WCD-HRA Series Permanent Magnet Frequency Conversion Circulating Pump User Manual

WMD Company OÜ
www.westonclimate.com

Preface

Thank you for choosing our WCD-HRA series frequency conversion circulating pump.

This manual provides the user with relevant precautions for installation, debugging, parameter setting, anomaly diagnosis, troubleshooting, and daily maintenance of this unit. To ensure correct installation and operation, please read this user manual carefully before installation and keep it properly for future reference.

Special Precautions:

1. Under no circumstances should you plug/unplug wiring or attempt to touch any contacts inside the socket while the power is on, to prevent electric shock and accidents.
2. Do NOT connect this unit to a 380V AC power supply, as this will cause severe and irreparable damage to the unit!
3. Please use the power cable supplied with this unit and ensure the PE (ground) wire is reliably connected.
4. Please operate strictly in accordance with this user manual. Our company assumes no civil or criminal liability for any equipment damage or personal injury resulting from failure to do so.
5. This unit contains no user-serviceable parts. Do not attempt to disassemble or repair the unit. If a fault occurs, please contact our company, and we will assist in troubleshooting as soon as possible.
6. Do not install in misaligned piping.
7. Pump surfaces may become very hot; avoid bodily contact.
8. Be aware of hazards or potential hazards from release devices.

Our company's after-sales service email: http://www.westonclimate.com

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1. Product Introduction

1.1 Application

This product is an energy-saving circulating pump featuring a canned structure design, driven by a permanent magnet synchronous motor, and controlled by intelligent frequency conversion. It is suitable for circulation and pressurization in hot and cold water supply systems up to 95°C, particularly ideal for variable flow applications such as underfloor heating systems, wall-hung heating systems, and domestic hot water circulation systems. The benchmark for highest efficiency circulator is EEI ≤ 0.23.

1.2 Features

1) Ultra-quiet Operation: The rotor is lubricated by the pumped liquid, resulting in extremely low noise levels.

2) Leak-free: The housing is sealed with gaskets, eliminating mechanical seals and effectively preventing liquid leakage.

3) High Temperature Resistance: The impeller and motor utilize high-temperature resistant materials, capable of handling liquids up to 95°C.

4) Wear Resistant: The motor bearings are made of high-hardness, wear-resistant ceramic, robust and maintenance-free.

5) High Efficiency: The motor uses a permanent magnet synchronous design with frequency conversion control, and the impeller employs a centrifugal design, resulting in high efficiency and significant energy savings.

6) Long Service Life: The rotor and stator are isolated by stainless steel cans. Heat dissipation is aided by the liquid in the internal cavity, slowing insulation aging and extending service life.

7) Multi-mode Operation: Offers multiple operating mode selections to meet various application needs.

8) Intelligent: Automatically adjusts system flow via variable frequency speed control according to the working mode, maintaining the system in its optimal operating state. Provides various information indicators for convenient user operation.

1.3 Main Technical Parameters

1) Input Power: Single-phase AC, rated voltage 220V, allowable fluctuation -40% to +20%; Frequency 50Hz/60Hz.

2) Ambient Operating Temperature: 0°C to 40°C.

3) Pumped Liquid: Clean water or diluted, clean, non-corrosive, and non-explosive liquids.

4) Pumped Liquid Temperature: 2°C to 95°C (The liquid temperature should be higher than the ambient temperature).

5) Maximum System Pressure: Not exceeding 1.0 MPa.

1.4 Model Definition

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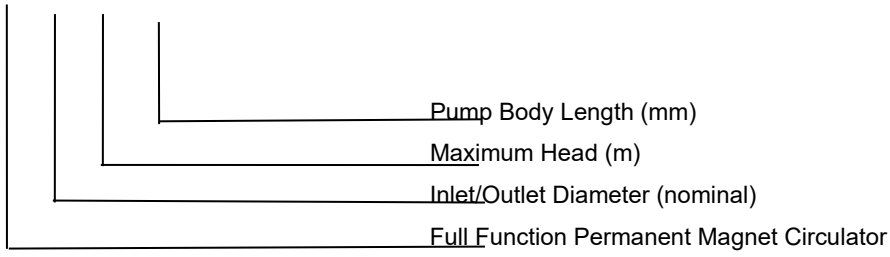
HRA 25 – 6 – 180



