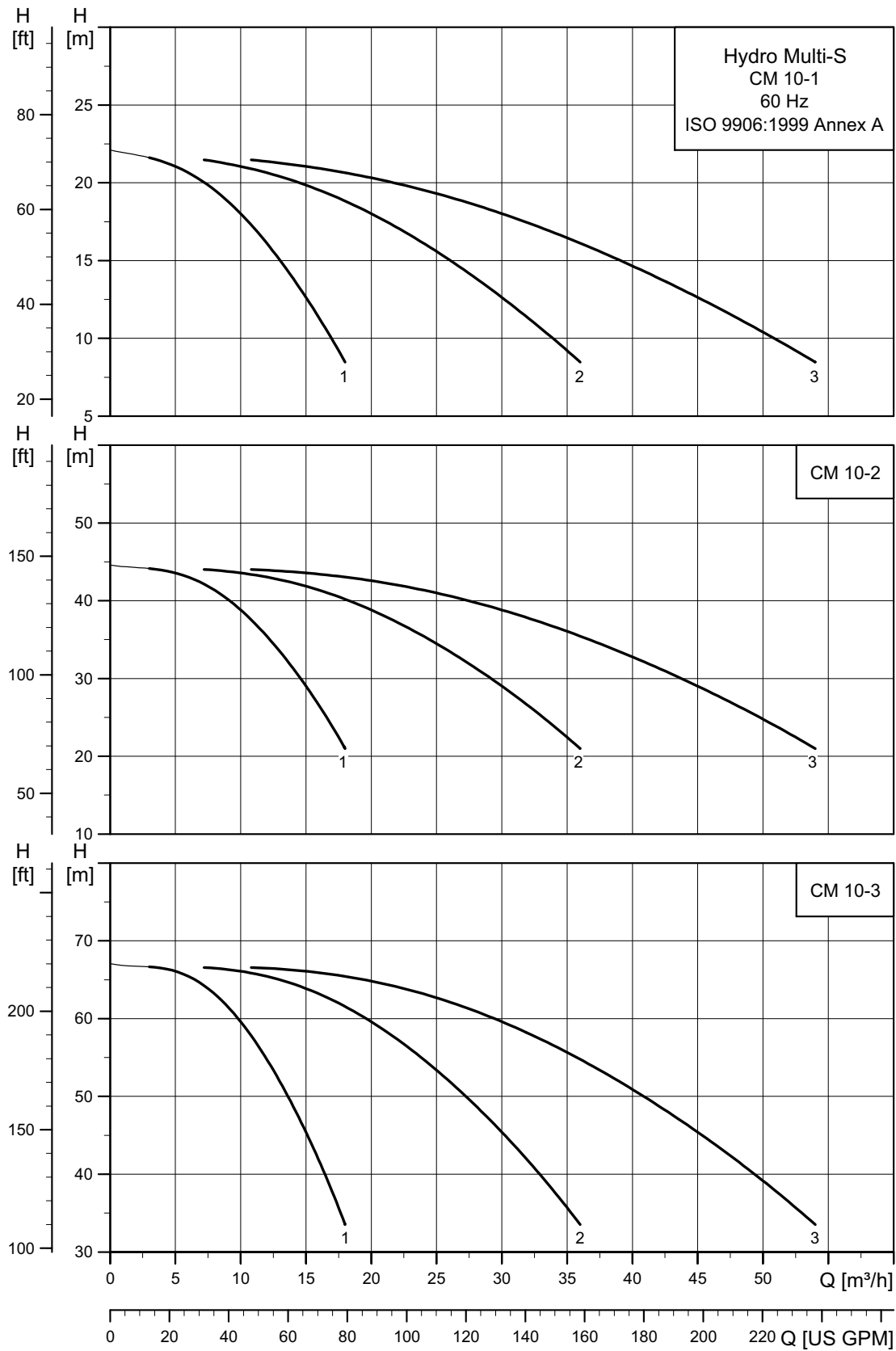
TM06 3276 5014

Hydro Multi-S with CM 5



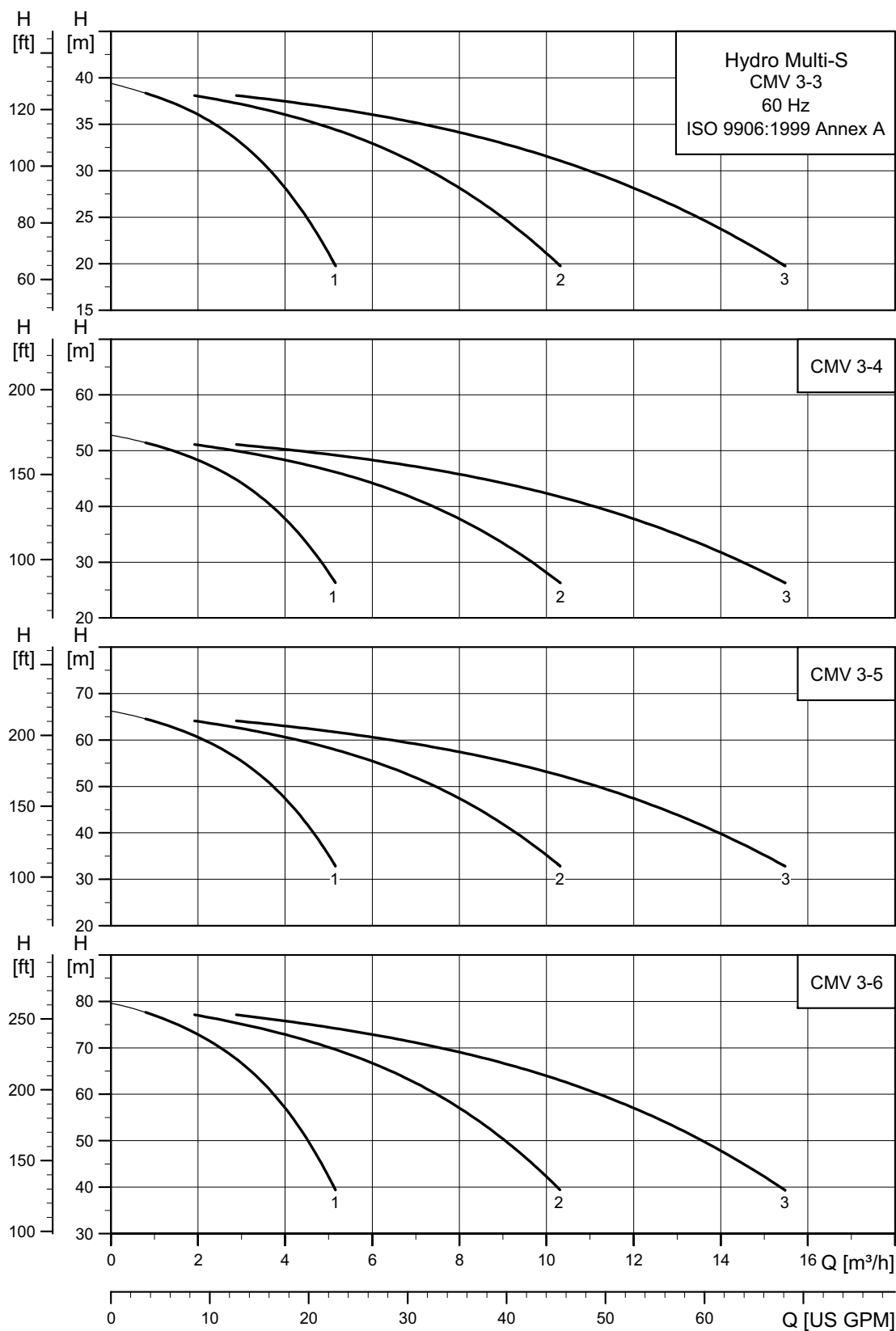
TM06 3277 5014

Hydro Multi-S with CM 10



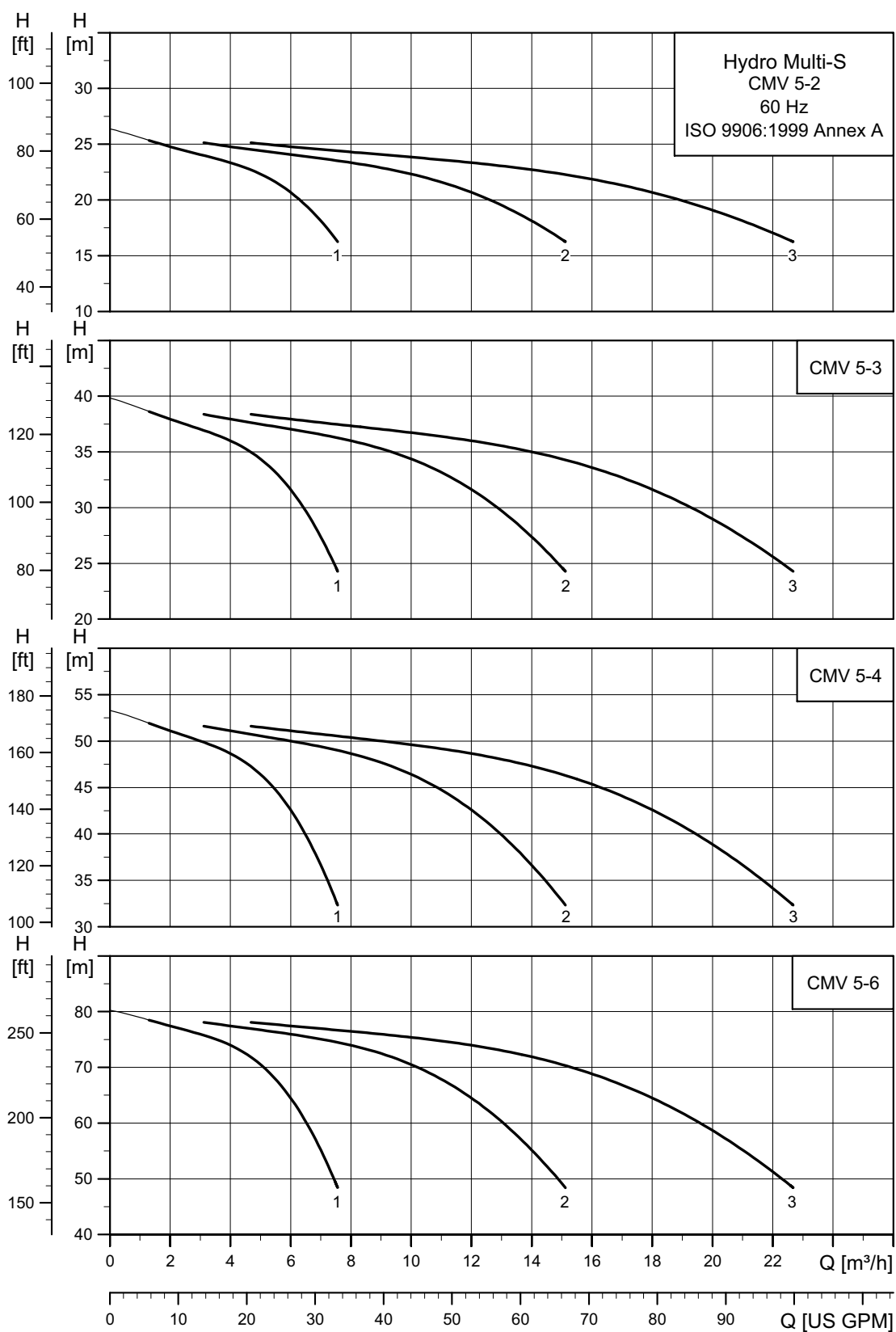
TM06 3278 5014

Hydro Multi-S with CMV 3



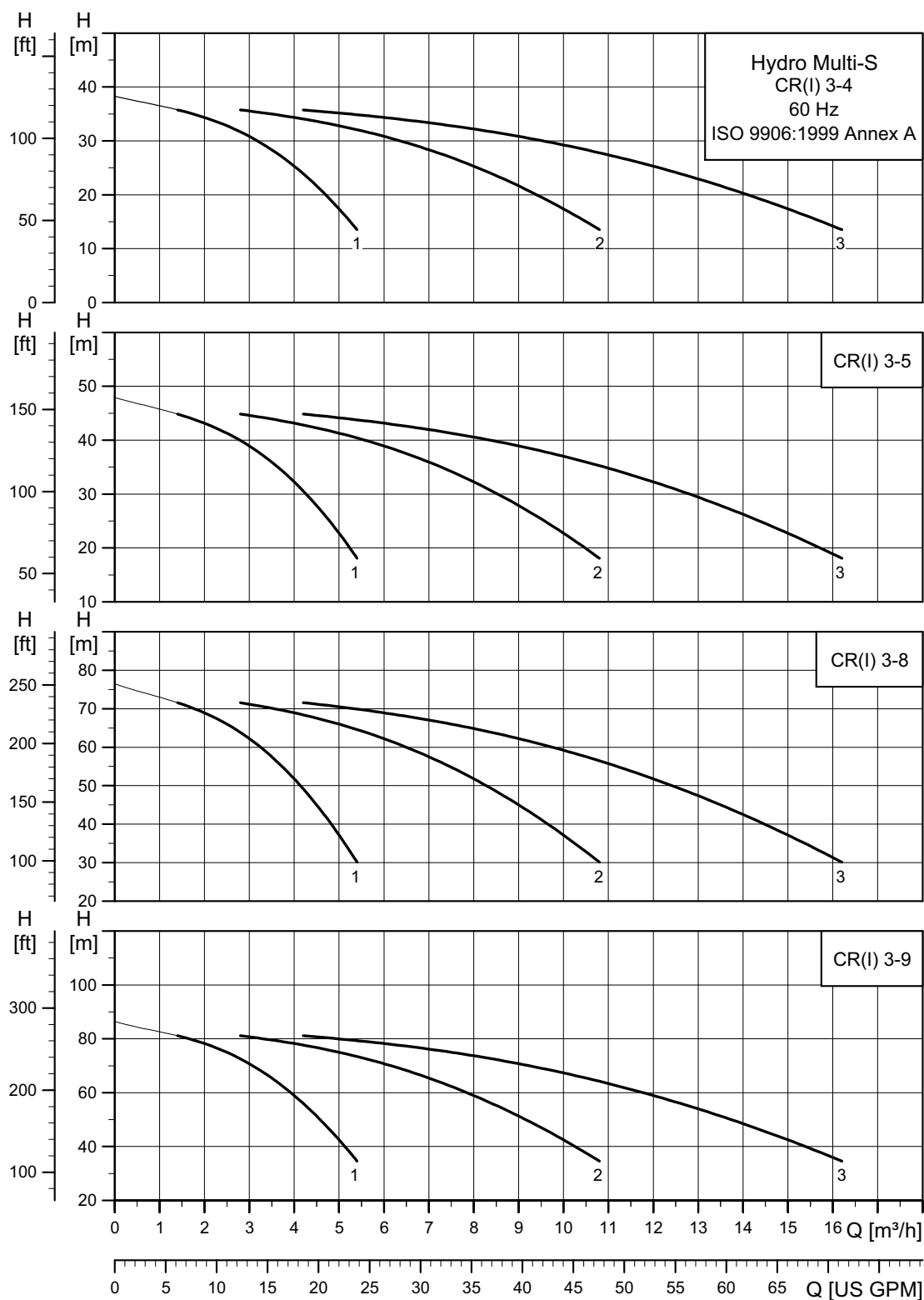
TM063279 5014

Hydro Multi-S with CMV 5



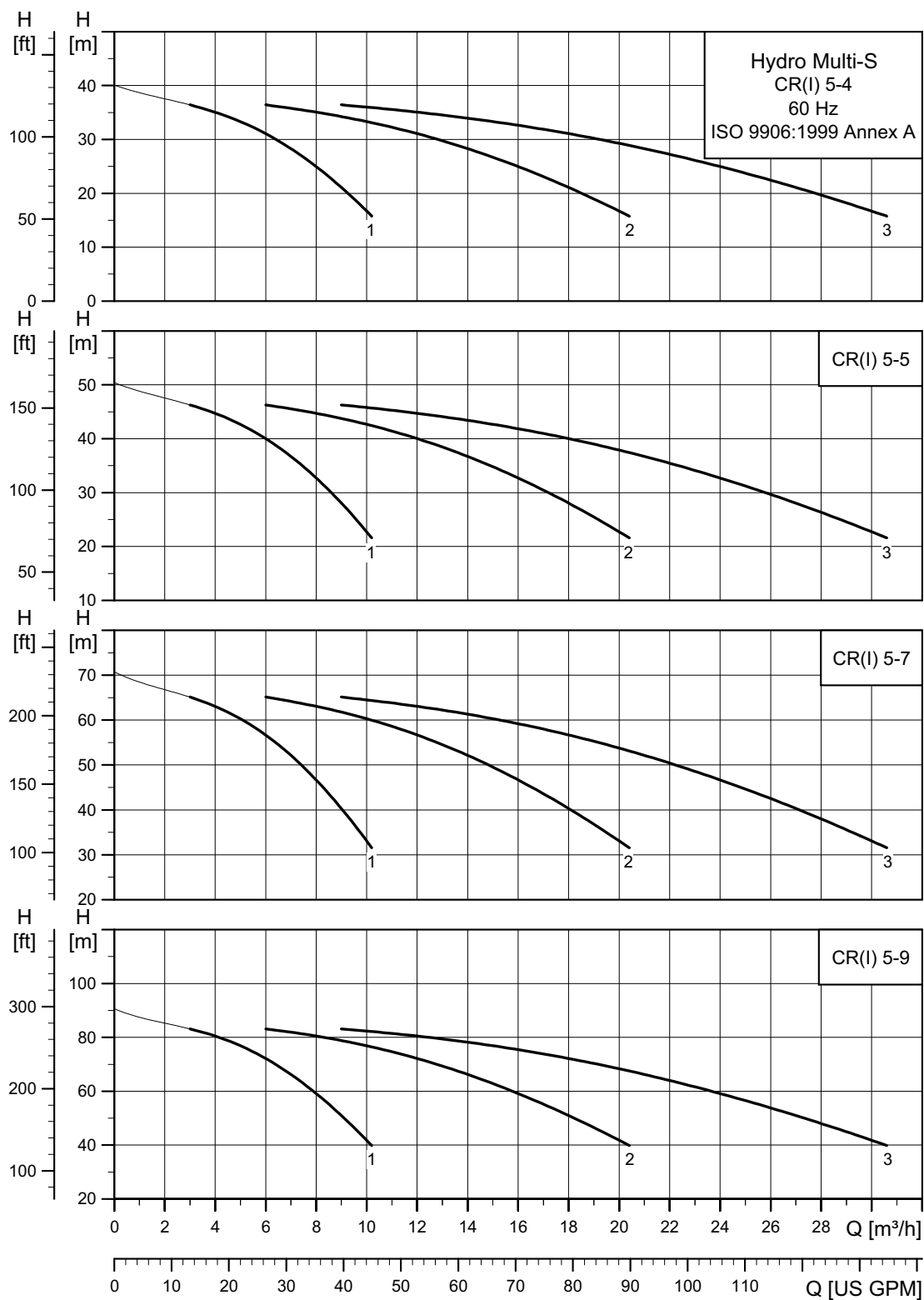
TM06 3280 5014

