



**Sensata**  
Technologies

**SENSOR AND  
CONTROL  
SOLUTIONS FOR  
DIVERSIFIED  
APPLICATIONS**

**We take pride in knowing that our technologies improve safety, efficiency and comfort for millions of people every day**

For more than 100 years, Sensata has provided a wide range of customized, sensor-rich solutions that address complex engineering requirements to help customers solve difficult challenges in many industries. Sensata's solutions help make products safer, cleaner, more efficient and connected.

## Table of Contents

### Why Sensata

### Solutions Overview

### Applications

#### Food Equipment

7

Espresso Machines

Beverage Dispensers

Professional Kitchen Appliances

#### White Goods

10

Dishwashers, Washing Machines and Dryers

Refrigerators

Vacuum Cleaners

Small Appliances

#### Transportation and Military

14

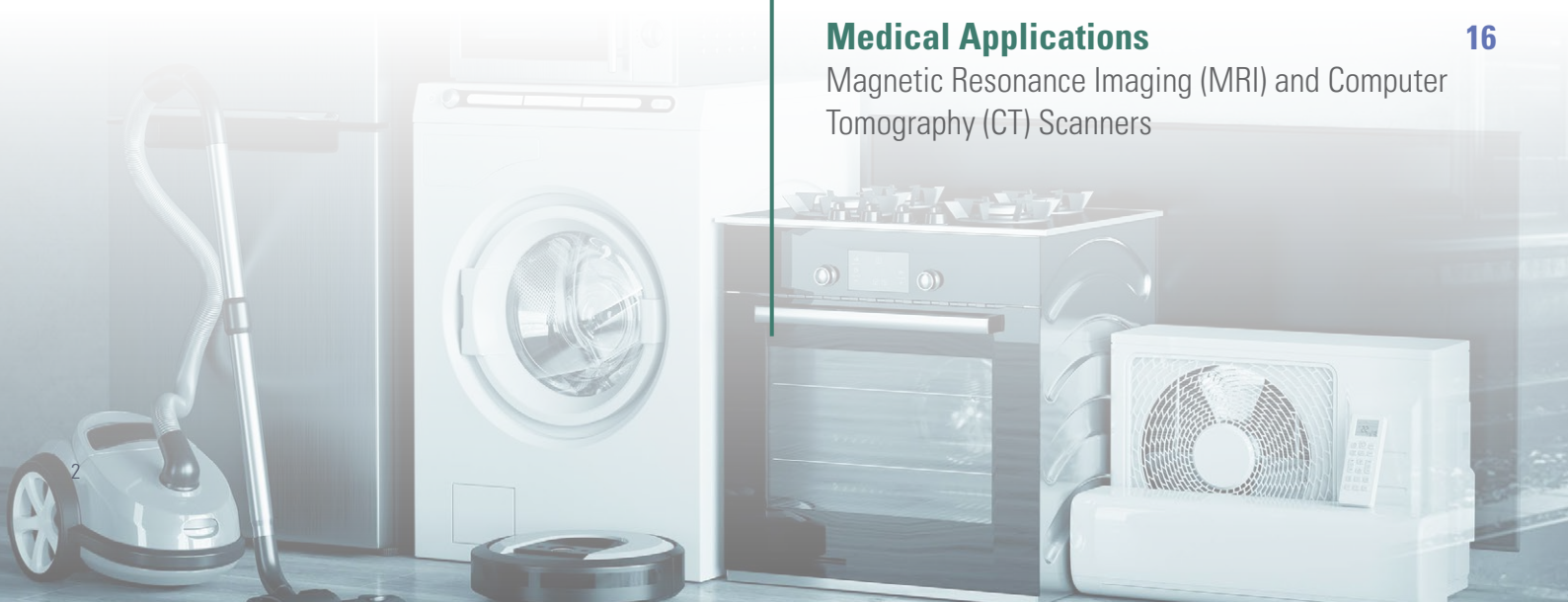
Railway

Vehicles Electric Circuits (Automotive, Military)

#### Medical Applications

16

Magnetic Resonance Imaging (MRI) and Computer Tomography (CT) Scanners



# Sensata solutions for thermal management, including motor and overheat protection, are reliable, cost-effective, and help ensure safety

Diversified applications like large and small household appliances, medical equipment, automotive and railway must perform high quality precision tasks while operating safely to prevent potential hazards or injuries. The market is very competitive, and any quality or safety issues generating product recalls will cause a waste of time and resources, financial losses and damage to the brand reputation of the manufacturers.

**Sensata solutions for thermal management, motor and overheat protection are reliable, cost-effective and help ensure safety. Sensata partners closely with its customers right from the design-concept to ensure a safe and reliable solution. All Sensata products are of exceptional quality and are designed and tested to meet the highest standards. Sensata's team of engineers have the experience and expertise to innovate and problem-solve no matter what the sensor challenges are.**

**Together with you, we enable a safer, cleaner, more connected and more comfortable world.**



**SAFE | CLEAN | EFFICIENT | COMFORTABLE**

## Why Sensata

Sensata's teams have a deep knowledge and understanding of a broad range of industrial applications and offer advice and support to help customers select the right product for their applications. All Sensata's products are of exceptional quality. Sensata takes pride in the flexibility it drive in its operations to customize products on a global scale.

-  Industry-specific knowledge and proprietary technology in mission critical and hard-to-do applications
-  Partnership mindset and flexible technology building blocks configured for customized solutions
-  Cost-effective manufacturing model with concentrated manufacturing operations across the globe
-  Strong teamwork to deliver fast responses to customers, with deep understanding of product design cycles and launch execution

## What Our Customers Say

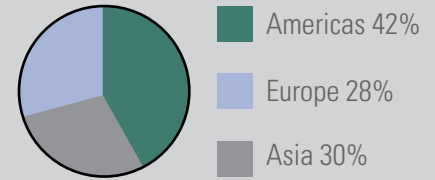
### Global Industrial Washing Machines Manufacturer:

*As an industrial washing machine manufacturer, we develop products which are different from the conventional washing machine used in a household. Our clients are hotels and cleaning companies. Therefore our machines need to withstand a constant operation, accommodating huge quantities of laundry.*

*We need highly reliable, robust and safe components that help our machines operate efficiently and safely all the time. Sensata is one of our preferred suppliers and we managed to build a true partnership along the way, based on trust and mutual understanding. We fully rely on their engineering capabilities and their level of support and engineering knowledge is truly one of their assets.*

## Fast Facts

2021 Net Revenues: **\$3.8B**



**47,000+**

different products  
manufactured

**1.1B**

devices shipped each year,  
each highly engineered

**21,000+**

employees worldwide

**13**

countries with business centers  
and manufacturing sites

# Solution Overview

Application		Pressure Sensors and Switches	Temperature Sensors and Thermal Cut-Outs	Position Sensors and Encoders	Motor Protectors	Solid State Relays	Circuit Breakers	Operator Controls
Professional Food Equipment	Beverage Dispensing Machines	•	•	•	•	•		
	Espresso Machines	•	•		•	•		
	Professional Kitchen Appliances	•	•	•	•	•		
Major Appliances	Washing Machines		•		•			
	Dishwashers		•		•			
	Dryers		•		•			
	Refrigerators		•		•			
Medium and Small Appliances	Vacuum Cleaners		•		•			
	Blenders		•		•			
	Hair Dryers		•		•			
Railway	Railway	•	•	•	•	•	•	
Automotive	Automotive Electric Systems		•		•		•	
Military Equipment	Military Vehicles Electric Systems		•		•		•	
Medical Application	CT/MRI							•

