

\*FDA 510(K) Cleared

\*FDA EUA Approved

### Urology

PSA plus  
Testosterone

### Thyroid

TSH  
Free T4  
Total T3  
Thyroid Duo

### Emergency

PCT  
BNP  
Troponin I  
Cardiac Triple  
D-Dimer  
hsCRP

### Respiratory

FLU A&B  
COVID-19 Ag  
COVID-19 Ag+FLU A&B  
COVID-19 total Ab  
COVID-19 IgG/IgM Duo  
COVID-19 SP  
COVID-19 NAb

### Vitamin

Vitamin D



Why wait for the result?

# Get FRENDO!

#### Key feature 01

## Accelerating decision-making

The FREND™ System is a point-of-care testing (POCT) that uses microfluidic and immunofluorescence technology. Accurate and fully automated FREND™ System offers fast results. With a simple 3 step operation and a wide range of disease markers, the system supports quick decision-making.

#### Key feature 02

## Easy & Fast Operation

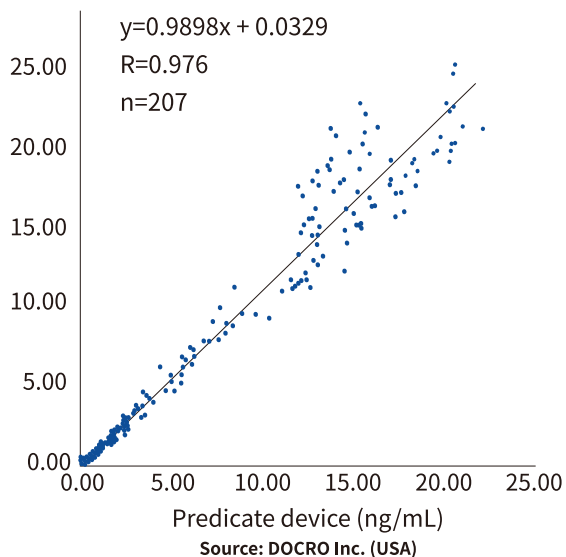
The quantitative results can be obtained in less than 3 minutes with only 35 µL of sample volume. The FREND™ System offers an intuitive and user-friendly interface. System QC and software updates are just a click away.

#### Key feature 03

## Superior Accuracy

The FREND™ System received FDA 510(k) clearance as the *in-vitro* diagnostics which provides a high correlation with large machinery and accurate results.

Correlation value of FREND™ PSA Plus is more than 0.97 compared to predicate device.



Key feature 04

## User-friendly Interface

The FREN<sup>TM</sup> System offers intuitive and easily accessible GUI. It stores up to 1,000 test results. Users can transfer the data easily to PC through USB and print out the test result with a printer provided.

Key feature 05

## Excellent Quality Control

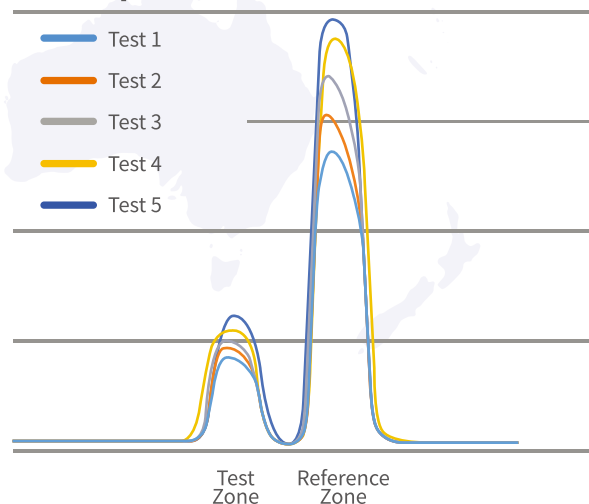
The FREN<sup>TM</sup> System provides free QC cartridge to quickly check the integrity of the system. A code chip significantly reduces possible errors in between-test values and LOT variation, hence provides more accurate results.



