AC Current Transducers

Current Transducers are designed to provide an analog current reading for monitoring, data logging and panel meter applications. NK Technologies’ current transducers offer a choice of 0–5 VDC, 0–10 VDC or 4–20 mA average responding or True RMS outputs. Self-powered and split-core options make these a cost-effective choice as a PLC input in motor status applications or where VFDs are involved.

Features:
• Average responding or True RMS output
• Jumper selectable ranges
• Solid-core, split-core and large aperture models

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  AC Current Transducers ........................................ page 34
- AT/ATR-FL SERIES
  AC Current Transducers ........................................ page 36
- AT/ATR-LS SERIES
  AC Current Transducers ........................................ page 38
- ATCR SERIES
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- ATH SERIES
  AC Current Transducer with Time Integration ............... page 42
- ATQ SERIES
  Frequency Output AC Current Transducers ............... page 44
- ATP SERIES
  AC Current Transducers ........................................ page 46
- ATP/ATPR-FL SERIES
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- ATPR “E-OUT” SERIES
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- ATS SERIES WITH DIGITAL SETPOINT DISPLAY
  AC Current Transducer/Switch ............................ page 54
- ATS SERIES WITH ROTARY SWITCH SETPOINT
  AC Current Transducer/Switch ............................ page 56
Our wide range of current transducers guarantees that you’ll find exactly what you need. We currently offer 11 series of current transducers in AC configurations. To assist in guiding you to the right series for your application, please begin your selection here.

**AC CURRENT TRANSDUCERS**

Selection Chart

<table>
<thead>
<tr>
<th>Load 200 A or lower</th>
<th>AT SERIES – p. 34</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Analog Output, 2-wire, Average Responding</td>
</tr>
<tr>
<td>Load 2000 A or lower</td>
<td>ATR SERIES – p. 52</td>
</tr>
<tr>
<td></td>
<td>Analog Output, 2-wire, True RMS</td>
</tr>
<tr>
<td>Load 1200 A or lower</td>
<td>ATP SERIES – p. 44</td>
</tr>
<tr>
<td></td>
<td>Analog Output, 4-wire, Average Responding</td>
</tr>
<tr>
<td>Load 1600 A or lower</td>
<td>ATPR SERIES – p. 50</td>
</tr>
<tr>
<td></td>
<td>Analog Output, “E-Out”, True RMS</td>
</tr>
<tr>
<td>Load 200 A or lower</td>
<td>ATH SERIES – p. 42</td>
</tr>
<tr>
<td></td>
<td>Time Integrated for Burst Fired Circuits</td>
</tr>
<tr>
<td></td>
<td>ATQ SERIES – p. 44</td>
</tr>
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<td></td>
<td>Frequency Output</td>
</tr>
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<td></td>
<td>ATS SERIES</td>
</tr>
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<td></td>
<td>WITH DIGITAL SETPOINT DISPLAY – p. 54</td>
</tr>
<tr>
<td></td>
<td>Current Transducer/Switch</td>
</tr>
<tr>
<td></td>
<td>ATS SERIES</td>
</tr>
<tr>
<td></td>
<td>WITH ROTARY SWITCH SETPOINT – p. 56</td>
</tr>
<tr>
<td></td>
<td>Current Transducer/Switch</td>
</tr>
<tr>
<td></td>
<td>AT/ATR-LS SERIES – p. 38</td>
</tr>
<tr>
<td></td>
<td>Analog Output, 2-wire Split Core</td>
</tr>
<tr>
<td></td>
<td>AT/ATR-FL SERIES – p. 36</td>
</tr>
<tr>
<td></td>
<td>Analog Output, 2-wire</td>
</tr>
<tr>
<td></td>
<td>ATP/ATPR-FL SERIES – p. 48</td>
</tr>
<tr>
<td></td>
<td>Analog Output, 4-wire</td>
</tr>
<tr>
<td></td>
<td>ATCR SERIES – p. 40</td>
</tr>
<tr>
<td></td>
<td>Analog Output, Flexible Loop Design</td>
</tr>
</tbody>
</table>
**AT SERIES**

**AC Current Transducers**

AT Series AC Current Transducers combine a current transformer and signal conditioner into a single package. The AT Series AC Current Transducers have jumper selected current input ranges and industry standard 4–20 mA, 0–5 VDC or 0–10 VDC outputs. The AT Series AC Current Transducers are designed for application on linear or sinusoidal AC loads. The AT Series AC Current Transducers are available in a split-core case or two types of solid-core cases.

**AC Current Transducer Applications**

**Automation Systems**
- Analog current reading for remote monitoring and software alarms.

**Data Loggers**
- Self-powered transducer helps conserve data logger batteries.

**Panel Meters**
- Simple connection displays power consumption.

**Preventative Maintenance of a Critical Lighting System**

![Diagram of Current Transducer Applications](image)

**AC Current Transducer Features**

**Accurate**
- Factory matched and calibrated single piece transducer is more accurate than traditional two-piece field installed solutions.

**Average Responding**
- “Average Responding” algorithm gives an RMS output on pure sine waves. Perfect for constant speed (linear) loads.

**Jumper Selectable Ranges**
- Reduces inventory.
- Eliminates zero and span pots.

**Isolation**
- Output is magnetically isolated from the input for safety.
- Eliminates insertion loss (voltage drop).

**UL, CUL and CE Approval**
- Accepted worldwide.

**AT Series Power Supply**

![Diagram of AT Series Power Supply](image)

**AC Current Transducer Connections**

- 4–20mA Option
- 0–5/10 VDC Option

**Notes:** Pressure plate screw terminals.
12–22 AWG solid or stranded.
Field adjustable setpoint.
AC Current Transducer Specifications

- **-005 Model**
  - Output Signal: 0–5 VDC
  - Output Limit: 8.2 VDC
  - Accuracy: 1.0% FS
  - Response Time (10–90% step change): 100 ms
  - Frequency Range: 50–60 Hz
  - Other Frequencies: Special calibration available for any frequency from 10–400 Hz*
  - Power Supply: Self-powered
  - Loading: 1 megohm minimum, 100 KΩ add 1.3% error
  - Isolation Voltage: UL listed to 1270 VAC, tested to 5 KV
  - Input Ranges: Field selectable ranges from 0–200 A; custom ranges available; consult factory.
  - Sensing Aperture: • FF Case: 0.55" (14 mm) dia.
  - Case: UL94 V0 Flammability Rated
  - Environmental: -4 to 122°F (-20 to 50°C)
  - Listings: UL 508 Industrial Control Equipment (USA & Canada), CE

