Energy Saving –
Reduce the carbon footprint of the dehumidifier
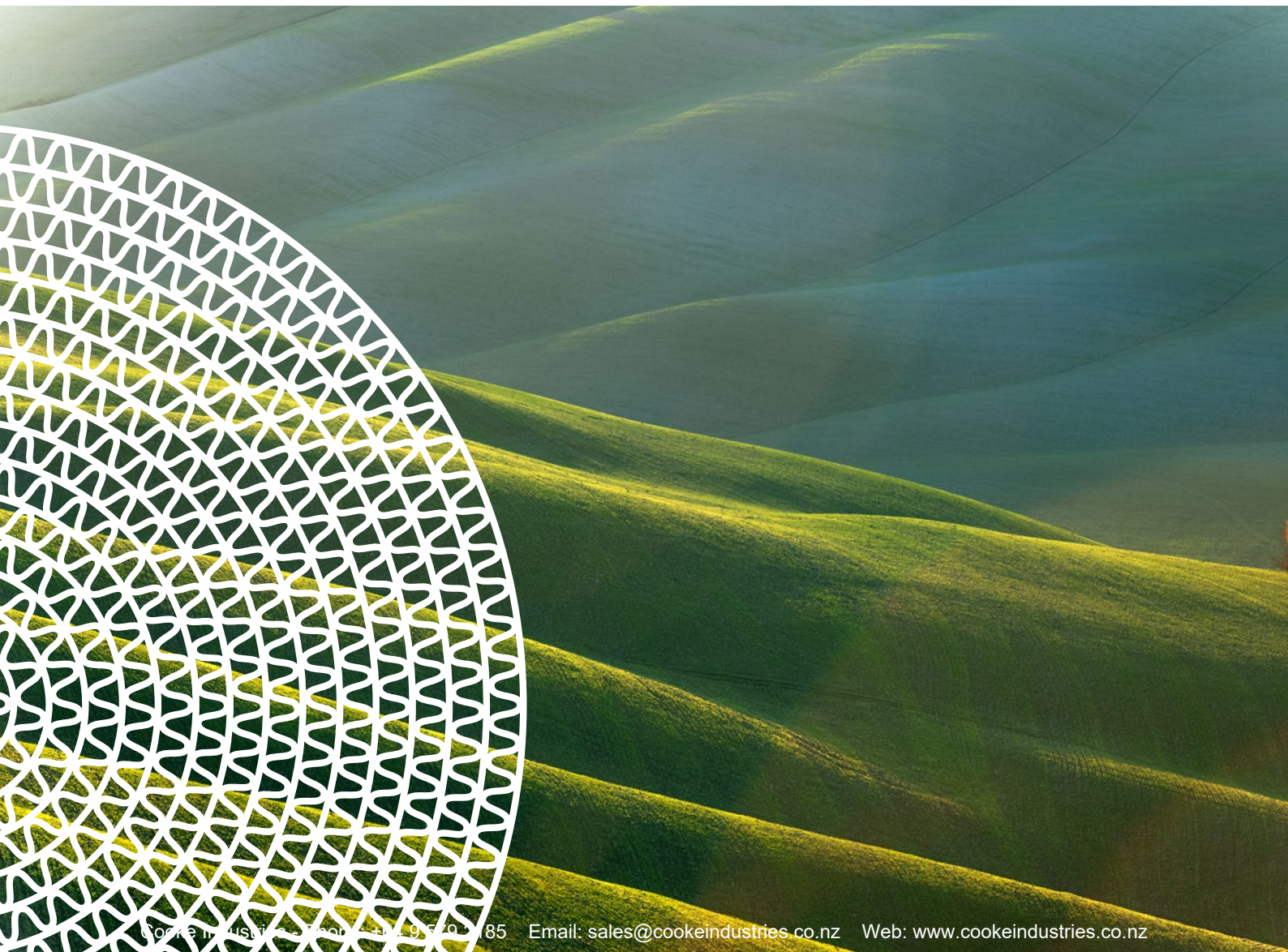
ENERGY EFFICIENT CONTROL
ECONOMICAL AND ENVIRONMENTALLY FRIENDLY

With new government efficiency targets and ever-increasing energy prices, it is DST's policy to use new technologies wherever possible. This ensures that our products continue to use energy effectively and efficiently. Our programmable logic control (PLC) systems can increase operating efficiency, lower carbon emissions and reduce running costs; factors that may be crucial for environmental certification.

