SCC

Cooling Consumption Monitor

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Version:Ver.A (English)

SHINI

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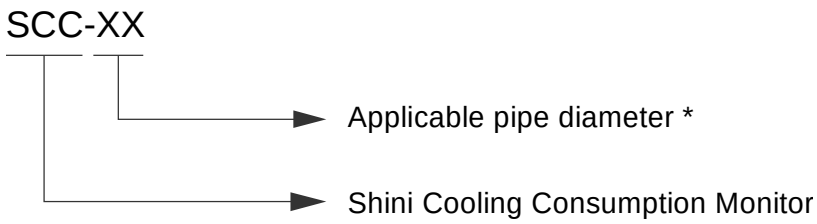
1. General Description

SCC is designed to achieve precision monitoring of water flow, temperature, cooling capacity and total consumption. It can provide data to monitoring host, which is convenient for centralized monitoring, analysis, logging, and operation, providing users with a more comprehensive basis for analysis, judgment and adjustment. It is a necessary component for the modern plastic industry to improve efficiency and quliaty.

Picture 1-1: Cooling Consumption Monitor

1.1 Coding Principle



Notes*

For example: Pipe diameter 1/2'' or 3/4'' is for SCC-20;

Pipe diameter 1-1/2" or 2" is for SCC-50;

1.2 Features

- Non-contact ultra-sonic flow measurement and temperature monitoring system to realize real-time displaying flow and temperature parameters.
- Adopt special cooling consumption board with concise panelfor easy operation.
- Adopt clamp-on flow meter for convenient installation, and the shell protection grade IP65/67 and multiple models for various pipe diameters.
- Real-time monitoring of the input or/and output water flow, temperature, cooling capacity, and total consumption.
- RS485 communication function can communicate with the host to realize centralized parameters monitoring and data logging.

All service work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing. Chapter 6, which contains service instructions intended for service engineers. Other chapters contain instructions for the daily operator.

Any modifications of the machine must be approved by SHINI in order to avoid personal injury and damage to machine. We shall not be liable for any damage caused by unauthorized change of the machine.

Our company provides excellent after-sales service. Should you have any problem during using the machine, please contact the company or the local vendor.

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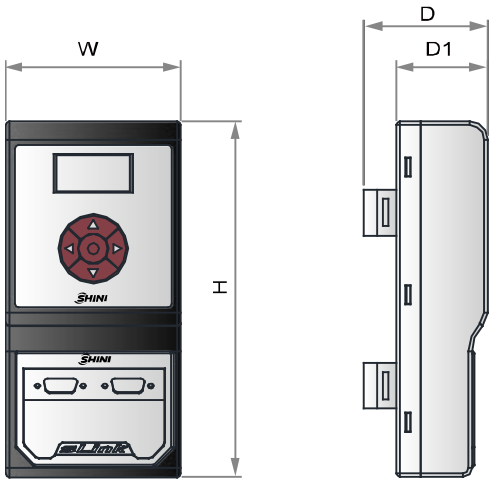
1.3 Machine Specifications

1.3.1 Outline Drawings



Picture 1-2: Outline Drawings

1.3.2 Specifications

Table 1-1：Specifications 1

Model	SCC-10	SCC-20	SCC-32	SCC-50
Working Temp.	0~100℃	0~100℃	0~100℃	0~100℃
Applicable Diameter	1/4"(1) or 3/8"(2)	1/2" (1) or 3/4" (2)	1" (1) or 1-1/4" (2)	1-1/2" (1) or 2" (2)
Measuring Range (L/min)	1~20(1)	1~60(1)	1~200(1)	1~400(1)
	1~30(2)	1~100(2)	1~300(2)	1~500(2)
Thermocouple Size (inch)	1/2"	1/2"	1/2"	1/2"
Dimensions H×W×D×D1(mm)	195×96×68×50	195×96×68×50	195×96×68×50	195×96×68×50
Weight(kg)	1.5	1.5	1.5	1.5

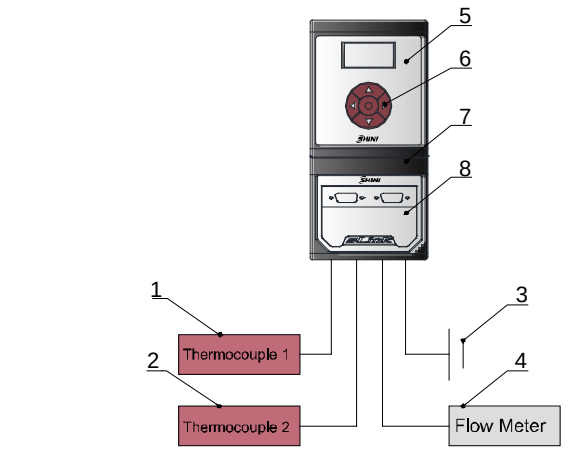
We reserve the right to change specifications without prior notice.