- **-010 Model**
  - Output Signal: 0–10 VDC
  - Output Limit: 15 VDC
  - Accuracy: 1.0% FS
  - Response Time (10–90% step change): 300 ms
  - Frequency Range: 20–100 Hz*
  - Other Frequencies: Special calibration available for any frequency from 10–400 Hz*
  - Power Supply: 12–40 VDC, Loop-powered
  - Loading: Contact NK for power requirements
  - Isolation Voltage: UL listed to 1270 VAC, tested to 5 KV
  - Input Ranges: Field selectable ranges from 0–200 A; custom ranges available; consult factory.
  - Sensing Aperture: • FT Case: 0.74" (19 mm) dia.
  - Case: UL94 V0 Flammability Rated
  - Environmental: -4 to 122°F (-20 to 50°C)
  - Listings: CE

- **-420 Model**
  - Output Signal: 4–20 mA
  - Output Limit: 32 mA
  - Accuracy: 1.0% FS
  - Response Time (10–90% step change): 100 ms
  - Frequency Range: 50–60 Hz
  - Other Frequencies: Special calibration available for any frequency from 10–400 Hz*
  - Power Supply: 12–40 VDC, Loop-powered
  - Loading: Contact NK for power requirements
  - Isolation Voltage: UL listed to 1270 VAC, tested to 5 KV
  - Input Ranges: Field selectable ranges from 0–200 A; custom ranges available; consult factory.
  - Sensing Aperture: • SP Case: 0.85" (21.6 mm) sq.
  - Case: UL94 V0 Flammability Rated
  - Environmental: -4 to 122°F (-20 to 50°C)
  - Listings: UL 508 Industrial Control Equipment (USA & Canada), CE

*For sinusoidal waveforms only. Select ATR Transducers for distorted waveforms.

AC Current Transducer Ordering Information

Sample Model Number: AT1-005-000-SP
AC current transducer, 10/20/50 A range, self-powered with a 0–5 VDC output in a split-core case.

<table>
<thead>
<tr>
<th>(1) Full Scale Range</th>
<th>(2) Output Signal</th>
<th>(3) Power Supply</th>
<th>(4) Case Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4–20 mA (4–20 mA only)</td>
<td>24L 24 VDC Loop-powered (4–20 mA output ONLY)</td>
<td>FF Solid-core, Front Term.</td>
</tr>
<tr>
<td>1</td>
<td>10, 20, 50 A</td>
<td>000 Self-powered (0–5/0–10 VDC output ONLY)</td>
<td>FT Solid-core, Tap Term.</td>
</tr>
<tr>
<td>2</td>
<td>100, 150, 200 A</td>
<td></td>
<td>SP Split-core</td>
</tr>
</tbody>
</table>

AC Current Transducer Dimensions

**FF Case**

- 2.75" 69.9mm
- 0.19" 4.8mm dia.
- 0.92" 23.4mm

**FT Case**

- 3.03" 77.0mm
- 0.19" 4.8mm dia.
- 0.93" 23.6mm

**SP Case**

- 3.04" 77.2mm
- 0.19" 4.8mm dia.
- 1.01" 30.2mm

NK Technologies

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800.959.4014 • www.nktechnologies.com • sales@nktechnologies.com
AT/ATR-FL SERIES
AC Current Transducers

AT/ATR-FL Series AC Current Transducers combine a current transformer and a signal conditioner into a single package for applications from 100 A to 2000 A. The AT version is Average Responding for use on linear (sinusoidal) loads. The ATR version is True RMS for use on distorted waveforms found in VFD or SCR outputs. The AT/ATR-FL Series AC Current Transducers are available in a solid-core case.

AC Current Transducer Applications

Large Pumps
• Detect dry run electronically.

Power Generation
• Measure the output of generators.

Electric Heating Elements
• Monitors heater loads.
• Faster response than temperature sensors.

Motor Load Monitoring

AC Current Transducer Features

Large Aperture
• Accommodates large conductors or wire bundles.

Select the Right Output
• True RMS technology is accurate on distorted wave form like those associated with VFD or SCR outputs.
• Average Responding for use with linear, sinusoidal waveforms.

Jumper Selectable Ranges
• Reduces inventory.
• Eliminates zero and span pots.

Isolation
• Output is magnetically isolated from the input for safety.
• Eliminates insertion loss (voltage drop).

Agency Approved
• UL, CUL approved.

Selecting the right transducer:
The current waveform of a typical linear load is a pure sine wave. AT transducers measure the peaks of these sine waves, then calculate the average amperage. This works well on constant speed linear loads in “clean” power environments. Select AT transducers for strictly linear loads on “clean” power. VFD and SCR output waveforms are rough approximations of a sine wave. There are numerous spikes and dips in a mathematical algorithm called “True RMS,” which integrates the actual waveform over time. The output is the amperage component of the true power (heating value) of the AC current waveform. True RMS is the only way to accurately measure distorted AC waveforms. Select ATR transducers for nonlinear loads on “noisy power.”
AC Current Transducer Specifications

- **Output Signal**: 4–20 mA, Loop-powered
- **Output Limit**: 23 mA
- **Accuracy**: ±1.0% FS accuracy, True RMS
- **Measurement**: True RMS or Average Responding (See Ordering Information)
- **Response Time**: 600 ms (to 90% step change)
- **Frequency Range**:
  - ATR: 10–400 Hz
  - AT: 50–60 Hz, Sinusoidal
- **Power Supply**: 24 VDC Nominal, 12–40 VDC
- **Isolation Voltage**: 600 VAC
- **Input Ranges**:
  - AT/ATR2: 100, 133, 200 A
  - AT/ATR3: 375, 500, 750 A
  - AT/ATR4: 1000, 1333, 2000 A
- **Sensing Aperture**: 3.0” (76.2 mm) dia.
- **Case**: UL94 V0 Fire Resistant Rated
- **Environmental**: -4 to 122°F (-20 to 50°C), 0–95% RH, non-condensing
- **Listings**: UL 508 Industrial Control Equipment (USA & Canada), CE

AC Current Transducer Dimensions

- **FL Case**
  - 4.50” (114mm) high
  - 3.94” (100mm) wide
  - 3.00” (76.2mm) dia.
  - 0.19” (4.8mm) dia.

