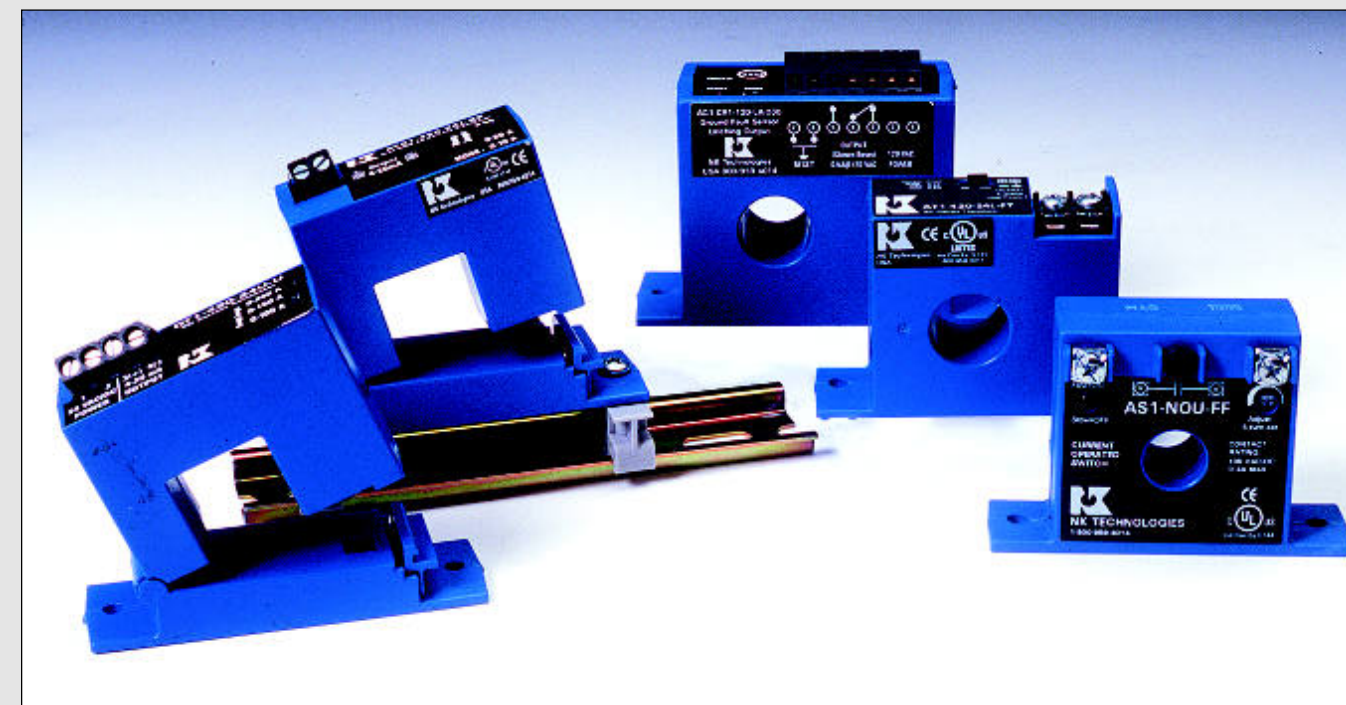
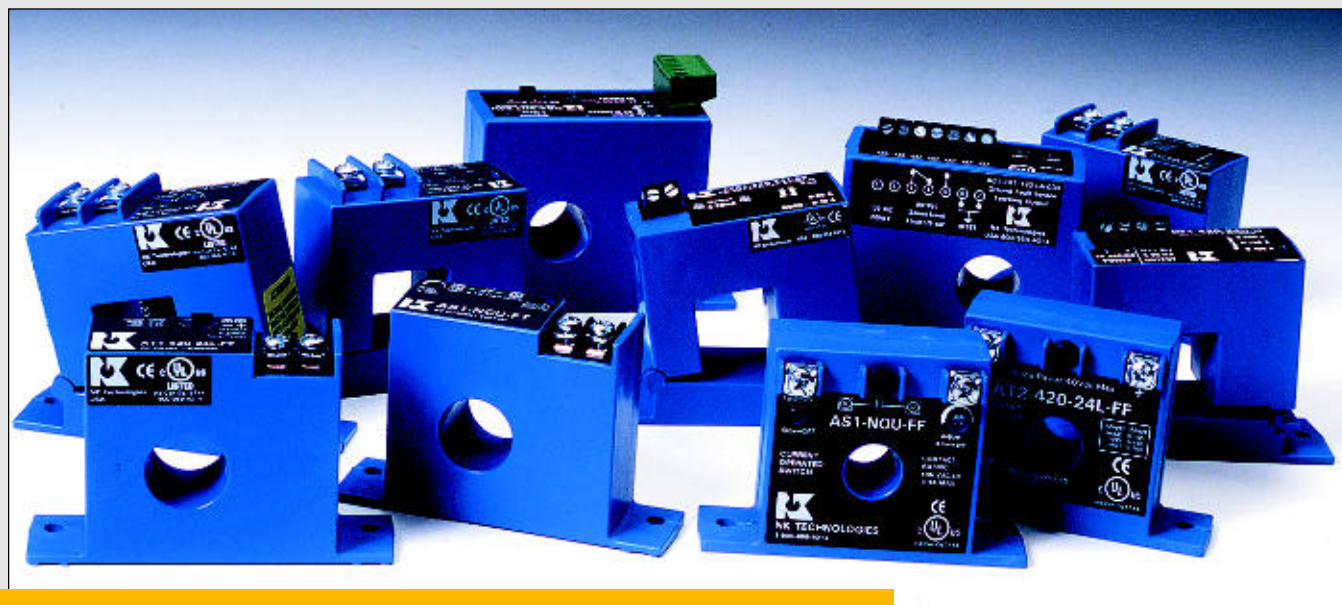


*Know your power...  
because with knowledge comes control.*

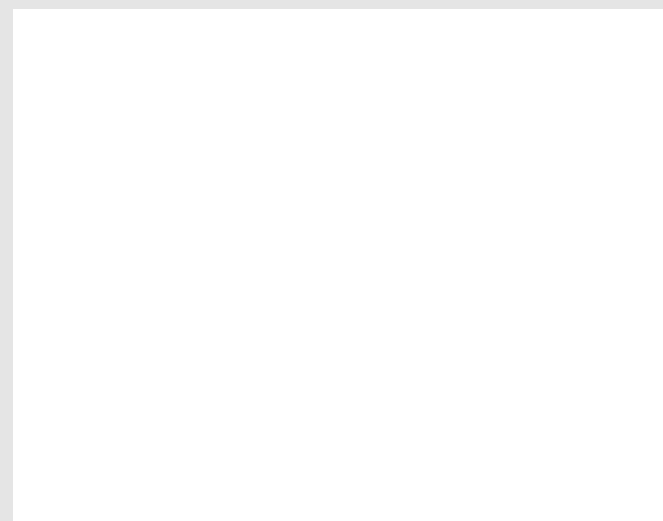


*Do you have other needs?*

**Contact us for:**

- Product Guide
- Application Guide
- Power Transducers, CTs and PTs
- Current Transducers and Transmitters
- Current Switches
- Current Fault Sensors

For expert technical help, contact your local  
Authorized Representative or Authorized Distributor



# *Industrial Current Sensors*

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# ATR Series

'ATR' transducers from NK Technologies combine a current transformer and a True RMS signal conditioner into a single package. The ATR Series provides True RMS output on distorted waveforms found on VFD or SCR outputs and on linear loads in "noisy" power environments. Available in a solid or split core case.



True RMS AC Current Transducers

### Selecting the right transducer:

VFD and SCR 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 or in "noisy" power environments.*

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 a "clean" power environment. *Select AT transducers for strictly linear loads on "clean" power.*

## 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.

## Applications

### VFD Controlled Loads

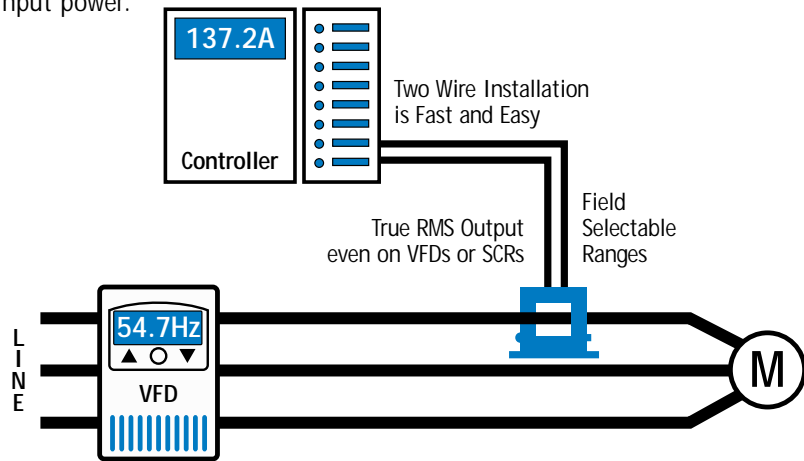
VFD output indicates how the motor and attached load are operating.

### SCR Controlled Loads

Accurate measurement of phase angle fired or burst 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.



True RMS AC Current Transducers

# Accessories

## Power Supply

PS series switching power supplies provide highly regulated 24VDC for NK Technologies transmitters and switches.



## Specifications

Input	85-264VAC, 47-400Hz
DC Output	24VDC, 25W (1.05A)
DC Regulation	+/-0.2% (0.048VDC)
DC Ripple	100mV (Peak-Peak)
EMF	Meets FCC Part 15J, Class B
Dimensions	5.1" x 3.85" x 1.5", 1.5 lb. (13 x 9.8 x 3.8 cm, 700 gm)
Environmental	14 to 140°F (-10 to +60°C), 20-90% RH
Safety	UL Recognized, CE



Instrument Tags

Instrument Tags allow users to individually identify each NK Technologies sensor in their system. IT Tags are permanent and non conductive. Traditional stamped stainless steel tags present a safety hazard and are not recommended for electrical sensors. Please provide a list of tag numbers with your Purchase Order.

## Specifications

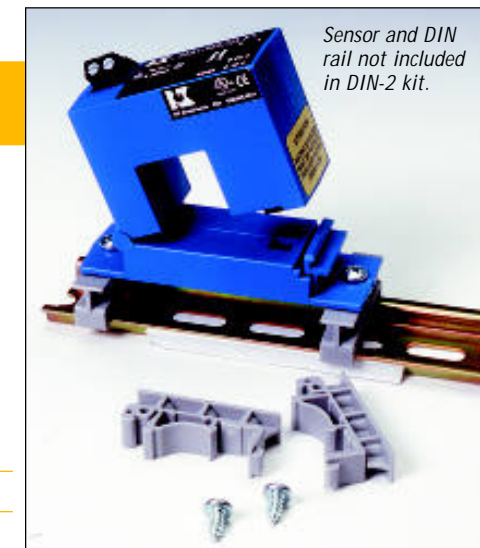
Dimensions	0.5" x 1.125"
Characters	2 lines of 18 characters (8 point). Spaces and dashes count as characters.

## DIN Rail Adapter

DIN-2 adapters allow NK Technologies switches, transducers and ground fault sensors to be mounted on DIN rail.

