DRAKOS-POLEMIS DP PUMPS

Submersible Pump Protection Controller

BH2098（S）

Catalogue

1. The product outline

The BH2098（S）type water pump protection controller is to be exclusively used for monitoring large water pump electric motor to round set, electric motor bearings temperature and electrical engineering, oil room, connect whether line box enter aqueous a sow in a line monitor.

The instrument is buried in the water pump motor thermal resistance sensor (PT100) to measure the motor winding and bearing current temperature. In addition, through the oil chamber electrodes buried in the water pump motor, the motor inlet switch and junction box water switch, oil chamber and motor terminal box whether water.

The instrument has following characteristics:
- Goo accuracy actually measure temperature, and amount of switch...etc.8 parameters
- The limit alarm temperature and other parameters, the more limited tripping
- Adopting latest model function is stronger, integration degree higher inner part control the chip is to control core
- Full-speed, non-intrusive online system debug interface
- Programmable enactment function
- RS485 network connection, support ModBus Statute
- Indicator work status: the more limited alarm, the more limited tripping, the power indicator

Instrument examination water pumps current status, and gives the corresponding alarm and trip signals indicating the switch output. Alarm and tripping signal output delay 0-10 seconds adjustable. Product Support RS485 serial interface, ModBus protocol. The temperature value can correct on the scene with and revise, correct temperature coefficient 0-2.55 adjustable, revise scope ± 7 ℃ .

Instrument using standard ModBus communication protocol, is widely used as a standard for system integration. With the international famous brand programmable sequence controller (PLC) or a third party has the effective transfer of information and data between ModBus compatible monitoring system.

The instrument has trouble holding function, pump total running time statistics and fault recording and retrieval function.

BH2098(S) products provide a very effective means of monitoring for the protection of the safe and reliable operation of submersible pumps to prevent the submersible pump damage triggered the machine ruined discontinued accident.

2. Main technique characteristic

Measure scope: 0 ℃ ~200 ℃

Measure accuracy: ±1 ℃

Use environment: Temperature:-20 ℃ ~60 ℃ degree of humidifies:≤ 95% Rhys

Storage environment: Temperature:-30 ℃ ~90 ℃ degree of humidifies:≤ 95% Rhys

Working power: AC220V

Shape size: 120 ×s 120 ×s 80(mm)

Opening: 112 ×s 112(mm) Embedded installation

Output contact: AC220V/5A (Alarm output is a normally open or a normally closed; the tripping output a normally open or a normally closed)

Communication interface: RS485 serial interface, ModBus protocol, communication baud rate 9600

3. Control logic

1, Current temperature value is less than 0, corresponding to the LCD display "<0 ° C".

2, The current temperature value is greater than the set alarm temperature, the alarm relay suck, alarm lights, to enter the alarm recovery, since only the current temperature is below the set alarm temperature minus 2 degrees, alarm lighting-off, the alarm relay to release.

3, The current temperature value is greater than the set trip temperature value, the tripping lamp light, trip relay pull into the trip the recovery period, after which only the current temperature value lower than that set back the difference, the tripping lamp is off, tripping relay released.

4, Be some all the way PT100 hot electric resistance when arbitrarily a line open a new road(break line) the road is bright towards shielding show "*** ℃", warning light on the LCD screen, the warning absorbs to match after the electric appliances. When PT100 hot electric resistance 2 with 3, 5 with 6, 8 with 9, 11 with 12, 17 with 18 carry contact bad or PT100 hot the electric resistance damage, will appear a don't be worth as usual or temperature jump about anomaly, therefore have to promise PT100 hot the electric resistance connect line to carry to get in touch with good.

5, When the user without detecting the motor a phase or B phase or C phase (three windings) or the Upper bearing or Down bearing of the temperature value can be short-circuited ends of the thermal resistance of the road.

● The above applies to the motor A-phase, B-phase, C-phase (three windings), the Upper bearing, and the Down bearing of the temperature value monitoring.