PLC's are tailored to ensure highest operating efficiency is achieved for each specific project. PLC's can be used independently, with one of our digital controllers (EH3 T2 & EH4) or interlinked with a building management system (BMS).

The primary functions of the PLC are to:
- Provide a user friendly interface
- Synchronize the operation of key components
- Monitor protection devices, trips and alarms
- Adjust unit capacity to maintain required humidity, temperature and airflow

One supplier
DST offers a number of systems which controls both humidity and temperature. This means you do not need to coordinate multiple installations – everything is supplied optimised, from a single supplier.

PLC for industrial dehumidifiers
DST's entry level PLC type C2 is fitted as standard to our larger industrial dehumidifiers. A user friendly keypad allows easy access to the menu options and a two-row backlit LCD screen displays important messages to the user. Used in conjunction with one of our humidity controllers, EH3 or EH4, or an external controller, BMS, the dehumidifier drying capacity can be finely tuned to accurately maintain the required set point.

PLC C2:1

PLC C2:1 In/Outputs
Digital Inputs: 9
Digital Outputs: 7
Analogue Inputs: 4
Analogue Outputs: 2

PLC C2:1 Features
A two row text display
Standard PLC for DST
dehumidifiers type RZ,
RLZ, CZ and Flexisorb

Energy Saving 1
The reactivation heater power output is regulated in two steps. Our humidity controller EH3 T2 or EH4 adjusts the drying capacity between High, Low & Off, as required to maintain the humidity (or dew point) between two programmable set points.

Applications:
- Where precise control is not required
- Where process air is fully recirculated
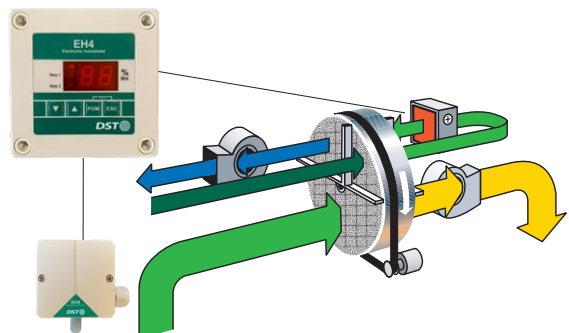
Dehumidifier capacity control is achieved by regulating the reactivation heater power

Energy Saving 2

The reactivation heater power is fully regulated between zero and full capacity using linear (solid state relay or actuator) control. Using our humidity controller EH3 T2 + PLC C2 or an external control signal (BMS + PLC C2), the drying capacity is finely adjusted to accurately maintain the required set point (humidity or dew point).

Applications:

- Where precise control is required
- Where the process air inlet condition is constantly changing
- Where a specific dry air outlet condition is required
- On large dehumidifiers to save energy
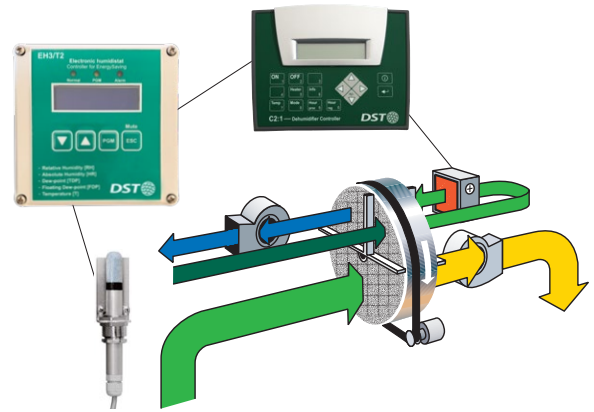
Rotor rotation guard is included in Energy Saving 2

Energy Saving 3

Used on steam reactivated dehumidifiers only, the reactivation air fan is regulated between 20% and full flow using a motor frequency inverter. The reactivation temperature is maintained at a high level. Using our humidity controller EH3 T2 + PLC C2 or an external control signal (BMS + PLC C2), the drying capacity is finely adjusted to accurately maintain the required set point (humidity or dew point).

