Smart Series®
SSM-15-11, SSM-15-12
& SSM-30-12

Microprocessor-Based Temperature Control Module With Digital Display

User's Manual

DME Company

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WARRANTY

DME Company warrants that this product will be free from defects in materials and workmanship for a period of three (3) years from the date of shipment. If any such product proves defective during this warranty period, DME Company, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. DME Company shall not be obligated to furnish service under this warranty; a) to repair damage resulting from attempts by personnel other than DME Company representatives to repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; or c) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

This warranty excludes replacement of fuses (in the 15 amp models) and damage to the module from the use of improper styles of fuses. Use only ABC type replacement fuses. The maximum allowable fuse rating is 15 amps. Lower ratings may used for improved protection.

SAFETY

DME Company products have been designed to be safe and simple to operate. As with any electronic equipment, you must observe standard safety procedures to protect both yourself and the equipment.

To Prevent Injuries:

- To avoid electrical shock or fire hazard, do not apply voltage to a terminal that exceeds the range specified for that terminal.
- To avoid mechanical injury, electrical shock or fire hazard, do not operate this product with covers or panels removed. All unused slots of a main frame must be covered with the appropriately sized blank panels.
- To avoid electrical shock or fire hazard, do not operate this product when wet.
- To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

To Prevent Product Damage:

- Do not operate this product from a power source that applies more than the voltages specified.

DME Standard
Smart Series® Microprocessor-Based
Temperature Control Modules
With Digital Display
SSM-15-11, SSM-15-12 (15 AMP)
& SSM-30-12 (30 AMP)

GENERAL DESCRIPTION

This Smart Series® SSM module is a user-friendly temperature controller of world-class caliber.

It is one of the most widely used controllers in the hot runner control industry.

It has a large process temperature display, and it incorporates a 3-digit pushwheel for entering process temperature setpoints.

The illuminated display shows process temperature in Auto, and Manual modes.

Diagnostic fault codes for open ("OPE"), reversed ("bAC"), or shorted ("SHO") thermocouples are displayed digitally. The module automatically inhibits output power to the heater load in Auto mode until such faults are corrected, unless the new "Automatic Bumpless Transfer" option is enabled.

The modules LED display indicators (located at the top left of each digit) show the mode of operation. The power to heater "load" LED doubles as a Smart Start® indicator by blinking during Smart Start. Five separate color-coded LED's located under the display indicate temperature deviation and over/under temperature conditions at a glance.

OPERATION

Auto Mode: The microprocessor maintains temperature using a proprietary closed loop control method. The microprocessor anticipates the heater load characteristics to make accurate adjustments and correct for errors.

"Fuzzy logic" is used to minimize overshoot of setpoint on start-ups, and to prevent over and undershoots when changing setpoints.

The SSM can also display the average percent output power when running in Auto mode. ("% Auto" setting)

Smart Start®: Smart Start® is automatic on start-up in Auto mode if the process temperature is below 212°F (100°C), and provides a linear power output ramp to ensure safe heater dry out.

Smart Start® is completed after four minutes and thirty seconds has elapsed, or when process temperature exceeds the lesser of either the setpoint or 212°F (100°C) in Auto mode.

Input Fault: Thermocouple break protection, and reversed thermocouple protection, override Smart Start® when in Auto mode. (Output power is inhibited)

Shorted thermocouple protection, thermocouple break protection, and reversed thermocouple protection, inhibit output power in normal Auto mode operation.

If a thermocouple fault occurs when the "Automatic Bumpless Transfer" feature is ON (after operating at setpoint temperature for >10 Minutes), the module will simulate manual mode using the average percent power learned during normal Auto operation.

Manual Mode: For no thermocouple, or a thermocouple failure, open loop percent output power is used.

In Manual mode, the microprocessor maintains a power level using an open loop power control method. This enables the user to continue production, and override thermocouple faults until the problem has been resolved. Manual mode overrides thermocouple break protection, shorted thermocouple protection, reversed thermocouple protection, and any other normal automatic modes.

FEATURES

- Fully self-tuning, fuzzy logic, microprocessor-based control.
- Selective Cycle®, and Smart Start® to prolong heater life.
- New optional Smart Start heater-dry-out in Manual mode. (Smart Start Override Disable)
- Zero crossing triac triggering for minimum Radio Frequency Interference. (RFI)
- Process temperature display operational even in Manual mode as long as the thermocouple (T/C) is intact.
- Automatic T/C fault protection and cold junction compensation.
- High impedance potentiometric input allows long distance T/C wiring.
- 100% solid-state circuitry, no mechanical relays.
- Completely self contained, no external output devices or power supplies required.
- Fast acting heater load fuses are provided on both sides of the AC line in 15 amp modules. Circuit breakers are used in 30 amp modules.
- Electrically isolated, and grounded front panel for operator safety.
- Plug in design for module interchangeability.
- Alarm output capability and Standby Heat (Idle) function with the DME TAS-05-02 module.
- Alarm output, Off, Standby Heat (Idle), and Boost functions available with new TAS-05-12 module.
- New Auto Boost option for automatic temporary raising of temperature at startup. (No additional module required)
- °F/°C configurable.
- J-type, or K-type thermocouple configurable.
- New Lights Out feature can be enabled to shut off the digital LED display during stable Auto control.
- Adjustable response time to shorted thermocouple faults.
- Compatible with all 10 and 15 amp G-Series®, and Smart Series® Main Frames.