Hydro Multi-S with CR(I) 3



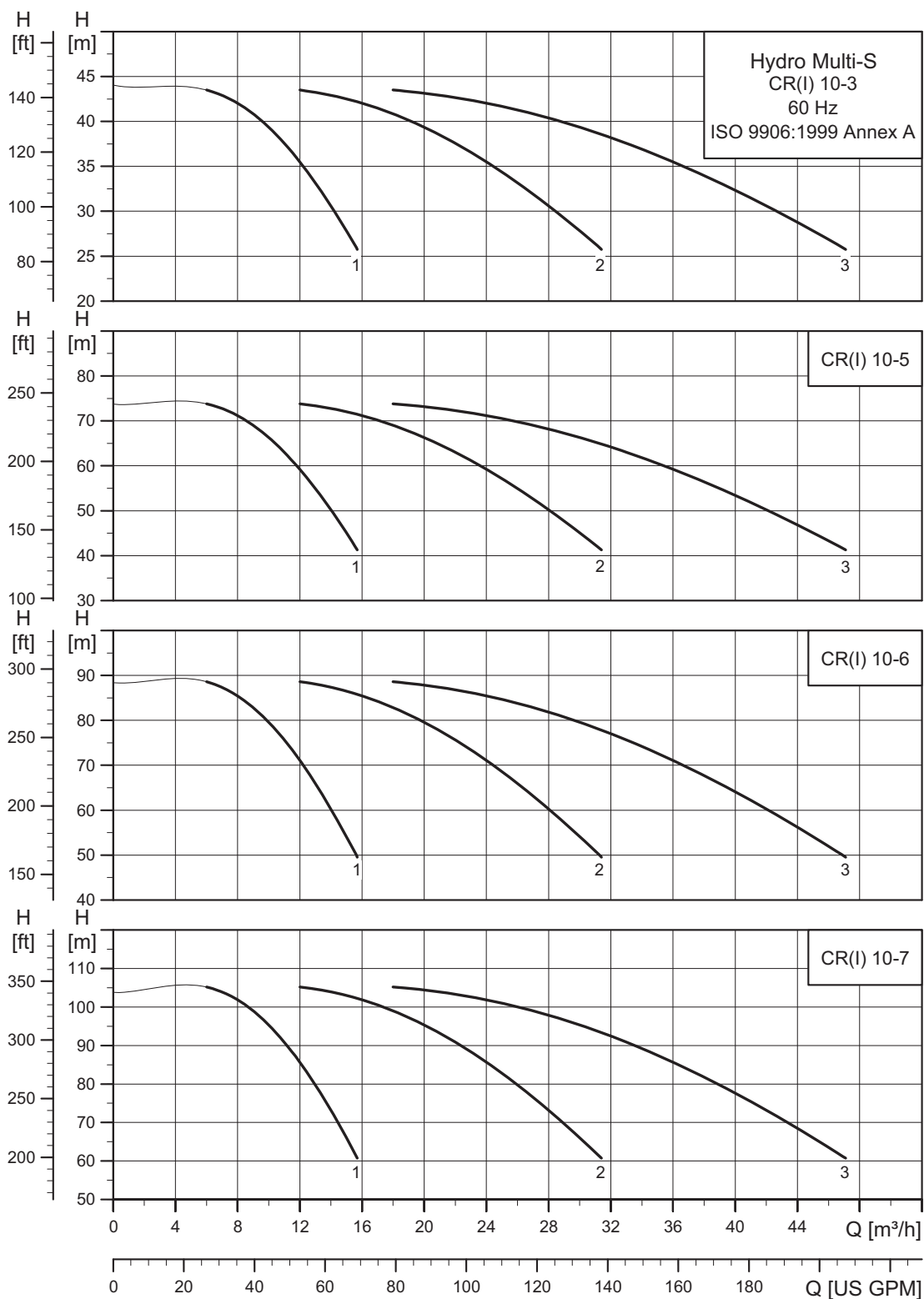
TM06 3281 5014

Hydro Multi-S with CR(I) 5



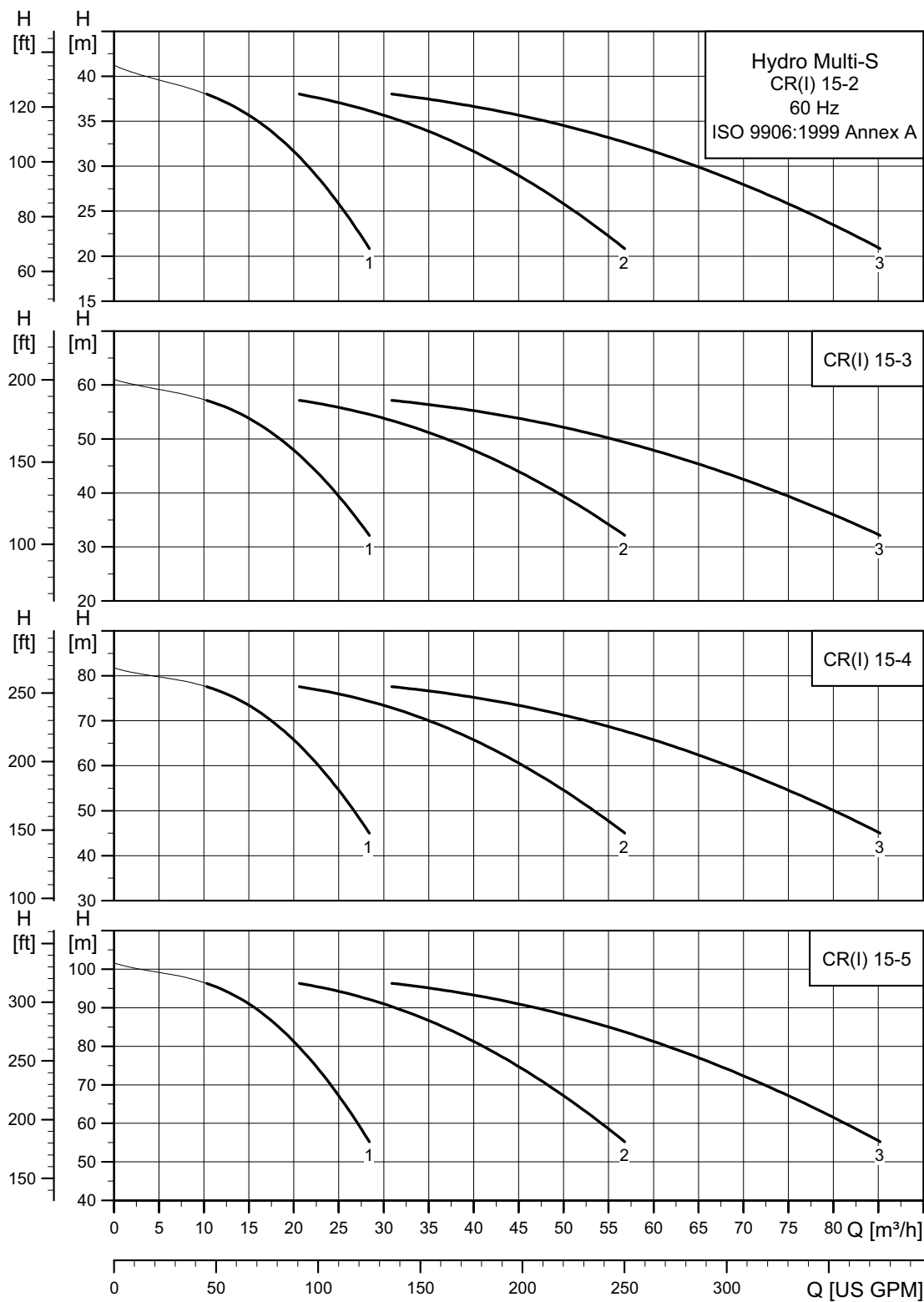
TM06 3282 5014

Hydro Multi-S with CR(I) 10



TM06 3283 5014

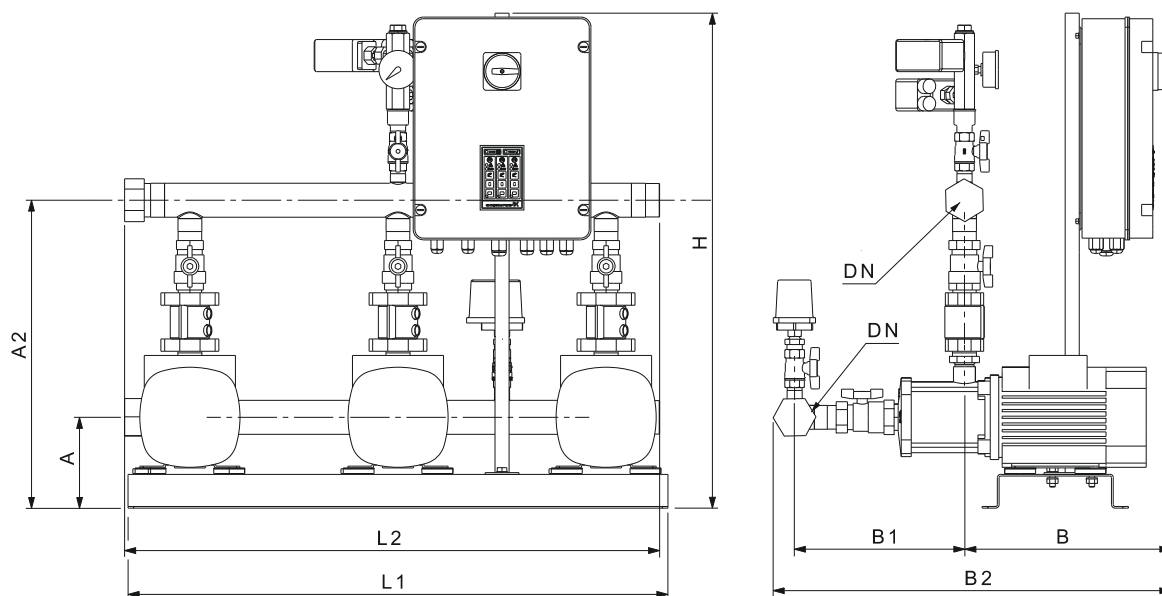
Hydro Multi-S with CR(I) 15



TM06 3284 5014

12. Technical data

Hydro Multi-S with two or three CM pumps - material code H



TM06 3995 1315