AC Current Transducer Connections

- **24 VDC Power**
- **Load**: (+) (+) (+) (+) (+) (+)
- **(+) (Controller, Meter, etc.)**
- **(−) (−) (−) (−) (−) (−)**
- **24 VDC Nominal, 12–40 VDC Loop-powered**

Notes:
- Deadfront captive screw terminals.
- 12–22 AWG solid or stranded.
- Observe polarity.

AC Current Transducer Ordering Information

Sample Model Number: ATR3-420-24L-FL
True RMS AC current transducer, 24 VDC, powered with a 4–20 mA output, 375/500/750 A ranges in a solid-core case.

```
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
| R | True RMS
| Average Responding (Blank) |
| 100, 133, 200 A |
| 375, 500, 750 A |
| 1000, 1333, 2000 A |
| 420 | 4–20 mA |
| 24L | 24 VDC Loop-powered |
| FL | Solid-core |
```
AT/ATR-LS SERIES
AC Current Transducers

AT/ATR-LS Series Current Transducers combine a current transformer and signal conditioner into a single package. The large, easy-to-install split-core design allows for installation over existing conductors without the need to disconnect the load, even in applications where there are multiple conductors per phase. For new installations, the installation is just as easy. Just remove the top portion of the sensing ring, place the conductors inside, and snap the top back in place. The transducer uses two wires to connect to the power supply and the load, programmable logic controller, panel meter or data acquisition system.

AC Current Transducer Applications
Monitor Large Machines
• Measure the current use to detect over or under current conditions before they cause break downs.

Water Delivery and Treatment
• Detect open discharge lines.
• See clogged filters or blocked intake to pumps.

Generators
• Keep the power system running by monitoring the output.

AC Current Transducer Features
Industry Standard Output
• 4–20 mA signal proportional to the AC current.
• Compatible with most automation systems.

Loop-powered
• Use the “live zero” output to verify proper connections (sensor output with no current flowing confirms the system is ready to go).

Factory Calibrated
• Eliminates zero and span potentiometer adjustment.

Split-core Case
• Sensing window provides ample space for bus bar, single or multiple conductors.

DIN Rail Mount
• Simple snap onto DIN rail for secure mounting.

Designed for UL, CUL and CE Approval
• Accepted around the world.

AC Current Transducer Connections

Pump Jam & Suction Loss Protection

Free program expedites evaluation process. See page 1 for details.
AC Current Transducer Specifications

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>24 VDC nominal (12–32 VDC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>4–20 mA Loop powered</td>
</tr>
<tr>
<td>Output Limit</td>
<td>23 mA</td>
</tr>
<tr>
<td>Accuracy</td>
<td>1% FS</td>
</tr>
<tr>
<td>Response Time</td>
<td>600 ms (90% step change)</td>
</tr>
<tr>
<td>Ranges</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0–800 A</td>
</tr>
<tr>
<td>10</td>
<td>0–1000 A</td>
</tr>
<tr>
<td>12</td>
<td>0–1200 A</td>
</tr>
<tr>
<td>16</td>
<td>0–1600 A</td>
</tr>
<tr>
<td>Isolation Voltage</td>
<td>Designed to meet UL 508 2200 VAC</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>AT: 50/60 Hz (average responding)</td>
</tr>
<tr>
<td></td>
<td>ATR: 20–400 Hz (True RMS responding)</td>
</tr>
<tr>
<td>Sensing Aperture</td>
<td>2.30&quot; (58.42 mm) X 3.42&quot; (86.87 mm)</td>
</tr>
<tr>
<td>Case</td>
<td>UL94 V0 flammability rated DIN rail mounting</td>
</tr>
<tr>
<td>Environmental</td>
<td>-4 to 122°F (-20 to 50°C) O–95% RH, noncondensing</td>
</tr>
<tr>
<td>Listings</td>
<td>Designed to meet UL 508 Industrial Control Equipment (USA &amp; Canada)</td>
</tr>
</tbody>
</table>

AC Current Transducer Ordering Information

Sample Model Number: ATR10-420-24L-LS
AC current transducer, 0–1000 A range, RMS output 4–20 mA, loop powered, large split-core case, DIN rail mounting.

```
(1) | (2) | (3) | (4) | (5)
AT  | -   | 4   | 2   | 0   | 2   | 4   | L   | L   | S
```

(1) Frequency
- Average responding [blank]
- True RMS responding output for distorted current
(2) Range
- 8 0–800 A
- 10 0–1000 A
- 12 0–1200 A
- 16 0–1600 A
(3) Output Type
- 420 4–20 mA
(4) Power Supply
- 24L 24 VDC Loop-powered
(5) Case Style
- LS Split-core, base terminals, DIN rail mounting

Note: Drawings are not to scale
ATCR SERIES
AC Current Transducers

ATCR Series AC Current Transducers combine a sensing coil and a True RMS signal conditioner as a matched, factory calibrated set. The ATCR Series AC Current Transducers are designed to produce an analog 4–20 mA signal proportional to AC current up to 2000 A. Coil opens to pass over the installed conductors. When connected to a controller or data logger, the sensor output is directly proportional to the primary current.

AC Current Transducer Applications

Monitor Large Machines
- Monitoring resistive or inductive load to detect current.
- Industry standard 4–20 mA output for connection to PLC or data loggers.

Flexible Coil Surrounds Conductors Without Disturbing Wiring
- Install over bus bars, single or multiple conductors easily.
- Fast response to changes in operating conditions.

AC Current Transducer Features

True RMS Output
- True RMS technology is accurate on distorted waveforms like VFD or phase angle-fired SC outputs.

Single Range
- No chance of field range selection errors.
- Eliminates zero and span pots.

Isolation
- Output is magnetically isolated from the input for safety.
- Eliminates insertion loss (voltage drop).

UL, CUL Approved
- Accepted worldwide.

