DIGITAL KNIGHT

Digital Controller Instructions

Version 302

Contents

Normal Operation

Normal Operating Mode

The normal operating mode of the press will display the current actual Temperature at the top of the screen and the time setting or elapsed time below the temperature.

The right side the screen will indicate the heating status by stating HEATING, READY, both of those words, or none at all, depending on if it is cooling down or heating up to the set temperature. READY is shown only if the current temperature is within 5 degrees of the set point temperature.

The right side of the screen will also indicate the timing status by stating OPEN, TIMING or DONE. The DONE indicator may remain on in some cases until the press is opened back up.

If the pressure feature is enabled, the pressure bar graph will show the last known pressure exerted when the press was closed.

Setting Temperature

From the normal operating mode, simply press the TEMP key to set the temperature.

The flashing 3-digit number is the temperature setting (not the current temp). Use the Arrow Keys to set the desired temperature. Press both Arrow Keys together to set it to 350°F.
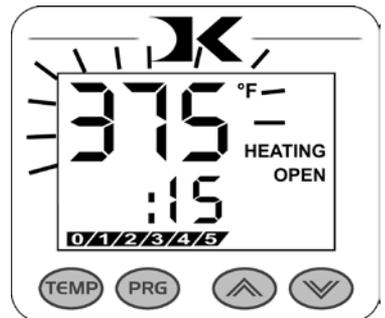
Press TEMP again to lock in the setting. The control will return to the normal operating mode after 10-15 seconds if TEMP is not pressed.   3

Setting Time

From the normal operating mode, simply use the Arrow Keys ONLY to set the time. Do not touch the PRG key.

Hold down either the Up or Down arrow key for more than 2 seconds and the time will increase rapidly. Press BOTH Arrow Keys and the time will reset to 00 seconds.

Pre-Press Timer

There is a second timer available for use, called the "Pre-Press Timer". This feature is useful if a multiple-step process is performed.

For example: If a product must be pre-pressed for 5 seconds before a main pressing cycle of 20 seconds, the Prepress timer can be set for 5 secs, and the main timer for 20. When the operator closes the press, the 5-sec time counts down. When the operator opens the press, the time setting switches to 20 seconds.

The word PREPRESS will be displayed next to the 2nd pre-press time setting when it is active. To set the pre-press time, simply use the Arrow Keys to set the time. If PREPRESS is not displayed next to the time, quickly close and then open the press to switch to the prepress time.

To turn on the prepress timer feature, enter the User Options Menus and go to the PPR setting and turn it ON. (See page 9, then page 15)

Operator Lockout

An operator lockout feature is available to the owner of the press. This prevents the average user from changing any settings or adjusting anything on the controller.

Contact the factory for instructions on using this feature.

ERR Mode

During operation of the press, if there is a loss of signal from the temperature sensor wire, the ERR display will appear.

This is a safety feature that will shut off the relay so the press will not overheat aimlessly without a temperature signal.

Once the temperature signal is restored (no longer broken, or plugged back into the control) the press will resume the temperature display, and start heating if necessary. If ERR persists, contact support.

Over-Temp Alarm

If the press heats beyond the set temperature by 40 degrees or greater, the OverTemp alarm will sound.

This is a safety feature that warns the operator of a possible thermal run-away of the press. This means the press relay may be locked in a heating position where it will never stop heating, to a possibly harmful temperature level.

If the OverTemp alarm sounds, turn off the press and let it cool off to room temperature.

Turn the power back on and immediately set the temperature to a low setting like 200°F. Wait for the press to heat up. When the press displays "READY", monitor the temperature and see if it continues to heat to a level that the OverTemp alarm activates again. If so, contact support.

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Programmable Presets

How Presets Work

There are 70 programmable presets in the controller. The operator can store a Temperature, Time, Prepress Time, and Pressure setting in each preset.

When a preset program is loaded by the operator, the Current Temperature Setting, Time and Prepress Settings (if there is a Prepress setting in that preset) are updated in the normal operating mode.

The pressure is NOT set for the operator mechanically. A brief display of the pressure value in the preset is shown while updating the current settings. This is simply a reference... a reminder of what pressure setting the operator must adjust for that preset.

