For frequencies of 50/60 Hz, specify a **JACKSON** Line Frequency Transformer.

**JACKSON** Line Frequency Transformers are customized to meet customer requirements, and are available in various ratings. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

Available from 120 to 6500 volts, 5 kVA to 3000 kVA.

Available in Single or Three Phase.

Available in a NEMA type enclosure or open frame.

**JACKSON** Line Frequency Transformers are available in dry type or water-cooled construction.

The water-cooled copper windings utilize a unique construction allowing for a compact and efficient design.

Cores are manufactured using high quality silicon steel with very low core loss and low exciting current.

Input and output connections can be designed to meet specific requirements.

Available in Metric or Standard U.S. Threads.

For a high quality customized Line Frequency Transformer - Specify a **JACKSON**
JACKSON® Load Matching/Work Station Transformers are customized to meet customer requirements, and are available in various ratings to match the appropriate load. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

The JACKSON® Load Matching/Work Station Transformers are the standard in the induction heating industry and are a proven quality product with hundreds of designs and thousands of units operating continuously throughout the world since 1955.

Available from 200 to 4000 volts, 200 Hz to 25 kHz, up to 20,000 kVA.

The water-cooled copper windings utilize a unique interleaved construction, which allows for a compact and efficient transformer.

Windings are available in either open or encapsulated design.

The water-cooled cores are made utilizing special thin electrical-grade steel to minimize core and eddy current losses.

Tap changing is made easy with the JACKSON® uniquely designed swing link tap changing arrangement.

Input and output connections can be designed to meet your specific requirements.

Available in Metric or Standard U.S. Threads.

The JACKSON® variable ratio Load Matching/Work Station Transformer delivers a massive amount of power in a small package.

For a high quality customized Load Matching/Work Station Transformer - Specify a JACKSON®.

JACKSON® Transformer Company provides our customers with a complete Specification Sheet upon request.

JACKSON® Quality Products are not only a wise choice, but the right choice.

All of our magnetic products are designed to meet your specific requirements.
For frequencies of 10 kHz and above, specify a Jackson KHZ Transformer.

Jackson KHZ Transformers are customized to meet customer requirements, and are available in various ratings to match the appropriate load. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

The Jackson KHZ Transformer is the Standard in the induction heating industry and is a proven quality product with hundreds of designs and thousands of units operating throughout the world since 1975.

Available from 50 to 3000 volts, 10 kHz to 2000 kHz to over 4000 kVA.

Jackson KHZ Transformers are available in either open or encapsulated designs.

The water-cooled copper windings utilize a unique interleaved construction allowing for a compact and efficient transformer.

The cores are manufactured using special ferrites that have very low core loss, low exciting current, and lower costs than high performance steels.

Tap changing is made easy with the Jackson uniquely designed swing link tap changing arrangement, side buss, or straight terminals.

Input and output connections can be designed to meet your specific requirements.

Available in Metric or Standard U.S. Threads.

For a high quality customized KHZ Transformer - Specify a Jackson.

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World Class Transformers are made to order and made to last! At Jackson, we work together with you, as a team, to design a product that meets your specific requirements.

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Reliable | Efficient | Economical | Compact

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We Manufacture Solutions

All of our magnetic products are designed to meet your specific requirements.

For further information, contact our Engineering Department.
JACKSON® Toroidal Transformers are customized to meet customer requirements, and are available in various ratings to match the appropriate load. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

The JACKSON® Toroidal Transformer is a proven quality product with thousands of units operating throughout the world since 1966.

Available from 200 to 4000 volts, 200 Hz to 25 kHz, up to 3000 kVA and are available as isolation (TV) or auto transformers (TA).

JACKSON® Toroidal Transformers are totally encapsulated for use in any environment and are vibration free.

The windings are made of copper tubing and are water-cooled.

The water-cooled toroidal cores are made utilizing special thin electrical-grade steel to minimize core and eddy current losses.