<Correct Test-to-Test variations>

	Fluorescence Intensity		Ratio (Test/Reference)
	Test Zone	Reference Zone	
Test 1	32557	112542	0.289
Test 2	24603	84160	0.292
Test 3	26133	93322	0.280
Test 4	30427	104619	0.291
Test 5	21302	74288	0.287
AVERAGE	27004	93786	0.288
S.D.	4516	15348	0.005
CV%	16.7	16.4	1.7

### Example

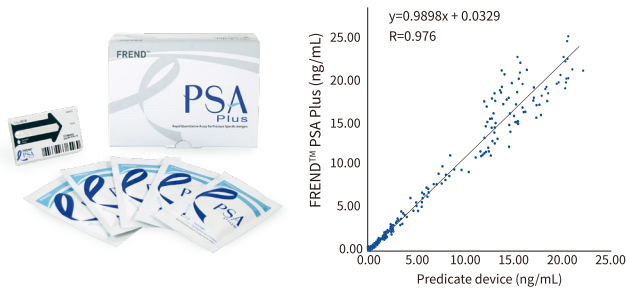


# UROLOGY

## PSA Plus

MFDS CE 0123 NMPA FDA 510(k) cleared

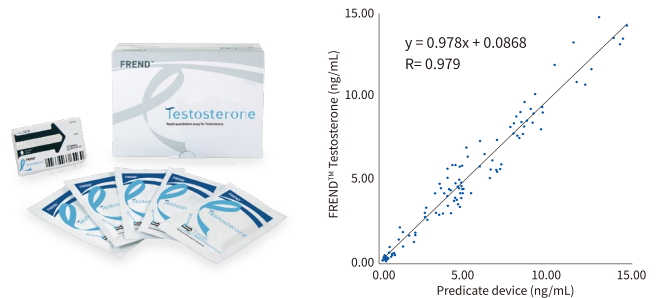
Prostate-specific antigen (PSA), also known as gamma-seminoprotein or kallikrein-3 (KLK3), is a glycoprotein enzyme encoded in humans by the KLK3 gene. It is a member of the kallikrein-related peptidase family and is secreted by the epithelial cells of the prostate gland. PSA is produced for the ejaculate, where it liquefies semen in the seminal coagulum and allows sperm to swim freely.



## Testosterone

MFDS CE FDA 510(k) cleared

Testosterone is a steroid hormone from the androgen group and is found in humans and other vertebrates. In humans and other mammals, testosterone is secreted primarily by the testicles of males and, to a lesser extent, the ovaries of females. Small amounts are also secreted by the adrenal glands. It is the principal male sex hormone and an anabolic steroid.



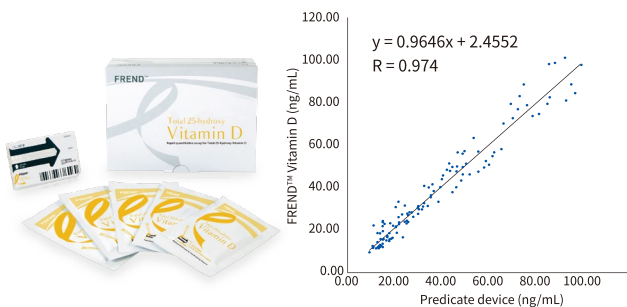
Test item	Principle	AMR	Sample type	Sample volume	Time	Pretreatment	Package	Storage	Expiration date
PSA Plus	Immunofluorescence	0.05 ~ 25 ng/mL	Serum or Plasma	35 µL	< 3 min	X	25 tests / Kit	2 ~ 8 °C	24 month
Testosterone	Immunofluorescence	0.20 ~ 15 ng/mL	Serum or Plasma	70 µL	< 3 min	O	20 tests / Kit	2 ~ 8 °C	18 month

# VITAMIN

## Vitamin D

MFDS CE FDA 510(k) cleared

Vitamin D is a steroid hormone involved in the activation of calcium, which is important in the formation and maintenance of bones. Lack of calcium and vitamin D for a long period of time can cause osteoporosis.



# RESPIRATORY

## FLU A&B

MFDS CE

Influenza A virus and Influenza B virus, commonly known as flu, are respiratory viruses that cause seasonal flu epidemics usually during winter each year. The FREND™ FLU A&B qualitatively measures the strains of influenza A and B viruses using human nasopharyngeal swab specimens.