Note: 1） The measuring range corresponds to the pipe diameter subscript. For example, if SCC-10 uses pipe diameter "(1), then the measuring range is 1-20 L/min(1) .

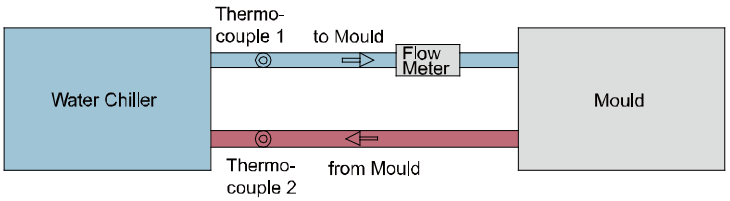
2) Machine power：DC/24V。

2. Structure Charateristics and Working Principle

2.1 Working Principle



Series No.	Item	Remark
1	Thermocouple 1	
2	Thermocouple 2	
3	Power	DC/24V
4	Flow Meter	
5	Circuit board displayer	
6	Operation panel	
7	Cooling Consumption Monitor Control Box	
8	RS485 interface	



Picture 2-1: Working Principle

After powered on (3), SCC monitor starts to work, and thermocouple (1), thermocouple (2) and flow meter (4) real time collect signal parametes and display the calculated data of the collected parameters on the circuit board through the controller's (5) analysis and calculation. It through the touch panel (6) to switch the parameters to be displayed, including water system flow, water input and output temperature, instantaneous cooling capacity and total cooling consumption; Through the communication interface (8), the collected data can be uploaded to the monitoring host that can achieve centralized monitoring and recording of the signal parameters.

3. Installation and Debugging

3.1 Installation Notice

1) The max. flow rate of the water inlet should be less than the maximum throughput of the cooling consumption monitor (See Table 1-1);
2) The fluid monitored by the cooling consumption monitor can be used for water / pure water;
3) The pressure of circulating water must be stable. If the pressure is unstable, it will cause flow fluctuation and incorrect measurement;
4) When connecting the main circuit inlet and outlet, please be noted to distinguish the direction of water inlet and outlet. If the direction is connected incorrectly, it will cause measurement error and abnormality.
5) The product is provided with the flow meter and thermocouple before shipment.

3.2 Wire Connection

1) When connecting the circuit, the terminals of thermocouple and flow meter shall correspond to the port of circuit board.

3.3 Power Connection

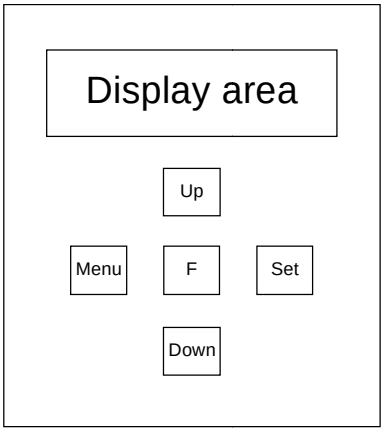
1) No power supply is provided with the product before the delivery, and the customer needs to configure an extra DC / 24V output power.
2) Confirm whether the power supply connected matches the required specification, and then connect the power cable.

4. Application and Operation

4.1 Operation Description

4.1.1 Main screen

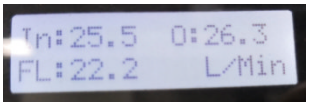
Picture 4-1: Main Screen



Picture 4-2: Circuit Board Key Button Screen

4.1.2 Operation

In the monitoring status, press the Up (△) and Down (▽) button to switch between monitoring screen 1 and screen 2.



Screen 1

Screen 2

After pressing the F( ) button, the system will switch the screen automatically every five secs. till the F( )button is pressed again.

4.1.3 Setting

The first layer setting (maximum and minimum flow)

1) In the monitoring status, press the Menu ( ) button to enter the first layer setting and set the maximum and minimum flow.
2) Press the Up (△) or Down (▽) button to select the maximum or minimum to be set. After selection, press the Set（ ） button to enter the setting screen.
3) Press the Up (△) or Down (▽) button to set the value. After confirmation, press the Set（ ） button to save the value.

