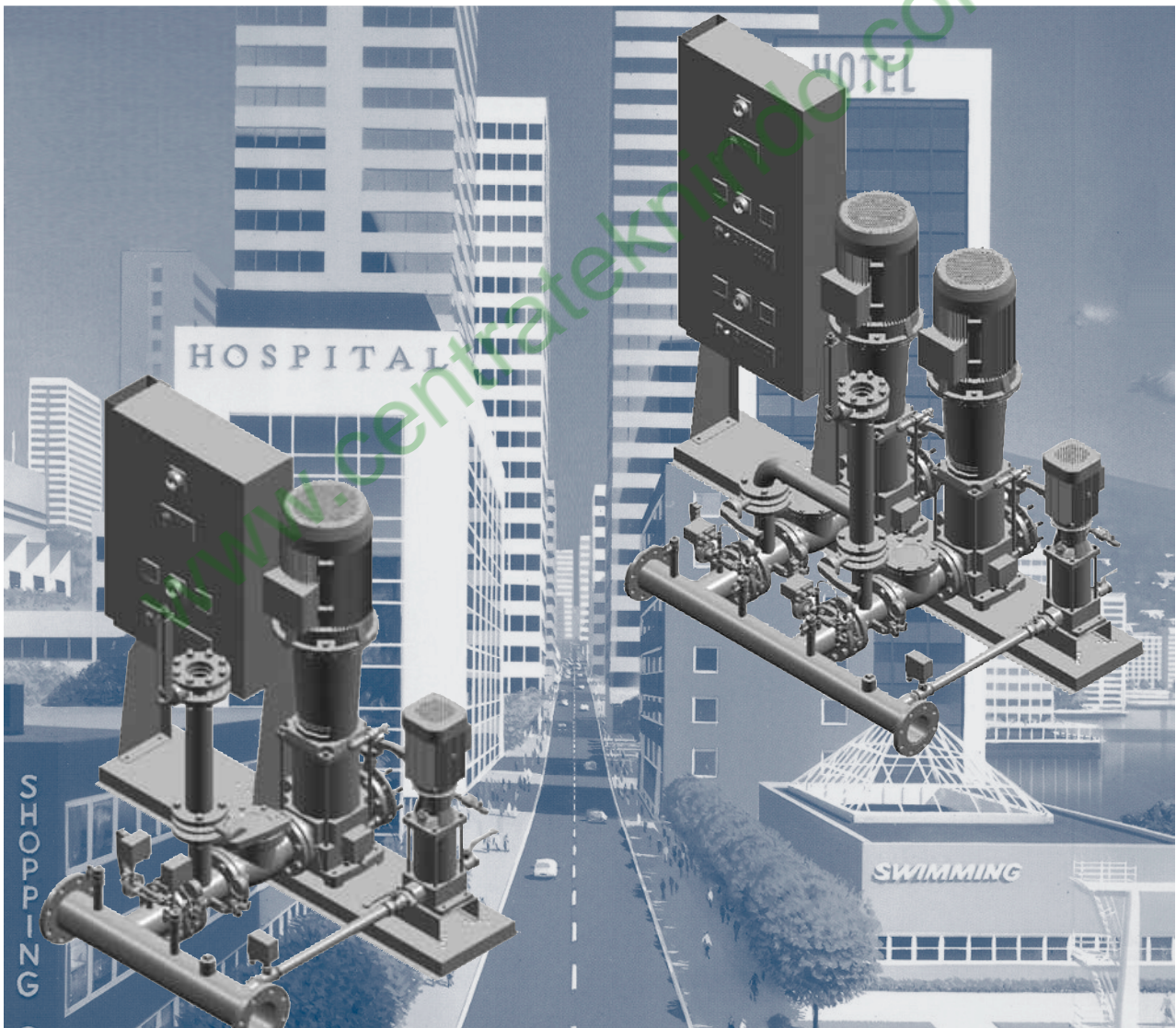


Hydro UNI-CR

Grundfos fire systems

Fire pump sets to UNI 9490 and 10779 standards
with electrically powered pumps (50 Hz)



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Grundfos Hydro UNI-CR automatic fire pump sets are typically used in fire fighting applications for supplying water to fire hose reels, fire hydrants or sprinkler systems.

The Hydro UNI-CR fire pump sets described in this data booklet cover all flow rates up to 110 m³/h and heads up to 100 m. Fire pump sets with a performance exceeding this range are available on request. Please contact Grundfos.

Performance range

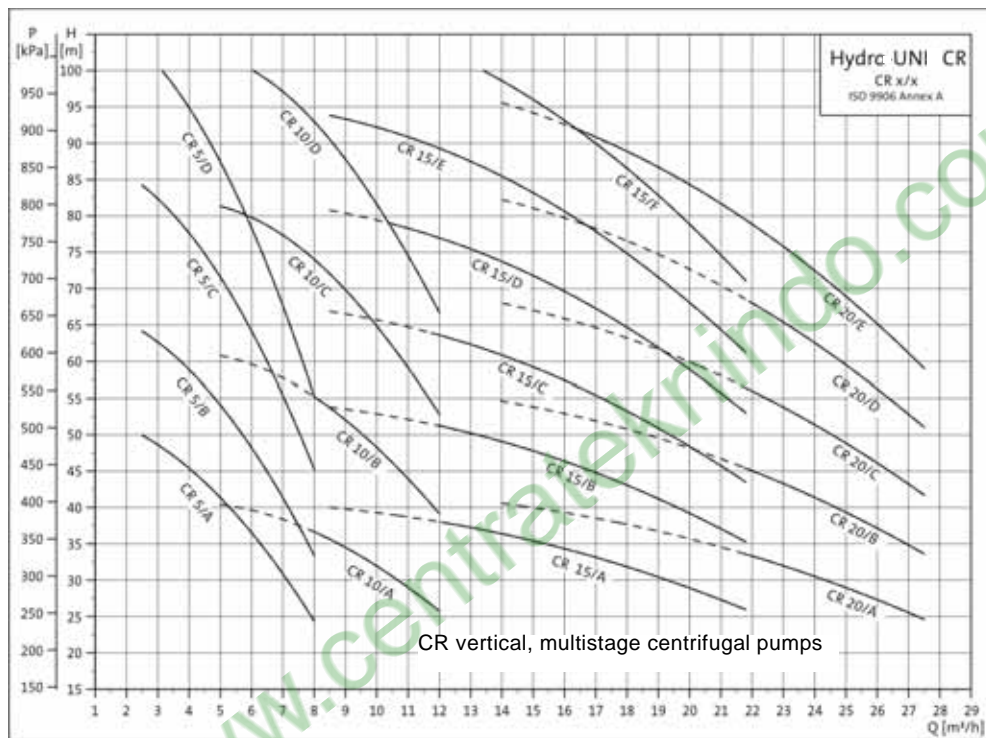


Fig. 1 Performance range CR 5, CR 10, CR 15, CR 20

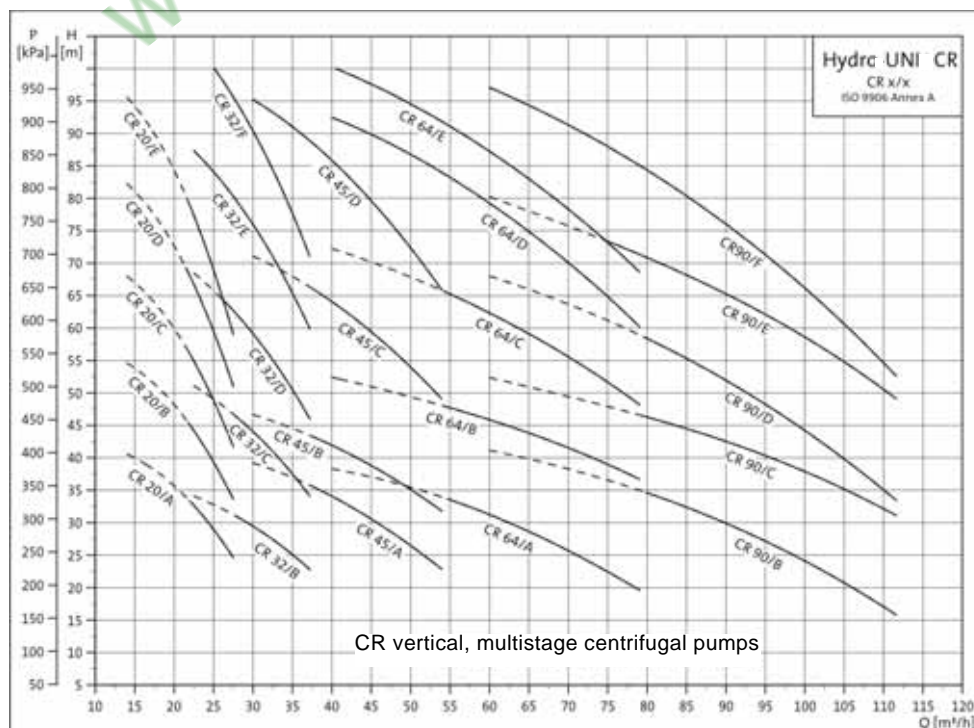


Fig. 2 Performance range CR 20, CR 32, CR 45, CR 64, CR 90

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General introduction

Hydro UNI-CR automatic fire pump sets are designed according to the Italian standards UNI 9490 of April 1989 and UNI 10779 of May 2002, both covering fire fighting equipment.