6, When the motor oil chamber water, alarm lights, alarm relay is energized.

7, When water when the motor water or junction box, alarm lights, alarm relay is energized, the trip lights, tripping relay is energized.

4. The front-panel indicates and key function
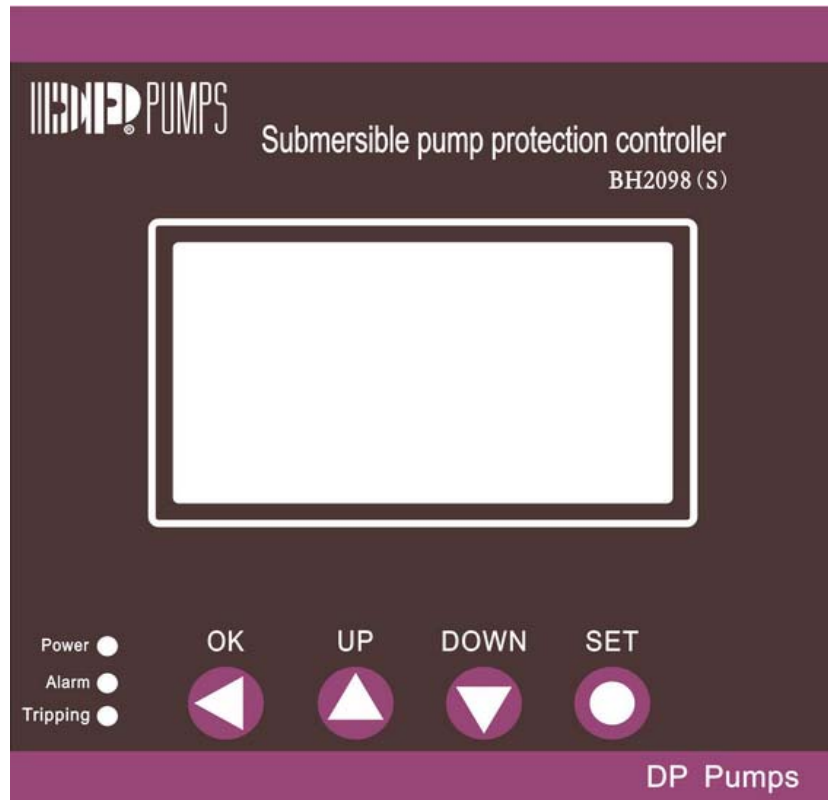
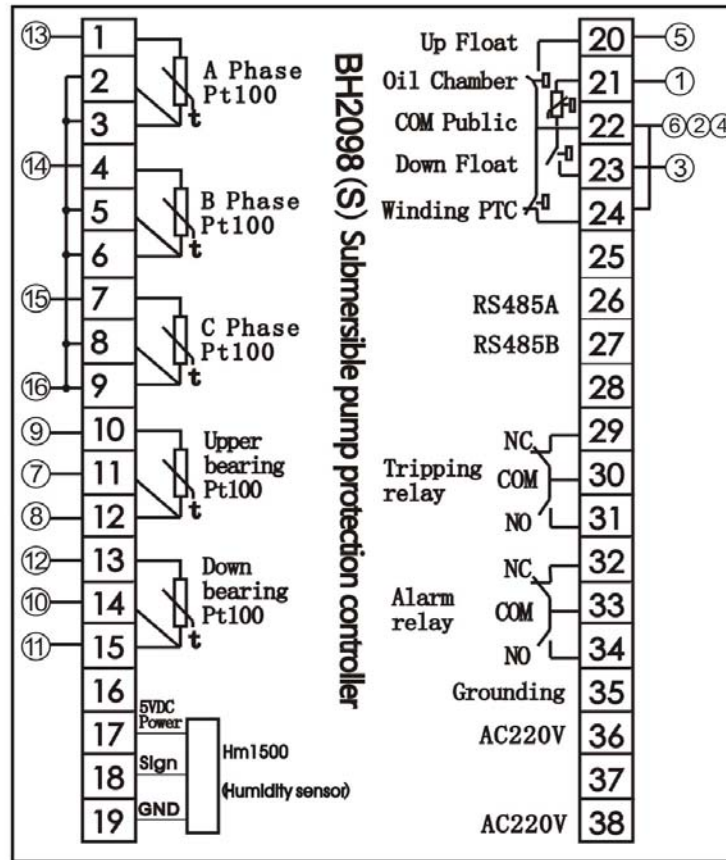 : SET key;   : UP key;

