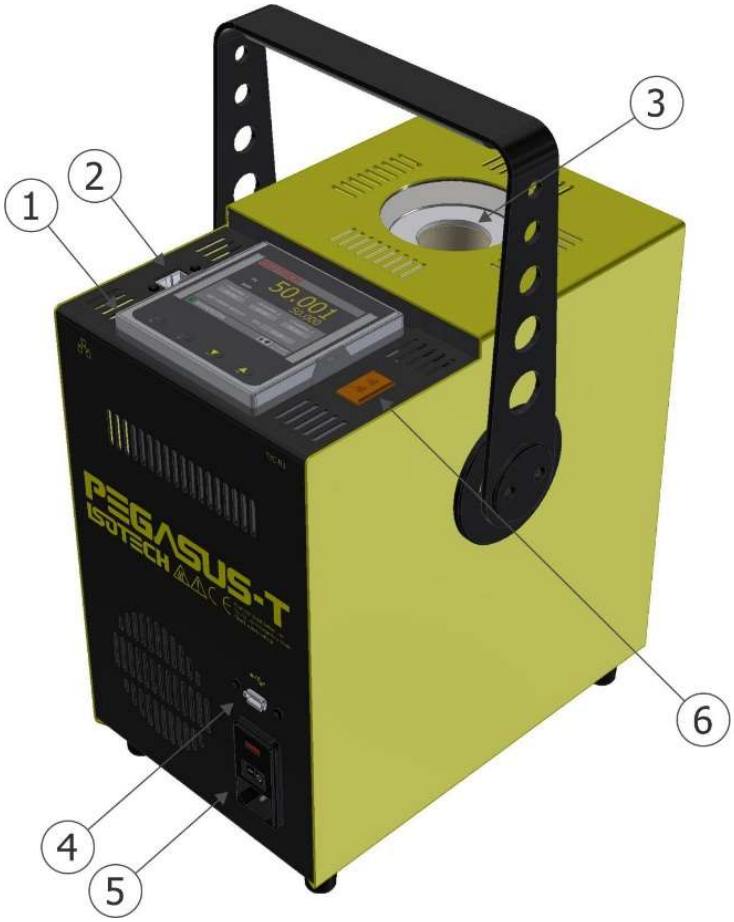
Addendum

Pegasus 853T version



1. **Main controller**
2. **Network connection**
3. **Thermal well**
4. **USB port**
5. **Power entry and fuse location**
6. **Type R thermocouple socket input**

Fig.1

Additional features incorporated February 2019:

This equipment now contains three control sensors. The immersion depths are distance from the top of the furnace, 25mm, 35mm and 50mm.

The user can define which control sensor is to be used to control the process. For example, if the process is to test 25mm sensor, then the user can define the 25mm immersion depth control sensor. This will allow much more control over the temperature of the heater wires at the process temperature.

We have also installed additional features such as Hours meters (both visible and not visible), drop dead alarm at 1230°C and a minimum setpoint values of 150°C.

Please see the new layout for the User access page below and the description of the function below that.

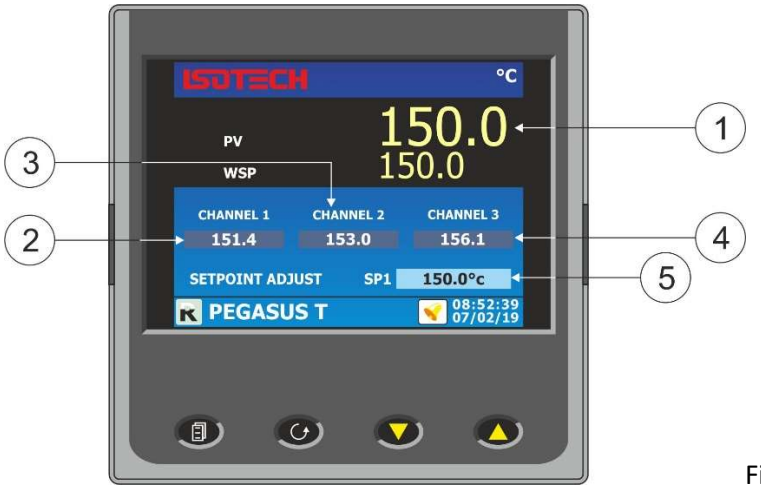


Fig.2

Display description:

1. **Main PV** – This is the 25mm immersion control sensor
2. **Channel 1** – This is the Reference sensor that can be plugged into the Type R socket indicated above. Note – this will only accept type R thermocouples and no other type as there is no external cold junction compensation installed on this version of the Pegasus
3. **Channel 2** – This is the 35mm immersion control sensor
4. **Channel 3** – This is the 50mm immersion control sensor
5. **SP1** – This is the setpoint select for all control sensors

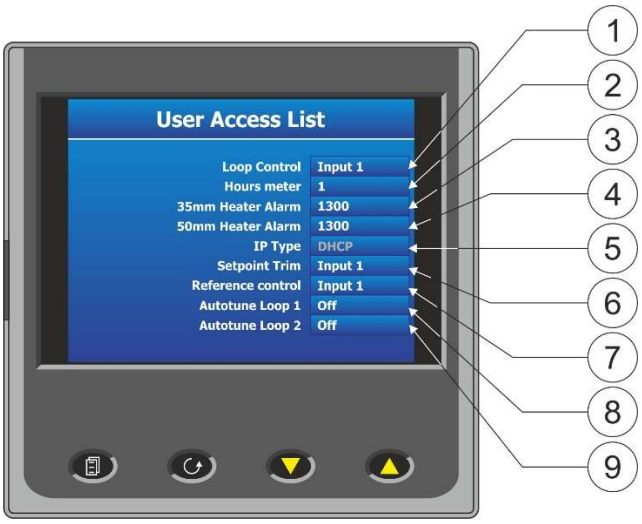


Fig.3

Function description:

1. **LOOP CONTROL –** This allows the user to define which sensor is controlling the process. To change the control sensor, follow the procedure below. The sensor temperature is indicated on the image Fig.3 above
    - **a.** Scroll to LOOP CONTROL and press SCROLL to access
    - **b.** Select the desired control sensor depth using the up/down buttons
        - **i.** Input 1 = 25mm immersion
        - **ii.** Input 2 = 35mm immersion
        - **iii.** Input 3 = 50mm immersion
    - **c.** Press select to enter
    - **d.** Follow the control temperature using the relevant display box indicated above.

2. **Hours meter –** This box indicates the hours of use to indicate heater life. The meter is triggered when the heater temperature is above 100°C. The value is read only and cannot be reset.

3. **35mm HEATER ALARM –** We have now included two extra sensors in the furnace assembly at 35mm immersion and 50mm immersion. These can now be used to protect the heater wire by triggering an alarm that is user definable from the USER ACCESS page.

    To adjust the alarms, use the following procedure:

    - **a.** Scroll to the USER ACCESS page using the UP/DOWN button
    - **b.** When at the correct page, press the SCROLL button to highlight the top cell and then press the DOWN button to scroll to the desired alarm value (35mm or 50mm)
    - **c.** Press the SCROLL button again to access the soft keyboard and enter the desired maximum temperature of the heater required
    - **d.** Press the PAGE button to confirm the entry

    We would not recommend setting the value any higher than 1300°C to extend the heater life to its maximum.

4. **50mm HEATER ALARM –** As 35mm alarm above

5. **IP TYPE –** Network connection type, refer to main handbook for details (Engineer login required)

6. **SETPOINT TRIM –** Refer to main handbook

7. **REFERENCE CONTROL –** Refer to notes below

8. **AUTOTUNE LOOP 1 –** Refer to notes below

9. **AUTOTUNE LOOP 2 –** Refer to notes below

This version of the controller has an additional feature installed that will allow the controller to switch the control from Loop 1 to Loop 2 of the controller when the Loop 1 Control sensor is within 100°C of the set point.

The control sensor for the Loop 2 control is connected to Channel 1. This has the ability to bring the insert temperature to the values required by the Reference sensor and not the Loop 1 control sensor.

