

Variable Frequency Circulating pump

User's manual



WMD Company OÜ

Preface

Thank you for using the HR series Variable Frequency Circulating Pump produced by our company.

This manual provides users with relevant precautions for installation and debugging, parameter setting, abnormal diagnosis, troubleshooting, and daily maintenance. In order to ensure correct installation and operation, users are requested to read this user manual carefully before installing the machine and to keep it properly.

Special Remarks:

1. Under no circumstances should you plug or un plug the connecting wires, or attempt to touch the contacts in the socket while the power is on, to prevent electric shock and accidents.
2. Do not connect this machine to 380V AC, otherwise it will cause serious and irreversible damage to the machine!
3. Please use the original power cable of the machine, and ensure that the PE cable of the power supply is reliably connected.
4. Please strictly follow this user manual. Otherwise, the company shall not bear any civil and criminal liability for any equipment or personal injury caused.
5. This machine has no adjusting parts and user-serviceable parts. Please do not try to disassemble the machine for repairs. If the machine fails, please call our company and we will help troubleshoot the problem as soon as possible.
6. Installation in misaligned pipework.
7. Human contact with pump surfaces which might be hot.
8. Hazards or considered hazards from a freeing device.

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1. Product introduction

1.1 Application

This product is an energy-saving circulating pump designed with a shielded structure, driven by a permanent magnet synchronous motor, and variable frequency intelligent control. The benchmark for the most efficient circulators is $EEL \leq 0.23$.

This product is suitable for cyclic pressurization of hot and cold water supply systems below 95°C. It is especially suitable for use in floor heating, wall-mounted heating, and domestic hot water circulation systems that require variable flow.

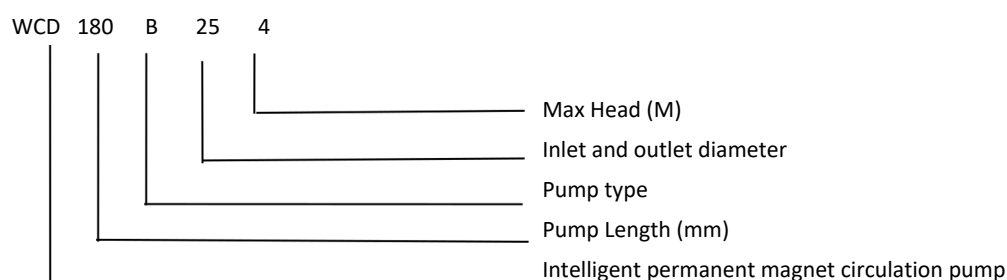
1.2 Features

- 1) Ultra-quiet operation: The rotor is lubricated by the pumped fluid, producing extremely low noise.
- 2) No leakage: The shell is sealed with a gasket and no mechanical seal, which can effectively prevent liquid leakage.
- 3) High temperature resistance: the impeller and motor are made of high temperature resistant materials, which can transport high temperature liquids below 110°C.
- 4) Wear resistance: The motor bearing adopts high temperature wear-resistant ceramic bearing, strong wear-resistant, no maintenance required.
- 5) High efficiency: The motor adopts permanent magnet synchronous motor and variable frequency control, and the impeller adopts centrifugal design, which has high efficiency and significant power saving.
- 6) Long life: the rotor and stator are isolated by stainless steel shielding sleeve, which can be dissipated by the liquid injected into the cavity to slow down the insulation aging and have a long service life.
- 7) Multi-mode: With multiple operating mode options, it can meet the different needs of various applications.
- 8) Intelligent: It can automatically adjust the system flow according to the working mode through variable frequency speed regulation to keep the system in the best operating condition, and provides a variety of message instructions to facilitate user operation.

1.3 Maintenance parameters

- 1) Input power supply: single-phase AC, rated voltage 220V, allowed fluctuations of -40% ~ 20%; Frequency 50HZ/60HZ.
- 2) Working ambient temperature: 0°C ~ 40°C.
- 3) Conveying liquid: clean water or diluted, clean, non-corrosive and non-explosive liquids.
- 4) Conveying liquid temperature: 2°C ~ 95°C (Liquid temperature should be higher than the ambient temperature).
- 5) Maximum system pressure: Not more than 1.0Mpa.