There are 2 main functions to using the presets. LOADING and EDITING the preset. LOADING a preset simply means selecting a desired preset, and returning to the normal operating mode where the current settings are changed. EDITING a preset is when the operator actually changes the preset's settings.

Loading a Preset

To enter the presets, press the PRG key.

SET will display on the screen.

Use the Arrow Keys to select a preset from 00 to 70.

Press PRG to return to the normal operating mode. The current active Temperature, Time & Prepress time settings (if there is a prepress setting in that preset) are now updated with the presets values.

6
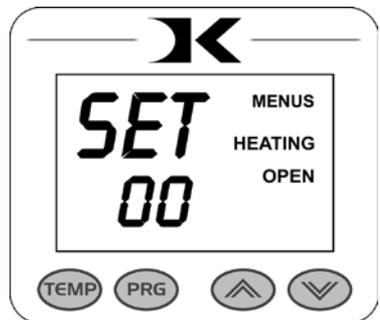
Editing/Programming a Preset

To edit a preset and change it's values to your own desired settings, you simply use the TEMP key while in the SET preset mode.

From the normal operating mode, press the PRG key. SET displays on the screen. Use the Arrow Keys to select the preset # you wish to edit.

Press the TEMP key. The temperature will flash. Use the Arrow Keys to set the temperature for that preset.

Press the TEMP key. The time will flash. Use the Arrow Keys to set the time for that preset.

Press the TEMP key. The Prepress time will flash. Use the Arrow Keys to set the Prepress time. Set the Prepress time to 00 if only one timer is to be used for that preset. Setting Prepress to 00 will disable the Prepress feature.

Press the TEMP key. The Pressure reference value will flash. Use the Arrow Keys to set the pressure for that preset. This will display 0 to 9 for presses configured for Bar Graph Pressure readout, and will display 0:00 to 10:00 for presses configured for a Height Gauge readout.

Press the TEMP key. The screen returns to the preset #. Press PRG to return to the normal operating mode, or use the Arrow Keys to select a different preset and edit that as well.
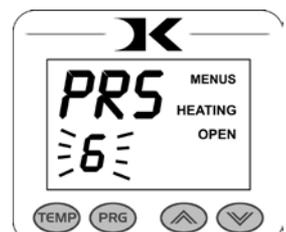
A Walkthrough Tutorial for using Presets

Here is a tutorial of programming 2 different presets, and then an example of using them in normal daily operations. Do this walkthrough to practice using presets.

Part 1: <u>Programming</u> 2 different presets.

From the normal operating mode, press PRG. SET appears.
Use the arrow keys to select SET 01.
Press TEMP. Set the flashing temperature to 400 with the arrow keys.
Press TEMP. Set the flashing time to 45 with the arrow keys.
Press TEMP. Set the flashing Prepress time to 00 with the arrow keys.
Press TEMP. Set the flashing Pressure ref to 6 with the arrow keys.
Press TEMP. Use the arrow keys to select SET 02.
Press TEMP. Set the flashing temperature to 350 with the arrow keys.
Press TEMP. Set the flashing time to 12 with the arrow keys.
Press TEMP. Set the flashing Prepress time to 3 with the arrow keys.
Press TEMP. Set the flashing Pressure ref to 8 with the arrow keys.
Press TEMP. Press PRG to leave the preset mode.
Presets SET 01 and SET 02 have now been programmed.

Part 2: <u>Loading</u> the presets. Let's say we are powering on the machine and starting a job. The first job will need to use preset 01, and later on the next job will need preset 02.

From the normal operating mode, press PRG. SET appears.
Use the arrow keys to select SET 01 then Press PRG. Done!
The press is now set for 400°F and 45 seconds and will start to heat to that temperature. When leaving the presets, the screen briefly displayed PRS 6 - indicating you must manually set the clamping pressure so the bar graph shows 6 (or close to it) at the bottom of the screen.

Now let's change to the next job. Press PRG. SET appears.
Use the arrow keys to select SET 02 then Press PRG. Done!
The press is now set for 350°F, 12 secs, 3 prepress, and you are reminded to set the pressure heavier to 8 on the bar graph display (when closed).

That's it! You can load a preset as often as needed: just press PRG, pick the preset you want with the Arrow Keys, and press PRG again.