Fig. 11 Dimensional sketch of a Hydro Multi-S booster system with CM pumps

Pump type	U [V]	P2 [kW]	H [mm]	A [mm]	A2 [mm]	B [mm]	B1 [mm]	B2 [mm]	DN	Hydro Multi-S with two pumps				Hydro Multi-S with three pumps					
										Dimensions [mm]		I _{1/1} [A]	Weight [kg]	Dimensions [mm]		I _{1/1} [A]	Weight [kg]		
																		L1	L2
CM 3-3	UE	0.60	769	135	480	310	250	274	1 1/2"	550	590	575	8.2	63	930	960	12.3	91	
CM 3-3	UG	0.74											6.8 - 7.2 / 3.4 - 3.6	58			10.2 - 10.8 / 5.1 - 5.4	86	
CM 3-4	UE	0.80											11.6	68			17.4	96	
CM 3-4	UG	0.74											6.8 - 7.2 / 3.4 - 3.6	63			10.2 - 10.8 / 5.1 - 5.4	91	
CM 3-5	UE	1.05											14.7	673			22.05	101	
CM 3-5	UG	1.04											8.2 - 7.9 / 4.0 - 4.0	73			12.3 - 11.8 / 6.0 - 6.0	101	
CM 5-2	UE	0.80			530		271	301		2"		575	11.6	71			17.4	99	