Applications:

- When using a steam reactivated dehumidifier
- Where precise control is required
- Where the process air inlet condition is constantly changing
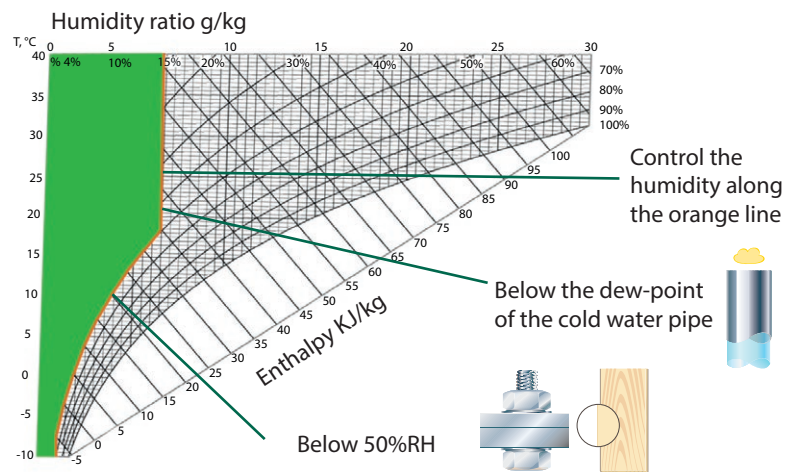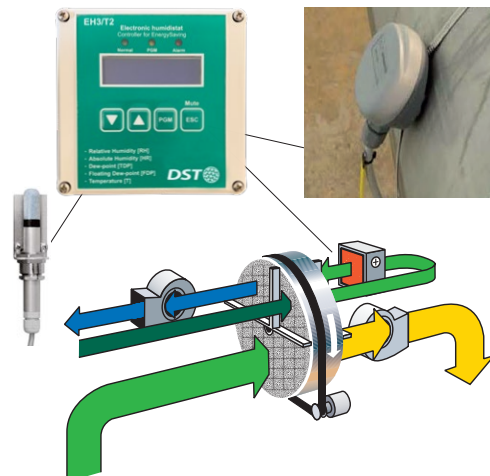- Where a specific dry air outlet condition is required
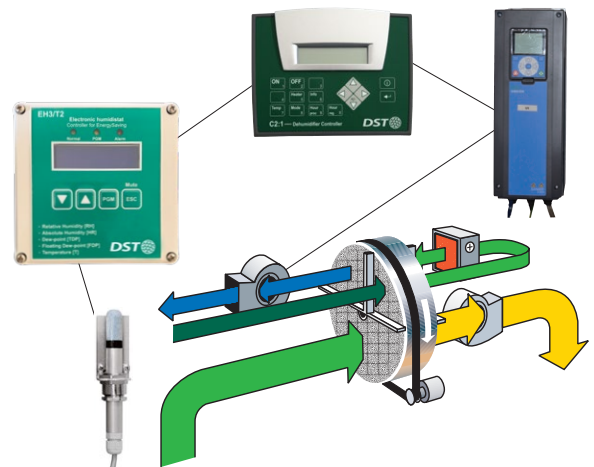
Steam flow automatically adjusts to a change in air flow. Rotor rotation guard is included in Energy Saving 3

Preventing condensation and corrosion using EH3 T2

A temperature sensor attached to the coldest surface is paired with a room humidity sensor. Our EH3 T2 simultaneously monitors surface temperature, relative humidity and dew point of the room air.