Test item	Principle	AMR	Sample type	Sample volume	Time	Pretreatment	Package	Storage	Expiration date
Vitamin D	Immunofluorescence	10 ~ 110 ng/mL	Serum or Plasma	35 µL	< 3 min	O	20 tests / Kit	2 ~ 8 °C	12 months
FLU A&B	Immunofluorescence	Positive/negative	Nasopharyngeal swab	35 µL	< 3 min	X	20 tests / Kit	2 ~ 8 °C	12 months

# RESPIRATORY (COVID-19)

## COVID-19 Ag

MFDS 



The antigen of SARS-CoV-2 is a nucleocapsid protein with viral activity which is essential for virus to replicate in a host. Individuals infected with SARS-CoV-2 are found to have these antigens in their body which can be detected using nasopharyngeal swab during diagnostic tests.

## COVID-19 Ag+Flu A&B

MFDS 



The antigen of SARS-CoV-2 and influenza A and B viruses in human can be directly detected using nasopharyngeal swab during diagnostic tests. The FREND™ COVID-19 Ag + FLU A&B is designed to detect both SARS-CoV-2 antigen and influenza A and B viruses simultaneously and qualitatively.

## COVID-19 total Ab\*\*

MFDS  



Total antibodies (immunoglobulin G and M) involved in the immune response during SARS-CoV-2 infection are detected using the FREND™ total Ab in human plasma to help indicate recent or prior SARS-CoV-2 infection.

## COVID-19 IgG/IgM Duo

MFDS 



IgG and IgM are immunoglobulin antibodies that are involved in the immune response during viral infection. The FREND™ COVID-19 IgG/IgM Duo detects anti-nucleocapsid IgG and IgM antibodies to SARS-CoV-2 in human serum or plasma from individuals suspected with SARS-CoV-2.

## COVID-19 SP

MFDS 



The spike protein (SP) of SARS-CoV-2 has subunits that help the virus to enter and infect host cells. Individuals infected with SARS-CoV-2 having mild to moderate condition are shown to have the highest level of spike-specific IgG. Thus, by detecting anti-spike IgG and IgM antibodies, an adaptive response to SARS-CoV-2 may be identified from those suspected with COVID-19.

## COVID-19 Neutralization Ab

MFDS 



The presence of neutralizing antibodies are found in individuals infected with SARS-CoV-2 or vaccinated. The neutralizing antibodies to SARS-CoV-2 neutralize the viral activity by preventing the spike protein from binding to the receptor binding domain.

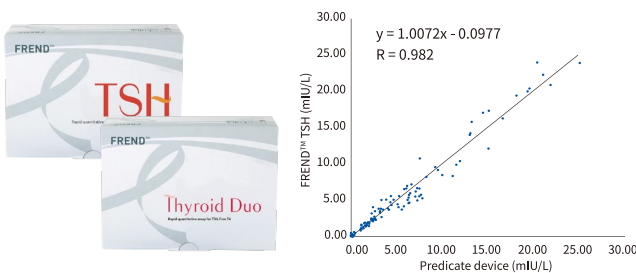
Test item	Principle	Sample type	Sample volume	Time	Pretreatment	Package	Storage	Expiration date
COVID-19 Ag	Immunofluorescence	Nasopharyngeal swab	35 µL	< 3 min	X	20 tests / Kit	2 ~ 30 °C	12 months
COVID-19 Ag+Flu A&B	Immunofluorescence	Nasopharyngeal swab	35 µL	< 3 min	X	20 tests / Kit	2 ~ 8 °C	12 months
COVID-19 total Ab**	Immunofluorescence	EDTA-Plasma	35 µL	< 3 min	X	20 tests / Kit	2 ~ 8 °C	12 months
COVID-19 IgG/IgM Duo	Immunofluorescence	Serum or Plasma	35 µL	< 3 min	X	20 tests / Kit	2 ~ 8 °C	12 months
COVID-19 SP	Immunofluorescence	Serum or Plasma	35 µL	< 3 min	X	20 tests / Kit	2 ~ 8 °C	12 months
COVID-19 Neutralization Ab	Immunofluorescence	Serum or EDTA-Plasma	35 µL	< 3 min	O	20 tests / Kit	2 ~ 8 °C	12 months

\*\*COVID-19 total Ab is for US sales only.

