Digi-Max D1000

Operating Instructions / Mounting Instructions

Espar

COMPONENTS

▷	**Right button**
◁	**Left button**
▦	**Sensor**
◎	**Green LED – Heater enabled**
▣	**ON/OFF Key**
·	**Service / Maintenance button**
◉	**Red LED – Heater requires attention**

Espar Products, Inc.

(800) 387-4800
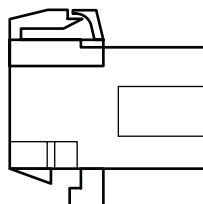(905) 670-0960
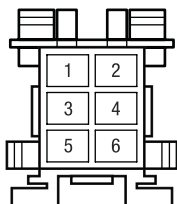(905) 670-0728 Fax

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WIRING

PIN CONNECTIONS

CONTROLLER		HARNESS
Red	Connect to pin 1	Red,+ Power
Yellow	Connect to pin 2	Yellow, ON/OFF
Brown/White	Connect to pin 3	Brown/White Ground Reference
Grey/Red	Connect to pin 4	Grey/Red Temperature setpoint
Grey*	Connect to pin 5	Grey Temperature sensor
Blue/White	Connect to pin 6	Blue/White Diagnostic

* The grey cable is an optional connection for external temperature sensor, see heater technical description manual.
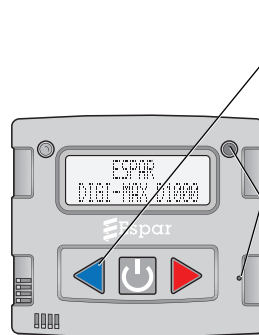

Side View	Cable Entry View (Rear View)

EXTERNAL CONTROL
Controller may have an optional violet wire.

The controller has an input which can be used by external devices such as timers, remote controls, etc. Positive signal on the external control wire enables the heater, removing the voltage disables the heater.
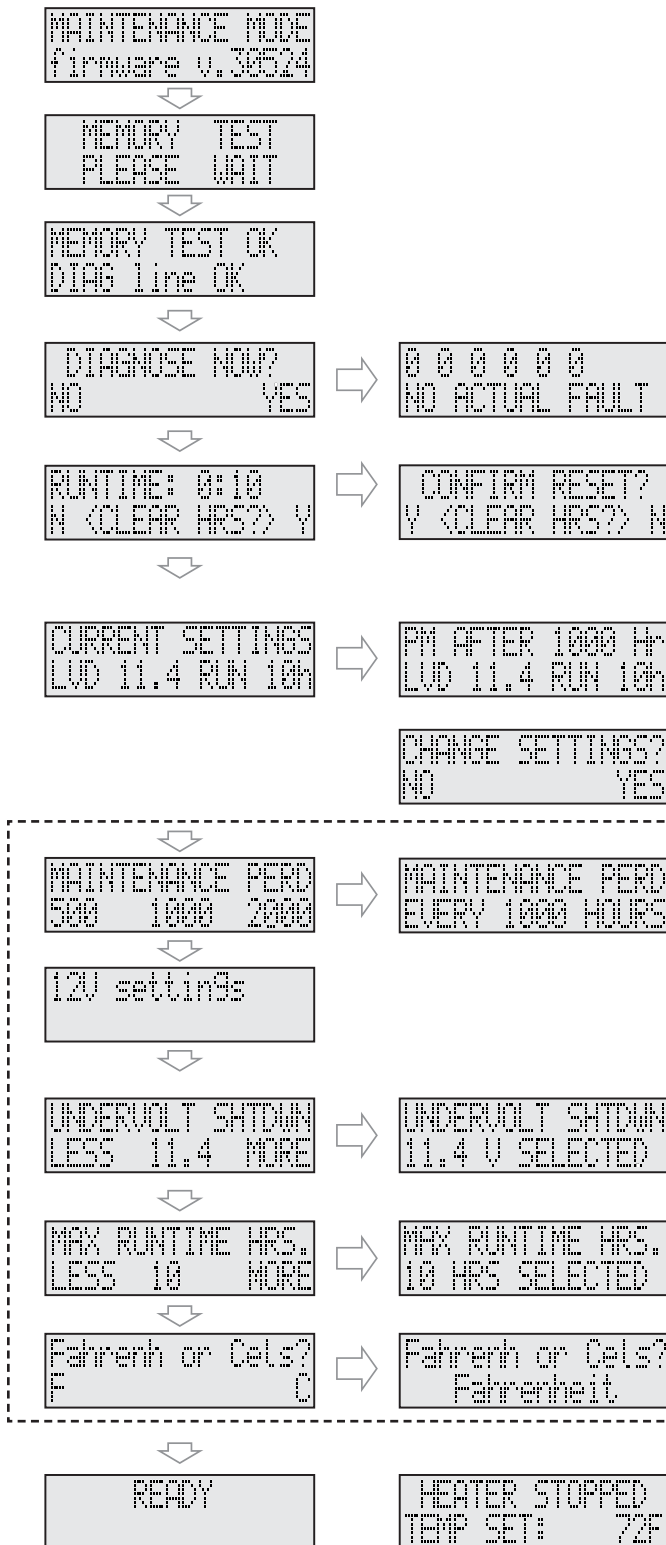
When voltage is applied to the external control wire and the heater is operating, "EXTERNAL START" is displayed.

