

EUROTHERM

Action Instruments

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EUROTHERM



... setting the standard

Eurotherm: a company that understands signal conditioning and isolating.

For over 35 years Eurotherm has built an international reputation for developing premium quality “fit for purpose” products and solutions. The Eurotherm brands (Action Instruments, Barber-Colman, Chessell, Continental and Eurotherm) have long been recognized as the leaders in the industrial automation market.

Action Instruments provides the signal conditioning industry the highest quality, most innovative solutions to remote signal conditioning and isolation applications. Action defined the standard for accuracy and reliability and our focus on technological innovation continues to raise that standard. The people behind the Action Instruments brand are devoted to understanding your needs and overcoming obstacles to the collection and transmission of industrial automation process signals.

Easy Solutions to Tough Problems

Every Action product is designed for easy installation, operation and maintenance. Whether you are amplifying or splitting signals, conditioning sensor outputs, isolating grounding problems, or adding more drive to current loops, Action’s complete product selection provides simple, convenient solutions to any analog signal conditioning need.

High Performance and Proven Reliability

Reliable signal processing under harsh conditions. That’s what Action’s products deliver. Nearly three decades of proven success can assure you of our adherence to the highest quality standards and the best in manufacturing techniques.

Real World Ruggedness

Action products are in tune with the industrial environment - the real world of hard-hats, forklifts, and EMI/RFI - they are ruggedized to survive the extremes of vibration, shock, temperature and humidity that are common to the manufacturing arena.

Action’s Personal Commitment to Your Success

We know how tough it is on the plant floor and we realize that every application has different requirements. That’s why Action’s solutions are tailored to your problems.

Best Engineering Support in the Industry

Experienced, knowledgeable and friendly engineers are available throughout the world to answer your questions.

Think Reliable, Think Smart, Think Action

Our goal is to be your exclusive supplier for industrial measurement and control products. What can we offer you? Plenty.

What do Action Products Do?

Isolation



A ground loop can occur if more than one ground connection is made to a single control signal. Because grounds are seldom at the same potential, an unwanted current will be generated and interfere with the control signal. Signal isolators break the ground loop current path and maintain the integrity of the measurement.

Signal Conversion



Industrial applications use a wide array of sensors to measure temperature, flow, length, speed, frequency, etc. These signals may then need to be converted into a form usable by the instrumentation to which they are connected. Any sensor signal (thermocouple, RTD, DC voltage, DC current, AC voltage, frequency, resistance, etc.) can be converted to any standard process signal.

Noise Filtering



Isolators incorporate low pass filters that eliminate high frequency EMI/RFI and unwanted signals from power lines, generators and motors.

Linearization



Many sensors output a signal that is not linearly related to the engineering value being measured. For example, a thermocouple used to measure temperature has a nonlinear millivolt output. A thermocouple input signal isolator translates this to a standard, robust linear signal such as 4 to 20 mA.

Limit Alarms



Limit alarm units take in a process signal and compare it to one or more setpoints. They then provide an output signal, usually a relay contact, when the signal crosses the setpoint.

Math



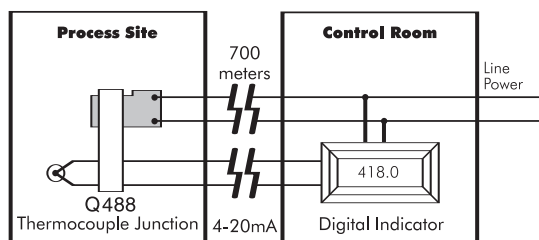
Isolators that can perform addition, subtraction, multiplication, division, square root, and averaging.

What is Signal Conditioning?

Signal conditioners are electronic instruments used in factory or machine automation. They can amplify, convert, boost, transform, buffer, filter, alarm and isolate process control signals. There seems to be no limit to the variety of things control engineers want to do with control signals. Signal conditioners are known by many names: converters, transducers, isolators, transmitters, and black boxes. Conventionally, most signal conditioners and isolators fall into two categories based on the number of wires required for power and signal.

Four-wire Transmitters

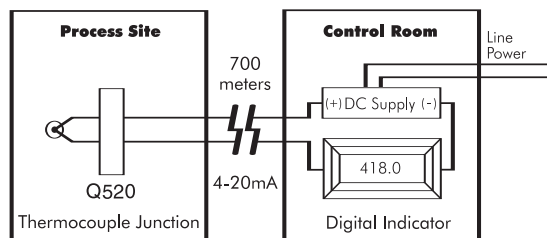
A four-wire transmitter has two wires for power and two wires for the signal output. A four-wire transmitter can be either AC or DC powered. Four-wire transmitters provide a powered output, either a voltage signal (e.g., 0-10V, 1-5V); a current signal (e.g., 4-20mA, 10-50mA); or in some cases a relay (e.g., solid state or contact closure). Four-wire transmitters require a power supply - they do not use power from the input or output signal lines. The power supply allows four-wire transmitters to power their output signal. Because of this, they are often used to boost signal strength for retransmission.



Four-wire Transmitter

Two-wire Transmitters

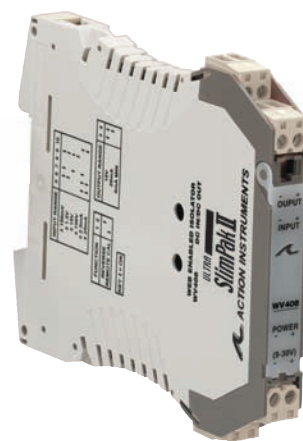
A two-wire transmitter is powered by the same two wires that carry the output signal. A two-wire transmitter is always DC powered and the output can only be a current signal, typically 4-20mA, or sometimes 10-50mA. The two-wire transmitter is considered a field device and requires very little power (milliwatts). It is therefore appropriate for hazardous (explosive) environments, such as chemical refineries and pharmaceutical plants. The low DC power requirement, which ranges from 10-48VDC at currents as low as 4mA, reduces the chances of an electrical spark causing ignition of flammable vapors or dust. Additionally, two-wire transmitters save on wire costs



Two-wire Transmitter

since both the signal and power are on the same wires. Locating a two-wire transmitter as far as 2000 feet from

the control room is possible and at half the wiring cost of a four-wire transmitter. It is important to note that two-wire transmitters can be isolated or non-isolated. Many low cost two-wire transmitters are not isolated, which makes it important to ensure that the input sensor is not grounded. All of Action's two-wire transmitters are fully isolated. Members of this group include the TransPak series and most of the Q5xx products.



WV408 Ultra SlimPak II

Limit Alarms

Limit alarms are considered a four-wire transmitter since they have two wires for power and at least two wires for the relay signal output. Limit alarms are similar to a thermostat. On your thermostat at home you may have the temperature set to a cozy 72°F or 23°C. If the room temperature falls below that "setpoint" the heater will turn on. This is an example of on/off control. A limit alarm performs the same function. It has a setpoint which is compared to a process signal. If the temperature gets too high, the limit alarm is used to alert an operator or shut down the process. Other applications include limit alarms that can also act as backup for a control system to perform a controlled shutdown process in order to prevent damage or other hazards.

Digital Indicators

Digital indicators (or panel meters) will also accept direct sensor inputs. For the most part, AC powered indicators can be considered a four-wire transmitter if they are configured with an analog or relay output. Indicators are most commonly used to display process variables, however some have secondary functions, such as a 4-20mA transmitter output, limit alarm, or relay contact closure output.