## Functional Solutions

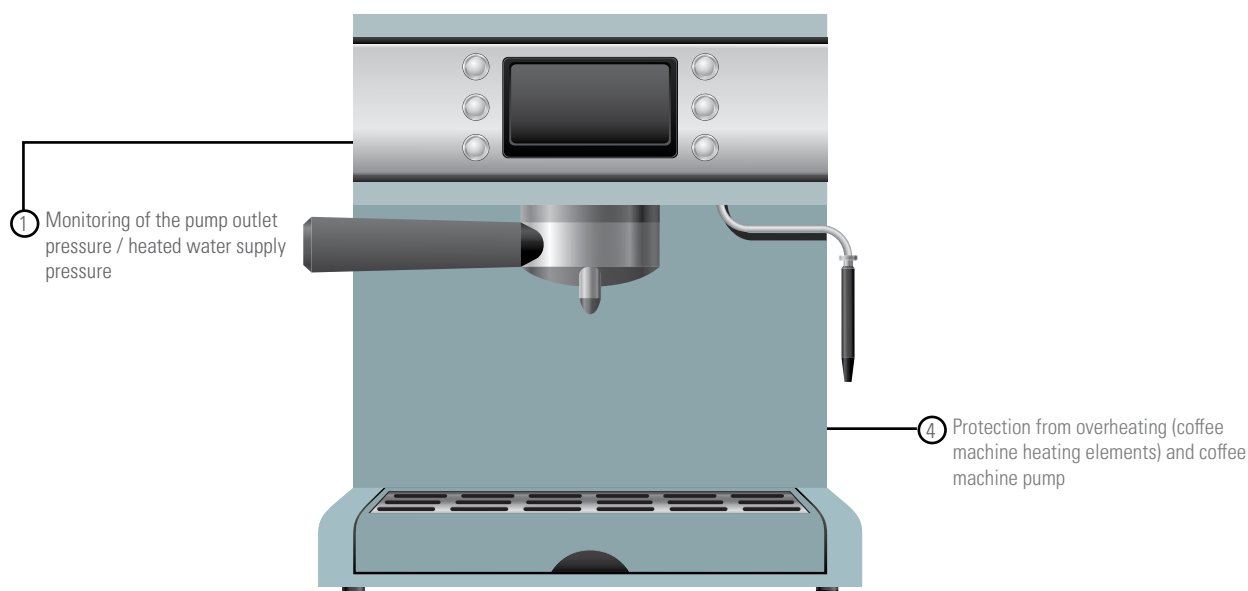
<p><b>Pressure Sensors and Switches</b></p> <p>Sensata offers a broad portfolio of pressure products based on a variety of proven technologies, from pressure sensors that offer ranges from 1 inch H<sub>2</sub>O to 10,000psi or vacuum up to 700bar, to our highly reliable pressure switches with a wide range from 0 – 2000 psi or 0 – 140 bar.</p>	<p><b>Temperature Sensors and Thermal Cut-Outs</b></p> <p>Sensata’s comprehensive range of thermal solutions can meet many electrical protection needs. Its portfolio is easily configurable and includes rugged industrial thermostat switches and temperature sensors, with a wide range of form factors and connection options.</p>	<p><b>Position Sensors and Encoders</b></p> <p>Sensata’s comprehensive position sensor line includes incremental and absolute encoders, hall effect sensors, rotary and linear potentiometers as well as inclinometers and draw wire solutions for a broad variety of applications within many industrial markets.</p>
<p><b>Motor Protectors and Circuit Breakers</b></p> <p>These products, including magnetic hydraulic circuit breakers, ground fault circuit interrupters, power switches and fuses, accurately protect against fault conditions and provide power distribution and control. They have an innovative design and proven performance.</p>	<p><b>Solid State Relays</b></p> <p>Sensata’s Crydom brand is a market leader with the widest range of off-the-shelf solid state relays and contactors, as well as custom-designed solid state switching solutions for professional ovens, vending machines, deep fat fryers, coffee machines and more.</p>	<p><b>Operator Controls</b></p> <p>Sensata designs and manufactures advanced operator controls and integrated systems with embedded diagnostics meeting strict product safety standards in medical, material handling and mobile elevating work platforms that simplify operation, increase reliability, and improve efficiency.</p>


## Commercial Espresso Machines

Water pressure measurement in professional coffee machines is required in the boiler and brewing loops. Pressure instruments must be accurate, able to withstand the temperatures and stresses generated by cleaning processes and have specialized wetted parts, certified for drinking water and food applications, as the use of pressure instrumentation is an essential part of safe food production.

To guarantee constant espresso quality the brew pressure (pump outlet pressure) must be stable. To ensure this espresso machine manufacturers install an over pressure valve (OPV) at the pump outlet side. An OPV can be adjusted with a screwdriver and is not always accessible without dismantling the machine. As manufacturers are constantly improving their technology and considering easy-to-use consumer requirements, modern coffee machines allow regulation of the brew pressure with a single button, which is easily accessible from outside the machine. In this case, an OPV is being substituted by a proportional valve and a pressure transducer, installed behind the valve.


**Pressure transducers from Sensata can be used to monitor brewing pressure: either in the cold-water piping, where the sensor is connected to the pump outlet, or in hot water piping, behind the boiler.**



①  **116CP Pressure Sensor**


- Accurate and reliable pressure measurement offered in a compact plastic package
- Drinking water certifications available

Monitoring of the pump outlet pressure and heated water supply pressure

②  **60CP, 70CP Ceramic Capacitive Pressure Sensors**


- Enhanced accuracy over wide operating range; housing options compatible with most media
- EMC protection to 100 V/m; broad operating temperature range (-40°C to 135°C)
- Exceptional shake and vibration tolerance
- Overvoltage and reverse polarity protection; small size and simple installation

Monitors the pump outlet pressure or the heated water supply pressure

③  **81CP, 100CP, 35CP Pressure Sensors**

- Robust and accurate, reliable at high operating pressure ranges
- Drinking water certifications available

Monitoring of the pump outlet pressure and heated water supply pressure

④  **1NT, 2MM Thermostats**

- Cost effective thermostat with high temperature capability, clean processing, high impact strength, low static generation
- Many termination and mounting configurations available
- Meets agency requirements for single operation device

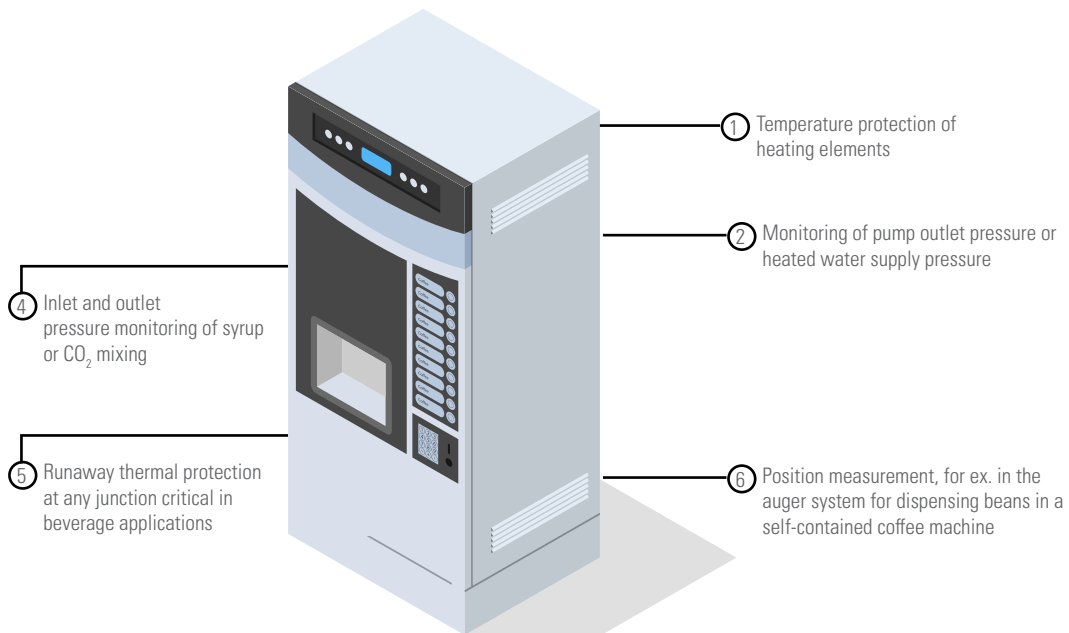
Protection from overheating (coffee machine heating elements) and coffee machine pump

