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**TRUMP in the field of Medical industry**

**----- Medical Therapy system**

**High Intensity Focused Ultrasound (HIFU)**

*The most advanced noninvasive therapeutic system in the world*

**Photodynamic Tumor Therapy system**

**Blood purification System**

*which catch up the world advanced technology*

**Urination Therapy Device**

*The only device in the therapy of Urination obstacle in the world.*

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# HIGH INTENSITY FOCUSED ULTRASOUND (HIFU)

## TRUMP-HIFU-1

### Characteristics:

#### Features of the HIFU system

The HIFU system is the first international extracorporeal device for the ablation of solid organ malignancy. It integrates advanced concepts and innovative practice with medical and engineering expertise into one impressive design. The system is the culmination of laboratory research, animal studies and clinical experience, and currently leads the field in the move from minimally-invasive to the non-invasive treatment of tumors. The flexibility of the science on which the system is based allows the treatment of many different types of tumors, both malignant and benign.



#### Main Parameters for HIFU system:

- The ideal focal region for treatment: 1.1mm×3.3mm—1.4mm×5.6 mm
- The range of acoustic intensity within focal field: 5000 W/c m<sup>2</sup>—25000 W/c m<sup>2</sup>
- Therapeutic frequency: 0.8MHz—2.4MHz
- Accumulative error of the linear movement: ±1mm
- System noise: ≤65dB (A)

#### 3-D conformal technique

Ensure complete targeting and ablation of solid tumor deposits.

Allows ablation of large-volume tumors in a single treatment session.

Enables ablation of malignant tumors with a surrounding margin of normal tissue, thus ensuring adequate clearance.

#### Real-time diagnostic ultrasound

Provides high-quality images for the location and targeting of the selected tumor.

Allows visualization of treatment as it happens, providing an assessment of therapeutic efficacy.

Real-time feedback ensures that the physician is able to tailor treatment to the specific case.

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### **Intelligent therapeutic software**

Novel software allows integration of diagnostic images and treatment parameters.  
User-friendly program provides a treatment plan which can be delivered from a single console.  
Provides the user with a clear representation of the acoustic focus during treatment.

### **Multi-dimensional motion of the therapy transducer**

Enables a great variety of anatomical sites to be treated.  
Electronic control allows millimetric accuracy in position.

### **High-intensity transducer**

Well defined and reproducible focus using an acoustic lens.  
Precise volume of coagulation necrosis associated with the acoustic focus.  
Excellent tissue penetration allows sparing of the pre-local region.  
Choice of lens provides flexibility in the depth of tumor treated.  
May be driven at different frequencies depending on tumor type and depth.

### **Degassed water system**

Provides an acoustic coupling medium.  
Precisely controls the water temperature.  
Filters and degassed the water to a pre-defined level.  
Allows the physician direct control during the treatment session.

### **Adjustable ultrasound therapeutic frequency**

Ensure the treatment effectiveness for various tumors.  
Increases the number of tumor types suitable for treatment.  
Shortens the treatment time.

### **Indications**

- Breast cancer
- Malignant bone tumor
- Liver cancer
- Sarcoma of soft tissue
- Kidney cancer
- Carcinoma of bladder
- Tumor in pelvic cavity
- Retroperitoneal tumor
- Pancreatic cancer
- Tumor metastasis
- Palliative treatment for advanced malignancy
- Recurrence of solid tumor after conventional surgery
- Residual tumor after failed surgery, which is not suitable for a repeat surgical procedure
- Superficial tumors

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- Uterine fibroid
  - Benign breast neoplasm
  - Benign tumors of solid tissues

### **Contraindications**

- Tumors in air-containing viscera, such as lung, stomach, and bowel
- Mediastinal tumors
- Spinal tumors

## **TRUMP-HIFU-2**

### **Summary**

The theory of TRUMP-HIFU-1 High Intensity Focused Ultrasound (HIFU) is to focus the ultrasound energy in patient's tissues and form a high intensity focusing area inside. The temperature of focused area will increase over 70°C within 0.5 to 1 second to curdle and putrefy the cells in the focusing area.

