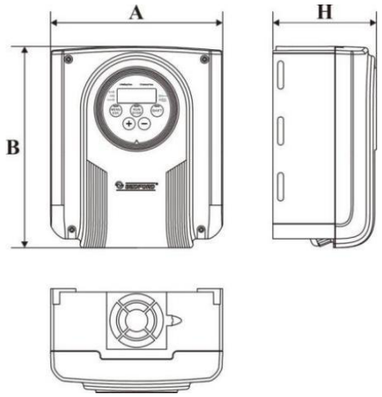
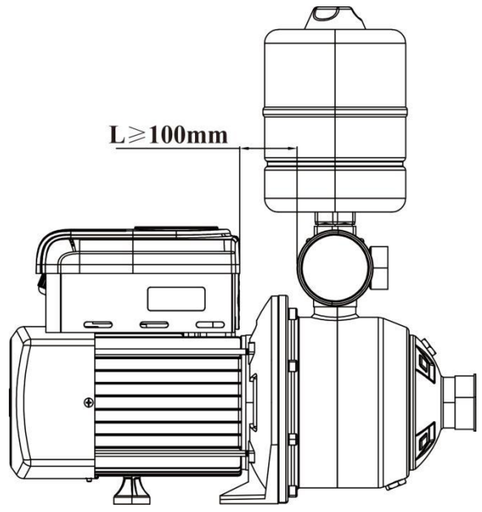
W191 Series Intelligent Controller for Water Pump Simple Manual

■ Dimension Model and Specification

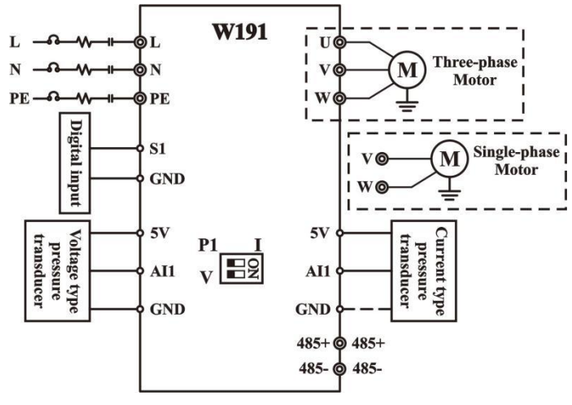


Model	Rated Output Current (A)	Motor Power (kW)	External Dimension		
			A(mm)	B(mm)	H(mm)
Input: AC 1PH 220V, Output: AC 3PH 0~220V					
W191-2003	10.0	2.2	154	180	92

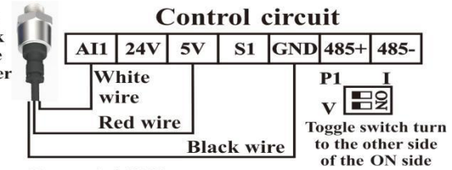
■ Recommended Installation Distance for Horizontal Pump



■ Wiring

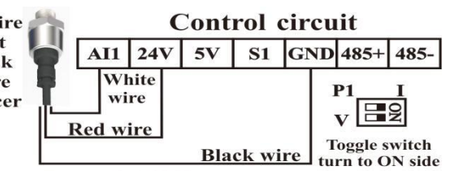


Voltage feedback pressure transducer



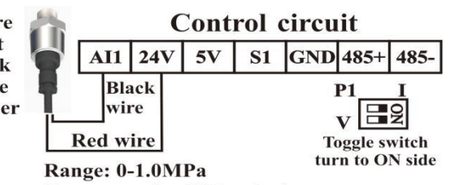
Range: 0-1.0MPa
Power supply: 5V, red wire, connected terminal 5V
Output: 0.5V~4.5V, white wire, connected to terminal AI1
Ground: black wire, connected to terminal GND

Three-wire current feedback pressure transducer



Range: 0-1.0MPa
Power supply: 24V, red wire, connected terminal 24V
Output: 4mA~20mA, white wire, connected terminal AI1
Ground: black wire, connected termina GND

