Specifications

Power Supply	24 VAC/VDC (+/- 10%)
Power Consumption	< 6.0 VA
Note: Power Supply and output signal ARE NOT isolated. Do not connect the negative terminals to a common point.	
Output Signal	0-5 VDC or 4-20 mA
Output Loading	0-5 VDC : > 33 KΩ 4-20 mA : < 400 Ω
Accuracy	1% FS (active kW)
Response Time	500 mS (to 90% of step change)
Frequency Range	40-65 Hz
kW Output Scale	0.5 to 200 kW (not all ranges are available for each voltage range)
Monitored Voltage Input	Measurement Category III (600 VAC max). There needs to be a reliably grounded neutral system in Wye configuration.
Note: Monitored voltage must be within 30-118% of the nominal range selected.	
Fusing	Use Field supplied fuses or circuit breakers for voltage inputs (600 V 100 mA fuse is recommended).
Indication	LED Green with proper phase match ups LED Amber if current and voltage are not matched correctly.
Isolation Voltage	UL listed to 5400 VAC
Sensing Aperture	0.84"ID (21.3 mm)
Enclosure	UL94 V-0 Flammability rated
Environmental	-4 to 122°F, (-20 to 50°C) 0-95% RH Non-condensing Altitude to 2000 meters (6561 ft) Pollution Degree 2
Listings	UL/cUL listed E475483, CE

Warning! Risk of danger

Safe operation can only be guaranteed if the transducer is used for the purpose for which it was designed and within the limits of the technical specifications. When this symbol is used, it means you must consult all documentation to understand the nature of potential hazards and the action required to avoid them.

Warning! Risk of electrical shock

When operating the transducer, certain parts may carry hazardous live voltage (e. g. primary conductors, power supply). The transducer should not be put into operation if the installation is not complete.

Model Number Key

APT 4 - 420 - 24U - 10.0 - TH

Monitored Voltage:
1 - 208 V
2 - 240 V
4 - 480 V
6 - 600 V

Output Signal:
420 - 4-20 mA
005 - 0-5 VDC

Power Supply:
24U - 24 VAC/VDC

Input Range:
0.50 - 0.5 kW
0.75 - 0.75 kW
1.00 - 1.00 kW
2.00 - 2.00 kW
5.00 - 5.00 kW
7.50 - 7.50 kW
10.0 - 10.0 kW
15.0 - 15.0 kW
20.0 - 20.0 kW
40.0 - 40.0 kW
50.0 - 50.0 kW
60.0 - 60.0 kW
75.0 - 75.0 kW
100 - 100 kW
150 - 150 kW
200 - 200 kW

Note: Not all ranges are available for each primary voltage input range. Consult product datasheet for details.

Housing Type:
TH - Three Hole

APT-TH Series Power Transducer

Know Your Power



Other NK Technologies Products Include:
AC & DC Current Transducers and Switches
1ϕ & 3ϕ Voltage and Power Transducers
Current Transformers (CTs)
Ground Fault Protection Relays

NK Technologies

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INSTRUCTIONS



APT-TH Series

Active Power Transducer w/Proportional Analog Output

Quick "How To" Guide

1. Mount APT-TH Power Transducer to DIN rail or panel in suitable enclosure. Note the "**Source**" and "**Load**" sides of the transducer.
2. With monitored load off, install each phase through the sensing windows. Designate each phase as A, B or C.
3. Connect line voltage (and neutral if used) to terminals 1-4, ensuring the same phase relationships (A, B, or C) between the current sensing aperture and voltage is consistent. A field supplied fuse/breaker is recommended on each voltage input.
4. For power, voltage input, and output signal connections, use 22-12 AWG copper wires rated 60/75ºC. Tighten to 6 inch-pounds torque.
5. Connect output terminals 6 (+) and 5 (-) to external controller.
6. Connect supply voltage (24 VAC or VDC) to terminals 7-8. Not polarity sensitive.
7. Energize power and monitored load.
8. LED shows Green when unit is installed correctly, Amber if the voltage and current wave shapes are not matched correctly. The LED will also be amber when power factor falls lower than 0.5.

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Description

The APT-TH Series is intended to monitor consumption of three-phase loads. It provides an analog output signal proportional to the active power consumed by the monitored load. The three current-carrying conductors pass through the three windows of the top section, and the phase matched voltage inputs are connected to the base terminals (1-4).

Wiring

De-energize the monitored circuit or adopt safe operating procedures when working on hazardous live installation during application and removal of the current sensor. Class 1 conductors are required to be reliably routed away from low voltage Class 2 circuits. The current sensors may not be installed in a panel where they exceed 75% of the wiring space of any cross-sectional area of the panel.

For power, voltage input, and output signal connections, use 22-12 AWG copper wires rated 60/75ºC. Tighten to 6 inch-pounds torque.

Current Sensing:

Pass each phase through the appropriate sensing window. For example, look at the sensor's source side (see diagram on right). The power supply and output signal should be visible. Thread phase A through the window on the left, phase B through the window in the center, and phase C through the window on the right.