# Commercial Beverage Systems

**Sensata's solutions range from the sensors that monitor system temperature to the relays that can withstand the high quantity of switching needed for commercial activity.**

Consumers' tastes in beverages have grown more eclectic over the years. Restaurants and cafes are expected to have the variety necessary to satisfy many different beverage desires. Furthermore, the prevalence of self-service beverage systems has increased as well. Through automation, restaurants must provide complex drinks to the customer in a consistent fashion. Versatility and automation are not the only factors. Size is also critical. Bar and kitchen space is at a premium and operators expect their beverage machine to accomplish more in the same or smaller footprint. Durability is a major concern as well. Beverage systems must withstand the wear and tear of constant commercial usage.

The trends in beverage systems are leading to an increased need for better and more efficient sensors and electronics. Sensata provides many components that make complex beverage systems possible and efficient. Our solutions range from sensors that monitor the temperature of systems to relays that can perform the high quantity of switching needed for commercial activity.



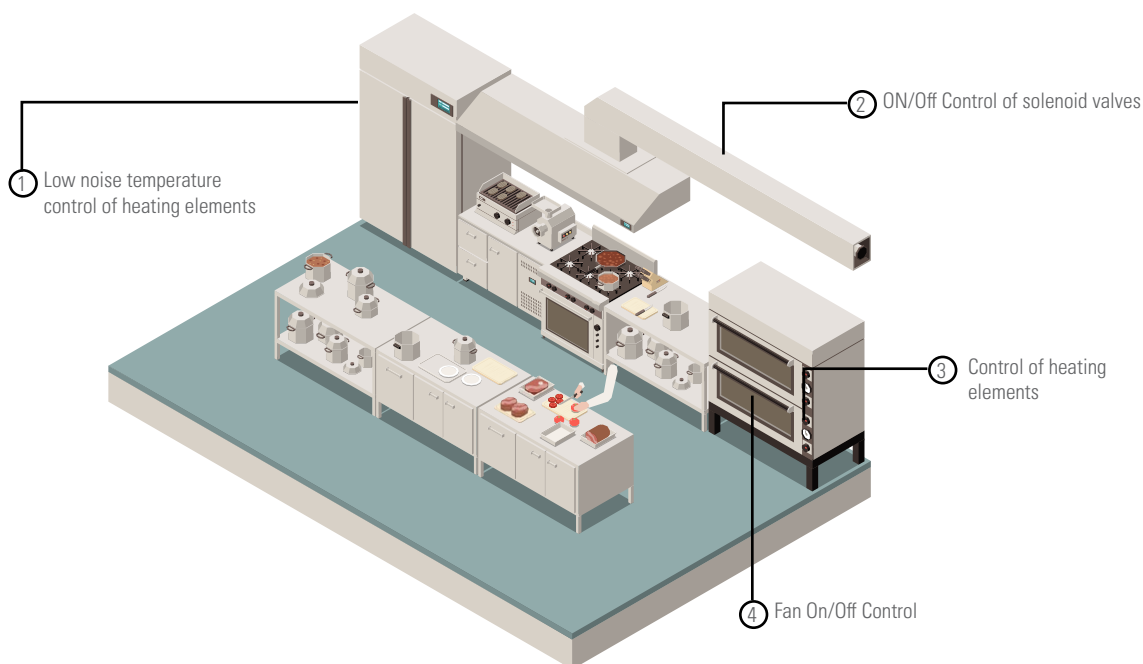
①		<b>EL, PMP Solid State Relays</b>	<ul style="list-style-type: none"> <li>• Compact package suitable for the space constraints of beverage systems</li> <li>• With no moving parts, it has the durability to last in demanding commercial applications</li> <li>• Allows for tighter and more consistent control of heating systems present in beverage systems</li> </ul>	Temperature protection of the heating elements
②		<b>116CP Pressure Sensors</b>	<ul style="list-style-type: none"> <li>• Accurate and reliable pressure measurement, offered in a compact plastic package</li> <li>• Drinking water certifications available</li> </ul>	Monitoring of the pump outlet pressure or the heated water supply pressure
③		<b>60CP Pressure Sensor</b>	<ul style="list-style-type: none"> <li>• Robust and accurate, reliable at high operating pressure ranges</li> <li>• Drinking water certifications available</li> </ul>	Monitoring of the pump outlet pressure or the heated water supply pressure
④		<b>P500, P528 Pressure Sensors</b>	<ul style="list-style-type: none"> <li>• Very durable. The minimum life expectancy is of 10 million cycles</li> </ul>	Inlet and outlet pressure monitoring of the syrup or CO <sub>2</sub> mixing
⑤		<b>1NT, 3NT Thermostats</b>	<ul style="list-style-type: none"> <li>• Due to the innovative dry seal design, the 3NT is ideal in beverage systems where moisture build up is common</li> </ul>	Runaway thermal protection at any junction is critical in beverage applications
⑥		<b>ACW4 Hall Effect Position Sensor</b>	<ul style="list-style-type: none"> <li>• Reverse polarity, short circuit protection available</li> <li>• Completely encapsulated electronics</li> </ul>	Position measurement, for ex. in the auger system for dispensing beans in a self-contained coffee machine







# Professional Kitchen Appliances

Today's successful restaurants and cafes rely upon the latest machinery for cooking, warming and beverage preparation. This includes mixers, convection ovens, combi steamers, deep fat fryers, dough divider rounders, food warming cabinets, coffee machines, etc. This demand has increased the use of highly accurate digital control technology that ensures compliance with related standards, such as low EMC (Electromagnetic Compatibility) directives for commercial and household use.

Sensata offers a broad range of solid state relays and contactors that are perfectly suited for use in the food equipment industry.

**Solid state relays are well suited for use with digital control signals due to their low input current and higher switching speed, which is required to maintain proper temperature control.**