Two-wire current feedback pressure transducer

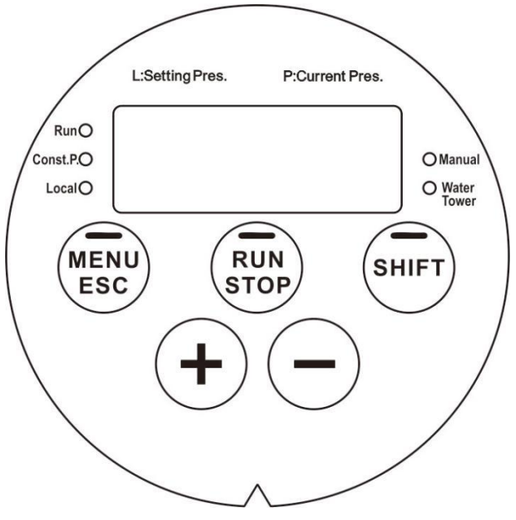


Range: 0-1.0MPa
Power supply: 24V, red wire, connected terminal 24V
Output: 4mA~20mA, black wire, AI1 connected terminal AI1

Main circuit terminal's function as following:

Terminal Symbol	Function Description
L, N	Terminals of single phase AC input
U, V, W	Terminals of 3 phase AC output (Three-phase Motor wiring terminal)
V, W	Terminals of 1 phase AC output (Single-phase Motor wiring terminal)
PE	Terminals of ground

■ Keypad Description



Key function description:

Button Symbol	Name	Function Description
MENU ESC	Menu/Escape Key	Enter the first-level menu or exit all menus. Pressing more than 2 second can change the status display to the parameter setting mode.
RUN STOP	RUN Key/STOP Key/Fault Reset Key	Run or Stop or Data Validation or Failure Rest Key.
SHIFT	Shift Key	In running or standby mode, press this button to select the parameters to cyclically display. In parameter setting mode, select the bit to be modified
+	UP Increment Key	Digital modification key, used to set the pressure value, parameter modification; At the primary interface, Pressing more than 2 second + or − key to increase or decrease the pressure value.
−	DOWN Decrement Key	
MENU ESC + SHIFT	Combination Key	In the stop state, press the MENU ESC and SHIFT key at the same time in the primary display interface to realize the manual/automatic switchover.

The display interface prefix alphabet meaning
H: Operating frequency (or giver frequency)
L: The setting pressure of pump outlet
P: The actual pressure of pump outlet

3.0 - 0.0 : The setting pressure of pump outlet and the actual pressure of pump outlet

A: Output current
d: DC-link voltage

Parameter Setting:

Three levels of menu are: 1. Function code group (first-level); 2. Function code (second-level); 3. Function code setting value (third-level)

(1) At the primary interface, press SHIFT will switch over display running/stop status monitoring parameters;

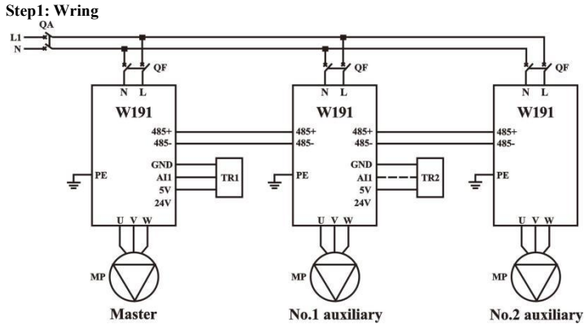
(2) At the primary interface, long press MENU ESC will enter the first-level menu then short press MENU ESC will return to the primary interface;

(3) At the first-level menu, press RUN STOP will enter the second-level menu. In second-level, press RUN STOP will enter the third-level menu, while press MENU ESC will return to the first-level menu;

(4) At the third-level menu, press MENU ESC or RUN STOP can return to the second-level menu, difference is: pressing RUN STOP will save the parameters into the controller and return to the second-level menu with shifting to the next function code automatically; while pressing MENU ESC will directly return to the second-level menu without saving the parameters, and keep staying at the current function code.

