

# T.C.S. **PRO**

Total sample Concentration System



Your  
Absolute Lab  
Solution

# Total sample Concentration System

T.C.S™ is a total sample concentration system featuring an evaporator and a gas generator. T.C.S has two different models that are Evatros T.C.S controlled by intuitive buttons, and T.C.S Pro, automatic system. T.C.S Pro equipped with HMI Software can make the whole process of sample concentration to be automated by updating/selecting concentration methods.

T.C.S™ can prevent unnecessary gas consumption by controlling gas supply of individual 48 nozzles independently with on/off buttons. Precise gas flow rate for each nozzle, and the stably descending nozzles can result in high reproducibility of sample concentration.



**Evatros C Pro**  
Solvent evaporator

**Evatros G**  
Gas generator



**T.C.S™ Pro**  
Automatic sample  
concentration with  
HMI Software



**Evatros T.C.S™**  
Sample concentration  
controlled by intuitive  
control buttons

T.C.S

PRO

## Features



One integrated system featuring an evaporator and a gas generator



Automatic sample concentration system equipped with HMI Software  
**T.C.S Pro model only**



Up to 48 sample concentration



Independent gas supply control for each nozzle



5-way gas blowing nozzle drying the condensed solvent vapor on the inner wall of test tubes



Aluminum test tube block with heating function (Ambient ~ 80°C)



Easy observation of the progress of sample concentration through the slits of the test tube block



Possible customized test tube block production covering a variety of test tube shapes, or volume



Easily replaceable test tube block depending on the size of test tubes



Convenient arrangement of test tubes in a test tube block on Pull & Push shelf



Automatic gas shut-off with audible alarm when operation or timer setting time is finished



Built-in hood venting out toxic gas and unpleasant smell



## OPTION 1

Acid-proof option recommendable when using acid solvent



## OPTION 2

UV blocking option for samples sensitive to UV

## Application field



Food industry



Pharmaceutical industry



Forensic science



Chemical industry



Water quality environment



Agriculture and fishery products



Veterinary research institute



Cosmetic industry



# Unique technology of T.C.S™

T.C.S PRO

T.C.S PRO

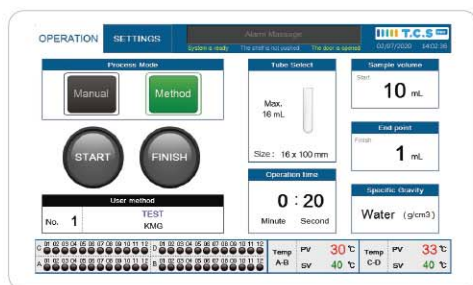
goojung

Please touch the screen.

## 1. Automation of sample concentration process by HMI Software

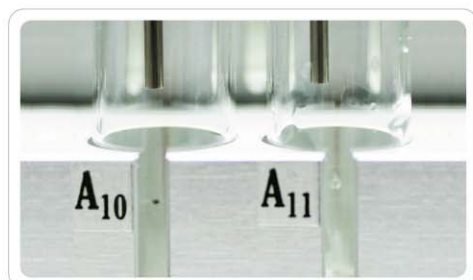
- Up to 10 sample concentration methods can be saved in HMI Software.
- Sample concentration can automatically be done using method parameters like test tube type, specific gravity of solvent, temperature, operation time, etc., or selecting a saved method.
- If required, manual mode could also be used.

HMI Software



## 2. Easy observation of sample concentration progress through the slits of the test tube block

- Sample concentration progress can easily be observed through the slits of the test tube block.
- Test tube block arranged in the terraced structure enables a lab researcher to observe sample concentration progress even for test tubes in the 2nd tier block.



## 3. Independent gas supply for each nozzle

- Individual on/off buttons matched with 48 nozzles can independently control gas supply for each nozzle.
- Gas supply for 4 or 8 nozzles can be selected at once by separate group buttons. (Evatros C model: 4 On/Off group buttons controlling 12 nozzles per each group)

