

INTERTEC Ceramic Heater Module

Use for water purifier IHM(Instantaneous Heating Module)
IHM-2228T-STS

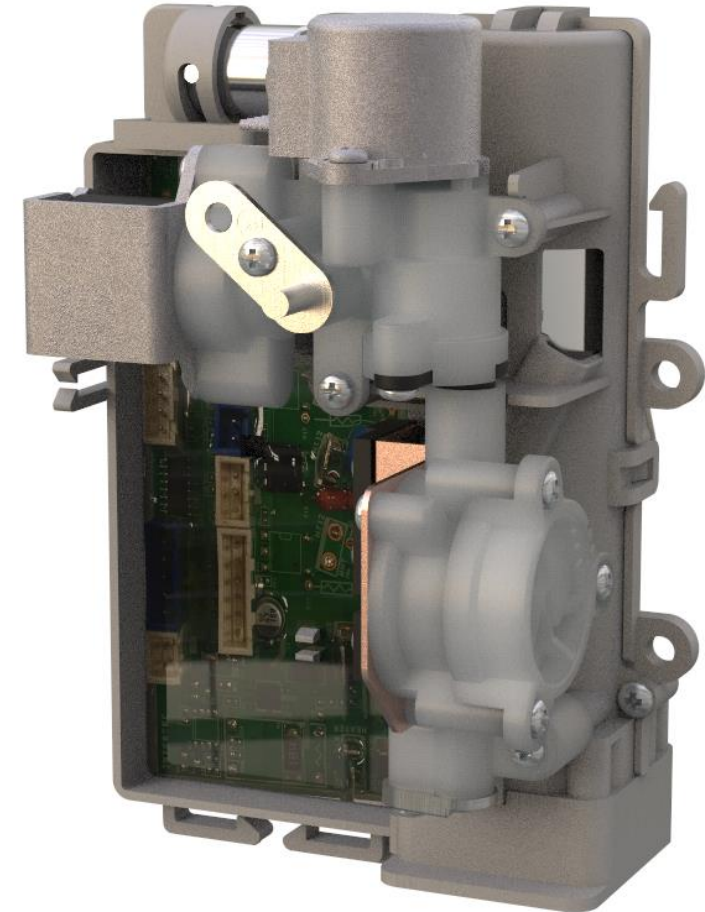


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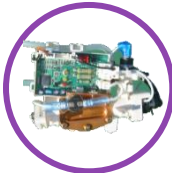


COMPANY HISTORY

CERAMIC HEATER MODULE

Instantaneous heating module developed

1st generation instantaneous heating module for bidet developed ; Kyocera Tube Heater used.



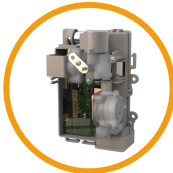
1st module for water purifier developed

1st generation Instantaneous heating module for water purifier developed. K company launched the water purifier with our instantaneous heating module



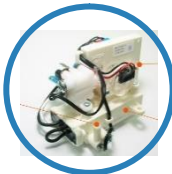
3rd module for water purifier developed

Developed STS heating module satisfying customer's need. Supplied to S Electronics



Intertec Co., Ltd. established

Partnership with Samsung Electronics Multi Control system of air conditioner Tele- remote control developed



2nd,3rd module for bidet developed

2nd,3rd generation instantaneous heating module for bidet developed ; Ceramic Sheet Heater used



2nd module for water purifier developed

2nd generation instantaneous tube Heating module developed Supplied to Company B, K, and C

DEVELOPMENT GOALS AND SPECIFICATIONS

CERAMIC HEATER MODULE FOR WATER PURIFIER

◆ Convenience

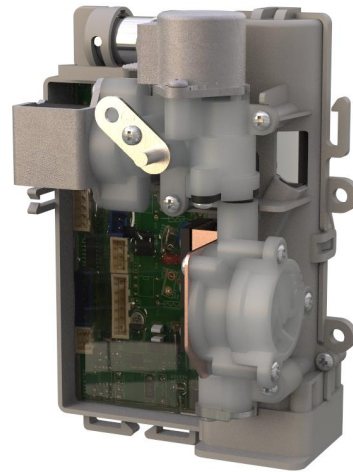
UART Rx,Tx communication control

- ▶ Easy control of the heating module by communication of UART with the main control unit of the water purifier.
- ▶ Water temperatures and flow customizable