## Specifications

Compatibility	<ul style="list-style-type: none"> <li>■ "Top Hat" Type: 35mm x 15mm, 35mm x 7.5mm</li> <li>■ "G" Type: 32mm x 15mm</li> </ul>
Material	UL 94V-2 Rated thermoplastic
Temp Range	-40 to 212°F (-40 to 100°C)



Power Supply  
DIN Rail Adapter  
Instrument Tags



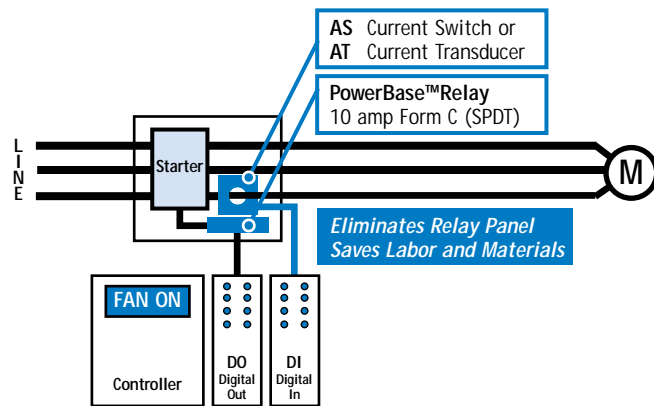
# Accessories

## PBR Series PowerBASE™ Relays



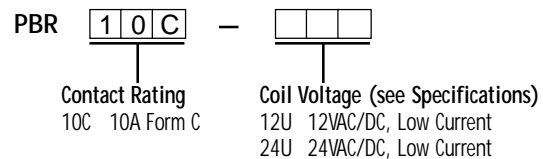
### Applications

- Motor Control**
- Switches up to NEMA Size 5 starter (200HP motor).
  - Directly controls fractional HP loads.
- Heaters and Lamp Control**
- Eliminates contactors for loads to 10A.



### Ordering Information

Example: PBR-10C-24L  
PowerBASE™ Relay with 10A contacts and universal 24-volt coil.



PBR "PowerBASE™" Series are industrial-grade relays in a specially designed package. PBR relays quick connect to NK Technologies top terminal AS and AT series current switches and transducers. This compact combination provides for added function and flexibility.

### Features

- PowerBASE™ Relay and Current Sensor combo**
  - Acts as an 'Interposing Relay'.
  - Isolates controller from line voltage.
- Cuts Installation Costs**
  - Installs as one item.
  - Cuts electrician's labor.
  - Eliminates need for relay panel.
- Assembly Options**
  - Factory assembled for convenience.
  - Field assembled for flexibility.
- UL, CUL and CE Approval**
  - Accepted worldwide.

### Specifications

<b>Contacts</b>	<ul style="list-style-type: none"> <li>10A Resistive, 7.2A Inductive @ 240VAC</li> <li>1/3HP @ 240VAC</li> <li>10A @ 30VDC</li> </ul>
<b>Coils</b>	<ul style="list-style-type: none"> <li>12L: 12VAC/DC +/-30%, 18.5mA</li> <li>24L: 24VAC/DC +/-30%, 10mA</li> </ul>
<b>Dimensions</b>	2.65"W x 1.5"D x 0.9"H, 4.5" Base
<b>Case</b>	UL 94 Flammability rated
<b>Compatibility</b>	<ul style="list-style-type: none"> <li>Solid Core Sensors: All "FT" case models</li> <li>Split Core Sensors: All "SP" case models</li> </ul>
<b>Environmental</b>	-4 to 122°F (20 to 60°C), 0-95% RH, non-condensing
<b>Listings</b>	UL 508 Industrial Control Equipment (USA & Canada), CE

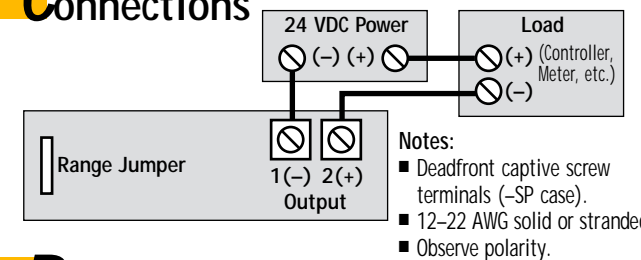
### Specifications

<b>Output Signal</b>	4–20mA, Loop-powered, True RMS
<b>Output Limit</b>	23mA
<b>Accuracy</b>	0.8% FS
<b>Response Time</b>	600mS (to 90% step change)
<b>Frequency Range</b>	10–400Hz
<b>Power Supply</b>	24VDC Nominal, 40VDC Maximum
<b>Isolation Voltage</b>	UL listed to 1,270VAC, tested to 5KV
<b>Input Ranges</b>	Field selectable from 0–200A (see Ordering Information). Consult factory for custom ranges.
<b>Sensing Aperture</b>	<ul style="list-style-type: none"> <li>—FT Models: 0.75" (19mm) dia.</li> <li>—SP Models: 0.85" (21.5mm) sq.</li> </ul>
<b>Case</b>	UL 94V-0 Flammability rated
<b>Environmental</b>	-4 to 122°F (-20 to 50°C), 0–95% RH, non-condensing
<b>Listings</b>	UL 508 Industrial Control Equipment (USA & Canada), CE

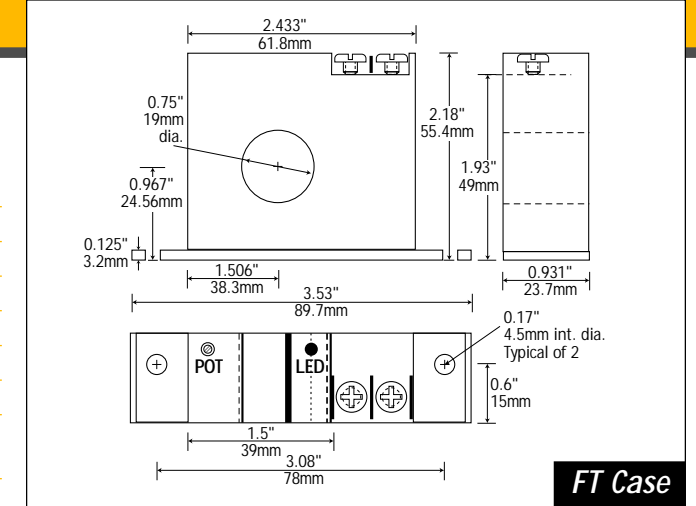
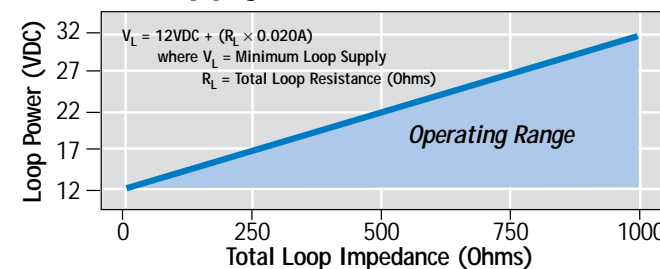
### Input Ranges

Model	Range	Continuous	MAXIMUM	
			6 Sec.	1 Sec.
ATRO	2A	80A	125A	250A
	5A	100A	125A	250A
ATR1	10A	80A	125A	250A
	20A	110A	150A	300A
	50A	175A	215A	400A
ATR2	100A	200A	300A	600A
	150A	300A	450A	800A
	200A	400A	500A	1,000A

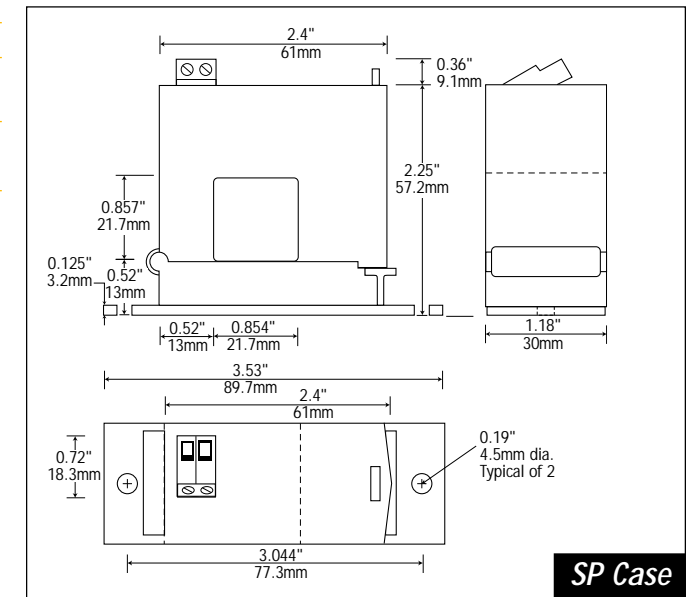
### Connections



### Power Supply (4–20mA output only)



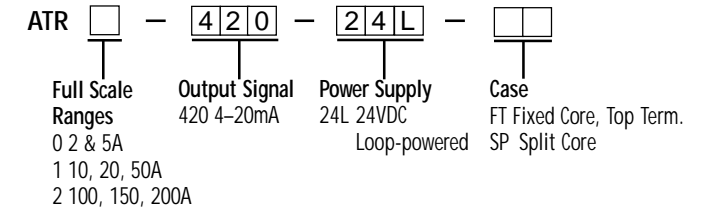
FT Case



SP Case

### Ordering Information

Example: ATR1-420-24L-SP  
True RMS AC current transducer, 10/20/50A ranges, 4–20mA output, 24VDC loop-powered in a split core case.



True RMS AC Current Transducers

PowerBASE™ Command Relays

# AT Series

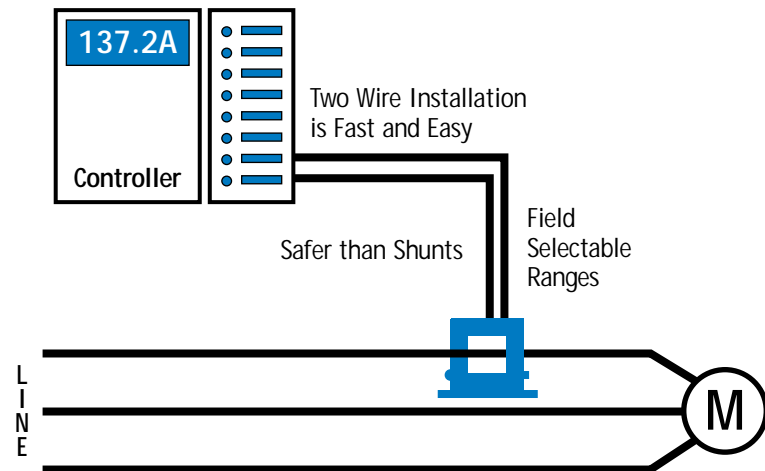


'AT' Current Transducers from NK Technologies combine a current transformer and signal conditioner into a single package. The AT Series has jumper selected current input ranges and industry standard 4–20mA, 0–5VDC or 0–10VDC outputs. The AT Series is designed for application on 'linear' or sinusoidal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

## AT Current Transducers 0–5/10VDC or 4–20mA Output

### Applications

- Automation Systems**  
Analog current reading for remote monitoring and software alarms.
- Data Loggers**  
Self-powered transducer does not drain data logger batteries.
- Panel Meters**  
Simple connection displays power consumption.



