ElectroMedical Solutions
Product catalogue
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Medical Technology

Most modern medical examination and surgical procedures would not be possible without electricity. Whether body scanning, heart monitoring using an electrocardiogram or dental treatment, the use of electrical equipment has replaced and improved traditional methods, whilst at the same time making certain medical procedures possible.

The use of electricity means that there is a potential for danger, electrical applications in medical technologies especially may have particular hazards for patients and operating personnel alike. These hazard sources will be avoided with standards like IEC 60601-1 which are responsible for safety power supplies in the medical area.

REO has been developing advanced solutions for transforming and regulating voltage since 1925. Today REO manufactures transformers for medical applications, which conform to global standards and set a benchmark for dependability and efficiency.
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The standard IEC 60601-1 and the EU guideline 93/42/EWG define the safety of electrical systems. To guarantee a safe power supply, experience and knowledge is necessary. REO has many years experience of transformer production for industrial applications, REO provides solutions which go above and beyond the required standards.

REO transformers are especially characterized by:

- Minimal leakage field - Meaning that high EMC compatibility can be guaranteed
- High quality core - Means high efficiency and good regulation properties
- Fully encapsulated - For protection from environmental influences and better heat dissipation
- Filter, overvoltage protection and inrush current limiting sections are developed and manufactured in-house, which ensures optimal performance.

REO also produces bespoke solutions integrating many of our core competencies. This allows customer-specific solutions such as special housing or mounting plates for example.

Components used in medical application must be safe and reliable, so each product is rigorously tested. REO also develops and manufactures test systems for railway traction and industrial applications. So safety and product testing to high standards are the norm for REO.

To ensure standards are maintained, REO has its own testing facility at Pfarrkirchen. Experience in many electrical fields and broad market knowledge guarantee optimal solutions with the latest technology and developments. REO is a partner that you can rely on. Constant research and development and continuous improvement systems ensure that REO always employs state of the art in its field.

Benefits of REO components

- REOMED with toroidal fixed cores
- Reduction of energy costs, especially at continuous operation
- Environmentally friendly by saving energy
- Integrated inrush current limitation
- Protection against short-circuit and overload
- Wide range of options
- Long product life
REOMED Isolating transformers for efficient reduction in costs and energy

Due to the increasing environmental impact and the resulting awareness of these issues energy efficiency is a key driver in REO’s product development.

REOMED transformers help to achieve this goal. The following chart shows the loss values between a normal transformer and a REOMED transformer at various power levels. The large difference shows the increased efficiency of REOMED transformers against conventional designs.

Selections for the REOMED:
- Mains input 115 or 230 V or wide input range 100-130 V / 200-250 V
- Output 115 or 230 V or wide output range 100-130 V / 200-250 V

Options:
Inrush current limiter:
- Option A 10 = NTC
- Option A 50 = Electronic switch-on attenuation
- Option X1 = Overvoltage protection
- Option X2 = Mains filter
- Option X3 = Overvoltage protection + Mains filter

Default or preferably our REOMED models are equipped as follows:
REOMED 300 = Option A10
REOMED 600 = Option A 50
REOMED 800 = Option A 50
REOMED ≥ 1000 = Option A 50

*Loss at operating temperature
**REOMED I Isolating transformers - ed 3.1**

**Medical transformers**

**Technical data***

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>115 / 230 [V]</td>
</tr>
<tr>
<td>Output voltage</td>
<td>115 / 230 [V]</td>
</tr>
<tr>
<td>Rated power</td>
<td>300 - 2200 [VA]</td>
</tr>
<tr>
<td>Casing protection</td>
<td>IP 20</td>
</tr>
<tr>
<td>Weight</td>
<td>4.5 - 19.0 [kg]</td>
</tr>
<tr>
<td>Earth leakage current at 127/254V / 50/60Hz</td>
<td>&lt; 300 / 500 [µA]</td>
</tr>
<tr>
<td>Number of output connections</td>
<td>4 - 9 x IEC 320 [V]</td>
</tr>
<tr>
<td>Test voltage</td>
<td>4 (between primary and secondary winding) [kVac]</td>
</tr>
<tr>
<td>Max. ambient temperature</td>
<td>40 [°C]</td>
</tr>
<tr>
<td>Isolation</td>
<td>&gt; 2 [MΩ]</td>
</tr>
<tr>
<td>PE resistance</td>
<td>&lt; 0.1 [Ω]</td>
</tr>
</tbody>
</table>

*All devices have an inrush current limiter (NTC or electrical), a equipotential bonding pin conforming to DIN 42801, a primary mains line and over current and thermal protection switch. The devices can be mounted on a wall, bench or even on the floor.

**REOMED I Isolating transformers - ed 3.1**

Medical systems must reliably comply with the leakage currents required by the standard - if several devices are connected together, the total leakage current increases accordingly.

The TÜV-tested REOMED I isolating transformers are tried and tested devices for use in all electrical systems in medical rooms. They limit the leakage current and thus help to ensure patient safety.