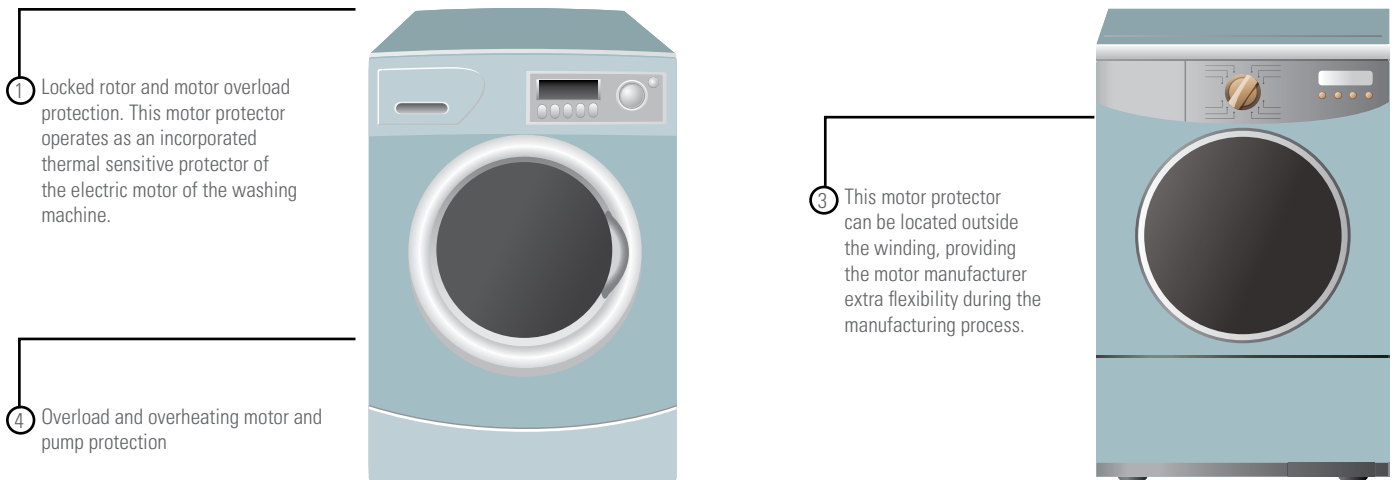
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|---|---|--|--|
| ① |  | <p><b>LN Solid State Relay</b></p> <ul style="list-style-type: none"> <li>• Panel mount solid state relay with patented low noise circuit</li> <li>• Built-in overvoltage protection</li> </ul>  | Low noise temperature control of the heating elements                                    |
| ② |  | <p><b>SeriesOne DR Solid State Relay</b></p> <ul style="list-style-type: none"> <li>• Compact DIN Rail Mount, ratings of 3, 6 and 12 Amps, LED input status indicator</li> <li>• Single or dual channel (AC output Only) - AC or DC control</li> <li>• UL Class I and II, Division 2 &amp; ATEX approved for hazardous locations</li> </ul>  | ON/Off Control of the solenoid valves  |
| ③ |  | <p><b>PMP Proportional Control Solid State Relay</b></p> <ul style="list-style-type: none"> <li>• Single phase proportional controller, output ratings up to 90 Amps at 600 VAC</li> <li>• Selectable operation mode: phase angle or burst fire control, selectable Control Input: 4-20 mA input does not require an auxiliary power supply, LED multifunction status indicator</li> </ul> | Control of the heating elements  |
| ④ |  | <p><b>DRC Solid State Relay</b></p> <ul style="list-style-type: none"> <li>• Suitable for frequently switching on and off three phase loads</li> <li>• Available in both contactor versions and reversing contactor versions</li> </ul>  | Fan On/Off control   |
| ⑤ |  | <p><b>1NT Thermostats</b></p> <ul style="list-style-type: none"> <li>• Cost effective thermostat with high temperature capability, clean processing, high impact strength, low static generation</li> <li>• Many termination and mounting configurations available</li> <li>• Meets agency requirements for single operation device</li> </ul>   | Control of the heating elements for ovens or microwaves                                  |
| ⑥ |  | <p><b>17MP Motor protectors</b></p> <ul style="list-style-type: none"> <li>• Robust, accurate and reliable bi-metal technology</li> <li>• Flexible mounting solutions in/on/off winding</li> </ul>   | Protection of the heating of fan motors, blender motors, kitchen robots or kitchen hoods |







# Dishwashers, Washing Machines and Dryers

**Sensata's motor protectors can be located outside the winding, providing the motor manufacturer extra flexibility during the manufacturing process.**

Washing machines are an indispensable appliance of any home today and people cannot imagine their daily life without one. Therefore, washing machines must work properly and operate safely, no matter how many washing cycles are needed over time. Dryers are also a useful addition especially in urban areas where space can be limited.

However, they can also be dangerous, and the hazards can be numerous, so ensuring the safety functions of washers is very important. Features aside, water appliances may leak, and heating elements can overheat and catch fire, so the motor and overheating protection are extremely important.