Our humidity controller EH3 T2 accurately adjusts the drying capacity to maintain the required RH set point. Should the air dew point exceed the monitored surface temperature, EH3 T2 will automatically override the RH set point, increasing its control output to the dehumidifier.

EH3 T2 regulates the drying capacity to control both RH and dew point while ensuring least possible energy is consumed.

Control the humidity along the orange line

Below the dew-point of the cold water pipe

Below 50%RH

CONTROL HUMIDITY AND TEMPERATURE

The PLC C4 and C7 can easily overview and manage the process of controlling both humidity and temperature. The user may also set regulator values and view the process-data. It is possible to manage the start-up process, control, see the functions as well as start and stop the dehumidifier via internet. The PLC's also offers great expansion possibilities since it is easy to add on different functions.

C4 and C7

- For advanced RL, RLZ, CZ and Flexisorb unit control
- Graphic touch display, C4 with 5.7" and C7 with 7"
- Communication via Modbus RTU or TCP/IP, Remote Access* or BACnet. C7 also have communicaition with Profibus
- Cost-effective process control online
- Communication through Ethernet or Modem**

PLC C4 with graphic touch display, 5.7". Advanced PLC control with great expansion options

C4 In/Outputs
Digital Inputs: 16
Digital Outputs: 16
Analogue Inputs: 4
Analogue Outputs: 4
Modbus TCP/IP, RTU or Remote Access* via Ethernet

C7 In/Outputs
Digital Inputs: 16
Digital Outputs: 16
Analogue Inputs: 4
Analogue Outputs: 4
Modbus TCP/IP, RTU, Remote Access* via Ethernet or Profibus

* Free software from Seibu Giken DST AB. The panel can be mirrored on a computer screen.
** Modem can be used when local Ethernet is not available or fine-walls stops external communication

PLC C7 with graphic touch display, 7". Advanced PLC control and possible to add Profibus communication

CUSTOMER ORIENTED SOLUTIONS

The functions of the C4 and C7 can be adapted in many different ways to suit the requirements of a customer. For instance, it is possible to view operating data and alarm logs online, as well as other settings. Since the PLC can be mirrored on a computer screen, allowing to control the dehumidifier via internet, a company can save both personnel resources and travelling time, which is good from an environmental standpoint. The software can be updated through a modem or internet.

REGULATE WITH PLC C4 AND C7

Integrating output temperature control in the dehumidification process makes it possible to reduce the total energy consumption thanks to interaction of the humidity and temperature parameters. Cooling and heating coils are built into the dehumidifier. DST is able to offer both DX cooling and coils for chilled water. Heating can be done with either hot water, electricity or steam heating.
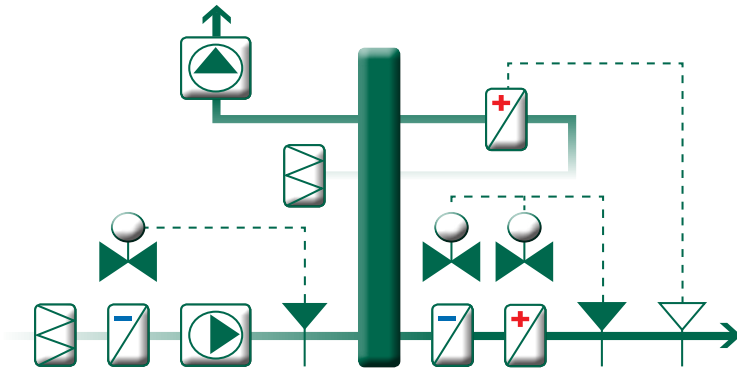
Example of configuration with options
DST provides pre- and post treatment coils complete with temperature control, and all from a single supplier. Contact your nearest DST representative for further information