### AC Current Transducers 0–5/10VDC or 4–20mA Output

### Features

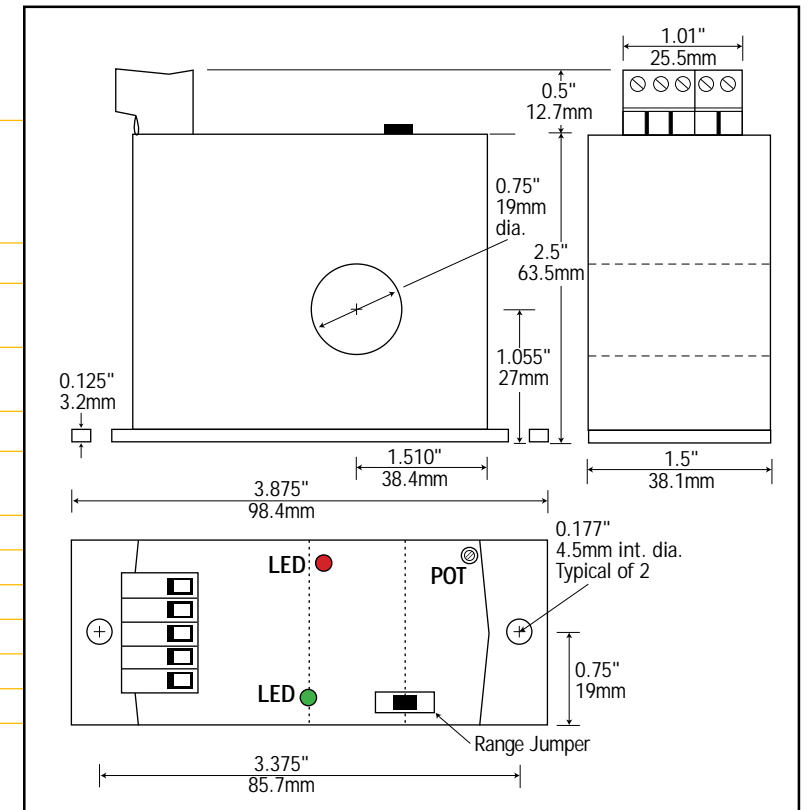
- Accurate**  
Factory matched and calibrated single piece transducer is more accurate than traditional two-piece field installed solutions.
- Average Responding**  
"Average Responding" algorithm gives a RMS output on pure sine waves. Perfect for constant speed (linear) loads.
- Jumper Selectable Ranges**
  - 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.

### Input Ranges

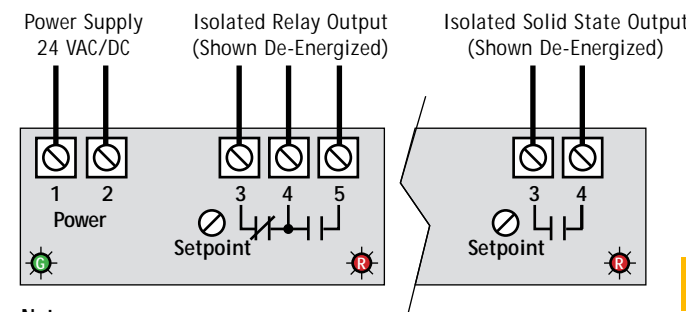
Model	Range	Continuous	MAXIMUM	
			6 Sec.	1 Sec.
AT0	2A	80A	60A	100A
	5A	100A	124A	250A
AT1	10A	80A	125A	250A
	20A	110A	150A	300A
	50A	175A	215A	400A
AT2	100A	200A	300A	600A
	150A	300A	450A	800A
	200A	400A	500A	1,000A

### Specifications

<b>Output</b>	Isolated dry contact
<b>Output Rating</b>	<ul style="list-style-type: none"> <li>■ Solid State: 0.2A @ 240VAC/DC (N.O. Only)</li> <li>■ Relay: 5.0A @ 240VAC, 5.0A @ 30VDC (SPDT)</li> </ul>
<b>Off State Leakage</b>	None
<b>Response Time</b>	<ul style="list-style-type: none"> <li>■ 100mS (10% above Setpoint)</li> <li>■ 20mS (100% above Setpoint)</li> </ul>
<b>Setpoint Range</b>	4–20, 10–50 and 15–100A (DC) Jumper select (derate by $\sqrt{2}$ for AC)
<b>Hysteresis</b>	5% of Setpoint
<b>Overload</b>	<ul style="list-style-type: none"> <li>■ 1,000% of range for 5 seconds</li> <li>■ 200% of range indefinitely</li> </ul>
<b>Isolation Voltage</b>	3kV
<b>Frequency Range</b>	DC to 400Hz
<b>Sensing Aperture</b>	0.75" (19mm) dia.
<b>Power Supply</b>	20–28VDC or VAC
<b>Power Consumption</b>	10VA
<b>Case</b>	UL 94V-0 Flammability rated
<b>Environmental</b>	<ul style="list-style-type: none"> <li>■ –4 to 122°F (–20 to 50°C), 0–95% RH, non-condensing</li> <li>■ –40 to 140°F (–40 to 60°C) (Solid State Output Only)</li> </ul>

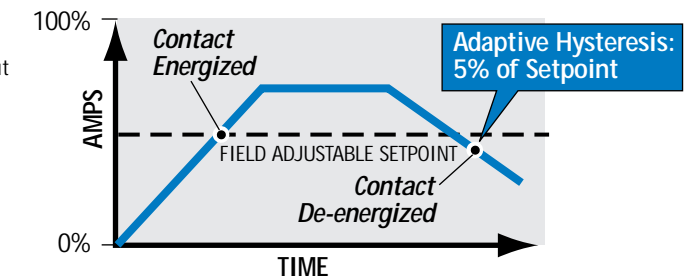


### Connections



- Notes:
- Pressure plate screw terminals.
  - 12–22 AWG solid or stranded.
  - Field adjustable setpoint.

### Output Operation



### Ordering Information

Example: DS1-SDT-24U  
DS current switch, low range with SPDT relay contacts and 24VAC/DC power supply.

DS [ ] – [ ] – [24U]

Setpoint Range: 3 4–20, 10–50 and 15–100A, Jumper Select C Custom (consult factory)

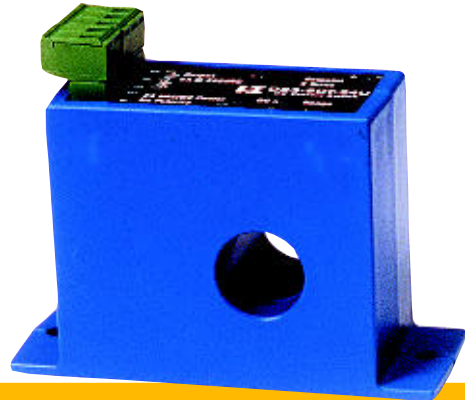
Output Type: SDT SPDT Relay (Form C) NOU Solid State N.O. AC/DC

Power Supply: 24U +24VAC/DC

### DC Current Switches

## DS3 Series

# DS3 Series

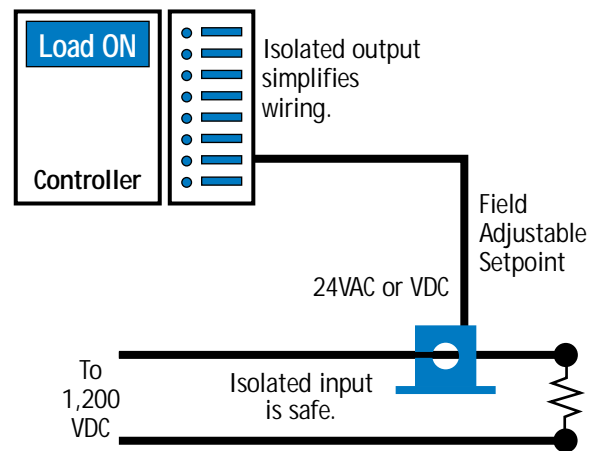


'DS3' Current Switches from NK Technologies combine a Hall effect sensor, signal conditioner and a limit alarm into a single package. The DS3 Series has three jumper selected current input ranges and frequency response from DC to 400Hz. Available in a top terminal solid core case with either a relay output or a universal solid state output.

## DC Current Switches

### Applications

- Electric Heating Elements**  
Instant indication of heater status.
- Power Supplies**  
Signals over-current before equipment fails.
- Machine Operation**  
Instant status of motors, lamps and other loads.
- Telecom Sites**  
Monitors battery output.



## DC Current Switches

### Features

- Compact, One-piece Design**  
Fits in crowded motor starters, power supplies and control panels.
- Input Isolation**  
Much safer than shunt/relay combinations.
- Output Installation**  
Isolated output greatly simplifies wiring.
- Tough**  
Designed to handle harsh industrial environments.
- Adaptive Hysteresis**  
— Hysteresis is 5% of setpoint.  
— Allows closer control than fixed hysteresis.
- Reliable**  
Solid state design.
- Built-in Mounting Bracket**  
Solid, secure mounting that inspectors want to see.

Know your power...  
because with knowledge comes control.

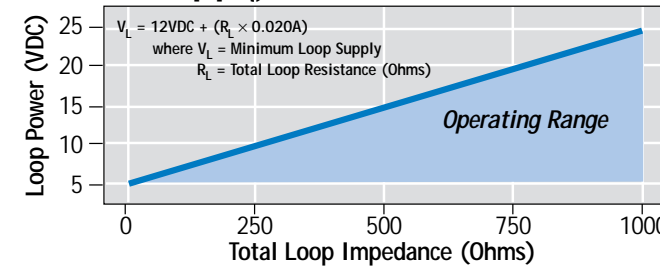
### Specifications

	-005 Models	-010 Models	-420 Models
Output Signal	0-5VDC	0-10VDC	4-20mA
Output Limit	10VDC	15VDC	40mA
Accuracy	1.0% FS	1.0% FS	0.5% FS
Response Time (10-90% step change)	100ms	100ms	300ms
Frequency Range	50-60Hz	50-60Hz	20-100Hz*
Other Frequencies	Special calibration available for any frequency from 10-400Hz*		
Power Supply	Self-powered	Self-powered	12-40VDC, Loop-powered
Loading	1mΩ minimum for rated accuracy 100kΩ add 1.3% error		See "Power Supply" below
Isolation Voltage	UL listed to 1,270VAC, tested to 5KV		
Input Ranges	Field Selectable Ranges from 0-200A (see Ordering Information). Custom ranges available, consult factory.		
Sensing Aperture	<ul style="list-style-type: none"> <li>-FF Case: 0.55" (14mm) dia.</li> <li>-FT Case: 0.75" (19mm) dia.</li> <li>-SP Case: 0.85" (21.5mm) sq.</li> </ul>		
Case	UL 94V-0 flammability rated		
Environmental	-4 to 122°F (-20 to 50°C), 0-95% RH, non-condensing		
Listings	UL 508 Industrial Control Equipment (USA & Canada), CE		

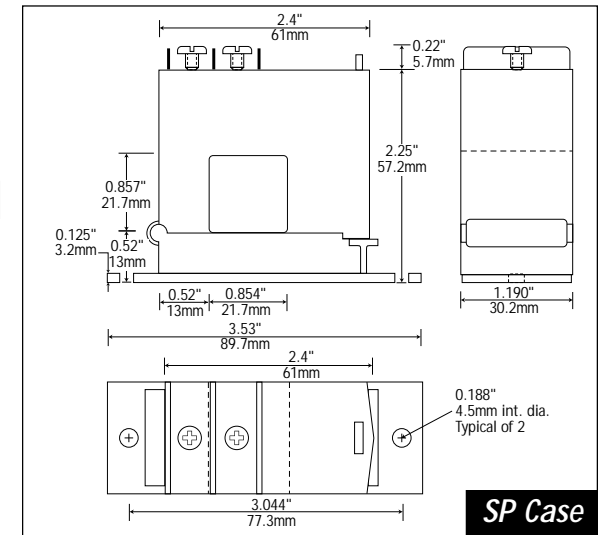
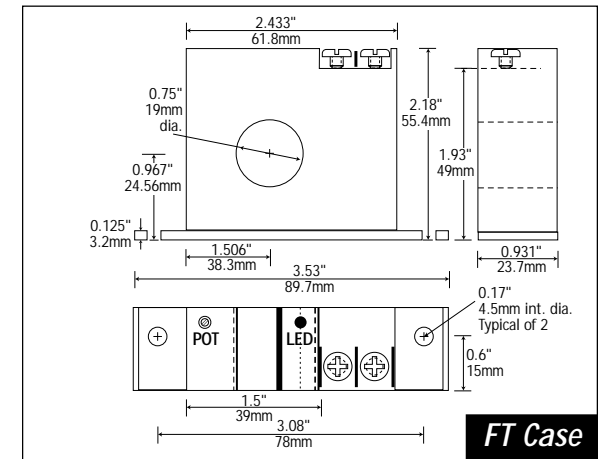
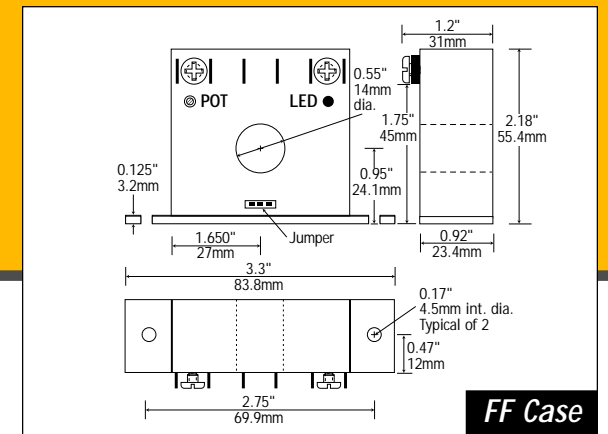
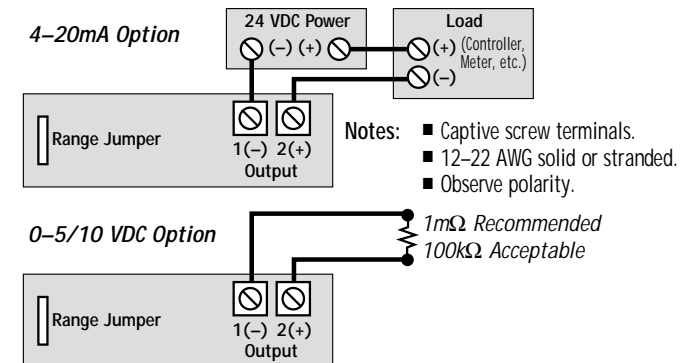
\*For sinusoidal waveforms only. Select ATR Transducers for distorted waveforms.