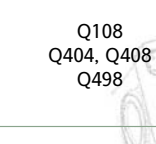
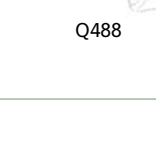




Loop powered indicators such as Action's V560 are an important type of digital indicator. These indicators are designed for field use and have operating characteristics similar to a two-wire transmitter. They use a 4-20mA signal for power and therefore, as low power devices, are ideal for use in hazardous environments.



VisiPak V408, 1/8 DIN Rail Mount Indicator

Product Selection Guide

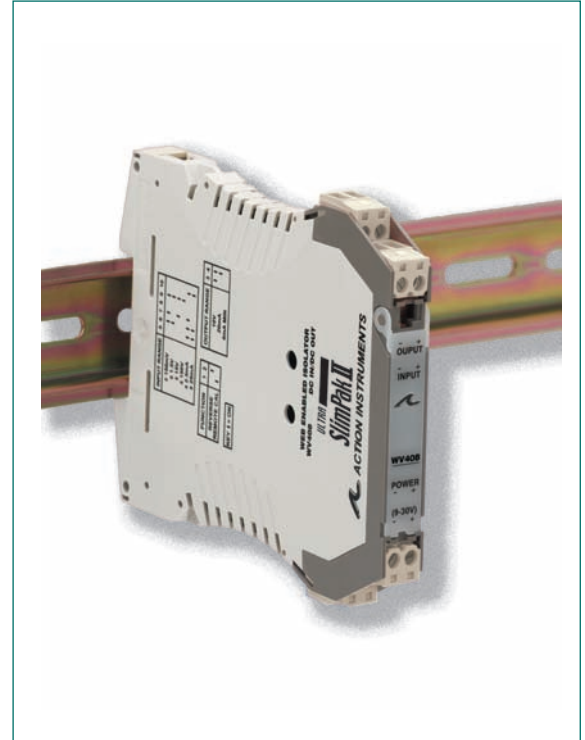
Input Type	Ultra SlimPak™ II		Ultra SlimPak™		ActionPak™	
	Limit Alarms	Signal Conditioners	Limit Alarms	Signal Conditioners	Limit Alarms	Signal Conditioners
DC Volts DC Current	WV108	WV408	G108	G408	AP1080 AP1090	AP4380, AP4382 AP4390, 4391, 4392 AP750x
RTD	WV118	WV418	G118	G418		AP4151
Thermocouple	WV128	WV428	G128	G428	AP1280 AP1290	AP4351
Potentiometer		WV438		G438		AP4003
Strain Gauge		WV448		G448		AP4081
AC Volts AC Current	WV168	WV468	G168	G468	AP1690	AP6380
Frequency		WV478		G478		AP7380 AP7510
Accessories	Configuration Tools available	Configuration Tools available				
24VDC Power Supplies	WV905	WV905	H910 H915	H910 H915	AP9046	AP9046
Other	Ethernet Connectivity PC and Button Setup Removable Connectors		Fixed Connectors		Most Complete Range of Legacy Models	

ActionIQ™			I/P	TransPak™	VisiPak™
					
AC Limit Alarms and Signal Conditioners	DC Limit Alarms and Signal Conditioners	Loop Powered 2/3 Wire Transmitters & Signal Conditioners	Current to Pressure Transducers	2 Wire Transmitters	Digital Displays
Q106 Q403, Q406	Q108 Q404, Q408 Q498	Q500 Q501	IP51 IP61	T280, T287 T700, T703	V108, V116, V132 V408, V430, V438 V560, V561, V565
Q116 Q486	Q488	Q510		T713 T280, T287 T797, T798	V108, V116, V132 V408, V432
Q126 Q486	Q488	Q425 Q520		T280, T287 T723 T797, T798	V108, V116, V132 V408, V432
Q436	Q438			T287 T752	V408, V438
Q446	Q448				V408, V434
Q466	Q468			T761	
Q476	Q478 Q498			T773	V437
IQRL-2xxx required for AC power distribution. Config Tools available	IQRL-Dxxx for DC power distribution. Config Tools available			T287 requires C680-0001 Software and Adapter	
				T609	
	Wide Ranging Input Math Capability		Ideal for Hazardous Environments	Intrinsic Safety Models	Intrinsic Safety Models

Ultra SlimPak™ II DIN Rail Mount Signal Conditioners, Isolators, Alarms, and Power Supplies

- Ethernet Connectivity to Most Client Software
- Built In Web Browser with Email and Logging Capability
- PC or Button Setup and Calibration
- Smart Power Technology Automatically Adjusts Power
- High Density Modules
- Reduced Wiring with Jumpers Transferring Power from Module to Module
- Removable Connectors
- Fast Response & High Accuracy
- In-Process Calibration

The Ultra SlimPak II Series can function as traditional stand-alone limit alarms and isolators, or they can simultaneously be connected to your company's intranet to monitor your signals via a standard browser when coupled with the optional WVC16 interface unit.



SPECIFICATIONS

Isolation:	1800VDC or peak AC between input, output and power
Operating Humidity:	15 to 95% @ 45°C
Temperature Range	
Operating:	0 to 60°C
Storage:	-20 to 85°C
Power Consumption:	1.5W typical, 2.5W max.
Supply Range:	9 to 30VDC
Agency Approvals:	UL; CSA; CE;
(WV408/428 only):	Class 1, Div 2, Gp A, B, C, D to 60°C ambient

ORDERING INFORMATION

Part Number	Function	Input	Input Span (Field Configurable)	Housing Width	Output (Field Configurable)
WV408	Isolator	DC Volts DC Current	+/-150mV, +/-1.5V, +/-15V, +/-150V +/-2.5mA, +/-25mA	12.7mm	DC Voltage (0-10V) DC Current (0-20mA, 4-20mA) (95% adjustment in any range)
WV108	Limit Alarm		+/-20mV, +/-200mV, +/-2V, +/-20V, +/-200V +/-10mA, +/-100mA	17.5mm	Alarm (Dual SPDT Relay)
WV418	Isolator	2, 3 & 4 Wire RTD	Platinum RTD: -200 to 600°C Copper RTD: -200 to 260°C (95% adjustment in any range)	17.5mm	DC Voltage (0-10V) DC Current (0-20mA, 4-20mA) (95% adjustment in any range)
WV118	Limit Alarm			17.5mm	Alarm (Dual SPDT Relay)
WV428	Isolator	Thermocouple	Type B: 75 to 1800°C Type C: 0 to 2315°C (428 only) Type E: -200 to 1000°C Type J: -210 to 760°C Type K: -200 to 1370°C Type N: -200 to 1300°C (428 only) Type R/S: 0 to 1760°C Type T: -200 to 390°C (95% adjustment in any range)	12.7mm	DC Voltage (0-10V) DC Current (0-20mA, 4-20mA) (95% adjustment in any range)
WV128	Limit Alarm			17.5mm	Alarm (Dual SPDT Relay)
WV438	Isolator	Potentiometer	100 ohms to 100k ohms	12.7mm	DC Voltage (0-10V) DC Current (0-20mA, 4-20mA) (95% adjustment in any range)
WV448	Isolator	Strain Gauge	+/-5mV to +/-200mV Excitation: 1-10VDC @ 120mA	17.5mm	DC Voltage (0-10V) DC Current (0-20mA, 4-20mA) (95% adjustment in any range)
WV468	Isolator	AC Volts AC Current	50mV AC to 250VAC 20mA AC to 100mA AC	12.7mm	DC Voltage (0-10V) DC Current (0-20mA, 4-20mA) (95% adjustment in any range)
WV168	Limit Alarm			17.5mm	Alarm (Dual SPDT Relay)
WV478	Isolator	Frequency	2Hz to 10kHz	12.7mm	DC Voltage (0-10V) DC Current (0-20mA, 4-20mA) (95% adjustment in any range)
WV905	Power Supply	AC Power DC Power	85 to 265VAC, 50 to 60Hz 120 to 300VDC	22.5mm	24VDC @ 500mA
WVC16	Communications Interface	DC Power		22.5mm	Config summary/editing; diagnostics; alarm setup/ status; e-mail; process variable viewing; data logging

Ultra SlimPak™ DIN Rail Mount Signal Conditioners, Isolators, and Alarms

- Field Configurable
- High Density DIN Rail Mount
- Wide Ranging
- ASIC Based Design for Maximum Reliability

Ultra SlimPaks are high density, DIN Rail mount, setpoint limit alarm and isolating signal conditioner modules. All Ultra SlimPak modules utilize Action's advanced, ASIC-based design for field configurable input and output flexibility.