Voltage Connection:

Ensure the monitored voltage matches the rated voltage for the APT transducer. Connect each voltage phase directly to the terminal blocks on APT transducer as indicated on the wiring diagram to the right. Phase A connects to terminal 1, phase B to terminal 2, phase C to terminal 3, and the neutral to terminal 4. Add fuses if required by local code (fuses not included). Use code approved splice materials and techniques.

Power Supply and Output Connection:

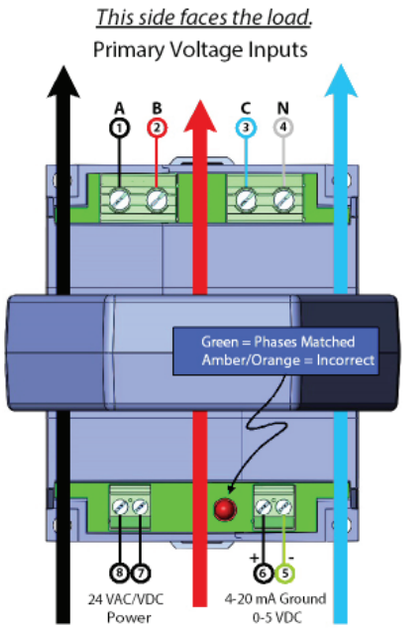
Connect APT output terminal 5 (negative) and terminal 6 (positive) to the external controller's input terminals. Tighten to 6 inch-pounds.

Connect power supply to APT as shown in wiring diagram (terminals 7-8). The power supply can be positive or negative on either terminal.

APT Power LED should illuminate Green to indicate device is powered and the input phases are properly matched. An Amber color indicates the input phases are not matched correctly and wiring should be checked. Energize load to confirm APT is sensing current/voltage and outputs correct signal proportional to kW being sensed.

Note: If the equipment is used in a manner not specified by Neilsen-Kuljian, Inc., the protection provided by the equipment may be impaired.

Wiring Schematic Diagram



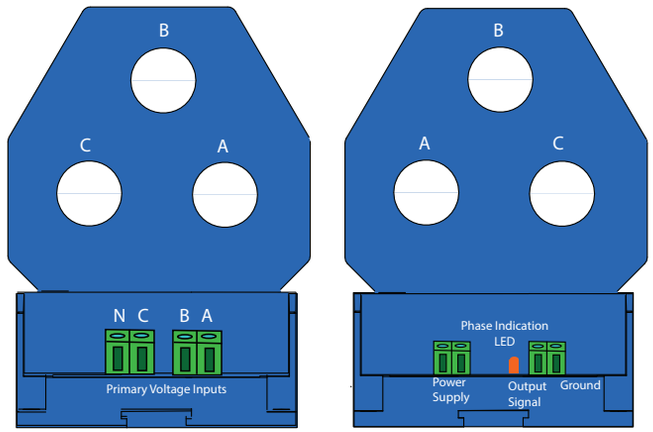
Note: Power and Output are not isolated.
This side faces the source.

The APT-TH power transducer provides current sensing windows with an inside diameter of 0.84 inches. This should be large enough to accommodate a single conductor carrying 200 amps.

Watt Calculation:
Voltage (phase to phase) ***X*** Current ***X*** √3 *(1.732)* ***X*** power factor

Example:
The APT6-420-24U-200-TH is factory scaled so full output signal (20 mA) represents 200 kW.

If the measured voltage is 600, and there is unity power factor, the current flow will be 192.455 amps. This would generally be carried using a conductor rated for 200 amps.



Load Side Source Side

Troubleshooting

1. Transducer output is higher than expected

Verify that the measured voltage is lower than the transducer range. Check the current in at least one phase to be certain that load uses less wattage than the transducer output range.

2. Transducer output is lower than expected

Check the measured voltage and current and multiply the readings. Multiply the result by 1.732, and that would be the 3-phase wattage actually used at unity power factor.

Example:
Measured voltages ((206+209+208)/3)=207.67
Measured current (42+40+43)/3)= 41.67
207.67 * 41.67*1.732= 14,986.9 watts (14.9869 kW)
Transducer output is full scale 15kW (APT1-420-24U-15.0-TH)
Output calculation: ((20-4)/15.0)*14.9869)+4= 19.99 mA
+/-1% would mean 19.83 to 20.15 mA output

Note that power factor may be lower than expected.

3. Amber LED

Check that the unit power supply and output terminals face the power source. Check that the phase A conductor is the same phase where phase A voltage is derived, and for the other two phases.
Change the orientation of the transducer, and/or change which conductor passes through each sensing window. The LED will show Green when the phase relationship is correct. Also note that if power factor falls below 0.50, the LED will show Amber/Orange.

4. No Output

If the voltage of any phase falls below 30% of nominal, the output will be reduced to the minimum. This would produce an output of 0 volts or 4 mA, depending on the model used.

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