User Guide – Evaluation Kit – P&S T45

Electronic Sprayer Kit P&S T45-MXX Nebx01 IHM

28/11/2023

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TEKCELEO
We Accelerate Innovation

ABOUT US

Tekceleo is a forward-thinking technology company dedicated to innovation and the creation of cutting-edge solutions. With a commitment to excellence, we specialize in providing innovative solutions with advanced motion and aerosol generation technologies.

Our mission is to simplify and empower lives across various industries, including medical, pharma, aerospace, and industrial automation. Tekceleo's diverse team of experts collaborates to drive technological advancements and deliver results that exceed expectations. We're not just a company, we're a catalyst for progress, and we invite you to join us on this exciting journey.

KEY FACTS

2 Patent Families

A unique Know-How

75% of Sales Abroad

Evaluation Kit – Conditions of Use

Warning and Best Practices – General Maintenance

1. General Characteristics

Liquids :
- Reference liquid for standard use of H-T45 nozzles is Reverse Osmosis (RO) Water, with a 40 µS/cm conductivity.
- For operation, avoid use of liquid with conductivity inferior at 10 µS/cm (i.e. pure or distilled water).
- For operation, avoid use of viscous liquid (information on demand).

Environment of Use :
- Nozzle can sustain a temperature from -20°C to +85°C, range of temperature can be increased on demand (up to +200°C).
- Nozzle can sustain very high relative humidity but are not fully waterproof, avoid submerging it.

Common Risks :
- Clogging : nozzle can be clogged over time. Make sure to use a liquid that has low risk of deposit over time (filtered).
- Material compatibility : make sure to use liquid that are compatible with SS316L and HDPE.

2. Maintenance

Preventive maintenance :
In case of use of corrosive and/or liquid with risk of clogging, it is recommended to set a cleaning routine by purging the system and making it operates with RO or distilled water for a short period of time.

Cleaning :
Nozzle and system can be cleaned using ethanol-based biocide.

Corrective maintenance :
Use 1/100 white vinegar to unclog the nozzle, or organic solvent.

Best Practices :
- Always check the liquid you'll use, if you have any interrogation contact Tekceleo's team
- Setting up a regular cleaning procedure in case of risk with your liquid will greatly increase nozzle lifespan and performance

P&S T45 – Kit Presentation

Evaluation kit for Tekceleo's Micronice Technology

The purpose of this kit is for you to easily use, test, evaluate and implement Tekceleo's unique aerosol generation technology.

To understand more about our technology you can consult our website :

www.tekceleo.com

Tekceleo's team is here to help you moving forward in your use case, for information, this kit intended use is for :

- **Directly use** our technology, as this kit is a standalone system that can be already used.
- **Evaluate** our technology, in order to ensure its viability for your project
- **Prototype** : all the parts of this kit are modular and can be implemented in a prototype
- **Be integrated** directly in your device, as a precise spraying device.

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Kit Presentation – Presentation of Parts

