BUILDING A *safer, more connected* FUTURE

sensience

ADVANCED SENSING TECHNOLOGIES

MICROTEMP®
FOUNDED 1965

THERMODISC
FOUNDED 1947

FUSITE™
FOUNDED 1942

THUNDERLINE Z
FOUNDED 1991

PACTROL
FOUNDED 1968

OUR BUSINESS

SENSING SOLUTIONS

Putting systems in touch with their surroundings to enable new levels of understanding, awareness and response.

SENSORS	ELECTRO-MECHANICAL	AUTOMATED CONTROLS
Temperature	Bi-metals	Electronic
Gas Sensing	Thermal Fuses (TCO)	Heating
Pressure		Control

HERMETIC SOLUTIONS

Ensuring a robust electrical or signal connection across adverse environmental conditions.

AC/R	INDUSTRIAL	DEFENSE
Terminals	Sensor/Power Feedthroughs	Packages
SH Plates	Battery Seals	Feedthroughs
Power Bolts		Initiator Assemblies
Sight Glass		Laser Lidding

ENABLING SAFE, RELIABLE AND EFFICIENT SYSTEM CONTROL

75+ Trustworthy, stable company with over 75 years of proven reliability

Leading product application experts

Multi-site, multi-region production for risk mitigation

Over 900 million units produced annually

Broadest range of product options

Rapid custom prototypes

GAS SENSORS

REFRIGERANT GAS SENSOR

Introducing Sensience's newly developed A2L gas detection sensor, enabled by patented NevadaNano technology, is an all-in-one sensing solution for accurate refrigerant detection systems to save development time and effort while providing high system reliability.

Model	30G
Communication Interface	RS-485 Digital Serial (3.3V or 5V) Analog (0-3.3V) Discrete I/O (alarm)
Voltage	5V ± 10%
Selectivity*	All A2L Refrigerants, R-32, R-454Blends
Agency/Compliance	UL 60335-2-40 Annex LL
Response Time*	<10 Sec. to 25% LFL Level
Measurement Range*	0-100% LFL
Sensitivity*	Insensitive to Poisoning Chemicals

ENVIRONMENTAL SUSTAINABILITY

- Enables HFC phase-down using A2L refrigerants less than 750 GWP
- Enables HVACR systems using flammable rerigerants to meet building codes

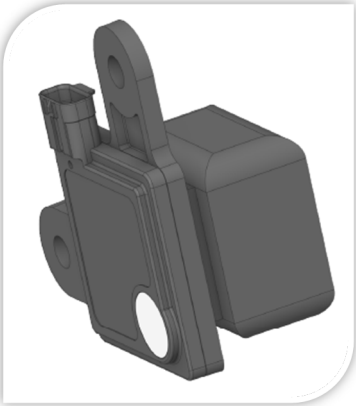
HIGH RELIABILITY MEMS TECHNOLOGY

- Meets all AHRTI testing requirements including vibration testing, and is proven to be best-in-class
- Proven technology: hundreds of thousands of devices successfully deployed in hazardous environment applications

PROVEN EXPERIENCE

- Providing environmental sensing and protection to the HVACR industry for over 70 years
- 15+ years of successful deployment of flammable gas sensing products
- Extensive in-house reliability test capability and experience at Sensience laboratories

A2L SENSOR WITH MITIGATION



Input Voltage
24VAC ± 25%
+24VDC ± 25%
Frequency 50/60 Hz

Output
Leak Detection
CC Dry Contact Leak Detection
SPST, C3000 Pilot Duty Rating
> 20,000 Cycles

Operating Environment
Operating Temperature -40C to 80C
Storage Temperature -40C to 85C
Relative Humidity 0-100%, Condensing

R290 A3 PROPANE GAS SENSOR*

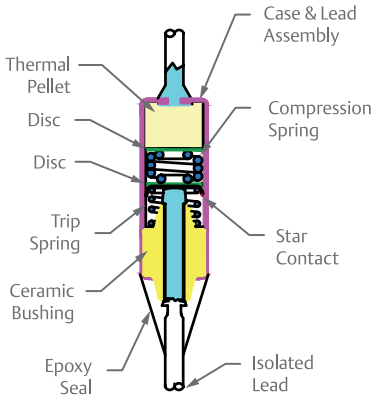
Model	30G
Communication Interface	RS-485 Digital Serial (3.3V or 5V) Analog (0-3.3V) Discrete I/O (alarm)
Voltage	5V ± 10%
Selectivity*	Propane
Operating Temperature Range	-40°C to 75°C
Response Time*	<10 Sec. to 25% LFL Level
Measurement Range*	0-100% LFL
Sensitivity*	Insensitive to Poisoning Chemicals

