Specifications

Output	0-5 VDC, 0-10VDC or 4-20mA proportional to watts consumed
Accuracy	0.5% FS (True RMS kW)
Response Time	100 mS (to 90% of step change)
Frequency Range	40-65 Hz (Monitored Circuit)

Power Supply

Model Option	Power Supply Voltage Range	Usage	OVP Category
24U	24VAC/DC +/-10% (50-60Hz AC power)	180mA	II
120	120VAC +/-10% 50-60Hz	50mA	II
240	240VAC +/-10% 50-60Hz	25mA	II

Use 75/90° copper wire for power supply connections. Use 20A branch circuit protection against the remote possibility of a short.

Watt Calculation: kW = Volts x CT Amperage x 1.732
Example at 480 VAC:

CT	kW at Max output (Unity PF)
50A	41.57 kW
100A	83.14 kW
150A	124.71 kW
200A	166.28 kW
250A	207.85 kW
300A	249.42 kW

Monitored Voltage Input	347/600 VAC 3 Phase Wye system with earthed neutral Measurement Category III 600 VAC 3 Phase Delta system Measurement Category III
Output Terminals	Captive screw, 14-22 AWG copper 75/90° Insulation.
Voltage Input Terminals	14-22 AWG copper wire, 600V max. 75/90° Insulation
All Terminals	Tighten to 5-7 inch-pounds torque
Fusing	Use Field supplied fuses or circuit breakers
Indication	Power LED
Isolation Voltage	1250VAC
Enclosure	UL94V-0 Flammability rated
Environmental	-4 to 140ºF, -20 to 60ºC 0-95% Relative Humidity non-condensing Altitude to 2000 meters Pollution Degree 2 Indoor Use in UL NRTL certified enclosure
Agency Approvals	UL/cUL Listed

Model Number Key

APT - 480 - 5A - 24U - 005

Full Scale Output
005 0-5 VDC
010 0-10 VDC
420 4-20 mA

Power Supply
24U 24 VAC/DC
120 120 VAC
240 240VAC

CT Inputs
5A 5A secondary (50-3000A)
MV 333mVAC (5-1500A)

Monitored Voltage
120 120V 3-Phase
240 240V 3-Phase
480 480V 3-Phase
600 600V 3-Phase

APT Series kW Transducer

Other Available Products Include:
DC Current Switches, Ground Fault Sensors
AC & DC Current Switches
Power Transducers
Current & Potential Transformers (CTs&PTs)

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NK Technologies

INSTRUCTIONS

APT Series

Active Power Transducer w/Proportional Analog Output

Quick "How To" Guide

1. Mount APT KW Transducer to DIN rail or to a back panel in suitable enclosure.
2. With monitored load off, install CTs on monitored lines and secure with mounting feet or tie-wrap as appropriate. Connect CTs to terminals 1-6, observing polarity.
3. Connect line voltage (and neutral if used) to terminals 7-10 ensuring phase relationships between the CTs and voltages is consistent. Use of field supplied fuses/circuit breakers as a means for disconnect is recommended.
4. Connect output terminals 13 and 14 using up to 14 AWG copper wires. Tighten to 5-7 inch-pounds torque.
5. Connect supply voltage (24VAC/DC, 120VAC or 240VAC; model dependent) to terminals 11-12. Wherever possible, ensure APT supply power is derived from a different source than monitored load. Green LED indicates unit is powered.

APT Instruction Sheet Rev 4 02/19 p/n 792000011

Description

APT Series transducers are intended to monitor KW consumption of three phase motors. They provide an analog signal proportional to the true power consumed by the monitored load and are intended for application on balanced three phase loads.

Wiring

Current Sensing:

Determine the type of electrical load you are monitoring. The APT is typically used to monitor total power of most 3-phase loads. Current transformer (CT) inputs must be 0-5A or 0-333mV (model dependent, see ordering information) full-scale. Use only UL Listed Energy Monitoring Current Transformers certified under category XOBA.

De-energize the monitored load (installation on which the current is measured)**,** or adopt safe operating procedures when working on hazardous live installation during application and removal of the current sensors on which the current is measured. Place monitored circuit conductor through aperture in CT and mount CT to the back of control panel using integral mounting feet, or use a nylon tie to secure to the conductor. Be sure to observe all notes on polarity. Connect CT to appropriate terminals on APT transducer using 22-14 AWG copper conductors. Tighten terminals to 5-7 in-lb torque. If installing on a live circuit, be sure to connect the CT secondary before placing the CT over the live conductor. The current transformers cannot exceed 75% of the wiring space of any cross-sectional area within the panel.

Voltage Connection:

The APT transducer can be used to measure power in the Wye or Delta connected system. Ensure the voltage of the system you are monitoring and rated voltage for APT transducer match. De-energize the monitored circuit voltage.

Add fuses if required by local code (fuses not included). Use code approved splice materials and techniques.

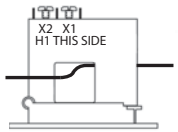
Connect voltage directly to terminal blocks on APT transducer as indicated on the wiring diagram to the right.

Power Supply and Output Connection:

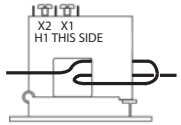
Connect output wiring to supervisory or other controller. Connect power supply to transducer as shown in wiring diagram using 30-12 AWG 75/90°C copper wire. Green Power LED should illuminate to indicate power is supplied to unit. Energize load to confirm KW transducer is sensing current/voltage and produces an output signal proportional to KW being sensed. Separate Class 1 and non-Class 1 conductors when installed in an enclosure as required by National Electrical Code.

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

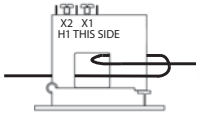
Increasing the CT output: As shown in Example 1, one pass of the monitored conductor through the CT will produce maximum CT output at the CT range. Doubling the conductor twice (Ex.2) will produce maximum output with half the current. Each CT must be doubled in the same manner, either using Ex. 2 or 3, but not a mix of the two.



Example 1



Example 2



Example 3

Wiring Schematic Diagram

The APT power transducer must have the current transformers connected properly. The side of the CT marked "H1" MUST face the line or source. The CT secondaries are supplied with a white wire and a black wire; the white must be connected to the positive terminal. If the CTs are supplied with terminals only, the positive terminal is marked "X1"

The phase relationships must be matched. The phase connected to voltage input terminal "A" must be the same phase to which the CT measuring phase "A" is connected.

The output of the transducer is dependant on the CT ratio, and the connected voltage. There will be full transducer output (20mA, 5or 10 VDC) when there is current through the CT at the range maximum, voltage at the model selected maximum, and unity power factor. As an example, the transducer selected is:

APT-480-5A-120-420, with 400:5 ratio CTs

When the supplied voltage is at the transducer maximum (480), and the CT has current at maximum (400 amps), and unity power factor, the output will be 20mA. This represents 332,544 watts. This is a straight mathematical calculation:

Voltage (E) x Current (I) x power factor x square root 3 (1.732) = Watts

The APT will measure the voltage and current simultaneously, comparing each phase angle to derive the output signal proportional to active or real power.

Please contact the factory for scaling support for two CT input applications.