User Menus

Entering the user menus & options

There are many useful features beyond simply setting time & temperature, and storing presets. All of these additional features are available to the operator in the User Menus.

To access the user menus, simply press TEMP & PRG at the same time from the normal operating mode and let go.

(Try to use two hands and press the keys at the exact same time. If one key is pressed too early from the other, the temperature setting or preset modes may be activated instead. Turn the press off and then on and try again.)

Fahrenheit / Celsius

The current and set temperature can be displayed in °F or °C. After entering the user menus (see above), use the arrow keys to select F or C. Press PRG to move to the next menu item.
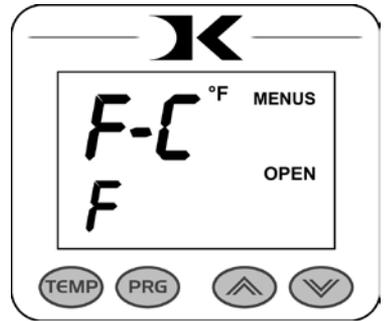
Timer Counter Units

The timer and Prepress timer can be set for mins/secs (default) or hours/mins. If special applications need a higher timer range than 99 mins, 59 secs, this can be changed. After entering the user menus (see top of page), Press PRG until CNT displays. Use the arrow keys to select SEC or HR. Press PRG to move to the next menu item.
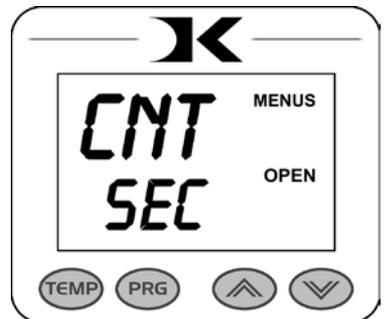
Recorded Pressings Odometer

There is an "odometer" that records pressing cycles done. This can be cleared and reset to 0 at any time when needed. The figure scrolls and it's beginning and end are separated by a "-" sign.

After entering the user menus (see top of page 9), Press PRG until REC displays. Use the arrow keys to reset the counter to 0. Press PRG to move to the next menu item.

Pressings Countdown Odometer

There is a second type of "odometer" that counts down the number of pressing cycles from a set amount.

After entering the user menus (see top of page 9), Press PRG until CTD displays. Use the arrow keys to set it ON or OFF.

When this feature is ON - the normal countdown timer display is replaced by this odometer instead. The arrow keys no longer adjust the countdown timer, but instead are used to set the countdown odometer. When OFF, the timers are visible.

The timer & prepress timer (if ON) still operate. However they are not visible. Instead, at the end of every main timing cycle (but not prepress), the odometer decreases by 1. This way, the opreator can keep track of how many pressings are left to do, without checking the REC menu.

This feature is useful when a specific amount of pressings must be performed, and the operator must be aware of how many pressings are remaining. Simply use the arrow keys to adjust this value in the normal operating mode (just like they are normally used to change the time). This value will automatically decrease at the end of each timing cycle.

10   Press PRG to move to the next menu item.

Pressure Menus

The PRO/PMX/PRL/PRH/PRR menu items are for model-specific pressure gauge features. Refer to the specific heat press manual for instructions on these. Press PRG to move to the next menu item.

Temperature Drop Sense

The press can be set to alarm if the temperature drops a certain range below the set temperature. This is useful to warn the operator if the press is too far out of temperature range during excessive use.

After entering the user menus (see top of page 9), Press PRG until DRP displays. Use the arrow keys to set it to OFF (default), or 10, 20, 30, etc.

If the current temperature drops below the set temperature by that many degrees, and alarm will sound. Press TEMP to silence the alarm.

Press PRG to move to the next menu item.
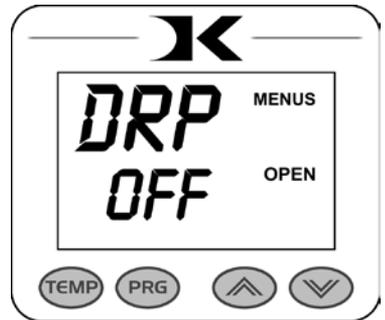
Temperature Drop Sense Timer Disable

The press can be set to disable the timer if the temperature drops a certain range below the set temperature. This is useful especially on automatic presses to "freeze" the operation of the machine if the temperature is below useful range.