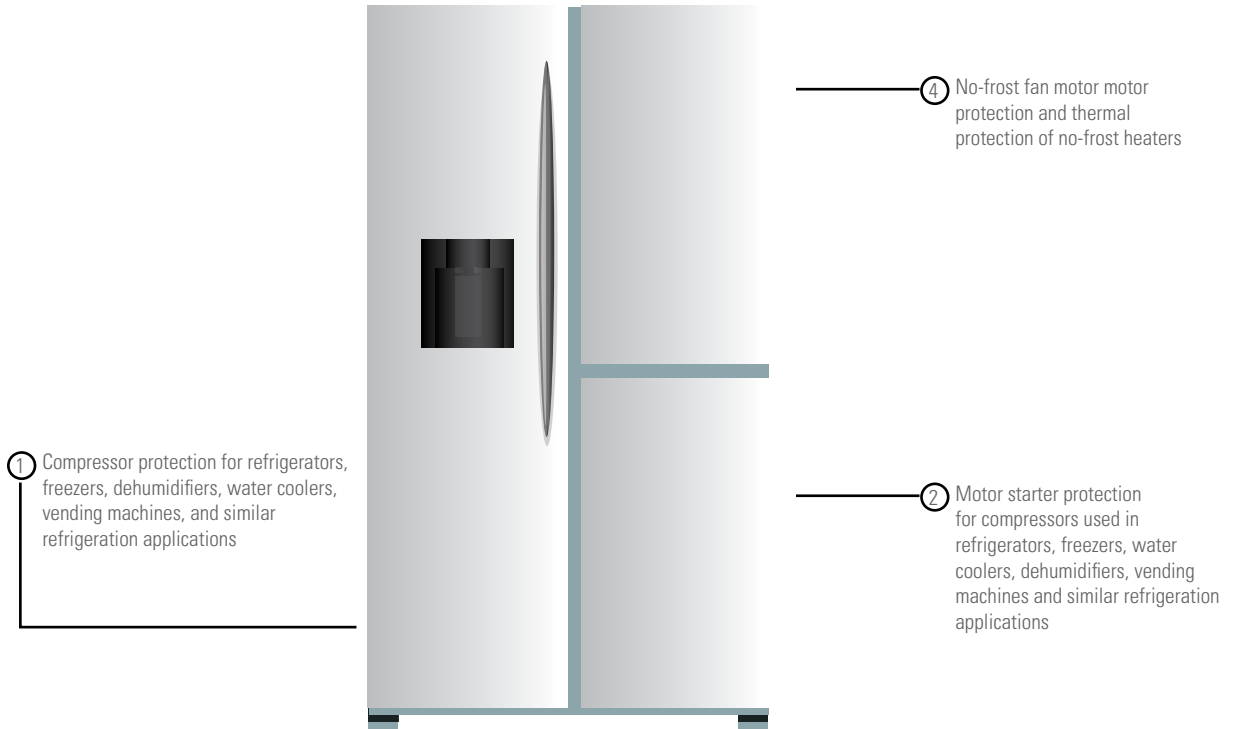






	<p><b>1NT Thermostats</b></p> <ul style="list-style-type: none"> <li>• Cost effective thermostat with high temperature capability, clean processing, high impact strength, low static generation</li> <li>• Many termination and mounting configurations available</li> <li>• Meets agency requirements for single operation device</li> </ul>	<p>Protection of the heating elements</p>
	<p><b>15AM Motor protector / Thermal cut-out</b></p> <ul style="list-style-type: none"> <li>• Robust, accurate and reliable bi-metal technology</li> <li>• Flexible mounting solutions in/on/off winding</li> <li>• Operates as an incorporated thermal sensitive protector of the electric motor of the washing machine</li> </ul>	<p>Locked rotor and motor overload protection.</p>
	<p><b>7AM Lighting, Electrical, Thermal, Battery, Motor Protector</b></p> <ul style="list-style-type: none"> <li>• Delivers maximum protection in the smallest package at a competitive price</li> <li>• Optimum snap-acting open and reset characteristics necessary to achieve consistent performance over the required life cycle</li> </ul>	<p>Overload and overheating motor and pump protection</p>
	<p><b>3MP Motor protector</b></p> <ul style="list-style-type: none"> <li>• Motor protector for 120 and 250 Vac applications to operate in wide temperatures and current ranges</li> <li>• Provides consistent performance characteristics and excellent reliability</li> <li>• The certification as a thermal cut-out device combined with its unique current sensitivity, positions the 3MP as an advanced and cost effective solution to protect toroidal transformers</li> </ul>	<p>3MP features permit to move the motor protector location outside the winding, providing the motor manufacturer extra flexibility during the manufacturing process.</p>
	<p><b>7MP Motor protector</b></p> <ul style="list-style-type: none"> <li>• Motor protector for 120 and 250 Vac applications to operate in wide temperature and current ranges</li> <li>• Provides consistent performance characteristics and excellent reliability</li> </ul>	<p>Overload and overheating motor and pump protection</p>
	<p><b>17AM Motor protector</b></p> <ul style="list-style-type: none"> <li>• Robust, accurate and reliable bi-metal technology</li> <li>• Flexible mounting solutions in/on/off winding</li> </ul>	<p>Overload and overheating motor and pump protection</p>

# Refrigerators

Refrigerators must be safe against fire due to motor overheating. Internal temperature sensors or thermal switches are installed to perform an automatic power shut off in the case of a fire. These thermal switches must be reliable and work in a timely fashion to avoid any potential fire hazard.

**Sensata's motor protectors provide overload protection in commercial motors which function in destructive or corrosive environments.**









	<p><b>4TM Plug-On Motor Protectors for Compressors</b></p> <ul style="list-style-type: none"> <li>• Compatible with PTCR starters and electromechanical relays and conform with worldwide certification agency standards</li> <li>• Its operating parameters are not affected by contact wear because the contacts are not part of the resistance circuit and are not part of the temperature calibration mechanism</li> <li>• Reduced temperature drift over life cycles, repeatability of trip time and ultimate trip, resistance to physical and thermal shock</li> </ul>	<p>Compressor protection for refrigerators, freezers, dehumidifiers, water coolers, vending machines, and similar refrigeration applications</p>
	<p><b>8EA Motor Starter Protectors</b></p> <ul style="list-style-type: none"> <li>• Cost-effective alternative to electro-mechanical relays, performing the PTC (positive temperature coefficient) solid-state starter function</li> <li>• Plugs directly onto the compressor terminal pins, and is frequently used with the 4TM plug-on motor protector</li> </ul>	<p>Motor starter protection for compressors used in refrigerators, freezers, water coolers, dehumidifiers, vending machines and similar refrigeration applications</p>
	<p><b>MSC Motor Starter Protector Combo</b></p> <ul style="list-style-type: none"> <li>• Compact, reliable, low power consumption motor starter and motor protector package that dissipates less than 2 watts under typical operating conditions</li> <li>• Utilizes ceramic PTC (Positive Temperature Coefficient) thermistor element to energize and de-energize motor start windings</li> <li>• Available for 120 and 220 volt applications, with many possible configurations</li> <li>• Less costly to install than discrete motor starter and protector components</li> </ul>	<p>One single package for compressor motor protection and motor starters used in residential refrigerators and freezers</p>
	<p><b>1NT Thermostats</b></p> <ul style="list-style-type: none"> <li>• Cost-effective thermostat with high temperature capability, clean processing, high impact strength, low static generation</li> <li>• Many termination and mounting configurations available</li> <li>• Meets agency requirements for single operation device</li> </ul>	<p>No-frost fan motor motor protection and thermal protection of the no-frost heaters</p>

# Vacuum Cleaners

**Sensata's 7AM motor protectors deliver the maximum protection of the motor and of the pump, in the smallest package at a competitive price.**

People trust their vacuum cleaners to clean their homes and rarely give these products more than a second of thought. Unfortunately, vacuum cleaners are electronic components that can malfunction. Therefore, vacuum cleaners need robust and safe motor protectors and circuit breakers in order to prevent any short circuit in the power cord. A short circuit could lead to a fire and may cause injuries to the person operating the vacuum. Damages to brand reputation can be overwhelming for manufacturers.



①		<b>15AM Motor protector / Thermal cut-out</b>	<ul style="list-style-type: none"> <li>Robust, accurate and reliable bi-metal technology</li> <li>Flexible mounting solutions in/on/off winding</li> <li>Operates as an incorporated thermal sensitive protector of the electric motor</li> </ul>	Locked rotor and motor overload protection
②		<b>7AM Lighting, Electrical, Thermal, Battery, Motor Protector</b>	<ul style="list-style-type: none"> <li>Delivers maximum protection in the smallest package at a competitive price</li> <li>Optimum snap-acting open and reset characteristics necessary to achieve consistent performance over the required life cycle</li> </ul>	Overload and overheating motor protection when the vacuum cleaner has a washing function or a steamer
③		<b>3MP Motor protector</b>	<ul style="list-style-type: none"> <li>Motor protector for 120 and 250 Vac applications to operate in wide temperatures and current ranges</li> <li>Provides consistent performance characteristics and excellent reliability</li> </ul>	3MP features permit to move the motor protector location outside the winding, providing the motor manufacturer extra flexibility during the manufacturing process
④		<b>7MP Motor protector</b>	<ul style="list-style-type: none"> <li>Motor protector for 120 and 250 Vac applications to operate in wide temperatures and current ranges</li> <li>Provides consistent performance characteristics and excellent reliability</li> </ul>	Overload and overheating motor and pump protection
⑤		<b>17AM Motor protector</b>	<ul style="list-style-type: none"> <li>Robust, accurate and reliable bi-metal technology</li> <li>Flexible mounting solutions in/on/off winding</li> </ul>	Overload and overheating motor and pump protection
⑥		<b>3MP Self Hold Motor Protectors</b>	<ul style="list-style-type: none"> <li>Self hold motor protector for both 120 &amp; 250 Vac applications in a wide current range ensures a high level of safety</li> <li>Housing is covered by the plate on which a heater can be welded to increase the current sensitivity of the device</li> </ul>	Overheating protection of the brush motor. Also used in domestic and industrial electric motors for washers, vacuum cleaners, chain saws, trimmers, lawn mowers and pumps