### Power Supply (4-20mA output only)



### Connections



### Ordering Information

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

AT	Full Scale Ranges	Output Signal	Power Supply	Case
420	4-20mA	24L 24VDC Loop-powered (4-20mA output ONLY)	FF Fixed Core, Front Term.	
0 2 & 5A	0-5VDC	005 Self-powered (0-5/0-10VDC output ONLY)	FT Fixed Core, Top Term.	
1 10, 20, 50A	0-10VDC	000 Self-powered (0-5/0-10VDC output ONLY)	SP Split Core	
2 100, 150, 200A				

AC Current Transducers  
0-5/10VDC or 4-20mA Output



# AT/ATR 3 & 4 Series

'AT/ATR 3 & 4' transducers from NK Technologies combine a high capacity current transformer and a signal conditioner into a single package. 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. Available in a solid or split core case.



Shown with solid core case.

## High Current Transducers

### Applications

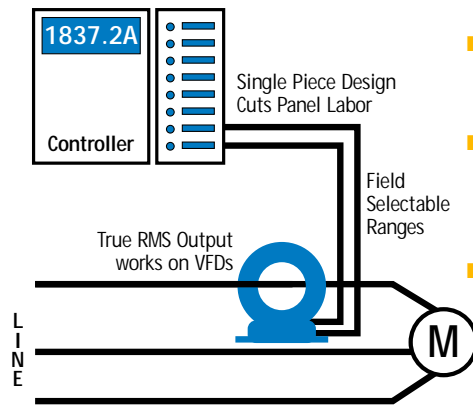
- Large Pumps**  
Detect dry run electronically.
- Generation**  
Measure the output of generators.
- Electric Heating Elements**  
— Monitors heater load.  
— Faster response than temperature sensors.

### Features

- Large Aperture**  
Accommodates large conductors or wire bundles.
- Select the Right Output**  
True RMS technology is accurate on distorted waveforms like VFD or SCR outputs. Average Responding—for linear, sinusoidal waveforms
- Three Jumper Selectable Ranges**  
— Reduces inventory.  
— Eliminates zero and span pots.
- Isolation**  
Magnetic isolation protects installers and systems.
- Easy Installation**  
Single piece with integral mounting brackets makes for a simple, solid installation.
- UL, CUL and CE Approval**  
Accepted worldwide.

**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 a "clean" power environment. *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 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 on "noisy" power.*



## High Current Transducers

### ATR 3 & 4 Series

### Specifications

<b>Setpoint Range</b>	<ul style="list-style-type: none"> <li>"Single-Set" Models: Factory adjusted and sealed (field adjustment possible) <ul style="list-style-type: none"> <li>AG1: 5–100mA, specify when ordering</li> <li>AG2: 80–950mA, specify when ordering</li> </ul> </li> <li>"Tri-Set" Models: 5, 10 &amp; 30mA jumper select</li> </ul>
<b>Output</b>	Isolated dry contact (solid state or relay, see Ordering Information)
<b>Output Rating</b>	<ul style="list-style-type: none"> <li>Solid State AC Switch: 1A @ 240VAC</li> <li>Solid State DC Switch: 0.15A 30VDC</li> <li>Relay: 0.5A @ 125VAC, 2A @VDC</li> </ul>
<b>Off State Leakage</b>	None
<b>Response Time</b>	<ul style="list-style-type: none"> <li>200mS @ 5% above setpoint</li> <li>60mS @ 50% above setpoint</li> <li>15mS @ 500% above setpoint</li> </ul>
<b>Isolation Voltage</b>	Up to 1,250VAC (monitored circuit)
<b>Frequency Range</b>	50–400Hz (monitored circuit)
<b>Sensing Aperture</b>	0.75" (19mm) dia., up to 4" (100mm) dia. available, consult factory.
<b>Power Supply</b>	<ul style="list-style-type: none"> <li>120, 200, 208, 220, 240VAC, 50-400Hz, operates from 55–110% of nominal voltage</li> <li>24VAC &amp; 24VDC, operates +/-10%</li> <li>Green LED = power (all models)</li> </ul>
<b>Case</b>	UL 94V-0 Flammability rated
<b>Environmental</b>	5 to 158°F (-15 to 70°C), 0-95% RH, non-condensing
<b>Safety</b>	UL 1053, Class 1 Recognized, CE*

\*Most option combinations are UL recognized.



### Output Table

	Normally Energized Models (-FS Option)		
	Protection from faults and loss of control power.		
	No Power	Control Power Applied	
		No Fault	Fault
N.C. Normally Closed	Closed	OPEN	Closed
N.O. Normally Open	Open	CLOSED	Open

	Normally Deenergized Models (-NF Option)		
	Protection from faults only when control power is applied.		
	No Power	Control Power Applied	
		No Fault	Fault
N.C. Normally Closed	Closed	CLOSED	Open
N.O. Normally Open	Open	OPEN	Closed

### Latching (-LA Option)

Latching models initially power up in the Reset position. If there is a fault or the test button is pressed, the output switches and is latched. The output will remain latched after the fault is cleared, even if control power is removed. To reset the output, apply a momentary contact across the "Reset" terminals (6–7).

### Ordering Information

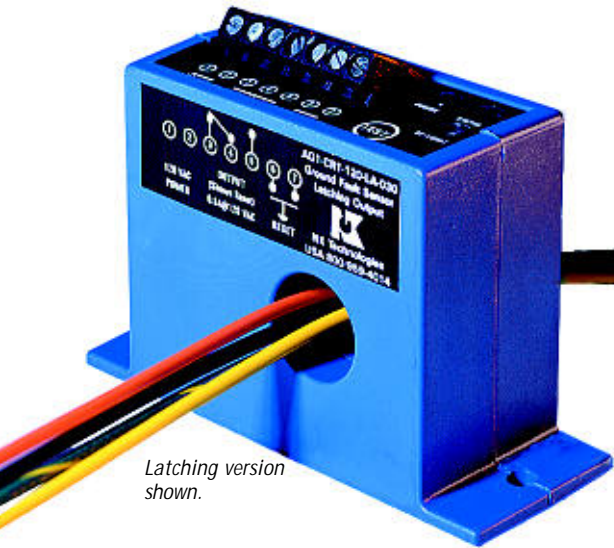
Example: AG1-NOAC-120-005-FS  
Ground fault sensor with normally open solid state output, 120VAC power supply, 5mA setpoint, fail safe version.

AG	Output Type	Power Supply	Options	Setpoint
1	NCAC Normally Closed 1A @ 240VAC	24U 24VAC/DC	FS Normally Energized	TR3 Tri-Set Models
2	NOAC Normally Open 1 A @ 240VAC	120 120VAC	NF Normally Deenergized	005 Factory Adjusted
3	NCDC Normally Closed 0.15A @ 30VDC	200 200VAC	LA Latching (available only with CR1 Output Option)	950 Setpoint in mA
	NODC Normally Open 0.15A @ 30VDC	208 208VAC		
	NCR1 Normally Closed Relay, 0.5A @ 125VAC, 2A @ 30VDC	240 240VAC		
	NOR1 Normally Open Relay, 0.5A @ 125VAC, 2A @ 30VDC			
	CR1 Form C Relay (SPDT) 0.5A @ 125VAC, 2A @ 30VDC (available only with LA Latching Option)			

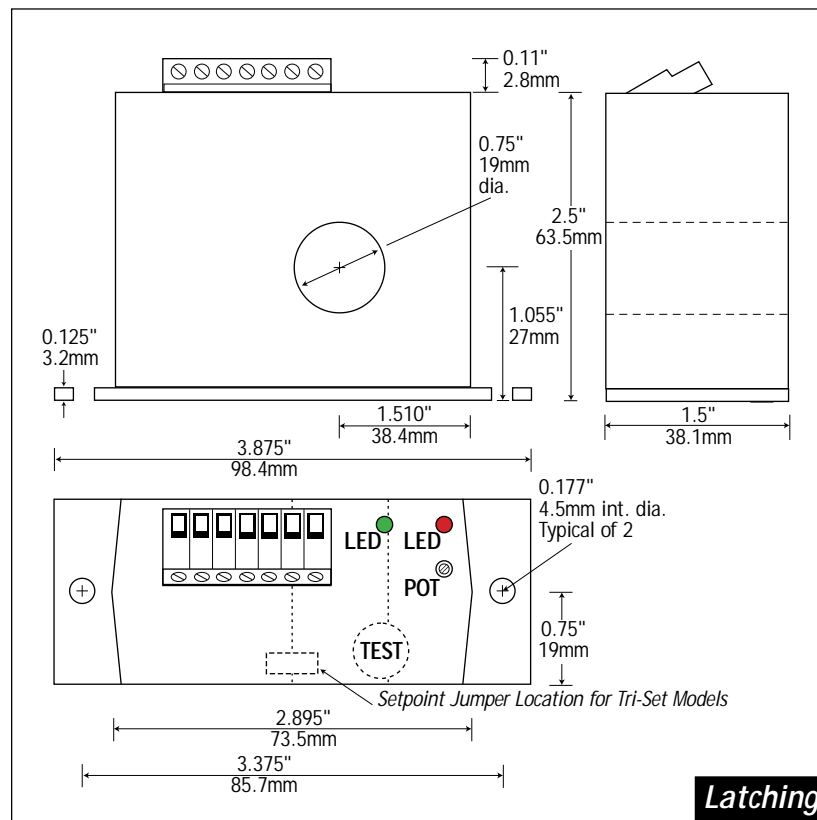
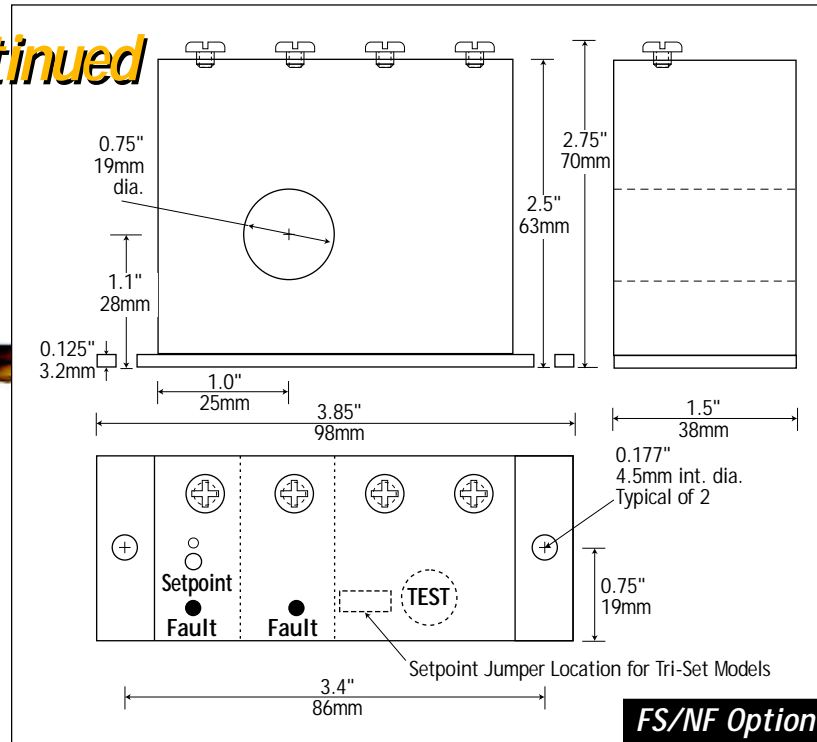
## Ground Fault Sensors