Content and included parts of this kit

H-T45 ELECTRONIC SPRAYER

ECU NEBx01 MXX WITH CASING

PROTECTIVE CAP

TRIPOD

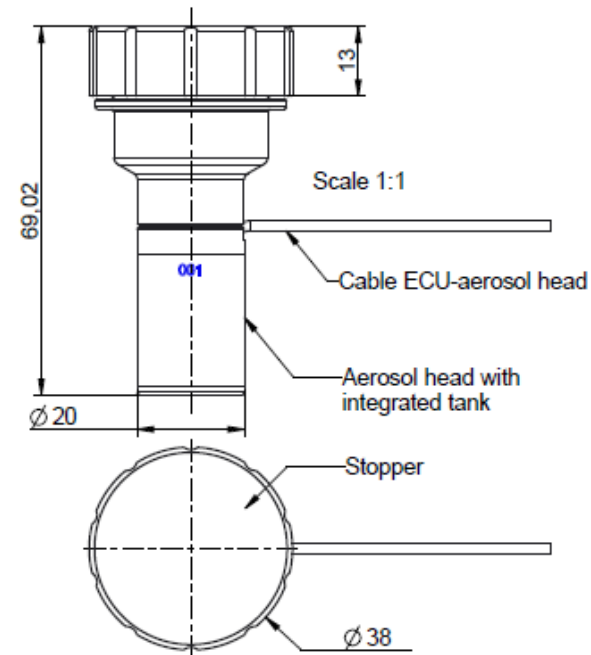**12V** POWER SUPPLY

BNC CABLE

1x DC-DC CABLE

IHM P&S MXX

Kit Presentation – Technical Datasheet

H-T45 Nozzle Datasheet

H-T45 Nozzle Outputs			
Nozzle Ref	Droplet Size (+/- 15%)	Nominal Output ml.mn (+/- 20%)	Nominal Output L.h (+/- 20%)
H-T45 – M05	05 μm	0,8 ml.mn	0,05 L.h
H-T45 – M08	08 μm	2,5 ml.mn	0,15 L.h
H-T45 – M12	12 μm	5,5 ml.mn	0,33 L.h
H-T45 – M20	20 μm	8 ml.mn	0,48 L.h
H-T45 – M50	50 μm	35 ml.mn	2,1 L.h

| H-T45 Nozzle Inputs			
Nozzle Ref	Power Supply	Water Supply	Max Pressure inside system
H-T45 – M05	12 VDC – 60cm standard cable length Connector : mini-XLR 3 pin Female	10 mL integrated tank	<0,1 bar
H-T45 – M08			
H-T45 – M12			
H-T45 – M20			
H-T45 – M50			

H-T45 NOZZLE DIMENSION (3D FILES UPON REQUEST)

Kit Presentation – Technical Datasheet

Electronic Control Unit (ECU) Datasheet

| H-T45 Electronic Control Unit (ECU)	
Characteristics	Values
Supply Voltage	12 Vdc
Current Consumption (per nozzle)	180 mA – 250 mA
Nebulization	Led ON : ON Led OFF : OFF
Time Response	< 1,5 ms
Dimensions	120 x 66,5 x 32,5 mm
PWM Control	BNC Connector at 3,3 V Frequency : 150 Hz

Interface Flow rate control

Connector Nebulizer

LED

12V Power supply

120

66,5

32,5
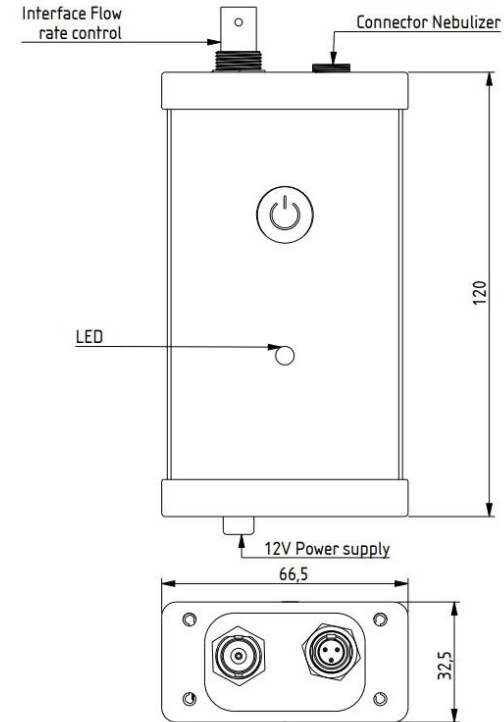
H-T45 ECU DIMENSION (3D FILES UPON REQUEST)

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Kit Presentation – Technical Datasheet

Human Machine Interface (HMI) - Touch Screen Display

H-T45 Human Machine Interface (HMI)	
Characteristics	Values
Supply Voltage	12 Vdc
Current Consumption (per nozzle)	150 mA
Cables Length	**HMI Power Supply** : 80 cm **HMI – ECU cable** : 50 cm
Dimensions	**HMI** : 136 x 84 x 44,2 mm **Touch-Screen** : 3,5 inch
Nebulizer Control	Touch ON/OFF
Flowrate Control	Nebulizer : 1% increment from 0% to 100%
Loop-Time Cycle Control	**Delay** : choice of time before beginning of a cycle **ON/OFF cycle** : choice of a time ON and a time OFF for alternating cycles **Number of Cycles** : choice of number of cycle or Infinite cycles