Tap changing is made easy with the JACKSON® uniquely designed swing link tap changing arrangement or straight terminals.

Input and output connections can be designed to meet your specific requirements.

Available in Metric or Standard U.S. Threads.

For a high quality customized Toroidal Transformer - Specify a JACKSON®.

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For further information, contact our Engineering Department.
Rectangular Transformers are customized to meet customer requirements, and are available in various ratings to match the appropriate load. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

The rectangular transformer is a proven quality product with hundreds of units operating continuously throughout the world since 1969.

Available from 200 to 3000 volts, 400 Hz to 100 kHz, up to 10,000 kVA and are available as isolation (RV) or auto transformer (RA).

Rectangular Transformers are available in either open or encapsulated designs.

The water-cooled copper windings utilize a unique interleaved construction allowing for a compact and efficient transformer.

For frequencies up to 10 kHz, the water-cooled rectangular shaped cores are made utilizing special thin electrical-grade steel to minimize core and eddy current losses.

For frequencies above 10 kHz, the cores are manufactured using special ferrites that have very low core loss and low exciting current.

Tap changing is made easy with the uniquely designed swing link tap changing arrangement or straight terminals.

Input and output connections can be designed to meet your specific requirements.

Available in Metric or Standard U.S. Threads.

For a high quality customized rectangular transformer - Specify a Jackson.

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We manufacture solutions

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For further information, contact our Engineering Department.
The **R.F. Transformer** is an air core device designed without core material and is normally referred to as a R.F. Current Transformer. The **R.F. Transformer** is typically used in vacuum tube power supplies.

The input voltage to the **R.F. Transformer** is usually 10,000 volts or higher.

The primary of the transformer is usually wound with round tubing while the secondary consists of a solid copper sheet, wrapping and shielding the primary inside the secondary.

Generally the primary winding is encapsulated in RTV material, which gives high dielectric strength and also protects it from the environment.

Clean room environment is highly recommended.

The critical element in the design is to obtain the highest current transfer ratio between the primary to secondary \( I_1 / I_2 \). And \( K = \sqrt{1 - (L_1 / L_o)} \).

Where \( L_1 \) = the leakage inductance referred to the primary

\( L_o \) = the open circuit inductance of the transformer

The greatest current transfer occurs when \( L_3 / L_2 = \sqrt{1 - K^2} \)

The kVA transfer is greater than \( L_2 = L_3 \)

Available in Metric or Standard U.S. Threads.

For a high quality customized **R.F. Transformer** - Specify a **JACKSON**!
**Narrow Profile High Frequency Transformer**

**JACKSON** Narrow Profile High Frequency Transformers are customized to meet customer requirements, and are available in various ratings to match the appropriate load. All designs are optimized using our exclusive computer programs to ensure the highest quality product.

A series of narrow profile transformers can be placed in a side-by-side relationship for simultaneously induction heating a plurality of different bearing surfaces located on a long shaft, such as the bearing surfaces of a crankshaft of an engine.

Available from 500 to 2000 volts, frequency from 5 kHz to 40 kHz up to 1500 kVA.

**JACKSON** Narrow Profile Transformers are water-cooled copper windings that utilize a unique interleaved construction allowing for a compact and efficient Transformer.

Our transformers are manufactured using ferrite core construction that have low exciting current and lower core losses than high performance steels.

**JACKSON** Narrow Profile Transformers are all encapsulated units to protect it from the environment.

Input and Output connections can be designed to meet your specific requirements.

Available in Metric or Standard U.S. Threads.

For a high quality customized Narrow Profile High Frequency Transformer - Specify a **JACKSON**.

---

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For further information, contact our Engineering Department.
Potential and Current Metering Transformers

Jackson product are customized to meet customer requirements, and are available in various ratings and ratios. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

Jackson custom designed metering transformers are available from 50 Hz to 200 kHz, 5 VA to 100 VA.