■ Quick Debug of Parameter Setting

Step1: Wring



Note:

◆The transducer used company's three-wire voltage style transducer. If the current style transducer is used, please refer to the wiring diagram on the front of the figure for the wiring method.

◆According to the transducer feedback type, put the toggle switch P1 to ON side (current type signal), or other side (voltage type signal).

◆Control 2 auxiliaries at most, up to 3 pump linkage work.

◆Connect the control terminal using a multi-core shielded cable or twisted pair cable. When using a shielded cable (by one end of the controller), it should be connected to the ground terminal PE of the controller.

◆When routing, the control cable should be more than 20cm away from the main circuit and strong current line (including power cord, motor line, relay, contactor connection line, etc.), and avoid parallel placement. Vertical wiring is recommended to prevent external interference from causing misoperation of the controller.

Step2: Modify b00.32~b00.38 parameters according to motor nameplate parameters

b00.32: Phase Selection, b00.32=0 (three-phase motor), b00.32=1 (single phase motor)

b00.33: Motor Model, b00.33=0 (user-defined), b00.33=1 (0.55kW), b00.33=2 (0.75kW), b00.33=3 (1.1kW), b00.33=4 (1.5kW), b00.33=5 (2.2kW)

b00.34: Rated power of motor (cannot exceed the power labeled on controller nameplate)

b00.35: Rated frequency of motor (Normally 50Hz/60Hz)

b00.36: Rated RPM of motor

b00.37: Rated Voltage of motor

b00.38: Rated current of motor (Cannot exceed the output current labeled on controller nameplate)

Step3: Confirmation of the pump operating direction

A short trial run to see if the pump's running rotation is correctly. The pump steering can be changed in the following two ways:

(1) Power off controller until its LED display extinguish, switch over any two output wires of U, V, W

(2) Stop inverter, modify parameter b00.03

Step4: Setting operational mode

b00.01: Set this parameter based on the required operational mode. b00.01=0 (Up-stream pressure boosting), b00.01=1 (Down-stream pressure boosting), b00.01=2 (Water tower supplement), b00.01=3 (Manual), b00.01=4 (Air Blower)

Step5: Pressure transducer range setting

(1) When not connected to the transducer, set b00.13 to 0.0

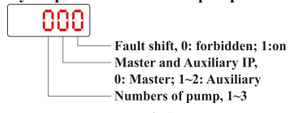
(2) Set b00.12 parameter according to the maximum range labeled on pressure transducer, when the transducer is rated as the maximum range of 16.0 bar, b00.12 set to 16.0

Step6: Correct displayed pressure value

b00.15: When display pressure smaller than the actual, increase this parameter value; when display pressure greater than the actual, decrease this parameter value.

Step7: Multi-pumps quick setting

b00.39: Can quickly set parameters of multi-pumps



For example, when set parameters of three pump, master b00.39=301, No.1 auxiliary b00.39=311, No.2 auxiliary b00.39=320