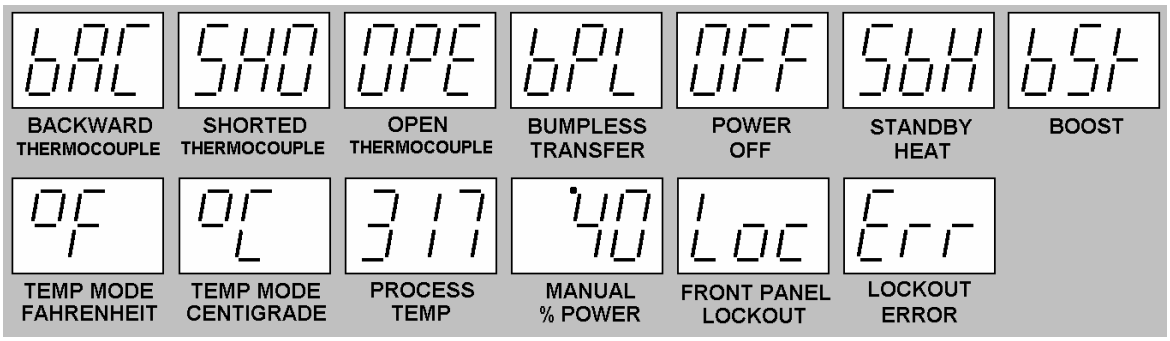

Figure 1 - SSM Display

PERFORMANCE SPECIFICATIONS

Auto and Manual Control Modes: Selective Cycle: high speed time proportioning.
Temperature Range: Ambient to 999°F (537°C) with J-type, and K-type thermocouples.
Control Accuracy: +/-1°F (0.5°C), dependent on the total thermal system.
Temperature Stability: +/-0.5% of full scale over the ambient range of 32 to 120°F. (0 to 50°C)
Calibration Accuracy: Better than 0.2% of full scale.
Power Response Time: Less than 0.13 seconds.
Reset: Automatically corrects reset to no more than +/-1°F (1°C) at all settings.
Manual Control: Adjustable from 0-99%. Maintains output power to within 1% of setting.
Diagnostics Indicators: LED's and 3-digit, 7-segment display.
Smart Start® (SS): Linear power output ramp from an initial temperature (< 212°F in Auto mode) to ensure safe heater dry out.
SS Duration: 4-1/2 minutes.
SS Override Temperature: 212°F (100°C) Auto mode only.
Operational Mode Priority:

- Smart Start precedes Auto mode if process temperature is < 212°F.
- Thermocouple (T/C) break, or reversed T/C overrides Auto mode Smart Start, and normal Auto mode.
- Shorted T/C overrides normal Auto mode.
- Manual mode overrides T/C break, T/C open, and reversed T/C.
- The output is inhibited during all T/C fault conditions in Auto mode unless Automatic Bumpless Transfer is enabled.

DIAGNOSTICS AND OTHER DISPLAY CODES (See figure 1)

The SSM® diagnostics automatically alert the user to a fault condition.

- Shorted thermocouple indicated by flashing ***SHO***.
  - ◊ **Troubleshooting-**
    Check for damage to the thermocouple lead wire. Also check for bare, twisted or pinched leads, open load fuse (F1,F2), or excessive distance between the heater and thermocouple.
- Open thermocouple indicated by flashing ***OPE***.
  - ◊ **Troubleshooting-**
    Check the thermocouple connections and wires for broken leads, check for damage to the sensor, or check for open fusible link resistor (R4, see figure 9)
- Reversed thermocouple indicated by flashing ***bAC***.
  - ◊ **Troubleshooting-**
    Check thermocouple wiring for reversed leads.
- Over/Under temperature. The red deviation LED on the left, flashes when the process temperature is below setpoint by 40°F or more. The red deviation LED on the right flashes when the process is above setpoint by 40°F or more.
  - ◊ **Troubleshooting-**
    Under temperature;
    open heater, low line voltage, t/c problem,
    open load fuse (F1,F2).
    Over temperature;
    output failure, shorted triac, interacting zones,
    heater shorted to ground.
- A remote signal ordering the module output off will cause a flashing ***OFF*** to be displayed.
- A remote signal ordering the module into standby heat (Idle) will cause a flashing ***SbH*** to be displayed.
- A remote signal ordering the module into boost heat will cause a flashing ***bSt*** to be displayed. Auto Boost will also display a flashing ***bSt***.
- A flashing ***Loc*** is an indication that the Smart Start Override option is ON, and that the module is in Smart Start. The Auto/Manual and Setpoint controls will be "locked out" while this mode is active.
- A flashing ***Loc Err*** is an indication someone has changed the front panel settings prior to the completion of Smart Start when the Smart Start Override option is ON. The Auto/Manual and Setpoint controls will be "locked out" when the ***Loc Err*** diagnostic is active.
  - ◊ **Troubleshooting-**
    If the module is operating in Auto mode with a process temperature above 212°F (100°C), turn the module off, and change the settings back to their initial positions, then turn the module back on. The module will resume controlling to the entered setpoint.
    If the process temperature is below 212°F, (100°C) the module will restart the Smart Start process.
    If the module is operating in Manual mode, turn the module off, and change the settings back to their initial positions, then turn the module back