 : DOWN key;   : OK key;

Power indicator (green)   Alarm indicator (red)   Trip indicator (red)

One class parameter enactment code"110" "OK" get into.

Second class parameter enactment password"210" "OK" get into.

(Note: non professionals not to set)

5. Connect line sketch map

6.　Operating instructions

6.1. The key explain

　　"OK" key: Used for confirm a plait while setting parameter go into of parameter. It is an assurance when the code inputs.

　　" SET/ return"　key: Get into parameter enactment while circulating status interface and movement parameter, while setting parameter, return to the upper grade parameter enactment, and don't modify a constitution.

　　"DOWN" key: Turn over page to look into parameter while circulating status interface and movement parameter. While setting parameter, modification parameter, connect to press the parameter to reduce quickly.

　　"UP" Key: Turn over page to look into parameter while circulating status interface and movement parameter. While setting parameter, modification parameter, connect to press the parameter to add quickly.

6.2. The supervision search status

　　After the power is turned on, the instrument into the surveillance state, six screen monitor state the following order:

A phase temperature	50℃
B phase temperature	50℃
C phase temperature	50℃
Upper bearing temperature	50℃

The current time
2009/10/10
10:10:58

Faulty data seven-fortieths	
OK key	Entering queries
Set key	Query exit
Up and down keys	Page

Down bearing temperature	50℃
Motor inlet	50℃
Oil inlet	50℃
Junction boxes into the water	50℃

Motor　run time
100　times
Motor　running: YES

System work accumulated time
150　times
Product serial number
BH2098(S)-109101005

　　Press "Up" or "DOWN" the key can turn over page to look into, the instrument LCD screen by turn shows:

　　Page 1(A-phase, B-phase, C-phase winding current temperature value, the Upper bearing current temperature value)

　　Page 2(Down bearing current temperature value, electrical engineering whether enter whether the water, oil room enters water, connect whether line box enter water)

　　Page 3(Displays the current real-time clock)

　　Page 4(Motor accumulated run time)

Detect motor run signal input is closed, the cumulative motor run time.

Save the motor run time is measured in hours, save less than one hour; trip when a failure when there is not time. Access level setting to clear the motor total running time.

Page 5 (40 fault records queries)

The breakdown surveys: 07 shows for totally have already broken down to record 7 at present.

At this time according to "OK" the ordinal number, breakdown that key gets into at present breakdown to survey and show current breakdown appearance, shows breakdown in the appearance always, break down of type. If break down for the A phase warning, then show of the breakdown appearance is as follows:

Fault logging: 01/40	Fault logging： 02/40	Fault logging: 08/40
Time ： 2009/10/10	Time: 2009/10/12	Time： NO
10:10:58	09:10:00	
Alarm：A phase 61℃	Fault: Motor influent	Faull: NO

Press the "UP" or "DOWN" the key page to view the different serial fault screen.

Press the "SET" key to withdraw break down to survey to return supervision to search interface.

Then will show "have no record" under the situation that didn't break down a record.

Eight parameters of the real-time monitoring, fault recording sequence is as follows: A-phase alarm , B-phase alarm , C-phase alarm, upper bearing alarm, down bearing alarm , A-phase tripping-phase tripping, C-phase tripping, upper bearing tripping , down bearing tripping , Motor inlet water, junction box inlet water,   oil chamber inlet water. A phase alarm, C-phase tripping, motor inlet water, and then the fault display screen fault type Motor inlet water.