Compact DIN rail Mount Enclosure*
- Space saving 35 mm wide enclosure mounts quickly.
*For information on the DIN Rail accessories kit, see page 109

Two-Wire Loop Powered Output

Display Meter

For additional Application Examples, see page 110 and www.nktechnologies.com

AC current monitoring of large loads:

Loads drawing large amounts of power are connected to the supply using large wire or bus bar. Disconnecting the conductors and threading them through a solid sensing ring or current transformer is difficult and time consuming. With this new design, the sensing is accomplished using a coil without a magnetically permeable core. This allows the installer to pass the coil around the conductors after they are connected with no need to disconnect. The coil is attached to a signal conditioning circuit, and the output signal is powered from the 24 VDC nominal loop voltage. Simple, easy to install, can monitor sinusoidal or distorted current wave forms at frequencies to 400 Hz, and designed for industrial uses.
AC Current Transducer Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Signal</td>
<td>4–20 mA, Loop-powered, True RMS</td>
</tr>
<tr>
<td>Output Limit</td>
<td>23 mA</td>
</tr>
<tr>
<td>Accuracy</td>
<td>1.0% FS (10–100% of range)</td>
</tr>
<tr>
<td>Response Time</td>
<td>600 ms (to 90% step change)</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>40–400 Hz or higher</td>
</tr>
<tr>
<td>Power Supply</td>
<td>24 VDC Nominal, 36 VDC Maximum</td>
</tr>
<tr>
<td>Isolation Voltage</td>
<td>UL listed to 1270 VAC, tested to 5 KV</td>
</tr>
<tr>
<td>Input Ranges</td>
<td>Single range, custom ranges available; consult factory.</td>
</tr>
<tr>
<td>Sensing Aperture</td>
<td>• 0–500 A approx. 12&quot; long (3.5&quot; OD)</td>
</tr>
<tr>
<td></td>
<td>• 0–1000–2000 A approx. 17.25&quot; (5.25&quot; OD)</td>
</tr>
<tr>
<td>Case</td>
<td>UL94 V0 Flammability Rated</td>
</tr>
<tr>
<td>Environmental</td>
<td>-4 to 122°F (20 to 50°C)</td>
</tr>
<tr>
<td></td>
<td>0–95% RH, non-condensing</td>
</tr>
<tr>
<td>Listings</td>
<td>UL 508 Industrial Control Equipment (USA &amp; Canada)</td>
</tr>
</tbody>
</table>

AC Current Transducer Dimensions

AC Current Transducer Connections

Notes: Fingersafe captive screw terminals. 14–22 AWG solid or stranded. Observe polarity.

AC Current Transducer Ordering Information

Sample Model Number: ATCR1-420-24L-DIN
True RMS AC current transducer, 1000 A ranges, 4–20 mA output, 24 VDC loop-powered, coil sensor connected to DIN rail mounting enclosure.

ATCR - 4 2 0 - 2 4 L - D

(1) Full Scale Range
1  500 A
2  1000 A
3  1500 A
4  2000 A

(2) Output Signal
420  4–20 mA

(3) Power Supply
24L  24 VDC Loop-powered (4–20 mA output ONLY)

(4) Case Style
D  Coil connected to DIN rail mounting enclosure
ATH SERIES
AC Current Transducer with Time Integration

ATH Series (patented) AC Current Transducers are the latest innovation from NK Technologies. Monitoring the current or power controlled by silicon-controlled rectifiers (SCRs) can be a challenge, especially the current used by heaters. When used to monitor zero-crossing (burst) fired SCRs, the ATH will provide an output signal directly proportional to the RMS amperage. Zero-crossing fired controls allow current to flow to the circuit for as short of a time period as one cycle, and off for several cycles. Most current sensors will not work well when there is no current present. This capability is important in case a heating element fails but the process continues operating, which could result in scrapped material.

AC Current Transducer Applications
Electrical Heaters
• Faster response than temperature sensors.
• Simplest method to monitor pulsed wave forms.

ATH SERIES
AC Current Transducer Features
Industry Standard Outputs
• 4–20 mA, 0–5 or 0–10 VDC.
• Compatible with most automation systems.

External Powered
• Split-core models available powered with 24 VAC or DC.
• Solid-core models powered with 24 VAC or DC or 120 VAC.

Factory Calibrated
• No need for zero and span adjustment potentiometers.

RMS Output
• Accurate measurement of sinusoidal or pulsed current wave shapes.

Built-in Mounting Feet
• Simple, two-screw panel mount or attach with optional DIN rail brackets.

Designed for UL, CUL and CE Approval
• Accepted worldwide

For additional Application Examples, see page 110 and www.nktechnologies.com

ATH AC current transducers will produce a signal proportional to the current used even when the controller is supplying power in one cycle increments. This is quite common as the “burst-fired” zero crossingwitching method produces less harmonic distortion than phase-angle fired controls.
AC Current Transducer Dimensions

**SP Case**

- 0.19" (4.8 mm) dia.
- 3.53" (89.7 mm)
- 3.04" (77.2 mm)
- 1.18" (30 mm)

**FL Case**

- 0.45" (11.4 mm)
- 0.85" (21.6 mm)
- 2.40" (61 mm)
- 61 mm

AC Current Transducer Connections

- Output loop is powered by Transducer. No loop power supply required.

AC Current Transducer Specifications

| Power Supply | • Split-core models with 24 VAC or DC  
|              | • Solid-core models with 24 VAC or DC or 120 VAC |
| Output       | 4–20 mA  
|              | 0–5 VDC  
|              | 0–10 VDC |
| Response Time| 600 ms maximum, 250 ms at 100% power |
| Isolation Voltage | Tested to 5000 VAC |
| Frequency Range | 40–400 Hz |
| Sensing Aperture | • SP Case: 0.85" (21.6 mm) sq.  
|                | • FL Case: 0.74" (19 mm) dia. |
| Environmental | -4 to 122°F [-20 to 50°C]  
|                | 0–95% RH, non-condensing |
| Listings      | Designed for approval to UL 508 Industrial Control Equipment (USA & Canada) |

AC Current Transducer Ordering Information

Sample Model Number: ATH1-420-24U-SP

AC current transducer, time proportioned, 4-20 mA output, 24 VAC or DC power supply, split-core case.

<p>| | | | |</p>
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**ATH**

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**Range**

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**Output Type**

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**Power Supply**

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</table>

**Case Style**

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</tbody>
</table>
ATQ SERIES
Frequency Output AC Current Transducers

ATQ Series AC Current Transducers have a patented frequency output design used as an input to high-speed counter or frequency PLC modules, panel meters or programmable relays. Use where no analog inputs are available. Eight ranges from 0–2 to 0–200 A across three models provide the best available resolution. The ATQ Series AC Current Transducers are designed with a split-core enclosure for easy installation.

AC Current Transducer Applications

Motion and Motor Control
- Pump, grinder, and fan motor status monitoring.
- Belt jam sensing in conveyor applications.
- Motor control in deburring/brush operations.
- Detect strain, acts as an electronic shear pin.

Current Measurement
- Measure current use in machine tools, polishing, and cutting operations where a small PLC has sufficient capacity to accept the sensor inputs measuring speed, time of use and electrical demands of the equipment.