◆ Functionality

Improvement of performance and stability control

- ▶ Improvement of control performance to increase water flow, to reduce waiting time of operation, and to adjust the first flow temperature.
- ▶ Prevention of voltage fluctuations, vapor discharge and stoppage during operation by active control of water pressure.
- ▶ High thermal efficiency : 95%



CE certification and STS heater applicable

- ▶ Predictive PID control technique and 1T3P heater applicable to improve Flicker/Harmonic,
- ▶ STS heater applicable to free from environmental hormones according to the customer's need

◆ Applicability

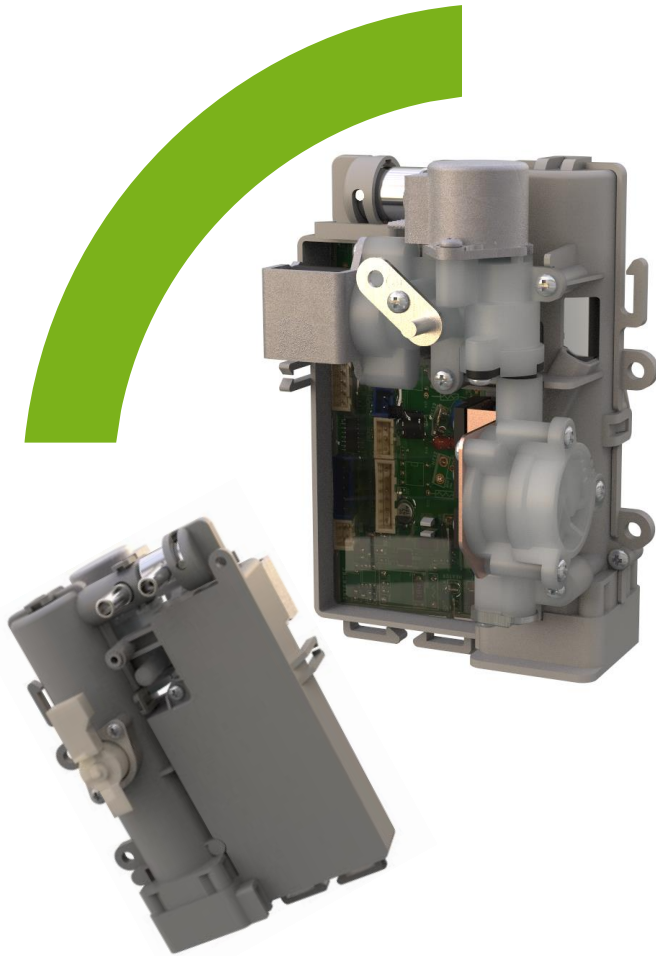
Quality components & Improved structural parts

- ▶ Cost competitiveness through global sourcing : Cost savings of 10% or more compared to the existing module.
- ▶ Productivity improvement & optimization of component by 1 Tube Heater.

◆ Profitability

DESIGN SPECIFICATIONS AND FUNCTIONS-COMPATIBILITY

CERAMIC HEATER MODULE FOR WATER PURIFIER



• Convenience

- Module control and water temperature/flow setting available by UART communication protocol.
- Options of each model to be integrated by applying ARM 32bit, 64KB MCU.
- Quick outflow of hot water by controlling the optimum flow rate according to the set temperature.
- Rapid outflow of first hot cup within 3.2 seconds by Quick Start Algorithm (1.5seconds when restarted).