1.4 Model definition



Note: A - Basic type (three fixed speeds), B - Automatic type (3 fixed speeds+AUTO), C - PWM type (3 fixed speeds+AUTO+PWM)

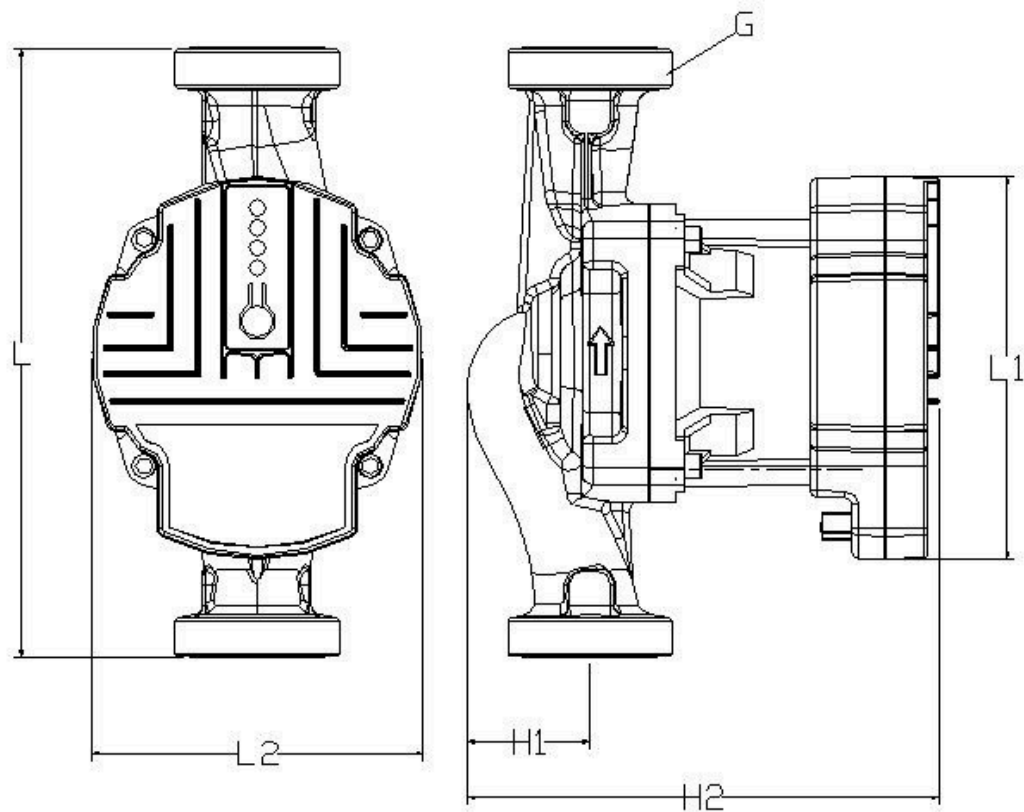
1.5 Performance

Table 1 Performance

Model	Pump Length (mm)	Power (W)	Flow (L/min)	Head (m)
WCD180B-25/4	180	25	40	4
WCD180B-32/4	180	25	45	4
WCD180C-25/4	180	25	40	4
WCD180C-32/4	180	25	45	4
WCD180B-25/6	180	45	50	6
WCD180B-32/6	180	45	55	6
WCD180C-25/6	180	45	50	6
WCD180C-32/6	180	45	55	6
WCD180B-25/7	180	52	55	7
WCD180B-32/7	180	52	60	7
WCD180C-25/7	180	52	55	7
WCD180C-32/7	180	52	60	7
WCD180B-25/8	180	65	75	8
WCD180C-25/8	180	65	75	8
WCD180B-25/10	180	80	85	10
WCD180C-25/10	180	80	85	10
WCD180A-25/12	180	120	93	12
WCD180B-25/12	180	120	93	12
WCD180C-25/12	180	120	93	12