*Preliminary Specifications. Contact our sales team for more information

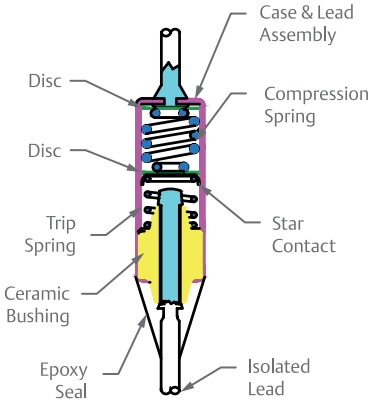
THERMAL FUSES

PACKAGED THERMAL FUSES

Before Operation



After Operation



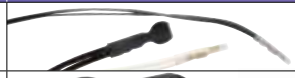
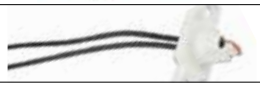
MICROTEMP® THERMAL FUSES

Model	Tf Range		
64 Series	72°C – 257°C, 162°F - 495°F	Up to 470°C (878°F)	10A/250VAC
G5 Series	72°C - 240°C, 162°F - 464°F	Up to 410°C (770°F)	20A/250VAC
G6 Series	72°C - 240°C, 162°F - 464°F	Up to 450°C (842°F)	16A/250VAC
Z6 Series	98°C - 240°C, 208°F - 464°F	Up to 380°C (716°F)	16A/250VAC
G7 Series	77°C - 192°C, 171°F - 378°F	Up to 270°C (518°F)	5A/250VAC
G8 Series	72°C - 240°C, 162°F - 464°F	Up to 410°C (770°F)	25A/250VAC
S9 Series	77°C - 240°C, 171°F - 464°F	N/A	15A/250VAC*

*S9 series rating is based on Japan's PSE JET standard only

TEMPERATURE SENSORS

APPLICANCE AND HVAC

Model	Operating Environment	Operating Temperature*	Mounting Configuration[1]	Product Images	Thermal Response**
13J	Dry Exposed NTC	-40°C to 175°C -40°F to 347°F	· Push-In		< 1 second
76J	Dry Measures Airstream Temp.	-40°C to 200°C -40°F to 392°F	· Screw		< 2 seconds
93J	Humid Immersion	-40°C to 200°C -40°F to 392°F	· Push-In · Flange/Bayonet		< 10 seconds
95J	Humid or Gas Immersion	-40°C to 140°C -40°F to 284°F	· Push-In · Screw		11+ seconds
36J	Small Design Measures Airstream or Surface Temperature	-40°C to 200°C -40°F to 392°F	· Push-In · Clip-On · Screw		
93J	Humid Immersion	-40°C to 200°C -40°F to 392°F	· Push-In · Flange/Bayonet		
95J	Humid or Gas Immersion	-40°C to 140°C -40°F to 284°F	· Push-In · Screw		
10J	Dry	-40°C to 80°C or -20°C to 105°C -40°F to 221°F	· Push-In · Clip-On · Bracket		
11J	Wet or Dry	-40°C to 150°C -40°F to 302°F	· Push-In · Clip-On · Bracket		
12J	Humid Refrigeration Measures Surface Temp.	-40°C to 80°C -20°C to 105°C -40°F to 221°F -40°C to 130°C -40°F to 266°F -40°C to 130°C -40°F to 266°F	· Push-In · Clip-On · Twist & Lock · Screw		
74J	Humid	-40°C to 130°C -40°F to 266°F	· Push-In · Twist & Lock		
75J	Humid	-40°C to 130°C -40°F to 266°F	· Push-In · Twist & Lock		
76J	Dry or Humid Measures Airstream Temp.	-40°C to 200°C -40°F to 392°F	· Screw		