SPECIFICATIONS

Isolation:	1800VDC between input, output and power (except G438)
Operating Humidity:	15 to 95% @ 45°C
Temperature Range	
Operating:	0 to 55°C
Storage:	-25 to 70°C
Power Consumption:	1.5W typical, 2.5W max.
Supply Range:	9 to 30VDC (except G448 is 18 to 30VDC)
Agency Approvals:	UL; CSA; CE



ORDERING INFORMATION

Part Number	Function	Input	Input Span (Field Configurable)	Housing Width	Output (Field Configurable)
G408	Isolator	DC Volts DC Current	10mV to 100V 1mA to 100mA	12.6mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
G408-1001					DC Voltage (-5 to +5V, -10 to +10V)
G108	Limit Alarm		10mV to 200V 1mA to 100mA	17.5mm	Alarm (Dual SPDT Relay)
G418	Isolator	3 Wire RTD	Platinum: 100, 500, 1000 Ohm with 16 ranges from -200 to 600°C down to -18 to 50°C Copper: 10, 25, 100 Ohm with 9 ranges from -200 to 260°C down to -18 to 50°C	17.5mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
G118	Limit Alarm			17.5mm	Alarm (Dual SPDT Relay)
G428	Isolator	Thermocouple	Type B: 500 to 1820°C Type E: -150 to 1000°C Type J: -200 to 750°C Type K: -200 to 1370°C Type R/S: 50 to 1760°C Type T: -150 to 400°C	12.6mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
G128	Limit Alarm			17.5mm	Alarm (Dual SPDT Relay)
G438	Isolator	Potentiometer	100 ohms to 100k ohms	12.6mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
G448	Isolator	Strain Gauge	0 to 200mV +/-5mV to +/-200mV Excitation: 1-10VDC @ 120 mA	17.5mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
G468	Isolator	AC Volts AC Current	50mV AC to 250VAC 50mA AC to 100mA AC	12.6mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
G168	Limit Alarm			17.5mm	Alarm (Dual SPDT Relay)
G478	Isolator	Frequency	2Hz to 10kHz	12.6mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
WV905	Power Supply	AC Power	100 to 240VAC, 50 to 60Hz	22.5mm	24VDC @ 500mA

ActionI/Q™ DIN Rail Mount Signal Conditioners, Isolators, and Alarms

- Multi-channel Conditioners
- Two-Wire Transmitters
- SnapLoc Terminal Blocks
- Removable Connectors
- Interlocking Modules
- Optional I/Q Rail Power Bus
- PC Based Setup
- Math Modules

The ActionI/Q Series of signal conditioners have wide ranging field configurable inputs and outputs. These DC, RTD, T/C, potentiometer, bridge/strain gauge, AC and frequency input devices incorporate TouchCal™ technology, which simplifies calibration and allows more than 90% adjustment of zero and span.

SPECIFICATIONS

Isolation:	1800VDC or peak AC between input, output and power
Operating Humidity:	15 to 95% @ 45°C
Temperature Range	
Operating:	0 to 55°C
Storage:	-25 to 70°C
Power Consumption:	2.5W max.
Supply Range:	85 to 265VAC (Qxx6, Qxx3); 9 to 30VDC (Qxx8 except Q448); 18 to 30VDC (Q448); 10.8 to 26.8VDC (Q404); 12 to 35VDC (Q501, Q510, Q520); 6VDC min. (Q500)
Agency Approvals:	UL; CSA; CE



ORDERING INFORMATION (AC Powered, 4-Wire)

Part Number	Function	Input	Input Span (Field Configurable)	Housing Width	Output (Field Configurable)
Q106	Limit Alarm	DC Volts DC Current	+/-10mV to +/-200V +/-1mA to +/-100mA	22.3mm	Alarm (Dual SPDT Relay) 24VDC, 20mA max. Excitation Supply
Q116	Limit Alarm	3 Wire RTD	Pt100, Pt500, Pt1000: -50 to 850°C Cu10, Cu100: -200 to 260°C Ni120: -30 to 320°C NiFe604: -200 to 240°C	22.3mm	Alarm (Dual SPDT Relay)
Q126	Limit Alarm	Thermocouple	Type B: 0 to 1820°C Type C: 0 to 2320°C Type E: -270 to 1000°C Type J: -210 to 760°C Type K: -270 to 1372°C Type N: -200 to 1300°C Type R: 0 to 1760°C Type S: 0 to 1750°C Type T: -270 to 390°C	22.3mm	Alarm (Dual SPDT Relay)
Q403-1L08 Q403-1L09 Q403-1L28 Q403-2L00	Isolators	DC Volts DC Volts DC Volts DC Current (2 Ch)	0 to 10V 0 to 10V -10 to 10V 4 to 20mA	22.3mm	4 to 20mA DC 0 to 10VDC -10 to 10VDC 4 to 20mA DC
Q406-A000 Q406-A001 Q406-A002 Q406-A003 Q406-A004	Isolators	DC VI (1 Ch) DC VI (1 Ch, 24VDC Excitation) DC VI (1 Ch In; 2 Out) DC VI (1 Ch In; 2 Out, 24VDC Excitation) DC VI (2 Ch)	+/-10mV to +/-100V +/-1mA to +/-100mA	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA) (0-20mA n/a on dual outputs)
Q436	Isolator	Potentiometer	100 ohms to 100k ohms	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
Q446	Isolator	Strain Gauge	0 to 10mV up to 0 to 200mV +/-5mV up to +/-200mV (50% adjustment any range) Excitation: 1-10VDC @ 120 mA	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
Q466	Isolator	AC Volts AC Current	50mV to 300V 5mA to 100mA	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
Q476	Isolator	Frequency	2Hz to 10kHz, 150mVp to 150Vrms	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
Q486	Isolator	Universal (includes 2, 3 & 4 Wire RTD)	(See thermocouple types above) Pt100, Pt200, Pt500, Pt1000: -200 to 850°C Cu-9.035: -40 to 260°C Ni120: -80 to 320°C +/-90mV +/-900mV 0 to 4000 ohms	22.3mm	DC Voltage (0-10V) DC Current (0-20mA)

ORDERING INFORMATION (DC Powered, 2-Wire)

