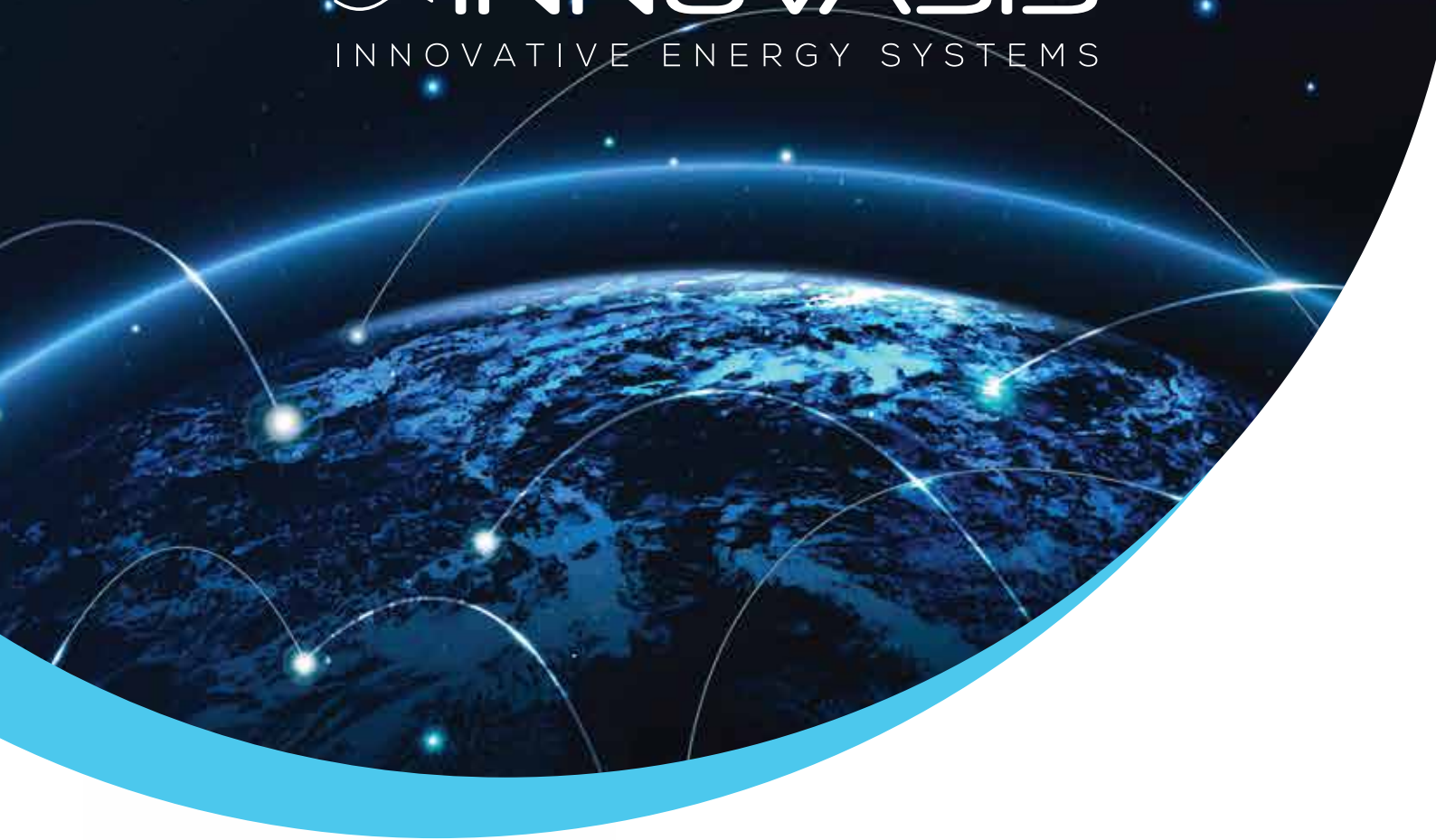


 **INNOVASIS**  
INNOVATIVE ENERGY SYSTEMS



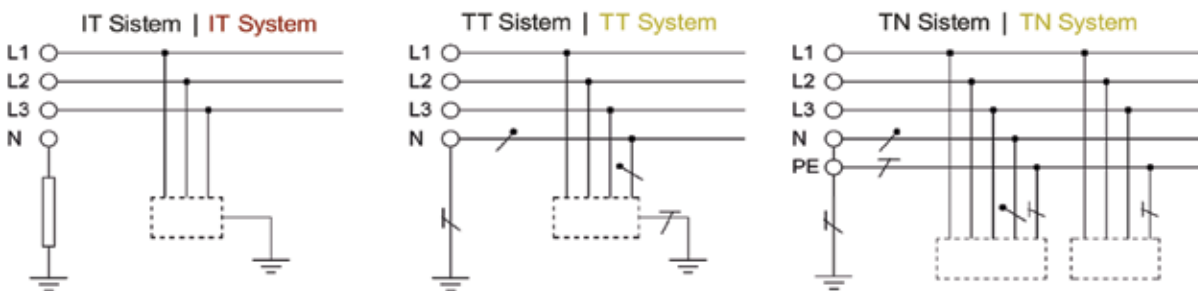
# MEDICAL ISOLATED POWER SYSTEMS



MEDICAL

# MEDICAL ISOLATED POWER SYSTEMS

Electrical power supply of the medical field, are selected according to the ambient electrical safety. TSE, IEC and IEE standards divide medical location into 3 group as Group 0, Group 1, Group 2 according to patient safety. Group 2 including operation room, cardiac area, intensive care unit is most critical part for electricity sustainability and insulation. Electrical devices in group 2 save patients life. When there are any failure of the devices in this environment without harming the people in the medical location, devices are required to work without interruption. For this reason, IT isolated power system is used in the Group 2 area.



## EARTHING CONNECTION TYPES

Network installation regulations distinguishes three families of earthing arrangements, using the twoletter codes TN, TT, and IT. The first letter indicates the connection between earth and the power-supply equipment (generator or transformer):

“T” — Direct connection of a point with earth,  
“I” — No point is connected with earth (isolation), except perhaps via a high impedance. The second letter indicates the connection between earth and the electrical device being supplied:

“T” — Direct connection of a point with earth,  
“N” — Direct connection to neutral at the origin of installation, which is connected to the earth.

The next letter (If it is exist) indicates the regulations of neutral and protection conductor:

“S” — Provide protection function with separate conductor from neutral or earthed line conductor,  
“C” — Combining neutral and protection safety on single conductor (PEN conductor).