Hydro UNI-CR are particularly suitable for installation in premises with limited space or where high heads are required even though a relatively low power supply is available.

Please note that in the following the term 'unit' covers the fire pump set described in this data booklet, whereas the term 'system' covers the fire hydrants or sprinkler systems of a building.

In accordance with UNI 9490, Hydro UNI-CR units with one duty pump are designed for fire systems of the low hazard class type, units with two duty pumps are designed for fire systems of the ordinary hazard class type.

Hydro UNI-CR are normally supplied as factory-tested units equipped with

- One or two Grundfos vertical, multistage, in-line, electrically powered duty pumps.
In two-pump units
 - each of the two pumps must be capable of achieving the required performance (one pump is a standby pump),
 - the two pumps must be supplied from separate power supplies to ensure continued operation in case of power cut or failure to the first duty pump.
See *Pump description* on page 12.
- One Grundfos CR multistage electrically powered jockey pump. The jockey pump is also connected to the common discharge manifold.
The jockey pump automatically maintains pressure in the system in case of leaks and prevents the duty pumps from starting up when not required.
See *Jockey pump* on page 12.
- One separate control panel for each pump.
See *Control panels* on page 14.

All the pumps are connected in parallel to a common discharge manifold and fitted with hydraulic components and fittings.

The units are designed for easy reading of gauges and signals.

The pumps are prepared for the connection of a priming circuit in the case of suction lift installation.

In order to prevent damage caused by overheating due to possible operation against closed isolating valve, the pumps are equipped with connection for a bypass.

To ensure correct operation of the jockey pump, the unit must be equipped with at least two 24-litre, PN-16 diaphragm tanks. Additional tanks may be connected to a port fitted for the purpose in the discharge manifold.

A common suction manifold is available as an option. A unit with suction manifold is called complete (CPL) version.

Other fire pump sets for fire fighting

Apart from the Hydro UNI-CR, the Grundfos fire system product range according to UNI standards includes

- **Hydro Syntex-NB/NK** fire pump set with two horizontal, single-stage, end-suction pumps (NB/NK) of which one is electrically powered and one is diesel powered
- **Hydro Diesel-NB/NK** fire pump set with one (or two) horizontal, single-stage, end-suction, diesel powered pumps (NB/NK)
- **Hydro UNI-NB/NK** fire pump set with one or two horizontal, single-stage, end-suction, electrically powered pumps (NB/NK);

Type key

Type designation Hydro UNI-CR	9	C	A	A	A	001
Fixed number						
Fire pump set						
C HUNI CR: One or two CR pumps with one jockey pump						
Hydraulic variants						
A Standard version						
B With suction manifold (CPL version)						
C With discharge manifold dimensioned for two pumps operating simultaneously						
D Variant B + variant C						
E Without flowmeter and test circuit						
G Stainless steel manifold						
H CPL version with stainless steel manifolds						
Duty pump variants						
A Standard version						
B Programmable and automatic test of duty pump(s)						
E Timer on duty pump (according to UNI 10779)						
H Timer and automatic test of duty pump (according to UNI 10779)						
L Starting method differs from standard (DOL or SD)						
Jockey pump variants						
A CR 3 pump						
2 CR 5 pump						
5 CR 10 pump						
6 CR 15 pump						
Serial number (consecutive numbering)						

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Operation

The jockey pump keeps the system pressurized and compensates for leaks in order to prevent the duty pumps from starting up unnecessarily.

When required, the first duty pump will be started automatically in order to provide the flow rate described in operating conditions in this section.

The second duty pump is a standby pump guaranteeing the supply of water to the fire system in case of power failure or any other failure of the first duty pump.

Each pump is controlled by a separate controller.

Starting method

Duty pumps up to and including 7.5 kW are started direct-on-line (DOL). Duty pumps of 11 kW and upwards are star/delta-started (SD) in order to avoid line overloads, stress on rotating parts and wear of system components.

Monitoring

In accordance with the requirements of UNI 9490, a remote alarm device must be connected to the duty pump control panel to indicate

- power failure
- phase failure
- pump start-up.

Furthermore, the alarm device must

- be equipped with a buffer battery
- give both audible and visual alarm signals
- be installed in manned premises, see *Accessories* on page 10.

Automatic operation

If the pressure in the system drops, the pumps will start up automatically and feed the system with water. The starting sequence is

1. jockey pump
2. first duty pump and, if necessary,
3. second duty pump.

Note: The second duty pump is intended to start up if there is a failure of the first duty pump.

Only the jockey pump is stopped automatically by means of a pressure switch when the upper pressure limit is reached.

The duty pumps can only be stopped manually by means of a push-button on the pump control panel. Alternatively, in fire hydrant systems the duty pumps may be stopped automatically by a timer (available as an accessory). The timer may be set to start counting from twenty minutes after water consumption has ceased. See *Accessories* on page 10.

Special "MAN-0-AUT" selector switches on the pump control panels allow each individual pump to be started and stopped at any time, see *Control panels* on page 14.

Test operation

In accordance with UNI 9490 test operation must be used during initial start-up and for periodic control testing.

The duty pumps can be tested one at a time by turning the selector switches on the control panel of the relevant pump to position "MAN".

Open the test circuit isolating valve and press the ON-button on the pump to be tested in order to simulate water consumption and pumping.

It will now be possible to measure

- FLOW RATE - by means of a flowmeter fitted in the test circuit
- HEAD - by means of a pressure gauge fitted in the discharge pipe
- SUCTION HEAD - by means of a pressure and vacuum gauge fitted in the suction pipe
- Input CURRENT - by means of an ammeter
- Mains VOLTAGE - by means of a voltmeter.

Operating conditions

Flow rate	Up to 110 m ³ /h per pump.
Operating pressure	Up to 10 bar.
Performance	According to ISO 9906 A.
Rated pressure	PN 16 - for components and materials.
Pumped liquid	Water without solids or fibres.
Water temperature	>0°C to +50°C.
Ambient temperature	10°C to +40°C.
Suction lift (with degassed water)	$H = p_b \times 10.2 - \text{NPSH} - H_f - H_s$ H = suction lift in m p_b = barometric pressure in bar NPSH* = net positive suction head in m H_f = friction loss in suction pipe in m H_s = safety margin (min. 0.5 m). * For information on NPSH for the pump, please contact Grundfos.
Max. inlet pressure	6 bar
Electrical power	Up to 30 kW + jockey pump.
Starting method	Direct-on-line (DOL) up to and incl. 7.5 kW; star/delta (SD) for 11 kW and upwards.
Electricity supply	3 x 400V, 50 Hz, N, PE.

System diagram

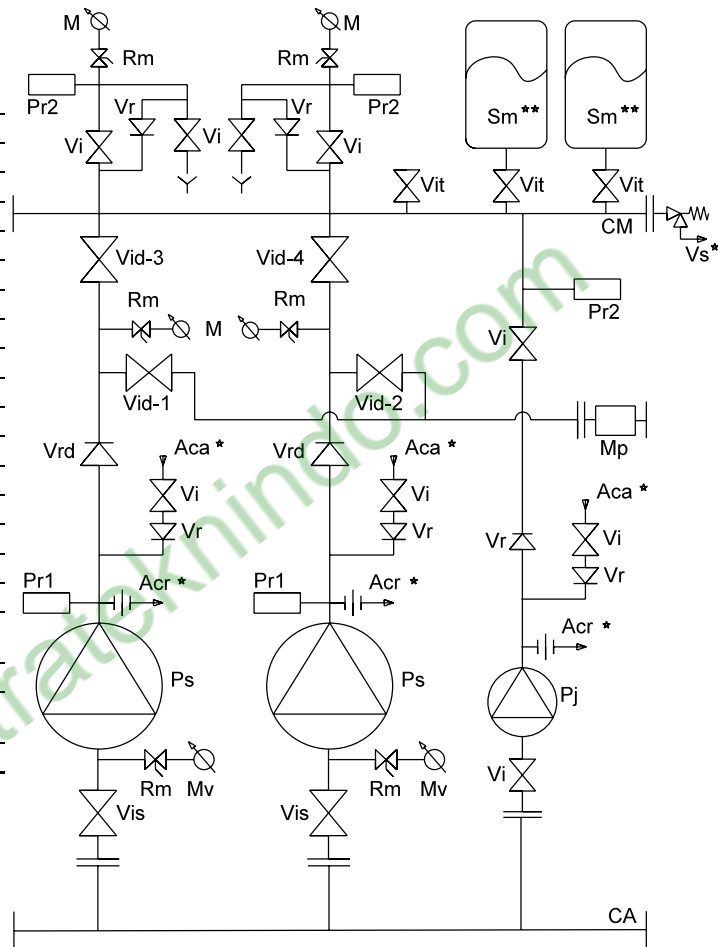
Configuration (example): Two duty pumps + one jockey pump