Part Number	Function	Input	Input Span	Housing Width	Output
Q500-1B00 Q500-2B00 Q500-4B00	Input Loop Powered Transmitters	DC Current (1 Ch) DC Current (2 Ch) DC Current (4 Ch)	0(4) to 20mA	22.3mm	0(4) to 20mA DC
Q501-1Bxx Q501-2Bxx	Output Loop Powered Transmitters	DC VI (1 Ch) DC VI (2 Ch)	0 to 1mA, 0 to 20mA, 4 to 20mA 0 to 50mV, 0 to 100mV, 0 to 500mV 0 to 1V, 0 to 5V, 1 to 5V, 0 to 10V, 0 to 100V +/-10V	22.3mm	4 to 20mA DC
Q510-0Bxx Q510-4Bxx	Output Loop Powered Transmitters	RTD (2 Ch) RTD (4 Ch)	Pt100: 0 to 100°C, 0 to 150°C, 0 to 200°C, 0 to 250°C, 0 to 500°C 0 to 200°F, 0 to 300°F, 0 to 400°F, 0 to 500°F, 0 to 1000°F	22.3mm	4 to 20mA DC
Q520-0Bxx	Output Loop Powered Transmitter	Thermocouple (2Ch)	Type J: 0 to 500°F, 0 to 1000°F, 0 to 500°C Type K: 0 to 500°F, 0 to 2000°F, 0 to 1000°C Type T: 0 to 500°F, 0 to 250°C	22.3mm	4 to 20mA DC

ORDERING INFORMATION (DC Powered, 4-Wire)

Part Number	Function	Input	Input Span (Field Configurable)	Housing Width	Output (Field Configurable)
Q108	Limit Alarm	DC Volts DC Current	+/-10mV to +/-200V +/-1mA to +/-100mA	22.3mm	Alarm (Dual SPDT Relay)
Q404-2L08 Q404-2L09 Q404-2L28 Q404-3L00 Q404-3L01 Q404-4L00	Isolators	DC Volts (2 Ch) DC Volts (2 Ch) DC Volts (2 Ch) DC Current (1 Ch, 24 VDC Excitation) DC Current (1 Ch, 24 VDC Excitation) DC Current (1 Ch In; 2 Ch Out)	0 to 10V 0 to 10V -10 to 10V 4 to 20mA 4 to 20mA 4 to 20mA	22.3mm	4 to 20mA DC 0 to 10VDC -10 to 10VDC 4 to 20mA DC 0 to 10VDC 4 to 20mA DC
Q408-A000 Q408-A004	Isolator	DC VI (1 Ch) DC VI (2 Ch)	10mV to 100V 1mA to 100mA	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA) (0-20mA on A000 only)
Q438	Isolator	Potentiometer	100 ohms to 100k ohms	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
Q448	Isolator	Strain Gauge	0 to 200mV +/-5mV to +/-200mV Excitation: 1-10VDC @ 120 mA	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
Q468	Isolator	AC Volts AC Current	100mV to 300V 10mA to 100mA	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
Q478	Isolator	Frequency	2Hz to 10kHz, 150mVp to 150Vrms	22.3mm	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 0-20mA, 4-20mA)
Q488	Isolator	Universal (includes 2, 3 & 4 Wire RTD)	Type B: 0 to 1820°C Type C: 0 to 2320°C Type E: -270 to 1000°C Type J: -210 to 760°C Type K: -270 to 1372°C Type N: -200 to 1300°C Type R: 0 to 1760°C Type S: 0 to 1750°C Type T: -270 to 390°C Pt100, Pt200, Pt500, Pt1000: -200 to 850°C Cu-9.035: -40 to 260°C Ni120: -80 to 320°C +/-90mV +/-900mV 0 to 4000 ohms	22.3mm	DC Voltage (0-10V) DC Current (0-20mA)
Q498*	Isolator	DC VI (2 Ch, Isolated) Frequency Discrete (to 18V) Math Functions	+/-150mV, +/-1.5V, +/-15V, +/-150V +/-2.5mA, +/-25mA 2Hz to 10kHz, 150mVp to 150Vrms Add, Subtract, Multiply, Divide, Square Root	22.3mm	DC Voltage (0-10V, +/-10V) DC Current (0-20mA) Frequency (0 to 10kHz) Discrete (to 18V)
Q425-0B01 Q425-0B03 (both 3-Wire)	Transmitter	Thermocouple	Type J: 0 to 500°F Type J: 0 to 500°C	22.3mm	DC Voltage (0-10V)

* The Q498 is a DC powered, DIN rail mount, DC input signal conditioner. The unit is fully isolated to 1800V between input, output and power. Two isolated analog inputs each accept either a DC voltage or current. One analog output delivers either DC bipolar voltage or unipolar current. The Q498 also has a separate frequency input channel and a frequency output, as well as a discrete input and output channel.

The Q498 can perform single or double input math calculations on the input values. The available operators are Addition, Subtraction, Multiplication, Division, Square Root and Average. Process control functions include Hi/Lo Select, Rate of Change Limiter, and Track & Hold. The frequency input can also have the math functions applied. A 25-point linearization function is available for Channel 1 Analog input only. All output math and process control functions require C698-0000 software.

Action Pak™ Plug-In Signal Conditioners, Isolators, Alarms, and Power Supplies

SPECIFICATIONS

Isolation:	
Limit Alarms:	1000VDC between input, output and power
Signal Conditioners:	1500VDC between input, output and power
Operating Humidity:	15 to 95% @ 45°C
Temperature Range	
Operating:	0 to 60°C
Storage:	-20 to 85°C
Power Consumption:	1.5W typical, 2.5W max.
Supply Range:	9 to 30VDC and 120 or 240VAC: 1080, 1090, 1280, 1290, 4380, 4382 120 or 240VAC: 4390, 4391, 4392, 4081, 6380, 1690, 7380, 7500, 7501, 4003, 4151, 7510 120VAC only: 4351
Agency Approvals:	UL; CSA