The operational modes include: automatic mode (Auto), fixed three- speed mode(S1, S2, S3)

1.6 Installation dimensions

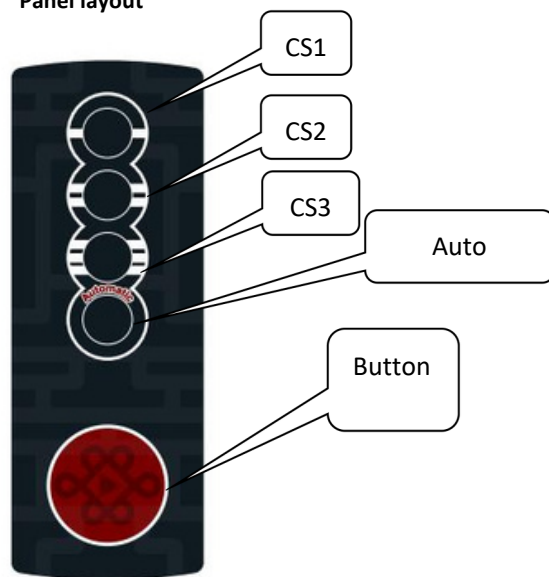


HR series size specifications:

Model	L (mm)	L1 (mm)	L2 (mm)	H1 (mm)	H2 (mm)	G (mm)	Distribution interface
WCD180B-25/4	180	115	100	36.8	141.5	G1.5"	G1.5" to G1"
WCD180B-32/4	180	115	100	36.8	141.5	G2"	G2" to G1.2"
WCD180C-25/4	180	115	100	36.8	141.5	G1.5"	G1.5" to G1"
WCD180C-32/4	180	115	100	36.8	141.5	G2"	G2" to G1.2"
WCD180B-25/6	180	115	100	36.8	141.5	G1.5"	G1.5" to G1"
WCD180B-32/6	180	115	100	36.8	141.5	G2"	G2" to G1.2"
WCD180C-25/6	180	115	100	36.8	141.5	G1.5"	G1.5" to G1"
WCD180C-32/6	180	115	100	36.8	141.5	G2"	G2" to G1.2"
WCD180B-25/7	180	115	100	36.8	141.5	G1.5"	G1.5" to G1"
WCD180B-32/7	180	115	100	36.8	141.5	G2"	G2" to G1.2"
WCD180C-25/7	180	115	100	36.8	141.5	G1.5"	G1.5" to G1"
WCD180C-32/7	180	115	100	36.8	141.5	G2"	G2" to G1.2"
WCD180B-25/8	180	115	100	40	160	G1.5"	G1.5" to G1"
WCD180C-25/8	180	115	100	40	160	G1.5"	G1.5" to G1"
WCD180B-25/10	180	115	100	40	160	G1.5"	G1.5" to G1"
WCD180C-25/10	180	115	100	40	160	G1.5"	G1.5" to G1"
WCD180A-25/12	180	115	100	40	160	G1.5"	G1.5" to G1"
WCD180B-25/12	180	115	100	40	160	G1.5"	G1.5" to G1"
WCD180C-25/12	180	115	100	40	160	G1.5"	G1.5" to G1"

2. Product setup and display

2.1 Panel layout



2.2 Functiondescriptionofpanelbuttons,indicatorsanddisplaylights

1. LEDdefinition

AUTO: Automatic transmission

5M : CS1 , Valve-closed head 5m , full power limit 32W

6M : CS2 , Valve-closed head 6m , full power limit 45W

7M : CS3 , Valve-closed head 7m , full power limit 52W

PWM Mode:

5M+6M+7M Light-on: GTPWM mode

5M+6M+7M interval 1 second flashes : STPWM mode

2. Gearswitchingsequence

CS3 (Default) -> AUTO ->PWM mode->CS1->CS2->CS3.....