Frequency Output Control

24 Volt Power

PLC high speed counter or frequency input

Increase Load

Decrease Load

AC Current Transducer Features

True RMS Output
- True RMS technology is accurate on distorted waveforms like VFD or SCR outputs.

Jumper Selectable Ranges
- Reduces inventory.
- Eliminates zero and span pots.

Isolation
- Output is magnetically isolated from the input for safety.
- Eliminates insertion loss (voltage drop).

Easy Installation
- Split-core enclosure means the monitored conductor does not need to be disconnected to install the sensor.

For additional Application Examples, see page 110 and www.nktechnologies.com
AC Current Transducer Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply</td>
<td>24 VAC/DC, &lt;1 VA (sensor only)</td>
</tr>
<tr>
<td>Output</td>
<td>• 5K Hz at full range current</td>
</tr>
<tr>
<td></td>
<td>• 10K Hz at full range current</td>
</tr>
<tr>
<td>Response Time</td>
<td>100 ms (to 90% step change)</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>10–400 Hz</td>
</tr>
<tr>
<td>Pulse Width</td>
<td>• 5K: 90–100 m sec.</td>
</tr>
<tr>
<td></td>
<td>• 10K: 45–50 m sec.</td>
</tr>
<tr>
<td></td>
<td>On: 40 m sec. Off: Variable</td>
</tr>
<tr>
<td>Isolation Voltage</td>
<td>Tested to 5000 VAC</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>6–100 Hz</td>
</tr>
<tr>
<td>Sensing Aperture</td>
<td>• SP Case: 0.85” (21.6 mm) square</td>
</tr>
<tr>
<td>Case</td>
<td>UL94 V0 Flammability Rated</td>
</tr>
<tr>
<td>Environmental</td>
<td>-4 to 122°F (-20 to 50°C)</td>
</tr>
<tr>
<td></td>
<td>0–95% RH, non-condensing</td>
</tr>
</tbody>
</table>

AC Current Transducer Dimensions

SP Case

AC Current Transducer Connections

Sinking Input Connection

- PLC (+) (-)
- 24 VDC (+) (-)
- ATQ

Sink Connection

- AC or DC
- Power

Sourcing Input Connection

- 24 VDC (+) (-)
- PLC (+) (-)
- ATQ

- AC or DC
- Power

AC Current Transducer Ordering Information

Sample Model Number: ATQ1-05K:24U-SP
AC current transducer, 5K frequency at 10, 20 or 50 A, split-core case.

<table>
<thead>
<tr>
<th>Range</th>
<th>Frequency Output</th>
<th>Power Supply</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>05K 5K Hz</td>
<td>24U 24 VAC/DC Power (External)</td>
<td>SP Split-core</td>
</tr>
<tr>
<td>1</td>
<td>10, 20, 50 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>100, 150, 200 A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ATP SERIES
AC Current Transducers

ATP Series Powered AC Current Transducers sense currents from 0–200 A and provide a proportional analog VDC or mA output. Powered by 120 VAC or 24 VAC/VDC, the ATP Series Powered AC Current Transducers eliminate the need for costly power supplies or voltage rectifiers inside the control panel. Designed for motor control applications with standard sinusoidal waveforms, the ATP Series Powered AC Current Transducers feature user-selectable input ranges, a choice of outputs and split-core or solid-core enclosures.

AC Current Transducer Applications

Commercial and Industrial Motor Control Centers
- 120 VAC power supply option allows for powering off of readily available supplies; ideal for pumping, water/wastewater, boiler and other industrial applications.
- Eliminates the need for 24 VDC power supply or AC rectifiers within the control panel; saves space, material and labor associated with power supplies.

Heater Failure Detection

AC Current Transducer Features

Fast, Accurate RMS Measurement
- Unique ‘average responding’ algorithm provides RMS output on pure sine wave and constant speed loads, offering improved accuracy over two-piece solutions.

Jumper Selectable Input Ranges
- Each unit has multiple input range capability and can be used for a variety of applications, reducing the need for separate models.

Isolation Output
- Output is magnetically isolated from the input for enhanced safety and elimination of insertion losses.

AC Current Transducer Connections

4–20mA Option

0–5/10 VDC

Notes:
- Terminals are deadfront captive screw terminals.
- Use 12–22 AWG solid or stranded.

For additional Application Examples, see page 110 and www.nktechnologies.com
**AC Current Transducer Specifications**

<table>
<thead>
<tr>
<th></th>
<th>-005 Model</th>
<th>-010 Model</th>
<th>-420 Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Signal</td>
<td>0–5 VDC</td>
<td>0–10 VDC</td>
<td>4–20 mA</td>
</tr>
<tr>
<td>Output Limit</td>
<td>112% (5.6 V)</td>
<td>112% (11.2 V)</td>
<td>112% (22.4 mA)</td>
</tr>
<tr>
<td>Loading</td>
<td>25 kΩ min.: VDC Models</td>
<td>500 Ω max.: 4–20 mA Models</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>100 ms (10–90% step change)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency Range</td>
<td>40–100 Hz standard. Special calibration for frequencies 100–400 Hz, consult factory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>1.0% FS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td>120 VAC or 24 VAC/VDC, 2 VA max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolation Voltage</td>
<td>Tested to 5 KV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Ranges</td>
<td>0–200 A jumper-selectable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensing Aperture</td>
<td>• FF Case: 0.55&quot; (14 mm) dia.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• SP Case: 0.85&quot; (21.6 mm) sq.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case</td>
<td>UL94 V0 Flammability Rated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>-4 to 122°F (20 to 50°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0–95% RH, non-condensing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**AC Current Transducer Ordering Information**

Sample Model Number: ATP1-420-120-SP

Powered AC current transducer, jumper-selectable 0–10/20/50 A range, 4–20 mA output, 120 VAC power supply, split-core enclosure.

- **(1)** Full Scale Range
  - 0: 2 A & 5 A
  - 1: 10, 20, 50 A
  - 2: 100, 150, 200 A

- **(2)** Output Signal
  - 005: 0–5 VDC
  - 010: 0–10 VDC
  - 420: 4–20 mA

- **(3)** Power Supply
  - 120: 120 VAC
  - 24U: 24 VAC/DC with isolated output

- **(4)** Case Style
  - FF: Solid-core
  - SP: Split-core
ATP/ATPR-FL SERIES
AC Current Transducers

ATP/ATPR-FL Series Powered High-AC-Current Transducers are large-format solid-core transducers designed for high current applications from 200 A to 2000 A. Powered by 120 VAC or 24 VAC/VDC, the ATP/ATPR-FL Series Powered High-AC-Current Transducers take advantage of available power supplies and eliminate the need for costly control power transformers. Options include average responding and True RMS versions, 0–5/10 VDC or 4–20 mA analog outputs and switch-selectable input ranges.