ORDERING INFORMATION

Part Number	Function	Input	Input Span (Field Configurable)	Output (Field Configurable)
AP4380	Isolator (1 Ch)	DC Volts DC Current	10mV to 100V (10 to 200V on AP4380-2001) 1mA to 100mA	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 4-20mA)
AP4390	Isolator (2 Ch)	DC Volts DC Current	10mV to 100V 1mA to 100mA	-5V to 5V -10V to 10V
AP4382	Isolator (1 Ch) Bipolar	DC Volts DC Current	10mV to 100V 1mA to 100mA	Ch A: (0-5V, 0-10V) or (0-1mA, 4-20mA) Ch B: (-5V to 5V) or (-10V to 10V)
AP4391	Isolator (2 Ch) 1 Bipolar	DC Volts DC Current	10mV to 100V 1mA to 100mA	-5V to 5V -10V to 10V
AP4392	Isolator (2 Ch) Bipolar	DC Volts DC Current	10mV to 100V 1mA to 100mA	Single Trip (1 DPDT Relay, 5A)
AP1080	Limit Alarm (1 Ch)	DC Volts	1mA to 100mA	Single/Dual Trip (2 SPDT Relay, 5A)
AP1090	Limit Alarm (1 Ch)	DC Volts DC Current	10mV to 200V	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 4-20mA)
AP4351	Isolator	Thermocouple	Type B: 500 to 1820°C Type E: -150 to 1000°C Type J: -200 to 700°C Type K: -200 to 1370°C Type R: 50 to 1760°C Type S: 50 to 1760°C Type T: -150 to 400°C	Single Trip (1 DPDT Relay, 5A)
AP1280	Limit Alarm (1 Ch)			Single/Dual Trip (2 SPDT Relay, 5A)
AP1290	Limit Alarm (1 Ch)			DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 4-20mA)
AP4081	Signal Conditioner	Strain Gauge	0 to 200mV ±5mV to ±200mV Excitation: 1-10VDC @ 120mA	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 4-20mA)
AP6380	Signal Conditioner	AC Volts AC Current	50mV to 200V 5mA to 100mA	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 4-20mA)
AP1690	Limit Alarm (1 Ch)	AC Volts AC Current	100mV to 200V 10mA to 100mA	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 4-20mA)
AP7380	Signal Conditioner	Frequency	2Hz to 10kHz, 150mVp to 150Vrms	Single/Dual Trip (2 SPDT Relay, 5A)
AP7500	Signal Conditioner	DC Volts DC Current	200mV to 200V 1mA to 100mA	DC Voltage (0-5V, 0-10V) DC Current (0-1mA, 4-20mA)
AP7501	Signal Conditioner	DC Volts DC Current	200mV to 200V 1mA to 100mA	Frequency (0 to 10kHz, down to 0-9ppm)
AP4003	Signal Conditioner	Potentiometer	100 ohms to 100k ohms	DPDT Relay, 100ms on-time 0-130ppm down to 0-0.12ppm
AP4151	Signal Conditioner	2 & 3 Wire RTD	Pt100 (0.00385, 0.003911, 0.003912): -200 to 870°C Pt200 (0.00385, 0.003911, 0.003912): -200 to 870°C Pt500 (0.00385, 0.003911, 0.003912): -200 to 870°C Ni100 (0.00618): -100 to 320°C Ni120 (0.00672): -100 to 320°C Cu9.035 (0.00427): -200 to 260°C	DC Voltage (0-5V, 0-10V) DC Current (0-20mA, 4-20mA)
AP7510	Frequency Divider/Scaler	Frequency	to 20kHz (50mVpp min.) to 40kHz (1Vpp min.) to 80kHz (5Vpp min.)	5VDC pulse @10mA max., TTL compatible or 24VDC pulse, 1kΩ min. load; frequency to 0.99999 of max. input.
AP9046	Power Supply	AC Power	120VAC, 50 to 400Hz	24VDC, +/-5%; 40 VDC unregulated 65mA max. @ 24VDC

IP51 and IP61 Current to Pressure Transducers

- NEMA 4X or Explosion Proof
- Accuracy Greater Than 0.15%
- Intrinsically Safe
- Calibrate Without Removing Tubes or Wires
- Field Configurable Direct, Split and Inverse Ranges

IP51 and IP61 current to pressure converters produce a pneumatic output in response to a current input. They are useful for applications involving the control of actuators and valves, or for interfacing electrical equipment to pneumatic instrumentation.

Their unique solid state current to pressure converter uses minimal electrical energy and air consumption to produce accurate output pressure signals. Because there are no moving parts, the unit will operate reliably for many years when installed properly.

These transducers are available in a NEMA 4X housing (IP51) or in an Explosion Proof housing (IP61). They are rated Intrinsically Safe and are available with FM approval (standard) and CSA approval (optional).



SPECIFICATIONS

Input:	4-20mA
Output:	3-27, 3-15, 6-30 PSIG
Accuracy:	3-15 PSIG: ±0.15% of Span 3-27, 6-30 PSIG: ±0.25% of Span
Repeatability:	0.05% of Span
Deadband:	0.02% of Span
Stability	
Reproducibility:	0.5% of Span / 6 months
Position Effect:	Not Measurable
Vibration Effect:	<0.25% from 1-200Hz/1g
Frequency	
Response:	-3db at 5Hz (per ISA-S26.4.3.1 Configuration A)
Loop Load:	3.8VDC + 5 ohms (195 ohm load at 20mA)
Operating Current:	3.7mA min., 200mA max, continuous at 120°F Half Cycle 70 amp 1/20sec. at 68°F
Failure Mode:	Transducer always fails in the direct mode, i.e., if input current drops below 3.7mA DC the output will drop to 1 to 2 psig regardless of direct or reverse mode selection.
Enclosure:	Internally purged NEMA 4X Cast/Machined Aluminum with powder coat epoxy.
Connections:	1/4" NPTF supply port (1) 1/4" NPTF output Port (2) 1/2" NPTF electrical conduit connection
Weight:	2.5 lbs
Supply Pressure:	Minimum of 3 psig and maximum of 10 psig above the maximum calibrated output.
Supply Pressure Effect:	Not measurable within recommended supply pressure range.
Output Capacity:	4.0 SCFM (Supply and Exhaust Characteristics are balanced to within ±10%)
Air Consumption:	0.04 SCFM Steady State Average (0.06 SCFM Maximum)
Operating Temperature:	-20 to 150°F (-29 to 66°C)
Temperature Effect	<1% per 100°F (38°C) change
RFI-EMI Effect:	Per SAMA PMC 33.1 standard (b), (c) 20 to 100MHz, Class 3 effect on zero & span less than 1%
Operational Modes:	Direct, reverse and/or split-range (field-selectable)
Agency Approvals:	CSA & FM approved for hazardous environments

OPERATION

See Figure 1. The electric to pneumatic conversion takes place in the E-Pi valve. A conditioned 4-20 mA input signal provides a current to the coil of the E-Pi. This creates a magnetic field which magnetizes the valve. The magnetization is proportional to the input current signal and positions the membrane relative to the valve seat. The pneumatic output (back pressure) is thereby modulated relative to the input current. Further conditioning of the pneumatic output is achieved with a volume booster.

Final conditioning of the boosted pneumatic output signal is achieved by actually measuring the output with a pressure sensor. This signal is then compared with the current to the "E-Pi" to achieve the exact pneumatic output relative to the 4-20 mA current input.

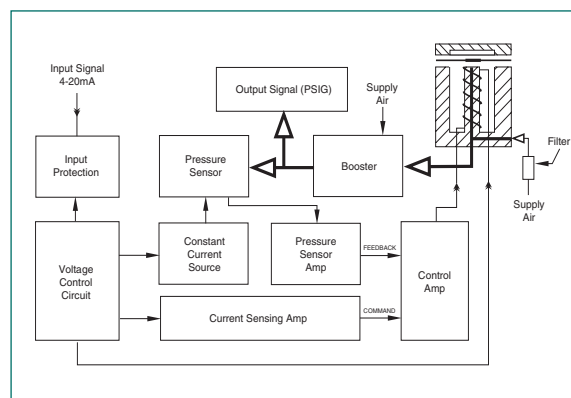


Figure 1. IP51/IP61 Block Diagram

ORDERING INFORMATION

- | | |
|------------|-----------------------------------|
| IP51-2000: | NEMA 4X, 3-27 psig output |
| IP51-3000: | NEMA 4X, 3-15 psig output |
| IP51-4000: | NEMA 4X, 6-30 psig output |
| IP61-2000: | Explosion Proof, 3-27 psig output |
| IP61-3000: | Explosion Proof, 3-15 psig output |
| IP61-4000: | Explosion Proof, 6-30 psig output |

TransPak™ T280

Isolating 2-Wire Transmitter for Pt100 RTD, Thermocouple, and mV



- Miniature, Thermal-Head Mounted
- 1000VDC Input to Output Isolation
- Cost Effective Fixed Inputs
- Eliminates Ground Loops
- Hinged Cover Protects Potentiometers
- Embedded Terminals

SPECIFICATIONS

Input Types	
Thermocouple:	B, E, J, K, L, N, R, S, T
RTD:	Pt-100, 2-wire or 3-wire
mV:	100mV max.
Input Span	
Thermocouple:	5mV min. span
RTD:	20°C min. 500°C max.
mV:	5mV min. span
Adjustability:	±15% for both zero & span
Output Span:	4-20mA, limiting @ <28mA
Isolation:	1000VDC
Supply Voltage:	10 to 40VDC, polarity protected
Operating Temperature:	-20 to +70°C
Agency Approvals:	CE