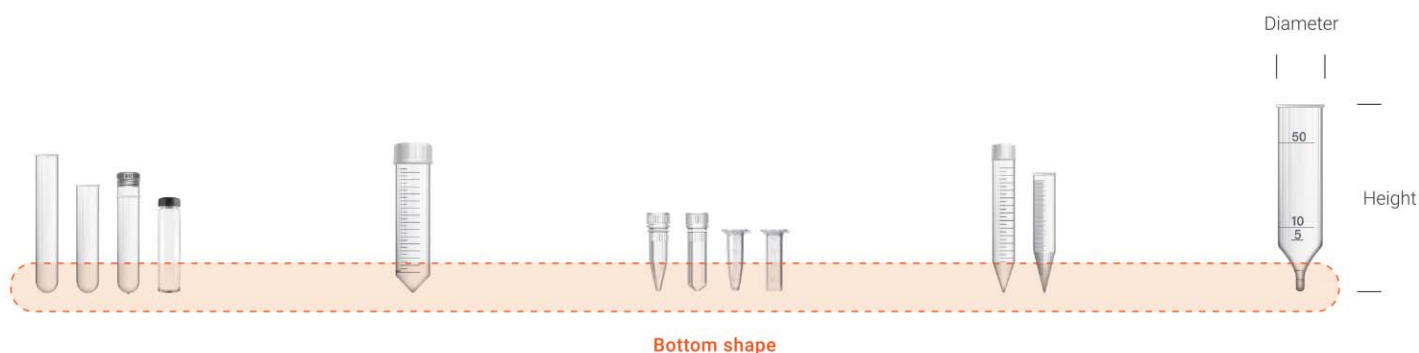
48

Nozzle



**Gas supply buttons of Evatros T.C.S model**  
(For Pro model, there is gas supply buttons in HMI software)

# Test tube blocks

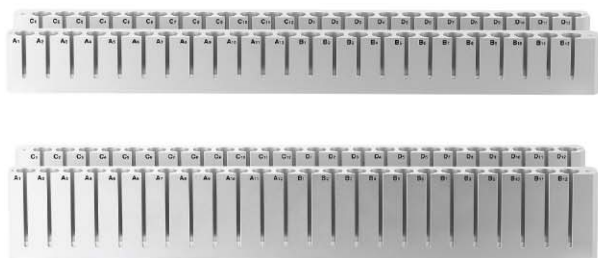


A variety of size of test tube blocks can be offered depending on diameter, height, bottom shapes(Round, Conical, End-point) of test tubes.

Two rows of 16.3mm round test tube blocks with 50mm height (1st tier: A-B block, 2nd tier: C-D block) are basically equipped in the T.C.S.

Test tube block is easily replaceable without any supporting tool.

## A - B & C - D separate type of test tube block



## A - B - C - D combined type of test tube block



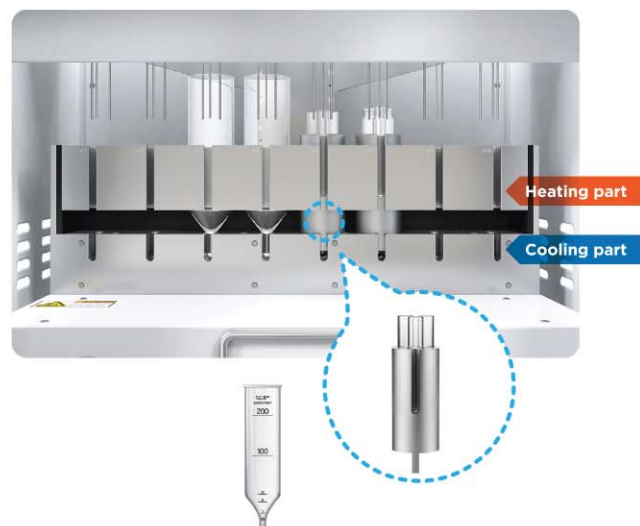
- 1st tier : A - B block with 24 holes  
2nd tier: C - D block with 24 holes
- Diameter of test tube block holes: 11.7mm ~ 18.5mm
- Height of test tube block: 50mm, 80mm, 100mm (depending on the height of test tube)
- Maximum diameter for A - B & C - D separate type: 20.5mm(12 holes)

- A - B - C - D combined test tube block with 24 holes in total  
(1st tier: 12 holes, 2nd tier: 12 holes)
- Diameter of test tube block holes: 21.5mm ~ 32.0mm

# Evaporator model for 200mL

EC-5108(8 sample concentration)

# T.C.S PRO



Diameter of test tube block holes	51mm
Test tube volume	200mL
No. of test tube holes	8

The cooling part of the test tube block makes some sample left in the end-point of test tubes.

200mL test tube block is fixed and not replaceable with other size of test tube blocks. Instead, an adapter applicable for other size of test tubes can be offered as an accessories if a lab researcher needs to use smaller volume of test tubes.

## T.C.S™

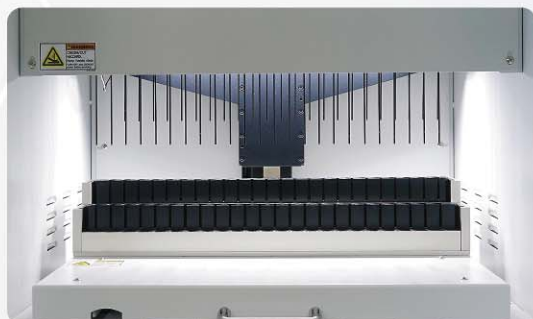
options for the evaporator

### OPTION

#### OPTION 1

#### Acid-proof option

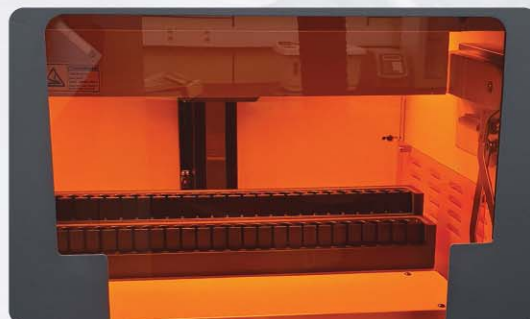
If solvent containing acid is used, acid proof option is required to prevent the evaporator from corrosion.