■ Running Fault and Trouble Shooting

Fault Code	Fault Type	Reason	Solution
LP	Low Water Pressure	1.Abnormal transducer; 2.Motor rotates in the reverse direction; 3.Insufficient water inflow; 4.There is air inside the pump	●Check the installation of pressure transducer; ●Check the motor's direction of rotation is correct or not; ●Check the parameter b00.09 (setting value too big); ●Check the pump whether is vent out the air inside
HP	High Water Pressure	1.Abnormal transducer; 2.The parameter b00.08 setting value is too small	●Check the installation of pressure transducer; ●Check the parameter b00.08 (setting value too small)
LL	Low Water Level	1.Water level of pool is too low; 2.Abnormal water level switch; 3.Wrong setting of water level switch style parameter	●Check the water system; ●Check the situation of the control terminal S1; ●Check the parameter b00.21
E022	AI1 Transducer Fault	1.Pressure transducer disconnected; 2.Wrong pressure transducer wiring; 3.Pressure transducer short circuit; 4.Pressure transducer break down	●Check the cable between pressure transducer and controller; ●Check the transducer whether is normal
E001	Controller unit fault	1.Acc/Dec time is too short; 2.IGBT module fault; 3.Malfunction caused by interference; 4.Grounding is not properly	●Increase Acc/Dec time; ●Check external equipments and eliminate interference; ●Ask supplier for support
E002	Over-current	1.Acc/Dec time is too short; 2.Low input voltage; 3.There are impurities in the pump; 4.Pump blocked	●Increase Acc/Dec time; ●Check the power supply; ●Check water quality and water intake environment ; ●Check motor and pump
E006	Over-voltage	1.High input voltage; 2.Dec time is too short; 3.Load is too heavy; 4.Regenerative energy from the motor is too large	●Check the power supply; ●Increase Dec. time; ●Increase braking unit; ●Avoid to restart the motor until it stop running completely
E009	DC Bus Under-voltage	1.Low input voltage	●Check the grid's input power supply
E010	Controller Overload	1.Acceleration time is too short; 2.Low input voltage; 3.Restart the motor when it does not stop totally; 4.Load is too heavy	●Increase acceleration time; ●Check the power supply; ●Avoid restarting during shutdown; ●Select proper capacity motor
E011	Motor Overload	1.Low input voltage; 2.Wrong setting of motor parameter; 3.Motor blocked or something stick in the pump; 4.Load is too heavy	●Check the power supply; ●Reset the rated current of motor; ●Check motor; ●Select proper capacity motor
E013	Output Phase Failure	1.Open-phase occurred at U,V,W output side (or there is asymmetric of load three phase)	●Check the output wiring; ●Check the motor and cable
E014	IGBT Overheat	1.Cooling fans of controller blocked or damaged; 2.Ambient temperature is too high; 3.Control board is abnormal	●Clear air duct or replace cooling fans; ●Decrease the ambient temperature; ●Ask supplier for support
E018	Current Detection Fault	1.Abnormal current detection circuit;	●Ask supplier for service
E021	EEPROM Fault	1.Error occurred in the read-write of control parameters; 2.EEPROM damaged	●Press RUN STOP button to reset; ●Ask supplier for service