on. The module will restart the Smart Start process.

- A flashing ***bPL*** is an indication that the Automatic Bumpless Transfer option is ON, the thermocouple has failed, and the module has invoked an Automatic Bumpless Transfer.
  - ◊ **Troubleshooting-**
    Either shut down and repair the broken thermocouple, or:
    Press the AUTO% switch to display and record the average percent power value being output. Then place the module in Manual mode, and enter the percent power previously recorded.

INPUT SPECIFICATIONS

Thermocouple (T/C) Sensor: Type "J" (default) or Type "K" (optional), grounded or ungrounded.
External T/C Resistance: High impedance potentiometric input allows long distance T/C wiring.
T/C Isolation: Isolated by control circuit power supply.
Cold Junction Compensation: Automatic, better than 0.02°F/°F. (0.01°C/°C)
Open T/C Protection: Automatically inhibits power to heater in Auto mode.
(Unless Automatic Bumpless Transfer is enabled)
Reversed T/C Protection: Automatically inhibits power to heater in Auto mode.
(Unless Automatic Bumpless Transfer is enabled)
Shorted T/C Protection: Automatically inhibits power to heater in Auto mode.
(Unless Automatic Bumpless Transfer is enabled)
Input Type: Potentiometric
Input Impedance: 22 Meg ohms.
Input Protection: Diode clamp, RC filter, and fusible link resistor R4. (See figure 9)
Input Amplifier Stability: 0.02°F/°F (0.01°C/°C)
Input Dynamic Range: 1000°F (550°C) with J-type, 1000°F (550°C) with K-type.
Common Mode Rejection Ratio: Greater than 100 db.
Power Supply Rejection Ratio: Greater than 90 db.

OUTPUT SPECIFICATIONS

Voltage/Power Capability:
15 AMP: 240 VAC nominal, single-phase.
SSM-15-12: 3600 watts @240 VAC
SSM-15-11: 1800 watts @120 VAC
30 AMP: 240 VAC nominal, single-phase.
SSM-30-12: 7200 watts @240 VAC
Output Drive: Internal solid-state-triac, triggered by AC zero crossing pulses.
Overload Protection:
15 AMP: Fuses are provided on both sides of AC line.
30 AMP: Fast acting circuit breaker.
Transient Protection: dv/dt and transient pulse suppression included.
Power Line Isolation: Optically, and transformer isolated from AC lines. Isolation voltage is greater than 2500 volts.

ELECTRICAL POWER SPECIFICATIONS

Supply Voltage: 240/120 VAC +10% -20%
Frequency: 50/60 Hz
DC Power Supplies: Internally generated, regulated and compensated.
Module power usage: Less than 5 watts, excluding load.
Dimensions:
15 AMP: 2"W x 7"H x 7 1/2"D (5.08 x 17.78 x 19.05cm)
30 AMP: 4"W x 7"H x 7 1/2"D (10.16 x 17.78 x 19.05cm)
NOTE: Standard (240 VAC) modules are compatible with main frames wired for either 240 VAC three phase (standard) or 240 VAC single-phase. Use SSM-15-11 (15 amp) or SSM-30-01 (30 amp) for 120 VAC operation.
FUSE REQUIREMENTS: (2) ABC-15 fuses, F1 & F2, Applies to SSM-15-11 and SSM-15-12 only.
(Note: (2) spare fuses included with module)
(1) 160 mA sub-miniature fuse. (F3) (See figure 9)

FRONT PANEL CONTROLS AND INDICATORS (See figures 1, 2 and 3)

1. DIGITAL LED MULTI-FUNCTION DISPLAY & DISPLAY MODE INDICATORS: Indicators are located in the display at the top left of each digit. Three 7-segment, (0.56-inch tall) digital displays indicate process temperature, % power output, operational modes, and advanced diagnostic codes.
Load Indicator: LED in display window illuminates when power is being supplied to the heater.
(also blinks during Smart Start®).
Manual Control Indicator: LED in display window illuminates when in Manual mode.
(also blinks after an Automatic Bumpless Transfer)