Jackson metering transformers are available in an assortment of shapes and forms to meet your specific requirements.

Current Transformers are available in dry type or water-cooled with a center hole for bus bar or cable. Input currents from 1 amp to 10,000 amps.

Jackson Potential and Current Transformers are available in either open construction or encapsulated designs.

Input and output connections can be designed to meet your specific requirements.

Available in Metric or Standard U.S. Threads.

For a high quality customized Potential or Current Transformers - Specify a Jackson.

Jackson Transformer Company provides our customers with a complete Specification Sheet upon request.

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Introducing Lightweight, **Portable Transformers**!

For Transportable Electric Heating by Induction specify a **JACKSON** Portable Transformer.

**JACKSON** Portable Transformers are customized to meet customer requirements, and are available in various ratings and ratios to match the appropriate load. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

The idea of bringing the power to the job is very exciting as forging, hardening, soldering, brazing, and curing can be performed in a very efficient and expedient manner.

The transformers can be adapted to portable handheld applications, mounted on a fixed position, or can be placed on a robot arm.

The **JACKSON** Portable Transformer is available in a coaxial or toroidal design.

The **JACKSON** Portable Transformer has a fixed ratio and is available from 200 to 1000 volts, 10 kHz to 200 kHz, up to 400 kVA and comes in cable lengths up to 200 feet.

The rectangular style portable transformer is particularly suited for higher power requirements. They offer a lower leakage and higher efficiency over the toroidal portable transformer.

The toroidal style portable transformer is lighter than the rectangular design and is normally used for lower power requirements.

Both styles are available in "T" handle and Pistol Grip handle.

All **JACKSON** Portable Transformer designs are water-cooled through the power input cables therefore eliminating the need for extra hoses.

The work coils are easily and quickly mounted to the output of the transformer utilizing the 4 studs.

Shown are a few variations of **JACKSON** Portable Transformers.

For a high quality customized Portable Transformers - Specify a **JACKSON**.

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For further information, contact our Engineering Department.
Coaxial Transformer

This rectangular handheld transformer is particularly suited for higher power requirements. They offer a lower leakage and higher efficiency over the toroidal handheld transformer.

Toroidal Coaxial Transformer

The toroidal handheld transformer is lighter than the rectangular design and is normally used for lower power requirements.

### Rectangular Coaxial Transformer Designs

<table>
<thead>
<tr>
<th>Input Volts</th>
<th>Input Amps</th>
<th>KVA</th>
<th>Freq (KHz)</th>
<th>Fixed Ratio</th>
<th>Cable Length</th>
<th>Size (approx)</th>
<th>Weight* (approx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>200</td>
<td>60</td>
<td>25-50</td>
<td>5-1</td>
<td>3' (.91 m)</td>
<td>4.5' x 3.5' x 8' (114 x 89 x 203 mm)</td>
<td>8 lb. (3.5 kg)</td>
</tr>
<tr>
<td>500</td>
<td>200</td>
<td>100</td>
<td>100-200</td>
<td>6-1</td>
<td>6' (1.83 m)</td>
<td>5.5' x 3.5' x 9' (140 x 89 x 229 mm)</td>
<td>11 lb. (5 kg)</td>
</tr>
<tr>
<td>500</td>
<td>500</td>
<td>250</td>
<td>20-25</td>
<td>6-1</td>
<td>10' (3.05 m)</td>
<td>5.5' x 4.5' x 10' (140 x 114 x 254 mm)</td>
<td>16 lb. (7 kg)</td>
</tr>
<tr>
<td>500</td>
<td>500</td>
<td>250</td>
<td>20-25</td>
<td>4-1</td>
<td>10' (3.05 m)</td>
<td>5.5' x 4.5' x 12' (140 x 114 x 305 mm)</td>
<td>19 lb. (8.5 kg)</td>
</tr>
</tbody>
</table>