Fault logging failure Save; when you exceed 40 failures, in time for order to replace earlier records. Access level setting to clear the fault records

Page 6 The system working accumulated time with the product serial number can not be modified

6.3. One class parameters set

The instrument allows a customer to set A, B and C by oneself three mutually round a set, before the electrical engineering stalk, electrical engineering after stalk of warning temperature value, tripping relay temperature value and tripping relay back bad temperature value, the this machine address, temperature revises coefficient, warning to postpone always, tripping relay to postpone always, clear electrical engineering total amount movement time and clearance break down a record and set etc. date time.

The parameter sets a step:
Press the "SET" key to hint to input a code again press after " OK" key, get into parameter enactment, establish appearance as follows:

Please enter the code:
  110
Press OK key to enter setup

A phase temperature parameter settings	B phase temperature parameter settings	C phase temperature parameter settings
A phase truth police 60 ℃	B phase truth police 60 ℃	C phase truth police 60 ℃
A phase trip of 80 ℃	B phase trip of 80 ℃	C phase trip of 80 ℃
A phase backlash of 70 ℃	B phase backlash of 70 ℃	C phase backlash of 70 ℃

Upper bearing temperature parameters set	Down bearing temperature parameters set	Fixed temperature parameter Settings
Upper bearing alarm 60 ℃	Down bearing alarm 60 ℃	A phase correction + 0 ℃
Upper bearing tripping 80 ℃	Down bearing tripping 80 ℃	B phase correction + 0 ℃
Upper bearing backlash of 70℃	Down bearing backlash of 70 ℃	C phase correction + 0 ℃

Correction temperature parameter Settings	Alarm trip delay Settings	Remove motor running time
Upper bearing correction +0 ℃	Alarm delay 1 second	0 time
Down bearing correction + 0 ℃	Alarm delay 1 second	Note: UP key cleared

Removal of fault record	Set parameters are reset	Set the time
Fault record: 10/40		2009/10/10
Note: UP key cleared	Note: UP key to reset	10:10:58

Device address Settings

Address: 1
Communication rate: 9600

Show cursor at this time, press "UP" or "DOWN" key change the number value add 1 or reduce 1;

When connect to press "UP" or "DOWN" key the parameter having added quickly or reduce quickly;

The setup is complete, press the "OK" key to go to the next parameter settings, all complete, click "OK" button to exit the setup.

A, B, C, Upper bearing, Down bearing alarm tripping temperature hysteresis parameter settings range from 0 to 255;

A phase, B phase, C phase, Upper bearing, Down bearing temperature correction factor parameter settings range from +20 to -20;

Alarm, tripping delay parameter settings range from 0-10 seconds;

Clear the motor run time, press the "UP" key to be cleared;

Clear the fault recording, press the "UP" key to clear;

The set parameter reset, press the "UP" key reset, which the motor running time, fault recording, the clock does not reset into factory settings;

Clock setting, year, month, day, hour, minute, seconds set;

Clock Accuracy: under normal temperature 25 degrees ± 5ppm, i.e. year's error of less than 2.5 points.

The parameter of this machine address establishes scope to 1-255, factory this machine address is the 1;

Range of parameter settings for the communication baud rate: 2400~ 38400bps.

6.4. The second class parameter set (Note: non professionals not to set)

The instrument allows a customer to set A, B and C by oneself three mutually round a set, before the electrical engineering stalk, the stalk temperature corrects coefficient enactment and error margin to correct after the electrical engineering.