After entering the user menus (see top of page 9), Press PRG until DTD displays. Use the arrow keys to set it to OFF (default), or 10, 20, 30, etc.

If the current temperature drops below the set temperature by that many degrees, the timer will not operate, and therefore on an automatic press, the press will not activate. The press will "unfreeze" once the temperature is within set point by the value selected or less.

For Example - DTD is set for 20. The temperature setting is for 400. As long as the current actual temperature is higher than 380, the timer (and automatic activation if the press is automatic) will operate normally. If the temperature drops to 380 or below, the timer will not start, and on automatic presses, the press will not activate. Set to OFF to disable.

Press PRG to move to the next menu item.

Keypad Beeper

The keypad beep can be silenced if needed.

After entering the user menus (see top of page 9), Press PRG until BEP displays. Use the arrow keys to set it to ON or OFF.

Press PRG to move to the next menu item.

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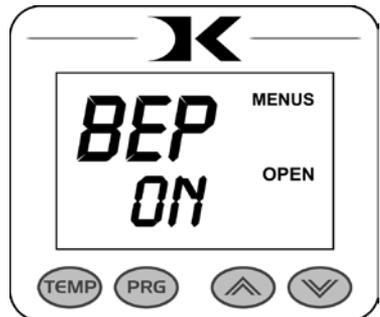
Alarms

The timer alarm can be adjusted for different beeping patterns. This can differentiate between multiple presses, and allow the operator to have a short beep or a continuously repeating beep.

After entering the user menus (see top of page 9), Press PRG until ALR displays. Use the arrow keys to set it to OFF, or 1 through 10.

Press PRG to move to the next menu item.

• denotes a short beep.

_ denotes a longer beep.

~ denotes infinite loop.

Alarm #	Alarm Pattern
Off	No alarm
01	• • • _
02	• • • _ ~
03	• • _
04	• • _ ~
05	• • •
06	• • • ~
07	_ ~
08	_
09	•
10	• (shorter)

Finished Warning Beep

The press can sound a beep on the last 3 seconds of the timer or Prepress timer countdown. This is useful if the press is automatic and the operator needs a warning that the press is about to finish, open, or pop-up dramatically.

After entering the user menus (see top of page 9), Press PRG until FWB displays. Use the arrow keys to set it to ON or OFF.

Press PRG to move to the next menu item.

Prepress Timer

The press can cycle back and forth between two distinct timer settings: the normal countdown timer, and a 2nd Prepress timer. (see page 11 & 12). This menu item turns the Prepress timer ON or OFF.

After entering the user menus (see top of page 9), Press PRG until PPR displays. Use the arrow keys to set it to ON or OFF.
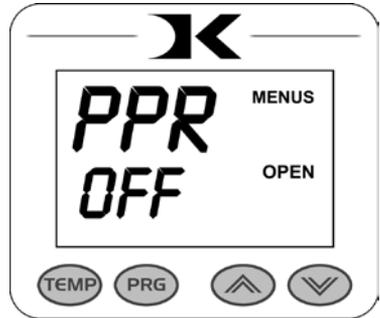
If PPR is set to OFF, pressing PRG will return to the normal operating mode.

If PPR is set to ON, pressing PRG will move to the next menu item.

Prepress Alarms

The Prepress timer alarm can be adjusted for different beeping patterns. This allows for differentiateing from the normal timer, and can allow the operator to have a short beep or a continuously repeating beep.

After entering the user menus (see top of page 9), Press PRG until AL2 displays. The PPR menu must be set to ON for this menu to be visible. Use the arrow keys to set AL2 to OFF, or 1 through 10.

Press PRG to return to the normal operating mode.

- • denotes a short beep.

- _ denotes a longer beep.

- ~ denotes infinite loop.