DESIGN SPECIFICATIONS AND FUNCTIONS-FUNCTIONAL

CERAMIC HEATER MODULE FOR WATER PURIFIER



• Performance improvement (convenience promoted)

- Comparison of waiting time for outflow (220VAC, inflow temperature 20°C)

	Company S	Intretec	Remark
Waiting time for first cup	Max 5.5sec	Max 3.2sec	
Restarted time for Second cup	7 ~ 9sec	1.5sec	
Time of outflow for 120cc	17.5sec	13.5sec	
Flow rate of first cup	420cc/min	530cc/min	

- When the main program is changed, the waiting time for the first cup can be shortened to less than 1.0 second, and additionally, heater stability can be secured.
- S/W to be upgraded consistently for module performance improvement.

DESIGN SPECIFICATIONS AND FUNCTIONS-FUNCTIONAL

CERAMIC HEATER MODULE FOR WATER PURIFIER



• Performance improvement (stability guaranteed)

- Heating performance and stability guaranteed by Accurate voltage detection.

No	Rated voltage	First cup temperature		Second cup temperature	
		Company S	Intertec	Company S	Intertec
1	220V → 200V	77.0°C	79.1°C	81.2°C	84.4°C
2	200V → 220V	Stopped	80.7°C	75.5°C	84.0°C
3	200V → 240V	Vapor discharge. Stopped.	80.7°C	76.0°C	85.6°C

- Test method : Tested by mounting the Heater on S company's purifier, and after discharging - cooling - residual water forcibly when checking the first cup temperature, at 15°C of inflow water temperature

DESIGN SPECIFICATIONS AND FUNCTIONS- APPLICABILITY

CERAMIC HEATER MODULE FOR WATER PURIFIER

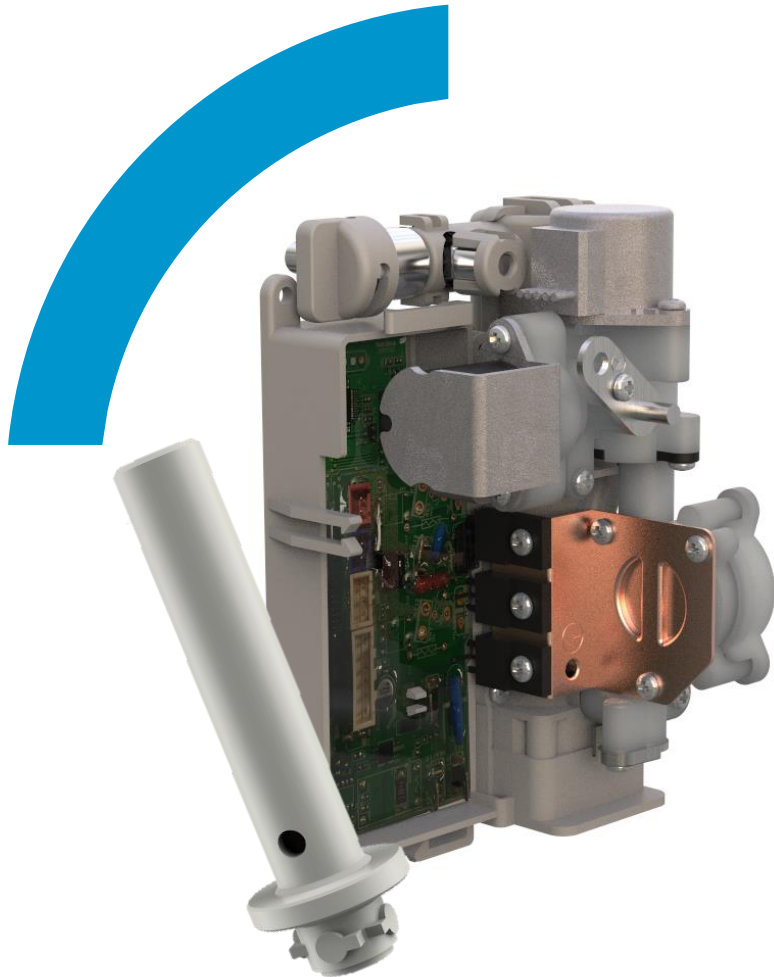


• Applicability

- Improvement of Flicker/harmoni for CE certification.
- Predictive PID control technique and 1T3P heater applicable to improve Flicker/Harmonic.
- STS heater applicable to free from environmental hormones according to the customer's need (STS 316L).
- Certified material for drinking water to be applied (POM-LOF, STS316L, CLAD)

DESIGN SPECIFICATIONS AND FUNCTIONS-PROFITABILITY

CERAMIC HEATER MODULE FOR WATER PURIFIER



• Cost saving

- Cost competitiveness through global sourcing of quality components
- Development of heater compatible for 1 Tube 1 Patten / 1 Tube 3 Patten
- PBA commonization that can apply up to 3 Triac control.
- Less than 0.03% of market quality goal.