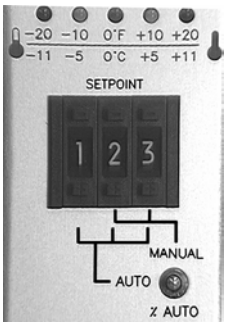

Figure 2 - Pushwheel & Auto / Manual Switch

Shorted Thermocouple (T/C) Indicator: Digital display alternates "SHO" with process temperature.
Open T/C Indicator: Digital display alternates "OPE" with process temperature. (typically "999")
Reversed (Backward) T/C Indicator: Digital display alternates "bAC" with process temperature.
Degrees F/C Indication: At power up, the module will display "°F" or "°C" for three seconds, depending on the position of function enable switch S4-7.
Bumpless Transfer Indication: If a thermocouple fault occurs with the Automatic Bumpless Transfer feature enabled, (S4-4 switched ON) the module will display "bPL" alternating with the process temperature, and the appropriate thermocouple fault code.
("SHO", bAC", or "OPE")
Smart Start Override Disable: Digital display alternates "Loc" with process temperature during Smart Start if S4-2 is ON.

The display will alternate “Loc” “Err” with process temperature after the completion of Smart Start, if the front panel settings were changed during Smart Start.

Remote Off Signal: If switch S1-5 is ON and a remote power off signal is present, the module will display "OFF" alternating with process temperature.

Remote Standby Heat Signal: If switch S4-1 is ON and a remote Standby Heat (Idle) signal is present, the module will display "SbH" alternating with process temperature.

Remote Boost Signal or Autoboost: If the module is in a boost mode, it will display "bSt" alternating with process temperature.

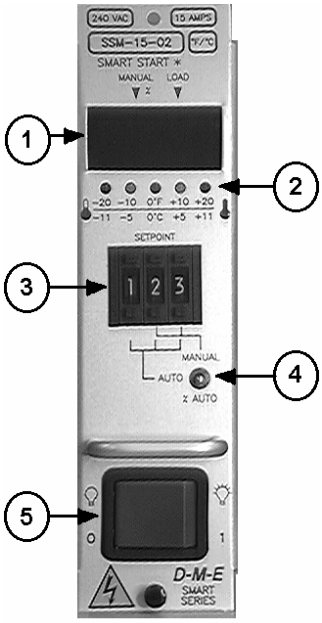

Figure 3 - SSM-15-12 Module

Note: The SSM-30-12 module is twice as wide as the SSM-15-12 and has a circuit breaker instead of item 5.

2. TEMPERATURE DEVIATION LIGHTS: Indicate amount of deviation from setpoint temperature. An outer light blinks when extreme over or under temperature condition (+/- 40°F) exists.

Temperature Deviation Indicators: Five separate LED’s: +/-20°F/11°C=(Red), +/-10°F/5°C=(Yellow), 0°F/0°C=(Green)

3. SETPOINT / % POWER ADJUSTMENT: Three-digit pushwheel adjusts setpoint (Auto), or % power (Manual).

Auto Setpoint Control Range: 0 to 999°F, 0 to 537°C. Resolution: 1°F (1°C)

Manual (% Power) Control: Right two digits of three-digit pushwheel.

Manual (% Power) Control Range: 0 to 99%.

4. AUTO / MANUAL / % AUTO SWITCH: Toggle switch, selects Auto, (setpoint temp.) or Manual (% power) control modes.

Lower momentary position displays the percent power output in Auto mode, or percent power Automatic Bumpless Transfer value in the case of a thermocouple fault.

5. POWER ON / OFF SWITCH: Controls AC power to module. 16-amp rocker switch, UL, CSA, VDE approved. SSM-30-12 has a high-speed circuit breaker instead of the switch, UL, CSA, VDE approved.

TEMPERATURE MODE °F / °C

To operate the SSM module in the °F (degrees Fahrenheit) mode, place switch S4-7 in the OFF position. To operate the SSM module in the °C (degrees Centigrade) mode, place switch S4-7 in the ON position. (See figures 4 and 9) The mode of operation is displayed on startup as either "°F" or "°C".

AUTOMATIC BUMPLESS TRANSFER

"Automatic Bumpless Transfer" is defined as a thermocouple failure causing the module to automatically switch into manual percent power mode, if the module has learned an average percent power. (The SSM requires approximately 10 minutes of stable temperature control to learn an average percent power) To enable Automatic Bumpless Transfer, place switch S4-4 in the ON position. To disable the Automatic Bumpless Transfer option, place switch S4-4 in the OFF position. If disabled, the power output will be inhibited after a thermocouple fault occurs. The user will then have to place the module in Manual mode to gain control of the output power.

With an Automatic Bumpless Transfer active, the module will also enter an alarm state. The display will alternate between "bPL" ("bumpless"), the diagnostic code for the thermocouple fault, and the process temperature. If an alarm module is present, it will activate. To silence the alarm, push the AUTO% switch to view the average percent power being used, place the module in Manual mode and enter that percent power.