In addition to very good efficiency and simple wiring, REOMED I isolating transformers are characterised by a very low stray magnetic field and high safety.

In addition to the standard series, the transformers can of course also be individually produced according to customer specifications and extended with electronic switch-on attenuation, overvoltage protection and a mains filter.

**Benefits**

- Wide range of options
- Small weight
- Short-circuit and overload protection
- Integral inrush current limiter
- Solid aluminum casing
- Equipotential bonding pin DIN 42801
- Plug connectors IEC 60320
## REOMED II Isolating transformers - ed 3.1

### Technical data*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>230 [V]</td>
</tr>
<tr>
<td>Output voltage</td>
<td>230 [V]</td>
</tr>
<tr>
<td>Rated power</td>
<td>660 - 2000 [VA]</td>
</tr>
<tr>
<td>Casing protection type</td>
<td>IP 20</td>
</tr>
<tr>
<td>Primary circuit breaker</td>
<td>4 - 12 [A]</td>
</tr>
<tr>
<td>Secondary circuit breaker</td>
<td>3 - 10 [A]</td>
</tr>
<tr>
<td>Earth leakage current at 254V / 50/60Hz</td>
<td>&lt; 500 [µA]</td>
</tr>
<tr>
<td>Test voltage</td>
<td>4 (between primary and secondary winding) [kVac]</td>
</tr>
<tr>
<td>Max. ambient temperature</td>
<td>40 [°C]</td>
</tr>
<tr>
<td>Isolation</td>
<td>&gt; 2 [MΩ]</td>
</tr>
<tr>
<td>PE resistance</td>
<td>&lt; 0,1 [Ω]</td>
</tr>
</tbody>
</table>

*All devices have an inrush current limiter (NTC or electrical), a equipotential bonding pin conforming to DIN 42801, a primary mains line and over current and thermal protection switch. The devices can be mounted on a wall, bench or even on the floor.

## REOMED II Isolating transformer

The REOMED II Isolating transformer provides reliable leakage current reduction in medical applications.

- Safe isolation on the input side is effected by using high quality materials and first class production methods. The isolating transformers are designed for low internal losses and so achieve very low no-load losses (≤ 1% relating to the input power).

- Overload and short-circuit protection on the input and output side is effected by an integral circuit breaker. The transformer is isolated using an illuminated mains switch and circuit protection is effected by two fuses on the input side and a single-pole one on the output side. As thermal protection is utilized problems regarding fuses (i.e incorrect values being fitted, power interruption are avoided).

- Furthermore, a temperature cut-out is integrated in the isolating transformer, which provides an additional protection in the event of exceptional ambient conditions or prolonged obstruction of the cooling vents.

### Benefits

- Compact dimensions
- Solid aluminium casing
- Green illuminated mains switch
- Low total weight
- Integrated circuit protection
- Plug connectors IEC 60320

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Norm IEC 60601-1 (ed 3.1)
Norm IEC 60601-1-2 (ed 4.0)
NRTL
Anti-interference transformer

With specially wound isolating transformers and segmented winding technology. The low-capacity construction and a high-quality filter provide a good attenuation of up to 90 dB. The isolating transformer effects additional safety for experimental work.

### Technical Data

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Primary</td>
<td>Secondary</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>RFT/SST-300</td>
<td>300</td>
<td>230</td>
<td>230</td>
<td>1,3</td>
<td>175</td>
</tr>
<tr>
<td>RFT/SST-600</td>
<td>600</td>
<td>230</td>
<td>230</td>
<td>2,6</td>
<td>175</td>
</tr>
<tr>
<td>RFT/SST-900</td>
<td>900</td>
<td>230</td>
<td>230</td>
<td>3,9</td>
<td>175</td>
</tr>
</tbody>
</table>

Maximum production range: up to 0,9 kVA
Primary/secondary voltages: 230 V
Rated current up to 3,9 A

- extremely high attenuation
- galvanically isolated from the mains
- Suppression of interference sources, for example switch-mode power supplies
- Enables interference-free operation of sensible equipment on noisy mains
- Simpler and faster connection
- Easy to transport with the handle

Technical data:
Rated power 300/ 600/ 900 VA
Input voltage 230 V
Output voltage 230 V
Current 1,3; 2,6; 3,9 A
REOMED Isonet Network isolator

The REOMED Isonet network isolator is used for electrical isolation of devices in copper wire-bound Ethernet networks. The isolation protects equipment and people from the effects of possible electrical voltage spikes on power supplies. Potential equalization currents on the shielding of the network cable are reliably prevented.