AC Current Transducer Applications

Commercial and Industrial MCC’s
- Fits conveniently in motor control centers, senses current on industrial motors and provides analog inputs back to PLC or controller.

VFD or SCR Controlled Loads, Electronic Ballasts
- Helpful in monitoring VFD-controlled motors to provide operational status. ATR Series also provides accurate measurement of ballast input power and phase angle fired SCRs.

Large Pumping Applications
- Ideal for proof-of-flow in water/wastewater, boiler and other industrial pumping applications 150 HP and over. 120 VAC or 24 VAC/VDC supply options allow for powering off of readily available supply, eliminating need for CPTs.

Power Distribution Centers (PDCs)
- Monitors current output on commercial generation equipment and serves as a current input for use in power consumption calculations.

AC Current Transducer Features

Large Aperture
- Accommodates large conductors or wire bundles.

Select the Right Output
- True RMS technology is accurate on distorted wave form like those associated with VFD or SCR outputs.
- Average Responding for use with linear, sinusoidal waveforms.

Jumper Selectable Ranges
- Reduces inventory.
- Eliminates zero and span pots.

Isolation
- Output is magnetically isolated from the input for safety.
- Eliminates insertion loss (voltage drop).

Centrifugal Pump Monitoring

For additional Application Examples, see page 110 and www.nktechnologies.com
**AC Current Transducer Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>-005 Model</th>
<th>-010 Model</th>
<th>-420 Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Signal</td>
<td>0–5 VDC</td>
<td>0–10 VDC</td>
<td>4–20 mA</td>
</tr>
<tr>
<td>Output Limit</td>
<td>112% (5.6 V)</td>
<td>112% (11.2 V)</td>
<td>112% (22.4 mA)</td>
</tr>
<tr>
<td>Loading</td>
<td>2.5 kΩ min.: VDC Models 500 Ω max.: 4–20 mA Models</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Response Time | • ATP: 100 ms (10–90% step change)  
• ATPR: 600 ms (10–90% step change) |
| Frequency Range | • ATP: 40–100 Hz, Sinusoidal  
• ATPR: 10–400 Hz |
| Accuracy | 1.0% FS |
| Power Supply | 120 VAC or 24 VAC/VDC, 2 VA max |
| Isolation Voltage | 600 VAC |
| Input Ranges (switch selectable) | • ATP3/ATPR3: 0–375 A/500 A/750 A  
• ATP4/ATPR4: 0–1000 A/1333 A/2000 A |
| Sensing Aperture | 3.0” (76.2 mm) dia. |
| Case | UL94 V0 Flammability Rated |
| Environmental | 5 to 122°F (-15 to 50°C)  
0–95% RH, non-condensing |

**AC Current Transducer Connections**

4–20mA Option

0–5/10 VDC Option

Load resistor 25 kΩ min., recommended

Notes:
Terminals are deadfront captive screw terminals. Use 12–22 AWG solid or stranded.

**Sample Model Number:** ATPR3-420-120-FL
True RMS AC current transducer, 120 VAC, powered with a 4–20 mA output, 375/500/750 A ranges in a solid-core case.

<table>
<thead>
<tr>
<th>(1) Measurement</th>
<th>(2) Full Scale Range</th>
<th>(3) Output Signal</th>
<th>(4) Power Supply</th>
<th>(5) Case Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>True RMS</td>
<td>375, 500, 750 A</td>
<td></td>
<td></td>
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<tr>
<td>Average Responding (Blank)</td>
<td></td>
<td>1000, 1333, 2000 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[3] Output Signal</td>
<td>005 0–5 VDC</td>
<td>010 0–10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[4] Power Supply</td>
<td>24U 24 VAC/DC</td>
<td>120 120 VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[5] Case Style</td>
<td>FL Solid-core</td>
<td></td>
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</tbody>
</table>
ATPR “E-OUT” SERIES
AC Current Transducers

ATPR RMS AC Current Transducers combine a current transformer with a true RMS signal conditioner in a single package. ATPR Series AC Current Transducers produce a 0–5 or 0–10 VDC RMS output on distorted waveforms found in the output of variable frequency drives, phase angle fired heating controls and on linear loads in “noisy” power environments. The ATPR Series AC Current Transducers are available in splitcore housing only.

AC Current Transducer Applications

VFD Controlled Loads
- Monitor the output of variable frequency driven loads, even when the unit is in bypass mode.

SCR Controlled Loads
- Accurate measurement of phase angle fired heating controls.
- Current measurement produces a quicker response to element failure than temperature controls.

Switching Power Supplies and Electronic Ballasts
- True RMS sensing is the most accurate way to measure power supply and ballast input power.

Monitoring a Variable Frequency Drive

Use the ATPR current transducer on the line or load side of the drive and the signal will be accurate in either position.

AC Current Transducer Features

True RMS Sensing
- Sensor output is proportional to the current flowing in the circuit, even with high distortion or harmonic loads.
- Compatible with most automation systems.

External Powered
- Provides the highest degree of accuracy and response.

Range Selectable
- One sensor covers a wide variety of loads.
- Field selectable ranges keep spare part inventory at a minimum and allow for changes in load conditions.

Split-core Case
- Simple installation, release the latch and snap over the conductor.

DC Voltage Output
- Perfect for data acquisition systems, panel meters or controllers with only voltage inputs available.

Built-in Mounting Feet
- Simple, two-screw panel mount or attach with optional DIN rail brackets. *

Designed for UL and CUL; CE Approval
- Accepted worldwide.