*Typical operating temperature – dependent on maximum temperature of components such as wire and epoxy

**Typical thermal response in stirred water

[1] Typical mounting configuration – various mounting and interface configurations available

HIGH TEMPERATURE SENSORS

	Type/Model	Applications	Primary Benefits	Key Features	Operating Temperature	Product Images
HVAC	**Thermocouple Sensor - 40J**	Residential & commercial cooking ovens & ranges Residential & commercial HVAC equipment Water heaters Cooking equipment	Wide temperature range Customized Stable sensor output Agency approval	Design flexibility with various tip, wire lengths & connector configurations Passive Sensor Ready to use, fully assembled RTD	70°C to 600°C	
APPLIANCE	**Cooking oven Sensor - 11J**	Furnaces Ovens Hot plates Stoves Power Generation Other high temp applications	PT200 RTD technology offers enhanced stability over product lifetime	Highly resistant to corrosive exhaust gases Long-term stability and high accuracy Moisture poof design offers extended life Flexible wire connection with the connector	-40°C to 1000°C	

20J SENSORS

	Sensor Type	Operating Environment	Operating Temperature*	Mounting Configuration[1]	Product Images
INTERNAL COMBUSTION ENGINES	**Ambient Air**	Ambient Air Temperature	-40°C to 105°C -40°F to 221°F	• Bracket • Push-In • Snap-In	
	Intake Air	Air Intake to the Engine	-40°C to 125°C -40°F to 257°F	• Twist & Lock	
	HVAC	Air Flow in Interior Air Ducts	-40°C to 85°C	• Push-In • Snap-In	
		Evaporator Fin	-40°C to 85°C -40°F to 185°F	• Push-In	
	Engine Coolant and Exhaust	Fluid in Engine Coolant	-40°C to 150°C -40°F to 302°C	• Thread	
ELECTRIC VEHICLES	**Battery**	Battery Cells	-40°C to 150°C -40°F to 302°C	• Thread	
	Coolant	Fluid in Engine Coolant	-40°C to 150°C -40°F to 302°C	• Screw	
	Charge Port	Charge Port Inlet and Outlet	-40°C to 150°C	• Push-In	
	Motor-Busbar	Motor Coil and Busbar	-40°C to 200°C	• Surface Sensor	
	HVAC Temperature	Air Flow in Interior Air Ducts	-40°C to 85°C	• Push-In • Snap-In	

Thermal Response**
< 1 second
< 2 seconds
< 10 seconds
11+ seconds

*Typical operating temperature – dependent on maximum temperature of components
**Typical thermal response in stirred water
[1] Typical mounting configuration – various mounting and interface configurations available

PRESSURE SENSORS

OPERATING PRINCIPLE

Pressure Sensors work by converting pressure into an electrical signal. A gauge uses the change in electrical resistance of a material when stretched to measure the pressure. The sensors are used for a variety of applications and can be used for both high and low pressure applications.

KEY FEATURES

- MEMS Piezo resistive strain gauges
- Better seal to protect components
- Smaller simplified design using ASIC instead of PCB Flex Circuit Anodized
- Aluminum shell to improve corrosion resistance
- Custom Design can be developed to meet complex application requirements
- Proven very low noise

PRESSURE SENSORS

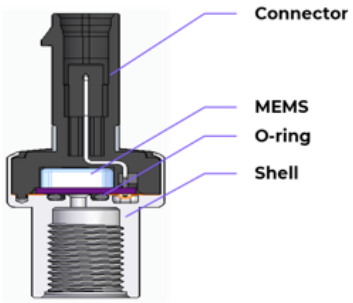
TECHNICAL SPECIFICATIONS

Function	Specification
Sensing Element	MEMS Piezo Resistive
Type	Absolute, Gage or Differential
Pressure Range	0-40 Bar
Operating Temp	40 to 150°C
Response Time	5 ms
Accuracy	+/- 2.5% FS
Input	5 or 12 Vdc
Output	0.5-4.5 Vdc
IP Rating	IPX6K
Shell	Plastic, Aluminum, SUS
Connector	Plastic