The main feature of the system: It adopts tri-dimension curative ultrasound transducer with excellent focusing character and small focusing area. It can ensure the patient to be contacted closely with the machine owing to ultrasound imaging, mechanical electronic scanning & positioning, high precision eight-direction curative machine and multi-direction patient bed. It uses the technology of computer aided melting discrimination for medical operation. The doctor can conclude the curing circuitry by the computer upon the tri-dimension image and judge the curative effect through melting discrimination technology.



### **Main performance and technique indexes**

(1) Operate the corresponding button on the control desk can order the ultrasound focus treating head to move up, down, swing in vertical or lateral level in a certain range.

(2) Operate the scanning move system can order the focusing ultrasound transducer to rotate in a range of 0°~180° and move up, down, left, right, forward and backward in a range of 0mm~100mm in the direction of X, Y, Z.

The probe should move up and down independently and the information of the corresponding position can be reflected.

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(3) Pulse control: the pulse duration time ( $T_{on}$ ) is between 0.1ms and 600s and can be regulated by integral number multiple of 0.1s; the pulse off time ( $T_{off}$ ) is no less than 0.1ms; the pulse number can be regulated in a range of 0~30,000.

(4) Insulation resistance:

a) the insulation resistance between the high potential and the low potential of the focusing ultrasound transducer:  $\geq 10M\Omega$

b) the insulation resistance between the high potential of the focusing ultrasound transducer and the metal shell:  $\geq 10M\Omega$

(5) The oxygen dissolved capacity of excluding oxygen in the water:  $\leq 5mg/L$

(6) Ultrasound power supply:

a) working frequency:  $1.5MHz \pm 10\%$

b) frequency range:  $\geq 1.5MHz \pm 10\%$

c) Sound and Light Alarming: alarm at overcurrent

(7) system noise( except the water processing system):  $\leq 65dB(A)$

(8) Focusing transducer

a) focus length: 135mm~160mm

b) range of focused area:  $< 1.5mm \times 1.5mm \times 9mm$  ( )

c) the largest acoustic intensity of the focused area:  $\geq 5000W/cm^2$  when output is at the peak.

(9) Distinguishing rate of the ultrasound diagnostic system:

Lateral distinguishing rate:  $\leq 2mm$  (depth $\leq 80mm$ )、

$\leq 4mm$  ( $80 < DEPTH \leq 130MM$ )

vertical distinguishing rate:  $\leq 1mm$  (depth $\leq 80mm$ )、

$\leq 2mm$  ( $80 < DEPTH \leq 130MM$ )

(10) Input power: no less than 11kVA。

### **Configuration**

Treatment main unit, treatment bed, control desk, ultrasound power source and water treating device.

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## PHOTODYNAMIC TUMOR THERAPY SYSTEM

### TRUMP-PCTS-1

#### Product introduction:

It is a wavelength of 0.633 micron, and the output power of hundreds of mW helium - neon laser medical equipment, State Fund Committee approved the research project, by the state as "Ninth Five-Year" major key technology projects; it has the world's largest power He - Ne laser as the light source, the power of 500 mW above, The key technologies, including a United States patent, the two patents in China, three Chinese utility model patents. It can be used as photodynamic therapy, laser therapy and laser acupuncture, and so on.



#### Treatment principle:

Photodynamic therapy (PDT) also known as photosensitive therapy is the use of photosensitizer more reserves to stay in the tumor. In particular wavelength (0.63 micron) laser role, the photosensitizer produce photochemical reaction, Singlet oxygen generation and destruction of tumor cells. Therefore, this treatment on normal cells rarely, so that it should not affect immune function, and the patients without obvious side effects. Optical and laser acupuncture therapy is the use of laser stimulation of biological effects of treatment with anti-inflammatory, analgesic and promote tissue regeneration, enhance immune function and metabolism.