136 mm

84 mm

HMI P&S MXX
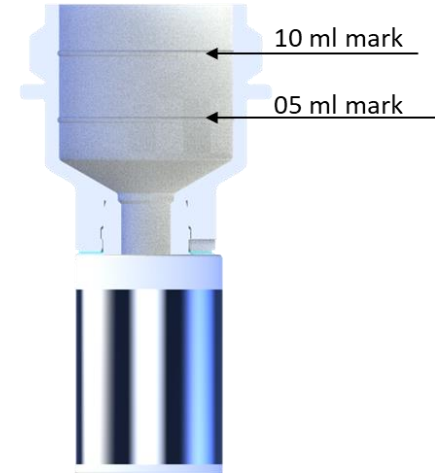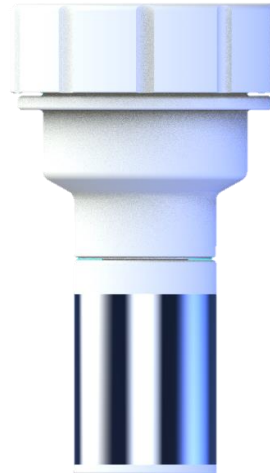Dimensions : 136x84x44.2mm
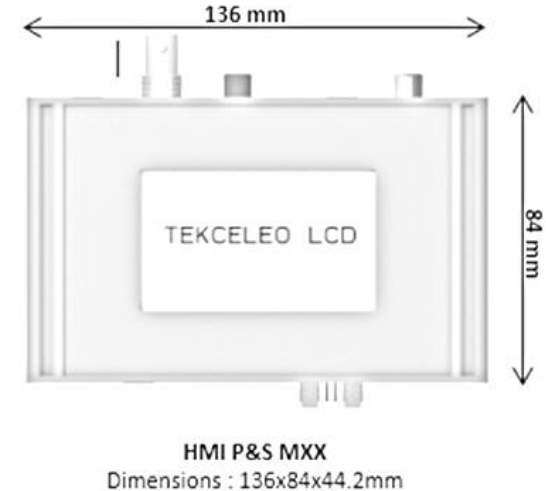
Kit Presentation – Technical Datasheet

Integrated tank specifications

Please make sure not to fill more than 10ml of liquid in the tank. This might lead to dripping.

10 ml mark

05 ml mark

Evaluation Kit – Configuration & Set-up

Instruction to set-up and start the P&S T45 Kit

- Unscrew the cap located on the nebulizer's integrated tank.
- Fill in the integrated tank with the liquid you want to nebulize.
- Make sure the maximum tilt for the aerosol head is 45°
- For the electronic assembly please make sur to plug the 12V adapter to the 12Vin of the IHM P&S MXX at the very end :
    1. Connect the IHM P&S MXX to the ECU NEBx01 (BNC-BNC-12Vout-12V).
    2. Connect the H-T45 electronic sprayer to the ECU NEBx01 via the mini XLR connector.
    3. Connect the IHM P&S MXX to the power supply (12V adapter-12Vin) and then follow the instructions on the **IHM P&S MXX : Quick Start Guide**

HMI P&S MXX Control features : Loop Time Cycle Control	
Flow rate	Press "+" or "-" to select the nebulizer flow rate (0% to 100% variation).
Delay	Choice of x (seconds/minutes/ hours) which will correspond to the time before the beginning of a cycle.
On/Off Cycle	Choice of x (seconds/minutes/hours) ON and x (seconds/minutes/hours) OFF which will correspond to the activation and stop time after the end of the timer.
Number of cycles or infinite	Choose a number of cycles with the "+" or "-" buttons or select the "infinite" button to choose an infinite cycle. When the "infinite" button is activated, the number of cycles displayed is 0. Please deactivate the "infinite" button to choose an number of cycles.