Ref.	Description
Aca	Priming circuit connection *
Acr	Bypass connection *
CA	Suction manifold (optional)
CM	Discharge manifold
M	Pressure gauge
Mp	Flowmeter
Mv	Pressure and vacuum gauge
Pj	Jockey pump
Pr1	Pressure switch (discharge pressure)
Pr2	Pressure switch (cut-in, cut-out of pump)
Ps	Duty pump
Rm	Multi-function valve for pressure gauge
Sm	Diaphragm tanks, 24 litres, PN 16 (accessory) **
Vi(t)	Isolating valve (ball valve)
Vid	Isolating valve on discharge side (butterfly type)
Vis	Isolating valve on suction side (ball or butterfly type)
Vr	Spring-loaded non-return valve
Vrd	Inspectable non-return valve on discharge side of duty pump
Vs	Automatic pressure relief valve * ●

* Connections to be made during installation

** During installation, fit at least two 24-litre diaphragm tanks, PN 16, see *Accessories* on page 10 and *Installation* on page 16.

● Standard in high-head versions. Limits the discharge pressure to 10 bar, see *Electrical data and performance data of duty pumps* on page 18.



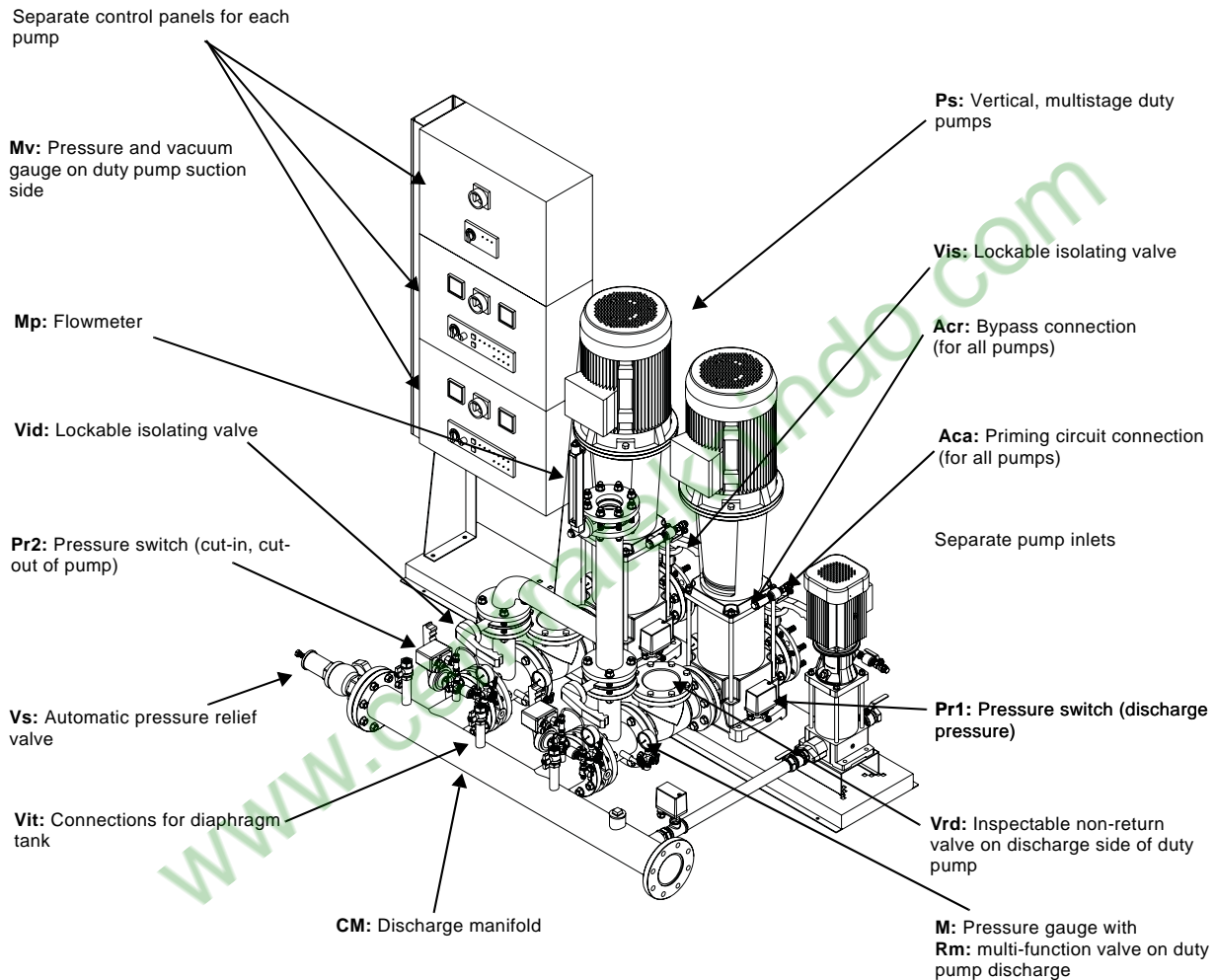
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Components and materials

Ref.	Description	Quantity	Materials
Pj	Jockey pump (CR 3)	1	Grundfos vertical multistage centrifugal pump; vital parts are made of stainless steel; connected to a standard Grundfos motor via a rigid coupling.
Ps	Duty pump (CR)	1 or 2	
CM	Discharge manifold	1	CR 5, CR 10: Threaded galvanised steel, PN 16;
CA	Suction manifold (optional)	1	CR 15, CR 20, CR 32, CR 45, CR 64, CR 90: Flanged, PN 16.
Vi	Isolating valves	see diagram	Ball type, nickel-coated brass housing, threaded, PN 16
Vid	Isolating valves (discharge side of duty pumps)	2 per pump	CR 5, CR 10: Ball type, nickel-coated brass housing, flanged, PN 16;
Vis	Isolating valves (suction side of duty pumps)	1 per pump	CR 15, CR 20, CR 32, CR 45, CR 64, CR, 90: Butterfly type cast iron housing, lockable handle, flanged, PN 16.
Vs	Automatic pressure relief valve	1	Brass housing, NBR seat, PN 16.
Vr	Spring-loaded non-return valves	see diagram	Polymer or brass, PN 16
Vrd	Inspectable non-return valves (discharge side of duty pumps)	1 per pump	CR 5, CR 10: Flap type with rubber seal, threaded, PN 16
Pr	Pressure switches	2 per pump	CR 15, CR 20, CR 32, CR 45, CR 64, CR, 90: Cast iron, flanged, PN 16.
M	Pressure gauges	2 per pump	NBR diaphragm, contacts of silver-plated copper, PN 16
Mv	Pressure and vacuum gauges	1 per pump	10 bar full scale deflection, PN 16, ¼" attachment, glycerine bath
Mp	Flowmeter for direct reading	1	-0.5 - 6 bar, PN 16, ¼" attachment
	Control panels	1 per pump	Flange type, calibrated flowmeter, PN 16
	Brackets for control panels	1 pair	Painted metal cabinet, IP 54
	Base frame	1 set	Galvanised steel
			Galvanised/painted steel

Configuration drawing

The following drawing shows the standard configuration of a Hydro UNI-CR unit with two duty pumps. For any changes or adaptations to specific requirements or additions of optional components and/or accessories not included in our standard scope of supply, please consult Grundfos.



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Hydro UNI-CR units are normally supplied pre-assembled on a common base frame. The pumps are fitted by means of bolts and the control panels are fastened on stands.

Operating pressure

Hydro UNI-CR units supply a maximum pressure of 10 bar as specified in the UNI 9489 standard. But the components and materials used are capable of operating at a pressure of 16 bar. The choice of materials provides operational compatibility with respect to two aspects stipulated in the relevant standards:

- UNI 10779 specifies a rated pressure of system components for connection to the fire brigade fire engine of at least 1.2 Mpa (12 bar).
- UNI 9490 and UNI 10779 specify a minimum pressure for fire systems of at least 14 bar when exposed to hydrostatic test during start-up and during periodic functional tests twice a year at minimum time spans of five months.