### AG Series

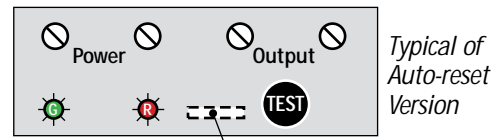
# AG Series continued



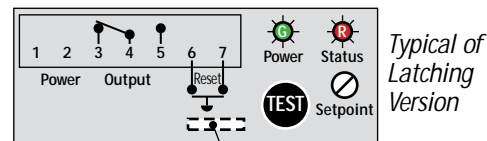
Latching version shown.



## Connections



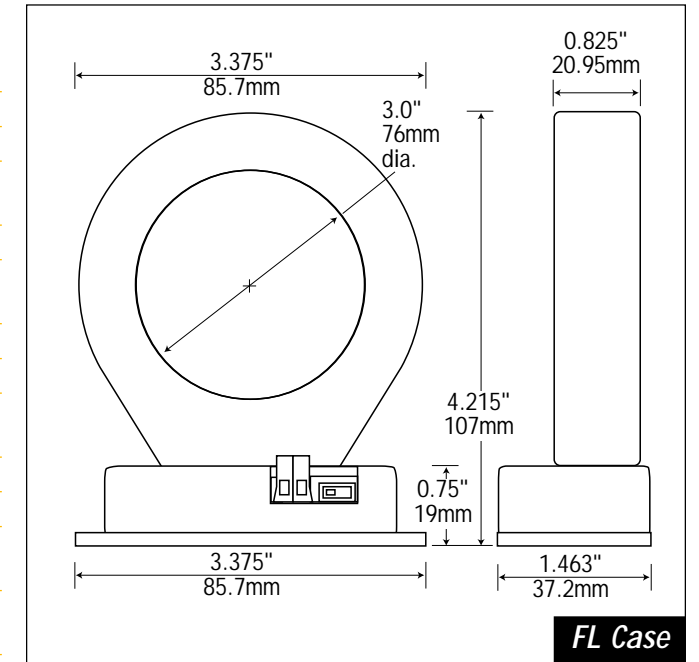
- Notes:
- Terminals are #6 screws.
  - Connections are polarity sensitive.
  - Adjustable Setpoint version has setpoint adjust but no jumper.



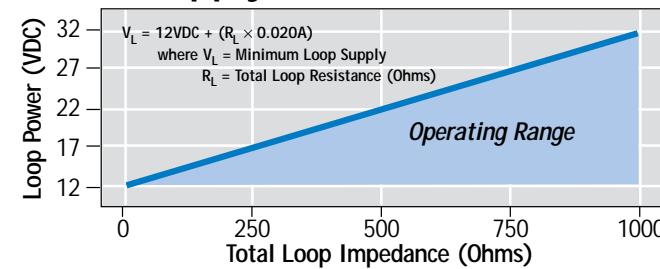
- Notes:
- Dead front terminals.
  - Connections are not polarity sensitive.

## Specifications

Output Signal	4–20mA, Loop-powered
Output Limit	23mA
Accuracy	1.0% FS accuracy, True RMS
Measurement	True RMS or Average Responding (see Ordering Information)
Response Time	500mS (to 90% of step change)
Frequency Range	ATR: 10–400Hz AT: 50–60Hz, Sinusoidal
Power Supply	24VDC Nominal; 40VDC Maximum
Isolation Voltage	600VAC
Input Ranges	AT/ATR3: 375, 500, 750A AT/ATR4: 1000, 1333, 2000A
Sensing Aperture	3.0" (76mm) dia.
Case	UL 94 Flammability rated
Environmental	–4 to 122°F (–20 to 50°C), 0–95% RH, non-condensing
Listings	UL 508 Industrial Control Equipment (USA & Canada), CE



## Power Supply



## Ordering Information

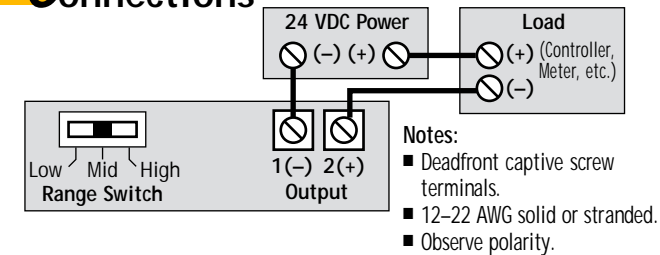
Example: ATR4-420-24L-FL

True RMS AC current transducer, 24VDC powered with a 4–20mA output, 375, 500 and 750 amp range in a fixed core case.\*

AT	-	-	420	-	24L	-	FL
Measurement	Full Scale Ranges	Output Signal	Power Supply	Case*			
R True RMS Responding (Blank)	3 375, 500, 750A	420 4–20mA	24L 24VDC Loop-powered	FL Fixed Core			
	4 1000, 1333, 2000A						

\*Split core version available in the Spring of 2000.

## Connections







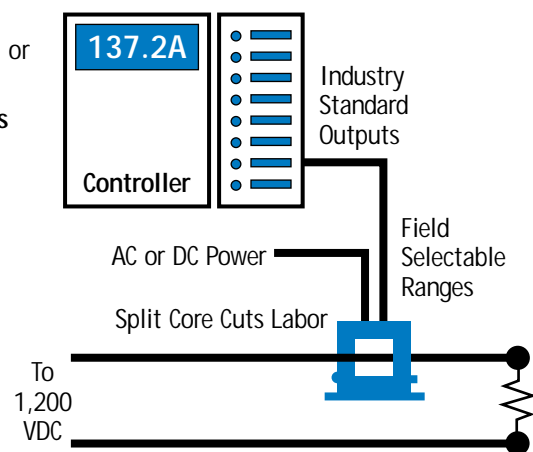
## DT Series

'DT' Current Transducers from NK Technologies combine a Hall effect sensor and signal conditioner into a single package. The DT Series has jumper selectable current input ranges and industry standard 0–20mA, 4–20mA, 0–3VDC, 0–5VDC or 0–10VDC outputs. Available in a split core package.

**DC Current Transducers**  
0–3/5/10VDC or 4–20mA Output

### Applications

- Battery Banks**
  - Monitors load current.
  - Monitors charging current.
  - Verifies operation.
- Transportation**
  - Measures traction power or auxiliary loads.
- Electric Heating Elements**
  - Faster response than temperature sensors.



### Features

- **Three 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).
- **Internal Power Regulation**
  - Works well, even with unregulated power.
  - Cuts installation costs.
- **Easy Installation**
  - Split core design with built-in mounting brackets makes installation a snap.

**DC Current Transducers**  
0–3/5/10VDC and 4–20mA Output

**DT Series**  
PAGE 8

## AG Series



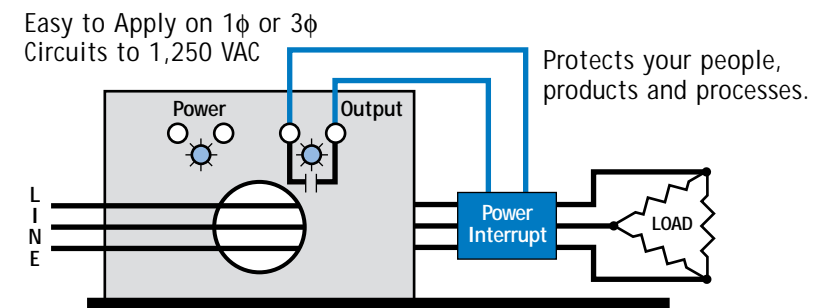
Auto-reset version shown.

'AG' Series sensors from NK Technologies protect people, products and processes from ground faults by monitoring all current-carrying wires in grounded single or 3-phase systems.

### Ground Fault Sensors

### Applications

- Personnel Protection** (typically 5mA)
  - Senses low fault currents and alarms to shut power before injury occurs.
- Equipment Protection** (typically 30mA)
  - When personal protection is not an issue, select a higher setpoint to protect equipment or product
- Regulatory Approval**
  - Meet requirements by industry groups and governments for Ground Fault Protection.



*Operating Principal:* Under normal conditions, the current in the hot leg of a two-wire load is equal in strength but opposite in sign to the current in the neutral leg. These two currents create magnetic fields that are also equal but opposite. When the wires are next to each other, the fields cancel, producing a "Zero Sum Current". If any current leaks to ground from one wire (Ground Fault), the two currents become imbalanced and the result is a net magnetic flux or field. AG Series ground fault sensors monitor this field and alarm when leakage rises above setpoint. This concept applies to grounded 3-phase delta and wye systems.

### Features

- **Operation to Match Your Application:**
  - Latching**—For controlling contactors.
  - Auto-Reset**—For controlling shunt trip breakers.
- **Setpoint Options to Match Your Needs:**
  - Tri-Set**—Field select 5, 10 or 30mA. Fast and convenient. (AG3 only)
  - Single-Set**—Factory adjusted setpoint. Specify 5–100mA (AG1) or 80–950mA (AG2) when ordering.
- **Compatible with Standard Equipment**
  - Works on 1φ or 3φ power. Controls standard shunt trip breakers or contactors. Tie into Emergency Circuits (EMO/EPO).
- **Isolated**
  - Magnetically isolated from the monitored circuit and control power
- **UL and CE Approval**
  - Accepted worldwide.

**Ground Fault Sensors**

**AG Series**  
PAGE 17



# AS3M Series

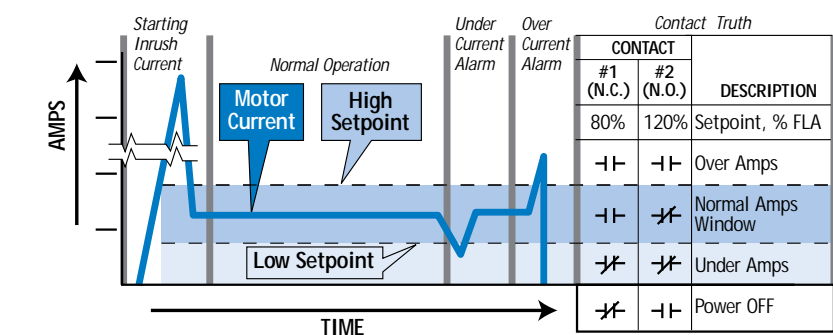
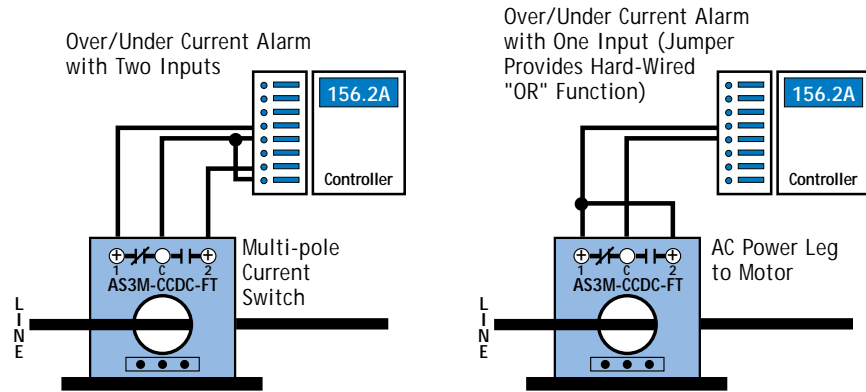


'AS3M' Current Switches are a multi-pole version of the popular AS3 Series. The AS3M Series combines a current transformer, signal conditioner and two limit alarms into a single package. The AS3 Series has three jumper-selected current input ranges, solid-state DC output and a wide frequency range. Available in a front terminal solid core case.