Alarm #	Alarm Pattern
Off	No alarm
01	• • • _
02	• • • _ ~
03	• • _
04	• • _ ~
05	• • •
06	• • • ~
07	_ ~
08	_
09	•
10	• (shorter)

Digital Knight
Heat Press Wiring Diagram

White

Black
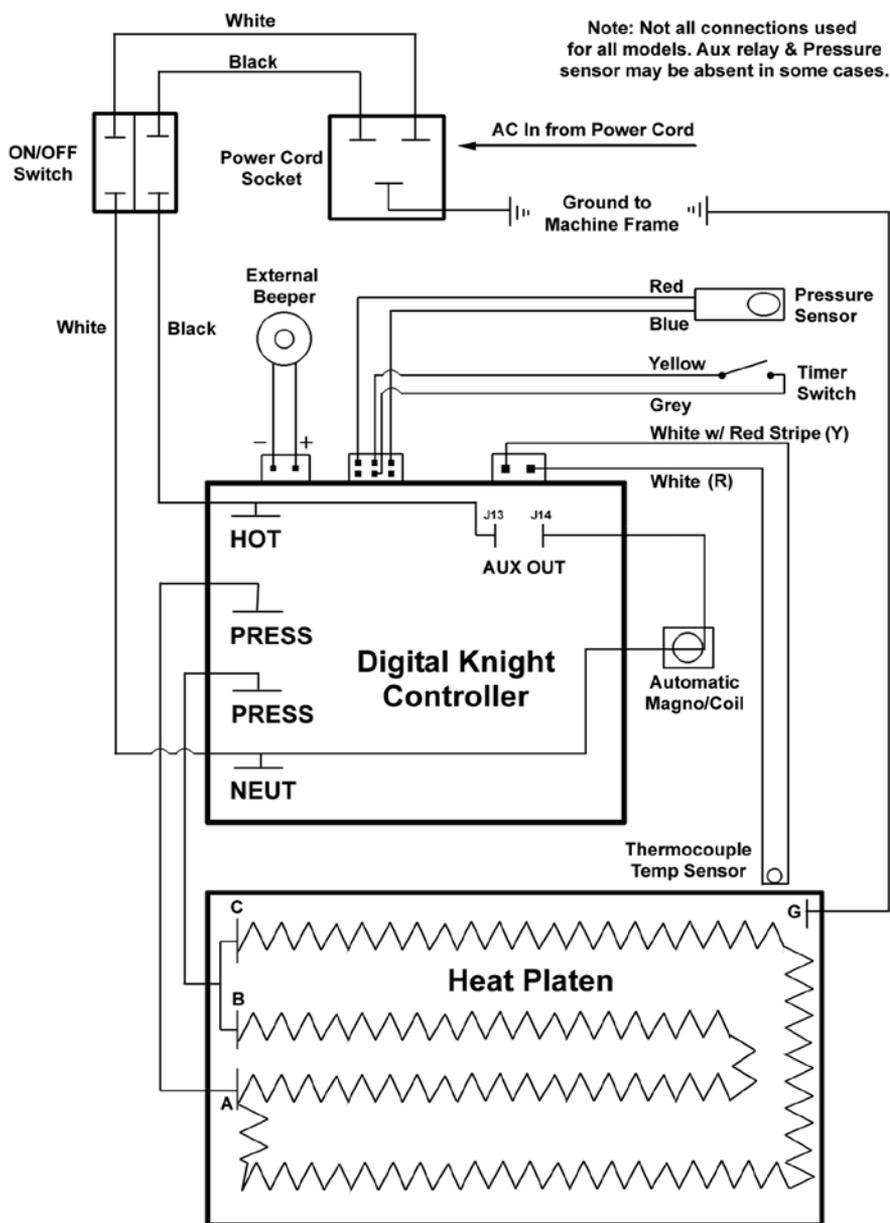
Note: Not all connections used
for all models. Aux relay & Pressure
sensor may be absent in some cases.

ON/OFF
Switch

Power Cord
Socket

AC In from Power Cord

Ground to
Machine Frame

External
Beeper

White   Black

Red   Pressure
             Sensor
Blue

Yellow   Timer
              Switch
Grey

White w/ Red Stripe (Y)

– +

White (R)

HOT

J13   J14

AUX OUT

PRESS

Digital Knight
Controller

Automatic
Magno/Coil

PRESS

NEUT

Thermocouple
Temp Sensor

C   G

Heat Platen

B

A

110V wiring shown
One power lead to A
Other power lead to B & C joined

For 220V, connect power
leads to B & C, leave A empty