Hydraulic components

A manifold is fitted on the pump discharge side. An isolating valve and a non-return valve are fitted between the discharge manifold and each individual pump. An isolating valve is fitted on the suction port of each duty pump to allow the connection of separate suction pipes.

As an option, a Hydro UNI-CR unit may be fitted with a discharge manifold sized for simultaneous operation of both duty pumps and/or a suction manifold (CPL version).

To facilitate installation, all the pumps are fitted with components designed for the connection of a priming circuit in the case of suction lift installation.

Further components can be identified in *System diagram* on page 8.

In order to prevent damage caused by overheating due to possible operation against closed isolating valve, the pumps are equipped with connection for a bypass.

Inspection and checks

As prescribed by UNI 9490, check the performance of the unit at start-up and during periodic functional tests prescribed by the standard. The pressure delivered by the unit is equal to the difference between the values read on the pressure gauge on the discharge and the pressure/vacuum gauge on the suction side.

Carry out the flow rate measurements required during start-up and regular checks by directly reading a flowmeter fitted in a test manifold with isolating valves. Flowmeter configuration and measurement precision should be as required by UNI 9490.

If determined by specific system requirements, the test manifold and flowmeter may be fitted reversely to the factory configuration during installation.

Jockey pump options

CR 3 pumps are standard as jockey pump. The following CR pump versions are also available as jockey pumps for Hydro UNI-CR units:

- CR 5, CR 10 or CR 15, see *Jockey pump* on page 12 and *Electrical data and performance data of jockey pumps* on page 19.

Accessories

The following accessories are available for Hydro UNI-CR units:

- timers to enable automatic duty pump cut-out when pressure is maintained above the pump cut-in pressure for at least 20 minutes (according to UNI 10779, this only applies to systems with fire hydrants)
- 24-litre, PN 16 diaphragm tanks with replaceable diaphragm
- remote alarm devices for indication of
 - power failure
 - phase failure
 - start-up of duty pumps, with audible and visual alarm signals, equipped with buffer battery (according to UNI 9490)
- 220 V locked power socket with fuses
- device for periodic, automatic, programmable testing of duty pumps with indication of missing pump performance (not required by UNI 9490).

In case you need other components or accessories, please contact Grundfos.

Versions on request

The following Hydro UNI-CR versions are available on request:

- with direct-on-line starting in stead of the standard star-delta starting (from 11 kW and upwards)
- without flowmeter circuit
- with flowmeter supplied separately
- with discharge manifold designed for simultaneous operation of both duty pumps
- with vertical, multistage pumps of other sizes than described in this data booklet
- with performance levels exceeding the range described in this data booklet
- with more than two duty pumps
- with suction manifold (CPL version)
- with AISI 316 (DIN W.-Nr. 1.4401) stainless steel manifolds.

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Duty pumps

The duty pumps (or supply pumps, as they are called in UNI 9490) are designed in accordance with UNI 9489 with specific reference to

- performance tolerance (according to ISO 9906 Annex A)
- value for NPSHR
- maximum head.

The duty pumps meet the criteria laid down in UNI 9490 with regard to power requirement at any of the duty points shown in *Electrical data and performance data of duty pumps* on page 18.

Jockey pump

A jockey pump serves the purpose of maintaining the pressure in the fire system. The jockey pump compensates automatically for any loss of pressure caused by leaks and thus prevents the duty pumps from starting unnecessarily.

According to the terms of UNI 9490, the jockey pump does not contribute to the total performance required of the unit (duty pumps).

The standard version of the unit is equipped with a CR 3 as jockey pump.

If a higher flow rate is required, other jockey pump models such as CR 5, CR 10 and CR 15 are available as an option, see *Electrical data and performance data of jockey pumps* on page 19.

Pump description

This description covers both the duty pumps and the jockey pump.

Grundfos CR pumps are vertical multistage centrifugal pumps with a standard Grundfos motor coupled to the pump shaft by means of a rigid coupling. They are highly efficient and offer great mechanical and operational reliability.

The pump has a base and a pump head. The chamber stack and outer sleeve are secured between the base and pump head by means of staybolts. The base features in-line suction and discharge ports, with Grundfos oval or DIN flanges.

The vital parts of the pump, such as shaft, outer sleeve, chambers and impellers are made of stainless steel.

Features and benefits

The vertical, multi-stage CR pumps from Grundfos offer the following features and benefits:

High efficiency	Low power consumption and consequently low costs during automatic duty
Low NPSH	High suction flow
Air evacuation	Minimises damage in the event of operation with uneven suction flow
Mechanical cartridge shaft seal	Allows inspection and routine maintenance to be carried out conveniently on site without removing the motor or dismantling the pump
Long coupling	Allows replacement of the cartridge shaft seal on site without removing the motor (from 11 kW and upwards)
Outer sleeve sealed by O-rings	Offers high resistance to pressure shocks and is insensitive to temperature fluctuations
Reinforced stop ring	For heavy-duty, reliable impeller rotation
Silicon carbide bearing rings	High durability as they are more resistant to wear and the effects of rotation with uneven lubrication

Operating conditions

Water temperature	0°C to +90°C (standard)
Maximum operating pressure	1.6 Mpa (16 bar)
Maximum inlet pressure	Equal to the difference between 16 bar and the maximum head of the specific pump model
Suction lift	Influenced by NPSH value (max. 3 m), see also <i>Operating conditions</i> on page 7

Pumped liquid

Thin, clean, non-explosive liquids, not containing solids or fibres and mechanically and chemically non-aggressive to the pump materials.

Description of construction

Mechanical shaft seal

The standard dimensions of the mechanical shaft seal comply with DIN 24960 and is a Grundfos type HQQE. The shaft seal is not suitable for liquids containing abrasive particles. Modified versions are available as options.

Material specification

Pos.	Component	Material
1	Pump head *	Cast iron EN 200 (ASTM 25B) or EN 500-7 (CR 32 - CR 90)
2	Shaft seal	Tungsten carbide/tungsten carbide, EPDM
3	Pump shaft	Stainless steel AISI 316 / UNI 6900/71
4	Impeller	Stainless steel AISI 304 / UNI 6900/71
5	Chamber	Stainless steel AISI 304 / UNI 6900/71
6	Pump base *	Cast iron EN 200 (ASTM 25B) or EN 500-7 (CR 32 - CR 90)
7	Bearing ring	Silicon carbide
8	Neck ring	PTFE or PTFE + 25% soft carbon (CR 32 - CR 90)
9	Outer sleeve	Stainless steel AISI 304 / UNI 6900/71
10	Coupling guard	Stainless steel AISI 304 / UNI 6900/71
11	Long coupling	Cast iron EN 500-7 (CR 32 - CR 90)
12	Bearing ring	Tungsten carbide
	Elastomers	EPDM or PTFE + 25% soft carbon (CR 32 - CR 90)

* Cast iron parts corrosion-protected by electro-coating.

Sectional drawings

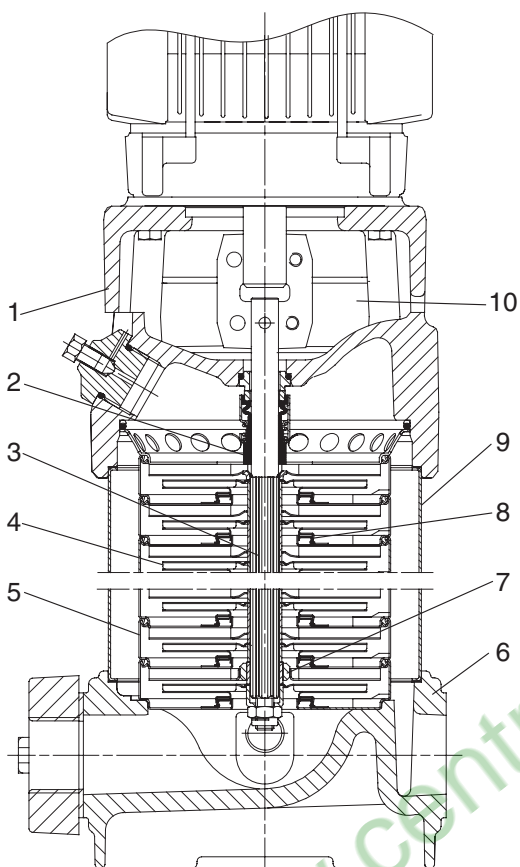


Fig. 3 Sectional drawing CR 3, CR 5, CR 10

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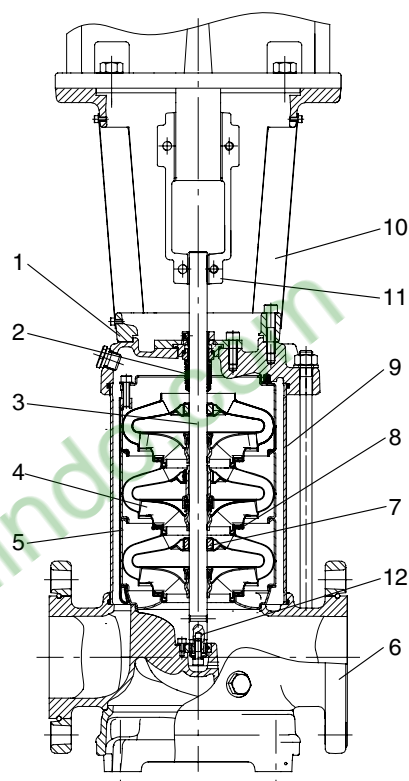


Fig. 5 Sectional drawing CR 32, CR 45, CR 64, CR 90

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Electric motor

Grundfos CR pumps are equipped with a Grundfos MG three-phase, two-pole, squirrel cage, totally enclosed, fan-cooled motor with dimensions complying with IEC and DIN standards.