## Multi-pole Current Operated Switches

### Applications

- Pump Control**  
Individually adjustable indication of overload (jam) and underload (suction loss).
- Dual Alarm**  
Easy setup for dual level alarms.



### Features

- Multi-pole Output**  
Monitor two setpoints with one sensor.
- Self-powered**  
Cuts installation and operating costs.
- Easily Adjustable Setpoint**  
Speeds startup.
- Solid or Split Core Case**  
Choose the right version for each installation.
- Built-in Mounting Bracket**  
Provides the solid installation inspectors want.
- UL, CUL and CE Approval**  
Accepted worldwide.

### Specifications

See page 15, "AS3 Series" specifications and dimensional drawings.

### Ordering Information

Example: AS3M-CCDC-FF  
Adjustable multipole current switch, "Super" Form C output, fixed core with front terminals.

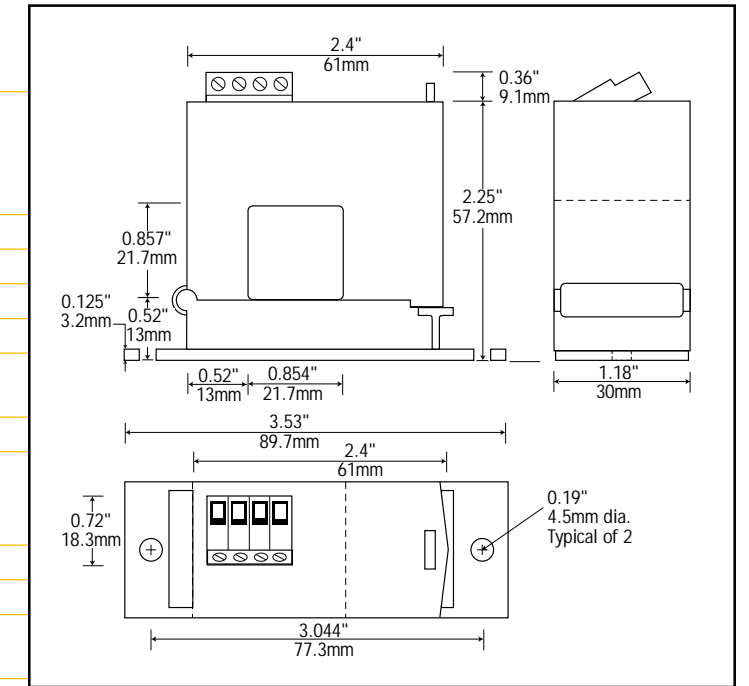
AS3M     -

**Output Rating**  
AADC Dual Normally Open, Individually Adjustable, 0.15A @ 30VDC  
CCDC "Super" Form C SPDT, Individually Adjustable, 0.15A @ 30VDC

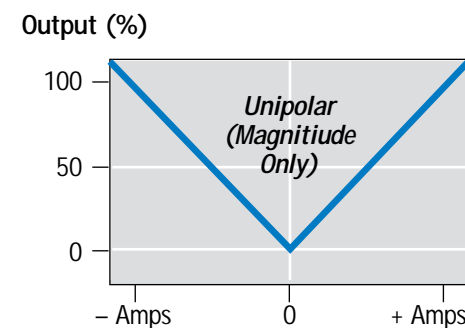
**Case Style**  
FF Fixed Core, Front Term.

### Specifications

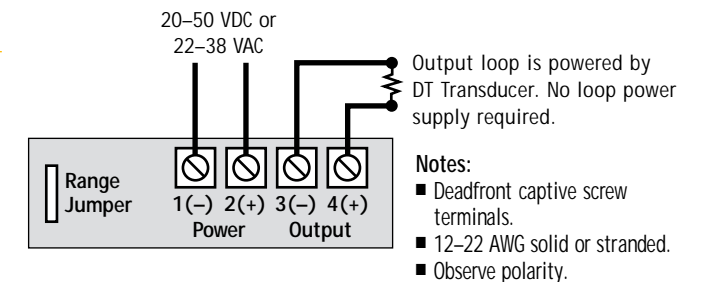
<b>Output Signal</b>	0-20mA, 4-20mA, 0-3VDC, 0-5VDC or 0-10VDC
<b>Output Limit</b>	<ul style="list-style-type: none"> <li>0-20mA, 4-20mA: 44mA</li> <li>0-3VDC: 6.5VDC</li> <li>0-5VDC: 13VDC</li> <li>0-10VDC: 26VDC</li> </ul>
<b>Accuracy</b>	1.0% FS
<b>Repeatability</b>	1.0% FS
<b>Response Time</b>	100mS (to 90% of step change)
<b>Frequency Range</b>	DC
<b>Power Supply</b>	20-50VDC, 22-38VAC. Power input and output signal are not isolated.
<b>Power Consumption 2VA</b>	
<b>Loading</b>	<ul style="list-style-type: none"> <li>0-20mA, 4-20mA: 650Ω max.</li> <li>0-3/5/10VDC: 250kΩ for rated accuracy; 25kΩ, add 1% error.</li> </ul>
<b>Isolation Voltage</b>	3kV (monitored line to output)
<b>Linearity</b>	0.75% FS
<b>Current Ranges</b>	Field Selectable Ranges from 0-400A (see Ordering Information)
<b>Sensing Aperture</b>	0.85" (21.5mm) sq.
<b>Case</b>	UL 94V-0 Flammability rated
<b>Environmental</b>	-4 to 122°F (-20 to 50°C), 0-95% RH, non-condensing



### Output Polarity



### Connections



### Ordering Information

Example: DT2-420-24U-U  
Split core DC/DC current switch, mid range, 24VAC/DC powered with a 4-20mA output that is unipolar.

DT	-	-	-	-	-	-	-	-	-						
Full Scale Range	1	2	3	4	C	Output Signal	020	420	003	005	010	Power Supply	24U	Output Polarity*	U
	50, 75, 100A	100, 150, 200A	150, 225, 300A	200, 300, 400A	Custom Range		0-20mA	4-20mA	0-3VDC	0-5VDC	0-10VDC		+24VAC/DC	Unipolar	

\*Bipolar version available in mid 2000.

## Multi-pole Current Operated Switches

# AS1 Series



## Current Operated Switches

'AS1' Current Switches from NK Technologies combine a current transformer, signal conditioner and limit alarm into a single package. The AS1 series has an extended current input range, universal solid-state outputs and a wide frequency response. Available in a split core case or two styles of solid core cases.

### Applications

#### Electronic Proof Of Flow

- No need for pipe or duct penetrations.
- More reliable than electromechanical pressure or flow switches.

#### Conveyors

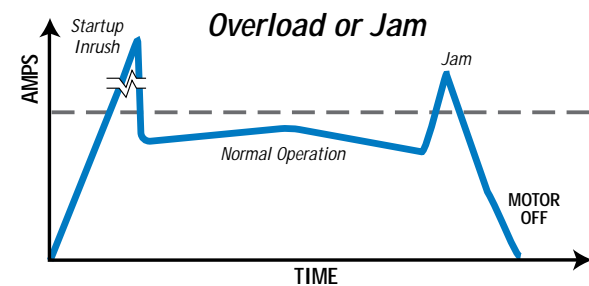
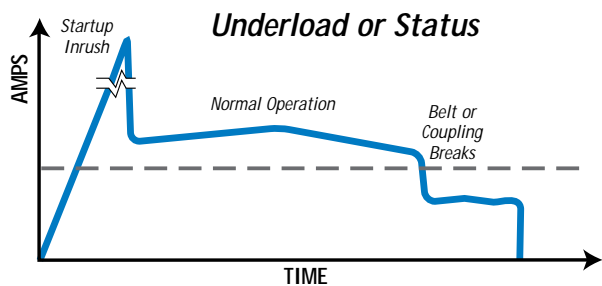
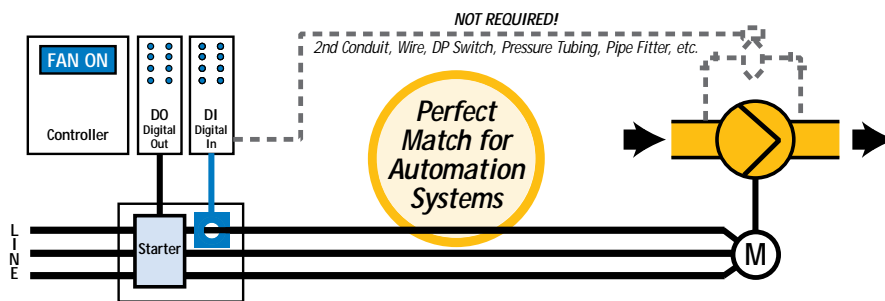
- Detects jams and overloads
- Interlocks multiple conveyor sections

#### Lighting Circuits

Easier to install and more accurate than photocells.

#### Electric Heaters

Faster response than temperature sensors.



### Features

- **Universal Output**
  - Solid state switch N.C. or N.O. works on AC or DC to 240VAC.
  - Compatible with any automation system.
  - Reduces inventory, installation and engineering costs.
- **Self-powered**
  - Cuts installation and operating costs.
- **Easily Adjustable Setpoint**
  - Speeds startup
- **Solid or Split Core Case**
  - Choose the right version for each installation.
- **Built-in Mounting Bracket**
  - Provides the solid installation inspectors want.
- **UL, CUL and CE Approval**
  - Accepted worldwide.

## Current Operated Switches

Know your power...  
because with knowledge comes control.