■ Instructions of Parameters Group

Function Code	Name	Setting Range	Factory Setting	Description
br-00 Group				
b00.00	Debugging Password	0~65535	65535	Set by b00.45, b00.00 password is invalid when b00.45 is set to 0, b00.00 password is valid when b00.45 is set to non-0
b00.01	Operational Mode	0~4	0	0: Up-stream pressure boosting ("Const.P." indicator light is on); 1: Down-stream pressure boosting ("Const.P." indicator light is flashing); 2: Water tower supplement ("Water Tower" indicator light is on); 3: Manual ("Manual" indicator light is on) 4: Air Blower ("Manual" indicator light is flashing)
b00.02	Pressure Setting	b00.09~ b00.08-1.0	3.0bar	Set according to the actual requirements of user (Invalid in manual/air blower mode)
b00.03	Motor Rotating Direction	0~1	0	0: Forward; 1: Reverse
b00.04	Water Tower Water Interval	0.1~12.0	6.0h	At intervals, start the water pump to replenish water to the water tower
b00.05	Manual Frequency Setting	b00.26~ b00.25	50.00Hz	Pump operating frequency (Valid only in manual/air blower mode)
b00.06	Manual Operation Time Limit	0.0~24.0	0.5h	If the manual mode starts longer than this time, the controller will stop. b00.06=0.0, the system runs continuously after startup. S1 Terminal Control Run, the system runs continuously after startup.
b00.07	Restart After Power-on	0~1	1	0: Invalid; 1: Valid
b00.08	High Water Pressure Alarm Value	b00.02+1.0~ b00.12	7.5bar	When pressure is higher than this preset value, the controller halts, alarms and displays "HP".
b00.09	Low Water Pressure Alarm Value	0.0~b00.02	0.5bar 0.2bar 0.5bar 0.5bar 0.5bar	When pressure is lower than the preset value for a low pressure running time, the controller halts, alarms and displays "LP".
b00.10	Low Pressure Running Time	0.0~900.0	120.0s	
b00.11	Low Pressure (LP) Restart Delay Time	0~1440	10min	When there is displays "LP" Error, b00.11≠0, the controller restarts to work according to the setting time automatically. b00.11=0, restart invalid. Retry three times within 20 minutes to automatically cancel the "LP" and then report "LP" will not automatically reset the "LP" fault reboot
b00.12	Maximum Transducer Setting Range	0.0~50.0	10.0bar	E.g. If the rated max. range of transducer is 16.0bar, b00.12 should be set to 16.0
b00.13	AI1 Feedback Lost Detecting Value	0.00~1.00	0.35	Transducer fault detecting setting value, corresponding to full range (1.00), when the detecting time exceeds feedback lost time, it is deemed as malfunction by transducer, the system will report "E022" as transducer fault code.
b00.14	Feedback Lost Detecting time	0.0~3600.0	2.0s	
b00.15	Feedback Deviation Correction	-0.9~0.9	0.0bar	Use to accordant display and transducer pressure: When display pressure smaller than the actual, increase this parameter value; when display pressure greater than the actual, decrease this parameter value.
b00.16	Sleeping Function	0~1	1	No consuming auto stop. 0: Invalid; 1: Valid.
b00.17	Sleeping Detection Coefficient	0.5~20.0	6.0	If it is difficult to sleep, please decrease the setting value.
b00.18	Sleep Detection Cycle	10.0~3600.0	20.0s	
b00.19	Wake-up Pressure Bias	0.0~b00.02	0.3bar	During sleeping the wake-up pressure bias, e.g. the setting value (L)=3.0bar, Bias (b00.19)=0.3bar, practical pressure (P)<L-0.3=2.7bar, the pump will restart again.
b00.20	Sleeping Bias	0.00~0.30	0.12bar	The pressure fluctuation which allows sleeping
b00.21	S1 Terminal Control	0~3	2	b00.21=0: Invalid b00.21=1: Start-stop, S1-GND on: Run, S1-GND off: Stop b00.21=2: Water Level Control (NC) b00.21=3: Water Level Control (NO)
b00.22	Low Lever Restart Delay	0.0~1440.0	0.5min	Delay time of restart after water level switch recover. Direct reset fault without