1.5 Performance

Table 1: WCD-HRA Series Performance Parameters

Specification Model	Voltage (V)	Max. Power (W)	Max. Flow Rate (L/min)	Max. Head (m)	Protection Grade
WCD-HRA20/4-130	220	25	35	4	IP44
WCD-HRA25/4-130		25	40	4	
WCD-HRA25/4-180		25	40	4	
WCD-HRA32/4-180		25	45	4	
WCD-HRA20/6-130		45	45	6	
WCD-HRA25/6-130		45	50	6	
WCD-HRA25/6-180		45	50	6	
WCD-HRA32/6-180		45	55	6	
WCD-HRA20/7-130		52	50	7	
WCD-HRA25/7-130		52	55	7	
WCD-HRA25/7-180		52	55	7	
WCD-HRA32/7-180		52	60	7	
WCD-HRA25/8-130		65	75	8	
WCD-HRA25/8-180		65	75	8	
WCD-HRA25/10-130		100	85	10	
WCD-HRA25/10-180		100	85	10	
WCD-HRA25/12-130		120	93	12	
WCD-HRA25/12-180		120	93	12	

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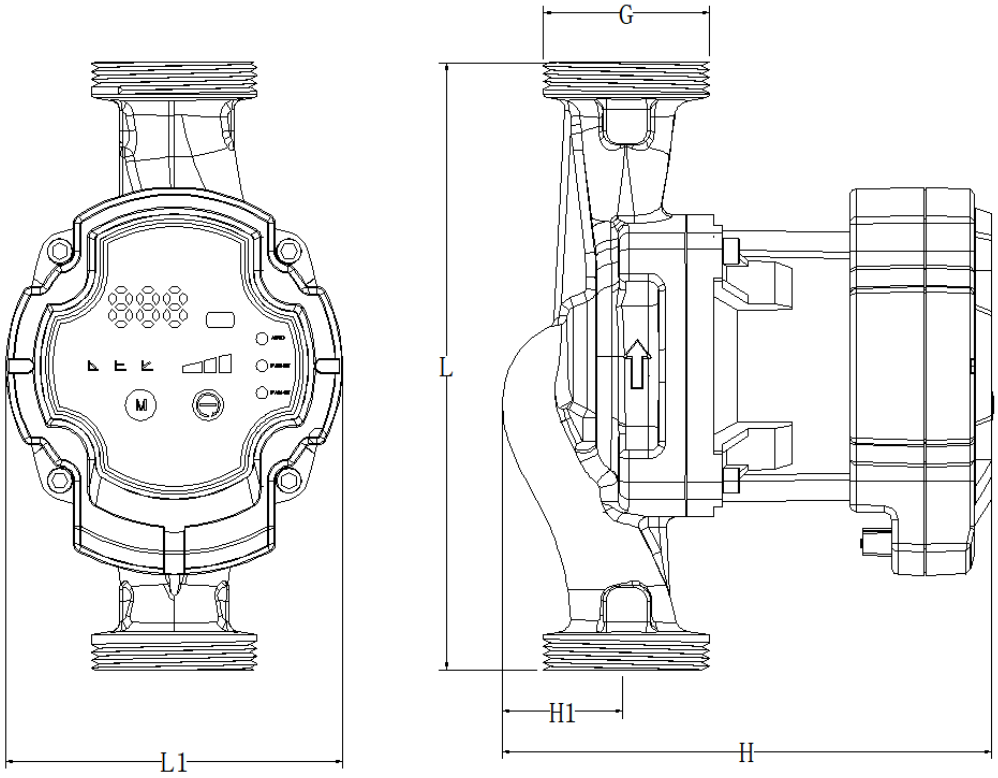
1.6 Installation Dimensions