With Automatic Bumpless disabled, the module will still learn the average percent power, but the user must press the AUTO% switch, and record the average percent power prior to a thermocouple failure. Upon a thermocouple fault, the module will inhibit output power, and will enter an alarm state. The appropriate diagnostic code will alternate in the display with the process temperature. The user must then place the module in Manual mode and enter the recorded percent power. This action will clear the alarm.

LIGHTS OUT

The module can be programmed to shut off the digital LED display during stable Auto mode operation. This is beneficial with large systems (many zones of control) since it makes it easier to locate control zones with problems. To enable this option, set switch S4-3 to ON. After the module achieves stable operation about setpoint for 10 minutes, the digital LED display will turn off. Only the green deviation LED will be on. The display will turn back on automatically should an alarm condition occur, if any of the front panel switch settings are changed, if the process temperature deviates more than +/-10 °F in temperature, or if any remote modes of operation are active. It is recommended that the AUTO% switch be used to temporarily restore the display manually. The display will then turn off again after five minutes of stable operation about setpoint in Auto mode.

SMART START OVERRIDE DISABLE

This Smart Start module incorporates an option to override the Smart Start feature in Auto mode by toggling the Auto/Manual switch to Manual and then back to Auto. By setting switch S4-2 to ON, this override can now be disabled. With switch S4-2 set to ON, the module will display "Loc" alternating with the process temperature during Smart Start. All front panel switch changes will be ignored during Smart Start. If the user changes any of

the front panel settings during Smart Start, the module will continue to display "Loc" to indicate that the front panel is still "locked out". After Smart Start is complete, the module will check for front panel settings changes, and then display “Loc” “Err” alternating with the process temperature if any changes have occurred. Output power will still be active.
If the module is operating in Auto mode with a process temperature above 212°F, (100°C) the user must turn the module off, and change the settings back to their initial positions, then turn the module back on. The module will resume controlling to the selected setpoint. If the process temperature is below 212°F, (100°C) the module will restart Smart Start.
If the module is operating in Manual mode, turn the module off, and change the settings back to their initial positions, then turn the module back on. The module will restart the Smart Start process.
Setting switch S4-2 to ON also activates a new Smart Start feature in Manual mode. With S4-2 ON, a module in Manual mode will ramp from zero percent to setpoint percent power over a 4-1/2 minute period, thus mimicking Smart Start in Auto mode. "Loc" will be displayed in this mode also. “Loc” “Err” will also be displayed afterward, if the user attempts changes to the front panel settings.

FUNCTION ENABLE SWITCHES

S1-1 Remote Boost Enable
S1-2 Add 10% Boost
S1-3 Add 20% Boost
S1-4 Auto Boost Enable
S1-5 Power Off Enable
S1-6 Gain Cut
S4-1 Standby Heat Enable (Idle)
S4-2 Smart Start (SS) Override Disable
S4-3 Lights Out Enable
S4-4 Auto Bumpless Enable
S4-5 SHO Long
S4-6 SHO Disable
S4-7 Deg F/C

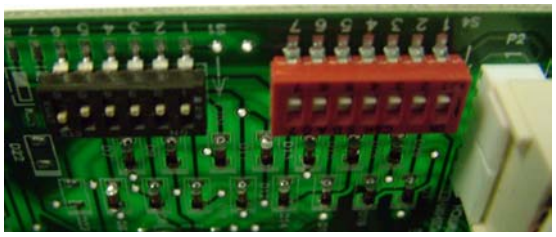

Figure 4 – Function Enable Switches

DESENSITIZING "SHO"

Shorted Input override, SHO, is defined as a condition when the thermocouple is shorted and the module does not detect a rising temperature that corresponds to the output power being delivered. If the temperature rise does not change at a rate of more than 2 °F in 90 seconds, this is interpreted as a Shorted Input.
Sometimes a 2-degree rise in 90 seconds is too sensitive. If this is the case, the module can be desensitized to this situation, or the diagnostic can be totally shut off. Switch S4-5 ("SHO Long") changes the sensitivity to 3 degrees in 255 seconds. Switch S4-6 ("SHO Disable") turns this diagnostic totally off. It is highly recommended that normal sensitivity be tried first. It should be sufficient for all nozzles and most manifolds. Large hot runner manifolds and molds may require desensitization. The SHO Disable feature should only be considered as a final resort.

REMOTE OFF

When the DME TAS module (or similar mainframe option) initiates an OFF signal, any SSM module that has this feature enabled will alternate "OFF" with the process temperature, and will shut off power to their respective heaters.*
To enable this option, switch S1-5 must be set to ON. This allows the user to select the modules in the system that will react to the OFF signal.
* A communication style mainframe is required to support this feature.