The second layer setting (comm. parameter setting)

1) In the monitoring status, press the Menu ( ) button to enter the first layer setting and then press the Menu( )button again to enter the second layer setting.
2) Press the Up (△) or Down (▽) button to select the parameters to be set. After selection, press the Set（ ） button to enter the setting.
3) Press the Up (△) or Down (▽) button to set the value. After confirmation, press the Set（ ） button to save the value.

The third layer setting (reset Q_C)

1) In the monitoring status, press the Menu ( ) button twice to enter the third layer setting.
2) Press the Set（ ） button to enter setting.
3) Press the Up (△) or Down (▽) button to select whether it resets the Q_C.

4.1.4 Parameters Description

1. Screen Description

Table 4-1：Monitor Screen Description

Display	Description
IN	Water inlet temp.℃
O	Water outlet temp. ℃
FL	Flow rate L/Min
Q_C	Total energy consumpted KWh
P	Instantaneous power KW

2．Setting Screen

Table 4-2：Setting Screen Description

Display	Description
Flow_max	Max. flow rate
Flow_min	Min. flow rate
Band	Baud rate setting
ID	ID setting
Parity	Parity check
StopBit	Stop bit

5. Trouble-shooting

Table 5-1： Trouble-shooting Instructions

Faults	Possible reason	Solution
After the power is connected, no value displaying on the screen.	DC power damaged Power cuicuit fault	Replace the DC power. Check the power circuit, and replace the fuse.
Flow/temp. “displays 0”	Sensor error Poor grounding	Check the sensor circuit and sensor. Check whether the main power supply is well grounded

6. Maintenance and Repair

1) Cut off the power first before machine inspection; Make sure to leave enough inspection and maintenance space before operation.
2) In order to prolong the system's service life prevent safety accidents, it make carry out regular inspection.
3) Please disassemble in strict accordance with the steps during maintenance to avoid monitoring elements damage.

6.1 Flow Meter Disassembly

1) The main body and bracket of the flow meter can be installed independently, and it can disassemble the flow meter separately;
2) Loosen the screws and take them out, and directly remove the flow sensor vertically;

6.2 Flow Sensor

Remove the flow sensor out from the pipeline, and clean the sensor detection unit.

6.3 Maintenance Schedule

6.3.1 About the Machine

Model: _____ Serial No.: _____ Manufactured Date: _____

Voltage: ___Φ _____ V Frequency: _____ Hz Power: _____ kW

6.3.2 Check after Installation

☐ Check that conveying pipes are correctly connected.

6.3.3 Daily Checking

☐ Check the start/stop function

☐ Check all power supply wires.

6.3.4 Weekly Checking

☐ Check whether electrical connectors are loose.

☐ Check the flow sensor.

☐ Check whether the pipe connectors are loose.

6.3.5 Monthly Check

- [ ] Check the flow sensor’s sensitivity.
- [ ] Clean the flow sensor.

6.3.6 Half-yearly Check

- [ ] Check whether the pipe joints are loose.
- [ ] Check whether the indicator works normally.
- [ ] Clean the circulating pipeline.

6.3.7 Yearly Check

- [ ] Check whether there’s pipe damage.
- [ ] Check whether circuit connectors are in good condition.

Appendix

Table 1：Modbus Communication

No.	Read & Write	Parameter Content	Parameter min	Parameter max	Default	Unit
1	R	Temp. 1(*0.1)	0	1000		0.1℃
2	R	Temp. 2 (*0.1)	0	1000		0.1℃
3	R/W	Max. flow (*0.1)	Min. value	9999	9999	0.1
4	R/W	Min. flow(*0.1)	0	Max. value	0	0.1
5	R	Integer bit of P				KW
6	R	Decimal place of P (*0.001)				KW
7	R	Integer bit of Q_C				KWH
8	R	Decimal place of Q_C (*0.001)				KWH
9	W	Reset Q_ C value	0	1(reset)	0	
10	R	Flow				0.1

Notes：

1) The index no. of 0x01 ~ 0x05 are all transmitted in the value of a multiple of 10. After receiving the value, it must be valued (* 0.1) to be correctly displayed, equal to keeping in the first decimal place.
   Example: 0x01 receives 208, which means 20.8 ℃.
2) The P value is the combination of the index no. 0x05 and 0x06 (* 0.001). Q_ C and P have the same calculation algorithm.
   Example: if 0x05 is 38 and 0x06 is 126, it means 38.126 kW;
3) Initial value (9600, 8bit, 1stopbit, None);