3. Buttonoperationmode

Short press, switch to working mode

In PWM mode, long press 3 seconds to switch between GTPWM and STPWM modes.

The above selected working modes all have power-down memory function.

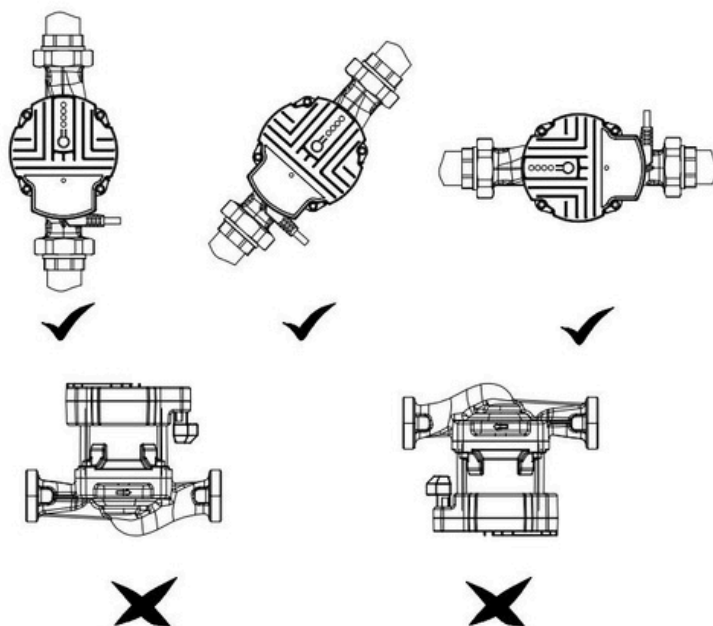
In addition, the PWM mode has the automatic entry function, that is, after receiving the effective PWM signal (Duty>0), no matter what the current working mode is, the system will automatically enter the PWM mode and be remembered; After the PWM signal is removed, it remains in PWM mode and no longer exits automatically.

2.3 Fault code

Fault name	remark	Fault display
Starting Protection	The motor is stalled or lacks phase. The stall lasts for 10 seconds when starting or for 4 seconds when running.	All indicator lights flash once
Phase-lacking Protection	When the motor is powered on and a phase loss occurs, this fault is reported.	All indicator lights flash 2 times
Module overheating	The IPM module is overheated and reports this fault.	All indicator lights flash 3 times
Hardware overcurrent	The motor phase current peak exceeds 2A The motor phase current peak exceeds	All indicator lights flash 4 times
Software overcurrent	0.8A If the waterless operation continues for	All indicator lights flash 5 times
Without water Protection	more than 1 minute, this fault will be reported (except for some gears) The water pump will be detected	All indicator lights flash 6 times
Hardware Fault	immediately after powering on. If this fault occurs, the board must be replaced.	All indicator lights flash 7 times

3. Installation and precautions

3.1 Installation



3.2 Precautions

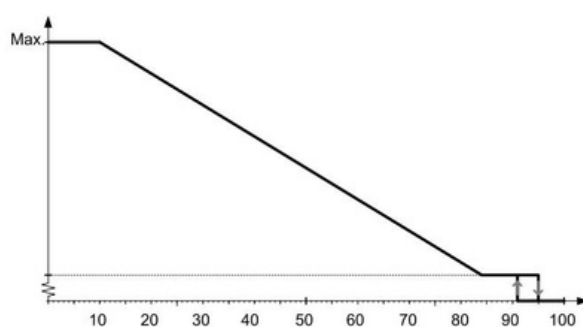
- 1) The inlet and outlet of the pump are pipe threaded connections, and the matching pipes should be consistent with its caliber and firmly connected.
- 2) When installing, the motor shaft must be kept level with the ground plane.
- 3) The power socket's PE cable (ground cable) should be reliably connected.