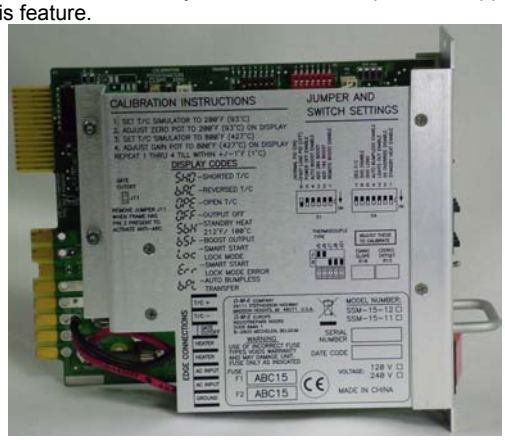

Figure 5 - Side Panel

REMOTE STANDBY HEAT (Idle)

When the DME TAS module (or similar mainframe option) initiates a Standby Heat (Idle) signal, any SSM module that has this feature enabled, and controlling in Auto mode, will immediately reduce the setpoint temperature to 212°F/100°C.
If the module is controlling in Manual mode, the power output will be reduced to 3%.
This function is useful for the continuous application of low power to heaters to prevent moisture build-up and initiate quick start-ups.*
To enable this option, switch S4-1 must be set to ON. This allows the user to select the modules in the system that will react to the Standby Heat (Idle) signal.
If a thermocouple failure occurs while in Standby Heat and Auto Bumpless is not enabled, the module will inhibit output power and will enter an alarm state.
If a thermocouple failure occurs while in Standby Heat and Auto Bumpless is enabled, (after stable control for 10 minutes) the module will automatically switch to an average percentage of output power and enter an alarm state. To silence the alarm, push the AUTO% switch to view the average percent power being used, place the module in Manual and enter that percent power.
* A communication style mainframe is required to support this feature.

REMOTE BOOST

When the DME TAS module (or similar mainframe option) initiates a Boost signal, any SSM module that has this feature enabled, and controlling in Auto mode, will immediately increase the setpoint temperature according to the settings of switches S1-2 and S1-3. This function is useful for increasing temperature of nozzles for unblocking, or initial startup of the hot runner system.*

If a thermocouple fails while in Boost, and Auto Bumpless is not enabled, the module will inhibit output power and will enter an alarm state.
If a thermocouple failure occurs while in Boost and Auto Bumpless is enabled, (after stable control for 10 min's) the module will automatically switch to an average percentage of output power and enter an alarm state. To silence the alarm, push the AUTO% switch to view the average percent power being used, place the module in Manual and enter that percent power.
To enable this option, switch S1-1 must be set to ON and either or both switches S1-2 and S1-3 must be ON. This allows the user to select the modules in the system that will react to the Remote Boost signal. Switch S1-2 adds 10% to the entered setpoint. S1-3 adds 20% to the entered setpoint. Having both S1-2 and S1-3 ON adds 30% to the entered setpoint. For example; if S1-2 is ON, and the entered setpoint is 500 degrees, a remote boost input signal will cause the module to assume a 550 degree setpoint. Upon removal of the remote boost signal, the module will return to the 500 degree setpoint.
* A communication style mainframe is required to support this feature.

AUTO BOOST

Upon startup, any SSM module in Auto mode that has this feature enabled will increase the setpoint temperature according to the settings of switches S1-2 and S1-3 after the completion of Smart Start. This function is useful for increasing temperature of nozzles for initial startup of the hot runner system, but doesn't require an external signal.
If a thermocouple fails during Auto Boost, the module will inhibit output power and will enter an alarm state.
To enable this option, switch S1-4 must be set to ON, and either or both switches S1-2 and S1-3 must be ON. This allows the user to select the modules in the system that will react to Auto Boost. Switch S1-2 adds 10% to the entered setpoint. S1-3 adds 20% to the entered setpoint. Having both S1-2 and S1-3 ON adds 30% to the entered setpoint. For example; if S1-2 is ON and the entered setpoint is 500 degrees, power up will cause the module to assume a 550 degree setpoint for a period of 3 minutes after the completion of Smart Start. After 3 minutes, the module will return to the 500 degree setpoint.
If also enabled, the presence of a Remote Boost signal will override Auto Boost. *
* A communication style mainframe is required to support this feature.

GAIN CUT

If temperature oscillates during operation, the user can compensate for this by turning S1-6 to OFF. This is recommended for coil heaters with ungrounded internal thermocouples or very small nozzles.

ALARM OUTPUT

When a DME TAS module is installed in the DME mainframe, this output feature will activate the alarm output on the TAS module. The TAS module will produce an audible alert, and provide a relay contact closure when a module alarm occurs. This alarm output feature is disabled upon power-up until the process temperature is within 10°F (5°C) of Setpoint temperature. It is also disabled when changing setpoints manually, or remotely. Once the Setpoint temperature is reached, a deviation of +/-40°F (11°C) will activate the alarm output.*
In Manual mode the alarm output will only activate due to a "Loc Err".
The user can silence a temperature deviation alarm by placing the module in Manual mode.
* A communication style mainframe is required to support this feature.

