

Engineering Note

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Title:	Hydro-View/HC-IV intermittent shut-down
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Products affected:	Hydro-Views prior to model HV02, HC-IV prior to revision C
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Summary:	This document describes how to replace a PTC device which is known to cause intermittent shut down of a Hydro-View or HC-IV operator terminal

Symptoms

The Hydro-View (or Hydro-Control IV operator terminal) appears to operate normally but after some hours operation the display goes blank and the unit enters a shut-down mode where it fails to respond to keys etc. Normal operation can be restored for a short while by removing power for a few minutes, but the unit eventually shuts down again.

The unit functions normally for extended periods without a moisture sensor connected.

Cause

This is due to a current limiting device (Positive Temperature Coefficient (PTC) multifuse) tripping due to the high temperatures being achieved within the unit, especially with a sensor connected when the internal power dissipation is higher. We have evaluated several systems and have found that they will trip out after several hours at around 45°C ambient. Since the PTC fuse is essentially a device which exhibits a high impedance at elevated temperatures, it must either be up-rated or removed and replaced with an alternative type of device. Unfortunately, up-rating this is quite difficult if it is still to function as a current limiting device since a suitable value is unavailable.

Remedial action

Recommended remedial action is as follows...

Locate the PTC multifuse on the circuit board as FS1. This is indicated in the circuit diagram and PCB silk screen legend diagram later in this document.

Either...

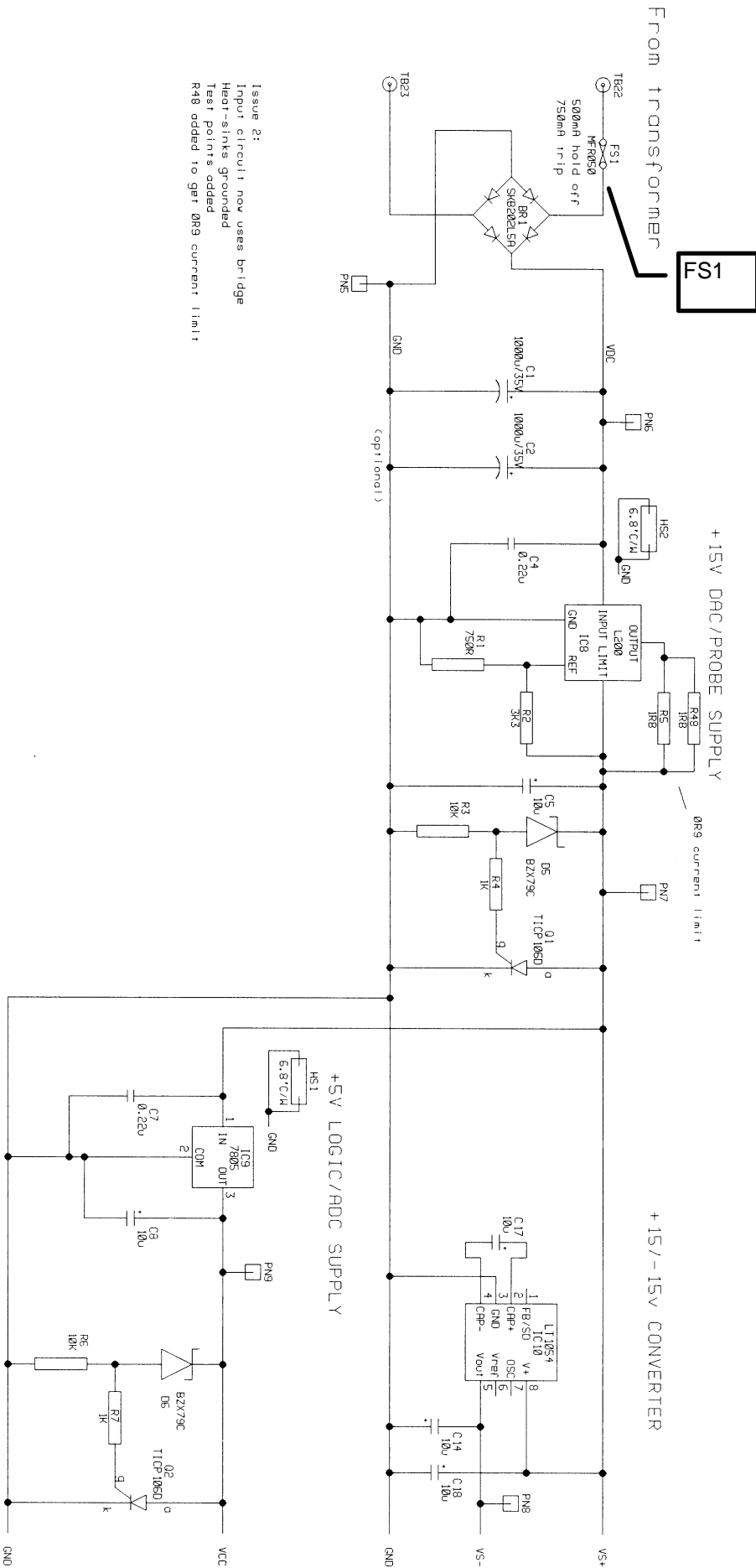
Replace the multifuse FS1 with a wire link. This removes the problem and may be a convenient on-site modification, but this reduces the protection level particularly against short circuits on the 24Vdc supply output (terminals 13 and 17) which is then unprotected. The system retains short-circuit protection on the sensor supply however since this is effected by voltage regulator current limiting. If you are not using the 24V output, then this is a viable option.

Or...

Replace the multifuse FS1 with a 1A TR5 style PCB mounted antisurge (T) thermal fuse such as those from WICKMANN (e.g. part number 19732K 1A). This will prevent the problem occurring and will also offer some protection to the transformer secondary, albeit at the cost of replacing a fuse in the event of an 'accident'. It is recommended that FS1 be mounted in a suitable 2-pin socket (also available from WICKMANN) to assist replacement should the need arise. This approach has been adopted in production units from Hydronix.

To implement this modification, locate the multifuse in the top left-hand corner of the circuit board, immediately adjacent to the power supply connection and heat-sinks. Replace the multifuse with the chosen solution.

We have tested a system at an ambient of 50°C for several hours with no sign of the system shutting down. However, it should be remembered that operating at such high temperatures should be avoided if possible since the liquid crystal display module will discolour.



Issue 2:
 Input circuit now uses bridge
 Heat-sinks grounded
 Test points added
 R48 added to get OR9 current limit

FS1