To enable the Reference sensor control:

1. Scroll to the USER ACCESS page from the Home page, as in Fig.4

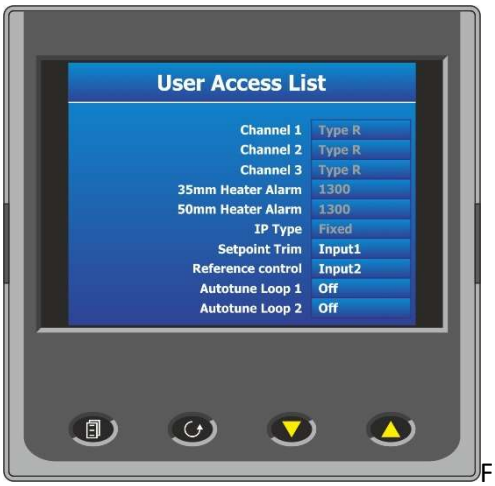


Fig.4

2. Press SCROLL button and scroll down to REFERENCE CONTROL
3. Highlight it by pressing the SCROLL button and switch to INPUT 2
4. Enter the value by pressing SCROLL again
5. Ensure that SETPOINT TRIM is set to INPUT 1
6. The REFERENCE CONTROL is now enabled

The controller will now ramp to the setpoint in the normal way, when the temperature of the CONTROL sensor within 100°C of the SETPOINT, the controller will now switch to LOOP 2 control.

This will now use the REFERENCE sensor connected to Channel 1 as the new control sensor. This will allow the controller to bring the insert to the required temperature for the REFERENCE sensor with a minimum of overshoot and avoid any “bump” as the controller trims the setpoint.

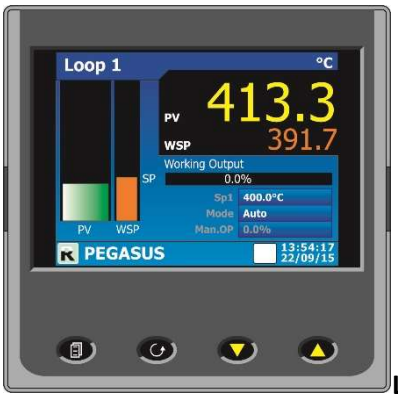
Other features enabled are the promotion of the AUTOTUNE feature for both LOOP 1 and LOOP 2. These are both located on the USER ACCESS screen. Enable them in the same way as the REFERENCE CONTROL when you require better stability or approach to temperature in certain conditions.

AUTOTUNE LOOP 1: This is best used when neither SETPOINT TRIM nor REFERENCE CONTROL are enabled. When enabled a small AT can be seen flashing in the bottom right hand corner of the ISOTECH home screen. During the tune the temperature can be seen to scroll either side of the setpoint whilst the controller calculates the best values. When the tune is complete, the controller will insert the values and the AT on the home page will disappear.

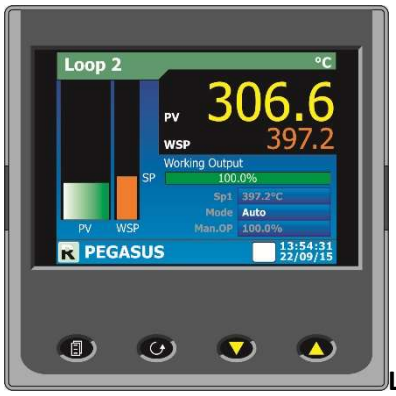
AUTOTUNE LOOP 2: Use this tune feature ***only*** when REFERENCE CONTROL is enabled**.** This will function in the same way as above but will only apply to LOOP 2 control. Therefore, the feature can only be used when the temperature of the equipment is with 100°C of the setpoint and REFERENCE CONTROL is enabled.

To disable the REFERENCE control feature, scroll to the USER ACCESS page and set REFERENCE control to INPUT 1. This will revert to normal LOOP 1 control.

Additionally, the promotion of the two LOOP control screens has been enabled to allow the operator to view the progress of each loop individually. Please see below:



Loop 1



Loop 2 Fig.5

Note.

During REFERENCE CONTROL use it may be observed that the LOOP 1 temperature may exceed the setpoint by several tens of degrees. This is normal as the temperature of the heaters rises to increase the insert temperature to the desired value. There is a cut-off that will disable the heaters if the temperature exceeds 75°C above the set point value. This will automatically reset when the temperature drops back to the “safe” zone again.

There is a full cut-off that will disable the heaters above 1230°C.

In the event that SETPOINT TRIM ***and*** REFERENCE CONTROL are ***both*** enabled, the REFERENCE CONTROL will have priority and will disable the SETPOINT TRIM feature.

Another feature enabled is:

Access to the PID values, promoted above the security blanket.

Accessible by logging in as the Engineer navigating the menu to

LOOP → LOOP 1 or LOOP 2 → PID