### Toroidal Coaxial Transformer Designs

<table>
<thead>
<tr>
<th>Input Volts</th>
<th>Input Amps</th>
<th>KVA</th>
<th>Freq (KHz)</th>
<th>Fixed Ratio</th>
<th>Cable Length</th>
<th>Size (approx)</th>
<th>Weight* (approx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>300</td>
<td>150</td>
<td>100</td>
<td>6-1</td>
<td>6' (1.83 m)</td>
<td>4.5' x 8' (114 x 203 mm)</td>
<td>12 lb. (5.5 kg)</td>
</tr>
<tr>
<td>500</td>
<td>300</td>
<td>150</td>
<td>100</td>
<td>5-1</td>
<td>6' (1.83 m)</td>
<td>4.5' x 8' (114 x 203 mm)</td>
<td>13 lb. (5.5 kg)</td>
</tr>
<tr>
<td>350</td>
<td>100</td>
<td>35</td>
<td>25-50</td>
<td>5-1</td>
<td>6' (1.83 m)</td>
<td>4.5' x 6' (114 x 152 mm)</td>
<td>10 lb. (4.5 kg)</td>
</tr>
<tr>
<td>350</td>
<td>75</td>
<td>25</td>
<td>25-50</td>
<td>4-1</td>
<td>10' (3.05 m)</td>
<td>4.5' x 6' (114 x 152 mm)</td>
<td>10 lb. (4.5 kg)</td>
</tr>
</tbody>
</table>

*Size and weight do not include the cable or handle. Figures in parenthesis denote Metric System.

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**ALL OUR TRANSFORMERS ARE DESIGNED TO MEET YOUR SPECIFIC REQUIREMENTS**

For further information, please contact our Engineering Department.
Water-Cooled Chokes and Reactors

**JACKSON® Water-Cooled Chokes and Reactors** are customized to meet customer requirements, and are available in various ratings. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

Designs can have currents up to 10,000 Amps.

The windings are made of copper tubing and are water-cooled.

**JACKSON® Air Core Chokes**
Available from .5 mH to 5 mH
300 to 5,000 Amps

**JACKSON® Iron Core Reactors**

- **DC Reactors** are available from 10 μH to 20 mH,
  100 to 10,000 Amps

- **AC Reactors** are custom designed to meet customer specification.

Available in Metric or Standard U.S. Threads.

For a high quality customized Water-Cooled Choke or Reactor - Specify a **JACKSON®**.
The **JACKSON** Transinductor® is a patented* method of combining a transformer and inductor in a single package utilizing the same magnetic circuit.

**JACKSON** Transinductors® are customized to meet customer requirements, and are available in various ratings to match the appropriate load. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

The **JACKSON** Transinductor® is a proven quality product with thousands of units operating throughout the world since 1994.

Available from 200 to 2000 volts, 400 Hz to 50 kHz up to 2000 kVA.

Using this integrated magnetic approach the **JACKSON** Transinductor® provides a fixed inductance in the primary, secondary, or both.

The exciting current remains virtually constant throughout the transformers ratios.

By combining the two components, the size of the unit is reduced, the leakage flux is minimized, and the overall efficiency of this magnetic device is increased.

**JACKSON** Transinductors® are totally encapsulated for use in any environment and are vibration free.

The windings are made of copper tubing and are water-cooled.

The water-cooled toroidal cores are made utilizing special thin electrical-grade steel to minimize core and eddy current losses.

Available with straight terminals or tap changing can be made easy with the Jackson uniquely designed swing link tap changing arrangement.

Input and output connections can be designed to meet specific requirements.

Available in Metric or Standard U.S. Threads.

For a high quality customized Transinductor® - Specify a **JACKSON**.

---

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**ALL OF OUR MAGNETIC PRODUCTS ARE DESIGNED TO MEET YOUR SPECIFIC REQUIREMENTS.**

For further information, contact our Engineering Department.
The **JACKSON® VIT®** is a patented* method of controlling power to a load.