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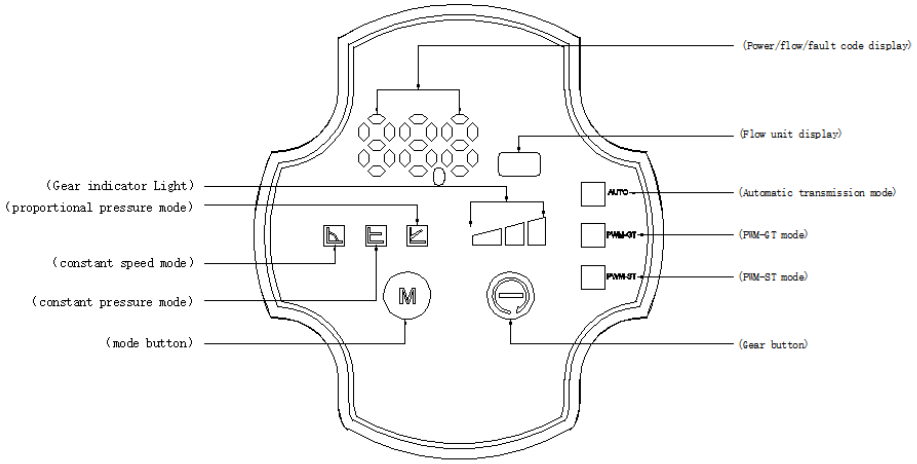
WCD-HRA Series Dimension Table

Specification Model	L(mm)	L1 (mm)	H(mm)	H1(mm)	G(mm)	Adapter Connection
WCD-HRA20/4-130	130	100	145	35.6	G1”	G1”toG3/4”
WCD-HRA25/4-130	130	100	145	35.6	G1.5”	G1.5”toG1”
WCD-HRA25/4-180	180	100	145	35.6	G1.5”	G1.5”toG1”
WCD-HRA32/4-180	180	100	145	35.6	G2”	G2”toG1.2”
WCD-HRA20/6-130	130	100	145	35.6	G1”	G1”toG3/4”
WCD-HRA25/6-130	130	100	145	35.6	G1.5”	G1.5”toG1”
WCD-HRA25/6-180	180	100	145	35.6	G1.5”	G1.5”toG1”
WCD-HRA32/6-180	180	100	145	35.6	G2”	G2”toG1.2”
WCD-HRA20/7-130	130	100	145	35.6	G1”	G1”toG3/4”
WCD-HRA25/7-130	130	100	145	35.6	G1.5”	G1.5”toG1”
WCD-HRA25/7-180	180	100	145	35.6	G1.5”	G1.5”toG1”
WCD-HRA32/7-180	180	100	145	35.6	G2”	G2”toG1.2”
WCD-HRA25/8-130	130	100	165	27.6	G1.5”	G1.5”toG1”
WCD-HRA25/8-180	180	100	167	39.4	G1.5”	G1.5”toG1”
WCD-HRA25/10-130	130	100	165	27.6	G1.5”	G1.5”toG1”
WCD-HRA25/10-180	180	100	167	39.4	G1.5”	G1.5”toG1”
WCD-HRA25/12-130	130	100	165	27.6	G1.5”	G1.5”toG1”
WCD-HRA25/12-180	180	100	167	39.4	G1.5”	G1.5”toG1”

2. Product Settings and Display

2.1 Panel Layout



2.2 Functions of Panel Buttons, Indicators, and Display Lights

	Mode Button	Speed Level Button	Remarks
Short Press & Release	1. In normal operation mode, cycles through CN, CP, PP, AUTO, PWM modes. The original speed level value remains unchanged. 2. In air purge mode, short press to exit air purge mode. 3. In locked rotor recovery mode, short press to exit locked rotor recovery mode. 1.	Keeps the current mode unchanged, cycles through speed levels 1~3.	Effective when no fault is present.
Long Press 2s & Release	Enters head specification viewing state.	Enters or exits flow display state (no power-off memory function).	Effective when no fault is present.
Long Press 3s & Release	Enters air purge mode.	No effect.	Effective when no fault is present.
Long Press 5s & Release	If in locked rotor alarm state, long press for 5s then release to enter locked rotor recovery state; otherwise, no effect.	No effect.	Effective during a locked rotor alarm.

Additional Notes:

If a PWM control signal is currently present, the mode will be locked in PWM mode. Both the gear key and the mode key can be used to switch between PWM-GT and PWM-ST modes.

