

## TROUBLESHOOTING GUIDE

This guide covers the most common moulding problems and remedies.

Machine Setting Alterations	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
Bush / manifold temperature: increase	X	X			X	X			X	X		X		X		X
Bush / manifold temperature: decrease			X	X	X		X	X	X	X		X	X	X		X
Injection pressure: increase	X										X		X		X	
Injection pressure: decrease			X	X			X			X	X				X	
Injection speed: increase	X					X			X	X		X		X		X
Injection speed: decrease			X	X			X		X	X		X		X		
Packing pressure: increase														X		X
Packing pressure: decrease			X	X	X			X								X
Packing time: increase			X	X										X		X
Packing time: decrease	X				X		X				X			X		
Screw back pressure: increase						X				X						
Screw back pressure: decrease			X	X	X						X	X	X			
Melt decompression: increase			X	X	X											
Cooling time: increase			X	X			X						X	X		
Cooling time: decrease	X	X			X	X		X								
Mould temperature: increase	X	X							X	X						X
Mould temperature: decrease			X	X			X				X	X	X			
Damp material—dry it thoroughly			X			X			X							
Insufficient or blocked vents						X	X									X
Incorrect start-up procedure	X															X

System Faults	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
Gate diameter too small	X				X	X	X	X	X	X	X		X		X	
Gate diameter too large			X	X	X							X		X		
Gate blocked by contamination	X				X	X	X	X	X	X	X		X		X	
Gate land length excessive	X				X	X	X	X	X	X			X		X	
Heater failed or disconnected	X	X			X											
Thermocouple loose or faulty	X	X	X	X		X	X	X	X	X		X		X		X
Thermocouple connections reversed			X	X		X	X	X	X	X		X		X		X
Thermocouple wired to wrong zone	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Temperature controller unsuitable or faulty	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Excessive bush tip-to-mould contact	X				X	X			X					X		X
Excessive bush head-to-mould contact		X			X											
Bush tip damaged or worn	X				X	X	X	X	X		X					
Machine nozzle orifice too small						X	X		X	X	X		X		X	

# SENSITWIN BUSHINGS OPERATING MANUAL



Please Note: These instructions are given as a general guide. They may need to be adapted to suit your standard operating procedures, or the specific requirements of the part or polymer being moulded.

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## ELECTRICAL WIRING

All Sensitwin based bushings and manifolds supplied by Fast Heat are fitted with 240V heating elements and Iron-Constantan (Fe-CuNi, J-Type) thermocouples.

On each heater, the two larger insulated wires are for POWER connection.

The two smaller insulated wires are for THERMOCOUPLE connection.

The most common thermocouple colour codings are:

	<b>Britain</b>	<b>Germany</b>	<b>USA</b>	<b>International</b>
<b>Positive (magnetic)</b>	Yellow	Red	White	Black
<b>Negative (non-magnetic)</b>	Blue	Blue	Red	White

If a rear heater band has been supplied with the nozzle locator, it must be operated from a separate temperature controller, and must not be connected together with any other heater.

## TEMPERATURE CONTROLLER

ONLY use recommended temperature control equipment or poor moulding quality and premature heater failure may occur.

Fast Heat Conductor temperature controller features include:

- Automatic moisture sensing and bakeout (intelligent soft-start)
- Automatic faultfinding and diagnostics, to identify any heater or thermocouple faults.
- Automatic switching to the 'learned' % power level in the event of a thermocouple failure.

## START UP PROCEDURE—TAKING CARE EXTENDS HEATER LIFE

- Ensure your machine nozzle bore matches the entry bore of the bush or nozzle locator — a mismatch can create a dead-spot, resulting in polymer degradation and poor colour changing.
- Bring the machine nozzle into contact with the bush or manifold gently, and maintain contact during the 'soak' time with the nozzle heater on.
- Ensure the nozzle radius matches the bush or nozzle locator seating radius, or melt leakage may result.
- If your controller does not have an 'intelligent soft start', pre-warm the bush at 85°C for at least 15 minutes to bake out any residual moisture.
- Set the required moulding temperature and allow the bush to 'soak' for at least 5 minutes.
- You are now ready to start moulding. Always use natural polymer to initially fill the system if colour changes will be required later.

## SETTING MOULDING CONDITIONS

Since starting up a new tool often involves interrupted cycles, it is sometimes necessary to keep gate-area cooling to a minimum until a regular cycle is established, or gate freeze-off may occur. On occasion, the bush temperature may also have to be increased at initial start-up.

It is important to establish a regular cycle so that fine adjustments can be made to temperature, pressure, speed and time settings to produce good quality mouldings. Always make small adjustments one at a time, and wait for several cycles to observe the effects on the mouldings. Avoid cycle interruptions because they disturb this setting process.

## SAFETY PRECAUTIONS

To guard against the possibility of injury from hot polymer, do not work on or inspect the mould until the following steps have been taken.

- Step 1: Use melt decompression to depressurise the hot bush or hot runner system.
- Step 2: Retract the machine nozzle from the hot bush or manifold.

- Step 3: Drop the bush temperature by 100°C.

We also recommend the use of goggles and asbestos gauntlets as minimum protection when working on hot manifolds and bushes.

## ELECTRICAL SAFETY

This system operates at 240Volts. Ensure there is always an earth connection from the mould to the controller. It is also important to ensure that no water or oil can leak on to the heater elements, thermocouples or wiring.

## CYCLE STOPPAGES

In the event of a cycle stoppage exceeding 5 minutes (less with volatile polymers) we recommend the 3 steps described above are taken to prevent polymer degradation.

## CHANGING COLOUR

To aid colour changing, always initially fill the system with a natural colour polymer.

- Purge the machine barrel with a natural colour.
- Increase the bush temperature(s) by 40°C and stand for 5 minutes.
- Mould the natural colour through the system until the melt shows no colour streaks\*.
- Reduce the bush temperature(s) by 40°C and stand for 5 minutes.
- Begin moulding the new colour.

\*If colour streaks persist, split the tool to expose the bush tips and clean at least the first 25mm of polymer from them.

Never purge through the manifold system with the mould open.

## SHUTTING DOWN

Treat the hot bush system as an extension of your machine barrel, and follow the same shut-down procedures, as recommended by the polymer suppliers.

## RE-STARTING

Follow the START-UP PROCEDURE and start moulding at normal machine settings. In some cases, it is necessary to briefly increase the bush temperatures and / or reduce gate-area cooling in order to start moulding—reset to normal settings once the cycle is established.

## GATE ALTERATION

Refer to the Fast Heat catalogue for gate alteration details.

## REPLACING HEATERS & THERMOCOUPLES

Refer to the Fast Heat catalogue for detailed instructions.

## TECHNICAL SUPPORT

Contact your Area Representative, e-mail us at [tech-support@fastheatuk.com](mailto:tech-support@fastheatuk.com), or phone the Hot Runner Helpline on 01323-647375 ext 32.

## TROUBLESHOOTING GUIDE

Key to coding used in tables shown overleaf.

A	Gate freezing off	B	Bush inlet freezing off	C	Melt drooling from the gate
D	Melt stringing from the gate	E	Gate vestige too high	F	Excessive injection pressure or temperature required to fill cavity
G	Melt burning or degrading	H	Distortion around the gate	J	Surface defects opposite the gate
K	Silver streaks on part	L	Persistent flow lines	M	Persistent flash
N	Sink marks on part	P	Parts sticking	R	Weak weld lines
S	Repeated heater failures				