All live parts are separated from the ground or from a point connected to ground via a high impedance. The exposed conductive parts of the electrical installation is grounded separately or combined or connected to the system ground.



## **MEDICAL ISOLATED POWER PANELS**

At the IT systems used in group 2 rooms in medical environments, isolation transformer is used to separate the grounding of the neutral conductor and phase conductor. The grounding plug is connected to the equipotential bus. In isolated power systems, grounding are insulated against both lines. If a low resistance short circuit touches the ground or a leakage occurs, continue to the function of the circuit breaker and do not open and medical electrical equipment is continue to their functionality. Also because of grounding network is isolated as create a very high resistance to earth will pass current level will not harm even through touching people. In isolated power systems, insulation levels, transformer temperature and the load current is continuously monitored and a possible case of failure alarm signal is generated. The alarm signal is provided the necessary interventions by transmitted to related panels.

- Operation Rooms
- Surgery Preparation Room
- Intensive Care Units
- Anesthesia Room
- Cardiac Catheterization Rooms
- Angiographic Surgery Rooms
- Premature Baby Rooms



## MEDICAL ISOLATED POWER PANELS

These panels are used in the power supply of places in medical locations within the scope of Group 2. Panels comply with TS IEC 60364-7-710 standards. Typical medical isolated power panels consist of an isolating transformer, insulation monitoring device detect insulation resistance, load current, transformer temperature, system, earth, CT connections, alarm indicator, equipotential bonding terminal. Electrical loads in Group 2 locations are protected against short circuit currents with fuses appropriate to IT system.