3. Fault Codes

When a fault occurs, the fault codes are as follows:

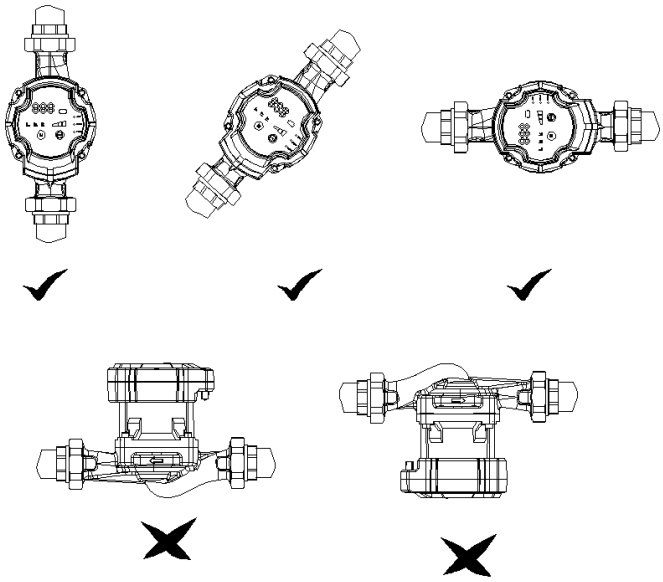
Fault Code	Fault Name
E1	Pump Rotor Locked
E2	Motor Phase Loss
E3	Power Device Over-temperature
E4	Hardware Overcurrent
E5	Software Overcurrent
E6	Pump Dry Running
E7	Irreparable Fault
E10	Startup Failure

Note: Fault recovery time: 15s.

If 10 faults occur continuously within 30 minutes, the pump will not restart; power cycle is required.

4. Installation and Precautions

4.1 Installation



4.2 Precautions

The pump's inlet and outlet are pipe thread connections. Ensure the connecting pipes match the port size and are securely fastened.

During installation, ensure the motor shaft is level with the ground.

The PE (ground) wire of the power socket must be reliably connected.

4.3 Debugging Method

Debugging should be performed after mechanical installation and power wiring are verified as correct.

Before debugging, close the outlet valve and open the inlet valve.

Connect the dedicated power cord to the power socket. The controller panel should display, and the motor should operate.

Open the inlet valve. After the pump runs stably, check if the power displayed on the panel is within the specified maximum power range.

Carefully observe the pump operation for any abnormalities. If any abnormalities are found, please refer

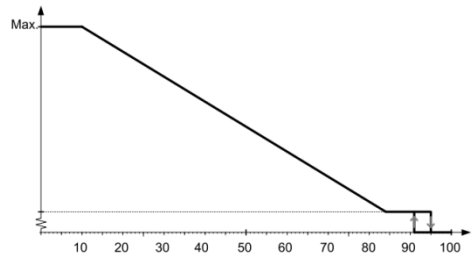
to the diagnostic information in Table 5 to identify the fault and resolve it promptly.

5. PWM Mode Technical Specifications

Signal Connection

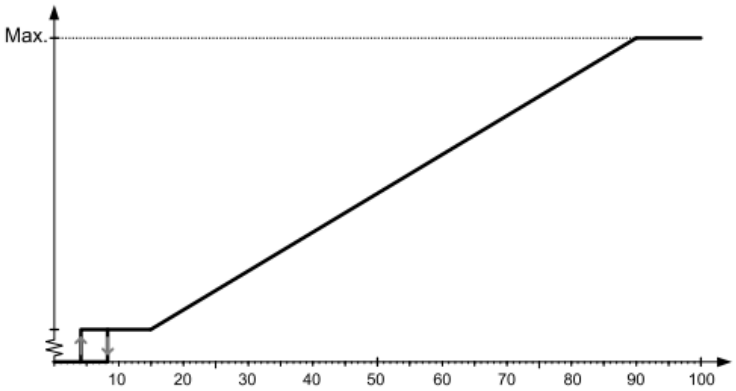
Signal Input Wire (PWM) – Black、Ground Wire (GND) – Brown、Feedback Wire (FG) – Blue

GTPWM Mode (Heating PWM Mode)



PWM Input Signal (%)	Pump State
[0，5]	Pump runs at maximum speed.
[6，85]	Pump speed decreases linearly from maximum to minimum.
[86，88]	Pump runs at minimum speed.
[89，93]	If the input signal fluctuates near the setpoint, hysteresis logic prevents the pump from starting/stopping frequently.
[94，100]	Pump stops and enters standby mode.