ORDERING INFORMATION

Specify:

T280-1xxx-C (F):	for RTD Input
T280-2xxx- [tc type] C (F):	for thermocouple Input
T280-3xxx:	for mV Input

Accessories:

T25H-0000:	Headmount enclosure - 1/2 NPT for thermowell and conduit.
AP9046:	ActionPak 24/40VDC, 65mA Loop Power Supply
T609:	24V, 600mA Loop Power Supply
V560/565:	3-1/2 digit Remote Loop Powered Indicator with wide ranging display

TransPak™ T287

Programmable Isolating Universal Input 2-Wire Transmitter



- PC Based User Friendly Configuration
- 2000VDC Input to Output Isolation
- Universal Input Reduces Inventory
- Custom Linearization for Special T/C Types and Math
- Single or Dual Inputs
- DIN Rail Mounting Adapter Included

SPECIFICATIONS

Input Types	
Thermocouples:	Most standard types & all special types using customer defined tables & polynomials.
RTD:	2-, 3- & 4-wire, Pt-100, Ni-110, Ni-120 & other RTDs. Includes Callandar-Van-Dusen adaptation and custom sensors linearization with user defined tables and polynomials.
DC mV:	-10 to 100mV
Potentiometers:	0 to 20k Ohms
Resistance:	0 to 400 Ohms
Infrared	
Minimum Range:	2mV
Output:	4-20mA
Supply Voltage:	9-40VDC @ no load, polarity protected
Operating Temp:	-40 to 85°C
Isolation:	2000VDC, input to output
Calibration:	Unit includes all calibration parameters, performs periodic zero and span self-test, and auto calibration.
Agency Approvals:	CE

ORDERING INFORMATION

Specify:

1. Model:	T287-0000
2. Model:	C680-0001 Isolated Communications Adapter, Configuration and Calibration Software, and User's Guide.

Accessories:

T25H-0000:	Headmount enclosure - 1/2 NPT for thermowell and conduit.
AP9046:	ActionPak 24/40VDC, 65mA Loop Power Supply
T609:	24V, 600mA Loop Power Supply
V560/565:	3-1/2 digit Remote Loop Powered Indicator with wide ranging display
C680-0002:	Zero/Span Trimmer

TransPak™ T797/T798

Isolating Universal 2-Wire Transmitters



- Programmable for 11 T/C Types, 6 RTD Types, mV, or Ohm Inputs
- Isolated, Linearized Current Loop Output for RTD or Thermocouple Input
- HART Compatible or Field Configurable with Optional Display
- Intrinsically Safe Operation or with Display and Explosion Proof Enclosure

The T797 is a programmable temperature transmitter that can be factory or field configured using the optional 1 or 2 line alphanumeric display.

The T798 is a Highway Addressable Remote Transducer (HART) based temperature transmitter that can be factory or field configured using either the optional 1 or 2 line alphanumeric display, or the optional PC based modem and software. Alternatively, an HC275 Hand-Held Communicator loaded with the Action T798 Device Description from the HART Foundation Library can be used.

SPECIFICATIONS

Input Types

Thermocouple: B, C, E, J, K, L, N, R, S, T, U and Special
 RTD: Pt-100, 2-wire, 3-wire, 4-wire (385 or 392)
 mV: -15mV to 115mV
 Resistance: 0 to 500 Ohms

Linearization: T/C and RTD linearized to +/-0.05°C

Accuracy: +/-0.05% of the millivolt or ohm equivalent input reading, or the value from the accuracy table, whichever is greater; plus 0.05% of span. For thermocouples, add 0.5°C (0.9°F) for cold junction compensation.

Output

Adjustments: Analog Zero: 100% of Sensor Range
 Analog Full-Scale: Normal or Reverse Acting

Operating

Temperature: Electronics and Display (with reduced visibility): -40 to +85°C
 Display (full visibility): -20 to +70°C

Agency

Approvals: CSA; FM; Cenelek EEX

ORDERING INFORMATION

T797-0000 Temperature Transmitter, Non IS
 T797-1000 Temperature Transmitter, IS-FM/CSA
 T798-0000 Temperature Transmitter, HART, Non IS
 T798-1000 Temperature Transmitter, HART, IS-FM/CSA

Displays and Options

T79A-C000 Configuration Software for T797 and T798
 T79A-D000 DIN Rail Mounting Kit
 T79A-M000 T797 Configuration Modem
 T79A-MH00 T798 HART Configuration Modem
 T79A-P000 Pipe Mount Bracket (for T79E-0/D only)
 T79D-1000 One Line Alphanumeric Display
 T79D-2000 Two Line Alphanumeric Display
 T79E-1000 Weatherproof Head-mount Enclosure

TransPak™

Isolating 2-Wire Transmitters



- Field Configurable Input Ranges
- Wide Ranging Zero and Span
- Eliminates Ground Loops
- Rugged Metal Case

TransPak two-wire transmitters are compact, rugged units that receive signals and direct sensor inputs, and operate on power derived from the output signal loop. The TransPak series provides a complete line of direct interface and conditioning modules for use with temperature, pressure, flow, strain, and other parameters. TransPak transmitters also accept a wide range of other electrical DC and AC voltage and current inputs.

Part Number	Input	Input Span	Output
T700	Current	1-20mA 4-20mA	1-20mA 4-20mA
T703	DC Volts DC Current	0 to 20mV 0 to 200V 0 to 50mA (0 to 1mA min.)	4-20mA
T713	3 Wire RTD	0 to 600°C -200 to 360°C	4-20mA 10-50mA
T723	Thermocouple	Type J: 0 to 760°C; -200 to 600°C Type K: 0 to 1370°C; -270 to 500°C Type T: 0 to 400°C; -270 to 400°C Type E: 0 to 1000°C; -270 to 850°C Type R/S: 0 to 1760	4-20mA 10-50mA
T752	Potentiometer	50 ohms to 200k ohms	4-20mA 10-50mA
T761	AC Volts AC Current	0 to 250V max.; 0 to 2mV min. 0 to 2A max.; 0 to 80µA min.	4-20mA 10-50mA
T773	Frequency	0 to 18kHz	4-20mA 10-50mA

ORDERING INFORMATION

T700-0001 Loop Powered Isolator
 T703-2000 DC Input 2-Wire Transmitter
 T713-0000 RTD (0 to 600°C) Input 2-Wire Transmitter
 T713-0013 RTD (-200 to 360°C) Input 2-Wire Transmitter
 T723-0000 T/C (J/K/T) Input 2-Wire Transmitter
 T723-0001 T/C (E/R/S) Input 2-Wire Transmitter
 T752-0000 Potentiometer Input 2-Wire Transmitter
 T761-0000 AC Input 2-Wire Transmitter
 T773-0000 Frequency Input 2-Wire Transmitter

Accessories

M004 Snap-in Channel Track (4ft.)
 T902 Mounting Plate for M004 (includes 4" track)
 T910 Bulkhead (flat surface) Mounting Plate
 T805 Explosion Proof/NEMA 4 Enclosure
 AP9046 Action Pak 24/40VDC, 65mA Power Supply
 T609 24VDC, 600mA Power Supply
 V565C 3-1/2 digit remote loop powered indicator. Wide ranging display, NEMA 4X enclosure. CSA and FM approval.