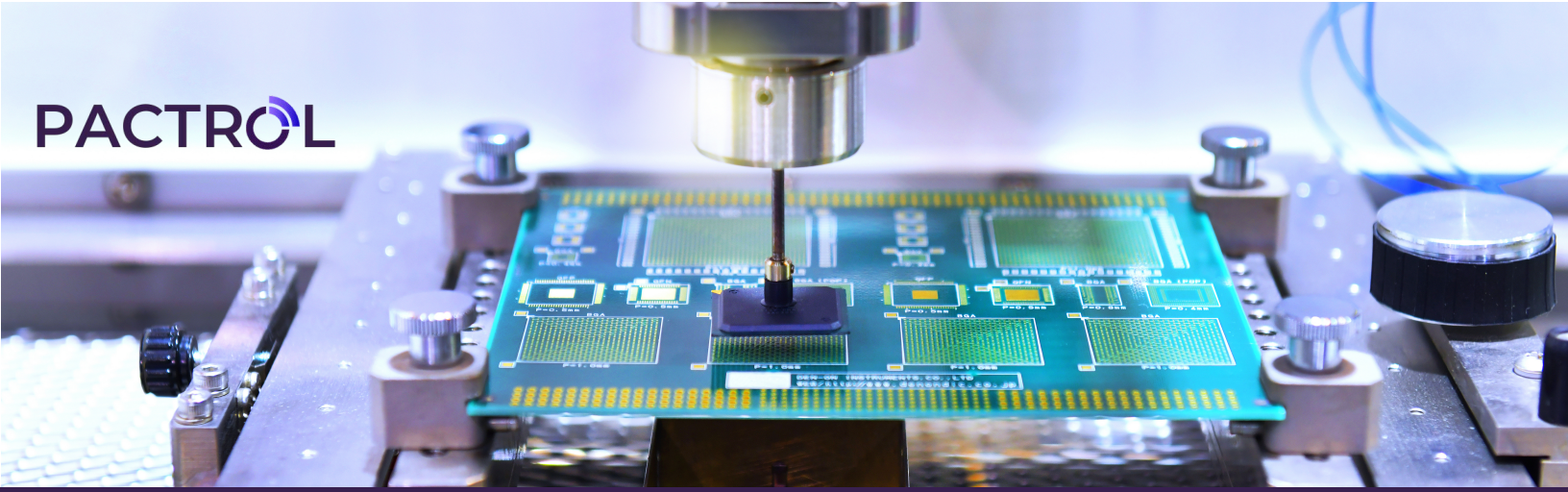
Product Standard Specifications

Customization Options

Low Pressure Sensor



PACTROL



ELECTRONIC CONTROLS

Product	Application	Features
HIU	District Energy	Accurate and Efficient Heating and Hot Water Control Smart Communication Interface Heating Flow and Return Control Water Pressure Sensor Interface Outside/Room Temperature Compensation Opentherm Room Stat Interface
P25F Range	Air Heaters Radiant Heaters Commercial Catering	Hot Surface Ignition Learning Algoritum to maximize igniter lifetime Atmospheric or forced draught applications with optional air proving lockout indicator programmable timing and options
Eco gas	Air Heaters Radiant Heaters	High Efficiency Heater Control Modulation and Temperature Sensing Programmable Timings and options Outside/Room Temperature Compensation Smart Communication Interfaces
CSI/CSS	Air Heaters Radiant Heaters Commercial Catering	Atmospheric or Forced draught applications with optional air proving Programmable timings and options P54 rated housing Diagnostic interface External ignitor output Single or two stage gas valve

HERMETIC PRODUCTS

Glass-to-metal seals (GTMS) provide a way to hermetically isolate electrical conductors from one environment to another. Glass forms a hermetic barrier and acts as an insulator between the pins and housing, since glass exhibits superior dielectric or electrical insulation properties and very low thermal conductivity. GTMS enable reliable electrical power and signal transmission in harsh environments, such as high pressure or temperature excursions and exposure to corrosive chemicals.