# THYROID

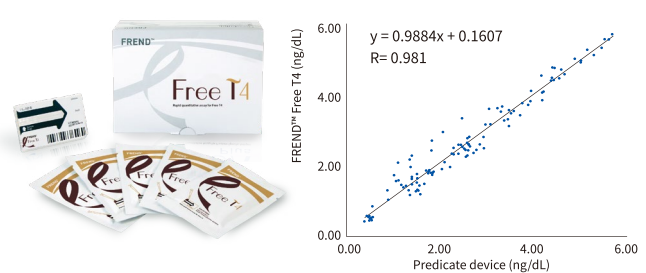
## TSH/Thyroid Duo MFDS CE FDA 510(k) cleared

Thyroid-stimulating hormone (also known as thyrotropin, thyrotropic hormone, TSH, or hTSH for human TSH) is a pituitary hormone that stimulates the thyroid gland to produce thyroxine (T4), and then triiodothyronine (T3) which stimulates the metabolism of almost every tissue in the body. It is a glycoprotein hormone synthesized and secreted by thyrotrope cells in the anterior pituitary gland, which regulates the endocrine function of the thyroid.



## Free T4 MFDS CE FDA 510(k) cleared

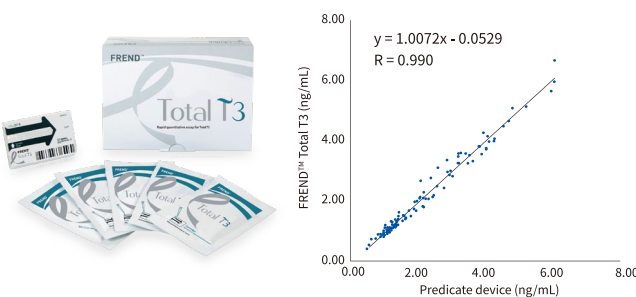
A hormone that is made by the thyroid gland and is one of the most important thyroid hormones. Four iodine molecules are attached to the molecular structure of thyroxine. Along with the more powerful thyroid hormone triiodothyronine (T3), thyroxine affects almost every process in the body, including body temperature, growth, and heart rate.



Test item	Principle	AMR	Sample type	Sample volume	Time	Pretreatment	Package	Storage	Expiration date
TSH	Immunofluorescence	0.06 ~ 25 mIU/L	Serum or Plasma	35 µL	< 3 min	X	25 tests / Kit	2 ~ 8 °C	24 months
Thyroid Duo	Immunofluorescence	TSH: 0.06 ~ 25 mIU/L Free T4: 0.40 ~ 6 ng/dL	Serum or Plasma	70 µL	< 3 min	O	20 tests / Kit	2 ~ 8 °C	12 months
Free T4	Immunofluorescence	0.40 ~ 6 ng/dL	Serum or Plasma	70 µL	< 3 min	O	20 tests / Kit	2 ~ 8 °C	18 months

## Total T3 MFDS CE

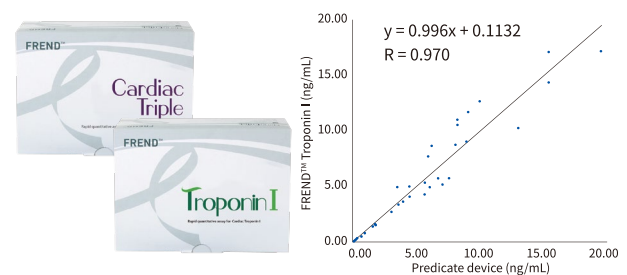
Triiodothyronine, also known as T3, is a thyroid hormone. It affects almost every physiological process in the body, including growth and development, metabolism, body temperature, and heart rate.



# EMERGENCY

## Cardiac Triple Troponin I MFDS CE

Cardiac Triple test measures the level of CK-MB, Troponin I and Myoglobin to detect and monitor heart attack or injury to heart muscle. It is fast and accurate quantitative *in vitro* diagnostic of the protein in human serum or plasma based on the lab-on-a-chip technology.