Mounting designation	V 18 up to and incl. 4 kW V 1 for 5.5 kW and upwards
Supply voltage	3 x 400 V, 50 Hz
Enclosure class	IP 55
Insulation class	F, according to IEC 85
Ambient temperature	Max. +40°C
Electrical tolerances	To IEC 34/EN 60034

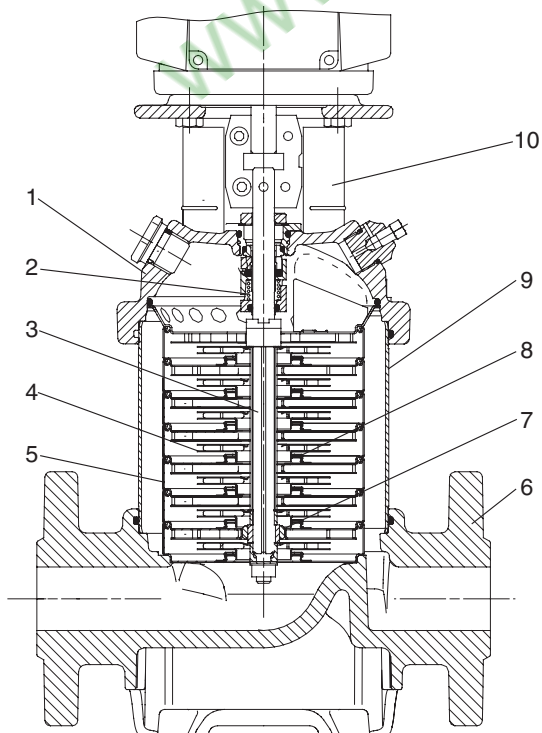


Fig. 4 Sectional drawing CR 15, CR 20

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Control panels of duty pumps

The duty pumps are controlled via separate control panels allowing easy reading of gauges and signals from their front doors. The starting method for motors with rated power up to and including 7.5 kW is direct-on-line (DOL); in order to avoid line overload, stress on rotating parts and wear of system components the starting method is star-delta (SD) for motors with power ratings from 11 kW and upwards. Other starting methods, such as DOL instead of SD, are available as options. The table below lists the components and functions available in the control panels. Ref. refers to Fig. 6 showing the front door of a control panel of a duty pump which is designed in compliance with UNI 9490 requirements.

Ref.	Component
	Metal cabinet IP 54
A	Mains switch, lockable
	Fuse and contactor circuit
	Transformer with fuses for auxiliary circuit
B	Ammeter
C	Voltmeter
D	Voltmeter selector 0-L1/L2-L2/L3-L1/L3-0
E	MAN-0-AUT selector switch Selector switch with key, only removable when in position AUT
F	Start-stop buttons for test or manual operation

Ref.	Component
	Indicator lights
	Mains voltage on
G	Auxiliary circuit supply on
H	Pump ready for operation
I	Pump operating
L	Voltage to motor (two LEDs)
M	Voltage or phase failure (two LEDs) with relay and buffer battery
	Other outputs
	Potential-free NO/NC-contact for remote indication of power and/or phase failure
	Potential-free NC-contact for remote indication that pump is operating and pressure supplied.

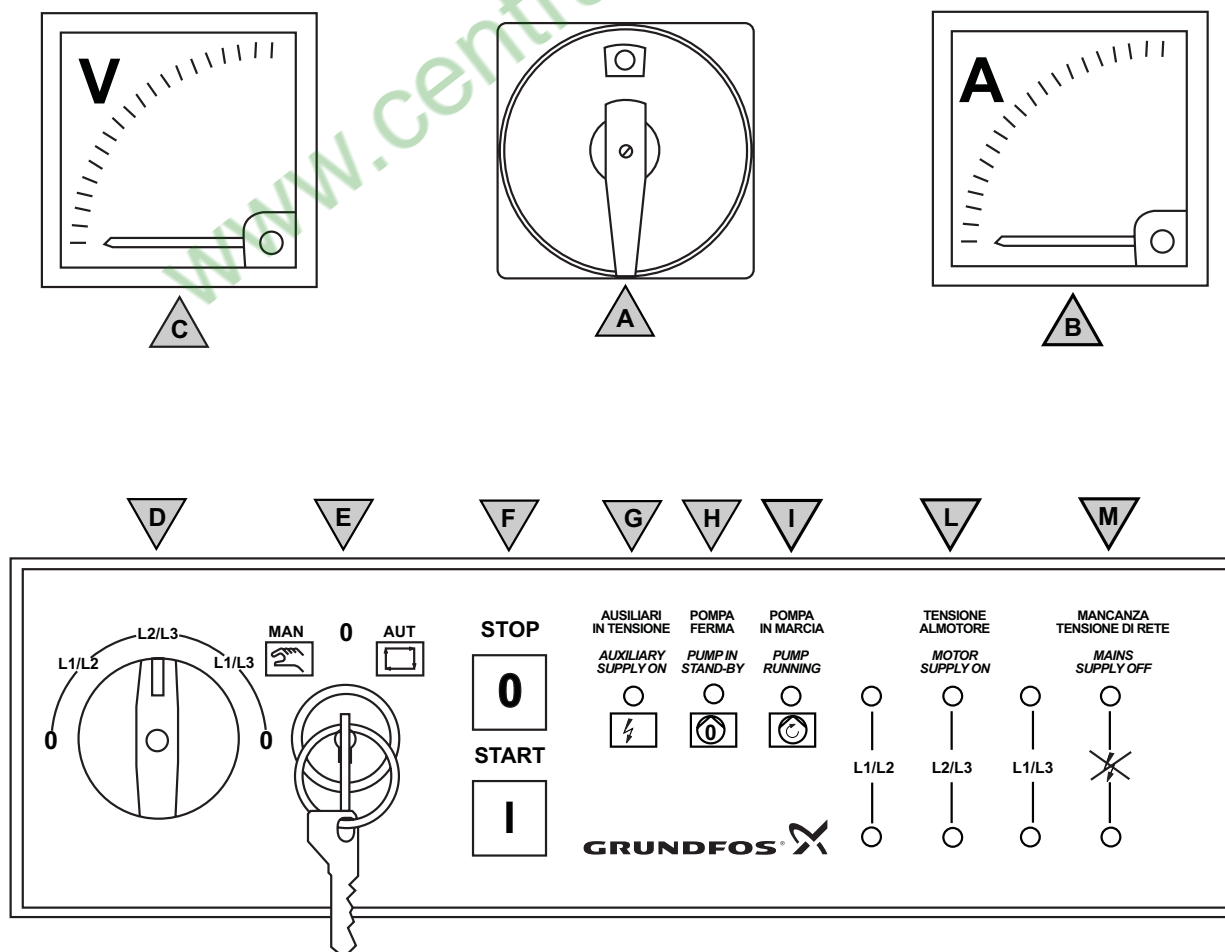


Fig. 6 Front door of control panel of duty pump

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Control panel of jockey pump

The jockey pump is controlled by an independent control panel including the following components and functions. Ref. refers to figure 7 showing the front door of a control panel of a jockey pump.