FLICKER / HARMONIC TEST RESULT

CERAMIC HEATER MODULE FOR WATER PURIFIER

Flicker - EN/IEC61000-3-3 Ed.3(Run time)

Test Report

Report title:	Harmonics
Company Name:	CTK Co., Ltd.
Date of test:	14:05 8.Nov 2018
Tester:	
Standard used:	EN/IEC 61000-3-3 Ed.3 Flicker
Short time (Pst):	1 min
Observation time:	1 min (1 Flicker measurement)
Flickermeter:	230V / 50Hz according IEC 61000-4-15 Ed.2
Flicker Impedance:	Zref (IEC 60725)
Customer:	
E. U. T.:	
Temperature :	22
Humidity :	35

Test Result	PASS
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(Date) _____ (Sign) _____

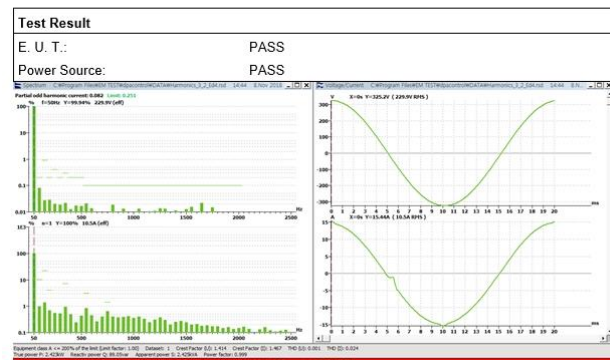
Maximum Flicker results

	EUT values	Limit	Result
Pst	0.598	1.00	PASS

Harmonics – EN/IEC 61000-3-2 Ed.4(Run time)

Test Report

Report title:	Harmonics
Company Name:	CTK Co., Ltd.
Date of test:	14:44 8.Nov 2018
Measurement file name:	Harmonics_3_2_Ed4.rsd
Tester:	
Standard used:	EN/IEC 61000-3-2 Ed.4 Short cyclic
	Equipment class A <= 200% of the limit (Limit factor: 1.00)
Observation time:	60s
Windows width:	10 periods - (EN/IEC 61000-4-7 Edition 2002 + A1:2008)
Customer:	
E. U. T.:	
Temperature :	22
Humidity :	35



Standard elution test for water (Notification No. 2016.50 of the Ministry of Environment)

KGL 시험성적서

1. 성적서 번호 : CT16-062823
 2. 의뢰자 : (주) 인터텍
 ○ 업체명 : (주) 인터텍
 ○ 주소 : 경기도 화성시 동안면 불탄기동로 15

3. 시험기간 : 2016년 05월 31일 ~ 2016년 06월 10일
 4. 시험성적서의 유효도 : 거래처 지출
 5. 시료명 : 분말형 순간온수모듈
 6. 시험방법
 (1) 한국기원 기준, 규격 및 검사기준 지참고서(분류 보고서 제2016.50호, 2016.02.29)

7. 시험결과

시험항목	단위	시험방법	시험결과	비고
비소	mg/L	(1)	불검출 (검출한계 0.005)	
중금속	mg/L	(1)	불검출 (검출한계 0.02)	

▶ 불검출은 시험

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2016년 06월 10일
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FLICKER / HARMONIC TEST RESULT

CERAMIC HEATER MODULE FOR WATER PURIFIER

- Flicker – Results of Flicker measurement according to flow rate and outflow temperature (EN/IEC 61000-3-3 Ed.3)