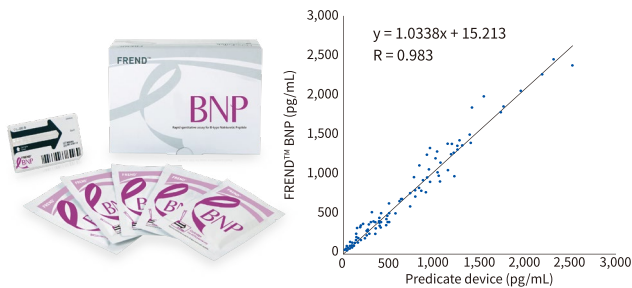
Test item	Principle	AMR	Sample type	Sample volume	Time	Pretreatment	Package	Storage	Expiration date
Total T3	Immunofluorescence	0.40 ~ 6 ng/mL	Serum or Plasma	70 µL	< 3 min	O	20 tests / Kit	2 ~ 8 °C	12 months
Cardiac Triple	Immunofluorescence	Troponin I: 0.05 ~ 20 ng/mL CK - MB: 1 ~ 80 ng/mL Myoglobin: 5 ~ 500 ng/mL	EDTA-Plasma	35 µL	< 3 min	X	25 tests / Kit	2 ~ 8 °C	12 months
Troponin I	Immunofluorescence	0.05 ~ 20 ng/mL	EDTA-Plasma	35 µL	< 3 min	X	25 tests / Kit	2 ~ 8 °C	12 months

# EMERGENCY

## BNP

MFDS CE NMPA

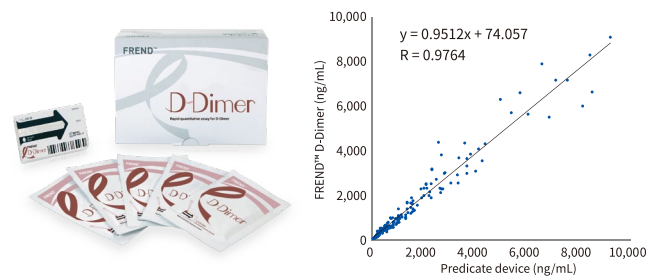
Brain natriuretic peptide (BNP) is a 32-amino acid polypeptide secreted by the ventricles of the heart in response to excessive stretching of heart muscle cells (cardiomyocytes). The release of BNP is modulated by calcium ions.



## D-Dimer

MFDS CE

D-dimer is a fibrin degradation product (or FDP), a small protein fragment present in the blood after a blood clot is degraded by fibrinolysis. The concentration of D-dimer may be determined by a blood test to help diagnose thrombosis. It is used in the diagnosis of DVT (Deep Vein Thrombosis) or PE (Pulmonary Embolism).

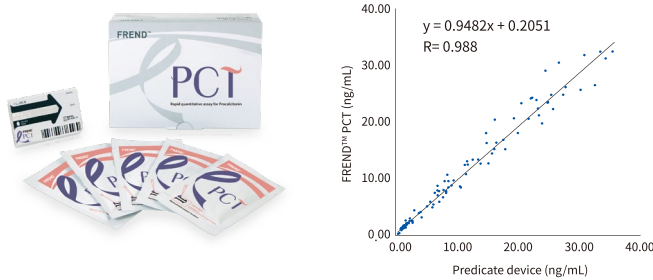


Test item	Principle	AMR	Sample type	Sample volume	Time	Pretreatment	Package	Storage	Expiration date
BNP	Immunofluorescence	30 ~ 2500 pg/mL	EDTA-Plasma	35 µL	< 3 min	X	25 tests / Kit	2 ~ 8 °C	12 months
D-Dimer	Immunofluorescence	50 ~ 10,000 ng/mL FEU	Citrate-Plasma	35 µL	< 3 min	X	25 tests / Kit	2 ~ 8 °C	12 months

## PCT

MFDS CE

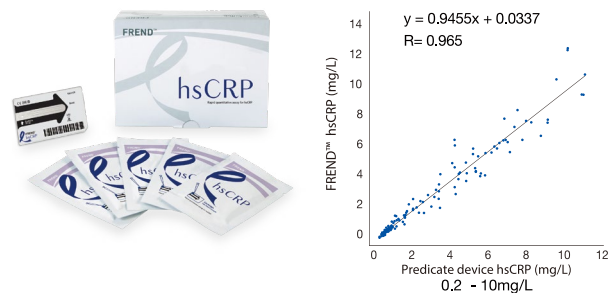
Procalcitonin (PCT) is a peptide precursor of the hormone calcitonin, the latter being involved with calcium homeostasis. It is composed of 116 amino acids and is produced by parafollicular cells (C cells) of the thyroid and by the neuroendocrine cells of the lung and the intestine.