CM 5-2	UG	0.74											6.8 - 7.2 / 3.4 - 3.6	71			10.2 - 10.8 / 5.1 - 5.4	99	
CM 5-3	UE	1.05											14.7	91			22.05	124	
CM 5-3	UG	1.04											8.2 - 7.9 / 4.0 - 4.0	91			12.3 - 11.85 / 6.0 - 6.0	124	
CM 5-4	UE	1.05											19.6	916			29.4	141	
CM 5-4	UG	1.7											12.5 - 11.7 / 5.96 - 5.7	916			18.75 - 17.55 / 8.94 - 8.55	141	
CM 10-1	UE	1.05		160	615	345	340	378	2 1/2"	625	615	14.7	117	980	975	22.05	165		
CM 10-1	UG	1.28										10.2 - 9.8 / 4.96 - 4.92	117			15.3 - 14.7 / 7.44 - 7.38	165		
CM 10-2	UE	2.5				405						370	408			17.9 - 17.0 / 8.6 - 8.0	117	26.85 - 25.5 / 12.9 - 12.0	180
CM 10-3	UG	4.0														29.6 - 28.4 / 14.4 - 14.0	117	44.4 - 42.6 / 21.6 - 21.0	180

H: Galvanized-steel manifolds, galvanized-steel base frame painted black, standard valves

