

Protection devices


This chapter describes protective devices provided with product. Alarm monitor indicator will show when any protective device becomes actuated, along with causes and remedies.


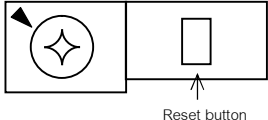








Be sure to investigate cause of abnormalities after cooled down for 5 hours after stopped operation. (Use gloves.)
Temperature is very high during operation and immediately after stopped, it is very dangerous.



When you got burned, cool that position immediately with pure cooled water and get medical attention.



- **Power breaker with SHT**
 When temperatures rise abnormally, power breaker will trip.
 When power breaker trips, check heater contactor (SSR) first.
- **Alarm monitor**

Alarm monitor display	Cause of abnormalities /interlock	Remedy
PUMP Reverse	[Abnormality] In case of power cord wires connection reversed or phase loss.	Turn OFF primary power supply, and exchange R phase wire (red) with T phase wire (black) to change to positive phase. ↓↓
	[Interlock] Machine becomes inoperable.	Turn ON the primary power supply again and check that “PUMP Reverse” is not displayed.
	[ALARM reset] Turn OFF primary power supply <div style="text-align: center;">NOTE</div> ALARM can be reset (alarm cancel) by pressing  key continually longer than 5 seconds. However, if reverse phase still occurs, ALARM will display again.	

Alarm monitor display	Cause of abnormalities /interlock	Remedy
<p>PUMP Overload</p>	<p>[Abnormality] In case of pump motor becomes overloaded, thermal relay tripped.</p> <p>[Interlock] Operation will stop automatically.</p> <p>※Possible causes of abnormalities :</p> <ul style="list-style-type: none"> ○ Excessive fastening of a valve. ○ Pump defective. ○ Pump motor defective. ○ Thermal defective. ○ Contamination in pump. <p style="text-align: center;">NOTE</p> <p>ALARM can be reset (alarm cancel) by pressing  key continually longer than 5 seconds. However, if thermal relay reset button is not being pressed, ALARM will display again.</p> <p style="text-align: center;">Figure 10.1</p> <p style="text-align: center;">Thermal relay</p>  <p style="text-align: center;">Reset button</p>	<p>Press  key to stop buzzer.</p> <p style="text-align: center;">⇓</p> <p>Shutdown disconnect switch or power breaker.</p> <p style="text-align: center;">⇓</p> <p>Eliminate causes of abnormalities.</p> <p style="text-align: center;">⇓</p> <p>Open front panel door and press thermal relay reset button.</p> <p style="text-align: center;">⇓</p> <p>Close front panel door and turn ON disconnect switch or power breaker.</p> <p style="text-align: center;">⇓</p> <p>Check that “PUMP Overload” is not displayed.</p> <p style="text-align: center;">⇓</p> <p>If operation is resumed by pressing  key, it means remedy has been completed.</p>

Alarm monitor display	Cause of abnormalities /interlock	Remedy
Medium Low Level	<p>[Abnormality] In case of medium level is lower than specified quantity.</p> <p>[Interlock] Pump will stop and moves to medium replenishment mode-but operation will be continued. When 「OPEN」 water supply valve, medium refill operation will be performed as it is and when medium quantity returns to specified quantity, operation will be resumed automatically.</p> <p>※Possible causes of abnormalities:</p> <ul style="list-style-type: none"> ○ Medium insufficient ○ Medium leaks ○ Foreign matter adhering to electrode ○ Water with electric conductivity less than 5.0 μS/cm such as pure water and distilled water cannot be used as a medium. ※In case of electrode type ○ Foreign matter adhering to floatless switch ○ Clogging of water supply strainer 	<p>Press  key to stop buzzer.</p> <p style="text-align: center;">↓</p> <p>Shutdown disconnect switch or power breaker.</p> <p style="text-align: center;">↓</p> <p>“CLOSE” water supply valve.</p> <p style="text-align: center;">↓</p> <p>Eliminate causes of medium level drop.</p> <p style="text-align: center;">↓</p> <p>Turn “ON” disconnect switch or power breaker.</p> <p style="text-align: center;">↓</p> <p>Medium Low Level is displayed by pressing  key.</p> <p style="text-align: center;">↓</p> <p>“OPEN” water supply valve. Medium supply (water supply) will be performed.</p> <p style="text-align: center;">↓</p> <p>When medium quantity returns to specified quantity, operation will be resumed automatically, it means remedy has been completed.</p>
Sensor Error	<p>[Abnormality] In case of sensor is disconnecting or sensor installation etc. is improper.</p> <p>[Interlock] Operation will stop automatically.</p> <p style="text-align: center;">NOTE</p> <p>ALARM can be reset (alarm cancel) by pressing  key continually longer than 5 seconds. However, if do not repair or change sensor, ALARM will display again.</p>	<p>Press  key to stop buzzer.</p> <p style="text-align: center;">↓</p> <p>Shutdowns disconnect switch or power breaker and check sensor connections and sensors. If abnormality is found, repair or change.</p>