VisiPak™ V108, V116 and V132 Temperature/Process Indicators



- Field Configurable Input for Thermocouple, RTD, mV & mA
- 3 Field Configurable Alarm Setpoints with 1 or 2 Alarm Outputs
- Bright Green 4-Digit (9999) LED Display, Programmable for Engineering Units
- Combination Alarm Functions, Alarm Blocking & Programmable Latching/Non-Latching
- IP65 Front Panel with Tactile Configuration Buttons
- Standard Power Supply 85 to 264VAC, 48 to 62Hz or Optional 20 to 29VDC/VAC (n/a on V108)

ORDERING INFORMATION

Specify:

V108-ALGNVH	1/8 DIN, Green LED Display, 85-264 VAC PS
V108-ALRDVH	1/8 DIN, Red LED Display, 85-264 VAC PS
V116-ALVH	1/16 DIN, Green LED Display, 85-264 VAC PS
V116-ALVL	1/16 DIN, Green LED Display, 20-29VDC/VAC PS
V132-ALVH	1/32 DIN, Green LED Display, 85-264 VAC PS
V132-ALVL	1/32 DIN, Green LED Display, 20-29VDC/VAC PS

Accessories:

SUB2-1V1	0 to 10V Input Adapter
SUB2-1R7	External Relay (V116 and V132 only)

(All units ship with mounting brackets, a 2.49 ohm shunt resistor, and a user manual.)

VisiPak™ V408 Universal Temperature/Pressure/ Process Indicators



- Universal Field Configurable Input for Thermocouple, RTD, mV & mA, Bridge, and 0 to 10V Signals
- Modular Design Provides 3 Option Slots plus 1 Optional Modbus® Communications Slot
- Option Modules for 2nd Input, DC Retran, Sensor Excitation, 3 Digital Inputs/Outputs, and Relays
- 4 Field Configurable Setpoints Support Combination Alarm Functions, Rate of Change, Deviation Alarms, Alarm Blocking and Latching/Non-Latching
- IP65 Front Panel with Plug In from Front Design for Quick Replacement
- Standard Power Supply 85 to 264VAC, 48 to 62Hz or Optional 20 to 29VDC/VAC

ORDERING INFORMATION

Specify:

V408-ALGNVH	1/8 DIN, Green LED Display, 85-264 VAC PS
V408-ALGNVL	1/8 DIN, Green LED Display, 20-29VDC/VAC PS
V408-ALRDVH	1/8 DIN, Red LED Display, 85-264 VAC PS
V408-ALRDVL	1/8 DIN, Red LED Display, 20-29VDC/VAC PS

Accessories:

SUB2K-D5	2nd Input
SUB2K-D6	DC Retran
SUB2K-R4	Form C Relay
SUB2K-TK	Triple Contact Input
SUB2K-TL	Triple Logic Input
SUB2K-TP	Triple Logic Output
SUB2K-RR	Dual Relay
SUB2K-LR	Logic Relay
SUB2K-A2	232 Communications
SUB2K-F2	422 Communications
SUB2K-Y2	485 Communications
SUB2K-MS	24VDC, 20mA Excitation
SUB2K-G3	5VDC Transducer Excitation
SUB2K-G5	10VDC Transducer Excitation

(All units ship with mounting brackets, a 2.49 ohm shunt resistor, and a user manual.)

VisiPak™ V560, V561 and V565 Loop Powered LCD Indicators



- Eliminates Extra Power Supply
- 3-1/2 Digit Display
- User Configurable Decimal Point
- FM and CSA Approved

These loop powered indicators provide a reliable solution regardless of environmental conditions. The V560 and V565 are intrinsically safe, and are approved by CSA and FM for use in hazardous locations, either with safety barriers and the standard NEMA 4X housing, or with the optional explosion proof housing. Because of its low voltage drop of only 1 volt, the V565 can provide an extra 3-5 volts of loop drive above standard loop powered indicators. The small V561 explosion proof loop powered indicator is ideal for pipe mount applications. The optional backlight sheds light on those dark, hazardous locations.

ORDERING INFORMATION

V560/565 Specify:

V560-0014-0 Loop Powered Indicator, 4-20 or 10-50mA Out
 V565-0000-0 High Performance Loop Powered Indicator,
 4-20 or 10-50mA Out

V560/565 Options:

Option C Conduit Housing for Internal Mounting of
 T600/T700 Transmitter
 Option EP Explosion Proof Housing
 Option U Urethane Coating of Internal Circuitry
 Option C620 Factory Calibration (specify range)
 Option T901 TransPak Mounting Plate for Option EP
 Option T906 TransPak Mounting Plate for Option C
 Option V860 Conduit Mounting Kit
 Option V906 Explosion Proof Mounting Kit

V561 Specify:

V561-0000 Loop Powered Explosion Proof LCD Indicator
 V561-1000 Loop Powered Explosion Proof LCD Indicator
 with Backlight

VisiPak™ V430 Series Digital Indicators



- Field Configurable Input
- NEMA 4X Front Panel
- 4 Visual Alarm Points with Front Panel LED Status
- Wide Ranging Displays

The V430 Series has an indicator for every application. All V430 Series indicators have options for dual relay contact outputs and 4-20mA outputs, as well as full field programmability.

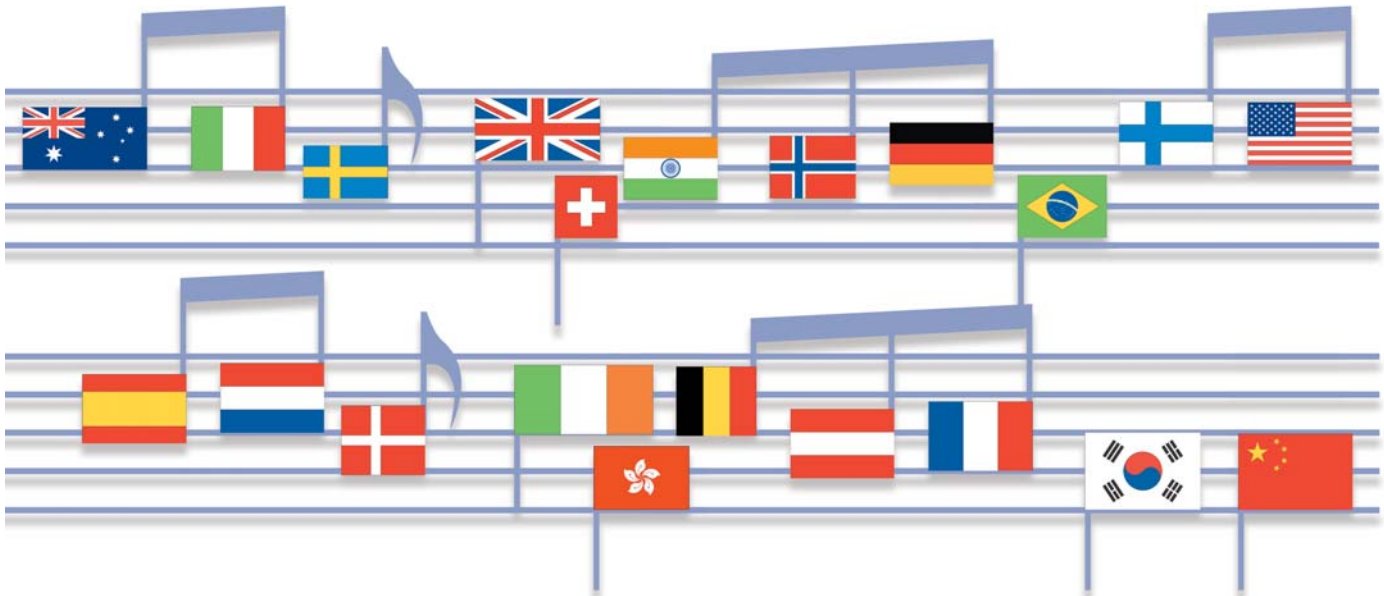
ORDERING INFORMATION

Specify:

V430-0000-1 DC VI Rate, Total, 120VAC
 V430-1000-1 DC VI Rate, Total, 120VAC, 2 Relays
 V430-2000-1 DC VI Rate, Total, 120VAC, 4-20mA out
 V430-3000-1 DC VI Rate, Total, 120VAC, 2 Relays, 4-20mA Out
 V432-0000-1 T/C, RTD, 120VAC
 V432-1000-1 T/C, RTD, 120VAC, 2 Relays
 V432-2000-1 T/C, RTD, 120VAC, 4-20mA Out
 V432-3000-1 T/C, RTD, 120VAC, 2 Relays, 4-20mA Out
 V432-0000-D T/C, RTD, 24VDC
 V432-1000-D T/C, RTD, 24VDC, 2 Relays
 V432-2000-D T/C, RTD, 24VDC, 4-20mA Out
 V432-3000-D T/C, RTD, 24VDC, 2 Relays, 4-20mA Out
 V434-0000-1 Bridge/Strain, 120VAC
 V434-1000-1 Bridge/Strain, 120VAC, 2 Relays
 V434-2000-1 Bridge/Strain, 120VAC, 4-20mA Out
 V434-3000-1 Bridge/Strain, 120VAC, 2 Relays, 4-20mA Out
 V437-0000-1 DC VI Rate, Total, 120VAC
 V437-1000-1 DC VI Rate, Total, 120VAC, 2 Relays
 V437-2000-1 DC VI Rate, Total, 120VAC, 4-20mA out
 V437-3000-1 DC VI Rate, Total, 120VAC, 2 Relays, 4-20mA Out
 V438-0000-1 DC VI w/lineariz., 120VAC
 V438-1000-1 DC VI w/lineariz., 120VAC, 2 Relays
 V438-2000-1 DC VI w/lineariz., 120VAC, 4-20mA out
 V438-3000-1 DC VI w/lineariz., 120VAC, 2 Relays, 4-20mA Out
 V438-0000-D DC VI w/lineariz., 24VDC
 V438-1000-D DC VI w/lineariz., 24VDC, 2 Relays
 V438-2000-D DC VI w/lineariz., 24VDC, 4-20mA out
 V438-3000-D DC VI w/lineariz., 24VDC, 2 Relays, 4-20mA Out

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AUSTRALIA Sydney
Eurotherm Pty. Ltd.
Telephone (+61 2) 9838 0099
Fax (+61 2) 9838 9288
E-mail info@eurotherm.com.au

AUSTRIA Vienna
Eurotherm GmbH
Telephone (+43 1) 7987601
Fax (+43 1) 7987605
E-mail eurotherm@eurotherm.at

BELGIUM & LUXEMBURG Huy
Eurotherm S.A./N.V.
Telephone (+32) 85 274080
Fax (+32) 85 274081
E-mail sales@eurotherm-belgium.be

BRAZIL Campinas-SP
Eurotherm Ltda.
Telephone (+5519) 3237 3413
Fax (+5519) 3234 7050
E-mail eurothermltda@eurothermltda.com.br

DENMARK Copenhagen
Eurotherm Danmark A/S
Telephone (+45 70) 234670
Fax (+45 70) 234660
E-mail info@eurotherm.se

FINLAND Abo
Eurotherm Finland
Telephone (+358) 22506030
Fax (+358) 22503201
E-mail info@eurotherm.fi

FRANCE Lyon
Eurotherm Automation SA
Telephone (+33 478) 664500
Fax (+33 478) 352490
E-mail ea@automation.eurotherm.co.uk

GERMANY Limburg
Eurotherm Deutschland GmbH
Telephone (+49 6431) 2980
Fax (+49 6431) 298119
E-mail info@regler.eurotherm.co.uk

HONG KONG & CHINA
Eurotherm Limited Aberdeen
Telephone (+85 2) 28733826
Fax (+85 2) 28700148
E-mail eurotherm@eurotherm.com.hk

Guangzhou Office
Telephone (+86 20) 8755 5936
Fax (+86 20) 8755 5831

Beijing Office
Telephone (+86 10) 6762 0936
Fax (+86 10) 6762 0931

Shanghai Office
Telephone (+86 21) 6352 6406
Fax (+86 21) 6352 7351

INDIA Chennai
Eurotherm India Limited
Telephone (+9144) 24961196
Fax (+9144) 2256682070
E-mail sales@eurothermdel.com

IRELAND Dublin
Eurotherm Ireland Limited
Telephone (+353 01) 469180
Fax (+353 01) 4691300
E-mail info@eurotherm.ie

ITALY Como
Eurotherm S.r.l.
Telephone (+39 31) 975111
Fax (+39 31) 977512
E-mail info@eurotherm.it

KOREA Seoul
Eurotherm Korea Limited
Telephone (+82 31) 2738507
Fax (+82 31) 2738508
E-mail help@eurotherm.co.kr

NETHERLANDS Alphen a/d Ryn
Eurotherm B.V.
Telephone (+31 172) 411752
Fax (+31 172) 417260
E-mail info@eurotherm.nl

NORWAY Oslo
Eurotherm A/S
Telephone (+47 67) 592170
Fax (+47 67) 118301
E-mail info@eurotherm.no

SPAIN Madrid
Eurotherm España SA
Telephone (+34 91) 6616001
Fax (+34 91) 6619093
E-mail ventas@iberica.eurotherm.co.uk

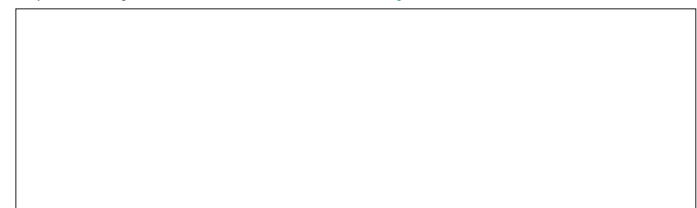
SWEDEN Malmo
Eurotherm AB
Telephone (+46 40) 384500
Fax (+46 40) 384545
E-mail info@eurotherm.se

SWITZERLAND Freienbach
Eurotherm Produkte (Schweiz) AG
Telephone (+41 55) 4154400
Fax (+41 55) 4154415
E-mail epsag@eurotherm.ch

UNITED KINGDOM Worthing
Eurotherm Limited
Telephone (+44 1903) 268500
Fax (+44 1903) 265982
E-mail info@eurotherm.co.uk
Web www.eurotherm.co.uk

UNITED STATES Leesburg, VA
Eurotherm Inc.
Telephone (+1 703) 443 0000
Fax (+1 703) 669 1300
E-mail info@eurotherm.com
Web www.eurotherm.com

Represented by:



Specialist Partners:
Tempcon Instrumentation Ltd.
Telephone 0870 774 6222
Fax 0870 774 6555
Email info@tempcon.co.uk
International Telephone +44 (0)1243 558277
International Fax +44 (0)1243 558288

Dalian China
Telephone (+86) 0411 265498
Fax (+86) 0411 2650498
E-mail sales@actionio.com.cn

Soliton Brazil
Telephone (+5511) 6950 1834
Fax (+5511) 6979 8980
E-mail soliton@soliton.com.br

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