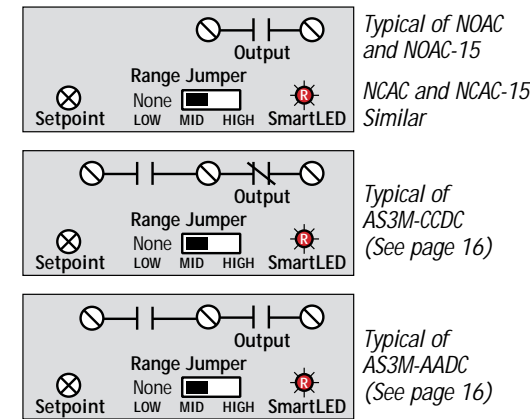
### Specifications

Power Supply	None — Self-powered																
Output	Isolated Solid State Switch																
Output Rating	1.0A @ 240VAC (Standard Units), 15A @ 120VAC, 10A @ 240VAC (-15 Option)																
Off State Leakage	■ NOAC: NONE, ■ NCAC: 2.5mA																
Response Time	0.04 to 0.120 Second																
Setpoint Range	■ Fixed Core: 1-6, 6-40 & 40-175A ■ Split Core: 1.5-6, 6-40 & 40-200A																
Hysteresis	5% of Setpoint																
Overload	<table border="1"> <thead> <tr> <th>MODEL</th> <th>CONTINUOUS</th> <th>6 SEC</th> <th>1 SEC</th> </tr> </thead> <tbody> <tr> <td>■ 1-6A</td> <td>150A</td> <td>400A</td> <td>600A</td> </tr> <tr> <td>■ 6-40A</td> <td>150A</td> <td>500A</td> <td>800A</td> </tr> <tr> <td>■ 40-175A</td> <td>210A</td> <td>800A</td> <td>1,200A</td> </tr> </tbody> </table>	MODEL	CONTINUOUS	6 SEC	1 SEC	■ 1-6A	150A	400A	600A	■ 6-40A	150A	500A	800A	■ 40-175A	210A	800A	1,200A
MODEL	CONTINUOUS	6 SEC	1 SEC														
■ 1-6A	150A	400A	600A														
■ 6-40A	150A	500A	800A														
■ 40-175A	210A	800A	1,200A														
Isolation Voltage	UL listed to 1,270VAC, tested to 5,000VAC																
Frequency Range	6-100Hz, works on VFDs																
Sensing Aperture	■ -FF Case: 0.55" (14mm) dia. ■ -SP Case: 0.85" (21.5mm) sq.																
Case	UL 94V-0 Flammability Rated																
Environmental	-58 to 149°F (-50 to 65°C), 0-95% RH, non-condensing																
Listings	UL 508 Industrial Control Equipment (USA & Canada), CE																

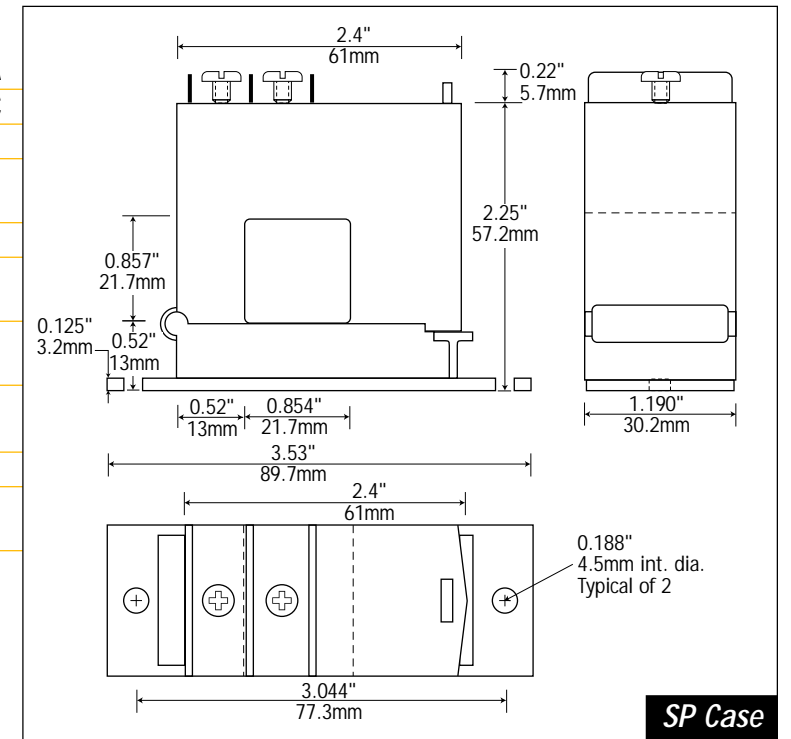
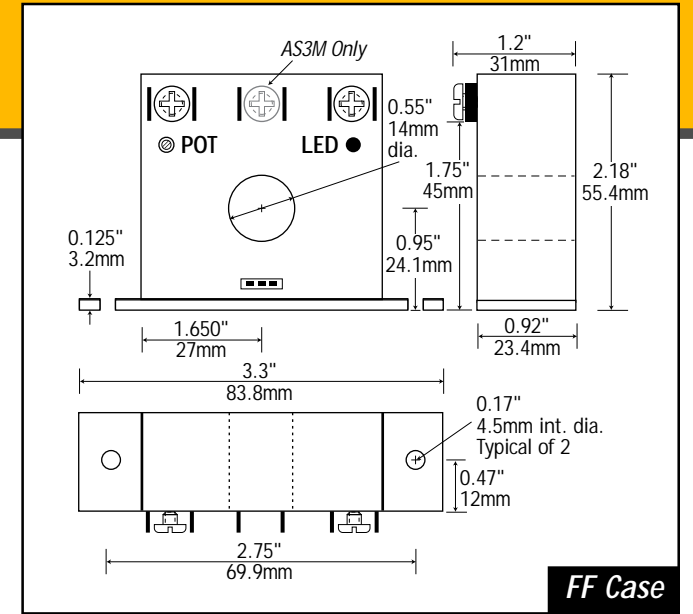
#### MULTI-POLE VERSION (SEE PAGE 16 FOR DESCRIPTION):

Switch Rating	0.15A @ 30VDC
Off State Leakage	■ AADC: NONE ■ CCDC: 0.3mA (NC terminal only)

### Connections



- Notes:
- Terminals are #6 screws.
  - DC contacts are polarity sensitive.



### Ordering Information

Example: AS3-NOAC-SP-NL  
Adjustable AC current switch, split core without indicating LED.

AS3	Output Rating	Case Style	Options
NCAC Normally Closed, 1A @ 240VAC	FF Fixed Core, Front Term.	NL No LED	15 15A @ 120VAC output
NOAC Normally Open, 1A @ 240VAC	SP Split Core		

## Current Operated Switches



# AS3 Series



## Current Operated Switches

### Applications

#### Electronic Proof of Flow

- No need for pipe or duct penetrations.
- More reliable than electro-mechanical pressure or flow switches.

#### Conveyors

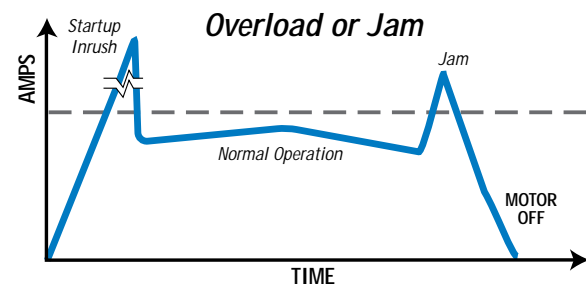
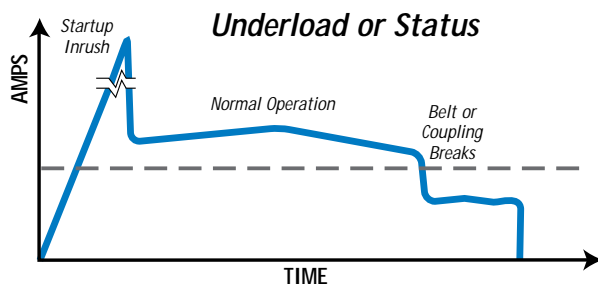
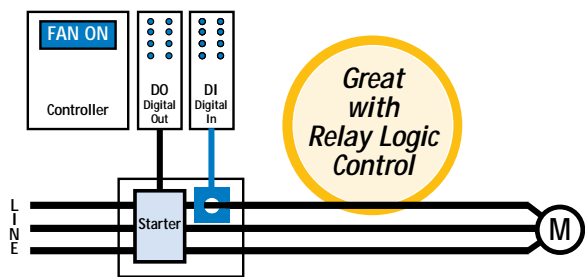
- Detects jams and overloads.
- Interlocks multiple conveyor sections.

#### Lighting Circuits

- Easier to install and more accurate than photocells.

#### Electric Heaters

- Faster response than temperature sensors.



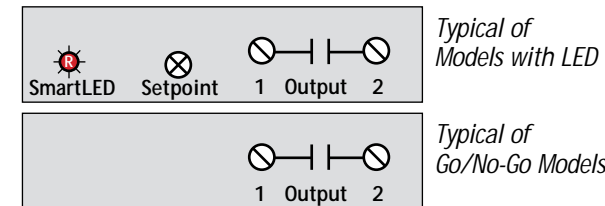
## Current Operated Switches

Know your power...  
because with knowledge comes control.

### Specifications

Power Supply	None — Self-powered																
Output	Magnetically Isolated Solid-State Switch																
Output Rating	<ul style="list-style-type: none"> <li>■ N.O. Version: 0.2A @ 240VAC or VDC</li> <li>■ N.C. Version: 0.2A @ 130VAC or VDC</li> <li>■ Not polarity sensitive</li> </ul>																
Off State Leakage	None																
Response Time	0.120 Second																
Setpoint Range	<ul style="list-style-type: none"> <li>■ Fixed Core: 1–150A</li> <li>■ Split Core: 1.5–150A</li> </ul>																
Hysteresis	5% of Setpoint																
Overload	<table border="1"> <thead> <tr> <th>MODEL</th> <th>CONTINUOUS</th> <th>6 SEC</th> <th>1 SEC</th> </tr> </thead> <tbody> <tr> <td>■ -GO</td> <td>250A</td> <td>500A</td> <td>1,000A (NOU)</td> </tr> <tr> <td>■ -GO</td> <td>150A</td> <td>400A</td> <td>1,000A (NCU)</td> </tr> <tr> <td>■ All Other</td> <td>150A</td> <td>400A</td> <td>1,000A</td> </tr> </tbody> </table>	MODEL	CONTINUOUS	6 SEC	1 SEC	■ -GO	250A	500A	1,000A (NOU)	■ -GO	150A	400A	1,000A (NCU)	■ All Other	150A	400A	1,000A
MODEL	CONTINUOUS	6 SEC	1 SEC														
■ -GO	250A	500A	1,000A (NOU)														
■ -GO	150A	400A	1,000A (NCU)														
■ All Other	150A	400A	1,000A														
Isolation Voltage	UL Listed to 1,270VAC, tested to 5,000VAC																
Frequency Range	6–100Hz																
Sensing Aperture	<ul style="list-style-type: none"> <li>■ -FF Case: 0.55" (14mm) dia.</li> <li>■ -FT Case: 0.75" (19mm) dia.</li> <li>■ -SP Case: 0.85" (21.5mm) sq.</li> </ul>																
Case	UL 94V-0 Flammability rated																
Environmental	-58 to 149°F (-50 to 65°C), 0–95% RH, non-condensing																
Listings	UL 508 Industrial Control Equipment (USA & Canada), CE																

### Connections



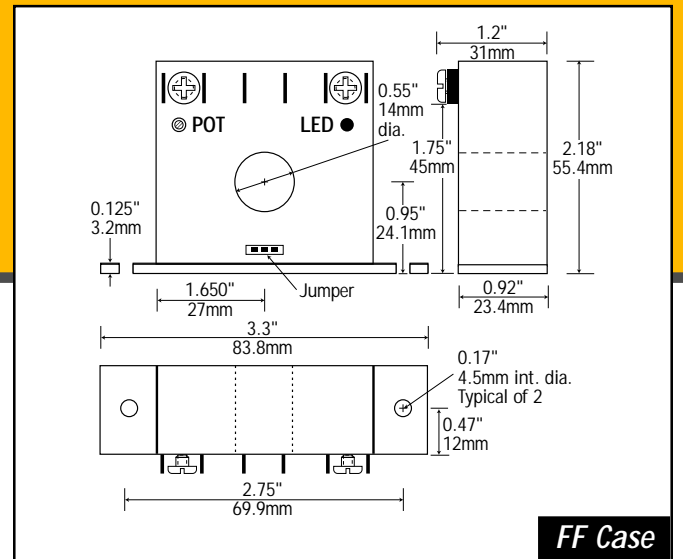
#### Notes:

- Terminals are #6 screws.
- Normally open contacts shown (NOU).
- Normally closed contacts similar (NCU).