Pin Metal Key	
CC	Copper Core
SS	Stainless Steel
A52	Alloy 52
M	Molybdenum
K	Kovar

	Model	Pin Metal	Bursting Pressure[1]	Minimum Dielectric Voltage	Product Images
INDUSTRIAL	**Sensor Feedthrough*†**	A52 SS	25,000 PSI	2,500 volts @ <0.5 mA leakage	
	Pump Feedthrough*†	CC SS	2,250 PSI	2,500 volts @ <0.5 mA leakage	
	Hybrid Car Compressor Electrical Feedthrough*†	CC	Should be verified in customer specific applications	2,500 volts @ <0.5 mA leakage	
	Battery Feedthrough*†	SS A52 M	-	-	
AIR CONDITIONING & REFRIGERATION	**Compressor Feedthroughs*†**	CC	2,250 PSI	2,500 volts @ <0.5 mA leakage	
	CO_2 Compressor Feedthrough*†	CC	8,000 or better PSI	2,500 volts @ <0.5 mA leakage	
	Single Pin Feedthrough*†	SS CC	2,250 PSI	2,500 volts @ <0.5 mA leakage	
	Semi-Hermetic Electrical Feedthroughs*†	CC	Up to 1,450 PSI	5,000 volts @ <0.5 mA leakage utilizing ceramic insulators or rubber overmolding	
	Sight Glasses	-	5,000 PSI	-	

* Hermeticity of < 1 x 10-7 standard cc/sec helium or better
† Insulation Resistance of 10,000 megohm @500 VDC or better
[1] Should be verified in customer specific applications
[2] Hermeticity of < 1 x 10-8 standard cc/sec helium or better

BI-METAL SNAP CONTROLS & LIMITS

Since 1947, Sensience's Therm-O-Disc® has been the global leader in the design, innovation and manufacture of temperature sensors and controls. Our bi-metal snap controls and limits provide temperature control, overheating protection, and unique configurations for many applications covering a wide array of industries.

	Model	Max Calibration	Amps	Switching Action
AUTO RESET	**36T**	220°C (428°F)	15	SPST
	60T	177°C (350°F)	25	SPST/SPDT
	64T	177°C (350°F)	25	DPST
	49T	288°C (550°F)	25	SPST
	69T	112°C (233°F)	25	SPST/SPDT
	44T	149°C (300°F)	1	SPST
	48T	150°C (302°F)	10	SPST
MANUAL RESET	**36T**	177°C (350°F)	15	SPST
	60T	177°C (350°F)	25	SPST
	10H	177°C (350°F)	25	SPST
	66T	113°C (235°F)	40	DPST
	HLX	149°C (300°F)	50	DPST

FUSE "ONE-SHOT"	**36F**	220°C (428°F)	15	SPST
	60F	177°C (350°F)	25	SPST
	64F	149°C (300°F)	40	DPST
	61F	177°C (350°F)	49	SPST
MOISTURE RESISTANT	**37T**	149°C (300°F)	10	SPST/SPDT
	39T	105°C (221°F)	10	SPST
	14T	105°C (221°F)	25	SPST/SPDT
ADJUSTABLE	**58T**	66°C (150°F)	25	SPST
	74T	121°C (250°F)	25	SPST
	59T	93°C (200°F)	30	SPST/SPDT
SPECIALTY	**12S** **14S** **15S**	-	30	SPST/SPDT/ DPST/3 Pole
	10H	177°C (350°F)	25	SPST
	10RS	-	5.7	SPST
	75TF	149°C (300°F) (Auto Reset Function) 177°C (350°F) (Fuse Disc Function)	25	SPST
	30M	149°C (300°F)	50 (LRA)	SPST (Manual Reset)

ADVANCED SENSING TECHNOLOGIES

Sensience, formerly Therm-O-Disc, is a global manufacturer of reliable and innovative sensing, control and sealing components that ensure safety and enhance performance. The company's products and solutions strengthen the connections between data, ideas and people to improve safety and sustainability across a range of applications, including consumer appliances; heating, air conditioning and refrigeration units; industrial process equipment; automotive and transportation; and aircraft.

Important Notice

The scope of the technical and application information included in this article is necessarily limited. Operating environments and conditions can materially affect the operating results of products.

Users must determine the suitability of any component for their specific application, including the level of reliability required, and are solely responsible for the function of the end-use product. It is important to review the Application Notes which can be found at Sensience.com

Sensience.com

Contact Us:
Please scan,
or call 1.419.525.8500