#### Characteristics:

1. Following surgery, chemotherapy and radiotherapy, the treatment of immune function, the fifth internationally recognized cancer means;
2. The current world leading position in the largest power He - Ne laser as the light source, its key technology allowed an American invention patents, two patents in China, three Chinese utility model patents;
3. Clinical indications for the broader, and the total efficiency of 90% and above, can be part of the disease eradication therapy;
4. Good selectivity, trauma small, low toxicity, applicability and can be repeated treatment, can protect vital organs appearance and function, synergies enhance the effectiveness of treatment to reduce the recurrence rate, and palliative therapy can eliminate hidden cancer lesions.
5. Photodynamic (PDT) in the treatment of tumors has been recognized domestic tumor experts; the next two years will set off photodynamic therapy of tumors upsurge.

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**Main technical indicators:**

- Laser wavelength : 0.633 micron;
- Output modes : Continuous;
- The surface of optical fiber end laser power: More than 380 mW;
- Power of input supply: About 1,800 volt-ampere;
- The stabilizing territories of laser power: Better than 10% per hour.

## HEMOPERFUSION DEVICE

### TRUMP-HPD-2000

#### Product introduction:



TRUMP-HPD-2000 hemoperfusion device, developed by ourselves, is a newest product for rescuing from the poison. It can clean the poison out of blood quickly and can be used by Acute Cure Unit, Kidney Int, ICU for rescuing, acute renal failure, liver ascites.

#### Principle

Pumped out of body, the blood is purified by perfusing device while infusing heparin in avoidance of cruor. Then, the blood purified is reinfused in body under the monitoring system to assure safety. By this cycle, the poison in blood can be cleaned out of body. If the perfusing unit is changed by filter, TRUMP-HPD-2000 can be used to rescuing acute renal failure, liver ascites and so on. TRUMP-HPD-2000, rescuing the patient in large degree, can promote the level of rescuing ability and strengthen the competition and bring of better social and economy interests for hospital.

This means for rescuing from the poison is more and more emphasized and used by hospital.

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**Technical data:**

Power and conditions

Power supply: AC220V±22V

Dimension: 1275×280×320(H×W×D)

Frequency: 50Hz ±1Hz

Weight: about 50kg

Power: no higher than 500W

Temperature: 0 to 40°C

Humidity: no higher than 85%

Blood pump

Range of rotation rate: 0 to 50 r/min

Resolution: ±0.5r/min

Range of blood volume: 0 to 450 ml/min

Air monitoring

ultrasonic, self-adaptive, can test the air bubble more than 0.05 ml.

Venous pressure monitoring

Range of display: 0 to 40 kPa.

Resolution: ±1kPa

Temperature monitoring

Range of display: 0 to 99°C

Resolution: ±0.5°C

Monitoring system including:

Air bubble monitoring, Blood volume monitoring, System debugging, Time monitoring, Temperature monitoring,

Venous pressure monitoring, Blood circuit's cleaning and sterilizing monitoring

Alarm lamp and buzzer

**Specialties:**

- Safe protective system -----assuring for safety
- Micro-control system-----controlling the purification precisely
- Stainless steel and plastic machine body-----movable and small
- High quality and low price-----various hospitals can afford it.

**Function:**

Hemoperfusion Hemofiltration

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**Abstract:**

Various kinds of poisoning, acute renal failure, acute heart failure, intensive liver disease, reinfusion of ascites and so on.

## TRUMP-HPD-2000A

### Product introduction:

Based on TRUMP-HPD-2000, TRUMP-HPD-2000A Hemoperfusion device is designed so that it can infuse heparin automatically by heparin pump and heat blood by auto-heater. And also, the stainless steel machine body is changed as cast plastic so that it's more beautiful than TRUMP-HPD-2000.