■	**Rotor**	◐	**Fan**
✚	**Heater**	⬡	**Pilot valve**
▬	**Cooler**	▽	**Temp. sensor**
〉	**Filter**	▽	**Humidity sensor**
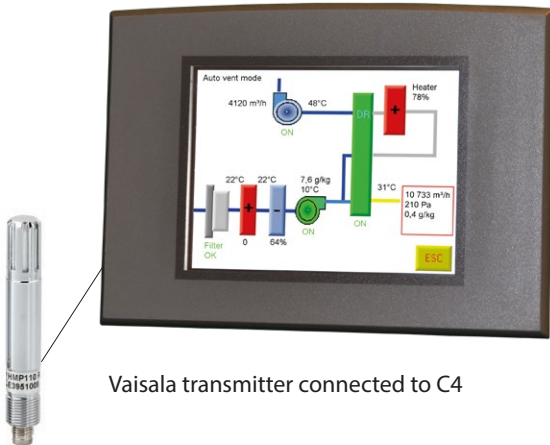
Vaisala transmitter connected to C4

Moist warm air passes through the dehumidifier and is supplied to the factory as dried and cooled air

Modbus, Profibus or BACnet
Communication via TCP/IP or RTU gives the actual values for temperature and humidity, possibility to start/stop the dehumidifier as well as alarm readouts and operation indicators.

Remote access
PLC C4 and C7 can be mirrored locally on one or more computers via a network connection.

You can communicate with and control your dehumidifier without actually being present. This saves time, money and personnel resources

EH3 T2 AND EH4

Humidistat and regulator EH3 T2

Humidistat EH4   Room sensor   Duct sensor IP 65

EH3 T2, Electronic humidistat and regulator

- Relative humidity in %RH
- Absolute humidity in g/kg
- Dewpoint °Cdp
- Temperature °C / K / °F
- Two independent potential PI Regulators for humidity or temperature
- Two step humidistat
- Two independent potential free closing contacts
- Possible to add extra temperature sensor to control condense

EH4, electronic humidistat

- Two-step humidistat
- Sensor with quick response
- Two independent potential free closing contacts %RH display with two dioids indicates e.g. too high RH

EH3 T2 In/Outputs
Digital Outputs: 2
Analogue Outputs: 2
Option: Modbus RTU

EH3 T2 Features:
PI regulator for humidity or temperature. Analogue outputs enable possibility to overview status by external computer

EH4 In/Outputs
Digital Outputs: 2

EH4 Features:
%RH display with two dioids indicates e.g. too high RH.
Option: External display.
Display and key set via a 25 meter low voltage cable

EXAMPLES OF INSTALLATIONS

A DR-010B with DST humidistat EH4 controls moisture at a water booster station

EH4 mounted in a R-61R dehumidifier

EH3 T2 mounted in a R-61R dehumidifier

PROCESS FAN CONTROL

The dehumidifier can adapt to the customer's process and save energy by controlling the process fan.

Constant flow with frequency converter
Constant flow regulation irrespective of pressure drop in filters. The flow remains constant even if the filters have been exposed to dirty air, and you can also read the desired and actual flow on your C4 as well.
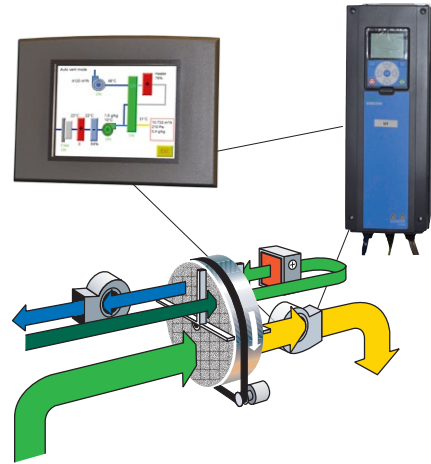