### Technical Specifications

Brand	Innovasis
Type	Innovasis
Standards	TSE-IEC 60364-7-710
Output Power	3,15 / 4 / 5 / 6,3 / 8 / 10 kVA
Supply Input	Single Phase Monophase Line
Rated Voltage	230 VAC
Frequency	50 / 60 Hz
Isolation Level	3 kV / 1 min
Input Protection	gL Fuse
Output Voltage	230 VAC
Output Protection	2 Pole Fuse
Watchdog	Isolation Resistance by LCD Screen
Alar Output	Insulation Fault, Overload, Overtemperature
Functional Test	Advanced Insulation Fault and Transfer Test
Enclosure leakage Current	<0,5 mA
Isolation Fault Detection Period	<1 s
Working Temperature	0°C / 50°C
Storage Temperature	-15°C / 70°C
Panel Dimensions	1500 x 500 x 500 mm / 1500 x 650 x 500 mm *
Ventilation	Fan
Protection Class	IP 41
Colour	RAL 9003
Distribution Output	6 - 12 - 18 - 24... pcs



## MEDICAL ISOLATED POWER PANEL WITH TRANSFER UNIT

Medical isolated power panels with transfer unit; are used in the system is fed from two different power supply to provide power continuity of isolated power systems. In addition to isolated power panels, these panels have transfer unit provide switching between two parallel power source. Transfer unit follow two and when voltage values exceed limit values, provide transferring between lines as automatically. In these way, interruption of energy is prevented and critical loads is always fed.

### Technical Specifications

Brand	Innovasis
Type	Innovasis
Standards	TSE-IEC 60364-7-710
Output Power	3,15 / 4 / 5 / 6,3 / 8 / 10 kVA
Supply Input	Double Phase Monophase Line
Rated Voltage	230 VAC
Frequency	50 / 60 Hz
Isolation Level	3 kV / 1 min
Input Protection	gL Fuse
Output Voltage	230 VAC
Output Protection	2 Pole Fuse
Watchdog	Isolation Resistance by LCD Screen
Alar Output	Insulation Fault, Overload, Overtemperature
Functional Test	Advanced Insulation Fault and Transfer Test
Enclosure leakage Current	<0,5 mA
Isolation Fault Detection Period	<1 s
Working Temperature	0°C / 50°C
Panel Dimensions	1700 x 500 x 500 mm / 1500 x 650 x 500 mm *
Ventilation	Fan
Protection Class	IP 41
Colour	RAL 9003 / Ral 7035
Distribution Output	6 - 12 - 18 - 24... pcs



## MEDICAL ISOLATED POWER PANELS WITH TRANSFER UNIT AND FAULT DETECTION SYSTEM

Medical isolated power panels with transfer unit and insulation fault detection device have also test signal generator, insulation fault evaluators and toroidal transformer in apart from other isolated panels. When any fault exist, this fault is detected by insulation monitoring device and test signal generator produce a test signal, after that fault detected according to response of system to this signal. Insulation fault evaluator send signal to alarm monitoring devices.

### Technical Specifications

Brand	Innovasis
Standarts	Innovasis
Type	TSE-IEC 60364-7-710
Output Power	3,15 / 4 / 5 / 6,3 / 8 / 10 kVA
Supply Input	Double Phase Monophase Line
Frequency	50 / 60 Hz
Isolation Level	3 kV / 1 min
Input Protection	gL Fuse
Output Voltage	230 VAC
OutPut Protection	2 Pole Fuse
Watchdog	Isolation Resistance by LCD Screen
Alarm Output	Insulation Fault, Overload, Overtemperature
Functional Test	Advanced Insulation Fault and Transfer Test
Enclosure leakage Current	<0,5 mA
Isolation Fault Detection Period	<1 s
Working Temperature	0°C / 50°C
Storage Temperature	-15°C / 70°C
Panel Dimensions	1700 x 500 x 500 mm / 1500 x 650 x 500 mm *
Ventilation	Fan
Protedction Class	IP 41
Colour	RAL 9003/B RAL 7035
Distubition Output	6 - 12 - 18 - 24... pcs
Transfer Time	50 - 500 kΩ
Transfer Time	<5 Ms