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Evaluation Kit – Configuration & Set-up

Cable Management Schematics

12V POWER SUPPLY ①

BNC CABLE ②   DC-DC CABLE ③

① 12V Power Supply

HMI

③ DC-DC Cable   BNC Cable ②

ECU

Nozzle Power Supply
(Mini XLR)

Nozzle

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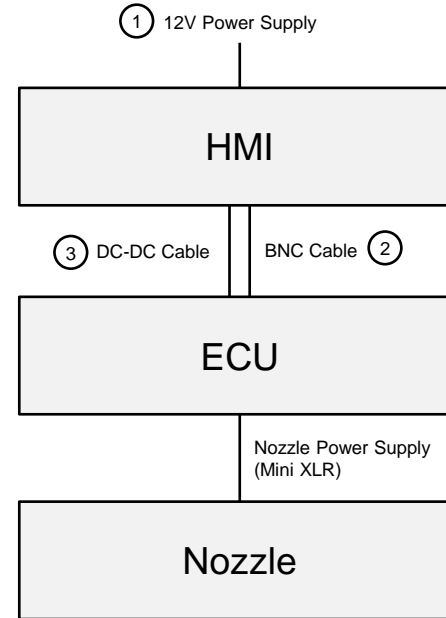
Evaluation Kit – Electronic Control

## Overview of Control Methodology – Nozzle ECU

Implementing ON/OFF and Flowrate Control with PWM :

- Use BNC Connector of the ECU

- Default state of BNC connector is at 3,3V (ON)

- The uses terminals for PWM control are the following :
    - 100% Duty Cycle : ON (150 Hz frequency)
    - 0% Duty Cycle : OFF (150 Hz frequency)

- From 0% to 100% : flowrate is linearly proportional to the PWM duty cycle. Please refer to the attached graph.

Important Notes :

- Default state of the electronic control is always ON when powered.
- Default state of the BNC Connector input is always 3.3V (ON by default).

Relationship between Aerosol Flow Rate and PWM Duty Cycle
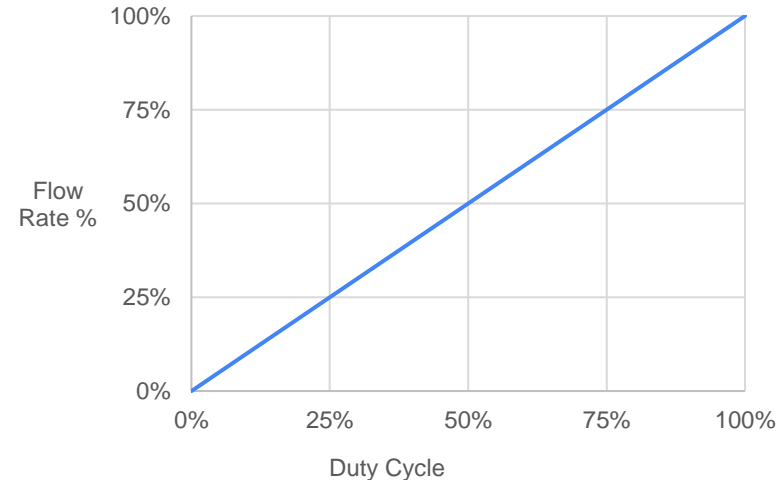
Evaluation Kit – Technical Support

Tekceleo's offer a complete technical support

- Directly contact your salesperson for any question. You can also directly contact Tekceleo using the contact@tekceleo.fr email address.

- In case of any trouble or issue you can freely open a support ticket by following this process :

  - Send an email to support-neb-1@tekceleo2.odoo.com
  - Object : order number + name of company
  - Content : explain the problem you're experiencing and join as many data, picture or video that you can to help us troubleshoot your problem.

- Tekceleo's team will get back to you as soon as possible to troubleshoot and resolve your problem

At any point of your project you can contact Tekceleo's for help regarding uses, integration or development project. We can also offer customization and engineering services if needed.

CONTACT US

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