### Technical data:

#### Power and conditions

Power supply: AC220V $\pm$ 22V

Dimension: 1275 $\times$ 280 $\times$ 320(H $\times$ W $\times$ D)

Frequency: 50Hz  $\pm$ 1Hz

Weight: about 50kg

Power: no higher than 500W

Temperature: 0 to 40 $^{\circ}$ C

Humidity: no higher than 85%

#### Blood pump:

Range of rotation rate: 0 to 50 r/min

Resolution:  $\pm$ 0.5r/min

Range of blood volume: 0 to 450 ml/min

#### Air monitor

Ultrasonic, auto-adaptive, can test the air bubble more than 0.05 ml.

#### Heparin pump

Range of volume: 0 to 10ml/h

Resolution:  $\pm$ 1.0ml/h

#### Venous pressure monitoring

Range of display: 0 to 40 kPa

Resolution:  $\pm$ 1kPa



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Temperature monitoring  
Range of display: 0 to 99°C  
Resolution: ±0.5°C

Monitoring system including:

Blood volume monitoring, Heparin volume monitoring, Temperature monitoring, Time monitoring, Venous pressure monitoring, Air bubble monitoring, System debugging, Alarm lamp and buzzer

**Specialties:**

- Infuse heparin automatically
- Heat blood automatically
- Plastic machine body

Optional:

UPS, auto-heater, movable stainless steel supporter, single blood pump.

## BLOOD PURIFICATION SYSTEM

### TRUMP-BPS-3000



**Function**

Hemofiltration, hemoperfusion, hemodialysis, plasma exchange

**Abstract**

Uraemia, acute renal failure, multi-organ failure acute, heart failure, reinfusion of ascites, intensive liver disease

**Product introduction**

Blood is powered into blood circuit from the patient, and then purified by the blood purification units such as hemofilter so as to remove the metabolite including urea, nitride and the deleterious materials. Meanwhile, heparin is infused to resist cruor. Substitution is added to maintain the balance of electrolyte and water in body. Then, the blood purified will be input back under the protective system's monitoring.

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## Technical data:

### Power and conditions

Power Supply: AC220V±22V

Dimension: 1470×400×350(H×W×D)

Frequency: 50Hz±1Hz

Weight: About 70kg

Power: About 600W

Temperature: 10 To 40℃

Humidity: No Higher Than 85%

### Venous pressure monitoring

Range of display: -20 to 50 kPa

Resolution: ±1kPa

### Arterial pressure monitoring

Range of display: -30 to 40 kPa

Resolution: ±1kPa

### Transmembrane pressure monitoring

Range of display: 0 to 70 kPa

Resolution: ±1kPa

### Blood pump

Range of blood volume: 0 to 500 ml/min

Resolution: ±5ml

### Ultrafiltration pump

Range of rotation: 0-50r/min

Resolution: ±0.5r

### Substitution pump

Range of display: 0 to 500 ml/min

### Heparin pump

Range of volume: 0 to 10ml/h

Resolution: ±0.1ml/min

### Temperature of Substitution

Range of display: 35 to 39℃

Resolution: ±0.5℃

### Air monitor:

Ultrasonic, auto-adaptive, can test the air bubble more than 0.05 ml.

### Blood leak detecting

Photoelectric, can detect blood leak volume more than 0.5ml/l.

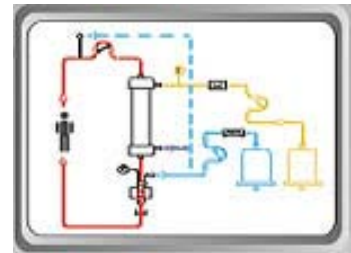
### Weight system

Range of display: 0-40kg

Resolution: ±20g

### monitoring system including:

Blood volume monitoring, Ultrafiltration volume monitoring, Substitution monitoring,



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Arterial pressure monitoring,  
Venous pressure monitoring, Transmembrane pressure monitoring, Air bubble monitoring, Blood leak monitoring,  
Temperature monitoring, Heparin volume monitoring, System debugging, Time monitoring, Alarm lamp and buzzer

**Specialties:**

- With automatic weight system, to assure the balance of substitution and ultrafiltration volume.
- With table weight system, no need to replace substitution
- With Good protective system, to assure safety and liability.
- Without pocket substitution, to decrease the cost of treatment.