STPWM Mode (Solar PWM Mode)



PWM Input Signal (%)	Pump State
[0，7]	Standby, pump stopped.
[8，12]	If the input signal fluctuates near the setpoint, hysteresis logic prevents the pump from starting/stopping frequently.
[13，15]	Pump runs at minimum speed.
[16，95]	Pump speed increases linearly from minimum to maximum.
[96，100]	Pump runs at maximum speed.

FG Feedback

FG Signal (%)	Model	Pump Status
95	All models	Pump standby
90		Locked rotor protection
85		No-water protection, overcurrent protection, phase loss protection
80		Input overvoltage/undervoltage,IPM over-temperature
75		Other faults
0~70	4-7m	Feedback at 0.03 m³/h per 1%
0~70	8m	Feedback at 0.045 m³/h per 1%
0~70	10m	Feedback at 0.05 m³/h per 1%
0~70	12m	Feedback at 0.055 m³/h per 1%

6. Maintenance

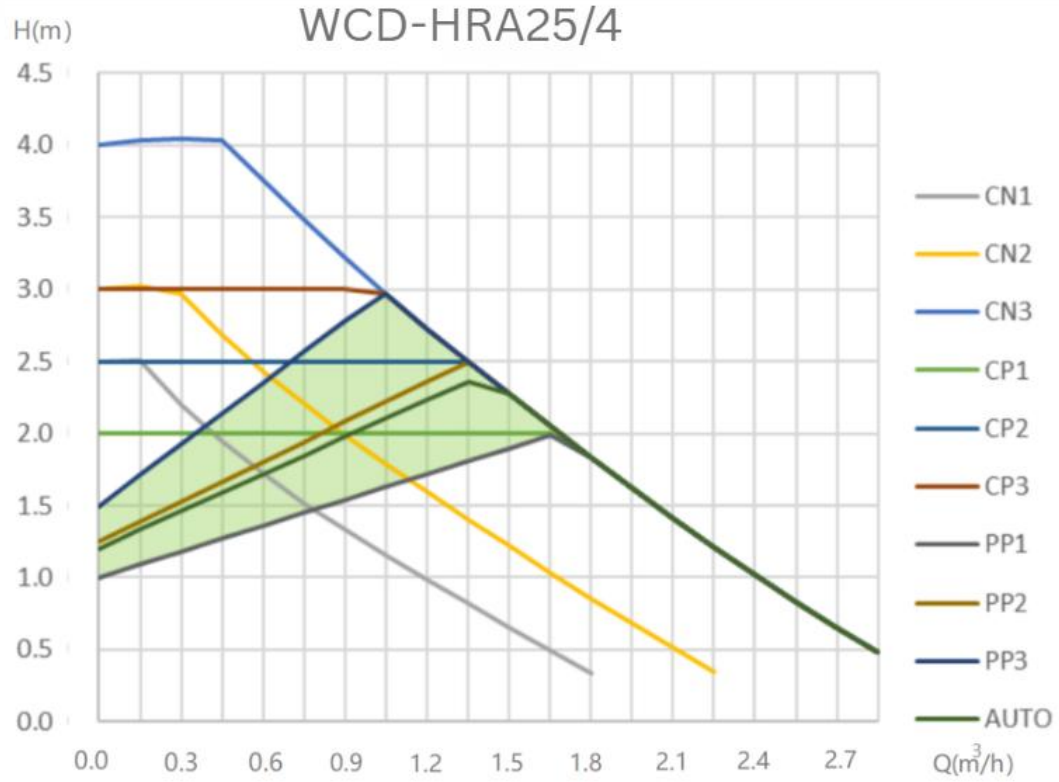
1) Avoid running the pump under dry conditions.

2) When the pump is out of service, close the inlet and outlet valves in sequence, and disconnect the power supply.

3) When putting the pump back into service, open the inlet and outlet valves in sequence, then connect the power.

4) If the pump malfunctions, please have it serviced by qualified personnel.