## hsCRP

MFDS CE

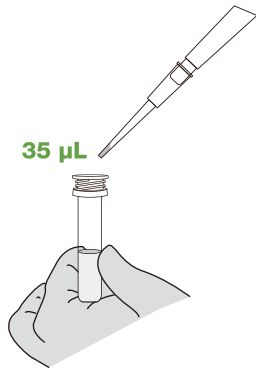
C-reactive protein (CRP) and high-sensitivity CRP (hsCRP) tests are used to measure different range of CRP in blood. The hsCRP test is used to measure the concentration of CRP lower than the standard CRP. As the CRP level is elevated mainly due to inflammation, infection and cardiovascular disease, hsCRP can be a useful marker for identifying not only infection, tissue injury, inflammatory disorders and associated diseases but also for identifying future cardiovascular disease.



Test item	Principle	AMR	Sample type	Sample volume	Time	Pretreatment	Package	Storage	Expiration date
PCT	Immunofluorescence	0.07 ~ 32 ng/mL	Serum	35 µL	< 3 min	X	25 tests / Kit	2 ~ 8 °C	18 months
hsCRP	Immunofluorescence	0.20 ~ 100 mg/L	Serum	35 µL	< 3 min	X	25 tests / Kit	2 ~ 8 °C	12 months

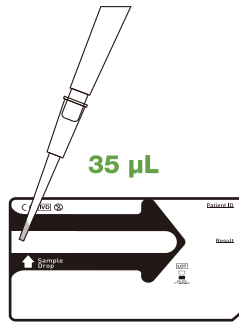
# With just simple 3 step operation FREND™ System provides accurate results easily and quickly

## Basic procedure



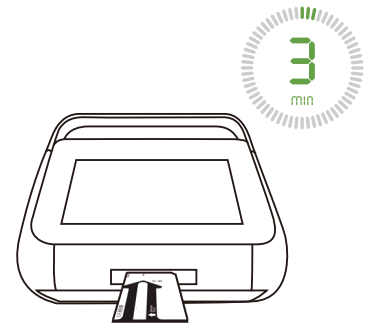
### STEP 01.

Pipette 35 µL of the sample



### STEP 02.

Load sample



### STEP 03.

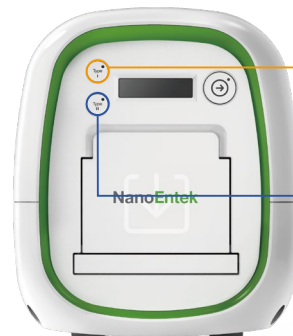
Get results

## Pretreatment procedure

The following items require a pretreatment process.

### AP System

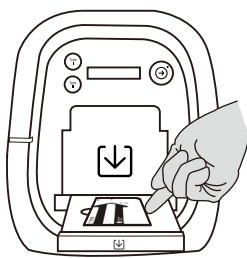
Automated pretreatment device that automatically performs incubation to sample injection.



Type I  
Vitamin D\*\*

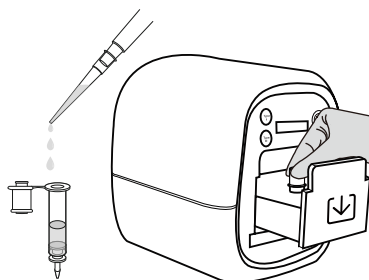
Type II  
Testosterone  
Free T4  
Total T3  
Thyroid Duo  
Neutralization Ab\*\*

! \*\* Test items require a dilution process.



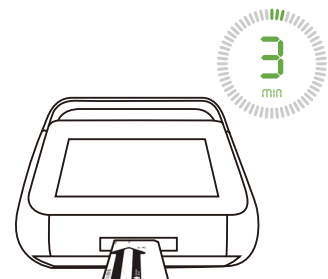
### STEP 01.

Insert a cartridge into the AP device.



### STEP 02.

Add sample to either dilution tube or pretreatment tube depending on the test item.



### STEP 03.

Insert the sample loaded cartridge into the FREND™ System.