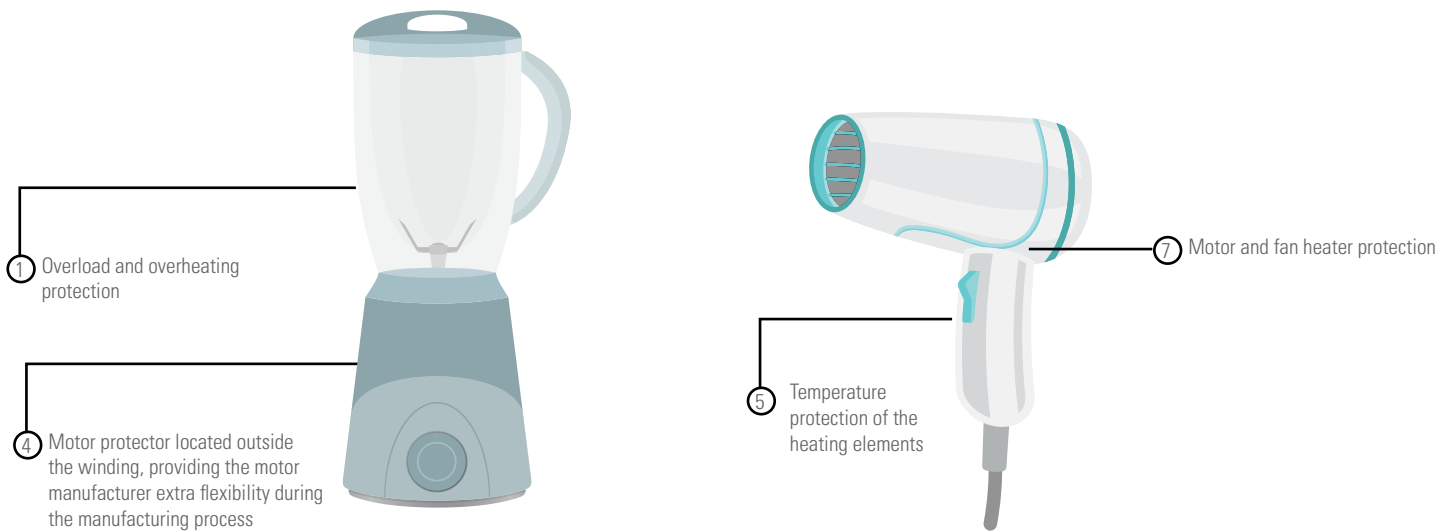
# Small Appliances

Small appliances like blenders or hair dryers can overheat when left plugged into the electrical connection. This poses a potential fire hazard, even when the appliance is switched off.

The bearings in the blender blades assembly can become seized from liquid and food seeping through, causing the motor to work harder than it should, and either overheat or burn out. Dull blades from blending large amounts of ice or other hard foods can also cause stress on the motor, sometimes resulting in a burning smell. Brushes and seals wear down over time when the blender is heavily used and allow liquid to get into the motor.

Sensata motor protectors ensure that the motor of these applications will not overload, protecting it from burning or electrical smells.

**Sensata's solutions protect against start winding overheating and other conditions which generate high main winding currents.**

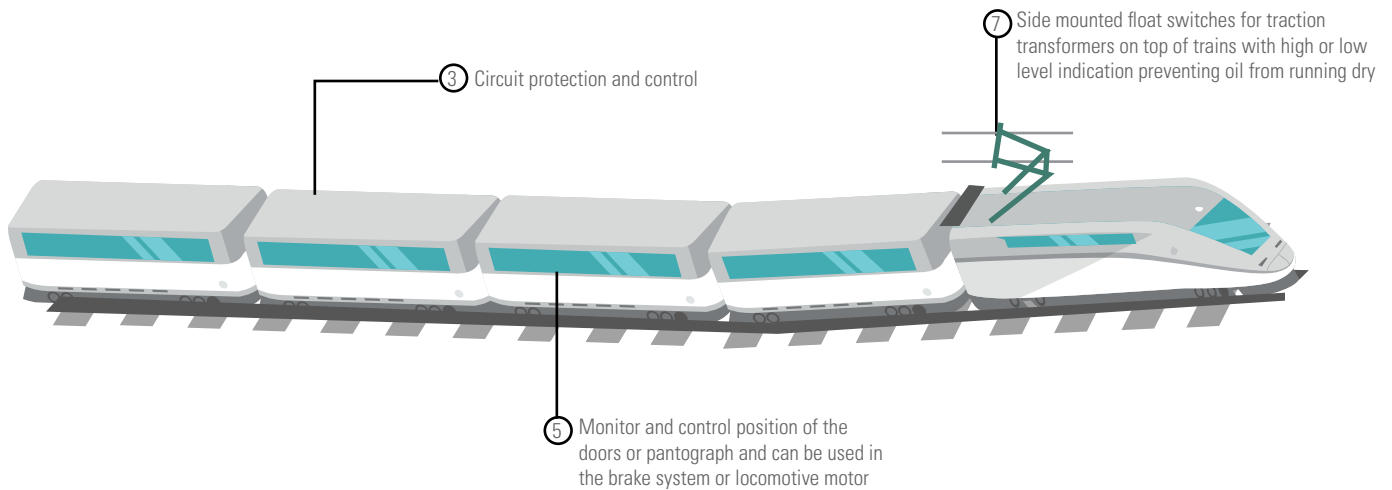









①		<b>3MPSH Motor protector</b>	<ul style="list-style-type: none"> <li>Proven bi-metal technology ensuring overload and overheating protection</li> </ul>	Overload and overheating protection
②		<b>7MP Motor protector</b>	<ul style="list-style-type: none"> <li>Motor protector for 120 and 250 Vac applications to operate in wide temperatures and current ranges</li> <li>Provides consistent performance characteristics and excellent reliability</li> </ul>	Overload and overheating motor and pump protection
③		<b>7MPSH Self-Hold Motor Protector</b>	<ul style="list-style-type: none"> <li>Provides high level of safety for appliances with free access to rotating parts and minimizes the total cost of the motor protection function</li> <li>Unique combination of bimetal disc and resistivity wire guarantees</li> </ul>	Overload and overheating motor and pump protection
④		<b>3MP Motor protector</b>	<ul style="list-style-type: none"> <li>Motor protector for 120 and 250 Vac applications to operate in wide temperatures and current ranges</li> <li>Provides consistent performance characteristics and excellent reliability</li> </ul>	Location outside the winding, provides the motor manufacturer extra flexibility during the manufacturing process
⑤		<b>TH Series Thermostat</b>	<ul style="list-style-type: none"> <li>Compact size for overheating protection with proven reliability</li> <li>Flexible mounting with 3 terminal configurations available, robust design with bimetal disc</li> <li>Provides stable setting value, low price due to the particular design providing high competitiveness</li> </ul>	Temperature protection of the heating elements
⑥		<b>MA10 Thermal Cut-Out</b>	<ul style="list-style-type: none"> <li>The MA10 has set the world standard in the field of open type temperature cutouts</li> <li>Offers reliable protection in a variety of small domestic and personal care appliances</li> </ul>	Motor and fan heater protection, is being used for higher wattage products
⑦		<b>YS10 Thermal Cut-Out</b>	<ul style="list-style-type: none"> <li>Automatically resettable, incorporated thermal cut-out, reliable long life</li> <li>High current capacity to cut off power circuit</li> </ul>	Motor and fan heater protection, with usage in higher wattage systems

# Railway

**Sensata's circuit protectors are designed using the latest in sensitive hydraulic magnetic technology. Ambient temperature does not affect their operation.**

Sensata's magnetic circuit protectors provide cost effective power switching, reliable circuit protection and accurate circuit control. Designed using the latest in sensitive hydraulic magnetic technology, ambient temperature does not affect the operation, making the range suitable for many rail applications and environments, wherever precision operation is required.