7. Performance Curves



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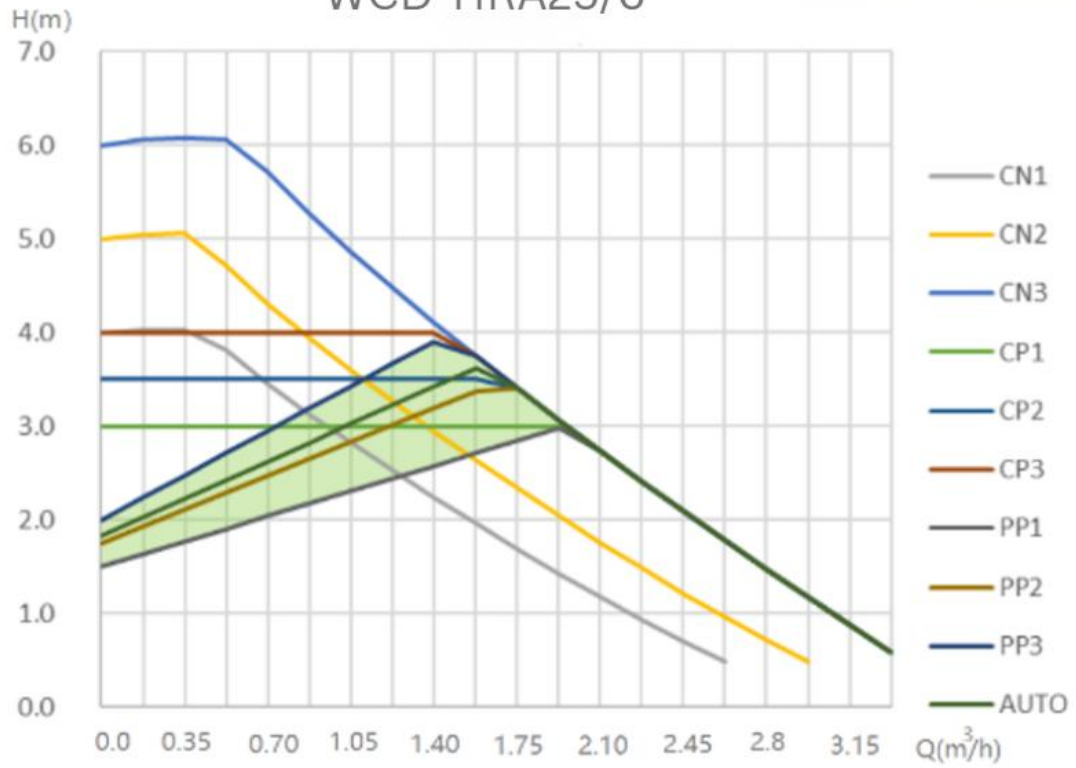

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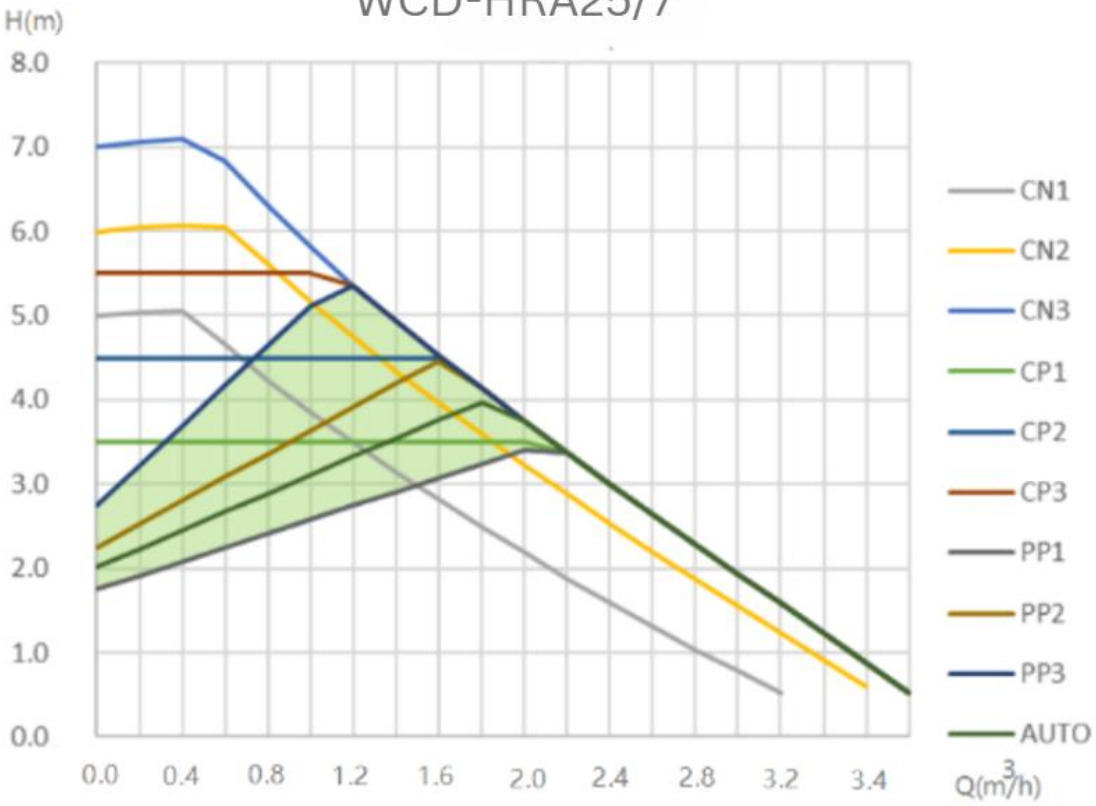