# FREND™ System provides a wide range of test items

## FREND™ System Application

Class	Test item	Cat. no	Sample type	Sample volume	AMR/Result	Pretreatment	Certification
UROLOGY	PSA Plus	FRPS 025	Serum or Plasma	35 µL	0.05 ~ 25 ng/mL	-	CE, MFDS, FDA, NMPA
	Testosterone	FRTEAP 020	Serum or Plasma	70 µL	0.2 ~ 15 ng/mL	O	CE, MFDS, FDA
THYROID	TSH	FRTS 025	Serum or Plasma	35 µL	0.06 ~ 25 mIU/L	-	CE, MFDS, FDA, PMDA
	Free T4	FRT4AP 020	Serum or Plasma	70 µL	0.4 ~ 6 ng/dL	O	CE, MFDS, FDA
	Total T3	FRTT3AP 020	Serum or Plasma	70 µL	0.40 ~ 6 ng/mL	O	CE, MFDS
	Thyroid Duo (TSH/Free T4)	FRTDAP 020	Serum or Plasma	70 µL	0.06 ~ 25 mIU/L (TSH) 0.4 ~ 6 ng/dL (Free T4)	O	CE, MFDS, PMDA
EMERGENCY	PCT	FRPC 025	Serum	35 µL	0.07 ~ 32 ng/mL	-	CE, MFDS
	BNP	FRBN 025	EDTA - Plasma	35 µL	30 ~ 2500 pg/mL	-	CE, MFDS, NMPA
	Troponin I	FRTI 025	EDTA - Plasma	35 µL	0.05 ~ 20 ng/mL	-	CE, MFDS
	Cardiac Triple (Tnl, CK-MB, Myoglobin)	FRCT 025	EDTA - Plasma	35 µL	0.05 ~ 20 ng/mL (Troponin I) 1 ~ 80 ng/mL (CK-MB) 5 ~ 500 ng/mL (Myoglobin)	-	CE, MFDS
	D-Dimer	FRDD 025	Citrate - Plasma	35 µL	50 ~ 10,000 ng/mL FEU	-	CE, MFDS
	hsCRP	FRhCR 025	Serum	35 µL	0.20 ~ 100 mg/L	-	CE, MFDS
RESPIRATORY	FLU A&B	FRFL 020	Nasopharyngeal swab	35 µL	Positive/Negative	-	CE, MFDS
	COVID-19 Ag	FRCOG 020P	Nasopharyngeal swab	35 µL	Positive/Negative	-	CE, MFDS*
	COVID-19 Ag+FLU A&B	FRCGFL 020	Nasopharyngeal swab	35 µL	Positive/Negative	-	CE, MFDS*
	COVID-19 total Ab**	FRCOA 020	EDTA-Plasma	35 µL	Positive/Negative	-	CE, MFDS*, FDA EUA
	COVID-19 IgG/IgM Duo	FRCOD 020	Serum or Plasma	35 µL	Positive/Negative	-	CE, MFDS*
	COVID-19 SP	FRCOS 020	Serum or Plasma	35 µL	Reactive/Non-reactive	-	CE, MFDS*
	COVID-19 Neutralization Ab	FRCON 020	Serum or EDTA-Plasma	35 µL	Reactive/Non-reactive	O	CE, MFDS*
VITAMIN	Vitamin D	FRVDAP 020	Serum or Plasma	35 µL	10 ~ 110 ng/mL	O	CE, MFDS, FDA

Products comply with CE certification.

\*Export only

\*\*COVID-19 total Ab is for US sales only.

## FREND™ System Specification

Specification	FREND System	FREND AP
Electrical rating	Voltage	100 - 240 V~
	Current	1.7 A
	Frequency	50 / 60 Hz
Output	Voltage	DC 12 V
	Current	3.33 A
Dimensions (WxLxH)	240 x 260 x 175 mm	195 x 230 x 210 mm
Weight	3 Kg	4 Kg



Scan for more information



NanoEntek, Inc. (HQ) 12F, 5, Digital-ro 26 gil, Guro-gu, Seoul, 08389, Korea  
 NanoEntek, Inc. (Manufacturing site) 851-14, Seohae-ro, Paltan-myeon, Hwaseong-si, Gyeonggi-do, 18531, Korea  
 NanoEntek America, Inc. (USA Branch) 220 Bear Hill Road, Suite 102, Waltham, MA 02451, USA  
 NanoEntek Bio-Technology(Beijing) Ltd. (China Branch) Room 302, 3F, Building 19, No. 88, Liuxiang Road, Fengtai District, Beijing, China

(Tel) +82-2-6220-7942 (Fax) +82-2-6220-7999 (e-mail) ivdst@nanoentek.com (website) www.nanoentek.com

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