3.3 Debug method

- 1) The debugging of this machine is carried out after the mechanical installation and power supply layout are checked and correct.
- 2) Before debugging, first close the water outlet valve, then open the water inlet valve.
- 3) Power on through the special power cord of the machine, the controller panel should display and the motor should be running.
- 4) Open the water inlet valve, and after the water pump runs stably, check whether the power displayed on the panel is within the specified maximum power range.
- 5) Carefully observe whether there are any abnormalities in the operation of the machine. If there are any abnormalities, please find the fault according to the diagnostic message content in Table 5 and eliminate it in time.

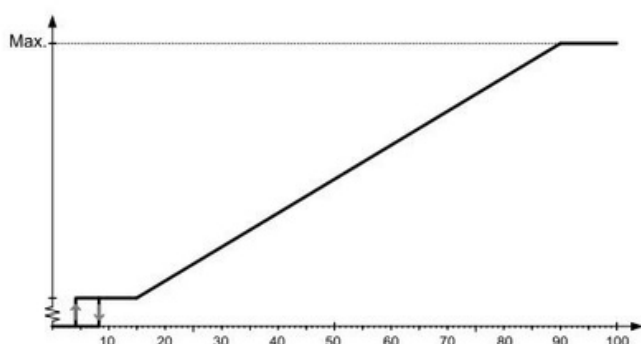
4. PWM mode technical indicators

GTPWM Mode (Heating PWM mode)



PWM Input Signal (%)	Pump Status
[0 , 5]	The pump operates at maximum speed
[6 , 85]	The pump linearly decreases from the highest to the lowest speed
[86 , 88]	The pump operates at minimum speed
[89 , 93]	If the input signal fluctuates near the speed change point, the pump will be prevented from starting and stopping based on the hysteresis principle
[94 , 100]	The pump stops operating and enters standby mode

STPWM (Solar PWM Mode)



PWM Input Signal (%)	Pump Status
[0 , 7]	Standby, the pump stops operating
[8 , 12]	If the input signal fluctuates near the speed change point, the pump will be prevented from starting and stopping based on the hysteresis principle
[13 , 15]	The pump operates at minimum speed
[16 , 95]	The pump increases linearly from the lowest to the highest speed
[96 , 100]	The pump operates at maximum speed