**JACKSON** Variable Impedance Transformers are customized to meet customer requirements, and are available in various ratings. All designs are optimized utilizing our exclusive computer programs to ensure the highest quality product.

Utilizing integrated magnetics to provide stepless power to electric furnaces, load banks, plating power supplies, etc.

The **JACKSON® VIT's®** is a current controlled device that requires minute signals to control large amounts of power.

Unlike SCR controlled power supplies, it can operate with large unbalanced loads or with an open circuit phase.

The **JACKSON® VIT's®** can withstand short circuits for prolonged periods of time without incurring any component failure.

All **JACKSON® VIT's®** are encapsulated for reliability and dependability and are available in dry or water-cooled.

Primary taps are provided for line correction and load voltage adjustment.

Available in single or three phase, from a few Hz to 200 kHz, from a few volts to 2000 volts.

For a high quality customized **VIT®** - Specify a **JACKSON®**.

---

**Withstands Dead Shorts | 5 Year Warranty**

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For further information, contact our Engineering Department.
The above chart depicts a block diagram consisting of three single phase VIT’s® showing a method of controlling the VIT’s® and their relative metering. They are available with many options, such as one control for three VIT’s®, or with no control package, with or without metering, etc.

**Graph 1**

Operation of the VIT® (Variable Impedance Transformer)

What does the term ‘current driven device’ mean? With the VIT® as long as it is operated in a non-saturated condition, that is, the flux in the cores of the magnetic amplifier does not exceed the saturated level, the VIT® is said to be working in a balance condition. The VIT®, then, follows the law of equal ampere turns. Therefore, the load current is determined by the following expression:

\[
I_L = K_1 \cdot \frac{N_C \cdot I_C}{N_S}
\]

Where:
- \(I_L\) is the load current flowing through load \(R_L\)
- \(N_C\) are the number of turns in the control winding
- \(I_C\) is the DC current of the control winding
- \(N_S\) is the secondary turns
- \(K_1\) is a constant
- \(R_L\) is the load resistance

It can be observed that for a specific design where the control windings and the secondary windings have been determined, the load current is directly dependent on the DC control current.

From equation above, the load current is independent of the load resistance and a constant current will be supplied even if the secondary has a bolted short. This relationship holds true as long as the law of equal ampere turns is applied, meaning that the design of the VIT® must be consistent with the load parameters. The VIT® must be designed to match the load for this law to apply (i.e. the VIT® cannot supply a constant current if the secondary is open circuited or if the resistance value of the load falls outside the range of the design). The relationship of DC amp turns is shown on Graph 1. The knee at the beginning of the curve reflects the DC ampere turns required to overcome the exciting current of the transformer.

Graph 2 shows the relationships of the output current versus load resistance. The slope of the current curve changes with load resistance. The current slope is given by the following relationship.

\[
\tan^{-1} \left( \frac{1}{R \cdot K_2} \right)
\]

Where \(R\) is the load resistance at 100% design, \(K_2\) is the constant by which the resistance is deviated from \(R\) in % of \(R\).

Example: \(R\) @ 100% is 1 \(\Omega\), if it increased to 1.2 \(\Omega\) then \(K = 120\%\)

\[
\tan^{-1} 0.89 = 39.8 \text{ degrees slope}
\]
We Manufacture Solutions!
Transformers, Integrated Magnetics, Reactors, Variable Impedance Transformers . . . and more!

Air or Water Cooled       Open or Encapsultated       Single or Three Phase       DC to over 1 mHz       5 VA to over 15,000 kVA

CORE MATERIALS
• Air   • Iron   • Ferrite

CORE STYLES
• Stacked   • Wound   • Toroidal

TYPE
• Isolation   • Reactor
• Auto   • Choke
• Current   • Scott “T”
• Potential

APPLICATION
• Forging   • Power
• Furnace   • Laser
• Welding   • RF Heating

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