The external control wire and the power button can override each other. If the heater was started by an external device, it can be stopped by the power button. Alternatively, if the heater was started by the power button, it can be stopped by applying and removing the external control signal. "EXTERNAL START" is displayed regardless of the starting method when power is applied to external control wire.

SET-UP/DIAGNOSTIC MODE

For first time power-up or switching between 12V to 24V, or vice versa, the controller will automatically switch to Setup/Maintenance/Diagnostic mode. For normal operation "READY" is displayed and the controller switches to idle mode.

MANUALLY ACCESSING SET UP/DIAGNOSTIC MODE

Press and hold the left button, press and release the service button (insert a clip on the pin hole). Keep holding left button.

The two LED (green and red) will blink once, then in about two seconds a solid red light comes on.

Once you have the solid red light, release the left button.
The LCD screen will then go to the Diagnostic Mode.

ALTERNATIVE PROCEDURE
Press and hold left button when connecting power to controller the controller to enter SETUP/MAINTENANCE/DIAGNOSTIC mode.

▪ **PLEASE NOTE!**
Pressing the service button alone or disconnecting and reconnecting power from the controller does not reset settings to factoy defaults. Once configuration is saved into the memory, settings can only be changed when set-up/diagnostic mode is activated or if the controller is moved from 12 to 24 volt system or vice versa.

SET-UP/DIAGNOSTIC MODE continuation...   SET-UP/DIAGNOSTIC MODE

```
MAINTENANCE MODE
firmware v.30524
```

```
  MEMORY   TEST
  PLEASE   WAIT
```

```
MEMORY TEST OK
DIAG line OK
```

Controller goes into the Maintenance mode and checks the memory's validity. It also checks the diagnostic line and displays "DIAG line OK" or "CHECK DIAG line!". If diagnostic line is not OK, diagnostic feature is disabled.

```
 DIAGNOSE NOW?
 NO        YES
```
⟹
```
 0  0  0  0  0
 NO ACTUAL FAULT
```

It prompts you if you want to diagnose the heater. If selected, fault codes are displayed for about 10 seconds, then a prompt for erasing codes appears. If erase option is selected, fault codes will be erased and diagnostic menu appears again, so the codes may be read again or skip to next menu.

```
RUNTIME: 0:10
N <CLEAR HRS?> Y
```
⟹
```
  CONFIRM RESET?
 Y <CLEAR HRS?> N
```

Runtime counter value is saved in memory (power independent). If the value is not equal to zero, an option to reset the counter is displayed, a confirmation follows if you choose to clear runtime.

```
CURRENT SETTINGS
LVD 11.4 RUN 10h
```
⟹
```
PM AFTER 1000 Hr
LVD 11.4 RUN 10h
```

To change stored settings, access the Set-Up/Diagnostic Mode where the controller will prompt you to "CHANGE SETTINGS?"

```
CHANGE SETTINGS?
NO           YES
```

If yes, controller goes to changing the settings (dotted box).
If no changes, then controller goes to ready/idle mode (skip dotted box).

```
MAINTENANCE PERD
500   1000  2000
```
⟹
```
MAINTENANCE PERD
EVERY 1000 HOURS
```

Confirm runtime hours for maintenance period. Pressing button beneath value will confirm selection (e.g. right button - 2000 hrs.). Default value is 1000 hrs.

```
12V settings
```

Digi-Max measures system voltage and presets for 12 or 24 Volt systems. If measured voltage exceeds 17 V, then 24 V system is assumed.

```
UNDERVOLT SHTDWN
LESS  11.4  MORE
```
⟹
```
UNDERVOLT SHTDWN
11.4 V SELECTED
```

Select under voltage shutdown threshold. Press left or right arrow buttons to increase or decrease value by 0.1V. Default value is 11.4V.

```
MAX RUNTIME HRS.
LESS  10    MORE
```
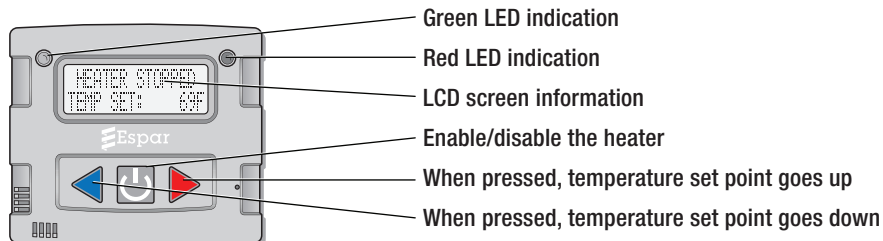⟹
```
MAX RUNTIME HRS.
10 HRS SELECTED
```

Maximum runtime value can be adjusted by pressing left or right arrow buttons to increase or decrease by 1 hour. Default value is 10 hrs. Values are from 1- 24 hrs – less than 1 or above 24 will change runtime into UNLIMITED (continous run).

```
Fahrenh or Cels?
F             C
```
⟹
```
Fahrenh or Cels?
   Fahrenheit
```

Menu for choosing the temperature display in "Fahrenheit" or "Celsius". Default will be in Fahrenheit.

```
     READY
```
```
HEATER STOPPED
TEMP SET:    72F
```

After going through these settings, the configurations are then saved in the controllers memory.