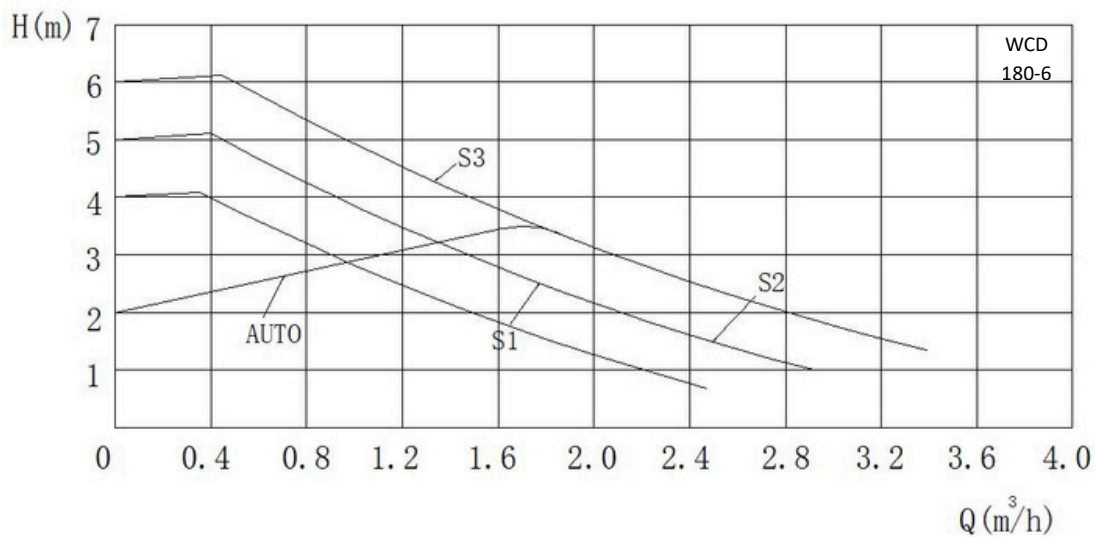
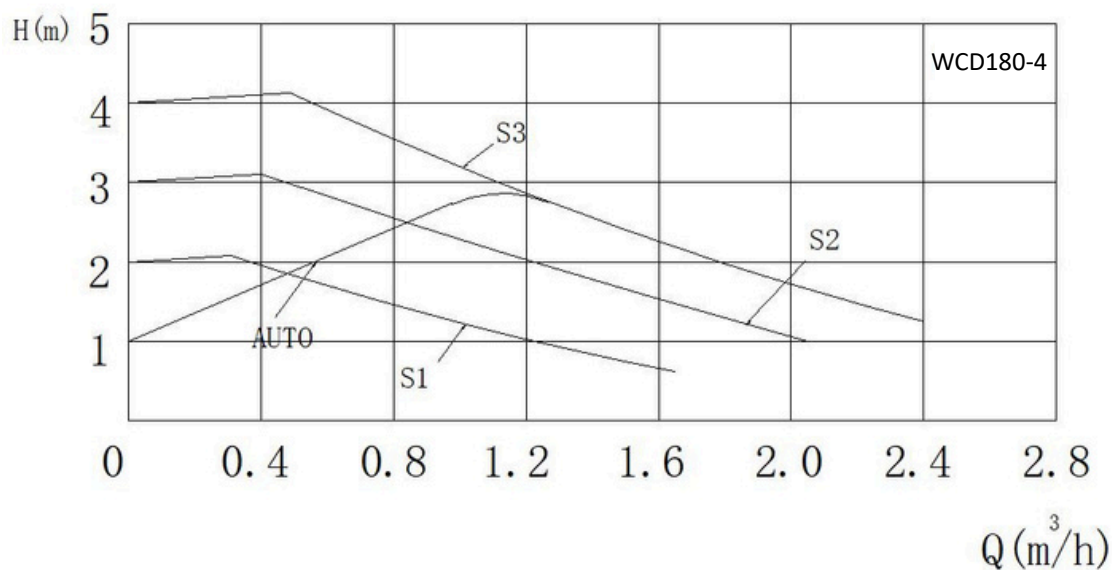
FG Feedback

