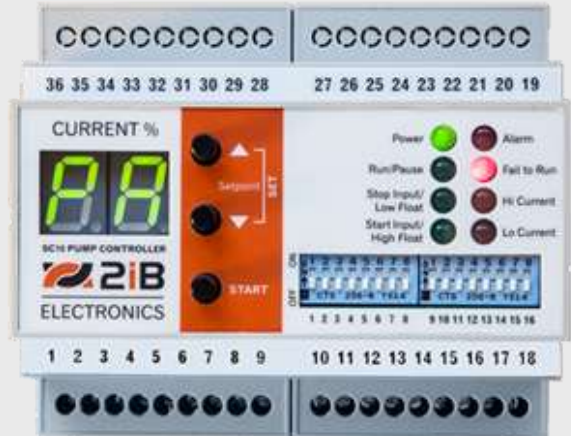


## SC10 Single Pump Controller

### Tips for Testing a Pump Starter / Switchboard

### For a Switchboard Manufacturer



## Introduction

The purpose of this document is provide guidance to Switchboard builders to most easily test a Starter containing an SC10 pump controller. It covers:

**Restart Timer:** There is a timer in the SC10 which prevents restart of the pump.

**Pause Timer and Testing Auto Start:** How to deal with the SC10's pause timer during testing.

**Injecting Current and avoiding *Fail to Run* Alarms.**

**Suggested Starter Test Procedure:** A test sequence that test the operation of the Operation in Auto mode and the Current Measurement, the Start and Stop pushbuttons and the High and Low floats.

## Restart (Stop to Start) Timer

The SC10 prevents the pump from starting within 30 secs of a previous stop.

### Why?

It is possible to damage some pumps by restarting them too soon. Where there is no non-return (or check) valve installed, the water can rush back through the pump when it stops. This can result in pump spinning in reverse. Starting the pump whilst it is spinning in reverse can cause mechanical damage (even including shaft breakage).

### What does this mean for testing the Starter?

Simply to be aware of this constraint when testing.

*It could be beneficial to operators to affix a label with wording like "Pump restart is prevented within 30 seconds of pump stop."*

## SC10's Pause Timer and Testing Auto Start

During testing you will usually test the Auto Start using the SC10. That is, testing that the SC10 correctly starts and stops the pump.

### Useful Information

1. On power-up the SC10 will start the pump after 30 seconds. (The auto-start will be prevented by the Stop / Low Float condition. This condition is indicated by the *Stop Input/Low Float* LED being lit.)
2. The Pause Time logic / algorithm of the SC10 will be reset by a power cycle. So, to get back to the initial Pause time (30 sec) re-cycle the power to restart the SC10.



## How to Test?

1. Power-up the starter and SC10;
2. Wait 30 seconds and the SC10 will start the pump (pull-in the contactor).

## Injecting Current and the Fail to Run Alarm

### Useful Information

The SC10 is primarily a Snore controller. The snoring detection is based upon measuring a low (snore) current from the pump.

### Fail to Run Alarm

The Fail to Run alarm is activated when the SC10 runs the pump (activates the *Run* relay) and detects no current (actually < 10%). In normal use, when the contactor pulls-in the pump will start and there will always be some current detected. This fault can be caused by a failed relay, contactor or tripped breaker or overload/motor protector.

### Snore Detection

Note also that when no load is present, the low current condition is also detected as the pump snoring. So the SC10 will normally stop the pump. (Dip SW 15 set to On will disable this, but usually you should leave Dip SW 15 set to Off so that snoring detection is enabled.

## Avoiding Fail to Run Alarms when Testing

So, in the workshop, when testing the starter without a load the SC10 will detect the No Load / Fail to Run condition and trigger the alarm.

To avoid this alarm (and also to test current measurement and snoring) you will need to inject current.