Ref.	Component
	Metal cabinet IP 54
A	Mains switch, lockable
	Relay
	Fuse and contactor circuit
	Transformer with fuses for auxiliary circuit
B	MAN-0-AUT selector switch
Indicator lights indicating	
C	Relay operation
D	Pump operating
E	Mains voltage

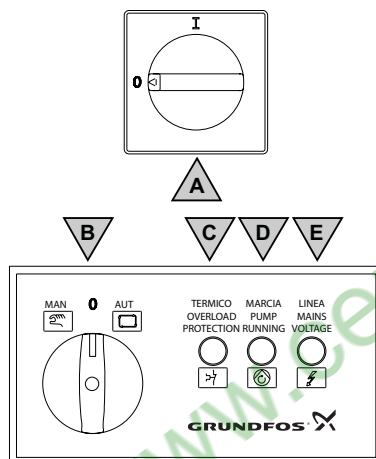


Fig. 7 Front door of control panel of jockey pump

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Requirements to the room

The UNI 9490 standard stipulates that a fire pump set for fire fighting must be located in a room designed exclusively for fire systems.

The UNI 10779 standard on fire hose reel and hydrant systems allows the installation of a fire pump set for fire fighting in rooms shared with other engineering systems provided the fire load in the room is low.

The Hydro UNI-CR units must be installed in a weatherproof, frost-free, well-ventilated room so as to ensure that the electric motors are satisfactorily cooled. According to UNI 9490 the ambient temperature must be below +40°C when the pumps are operating at maximum load.

The unit must be placed with sufficient clearance in front of it and at the sides for inspection, testing and maintenance. The unit must be placed on a flat, even surface, such as a concrete floor or foundation. If the unit is not equipped with vibration dampers, it may be bolted direct to the floor or foundation.

Requirements to the pipework

The pipes connected to the unit must be of appropriate size. Provide expansion joints on the discharge manifold - and the suction manifold, if fitted - to prevent resonance or mechanical stress due to incorrect alignment.

Always install pipe hangers on both the discharge and suction sides to ensure that the weight of the pipes does not rest on the manifold (including the suction manifold, if fitted) or on the pump.

To facilitate installation, the pumps are fitted with components designed for the connection of a priming circuit in the case of suction lift conditions.

To ensure the due precision of the flowmeter, follow the instructions in the installation and operating instructions when connecting the flowmeter downstream.

If determined by specific system requirements, the test manifold and flowmeter may be fitted reversely to the factory configuration during installation.

To ensure correct operation of the jockey pump, the unit must be equipped with at least two 24-litre, PN 16 diaphragm tanks, see *Product description* on page 4, *System diagram* on page 8 and *Accessories* on page 10. If necessary, additional diaphragm tanks may be connected to the discharge manifold.

Requirements to control panels

To meet the requirements of UNI 9490, connect the duty pump control panels with remote alarm equipment to indicate power, phase failure and start-up of pumps. The alarm equipment should

- give audible and visual signals
- be equipped with a buffer battery
- be installed in a manned area, see *Accessories* on page 10.

How to choose a unit

In a Hydro UNI-CR unit, the second duty pump (if installed) is designed to act as a back-up to the first duty pump, see *Product description* on page 4 and *Electrical data and performance data of duty pumps* on page 18. Both pumps therefore supply the same performance.

When selecting a unit, consider certain criteria such as size of rated flow, requirements and specifications laid down by the system designer, local authority or regulatory requirements etc.

Using the specific performance required by the fire system as reference, proceed as follows:

- **Required flow: 10 m³/h.**

Go into the tables on page 18 under the heading “Flow”. Find the required flow, 10 m³/h. This flow is the optimum operating flow. The unit type most effectively meeting this requirement is **CR 10**.

Find any required flow in the grey background ranges under the heading “Flow” in the tables on page 18 (Contact Grundfos if you need to refer to specific technical documentation).

Duty pump CR 10				Flow [m ³ /h] with 1 duty pump in operation									Jockey pump
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	5	5.5	6	7	8	9	10	11	
				Head [m]									

- **Required head: 65 m.**

From the 10 m³/h move down till you come to the part of the table with the heading “Head”. Move further downwards till you come to a figure equal to or slightly below/above the required head, in this case 65. The unit best meeting this requirement is the 3 kW **HUNI CR 10/C** which supplies a head of 65 m.

Duty pump CR 10				Flow [m ³ /h] with 1 duty pump in operation									Jockey pump	
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	5	5.5	6	7	8	9	10	11		12
				Head [m]										
HUNI CR 10/C	3	6.4	DOL	82	81	80	79	77	74	70	65	59	52	B

- **Jockey pump**

The column on the far right of the duty pump performance tables states a reference letter for the jockey pump. If you take this reference letter to the tables on page 19, you will find the jockey pump for your unit - in this case a 1.1 kW CR 3-15.

Jockey pump CR 3				Jockey pump flow [m ³ /h]									
Jockey pump	Pump	P ₂ [kW]	I _{1/1} [A]	Starting method	0	1.7	2.1	2.5	2.9	3.3	3.7	4.1	4.5
					Jockey pump head [m]								
B	CR 3-15	1.1	2.6	DOL	98	88	83	78	71	64	55	45	34

Electrical data and performance data of duty pumps

The electrical data stated in the following tables refer to the duty pump. To select a unit, refer to the tables showing the electrical and performance data of a single duty pump (according to ISO 9906 Annex A).

Duty pump CR 5				Flow [m ³ /h] with 1 duty pump in operation								Jockey pump		
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	2.5	3.5	4.5	5.5	6	6.5	7		7.5	8
HUNI CR 5/A	1.1	2.6	DOL	Head [m]										B
HUNI CR 5/B	1.5	3.4		53	50	47	44	39	36	33	30	27	24	B
HUNI CR 5/C	2.2	4.7		68	64	60	56	51	48	45	41	37	33	C
HUNI CR 5/D ■	2.2	4.7		88	84	80	74	68	64	60	55	50	45	C
Duty pump CR 10				Flow [m ³ /h] with 1 duty pump in operation								Jockey pump		
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	5	5.5	6	7	8	9	10		11	12
HUNI CR 10/A	1.5	3.4	DOL	Head [m]										A
HUNI CR 10/B	2.2	4.7		42	41	40	39	38	36	34	32	29	25	B
HUNI CR 10/C	3	6.4		61	61	60	59	57	55	52	48	44	39	B
HUNI CR 10/D ■	4	8		82	81	80	79	77	74	70	65	59	52	C
Duty pump CR 15				Flow [m ³ /h] with 1 duty pump in operation								Jockey pump		
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	8.5	10.5	12.5	14.5	16.5	18.5	19.5		20.5	21.5
HUNI CR 15/A	3	6.4	DOL	Head [m]										A
HUNI CR 15/B	4	8		43	40	39	38	36	34	31	30	28	26	B
HUNI CR 15/C	4	8		57	54	53	51	48	46	42	40	38	36	B
HUNI CR 15/D	5.5	11		71	67	65	63	60	56	52	50	47	44	B
HUNI CR 15/E	5.5	11		85	81	79	76	73	68	63	60	57	54	C
HUNI CR 15/F ■	7.5	15.2		99	94	92	88	84	79	73	70	66	62	C
Duty pump CR 20				Flow [m ³ /h] with 1 duty pump in operation								Jockey pump		
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	14	16	18	20	22	24	25		26	27
HUNI CR 20/A	4	8	DOL	Head [m]										A
HUNI CR 20/B	5.5	11		44	40	39	38	36	33	30	29	27	25	B
HUNI CR 20/C	5.5	11		59	55	53	51	48	45	41	39	37	35	B
HUNI CR 20/D	7.5	15.2		73	68	66	63	60	56	52	49	46	43	B
HUNI CR 20/E	7.5	15.2		88	82	80	77	73	68	63	60	56	52	C
				100	96	93	89	84	79	73	69	65	61	C
Duty pump CR 32				Flow [m ³ /h] with 1 duty pump in operation								Jockey pump		
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	20	23	26	29	31	33	35		36	37
HUNI CR 32/B	4	8	DOL	Head [m]										A
HUNI CR 32/C	5.5	11		39	35	34	32	30	28	27	25	24	23	B
HUNI CR 32/D	7.5	15.2		59	53	51	48	45	43	40	37	36	34	B
HUNI CR 32/E	11	21.5	SD	78	71	68	65	61	58	54	50	48	46	C
HUNI CR 32/F ■	11	21.5		98	90	87	83	78	74	70	65	63	60	C
Duty pump CR 45				Flow [m ³ /h] with 1 duty pump in operation								Jockey pump		
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	30	33	36	39	42	45	48		51	54
HUNI CR 45/A	5.5	11	DOL	Head [m]										A
HUNI CR 45/B	7.5	15.2		41	39	38	36	34	33	30	28	25	21	B
HUNI CR 45/C	11	21.5	SD	52	47	46	44	42	41	39	37	34	30	B
HUNI CR 45/D	15	28.7		77	71	68	67	64	62	58	56	51	45	C
			100	95	92	90	86	83	78	75	69	62	C	

■ Units equipped with automatic pressure relief valve to limit the discharge pressure to 10 bar.