**TRUMP-BPS-4000 HDF DEVICE**



**Functions:**

blood dialysis, blood filtration, on-line HDF, bedside HDF and blood perfusion

**Indication:**

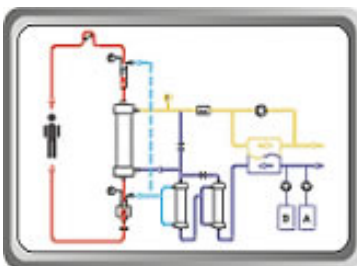
acute and chronic renal failure, uremia, multi organ failure, intoxication etc.

**Technical Features:**

The multi-functional machine offers customized curing mode for patients.

The advanced volume balance control system enables accurate control of ultrafiltration.

The adaptive regulation and control system effectively avoids various complications.



**Function Features:**

Adjustable sodium and multi ultrafiltration curves enable customized treatment for patients.

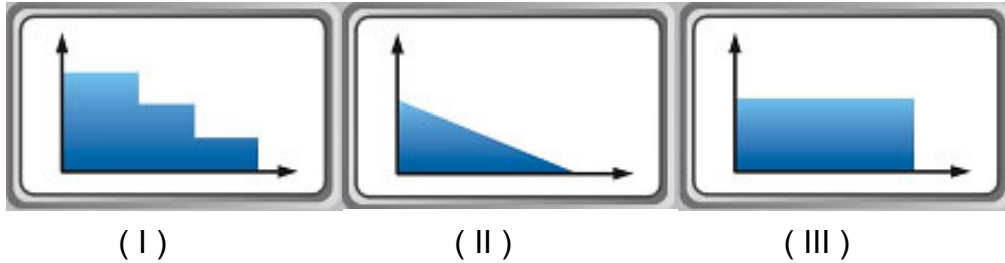
High volume hemofiltration (HVHF) is available (substitution fluid

≧ 25L/h)

KT/V calculation function can be used to evaluate the sufficiency of dialysis via the urea kinetic model

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## Volume balance system



### Technical Data:

Venous pressure range (kPa) -13~66  
Arterial pressure range (kPa) -26~53  
Transmembrane pressure range (kPa) -13~66  
Blood volume (mL/min) 0~500  
Dialysate volume (mL/min) 300, 500, 800  
Substitution fluid flow (L/h) 0~25  
Dialysate temperature range (°C) 34~40  
Control precision of Dialysate temperature (°C)  $\pm 0.5$   
Heparin injection precision (mL/h)  $\pm 0.1$   
Dialysate conductivity (mS/cm) 10~20  
Air monitoring method Self-adapting ultrasonic waves  
Balance control method Volume balance chamber

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# Urination Therapy Device

## Introduction:

This device is the innovative instrument for the clinic treatment, which is based on the technology of electronics and the theory of electrophysiology and pathophysiology. It's the original patent product in the world. The product works on such principle. Taking the advance of the characters of bladderwall such as its sensitivity to stimulation and its slow contractility, the mimical variable bio-current generated by the micro-controller, stimulates the smooth muscle of the bladder wall multidirectionally via skin, and makes it contract slowly and rhythmically, which is helpful for the urination of patients. The product is designed specially for the treatment of urination disorders caused by many reasons such as dysuresia, slack emiction, frequent emiction, nocturia, urinary retention, uroclepsia (Neurogenic bladder induced by diabetes or other causes, acontractile detrusor induced by the postoperative, postpartum reasons or the cases after prostate operation, urination disorders caused by clinostatism). The product may be helpful for avoidance of insertion of catheter and success of take out the catheter at the first time. Furthermore, it can cure constipation and be benefit for the increment of postpartum uterine contraction and recovery of uterine.