### Ways to Inject Current

1. Use a single-phase load like a fan heater (10 A) through the CT attached to the SC10. You may need to feed this through the SC10's CT only and power it from another power source so as to avoid the Earth Leakage or Motor Protector tripping. (Note that a common fan heater will be 240VAC and will need to be run phase to neutral. This is why you will probably need to use a separate power supply for the heater. Other reasonable load are heat guns, fans or lamps but for some you might need more turns through the CT to get enough current.)
2. Use a small 3-phase load / motor. (May not be practical.)
3. Use a Loop Calibrator / 4-20mA Signal Injector: Disconnect the CT and inject 4-20mA into the SC10. This probably doesn't achieve what you want because it does not properly test the current measurement using the CT.

Note that to test normally you can leave the load active even when the Run relay / Contactor is not energised.

## If you cannot Inject Current

To test the CT, wiring and SC10 we strongly recommend to inject some current to verify operation.

If you cannot inject enough current then:

- Consider using multiple turns of you single-phase load during testing OR
- Accept that you will see a *Fail To Run* alarm during your test. But do verify that you are reading current on the display.

Compared to other pump controllers they still need to measure / detect the current. With the SC10 you can easily see the measured current on the display – which makes testing easier.

## Suggested Pump Starter Test Procedure

Here is a suggested test sequence that verifies the usual connections to the SC10 Pump Controller are functioning correctly. This is a minimal test sequence that covers all of the I/O connections normally present in a dewatering starter panel.

You will likely need to adapt this to your needs. If you do not have Start or Stop Buttons or Float switches connected to the SC10 then you can skip those steps.

1. Power-up.
2. **Setup:** Inject a current (to the SC10's CT) using a load (eg a Heater). (Use a current greater than 15%).
  - a. Verify the current display on the SC10.
  - b. Note the measured current X%.
  - c. Use the ↑Up and ↓Down buttons to set the Stop Current Setpoint to <X% (say X-5%).
  - d. If the Low Float is designed to be Open-circuit on a Low Level then bridge the Low Float input. (A Low Level / Stop signal will prevent the pump from starting.) Also ensure the Dip SW 10 is set to On meaning Open Circuit = Low Level.
  - e. Ensure that both the *Start Input / High Float* LED is NOT lit and the *Stop Input / Low Float* LED is NOT lit.
3. Re-cycle Power (Off, On).
4. **Auto Start:** Ensure the Pump Starts (contactor pulls-in) after 30 seconds.
5. **Auto / Snore Stop:** Switch of the Current Injection / Load.
  - a. This should display a low (usually 0%) current and trigger snore detection (Indicated by the *Run / Pause* LED flashing fast).
  - b. After 10 seconds the pump should stop (contactor drops out).
6. **Start Button:** Press the Start button and ensure that the *Start Input / High Float* LED activates. (It flashes briefly then turns on.)
7. **Stop Button:** Press the Stop button and ensure that the *Stop Input / Low Float* LED activates. (It flashes briefly then turns on.)
8. **High (Start) Float:** Bridge the High / Start Float input to the Starter and ensure that the *Start Input / High Float* LED activates. (It flashes briefly then turns on.)
9. **Low (Stop) Float:**
  - a. If the Low Float is designed to be Open-circuit on a Low Level then open-circuit the Low / Stop Float and ensure that the *Stop Input / Low Float* LED activates. (It flashes briefly then turns on.)
  - b. If the Low Float is designed to be Closed-circuit on a Low Level then close-circuit (or bridge) the Low / Stop Float and ensure that the *Stop Input / Low Float* LED activates. (It flashes briefly then turns on.)

You have now verified that the SC10 can start and stop the pump (load) and that the I/O to the SC10 is functioning correctly.

Tip: Re-cycling the power to the SC10 resets the Pause Timer back to its initial value of 30 seconds. This can be useful if you need to retest or to add additional starts and stops to the test.



**[www.2ib.com.au](http://www.2ib.com.au)**

© 2018 2iB Pty Ltd. All Rights Reserved.  
V20180709