K TYPE THERMOCOUPLE SELECT

The SSM module can be converted for a K type thermocouple input by re-configuring the thermocouple type select jumpers. (see figures 6 and 9)
Remove jumpers J5 and J6, and install jumpers J7, J8, and J21 for a K type thermocouple input.
After converting the T/C to K type, or back to a J type, the module will require re-calibration.

CALIBRATION PROCEDURE – J OR K TYPE T/C (See figure 6 and 9)

1. Insert controller into the calibration fixture* and turn the power on. Wait 10-15 minutes for warm up.
2. Set the simulation temperature to 200°F (93°C) for J-type T/C. (400°F (205°C) for K-type T/C)
3. Adjust the ZERO trim pot, R13, to read 200°F (93°C) on the display for J-type T/C.
(400°F (205°C) for K-type T/C)
4. Set the simulation temperature to 800°F (427°C) for J-type T/C. (650°F (344°C) for K-type T/C)
5. Adjust the GAIN trim pot, R18, to read 800°F (427°C) on the display for J-type T/C.
(650°F (344°C) for K-type T/C)
6. Repeat steps 2 through 5 until no further trim pot adjustment is needed.
7. Turn power off and remove from calibration fixture *.

Figure 6 - Calibration Potentiometers

**The user can construct a calibration fixture from a DME MFP-1G (or MFHP-1G for 30 amp modules) mainframe and a thermocouple simulator. (I.E. Omega model #CL25) A slot must be cut in the top of the main frame in order to access the calibration potentiometers.*

RETURN POLICY

The DME® SSM® modules are warranted for 1-year parts and labor, excluding fuses. Contact D-M-E Customer Service for return authorization for repairs, or warranties. Replacement parts are also available through the Customer Service Department.

D-M-E Customer Service

In U.S., 800-626-6653
Global 248-398-6000
In Canada: 800-387-6600
SERVICE CENTER U.S.A.
DME WORLD HEADQUARTERS
42827 IRWIN DRIVE
HARRISON TWP., MICHIGAN 48045

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REPLACEMENT PARTS LIST

To meet warranty requirements, use only DME® parts.	
F1, F2, **Fuse**, 15 Amp, 250 Volt **The use of lower amperage fuses for increased protection is recommended.**	ABC15
Unlatch fastener, Plunger and Grommet	NYL0001
Power Rocker Switch, 16 Amp, 250 VAC	RPM0008
T1, Transformer, 240/120 Volt	RPM0009
U5, Triac Driver	RPM0010
Handle, 15 amp modules	RPM0027
R4, Flameproof Fusible link resistor **WARNING! DO NOT SUBSTITUTE**	RPM0050
Set point pushwheel switch assembly, on front panel.	RPM0053
Q1, Triac, 40 Amp, 800 Volt	RPM0054
S3, 3 position switch on front panel	RPM0055
F3, **Fuse**, 160mA, 250 V, Sub-miniature	RPM0090
IC2, Microprocessor, Pre-programmed, (DME proprietary software)	SSM0003

NOTE: If the microprocessor chip (replacement part number SSM0003) is replaced the module will require re-calibration.

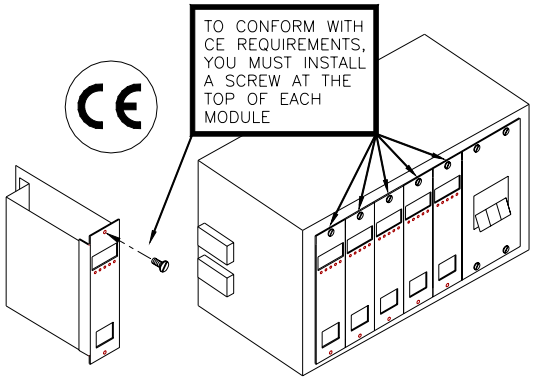

Figure 7 - European Conformity (CE) Requirement

COMMUNICATION CONNECTOR COMPATIBILITY

The Communication Connector strip in your mainframe allows communications to all the other modules in the mainframe. If the communications connector in your mainframe has pins 3 & 4 missing, you must order a new communication strip from D-M-E to allow the alarm feature in this module to function properly with a DME TAS module.

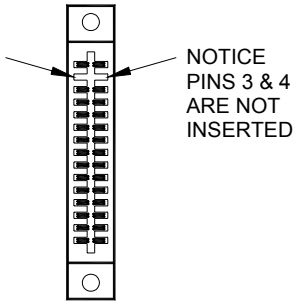

Figure 8 - Communication Connector Not Compatible

It will not work without these pins installed. The SSM-15-12 and the SSM-30-12 modules are also compatible with an older alarm module that is now obsolete, known as a TAF-15-G.

TRIAC GATE CUTOFF; POWER CONNECTOR COMPATIBILITY

The modules power output can now be inhibited until the module is fully seated into a mainframe zone connector, if an operator mistakenly inserts the module into the zone slot while under live power.

NOTE: This feature is meant as a safeguard to prevent damage to the copper fingers on the module, and by no means should the module be inserted or removed into a mainframe with live power present.