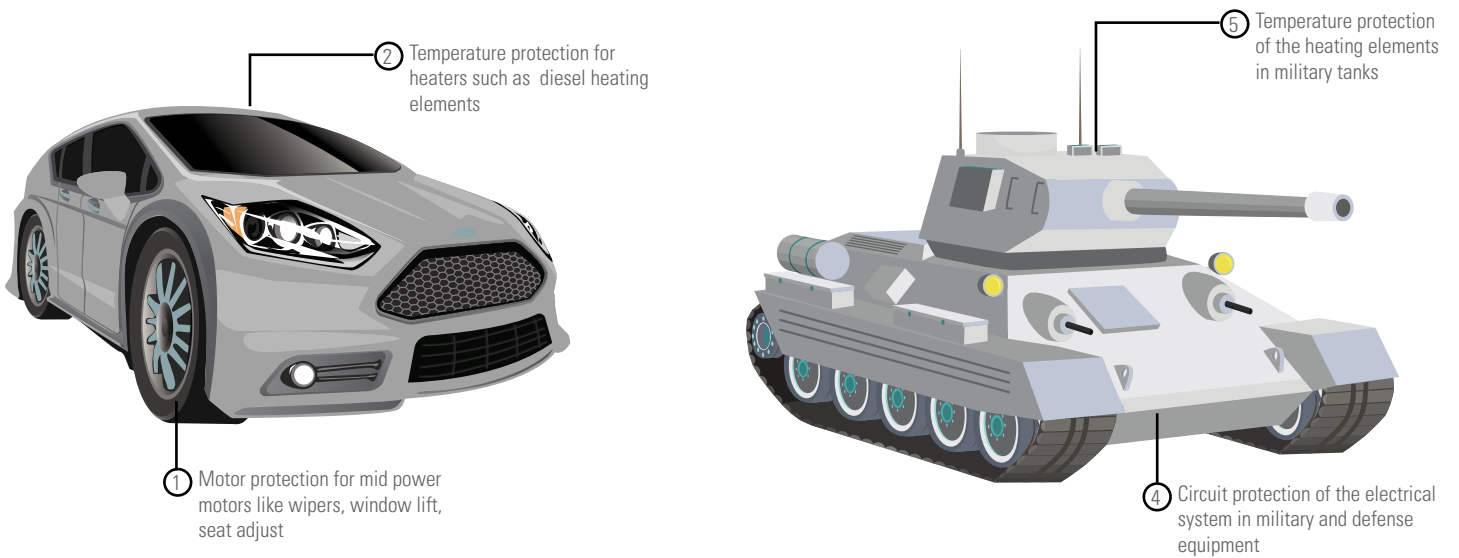
	<p><b>DR22, CW, Series1 Solid State Relays</b></p>	<ul style="list-style-type: none"> <li>Ratings up to 35 Amps at 600 VAC, with configurations offering versatility and the possible use of plug-in connectors for control input in either standard "screw" or "spring cage" terminals</li> </ul>	<p>Rail heating and rail switch control</p>
	<p><b>CS, Series1, SeriesOne DR Solid State Relays</b></p>	<ul style="list-style-type: none"> <li>Compact design, fast switching capability, compatibility with multiple control systems</li> </ul>	<p>Rail door actuators, rail road signaling and traffic control systems</p>
	<p><b>IAG, IUG, IAL, IUL Series Magnetic Circuit Breakers</b></p>	<ul style="list-style-type: none"> <li>Cost effective power switching, reliable and accurate circuit control</li> <li>Enables precision operation and is not affected by ambient environment</li> </ul>	<p>Circuit protection and control</p>
	<p><b>DH05 Optical Incremental Encoders</b></p>	<ul style="list-style-type: none"> <li>Robust and excellent resistance to shocks / vibrations</li> <li>High protection level IP65, high resolutions available, universal electronic circuits from 4.75 to 30 Vdc</li> </ul>	<p>Monitor and control position of the doors or pantograph, and can be used also in the brake system or in the locomotive motor</p>
	<p><b>PH05 Absolute Multiturn Encoders</b></p>	<ul style="list-style-type: none"> <li>58mm encoder, extra-flat, Ø14mm through shaft version, reduction hubs available</li> <li>Robust and excellent resistance to shocks / vibrations, high protection level IP65, high performances in temperature -20°C to 85° (-30°C option)</li> </ul>	<p>Train speed control. Can be used also in the brake system.</p>
	<p><b>9360 Hall Effect Rotary Position Sensor</b></p>	<ul style="list-style-type: none"> <li>Shaft Size: 4.6mm, resolution (Max): 12 Bit, range of Motion: 15° to 360°, standard operating temperature °C: -40 to +85</li> <li>Extreme Environments: wet, dirty/dusty, extended temperature, high shock and vibration</li> </ul>	<p>Monitors position of the pedals and handles in the operator cabin</p>
	<p><b>S35 Series Flange Mount Side Entry Switch</b></p>	<ul style="list-style-type: none"> <li>Flange mount, side mounted float switches for traction transformers on top of trains</li> <li>Single and dual level versions available</li> <li>Enclosure Stainless Steel IP68 or Aluminium IP65</li> <li>All custom built to customers application</li> <li>Designed and tested to railway industry acceptance</li> </ul>	<p>Side mounted float switches for traction transformers on top of trains with high or low level indication preventing oil from running dry</p>

# Vehicles Electric Circuits

Thermal automotive circuit breakers are devices used to break the flow of current in automotive circuits in order to protect them against a fault such as an overcurrent or short circuit. The thermal aspect of this type of circuit breaker allows for smaller over-currents over a longer period of time, but will quickly trip the circuit for larger over-currents. This is useful in the case of motors as there will be a small overcurrent each time the engine is switched on for a short length of time, which should not trip the circuit.

Thermal automotive circuit breakers from Sensata protect electrical networks in most types of vehicles, including cars, vans, buses, boats but also military and defense vehicles or any other types of transportation equipment.

**Sensata's thermal automotive circuit breakers protect electrical networks in most types of vehicles including cars, vans, buses, boats, and military and defense vehicles.**



**5AP, 6AP, SMB Thermal Motor Protectors**

- Reacts to both current and temperature, with a wide variety of standard thermal configurations
- Terminal material provides trouble-free welding
- Unique combination of bimetal disc and resistivity wire guarantees very precise tripping times thus prevents too high motor temperature

Motor protection for mid power motors like wipers, window lift, seat adjust



**1NT Thermostats**

- Cost effective thermostat with high temperature capability, clean processing, high impact strength, low static generation
- Many termination and mounting configurations available
- Meets agency requirements for single operation device

Temperature regulation of the Diesel heater



**EXT Mini-Circuit Breakers**

- Designed for wiring harness protection in 12 Volt automotive applications
- Sensitive to both over-current and over-temperature fault conditions

Circuit protection of the electrical systems when they occasionally experience momentary overloads



**IAG/IUG/IAL/IUL Series Magnetic Circuit Breakers**

- Cost effective power switching, reliable and accurate circuit control
- Enables precision operation and is not affected by ambient environment

Circuit protection of the electrical system in military and defense equipment



**7BT High-Current Sealed Thermostats**

- High current capacity thermostats providing an environmentally sealed thermal switch capable of carrying up to 15 amps at 120VAC or 10 amps at 30 VDC
- Designed around a bi-metallic disc, it provides crisp, positive switching action in a device that protects against dust and other foreign particles

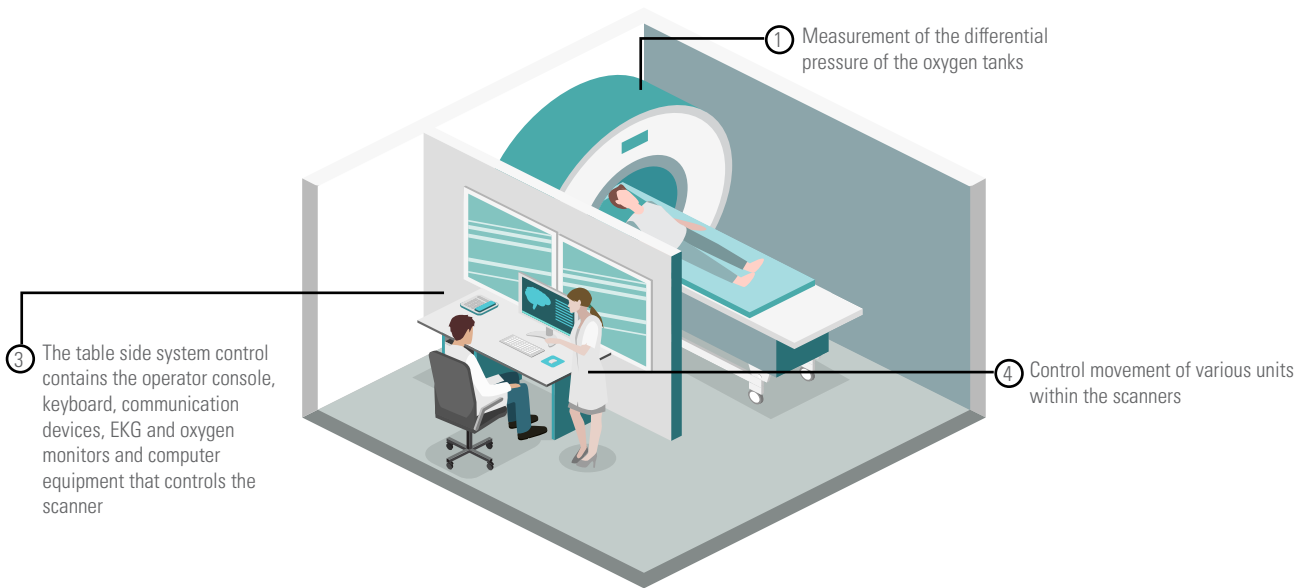
Temperature protection of the heating elements in military tanks