The parameter sets a step:
  Press the "SET" key to hint to input a password, importation after setting the password press after "OK" key, get into parameter enactment, establish appearance as follows :(Will can not get into such as the password inaccuracy)

Please enter setup code: 210 Press OK key to enter setup	Calibration temperature parameter Settings A phase correction 1.00 B phase correction 1.00 B phase correction 1.00	Calibration temperature parameter Settings Upper bearing calibration 1.00 Down bearing calibration 1.00

0 degrees correction Key on the correction	0 degrees correction A phase B phase C phase Upper bearing Down bearing calibration failure Key on the correction

200 degrees correction Key on the correction	2000 degrees correction A phase B phase C phase Upper bearing Down bearing calibration failure Key on the correction

Phase A calibration, that is phase A the temperature correction coefficient: A phase when the actual measured phase A winding temperature is 65, and displayed on the LCD screen of the instrument of the A-phase temperature of 66, then the A phase correction is 65/66 = 0.98; If the actual measured temperature of the A-phase is 65, and is displayed on the LCD screen of the A-phase temperature of 64, then the A phase correction is 65/64 = 1.01.

The 0/200 degrees correction: is A-phase, B phase, C phase, the front axle, rear axle PT100 sensors at 0 degrees correction, correction value limited to a certain range beyond will prompt correction failed.

7. Communication code

7.1. Correspond by letter

Host sends	Byte count	For example (Hexadecimal)	
Son machine address	1	01	Send to son machine 01
Function code	1	03	Read register
Starting address	2	00	Starting address is 0032
		32	
Read the number of	2	00	Read three registers (A total of 6 bytes)
		03	
CRC code	2	A4	The CRC code got to from the host calculation
		3F	

Sub-machine response	Byte count	For example (Hexadecimal)	
Son machine address	1	01	Send to son machine 01
Function code	1	03	Read register
Read the number of bytes	1	06	Three registers (A total of 6 bytes)
Register data 1	2	EA	Address is 0032 inside of contents
		60	
Register data 2	2	C3	Address is 0034 inside of intents
		50	
Register data 3	2	DB	Address is 0036 inside of contents
		6C	
CRC code	2	D1	CRC code got by son machine calculation
		3F	

7.2. Appendix: Data and deposit a machine address

Table 1: The function code 03H mapping data area-basic data:

Serial number	Address	Item	Explain
1	0032H	Ta phase	A phase temperature
2	0034H	Tb phase	B phase temperature
3	0036H	Tc phase	C phase temperature
4	0038H	T upper bearing	Upper bearing temperature
5	003AH	T down bearing	Down bearing temperature
6	0042H	Alarm Indication	0: no alarm status; 1: alarm status
7	0044H	Tripping indication	0: No tripping status; 1: tripping state
8	0046H	Motor inlet	0: Motor no water; 1: Motor inlet
9	0048H	Junction boxes inlet water	0: no water; junction box 1: junction boxes inlet water
10	004AH	Oil chamber inlet water	0: oil chamber no water; 1: oil chamber inlet water
11	004CH	A phase platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance
12	004EH	B phase platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance
13	0050H	C phase platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance
14	0052H	Upper bearing platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance
15	0054H	Down bearing platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance

Table 2: The function code 03H mapping data area-basic data:

Serial number	The offset	Item	Explain
1	0000	Ta phase	A phase temperature
2	0001	Tb phase	B phase temperature
3	0002	Tc phase	C phase temperature
4	0003	T upper bearing	Upper bearing temperature
5	0004	T down bearing	Down bearing temperature
6	0005	Alarm Indication	0: no alarm status; 1: alarm status
7	0006	Tripping indication	0: No tripping status; 1: tripping state
8	0007	Motor inlet	0: Motor no water; 1: Motor inlet
9	0008	Junction boxes inlet water	0: no water; junction box 1: junction boxes inlet water
10	0009	Oil chamber inlet water	0: oil chamber no water; 1: oil chamber inlet water
11	00010	A phase platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance
12	0011	B phase platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance
13	0012	C phase platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance
14	0013	Upper bearing platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance
15	0014	Down bearing platinum resistance open	0: platinum resistance does not open; 1: open platinum resistance