## AUXILIARY DEVICES MEDICAL ISOLATING TRANSFORMER

Medical isolating transformer is produced comply with IEC 61558-2-15 standards for supplying critical loads. With a static screen placed between the primary and secondary windings is isolated from the fixed angle transformer core. With built-in PTC thermistor, temperature measurement can be performed.

### Medical Transformer Technical Specs EN 61558-2-1

Power	10 kVA
Frequency	50 Hz
Input Voltage	230 V
Output Voltage	230 V
Instantaneous Input Current	7,39 A
Leakage Current	≤ 10 μA
No Load Output Voltage	238,6 V
Regulation	4,64%
Maximum Temperature Rise	59,4 °C
Protection Class	IP00
Insulation Class	F
Ventilation	AN AN
Standards	EN 61558-2-15
Working Tem perature	<0,5 mA
Working Temperature	-10°C + 50°C
Storage Temperature	-15°C / 70°C



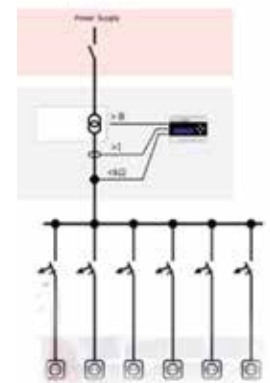
## ISOLATION MONITORING

Isolation monitoring device continuously monitoring isolation resistance level and detect any possible insulation faults. Device is set to alarm when insulation of whole network is below than set value. Moreover, device monitor temperature of transformer and load current. If this values exceed limits, it generate alarm signal.



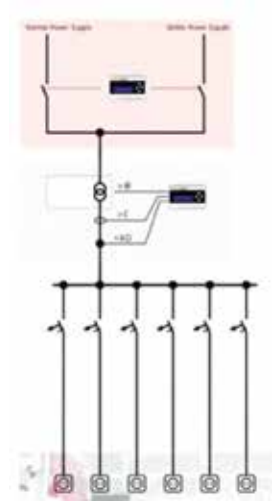
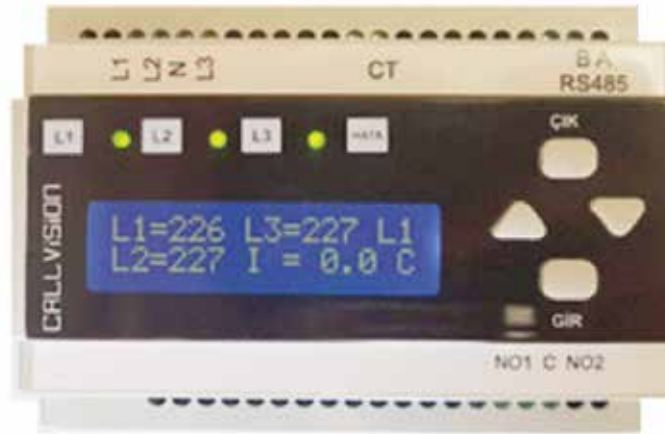
### Technical Specifications

Brand	Innovasis
Type	Innovasis
Standarts	TSE-IEC 60364-7-710
Rated Impulse Withstand Voltage	4 kV
Supply Voltage	24 VAC
Operating Voltage	16-35 VAC
Frequency	50 / 60 Hz
Measurement Range	1 - 500 K $\Omega$
Test Current	50 $\mu$ A
Test Voltage	24 VDC
Internal Impedance	1.8 MOhm
Impedance	800 kOhm
Communication Interface	RS 485 (BMS protocol)
Load Current Range	0-10A / 0-100A
Product Dimensions	126 x 91 x 50 mm
Working Temperature	-10°C / 50°C
Storage Temperature	-15°C / 70°C