# Magnetic Resonance Imaging (MRI) and Computer Tomography (CT) Scanners

**Sensata can develop custom and exclusive operator control solutions for computer tomographic and magnetic resonance imaging scanners, ensuring knowledge property transfer and allowing medical OEMs to focus on the creation of more innovation.**

Our medical product offering and experienced application engineers help medical equipment designers in finding the right sensing solution for a variety of medical applications, including ventilators, oxygen concentrators, patient monitoring systems, laboratory, vascular equipment, and more. Our sensors for medical applications are reliable, accurate, robust, and have a long life cycle.

Besides these sensing solutions, Sensata can develop also custom and exclusive operator control solutions for computer tomographic and magnetic resonance imaging scanners, ensuring knowledge property transfer. We partner with you right from the design stage and our deep engineering knowledge of the applications, as well as our partnership approach, will contribute to develop top quality, ergonomic and high-class design control solutions for your unique end equipment.



①		<b>P1J Differential Pressure Sensors</b>	<ul style="list-style-type: none"> <li>• Compact package, with internal temperature compensation providing accurate and reliable measurement</li> <li>• The industry standard terminal pins allow for easy printed circuit board designs</li> </ul>	Measurement of the differential pressure of the oxygen tanks
②		<b>Linear and Rotary Voice Coil Actuators (VCA)</b>	<ul style="list-style-type: none"> <li>• Capable of withstanding billions of cycles of use, constructed with high energy product rare earth magnets</li> <li>• Moving coil and moving magnet designs available</li> </ul>	Control precision and high accuracy motion
③		<b>Table Side System Control</b>	<ul style="list-style-type: none"> <li>• Ergonomic design, top-quality materials, complex unit connected to the system</li> <li>• Includes upper &amp; lower shells, joystick silicones and silicone buttons, handle, joysticks, emergency stop button</li> </ul>	The table side system control contains the operator console, keyboard, communication devices, EKG and oxygen monitors and computer equipment that controls the scanner
④		<b>Operator Control Unit</b>	<ul style="list-style-type: none"> <li>• Smart control unit, ergonomic design, top quality materials and components</li> </ul>	Control movement of various units within the scanners
⑤		<b>Operator Joystick</b>	<ul style="list-style-type: none"> <li>• Ergonomic design, high-quality haptic feedback and handling, includes table and lift detector joysticks</li> <li>• It can be easily clamped on the table rail and strong enough to avoid slippage on the rail</li> </ul>	Position control of moving parts
⑥		<b>Operator Control Assembly</b>	<ul style="list-style-type: none"> <li>• The operator control assembly is mounted on the front cover of the magnet and functions in a high magnetic field that has a proportional electric field</li> </ul>	Functions as the operator interface to the system, from within the scan room
⑦		<b>Gantry Panels</b>	<ul style="list-style-type: none"> <li>• LED power, test pins for maintenance equipped and easily accessible, double contact switches relating to motion control, input voltage of GCP main power 24V, maximum consumption power less than 10W</li> <li>• CAN interface, interface for debugging, 4bit DIP switch on the board, reset switch on the board,</li> </ul>	Helps to position the patient according to requirements, allowing very accurate position adjustments

## Americas

SENSATA TECHNOLOGIES INC.  
529 Pleasant Street,  
Attleboro, MA 02703  
USA

PRESSURE SENSORS & SWITCHES  
+1 (800) 350 2727  
sensors@sensata.com  
switches@sensata.com

TEMPERATURE SENSING  
+1 (888) 438 2214  
sensors@sensata.com

POSITION SENSORS AND ENCODERS  
+1 (800) 350 2727  
sales.beisensors@sensata.com

SOLID STATE RELAYS  
+1 (877) 502 5500  
sales.crydom@sensata.com

MOTORS & ACTUATORS  
+1 (760) 597 7042  
sales.beikimco@sensata.com

OPERATOR CONTROLS  
+1 (800) 350 2727  
sales.deltatech@sensata.com

ELECTRICAL PROTECTION /POWER CONTROLS  
+1 (508) 236 3287  
klixon@sensata.com

GIGAVAC CONTACTORS  
Phone +1 (805) 684-8401  
gigavac@sensata.com

CYNERGY3 COMPONENTS  
+44 (0) 1202 897969  
sales@cynergy3.com

## Europe, Middle East & Africa

SENSATA TECHNOLOGIES HOLLAND B.V.  
Jan Tinbergenstraat 80  
7559 SP Hengelo  
The Netherlands

PRESSURE SENSORS & SWITCHES  
+359 (2) 809 1826  
pressure-info.eu@sensata.com

TEMPERATURE SENSING  
+359 (2) 804 7165 (Klixon)  
+31 (74) 357 8156 (Airpax)  
temperature-info.eu@sensata.com

POSITION SENSORS AND ENCODERS  
+33 (3) 88 20 8080  
position-info.eu@sensata.com

SOLID STATE RELAYS  
+44 (1202) 416170  
ssr-info.eu@sensata.com

MOTORS & ACTUATORS  
+1 (760) 597 7042  
support@sensata.com

OPERATOR CONTROLS  
+359 (2) 809 1826  
ost-info.eu@sensata.com

ELECTRICAL PROTECTION /POWER CONTROLS  
+31 (74) 357 8156  
temperature-info-eu@sensata.com

GIGAVAC CONTACTORS  
Phone + (805) 684-8401  
gigavac@sensata.com

CYNERGY3 COMPONENTS  
+44 (0) 1202 897969  
sales@cynergy3.com

## Asia Pacific

SENSATA TECHNOLOGIES CHINA CO., LTD.  
30th Floor, InterContinental Center,  
100 Yu Tong Rd, Jing An District, 200070  
Shanghai, China  
+86 (21) 2306 1500  
sales.isasia@list.sensata.com

JAPAN  
+81 (45) 277 7117  
sales.isasia@list.sensata.com

KOREA  
+82 (31) 601 2004  
sales.isasia@list.sensata.com

INDIA  
+91 (80) 67920890  
sales.isasia@list.sensata.com

REST OF ASIA  
+603-5566 8001  
sales.isasia@list.sensata.com

ELECTRICAL PROTECTION/POWER CONTROLS  
+86 (21) 2306 1500  
AIRPAXSH@sensata.com (Airpax)  
EP\_Asia\_Public@list.sensata.com (Electrical  
Protection)

GIGAVAC CONTACTORS  
Phone + (805) 684-8401  
gigavac@sensata.com

CYNERGY3 COMPONENTS  
+44 (0) 1202 897969  
sales@cynergy3.com