Function Code	Name	Setting Range	Factory Setting	Description
	Time			delay when b00.22=0.0
b00.23	Acceleration Time	0.5~60.0	5.0s 5.0s 5.0s 5.0s 10.0s	The setting time from zero to max. frequency
b00.24	Deceleration Time	0.5~60.0	5.0s 5.0s 5.0s 5.0s 10.0s	The setting time from max. frequency to zero
b00.25	Up limit of Output Frequency	b00.26~ 60.00	50.00Hz	Maximum running frequency
b00.26	Lower Limit of Output Frequency	10.00~ b00.25	20.00Hz	The minimum running frequency of pump
b00.27	Carrier Frequency	4.0~16.0	16.0kHz	Use to ameliorate the noise of motor and controller's interference to the surroundings. A high carrier makes a low motor noise, but leads to a big temperature rise and interference. Should not be altered if unnecessary.
b00.28	Software Version			
b00.29	Restore Defaults	0~2	0	0: No action 1: Set to default 2: Clear error records
b00.30	Proportional Gain (KP)	0.0~1000.0	50.0	Determining the strength of PID regulation, KP is bigger, regulation is stronger, but fluctuate easier too.
b00.31	Integral Coefficient (KI)	0.00~200.00	2.00	Bias between the feedback and the given, determining the speed of regulation, KI is bigger, regulation is stronger.
b00.32	Phase Selection	0~1	0	0: Three-phase motor 1: Single phase motor
b00.33	Motor Model	0~5	5	0: User-defined; 1: 0.55kW; 2: 0.75kW; 3: 1.1kW; 4: 1.5kW; 5: 2.2kW
b00.34	Motor Rated Power	0.3~2.2	2.2kW	Depend on model, setting parameters according to nameplate of motor
b00.35	Motor Rated Power	50.00~60.00	50.00Hz	
b00.36	Motor Rated Speed	960~3600	2900rpm	
b00.37	Motor Rated Voltage	100~250	220V	
b00.38	Motor Rated Current	0.01~13.00	10.00A	
b00.39	Quick debugging setting	0x100~ 0x320	0x100	000 Fault shift, 0: forbidden; 1:on Master and Auxiliary IP, 0: Master; 1~2: Auxiliary Numbers of pump, 1~3
b00.40	Alternating Time	0.00~300.00	8.00h	In order to balance and prolong the pump service life to set the parameter, the unit is hour. 0.00 H is not alternate. The master and the auxiliary pumps take turns to act as the host machine according to the set time.
b00.41	Alternating Mode	0~1	0	0: Alternate according to alternating time or sleeping wake-up 1: Only alternate according to alternating time
b00.42	Minimum Freeze-proofing Frequency	10.00~ b00.26	10.00Hz	Be valid when b00.43 was set to 2, whenever sleep, running with the setting frequency in case of freezing. This value should be lower than the lower limited frequency (b00.026).
b00.43	Below Lower Limit Frequency Run Selection	0~2	1	0: Main pump running at lower frequency limit 1: Sleeping 2: Run at Freeze-proofing frequency
b00.44	Output phase Protection Selection	0~1	1	0: Invalid; 1: Valid Automatically update to 0 after setting to single phase motor (b00.32=1)
b00.45	Set the Password of b00.00	0~65535	65535	b00.00 password is invalid when b00.45 is set to 0, b00.00 password is valid when b00.45 is set to non-0
br-01 Group				
b01.00	Latest Fault Type		read only	For details about the fault type, see common operating faults and handling measures
b01.01	Second Latest Fault Type			
b01.02	Third Latest Fault Type			
b01.03	Fourth Latest Fault Type			
b01.04	Fifth Latest Fault Type			
b01.05	Output Frequency at Current Fault	0.00Hz~ 655.35Hz		
b01.06	Output Current at Current Fault	0.00A~ 655.35A		
b01.07	DC bus Voltage at Current Fault	0.0V~ 6553.5V		
b01.08	Output Frequency at Second Latest Fault	0.00Hz~ 655.35Hz		
b01.09	Output Current at Second Latest Fault	0.00A~ 655.35A		
b01.10	DC bus Voltage at Second Latest Fault	0.0V~ 6553.5V		
b01.11	Output Frequency at Third Latest Fault	0.00Hz~ 655.35Hz		
b01.12	Output Current at Third Latest Fault	0.00A~ 655.35A		
b01.13	DC bus Voltage at Third Latest Fault	0.0V~ 6553.5V		
b01.14	Output Frequency at Fourth Latest Fault	0.00Hz~ 655.35Hz		
b01.15	Output Current at Fourth Latest Fault	0.00A~ 655.35A		
b01.16	DC bus Voltage at Fourth Latest Fault	0.0V~ 6553.5V		
b01.17	Output Frequency at Fifth Latest Fault	0.00Hz~ 655.35Hz		
b01.18	Output Current at Fifth Latest Fault	0.00A~ 655.35A		
b01.19	DC bus Voltage at Fifth Latest Fault	0.0V~ 6553.5V		

Attention: Function code b00.12, b00.32~b00.38 won't restore the default setting even if resetting.