*See DIN Rail accessory page for panel mounting kit.
AC Current Transducer Connections

**AC Current Transducer Dimensions**

SP Case

**AC Current Transducer Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply</td>
<td>24 VDC nominal (20–28 VDC)</td>
</tr>
<tr>
<td>Output</td>
<td>0–5 VDC, Proportional to RMS Current</td>
</tr>
<tr>
<td></td>
<td>0–10 VDC, Proportional to RMS Current</td>
</tr>
<tr>
<td>Response Time</td>
<td>600 ms</td>
</tr>
</tbody>
</table>
| Output Range                | • 0–2 or 0–5 A  
• 0–10, 20 or 50 A  
• 0–100, 150 or 200 A |
| Output Ripple               | 1% Maximum |
| Isolation Voltage           | UL listed to 1270 VAC, tested to 5000 VAC |
| Frequency Range             | 10–400 Hz |
| Sensing Aperture            | 0.85” (21.6 mm) sq. |
| Case                        | UL94 V0 Flammability Rated |
| Environmental               | -4 to 122°F (-20 to 50°C)  
0–95% RH, non-condensing |
| Listings                    | Designed to meet UL 508 Industrial Control Equipment (USA & Canada) |

**AC Current Transducer Ordering Information**

Sample Model Number: ATPR1-010-24D-SP

True RMS AC current transducer, 10/20/50 A FS input ranges, 0–10 VDC output, 24 VDC power supply, split-core case.

<table>
<thead>
<tr>
<th>ATPR</th>
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<th>(4)</th>
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<tbody>
<tr>
<td></td>
<td>Full Scale Range</td>
<td>2 4 D</td>
<td>S P</td>
<td></td>
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<tr>
<td>0</td>
<td>2, 5 A</td>
<td>10, 20, 50 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>100, 150, 200 A</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>005</td>
<td>0–5 VDC, True RMS</td>
</tr>
<tr>
<td>010</td>
<td>0–10 VDC, True RMS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>24D</td>
<td>24 VDC Nominal (20–28 VDC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case Style</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>Split-core</td>
</tr>
</tbody>
</table>
ATR SERIES
AC Current Transducers

ATR Series AC Current Transducers combine a current transformer and a True RMS signal conditioner into a single package. The ATR Series AC Current Transducers provide True RMS output on distorted waveforms found on VFD or SCR outputs, and on linear loads in “noisy” power environments. The ATR Series AC Current Transducers are available in a solid- or split-core case.

AC Current Transducer Applications

VFD Controlled Loads
- Monitoring VFD output indicates how the motor and attached load are operating.

SCR Controlled Loads
- Accurate measurement of phase angle fired (time proportioned) SCRs.
- Current measurement gives faster response than temperature measurement.

Switching Power Supplies and Electronic Ballasts
- True RMS sensing is the most accurate way to measure power supply or ballast input power.

AC Current Transducer Features

True RMS Output
- True RMS technology is accurate on distorted waveforms like VFD or SCR outputs.

Jumper Selectable Ranges
- Reduces inventory.
- Eliminates zero and span pots.

Isolation
- Output is magnetically isolated from the input for safety.
- Eliminates insertion loss (voltage drop).

UL, CUL and CE Approval
- Accepted worldwide.

Selecting the right transducer:

The current waveform of a typical linear load is a pure sine wave. In VFD and SCR applications, however, output waveforms are rough approximations of a sine wave. There are numerous spikes and dips in each cycle. ATR transducers use a mathematical algorithm called “True RMS” which integrates the actual waveform over time. The output is the amperage component of the true power (heating value) of the AC current waveform. True RMS is the only way to accurately measure distorted AC waveforms. Select ATR transducers for nonlinear loads in “noisy” power environments.

For additional Application Examples, see page 110 and www.nktechnologies.com
## AC Current Transducer Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Signal</td>
<td>4–20 mA, Loop-powered, True RMS</td>
</tr>
<tr>
<td>Output Limit</td>
<td>23 A</td>
</tr>
<tr>
<td>Accuracy</td>
<td>1.0% FS</td>
</tr>
<tr>
<td>Response Time</td>
<td>600 ms (to 90% step change)</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>10–400 Hz</td>
</tr>
<tr>
<td>Power Supply</td>
<td>24 VDC Nominal, 12–40 VDC Maximum</td>
</tr>
<tr>
<td>Isolation Voltage</td>
<td>UL listed to 1270 VAC, tested to 5 KV</td>
</tr>
<tr>
<td>Input Ranges</td>
<td>Field selectable ranges from 0–200 A; custom ranges available; consult factory.</td>
</tr>
<tr>
<td>Sensing Aperture</td>
<td>-FT Case: 0.74&quot; (19 mm) dia.</td>
</tr>
<tr>
<td></td>
<td>-SP Case: 0.85&quot; (21.6 mm) sq.</td>
</tr>
<tr>
<td>Case</td>
<td>UL94 VO Flammability Rated</td>
</tr>
<tr>
<td>Environmental</td>
<td>-4 to 122°F (20 to 50°C)</td>
</tr>
<tr>
<td></td>
<td>0–95% RH, non-condensing</td>
</tr>
<tr>
<td>Listings</td>
<td>UL 508 Industrial Control Equipment (USA &amp; Canada), CE</td>
</tr>
</tbody>
</table>

## AC Current Transducer Ordering Information

Sample Model Number: ATR1-420-24LSP

True RMS AC current transducer, 10/20/50 A ranges, 4–20 mA output, 24 VDC loop-powered in a split-core case.

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATR</td>
<td>-</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>24L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(1) Full Scale Range</th>
<th>(2) Output Signal</th>
<th>(3) Power Supply</th>
<th>(4) Case Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2 &amp; 5 A</td>
<td>24L</td>
<td>FT</td>
</tr>
<tr>
<td>1</td>
<td>10, 20, 50 A</td>
<td></td>
<td>Solid-core, Top Term.</td>
</tr>
<tr>
<td>2</td>
<td>100, 150, 200 A</td>
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</tbody>
</table>

Notes:
- Deadfront captive screw terminals (SP case).
- 12–22 AWG solid or stranded.
- Observe polarity.
ATS SERIES
AC Current Transducer/Switch with Digital Setpoint Display

ATS Series AC Current Sensors combine a current operated switch and transducer into a single package. The FL model features a digital display that gives visual indication of the setpoint for greater accuracy. The sensor provides a solid-state contact which will change state when the current exceeds an adjustable level or falls below the normal running current. This means reduced installation time, plus the option to have local control of a starter coil while at the same time sending the analog signal back to a controller housed in a separate cabinet.

Applications

Electronic Proof of Operation
- Current operated switches eliminate the need for multiple pipe or duct penetrations and are more reliable than electromechanical pressure or flow switches.

Conveyors
- Detects jams and overloads.
- Interlocks multiple conveyor sections.

Pump Control
- Provides signal to measure current and shuts down the pump if the current rises over the setpoint.

Cooling Towers
- Analog monitors time of use and contact opens if a filter clogs.