The grey background indicates that the performances fully comply with the applicable standards; any data can be selected as duty point.

DOL = direct-on-line starting; SD = star/delta-starting. Non-standard starting configuration is available as an option.

Duty pump CR 64				Flow [m ³ /h] with 1 duty pump in operation								Jockey pump		
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	48	52	56	60	64	68	72		76	80
HUNI CR 64/A	7.5	15.2	DOL	41	36	35	33	31	29	27	25	22	19	A
HUNI CR 64/B	11	21.5	SD	61	49	48	47	46	44	42	40	38	36	B
HUNI CR 64/C	15	28.7		80	69	67	65	63	60	57	54	51	47	B
HUNI CR 64/D	18.5	35.9		99	88	85	82	79	76	72	68	63	59	C
HUNI CR 64/E ■	22	42		100	96	93	90	87	84	80	76	72	68	C
Duty pump CR 90				Flow [m ³ /h] with 1 duty pump in operation								Jockey pump		
Unit	P ₂ [kW]	I _{1/1} [A]	Starting method	0	70	75	80	85	90	95	100		105	110
HUNI CR 90/B	11	21.5	DOL	49	38	37	35	33	30	27	24	21	17	A
HUNI CR 90/C	15	28.7		69	49	48	46	44	42	40	38	35	32	B
HUNI CR 90/D	18.5	35.9		82	64	61	58	55	52	48	44	40	35	B
HUNI CR 90/E	22	42		100	75	73	71	68	65	62	59	55	51	C
HUNI CR 90/F ■	30	56		100 ■	91	88	84	80	76	71	66	61	54	C

■ Units equipped with automatic pressure relief valve to limit the discharge pressure to 10 bar.

The grey background indicates that the performances fully comply with the applicable standards; any data can be selected as duty point.

DOL = direct-on-line starting; SD = star/delta-starting. Non-standard starting configuration is available as an option.

Electrical data and performance data of jockey pumps

The standard version of the unit is equipped with a CR 3 jockey pump.

Standard jockey pumps

The standard type CR 3 jockey pumps offer the following electrical data and performance data, which comply with ISO 9906 Annex A. The column on the far right of the duty pump performance tables on page 19 states a reference letter for the jockey pump.

Jockey pump	Jockey pump CR 3				Jockey pump flow [m ³ /h]								
	Pump	P ₂ [kW]	I _{1/1} [A]	Starting method	0	1.7	2.1	2.5	2.9	3.3	3.7	4.1	4.5
A	CR 3-10	0.75	1.9	DOL	66			52	48	43	37	31	29
B	CR 3-15	1.1	2.6		98	88	83	78	71	64	55	45	34
C	CR 3-17	1.5	3.4		113	98	92	84	77	66	55	43	

The grey background indicates the performance in automatic operation according to the relevant pressure switch settings.

Jockey pumps on request

If specific requirements call for higher flow rates, other jockey pump sizes such as CR 5, CR 10 and CR 15 are available as options.

The following tables show the appropriate, alternative jockey pump for each fire pump set.

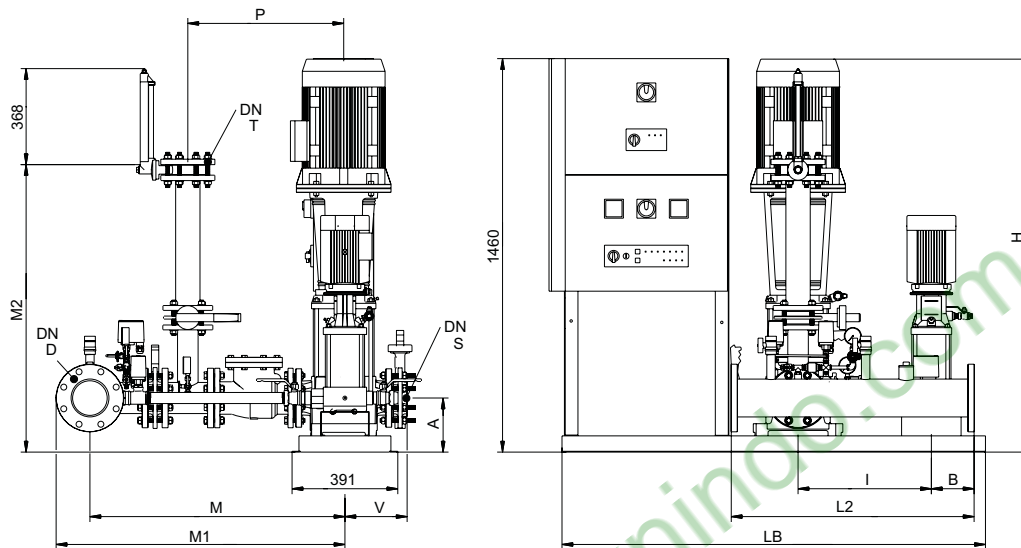
Unit	Ref. jockey pump			Unit	Ref. jockey pump			Unit	Ref. jockey pump		
	CR 5	CR 10	CR 15		CR 5	CR 10	CR 15		CR 5	CR 10	CR 15
HUNI CR 5/A	-	-	-	HUNI CR 20/A	D	G	L	HUNI CR 64/A	D	G	L
HUNI CR 5/B	-	-	-	HUNI CR 20/B	E	H	M	HUNI CR 64/B	E	H	M
HUNI CR 5/C	-	-	-	HUNI CR 20/C	E	K	N	HUNI CR 64/C	F	K	N
HUNI CR 5/D	-	-	-	HUNI CR 20/D	F	K	N	HUNI CR 64/D	F	K	N
HUNI CR 10/A	D	-	-	HUNI CR 20/E	F	K	N	HUNI CR 64/E	F	K	N
HUNI CR 10/B	E	-	-	HUNI CR 32/B	D	G	L	HUNI CR 90/B	D	G	M
HUNI CR 10/C	F	-	-	HUNI CR 32/C	E	H	M	HUNI CR 90/C	E	H	M
HUNI CR 10/D	F	-	-	HUNI CR 32/D	E	K	N	HUNI CR 90/D	F	K	N
HUNI CR 15/A	D	G	-	HUNI CR 32/E	F	K	N	HUNI CR 90/E	F	K	N
HUNI CR 15/B	D	H	-	HUNI CR 32/F	F	K	N	HUNI CR 90/F	F	K	N
HUNI CR 15/C	E	K	-	HUNI CR 45/A	D	G	L				
HUNI CR 15/D	F	K	-	HUNI CR 45/B	D	H	M				
HUNI CR 15/E	F	K	-	HUNI CR 45/C	E	K	N				
HUNI CR 15/F	F	K	-	HUNI CR 45/D	F	K	N				

The electrical data and performance data of optional jockey pump models can be obtained from the following tables. These data also comply with ISO 9906 Annex A. For selection, look up the reference letter related to the various jockey pumps in the above tables.

Jockey pump	Jockey pump CR 5				Jockey pump flow [m ³ /h]								
	Pump	P ₂ [kW]	I _{1/1} [A]	Starting method	0	3.6	4.3	5	5.7	6.4	7.1	7.8	8.5
D	CR 5-10	1.5	3.4	DOL	Jockey pump head [m]								
E	CR 5-13	2.2	4.8		71	61	58	54	49	45	39	34	28
F	CR 5-16	2.2	4.8		88	80	76	72	66	61	54	47	40
					108	97	93	88	81	74	66	58	48
Jockey pump	Jockey pump CR 10				Jockey pump flow [m ³ /h]								
	Pump	P ₂ [kW]	I _{1/1} [A]	Starting method	0	6.4	7.2	8	8.8	9.6	10.4	11.2	12
G	CR 10-6	2.2	5.1	DOL	Jockey pump head [m]								
H	CR 10-8	3	6.2		62	57	55	53	50	47	43	39	
K	CR 10-10	4	8		82	79	77	74	71	67	63	58	53
					103	96	93	89	84	79	73	67	
Jockey pump	Jockey pump CR 15				Jockey pump flow [m ³ /h]								
	Pump	P ₂ [kW]	I _{1/1} [A]	Starting method	0	11.5	13	14.5	16	17.5	19	20.5	22
L	CR 15-4	4	8.7	DOL	Jockey pump head [m]								
M	CR 15-6	5.5	11		57	48	46	44	41	38	35		
N	CR 15-8	7.5	15.2		85	78	76	73	70	66	62	57	52
					113	97	93	88	83	77	70		

The grey background indicates the performance in automatic operation according to the relevant pressure switch settings.