Alarm monitor display	Cause of abnormalities /interlock	Remedy
<p>High Alarm</p>	<p>[Abnormality] In case of controlled temperature became higher than upper limit of set value due to cooling capacity balance of injection molding machine load and this machine is not good or cooling water shortage, water supply temperature was high etc.</p> <p>[Interlock] It will differ by operation selection conditions while upper limit alarm is occurring. When selecting <u>Continue</u>, operation will continue. When selecting <u>STOP</u>, it will stop.</p> <p>※Possible causes of abnormalities:</p> <ul style="list-style-type: none"> ○ Cooling water deficiency. ○ Cooling capacity deficient. ○ Failure of Drain solenoid valve. ○ Heater not powered off. ○ Malfunction of temperature controller. 	<p>Press  key to stop operation when changing solenoid valve, heater, or temperature controller.</p> <p style="text-align: center;">↓ ↓</p> <p>Please change parts after shut down disconnect switch or power breaker.</p> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> ● If upper limit alarm set value is "0," alarm will not be actuated. If set value is lower than 3°C, alarm may display upon temperature rise in normal operation under some using conditions.
<p>Low Alarm</p>	<p>[Abnormality] In case of controlled temperature became lower than lower limit of set value due to heating capacity balance of injection molding machine load and this machine is not good or heater failure etc.</p> <p>[Interlock] Operation will continue.</p> <p>※Possible causes of abnormalities:</p> <ul style="list-style-type: none"> ○ Heating capacity deficient. ○ Solenoid valves left open. ○ Heater not powered on. ○ Malfunction of temperature controller. 	<p>Press  key to stop operation when changing solenoid valve, heater, or temperature controller.</p> <p style="text-align: center;">↓ ↓</p> <p>Please change parts after shut down disconnect switch or power breaker.</p> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> ● If lower limit alarm set value is "0," alarm will not be actuated. If set value is lower than 3°C, alarm may display upon temperature drop in normal operation under some using conditions.

Alarm monitor display	Cause of abnormalities /interlock	Remedy
Data Error	<p>[Abnormality] In case of abnormality occurred with Control panel (MR16).</p>	<p>Press  key to stop buzzer.</p>
RAM Error	<p>[Interlock] Operation will stop automatically.</p>	<p style="text-align: center;">↓</p>
PV Error	<p>※Possible causes of abnormalities: Data Error, RAM Error ○ Board defective PV Error ○ Temperature sensor defective ○ Board defective</p>	<p>Change controller (MR16) after shutdown disconnect switch or power breaker.</p> <p>Contact our service division for inspection and replacement.</p>
PV display FFFF flashing	<p>[Abnormality] In case of temperature sensor switched to mold side when mold sensor is not installed.</p> <p>[Interlock] Operation will stop automatically.</p>	<p>Install mold sensor or use after changed temperature control sensor to medium side.</p>
PV display actual temperature flashing	<p>[Abnormality] In case of medium temperature was over than upper limit value.</p> <p>※Upper limit value L type : 95°C H type : 120°C</p> <p>[Interlock] Operation will continue.</p> <p>※Possible causes of abnormalities: ○ Overshoot</p>	<p>When overshoot, if temperature control becomes stable, it will be cancelled automatically.</p> <p style="text-align: center;"></p> <p>In case of temperature is going up, capacity is not enough. Please stop machine operation.</p>