Constant pressure with frequency converter
This solution allows you to maintain a constant pressure in the dry air duct. Set the desired pressure in the dry air duct to adapt the speed of the process fan to the customer's process. This allows you to open and close valves to various parts of the process and the dehumidifier adapts automatically.
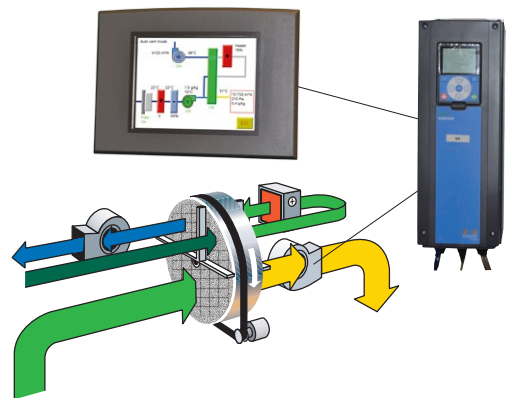
Ecovent
The Ecovent function is running the unit for 5 minutes/ hour or a fixed time set on the customers PLC, when the humidity is under the set-point. This mean that the unit is running only when necessary and it saves several hours of kWh. The Ecovent is possible to combine with Energysaving 2.
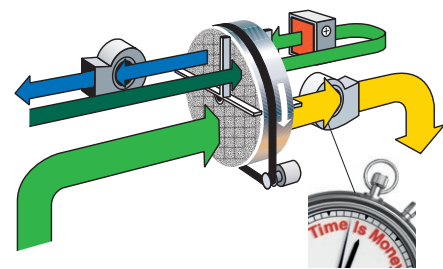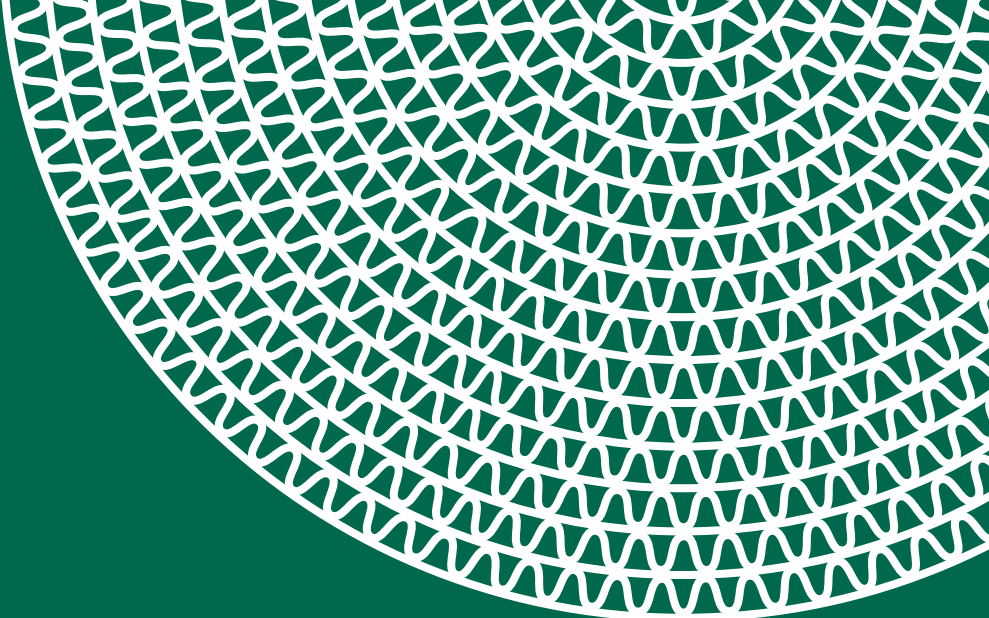

The unit is switched on every 5 minutes/hour to reassure the humidity hasn't gone over the set limit

TIMER CONTROL

In those cases when it can be difficult to measure the humidity, the dehumidifier can be controlled by a timer. This way, the customer can be reassured that the energy-consumption is kept low and the area will be dehumidified e.g. during hours with a high level of moisture load.

Seibu Giken DST AB has representatives
in more than 40 countries worldwide.

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