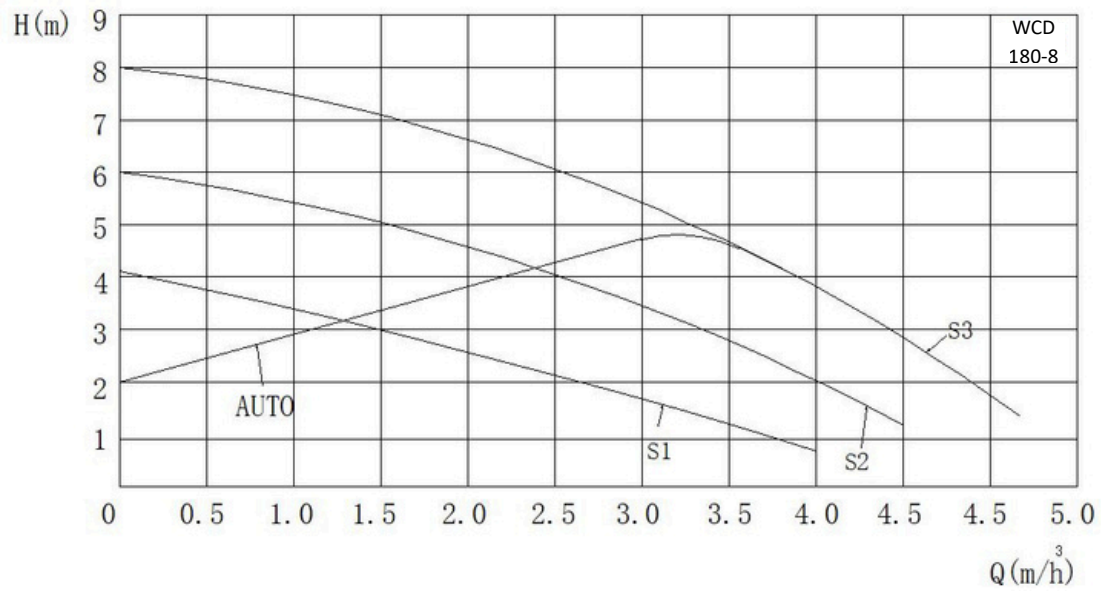
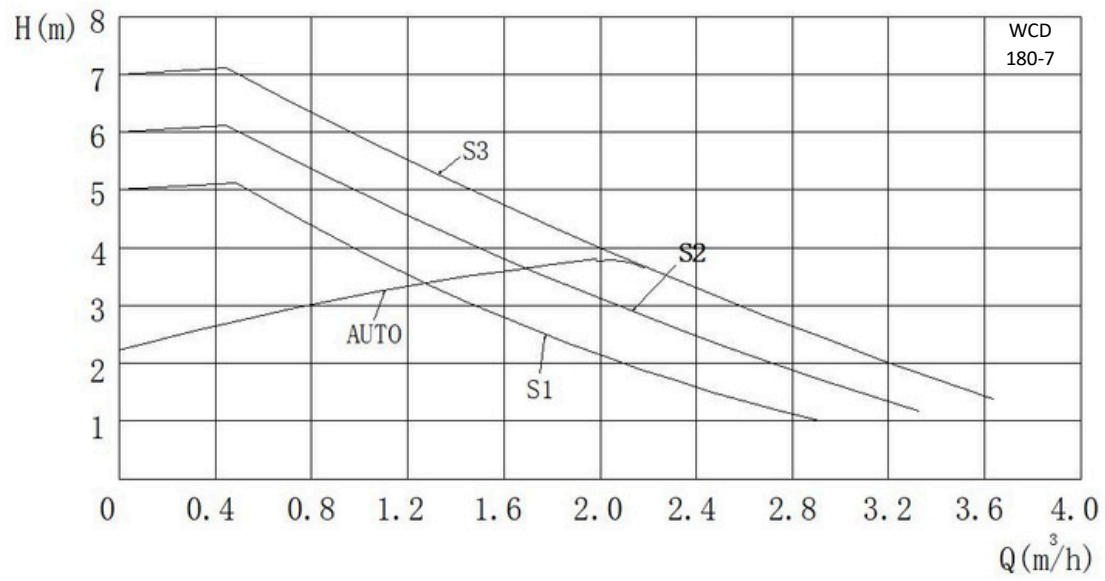
FG Signal (%)	Pump Status
95	Pump Standby Status
90	Locked-rotor protection
85	Waterless operation protection, over current protection, open-phase protection
80	The input voltage is too high or too low, or the IPM temperature is too high
75	Other errors
0~70	Feedback based on 0.03m ³ /h per 1%