Settings are unaffected by just pushing the rest button or unplugging the controller. It could only be changed when going through the Set-up/ Diagnostic mode or by applying a different voltage (e.g. 12V to 24V or 24V to 12V).

IDLE/RUN MODE

Green LED indication
Red LED indication
LCD screen information
Enable/disable the heater
When pressed, temperature set point goes up
When pressed, temperature set point goes down

LCD: HEATER STOPPED / TEMP SET: 69F

NO FAULT CONDITION
IDLE MODE

```
HEATER STOPPED
TEMP SET:     69F
```

Middle button ENABLES the heater. GREEN LED light enabled.

Green "ON"

```
HEATER ENABLED
10:00   SET:   69F
```
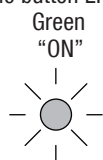
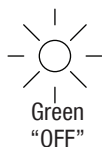Temperature setpoint
Runtime left until shutdown

Left button pressed ◁

```
HEATER ENABLED
09:01   SET:   68F
```
```
HEATER ENABLED
09:01   SET:   67F
```

Right button pressed ▷

```
HEATER ENABLED
09:00   SET:   69F
```
```
HEATER ENABLED
09:00   SET:   69F
```

Pressing the Middle button again DISABLES the heater. GREEN LED light disabled.

Green "OFF"

```
HEATER STOPPED
TEMP SET:     69F
```

VOLTAGE TRESHOLD

Green "ON"

```
HEATER ENABLED
10:00   SET:   69F
```
⇒
```
HEATER ENABLED
10:00   SET:   69F
```
⇒
```
LOW VOLTAGE 11.3
9:55   SET:   69F
```

Red "ON"

⇓

```
LOW VOLTAGE STOP
TEMP SET:     69F
```

Green OFF"

During heater operation, the controller monitors system voltage and stops heater if voltage drops below pre-programmed value and stays below for 10 minutes (factory default 11.4 Volt). After 5 minutes of undervoltage condition the RED LED comes on and a warning is displayed.
After 10 minutes controller stops the heater and displays "LOW VOLTAGE STOP" message which remains on screen until next start.

WITH FAULT CONDITION
Middle button ENABLES the heater. GREEN LED light enabled.

Green "ON"

```
HEATER ENABLED
10:00   SET:   69F
```

Red "ON"

```
HEATER ENABLED
09:00   SET:   69F
```
```
48 48 0 0 0 0
CHECK FUEL PUMP
```

When fault is detected GREEN LED turns off and RED LED enabled.

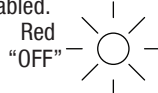The screen is alternately displayed until the Middle button is pressed.

```
48 48 0 0 0 0
CHECK FUEL PUMP
```

Actual and previous faults
Short description of the actual fault

Pressing the Middle button DISABLES the heater. RED LED light will then be disabled.

Red "OFF"

```
HEATER STOPPED
CHECK HEATER 69F
```
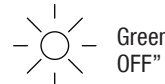
CHECK HEATER indication

■ **PLEASE NOTE!**
Voltage shown in the controller is voltage detected at controller (internal circuit), not battery voltage.

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IDLE/RUN MODE Continuation...

If an actual fault is detected, the controller switches between displaying regular information and fault codes. The heater is still enabled so if the issue is not critical and heater's controller does not stop the heater, Digi-Max allows it to run.

```
    CHECK HEATER
09:58  SET:   66F
```

```
48 48 0 0 0 0
CHECK FUEL PUMP
```

```
  HEATER STOPPED
MAINTENANCE REQD
```

If a fault code is detected, and once the heater is restarted, a "CHECK HEATER" message appears indicating the heater registered a fault in the previous run.

If runtime counter exceeds pre-programmed maintenance limit, "MAINTENANCE REQUIRED" is displayed on the screen. This is only a reminder, the heater is still functional.

TEST MODE

To test button response and led lights, test mode can be accessed by pressing and holding all three buttons then pressing and releasing the service button. Follow the instructions for the button test (press and hold each button to see a response from the controller):
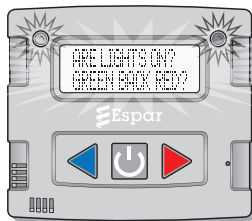
Button 1 - Left Button
Button 2 - Power Button
Button 3 - Right Button

```
  TEST COMPLETED
```

Once the test is complete, "TEST COMPLETED" is displayed. Press and release the service button to return controller to normal function.

DRILLING TEMPLATE

(65.5 mm)
(2.58")

(44 mm)
(1.73")

(16 mm)
(0.63")

57.66 mm
(2.27")

20 mm
(0.79")

2 x Ø 7.5 mm (1/4") FIXING S FOR
ESPAR CONTROLLER LUGS

Ø 9.5 mm (3/8") FIXING
FOR CABLE ENTRY HOLE

SECTION A-A