UE: 1 x 220-240 V, PE, 60 Hz

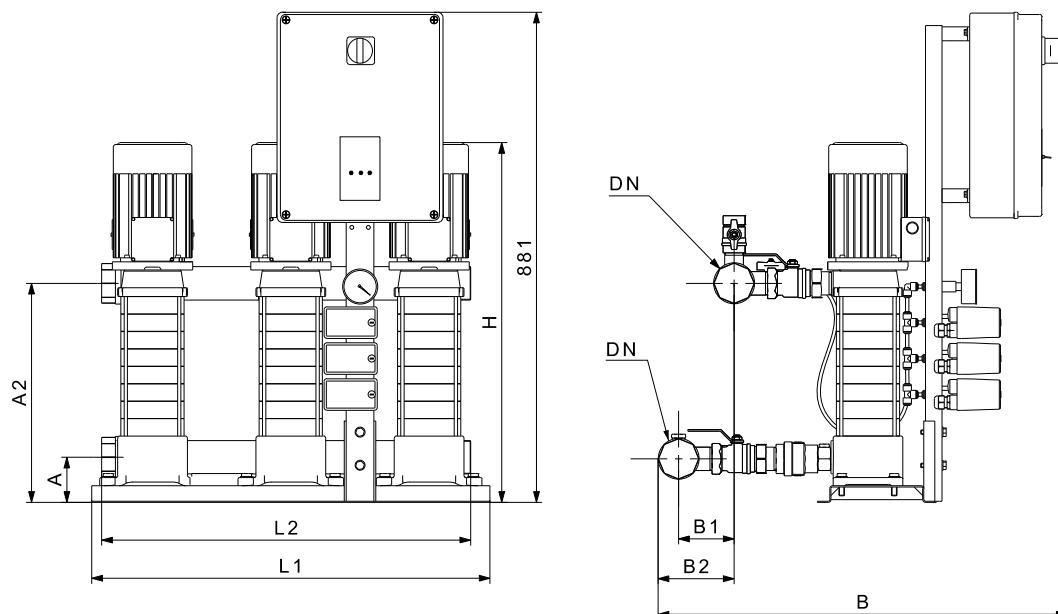
UG: 3 x 208-230/440-480 V, PE, 60 Hz

Please note that the dimensions stated may vary by ± 20 mm.

Due to improvements or modifications of the components, the dimensions may change without any previous notification.

All pump types for Hydro Multi-S with two or three CM pumps, material code H are only available for ASEAN countries.

Hydro Multi-S with two or three CMV pumps



TM05 1101 2111

Fig. 12 Dimensional sketch of a Hydro Multi-S booster system with CMV pumps

Pump type	U [V]	P2 [kW]	H [mm]	A1 [mm]	A2 [mm]	B [mm]	B1 [mm]	B2 [mm]	DN	Hydro Multi-S with two pumps			Hydro Multi-S with three pumps				
										Dimensions [mm]		Weight [kg]	Dimensions [mm]		Weight [kg]		
										L1	L2		G/H	L1		L2	G/H
CMV 3-53	UE	0.60	412	81	174	727	105	135	2"	500	460	8.2	59	750	710	12.3	73
CMV 3-3	UG	0.74	210		6.8 - 7.2 / 3.4 - 3.6							10.2 - 10.8 / 5.1 - 5.4				74	
CMV 3-4	UE	0.84	470		174							11.6				17.4	73
CMV 3-4	UG	0.74	210		6.8 - 7.2 / 3.4 - 3.6							10.2 - 10.8 / 5.1 - 5.4				74	
CMV 3-5	UE	1.14	488		174							14.7				22.05	73
CMV 3-5	UG	1.04	210		8.2 - 7.9 / 4.0 - 4.0							12.3 - 11.85 / 6.0 - 6.0				74	
CMV 3-6	UE	1.28	544		174							19.6				29.4	73
CMV 3-6	UG	1.54	452		210							10.2 - 9.8 / 4.96 - 4.92				15.3 - 14.7 / 7.44 - 7.38	74
CMV 5-2	UE	0.84			174							11.6	64			17.4	80
CMV 5-2	UG	0.74	522									8.2 - 7.9 / 4.0 - 4.0	63			12.3 - 11.85 / 6.0 - 6.0	79
CMV 5-3	UE	1.14										14.7	64			22.05	80
CMV 5-3	UG	1.04	240									8.2 - 7.9 / 4.0 - 4.0	63			12.3 - 11.85 / 6.0 - 6.0	79
CMV 5-74	UE	1.580										19.6	64			29.4	80
CMV 5-94	UG	1.70	576									12.5 - 11.7 / 5.96 - 5.7	63			18.75 - 17.55 / 8.94 - 8.55	79
CMV 5-6	UE	1.2.50										17.9 - 17.0 / 8.6 - 8.0				26.85 - 25.5 / 12.9 - 12.0	79

G: Galvanised-steel base frame and manifolds, cast-iron CMV pumps

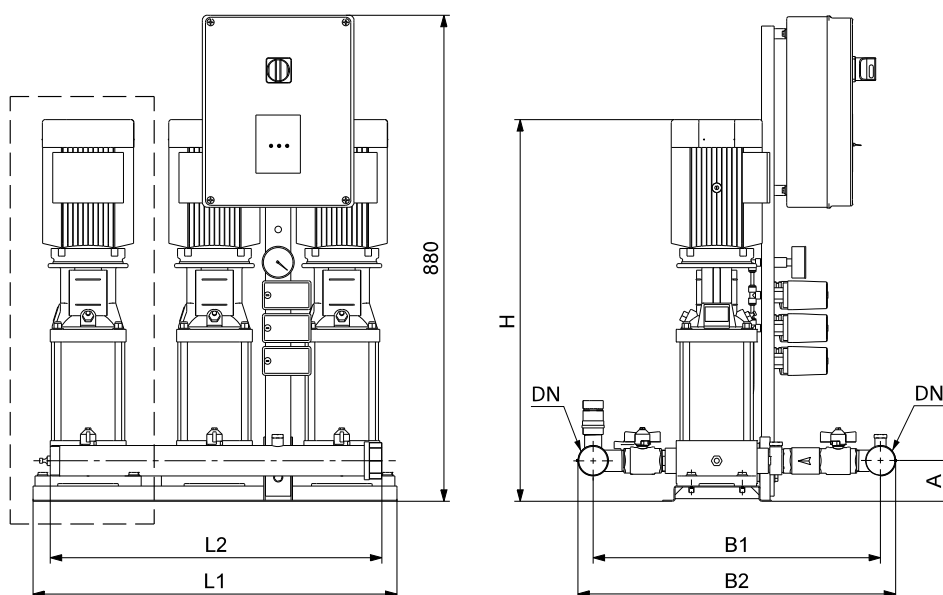
UE: 1 x 220-240 V, PE, 60 Hz

UG: 3 x 208-230/440-480 V, PE, 60 Hz

Please note that the dimensions stated may vary by ± 20 mm.

Due to improvements or modifications of the components, the dimensions may change without any previous notification.