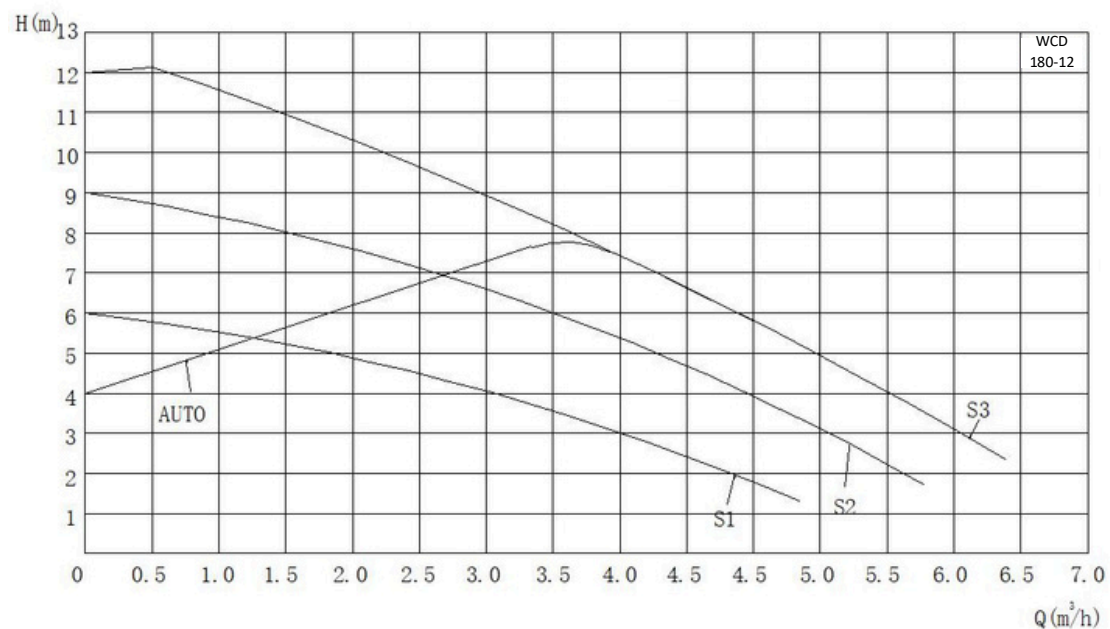
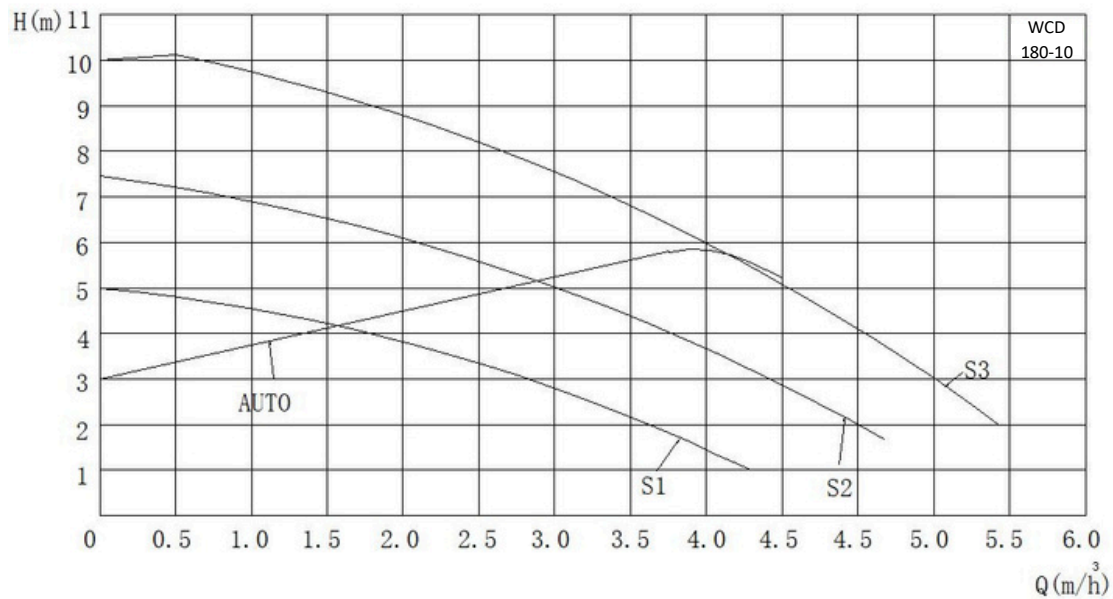
5. Maintenance

- 1) Avoid running the pump without water.
- 2) When the machine is out of service, the inlet and outlet valves should be closed in order and the power supply should be cut off.
- 3) After the machine is out of service and then resumed use, the inlet and outlet valves should be opened in order, and then powered on.
- 4) If the machine fails, please ask for professional maintenance.

6. Running parameter curve







WESTON
CLIMATE



WMD Company OÜ
Vabaduse pst 174b, Nõmme, Tallinn, 10917, Eesti (Manta maja)
E – R 9:00 – 17:00
+372 5568 9584

info@westonclimate.com
www.westonclimate.com