Features

Solid-State Output
- N.O. or N.C. solid-state switch for control circuits up to 240 VAC.
- Compatible with most automation systems.

Externally powered
- Allows for higher accuracy.

Easily Adjustable and Precise Setpoint
- Speeds startup.

Analog Output
- Measure the current used at all times.

LED Display
- Provides quick visual indication of where the contact changes.
- Easiest and most accurate setpoint adjustment available.

Built-in Mounting Feet
- Simple, two-screw panel mount or attach with optional DIN rail brackets.

Designed for UL, CUL and CE Approval
- Accepted worldwide.

For additional Application Examples, see page 110 and www.nktechnologies.com
AC Current Transducer Specifications

Power Supply 18–30 VAC/DC (40–70 mA consumption)
Digital Output Magnetically Isolated Solid-State Switch
Contact Rating • 1.0 A up to 240 VAC max. [AC only]
Off-State Leakage • <10 μA Normally Open
• 2.5 mA Normally Closed
Contact Response Time • <500 ms (5% above setpoint)
• <200 ms (50% above setpoint)
• <150 ms (100% above setpoint)
Setpoint Range • ATS1: 1–50 A, adjustable
• ATS2: 4–200 A, adjustable
Hysteresis 5% of Setpoint
Analog Output • ATS1: 0–50 A
• ATS2: 0–200 A
Analog Signal Loading • 4–20 mA, 500 ohm max.
• 0–5 or 0–10 VDC, 5k ohm min.
Analog Response Time • <300 ms (90% step change)
• <400 ms (100% step change)
Overload MODEL 6 SEC 1 SEC
• ATS1 400 A
• ATS2 800 A
• 600 A
• 1200 A
Isolation Voltage Tested to 5000 VAC
Frequency Range 40–400 Hz
Sensing Aperture -FL Case: 0.74” (19 mm) dia.
Case UL94 V0 Flammability Rated
Environmental -4 to 122°F (-20 to 50°C)
0–95% RH, non-condensing
Listings Designed to meet UL 508 Industrial Control Equipment (USA & Canada)

AC Current Transducer Ordering Information

Sample Model Number: ATS1-420-NOAC-24U-FL
Adjustable AC current operated switch/transducer, normally open, solid-core.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>ATS</td>
<td>Range</td>
<td>Analog Signal Type</td>
<td>Power Supply</td>
<td>Case Style</td>
</tr>
<tr>
<td>1</td>
<td>0–50 Analog, 1–50 switch adjustment</td>
<td>420</td>
<td>24U</td>
<td>FL</td>
</tr>
<tr>
<td>2</td>
<td>0–200 Analog, 4–200 switch adjustment</td>
<td>005</td>
<td>0–5 VDC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>010</td>
<td>0–10 VDC</td>
<td></td>
</tr>
</tbody>
</table>

NOAC: Normally Open, closes on current rise, AC control only
NCAC: Normally Closed, opens on current rise, AC control only

Power Supply
24U: 24 VAC or DC
Case Style
FL: Solid-core
ATS SERIES
AC Current Transducer/Switch with Rotary Switch Setpoint

The ATS Series AC Current Sensors combine a current operated switch and transducer into a single package for use in AC current applications up to 1200 A. The large sensing window provides complete isolation between the primary circuit and the controls. The DIN rail mounting makes installation a breeze, and provides a very secure mount that is resistant to conductor movement.

AC Current Transducer Applications

Large AC Motor Loads
- Produces an analog signal at all times to detect increases or decreases in current.
- Provides limit alarm contacts for over or under current conditions.
- Extra large aperture allows for single or multiple conductor passage.

Main Service Entrance
- Allows a viewer to see the amount of current used at any time when connected to a standard panel meter.

Generators
- Measure the AC current produced or consumed.
- Detect mechanical problems before failure occurs.

AC Current Transducer Features

Easily Established Relay Actuation Point
- Patented rotary switch setpoint selection (patent pending).
- Trip point indicated on the labeling.

Isolation
- Output is magnetically isolated from the input for safety.
- Eliminates insertion losses, no added burden.

Analog Signal Available At All Times
- 4–20 mA signal proportional to 0–1200 AC A.
- Reduces components by combining transducer and limit alarm (current switch).
- Analog signal powered from the sensor; no loop powered required.

DIN Rail Mounting*
- Integral DIN rail mount with spring loaded mounting clips.
- Makes installation a snap.

Fail-Safe Relay Action
- Single Pole Double Throw Relay changes state with power to the sensor.
- LED indication if power is removed from the sensor or primary current exceeds the adjustable trip point.
- Field adjustable time delay from 0.5 to 12 seconds.

*For information on the DIN Rail accessories kit, see page 109.
AC Current Transducer Specifications

<table>
<thead>
<tr>
<th>Output Signal</th>
<th>4–20 mA</th>
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</thead>
<tbody>
<tr>
<td>Output Limit</td>
<td>4–20 mA; 23 mA (if trip point is &lt;150 A, max. signal is 6 mA; if &lt;300 A, max. signal is 8 mA)</td>
</tr>
<tr>
<td>Transducer Accuracy</td>
<td>1% FS</td>
</tr>
<tr>
<td>Repeatability</td>
<td>1.0% FS</td>
</tr>
</tbody>
</table>
| Response Time | • Relay Output: 200 ms to 90% of step change  
• Transducer: 600 ms to 90% step change |
| Frequency Range | AC 10–100 Hz |
| Power Supply | 120 VAC or 24 VDC, isolated from output |
| Power Consumption | 5 VA |
| Loading | 4–20 mA: 650 Ω maximum |
| Contact Rating | 1 A @ 125 VAC, 2 A @ 30 VDC |
| Isolation Voltage | Tested to 5 KV |
| Linearity | 1.00% FS |
| Current Ranges | Ranges from 0–1200 A |
| Sensing Aperture | DL Case: 1.875” (46 mm) diameter |
| Case | UL94 V0 Flammability Rated |
| Environmental | -4 to 122°F (-20 to 50°C)  
0–95% RH, non-condensing |
| Listings | Designed to meet CE |

AC Current Transducer Output Type

Single pole, double throw relay adjustable from 10 to 1200 A in 10 A increments. 4–20 mA signal proportional to 0–1200 A. Analog signal capped at 6 mA when trip point <150 A, 8 mA if trip point <300 A, 23 mA if the trip point is 310 or higher.

Notes:
Dead front captive screw terminals.
12–22 AWG solid or stranded.
Observe polarity.

*DIN rail kit available. See DIN rail accessories page.