In order for this feature to operate, the zone power connector in the mainframe must have an exterminated pin installed in the third position of the connector. If this pin is missing, it can be ordered through D-M-E using replacement part RPM0046.
This feature can be enabled on the module by removing jumper J11 (Gate Cutoff), located near the modules power connector. (See figure 9)

NOTE: If J11 is removed, and the mainframe power connector pin is missing from position 3, the module will be unable to output any power until J11 is replaced.

EUROPEAN CONFORMITY (CE) REQUIREMENTS

This module is shipped with a 3MM x 10MM screw that is used to secure the module to a mainframe for the purpose of satisfying CE requirements. (see figure 7)
When the module is screwed down securely, this module is considered to be CE compliant.
Never remove or insert modules when mainframe circuit breaker is on.

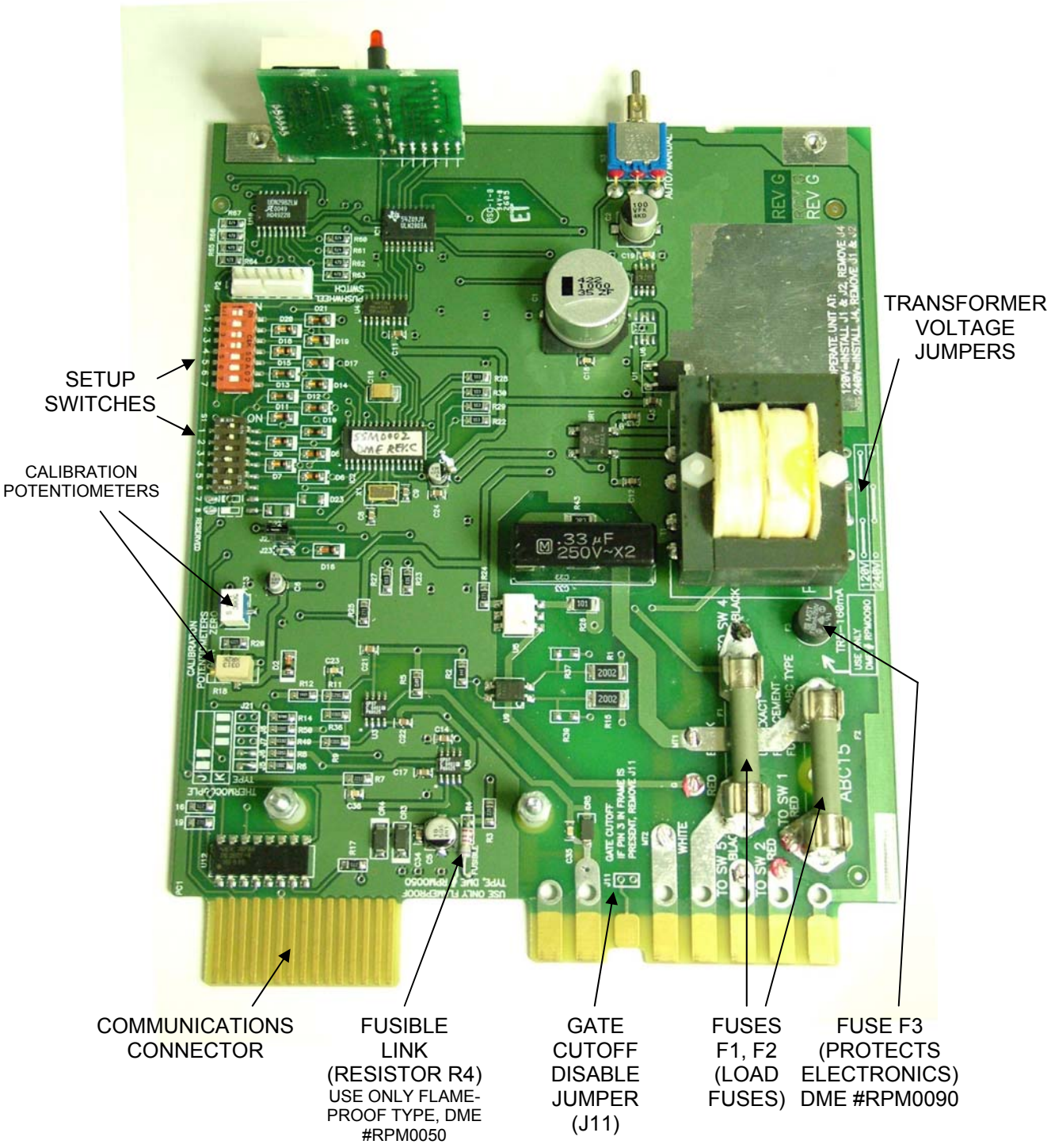

Figure 9 – SSM-15-12 Main Printed Circuit Board

APPROVAL

_____ SENIOR PRODUCT ENGINEER _____ DATE

_____ MANAGER OF ENGINEERING _____ DATE