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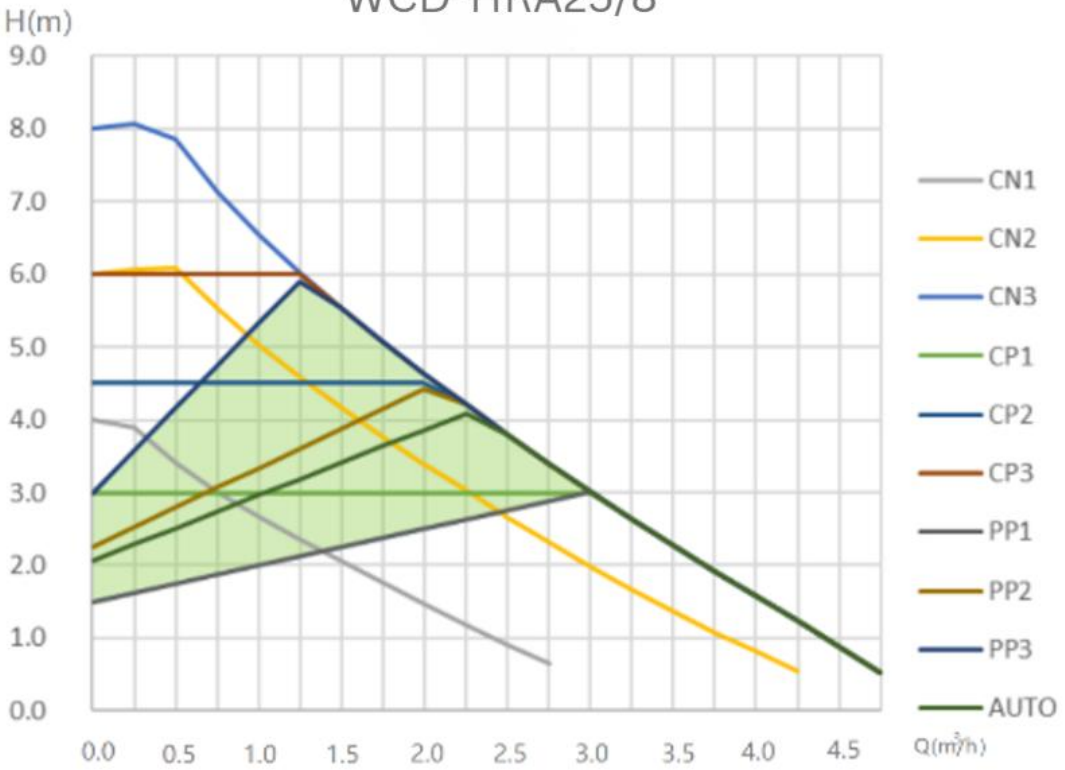

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