#### OPTION 2

#### UV shielding option

If samples are sensitive to UV, UV shielding option can protect samples from UV.



## Test tube block accessories

\* Other size of test tube blocks can also be customized.

Part No.	A - B & C - D	Block tier	Bottom type	No. of holes	Height	Diameter of holes
GJ-00801	Separate	A - B	Round type	24	50mm	10.8mm
GJ-00802	Separate	C - D	Round type	24	50mm	10.8mm
GJ-00803	Separate	A - B	Round type	24	50mm	11.7mm
GJ-00804	Separate	C - D	Round type	24	50mm	11.7mm
GJ-00805	Separate	A - B	Round type	24	50mm	14mm
GJ-00806	Separate	C - D	Round type	24	50mm	14mm
GJ-00807	Separate	A - B	Round type	24	50mm	15.3mm
GJ-00808	Separate	C - D	Round type	24	50mm	15.3mm
GJ-00809	Separate	A - B	Round type	24	50mm	16.3mm
GJ-00810	Separate	C - D	Round type	24	50mm	16.3mm
GJ-00811	Separate	A - B	Round type	24	80mm	16.3mm
GJ-00812	Separate	C - D	Round type	24	80mm	16.3mm
GJ-00813	Separate	A - B	Round type	24	100mm	17.3mm
GJ-00814	Separate	C - D	Round type	24	100mm	17.3mm
GJ-00815	Separate	A - B	Round type	24	50mm	18.5mm
GJ-00816	Separate	C - D	Round type	24	50mm	18.5mm
GJ-00817	Separate	A - B	Round type	12	50mm	20.5mm
GJ-00818	Separate	C - D	Round type	12	50mm	20.5mm
GJ-00819	Separate	A - B	Conical type	24	50mm	16.3mm
GJ-00820	Separate	C - D	Conical type	24	50mm	16.3mm
GJ-00821	Separate	A - B	Conical type	24	50mm	17mm
GJ-00822	Separate	C - D	Conical type	24	50mm	17mm
GJ-00823	Combined	A - B - C - D	Conical type	12	120mm	21.5mm
GJ-00824				12		21.5mm
GJ-00825	Combined	A - B - C - D	Conical type	12	120mm	26mm
GJ-00826				12		26mm
GJ-00827	Combined	A - B - C - D	Conical type	12	120mm	30mm
GJ-00828				12		30mm
GJ-00835	Combined	A - B - C - D	End-point	12	120mm	30.5mm
GJ-00836				12		30.5mm

## Concentration time for organic solvents

Solvent	Time(min)
Acetone	4
Methanol	9
Hexane	5
Ethylene Acetate	8
Methylene Chloride	5
Acetonitrile	13

### Experiment condition

Gas: Nitrogen (2mL/min @ 30psi per a nozzle)

Solvent volume: 2mL

Test tube: 16mm x 150mm round type

Temperature: 40℃



## Evaporator specification

Model	Evatros C		Evatros C Pro	
Part No.	EC-1648	EC-5108	EC-1648P	EC-5108P
No. of samples	48	8	48	8
Diameter of test tube block holes (mm)	16.3	51	16.3	51
Replaceable test tube block	Yes	No	Yes	No
No. of nozzles	48	24 *	48	24 *
Heating method	Aluminum test tube block(No need to use water)			
Temperature range	Ambient ~ 80℃ (Precision: ±0.3%)			
HMI touch panel	-		7" touch screen	
Temperature setting mode	-		Dual or Single Mode **	
No. of methods	-		10	
Electrical requirements	220[V], 50/60[Hz], 2.5[A]			
Dimensions (mm)	800(H) x 640(W) x 750(D)		920(H) x 640(W) x 750(D)	
Weight (Kg)	98	107	110	119
Gas consumption	2L/min @ 30psi per a nozzle			

\* 3 nozzles blow gas out into a test tube.

\*\* Temperature can differently be set between the 1st tier test tube block and 2nd tier test tube block for the dual mode.

## Gas generator specification

Model	Evatros G		
Part No.	EN-0600	EA-3000	ES-3600 *
N2 flow rate	60L/min	-	60L/min
Dry Air flow rate	-	120L/min	120L/min
Pressure	30 psi		
Hollow fiber membrane(N2)	0	-	0
Dry point membrane(Air)	-	0	0
Phthalate	None		
Noise level	50[dB]		
Electrical requirements	220[V], 50/60[Hz], 8[A]		
Dimensions(mm)	1,000(H) x 640(W) x 750(D )		
Weight(Kg)	160	155	160



\* A button can switch a gas mode between N2 and Dry Air.



### Goojung Engineering Co., Ltd.

#903 Ace Techno Tower 1, 38-9, Digitalro 31gil, Guro gu, Seoul, South Korea(08376)

Tel. +82. 2. 3281. 3376 Fax. +82. 2. 2109. 5376

Web. [www.goojung.com](http://www.goojung.com) Email. [marketing@goojung.com](mailto:marketing@goojung.com)

© Goojung Engineering Co., Ltd. 2020 T.C.S Brochure, EN, Rev 3, 2020-07-22, GJEB1012