## TRANSFER RELAY

Transfer unit is device supply proper feeding load by active line when there is any problem at supplied power lines. Device make transferring less than 3 period duration



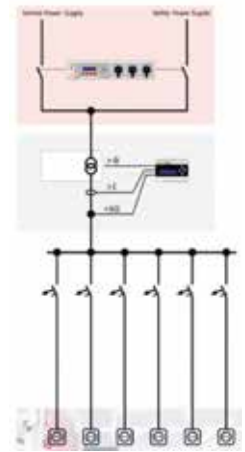
### Technical Specifications

Brand	Innovasis
Type	Innovasis
Standarts	TSE-IEC 60364-7-710
Transfer Time	< 7ms
Rated Current Range	15A 20A 25A 32A 40A 50A
Supply Input	230 VAC
Efficiency	96%
Frequency	50 / 60 Hz
Input Protection	Class B
Working Temperature	0°C / 50°C
Storage Temperature	-15°C / 70°C
Product Dimensions	126 x 91 x 50 m m



## TRANSFER UNIT

Transfer unit is device supply proper feeding load by active line when there is any problem at supplied power lines. Device make transferring less than  $\frac{1}{4}$  period duration.



### Technical Specifications

Brand	Innovasis
Type	Innovasis
Standarts	TSE-IEC 60364-7-710
Transfer Time	< 5ms
Rated Current Range	15A 20A 25A 32A 40A 50A
Supply Input	230 VAC
Efficiency	96%
Frequency	50 / 60 Hz
Input Protection	Class B
Working Temperature	0°C / 50°C
Storage Temperature	-15°C / 70°C
Product Dimensions	320 x 120 x 350 mm
Ventilation	Natural Cooling
Protection Class	IP 21
Colour	RAL 9003 / RAL 7035





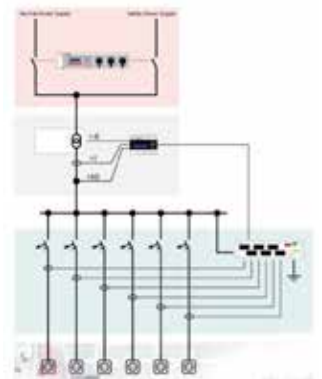
## INSULATION FAULT DETECTION SYSTEM

Transfer unit is device supply proper feeding load by active line when there is any problem at supplied power lines. Device make transferring less than  $\frac{1}{4}$  period duration.



### Technical Specifications

Brand	Innovasis
Type	Innovasis
Standarts	TSE-IEC 60364-7-710
Output Power	< 10W
Supply Voltage	24 VAC
Supply Input	16-35 VAC
Rated Voltage	24 VAC
Frequency	50 / 60 Hz.
Isolation Level	4 kV
Input Protection	Class B
Alarm Output	1 pcs dry contact
Enclosure Leakage Current	< 50 $\mu$ A
Isolation Fault Detection Period	< 300 m sn.
Working Temperature	0°C / 50°C
Storage Temperature	-15°C / 70°C
Product Dimensions	254 x 60 x 25,5 m m
Ventilation	Natural Cooling
Internal Resistance	500 - 800 $\Omega$
Max. Input Current	1A
Max. Input Current	125 $\mu$ A
Turn Ratio	8000 / 1



## LOCAL ALARM PANEL

Local alarm panel duplicates fault, alarm and operating messages of monitoring devices in accordance with TS IEC 60364-7-710 standard. By panel, authorized technical staff can follow alarm messages.