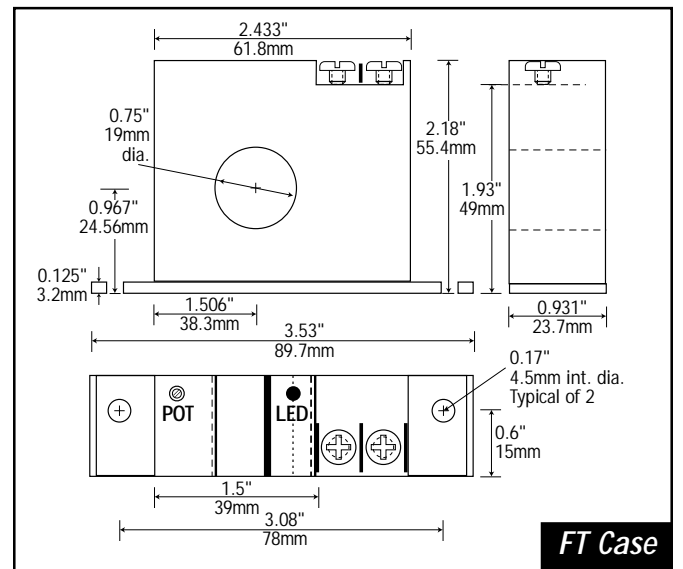
### Ordering Information

Example: AS1-NOU-SP  
Adjustable AC current switch, split core, with indicating LED.

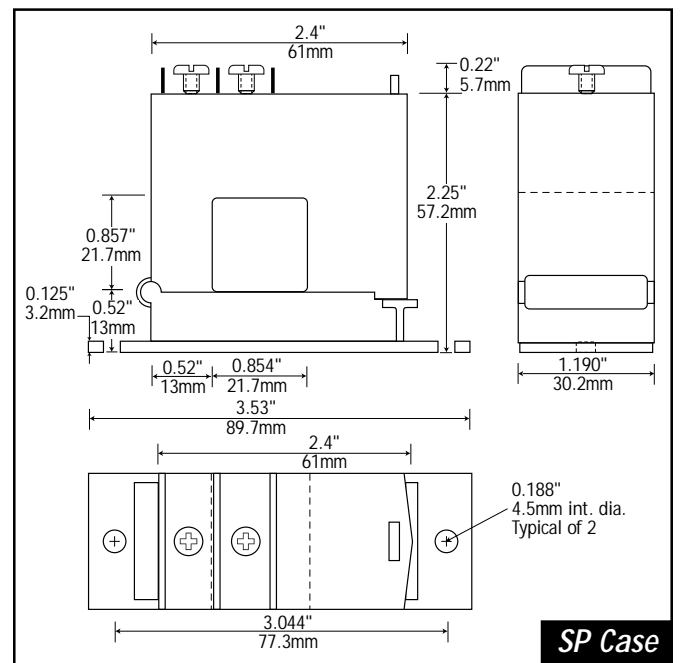
AS1	Output Rating	Case Style	Options
NOU	Normally Open	FF Fixed Core, Front Term.	GO Go/No-Go Version (Fixed Setpoint)
NCU	Normally Closed	FT Fixed Core, Top Term.	NL No LED
		SP Split Core	— With LED (Blank)



FF Case



FT Case



SP Case

## Current Operated Switches

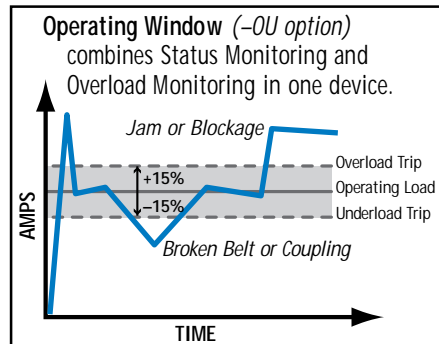
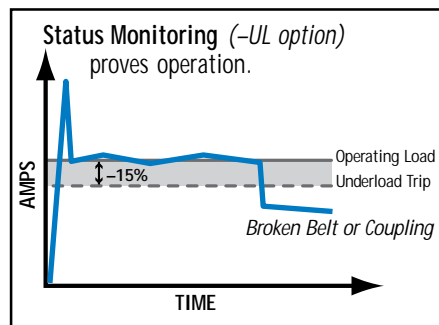
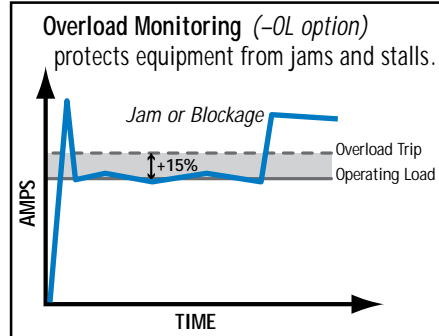
# ASM Series



'ASM' Current Switches from NK Technologies combine a current transformer, signal conditioner and self-calibrating limit alarm into a single package. The ASM Series has an extended current input range, universal solid-state outputs and a wide frequency response. Available in a split core or top terminal solid core case.

## Operation

Choose the right operating type for your application:



## Self-Calibrating Current Switches

### Applications

- Conveyors (-OL option)**
  - Detects jams and overloads.
  - Interlocks multiple conveyor sections.
- Electronic Proof of Flow (-UL option)**
  - No need for pipe or duct penetrations.
  - More reliable than electro-mechanical pressure or flow switches
- Lighting or Heating Circuits (-UL option)**
  - Fast and easy installation.
- Pump Protection (-OU option)**
  - Provides overload (jams) and underload (suction loss) indication.

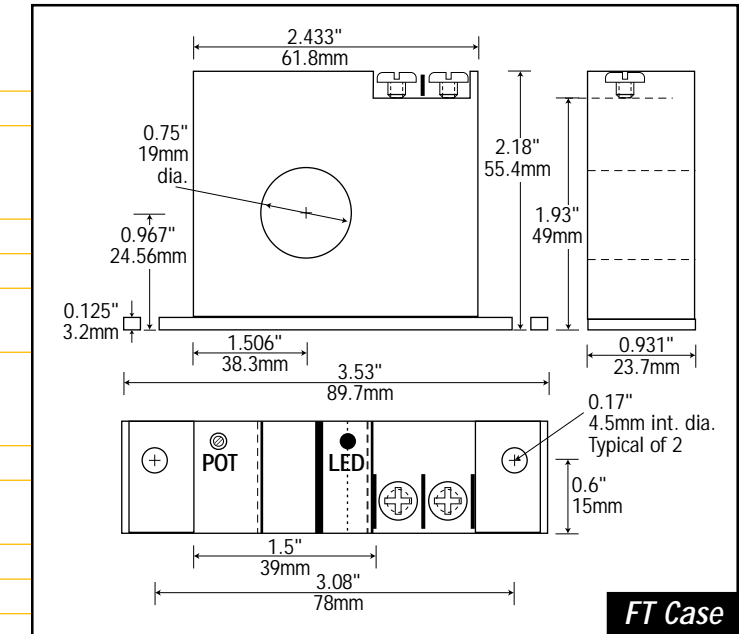
### Features

- **Self Calibrating Switch**  
Speeds startup.
- **Self-powered**  
Cuts installation costs.
- **Choose the Operating Style that Matches your Application**
  - **Status alarms** on underload, proving that equipment is running properly.
  - **Overload** protects against jams and blockages.
  - **Operating window** provides both status and overload in a single device.
- **Universal Output**  
AC or DC switching means compatibility with any automation system.
- **Compact**  
Fits in starters and panels.
- **UL, CUL and CE Approval**  
Accepted worldwide.

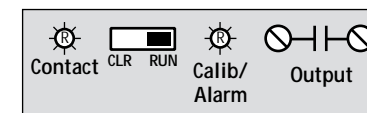
## Self-Calibrating Current Switches

## Specifications

Power Supply	None — Self-powered								
Output	Magnetically Isolated Solid-State Switch								
Output Rating	<ul style="list-style-type: none"> <li>■ N.O. Version: 0.2 A @ 240VAC or VDC</li> <li>■ N.C. Version: 0.2 A @ 130VAC or VDC</li> <li>■ Not polarity sensitive</li> </ul>								
Off State Leakage	None								
Response Time	0.2 Second								
Setpoint Range	<ul style="list-style-type: none"> <li>■ 1.5–150A (Fixed Core)</li> <li>■ 2.8–150A (Split Core)</li> </ul>								
Setpoint	<ul style="list-style-type: none"> <li>■ Overload: +15% of Load (-OL)</li> <li>■ Underload: -15% of Load (-UL)</li> <li>■ Operating Window: +/-15% of Setpoint</li> </ul>								
Hysteresis	5% of Setpoint								
Overload	<table border="1"> <tr> <th>MODEL</th> <th>CONTINUOUS</th> <th>6 SEC</th> <th>1 SEC</th> </tr> <tr> <td>All</td> <td>150A</td> <td>500A</td> <td>1,000A</td> </tr> </table>	MODEL	CONTINUOUS	6 SEC	1 SEC	All	150A	500A	1,000A
MODEL	CONTINUOUS	6 SEC	1 SEC						
All	150A	500A	1,000A						
Isolation Voltage	UL Listed to 1,270VAC, tested to 5,000VAC								
Frequency Range	6–100Hz								
Sensing Aperture	<ul style="list-style-type: none"> <li>■ -FT Case: 0.75" (19 mm) dia.</li> <li>■ -SP Case: 0.85" (21.5mm) sq.</li> </ul>								
Case	UL 94V-0 Flammability rated								
Environmental	-58 to 149°F (-50 to 65°C), 0–95% RH, non-condensing								
Listings	UL 508 Industrial Control Equipment (USA & Canada), CE								



## Connections

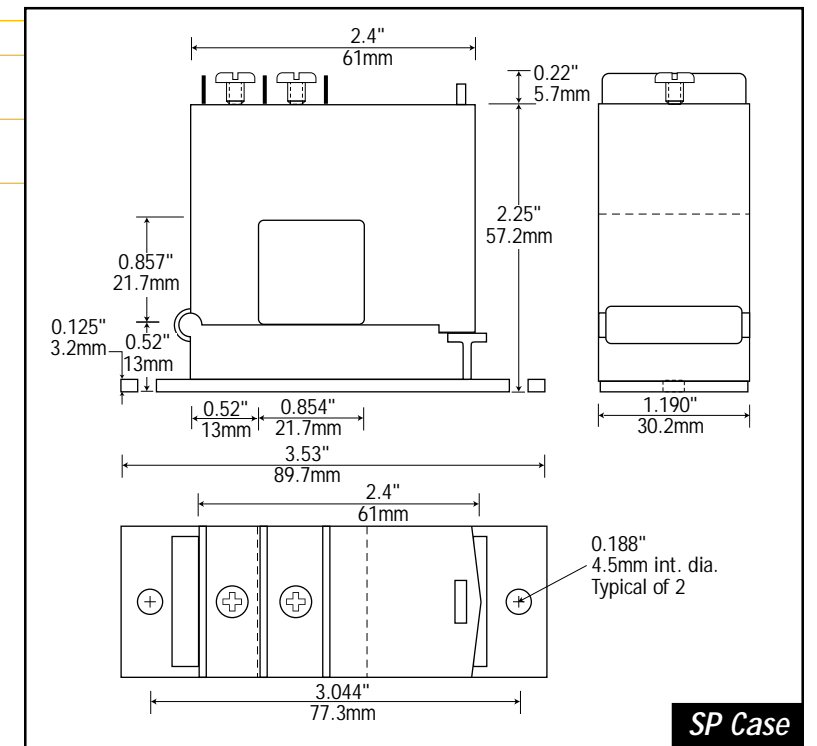


- Notes:
- Terminals are #6 screws.
  - Smart LED standard.
  - NOU shown, NCU similar.

## Ordering Information

Example: ASM-NOU-OL-SP  
Adjustable universal AC current switch, normally open, self-calibrating overload operation in a split core case.

ASM	□ □ □	—	□ □	—	□ □
Output Rating	NOU Normally Open NCU Normally Closed		Operation OL Overload UL Underload (Status) OU Over/Underload (Operating Window)		Case Style FT Fixed Core, Top Term. SP Split Core



## Self-Calibrating Current Switches