Advantages

- Protection in both transfer directions
- Interruption of the shield connection of the network cable
- No additional power supply required
- No software installation required
- Maintenance-free
- RoHS compliant
- EN 60950-1
- EN 60601-1

### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation voltage</td>
<td>4 [KV]</td>
</tr>
<tr>
<td>Input / output connector</td>
<td>RJ45</td>
</tr>
<tr>
<td>Supported network protocols</td>
<td>10BaseT, 100BaseTx, 1000BaseT</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>-1.3 max. [dB]</td>
</tr>
<tr>
<td>Return loss</td>
<td>-8 min. [dB]</td>
</tr>
<tr>
<td>Protection</td>
<td>IP 20</td>
</tr>
<tr>
<td>Max. voltage of the connected devices</td>
<td>250 [Vac rms]</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10 ... +70 [°C]</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... +85 [°C]</td>
</tr>
<tr>
<td>Humidity</td>
<td>10 ... 90 (without condensation) [%]</td>
</tr>
<tr>
<td>Housing</td>
<td>plastic</td>
</tr>
<tr>
<td>Weight</td>
<td>45 [g]</td>
</tr>
<tr>
<td>Dimensions (B x H x T)</td>
<td>25 x 66 x 40 [mm]</td>
</tr>
</tbody>
</table>
**Isomonitor - Isolation monitor for REOMED transformers**

<table>
<thead>
<tr>
<th>Technical data*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated voltage</strong></td>
<td>230</td>
</tr>
<tr>
<td><strong>Operation range</strong></td>
<td>200 - 240</td>
</tr>
<tr>
<td><strong>Response value</strong></td>
<td>≤ 50</td>
</tr>
<tr>
<td><strong>Response time</strong></td>
<td>&lt; 2</td>
</tr>
<tr>
<td><strong>Signal display</strong></td>
<td>LED yellow (Temperature): Transformer limit temperature reached</td>
</tr>
<tr>
<td></td>
<td>LED yellow (Isolation): Insulation fault</td>
</tr>
<tr>
<td></td>
<td>LED green (Power on): Operation</td>
</tr>
<tr>
<td></td>
<td>Power utilization of the transformer (Power):</td>
</tr>
<tr>
<td></td>
<td>LED green: 30 %</td>
</tr>
<tr>
<td></td>
<td>LED yellow: 60 %</td>
</tr>
<tr>
<td></td>
<td>LED red: 90 %</td>
</tr>
<tr>
<td><strong>Acoustic signal</strong></td>
<td>pulsating at insulation fault</td>
</tr>
<tr>
<td></td>
<td>continuous tone at overtemperature</td>
</tr>
<tr>
<td><strong>Ambient operating temperature</strong></td>
<td>0 ...+40</td>
</tr>
<tr>
<td><strong>Relative humidity of environment</strong></td>
<td>30 ...75</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>II</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>IP 20</td>
</tr>
<tr>
<td><strong>Dimensions [H x B x T]</strong></td>
<td>192 x 34 x 56</td>
</tr>
</tbody>
</table>

*Note: The ISOMONITOR has been designed solely for use with REOMED Isolating transformers.

**ISOMONITOR - Isolation monitor for REOMED transformers**

Normal safety devices used for protection against isolation failures, such as residual-current device (RCD) used in domestic installations, cannot detect isolation breakdown on the secondary side of isolating transformers.

The ISOMONITOR monitors the dielectric resistance between both of the live output-socket terminals of the isolating transformer and earth potential, and generates a warning signal in the event of a fault condition. The insulation resistance is constantly monitored to ensure that it does not drop below a limit of 50 kOhm (25 kOhm). If it does fall below this value, then both an acoustic alarm (sound pulsating at approximately 3kHz and 98 db) and a visual signal (LED display) are generated.

The ISOMONITOR can be connected to one of the socket outlets of the isolating transformer.

Further functional options are monitoring of the temperature of the transformer including audible and visual alarm, as well as a visual display of the transformers power consumption.

**Benefits**
- Easy to operate
- Audio/Visual alarm
- Functional test with test plug
- Display of power consumption (optional)
- Temperature warning (optional)
Accessory

**Disconnect protection**
Prevents unintentional removal of the plug from the secondary connections.

**Mounting rails**
The mounting rails can be mounted instead of the rubber feet. The device can therefore be permanently mounted on equipment carriages etc. Available for all REOMED I and REOMED II devices.

**Power cable**

**Power cable - Europe (NK5) device plug**
Protection contact angle plug CEE7 / VII to IEC320 / C13 / Length: 2,0m

**Power cable - Swiss- (NK13) device plug**
Connector Type 12 to IEC320 / C13 / Length: 2,5m

**Power cable- USA (NK7) Hospital grade connector UL-CSA**
Type LT 205 (green dot) to IEC320 / C13 / Length: 2,5m
Accessory REOMED

**Special power cable-European (NK8) device plug**
Protection contact angle plug CEE7 / VII to IEC320 / C13 / Length: 2,5m / red

**Power cable -Europe- (NK29) device plug**
Protection contact angle plug CEE7 / VII to IEC320 / C19 / Length: 2,0m

**Appliance cable (extension)**

**Extension cable (NK19) Device plug**
IEC320-C14 on the IEC320 / C13 unit / Length: 2,0m