Hydro UNI-CR units with one duty pump and jockey pump



Dimension H is always smaller than dimension HQ (1460).

Note, however, the following units:

- HUNI CR 32/F: H = 1489
- HUNI CR 64/E: H = 1579
- HUNI CR 90/E: H = 1525
- HUNI CR 90/F: H = 1684

Unit	DN S	DN D	DN T	Dimensions [mm]													
				A	B	H	(HQ)	I	LB	L2	M	M1	M2	P	V		
HUNI CR 5-x	Rp 1 1/4	R 2		115	140												
HUNI CR 10-x	Rp 1 1/2	R 2 1/2		145													
HUNI CR 15-x			Rp 1 1/2	150	170												
HUNI CR 20-x	50	50															
HUNI CR 32-x	65	65		165													
HUNI CR 45-x	80	80															
HUNI CR 64-x																	
HUNI CR 90-x	100	100	80	200	150												
HUNI CR 90/F						1684											

All flange connections to Hydro UNI-CR units are PN 16.

- Jockey pump suction port: Rp 1.
Other jockey pump models, such as CR 5, CR 10 and CR 15, are available as options, see *Electrical data and performance data of jockey pumps* on page 19.
For the dimensions of units with alternative jockey pumps, please contact Grundfos.
As an option, units can be supplied with a suction manifold (CPL version); for dimensions, please contact Grundfos.

Note: The tolerance for the dimensions shown in the above table is ± 20 mm.

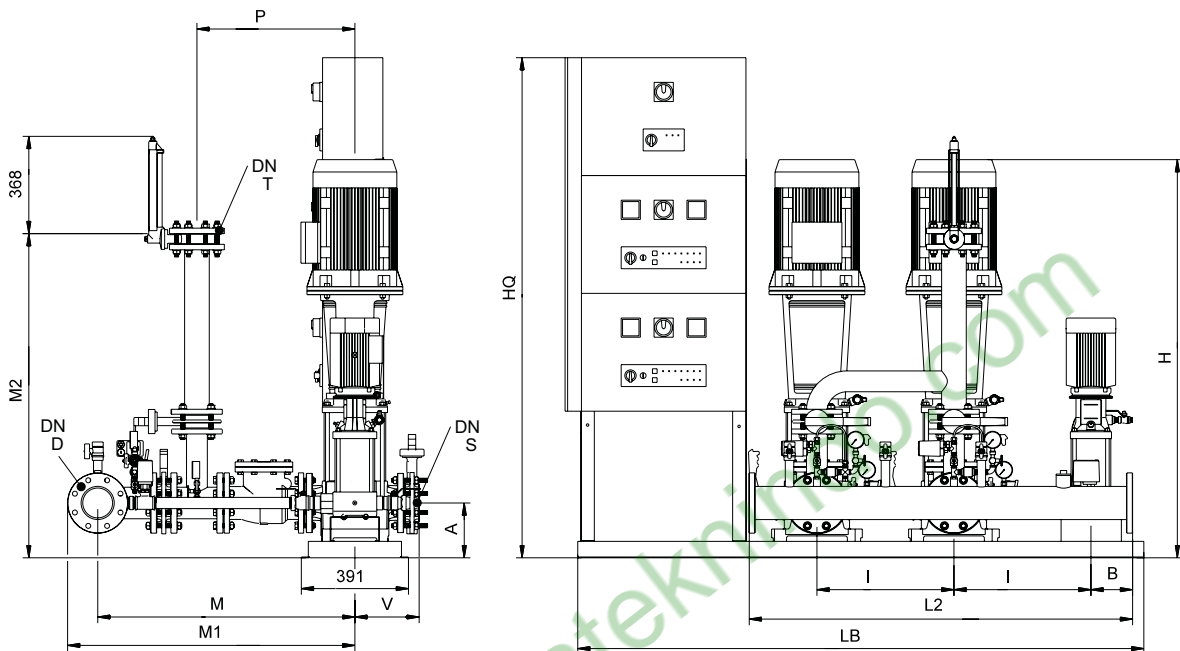
Dimensions may be changed without notice as a result of technological improvements to the components and/or materials used.

Unit	Weight [kg]	Unit	Weight [kg]	Unit	Weight [kg]	Unit	Weight [kg]	Unit	Weight [kg]
HUNI CR 5/A	139	HUNI CR 15/A	202	HUNI CR 20/C	236	HUNI CR 45/A	296	HUNI CR 64/D	427
HUNI CR 5/B	146	HUNI CR 15/B	213	HUNI CR 20/D	240	HUNI CR 45/B	301	HUNI CR 64/E	493
HUNI CR 5/C	149	HUNI CR 15/C	215	HUNI CR 20/E	241	HUNI CR 45/C	358	HUNI CR 90/B	379
HUNI CR 5/D	150	HUNI CR 15/D	237	HUNI CR 32/B	257	HUNI CR 45/D	395	HUNI CR 90/C	412
HUNI CR 10/A	160	HUNI CR 15/E	239	HUNI CR 32/C	266	HUNI CR 64/A	320	HUNI CR 90/D	429
HUNI CR 10/B	164	HUNI CR 15/F	242	HUNI CR 32/D	274	HUNI CR 64/B	373	HUNI CR 90/E	482
HUNI CR 10/C	170	HUNI CR 20/A	212	HUNI CR 32/E	331	HUNI CR 64/C	411	HUNI CR 90/F	587
HUNI CR 10/D	182	HUNI CR 20/B	234	HUNI CR 32/F	346				

The drawings and dimensions shown above apply to the Hydro UNI-CR units described in this data booklet. For any changes or adaptations to specific requirements or additions of optional components and/or accessories not included in our standard scope of supply, please consult Grundfos.

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Hydro UNI-CR units with two duty pumps and jockey pump



Dimension H is always smaller than dimension HQ.

Model unit	DN S ●	DN D ■	DN T	Dimensions [mm]														
				A	B	H	HQ	I	LB	L2	M	M1	M2	P	V			
HUNI CR 5-x	Rp 1 ¼	R 2		115	140													
HUNI CR 10-x	Rp 1 ½	R 2 ½		145														
HUNI CR 15-x			Rp 1 ½		170													
HUNI CR 20-x	50	50		150														
HUNI CR 32-x	65	65		165														
HUNI CR 45-x	80	80																
HUNI CR 64-x			80	200	150													
HUNI CR 90-x	100	100																
HUNI CR 90/F	Configuration and dimensions supplied on request																	

All flange connections to Hydro UNI-CR units are PN 16.

● Jockey pump suction port: Rp 1. Other jockey pump models, such as CR 5, CR 10 and CR 15, are available as options, see *Electrical data and performance data of jockey pumps* on page 19.

For the dimensions of units with alternative jockey pumps, please contact Grundfos.

As an option, units can be supplied with a suction manifold (CPL version); for dimensions, please contact Grundfos.

■ As an option, units are supplied with a discharge manifold sized for simultaneous operation of both duty pumps; for dimensions, please contact Grundfos.

Note: The tolerance for the dimensions shown in the above table is ± 20 mm.

Dimensions may be changed without notice as a result of technological improvements to the components and/or materials used.

Unit	Weight [kg]	Unit	Weight [kg]	Unit	Weight [kg]	Unit	Weight [kg]	Unit	Weight [kg]
HUNI CR 5/A	197	HUNI CR 15/A	304	HUNI CR 20/C	372	HUNI CR 45/A	487	HUNI CR 64/D	741
HUNI CR 5/B	210	HUNI CR 15/B	324	HUNI CR 20/D	380	HUNI CR 45/B	497	HUNI CR 64/E	860
HUNI CR 5/C	217	HUNI CR 15/C	330	HUNI CR 20/E	382	HUNI CR 45/C	605	HUNI CR 90/B	645
HUNI CR 5/D	219	HUNI CR 15/D	374	HUNI CR 32/B	413	HUNI CR 45/D	679	HUNI CR 90/C	711
HUNI CR 10/A	239	HUNI CR 15/E	378	HUNI CR 32/C	431	HUNI CR 64/A	533	HUNI CR 90/D	745
HUNI CR 10/B	247	HUNI CR 15/F	384	HUNI CR 32/D	447	HUNI CR 64/B	633	HUNI CR 90/E	851
HUNI CR 10/C	259	HUNI CR 20/A	324	HUNI CR 32/E	555	HUNI CR 64/C	709	HUNI CR 90/F	option
HUNI CR 10/D	283	HUNI CR 20/B	368	HUNI CR 32/F	574				

The drawings and dimensions shown above apply to the Hydro UNI-CR units described in this data booklet. For any changes or adaptations to specific requirements or additions of optional components and/or accessories not included in our standard scope of supply, please consult Grundfos.

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Subject to alterations.