Hydro Multi-S with two or three CR pumps



TM03 9721 4307

Fig. 13 Dimensional sketch of a Hydro Multi-S booster system with CR pumps

Pump type	U [V]	P2 [kW]	A [mm]	B1 [mm]	B2 [mm]	DN	Hydro Multi-S with two pumps			Hydro Multi-S with three pumps				
							Dimensions [mm]		I _{1/1} [A]	Weight [kg]	Dimensions [mm]		I _{1/1} [A]	Weight [kg]
							L1	L2			L1	L2		
CR 3-4	UE	0.55	85	544	680	2"	500	470	17.0	73.6	750	720	25.5	97.6
CR 3-4	UG	0.55		498					2.4	64.9			3.6	84.9
CR 3-5	UE	0.75		562					22.8	75.1			34.2	99.9
CR 3-5	UG	0.75		562					3.2	71.8			4.8	95.3
CR 3-8	UE	1.1		682					16.2	88.9			24.3	121
CR 3-8	UG	1.1		636					4.6	78.4			6.9	105
CR 3-9	UE	1.5		740					22.0	97.2			33.0	133
CR 3-9	UG	1.5		700					5.72	95.8			8.58	131
CR 5-4	UE	1.1		646					16.2	87.6			24.3	118
CR 5-4	UG	1.1		600					4.6	77.1			6.9	103
CR 5-5	UE	1.5		713					22.0	96.2			33.0	131
CR 5-5	UG	1.5		673					5.72	94.8			8.58	129
CR 5-7	UE	2.2	767	30.0	106	45.0	145							
CR 5-7	UG		767	8.0	106	12.0	146							
CR 5-9	UE		821	30.0	108	45.0	149							
CR 5-9	UG		821	8.0	108	12.0	149							
CR 10-3	UE		749	30.0	129	45.0	181							
CR 10-3	UG		749	8.0	130	12.0	183							
CR 10-5		3.0	828	11.44	142	17.16	201							
CR 10-6		4.0	895	14.4	168	21.6	240							
CR 10-7		5.5	976	19.64	240	29.46	348							
CR 15-2		3.0	790	11.44	154	17.16	214							
CR 15-3		4.0	872	14.4	180	21.6	253							
CR 15-4		5.5	968	19.64	252	29.46	361							
CR 15-5		7.5	1001	25.75	270	38.625	388							

UE: 1 x 220-240 V, PE, 60 Hz

UG: 3 x 208-230/440-480 V, PE, 60 Hz

Please note that the dimensions stated may vary by ± 20 mm.

Due to improvements or modifications of the components, the dimensions may change without any previous notification.

13. Accessories

Diaphragm tank

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.



TM02 9097 1804

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

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	DN 50	96573358
120	DN 50	96573359
180	DN 50	96573360
300	DN 50	96573361

Machine shoes



TM04 3245 3908

Machine shoes reduce any vibrations from the system to the floor, allowing the system to be height-adjusted by ± 20 mm.

Description	Hydro Multi-S with	Product number
Machine shoe	CM 3 or CM 5 CMV 3 or CMV 5 CR 3 or CR 5	96412344
	CM 10 CR 10 or CR 15	96412345

Note: The product number covers one (1) machine shoe.

Hydro Multi-S with CM pumps must be bolted directly to the floor and therefore machine shoes cannot be used.

14. Alternative booster systems

Alternative booster systems

Booster system	Data and features	
	Maximum head	10 to 150 m
	Flow rate	2 to 1080 m ³ /h
	Maximum operating pressure	16 bar
	Number of pumps	2 to 6
	Pump types	CR, CRI, CRE, CRIE
	Maximum head	10 to 100 m
	Flow rate	2 to 85 m ³ /h
	Maximum operating pressure	10 bar
	Number of pumps	2 or 3
	Pump type	CME, CRE, CRIE
	Maximum head	10 to 100 m
	Flow rate	2 to 55 m ³ /h
	Maximum operating pressure	16 bar
	Number of pumps	1
	Pump types	CRE, CR*

TM05 3234 2512

Features

- Optimised for your application!
- Easy to install and commission with the built-in startup wizard
- Many communication options
- Very user-friendly
- Large colour display for setting and monitoring
- Modular design.

Gr-1015574

Features

- Specially designed for water supply in buildings
- 100 % adaptation to consumption
- Easy to install and commission
- Small foot print
- Communication via Grundfos GO.

Gr5164 - Gr5165

Features

- Easy to install and commission
- Constant pressure
- Communication via Grundfos GO.**

* Hydro Solo-E incorporates a CRE pump and Hydro Solo-S.

** Applies only to Hydro Solo-E.

15. 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.

The screenshot shows the Grundfos Product Center website. At the top, there's a navigation bar with 'HOME', 'FIND PRODUCT', 'COMPARE', 'YOUR PROJECTS', 'SAVED ITEMS', and 'HELP'. Below this is a search bar with the placeholder text 'Input product number or a whole or partial product name' and a 'SEARCH' button. The main content area has four large buttons: 'SIZING' (with a pump icon), 'CATALOGUE' (with a book icon), 'REPLACEMENT' (with a swap icon), and 'LIQUIDS' (with a liquid drop icon). Below these buttons is a 'QUICK SIZING' section with input fields for 'Flow (Q)*' and 'Head (H)*', and a 'Select what to size by' section with radio buttons for 'Size by application', 'Size by pump design', and 'Size by pump family'. There is also a 'START SIZING' button. At the bottom, there's an 'ADVANCED SIZING' section with checkboxes for 'Advanced sizing by application' and 'Guided selection'. Callouts point to the 'SIZING' button, the 'CATALOGUE' button, and the 'LIQUIDS' button, explaining their functions.

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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ECM: 1155492

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