## Advantages

- The first device of the treatment of urination disorders in the world;
- Non-invading operation, which is safe, convenient and easy to be received by patients
- The restore or increase the emiction sense, mostly or completely decrease the remnant urinal capacity of patients, and remove of urinary retention
- To decrease the chances of using catheter remarkably, avoid using catheter repeatedly and take nurses away from the heavy work of tending the sick with catheter
- To decrease the rate of the urinary infection, systemic infection, kidney failure, septicaemia, and increase the rate of survival and improve the quality of life of patients
- The power and time of treatment are controlled by the microcomputer and showed digitally, and the parameters can be adjusted individually

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## Technological specifications

Parameter	Value	Unit
The weight of direct current	0	V
The frequency of impulses	<500	Hz
The maximum energy of a single impulse	<300	mJ
The maximum current of a single impulse	>7	uC
The virtual value of the maximum width of output	≤25 (500Ω load)	V
The voltage of open loop	<500	V
The time of a single course of treatment	40	min

## Clinical Applications

### Urology Surgery

Preoperative or postoperative acontractile detrusor induced urination disorders, urinary retention, cases that the catheter has been inserted or needs insert repeatedly (be helpful to take it away successfully at the first time or earlier), constipation, uroclepsia, etc.

### Gastroenterology, colorectal Surgery

Postoperative urination disorders, urinary retention (include the cases with analgesic pump), cases that the catheter has been inserted in operation or needs insert repeatedly (be helpful to take it away successfully at the first time or earlier), constipation, etc..

### Obstetrics-Gynecology

Postoperative, postpartum urination disorders, puerperal (to improve the exhaust of lochiorrhoea and recovery of uterine), cases that the catheter has been inserted in operation or needs insert repeatedly (be helpful to take it away successfully at the first time or earlier), constipation, uroclepsia, etc.

### Endocrinology

The increment of remnant urinal capacity of diabetes induced neurogenic bladder (frequent emiction, nocturia), urinary retention, uroclepsia ( to make it successful to remove catheter at the first time for the patient using catheter once or more), constipation, etc. .

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### **Tumor Surgery**

Postoperative urination disorders, urinary retention (include the cases with analgesic pump), cases that the catheter has been inserted in operation or needs insert repeatedly (be helpful to take it away successfully at the first time or earlier), constipation, etc.

### **Orthopedic Surgery**

Postoperative or clinostatism induced urination disorders, urinary retention, cases that the catheter has been inserted in operation or needs insert repeatedly and paraplegia (be helpful to take it away successfully at the first time or earlier), constipation, uroclepsia, etc.

### **Minimally Invasive Surgery**

Postoperative urination disorders, urinary retention (include the cases with analgesic pump), cases that the catheter has been inserted in operation or needs insert repeatedly (be helpful to take it away successfully at the first time or earlier), constipation, etc.

### **Neurosurgery**

Preoperative or postoperative urination disorders, urinary retention (include the cases with clinostatism or unconsciousness), cases that the catheter has been inserted in operation or needs insert repeatedly (be helpful to take it away successfully at the first time or earlier), constipation, uroclepsia, etc.

### **Neurology, Department of Rehabilitation, Special Room for the Older or Officer, Department of Gerontology**

All kinds of causes induced urination disorders and urinary retention (include the cases with clinostatism or unconsciousness), cases that the catheter has been inserted or needs insert repeatedly (be helpful to take it away successfully at the first time or earlier), constipation, uroclepsia, etc.

### **Infectious Disease**

All kinds of causes induced urination disorders and urinary retention (include the cases with unconsciousness), cases that the catheter has been inserted or needs insert repeatedly (be helpful to take it away successfully at the first time or earlier), constipation, uroclepsia, etc.