### Technical Specifications

Brand	Innovasis
Type	Innovasis
Standarts	TSE-IEC 60364-7-710
Frequency	50 / 60 Hz
Watchdog	Line Base Fault Monitoring
Alarm Output	2 Relay Outputs
Working Temperature	0°C / 50°C
Storage Temperature	-10°C / 50°C
Input Protection	Class B
Monitor	4.3" Touchscreen LCD
Communication Interface	RS-485 (BMS Protocol)
Alarms	Insulation Resistance
	Load Current Rate
	Insulation Fault
	Overload Current
	Device Failure
Supply Input	24 V
Max. Input Current	125 $\mu$ A
Product Dimensions	220 x 190 mm

## CENTRAL ALARM PANEL

Central alarm panel is the device enable to remote monitoring all fault, alarm and operating messages of medical system in only a screen in accordance with TS IEC 60364-7-710 standards. By this panel, can be monitored fault messages as like UPS fault room temperature, air condition fault and oxygen, vacuum, dry air, nitrous oxide, pressurized air, nitrogen values of medical gas systems in addition to all specifications of alarm indicator panel.



### Technical Specifications

Brand	Innovasis
Type	Innovasis
Standarts	TS IEC 60364-7-710, EN60950-1, EN62311, EN55022, EN61000-3-3, EN61000-3-2, EN55024, EN55022
Frequency	50 / 60 Hz
Watchdog	Line Base Fault Monitoring
Alarm Output	2 Relay Outputs
Working Temperature	0°C / 50°C
Storage Temperature	-10°C / 50°C
Monitor	Touchscreen LCD
Communication Interface	RS-485 (BMS Protocol)
Alarms	Insulation Resistance
	Transformer Overload Current
	Transformer Overtemperature
	Oxygen
	Vacuum
	Nitrogen Oxide
	UPS Fault
Air Condition Fault	
Room Temperature	
Supply Input	24 V



## OPERATING ROOM CONTROL PANEL

Touch screen operating room control panel offers comfort for medical personel in order to operate in operating room and also enable to control environment conditions and medical devices. Surgical team can control medical devices easily and communicate with other rooms by using hands-free phone with high voice quality. Operating room panel consist of one smart electronic card and one touch screen Android operating system.



### Technical Specifications

Brand	Innovasis
Type	Innovasis
Panel Material	Stainless Steel (304,2m )
Demand Power	185W (max)
Operating Voltage	100-240 VAC
Frequency	50 / 60 Hz.
Monitor	Resistive Touchscreen
Working Temperature	0°C / 40°C
Storage Temperature	-20°C / 60°C
Analogue Output	8 pcs Automation (0-10V), 5 pcs Dimmer, 2 pcs Air Conditioner, 2 pcs Reserve
Analogue Input	4 pcs Air Conditioner
Digital Output	8 pcs Automation
Digital Input	9 pcs Medical Gas
Communication Ports	1 pcs Leakage Current (RS485), 2 pcs Reserve (RS485), 1 pcs Ethernet, 1 pcs Telephone (RJ11)
Protection Class	IP65
Colour	Metallic Grey or Black
Product Dimensions	740 x 432 mm
Displayed Parameters	Temp., Humidity, Room Differential Pressure, Filter Contamination Level, Gas Alarm Indicators
Standards	TS EN 55022, TS EN 55024

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### **GENERAL SPECIFICATIONS**

- Microprocessor controlled
- Stainless steel front sheet
- LCD
- Four On/Off switch controlling four lighting armature group separately
- Surgical operating light On/Off switch
- Negatoscope control switch
- Light indicating when room is in use
- Full/Half flow control switch
- Damper On/Off switch
- VAV switch
- UV lamb control switch
- Gas extractor switch
- 1 pcs reserve switch
- 1 pcs reserve RS485 port

0-100V analogue measurement outputs of temperature, humidity, room differential pressure, filter contamination level are received, transmitting to smart panel and assign output ports. Data transmitting to automation by 8 pcs 10 bit analogue 0-10V output and 8 pcs digital I/O Music channel selection between 2 channel, 3 watt hi-fi sound amplifier, music speaker, %100 voice level adjustment Hands-free phone with digital acoustic control allow you to answer and make call, %100 voice level control %100 dimmer function for 5 different lamb



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[www.innovasis.com.tr](http://www.innovasis.com.tr)

The company reserves the right to change specifications and designs without notice.