

Users of Sarasota density meters or specific gravity analyzers are offered the choice of a HART® compatible, field mounted density converter, or a control room based unit, ensuring that the optimum data processing solution that best suits the user's application can be selected. The high integrity calculations of density and density related variables achieved in the converters are critical for effective custody transfer and process optimizations such as fuel gas management, burner control, or product quality control systems.

Sarasota CM200
Sarasota HME900
 Density Converter Electronics



General Features

- High accuracy calculations
- Choice of field or control room installation
- Flexible input into user DCS
- Extensive range of standard calculations
- Customer Defined Function (CDF) for non-standard calculation

Thermo Electron Corporation offers users of its Sarasota range of liquid or gas density meters or specific gravity analyzers the choice of two density converter options to allow the optimum processing solution for the application to be selected.

The Sarasota HME900 headmounted electronics option gives the user the power of control room electronics in the field with full HART compatibility. For applications requiring greater input/output flexibility or where the electronics are control room based, users may prefer the Sarasota CM200 density converter.

The density converters accept the frequency and PT100 (RTD) temperature outputs from the density meter, together with a pressure input (if required), and calculate a selection of density and density derived parameters such as live density, specific gravity, molecular weight, °Brix, °Baume, °API, and gas compressibility (depending on fluid type). The customer defined function (CDF) facility allows non-standard calculations to be performed such as %concentration, %solids, %alcohol, %fat using a look up table derived from customer supplied data.



Sarasota HME900 Headmounted Density Converter

The Sarasota HME900 headmounted density converter option may be included with any Sarasota liquid or gas density meter or specific gravity analyzer. The headmounted electronics unit conditions the output signal to give a HART compatible 4-20mA signal that can be used for indication or can be connected directly to the user's DCS. Alternatively, the output can be read digitally by a HART compatible control or data collection system. An optional local display allows the process engineer to view the prime variable value either in engineering units alone, or with an alternating display of percent of chosen span.

The selection of Sarasota HME900 electronics is ideal in most general density measurement applications and is essential when HART communications are required. The Sarasota density meter/Sarasota HME900 system is certified for use in flammable atmospheres.

Sarasota HME900 Ordering Information

The Sarasota HME900 headmounted electronics unit may only be specified as part of a Sarasota liquid or gas density meter or Sarasota SG900 specific gravity analyzer order by selecting the SIGNAL OUTPUT / 'H' option. It is also possible to select the optional local display by selecting the OPTIONS / 'L' option, and the WinHME900 communications software and modem package by selecting the OPTIONS / 'W' option.

Full ordering information for the Sarasota liquid density meters is available in the Sarasota FD910, FD930, FD950, FD960 Liquid Density Meters for General Industrial, Hygienic, Chemical and Fiscal Applications specification sheet.

Full ordering information for the Sarasota gas density meters is available in the Sarasota FD900, ID900, PD900 Gas Density Meters for Gas Metering and Control specification sheet.

Full ordering information for the Sarasota specific gravity analyzers is available in the Sarasota SG900 Specific Gravity Analyzer specification sheet.

Sarasota HME900 Features

- Available on Sarasota density meters/SG analyzers
- Field mounted, direct density output
- High accuracy calculations
- Local display option
- HART compatible
- Hazardous area approvals
- WinHME900 PC configuration program
- Device description (DD) available for Emerson 375 field communicator





Sarasota CM200 Density Converter

The Sarasota CM200 is a versatile density converter that can be configured as required to meet the input/output requirements of the end user's application.

Operating as a single channel density converter, the Sarasota CM200 will accept a frequency and temperature output from any Sarasota gas or liquid density meter or specific gravity analyzer. The unit performs calculations to give various density derived parameters including process line density, referred density, specific gravity, process gravity and molecular weight.

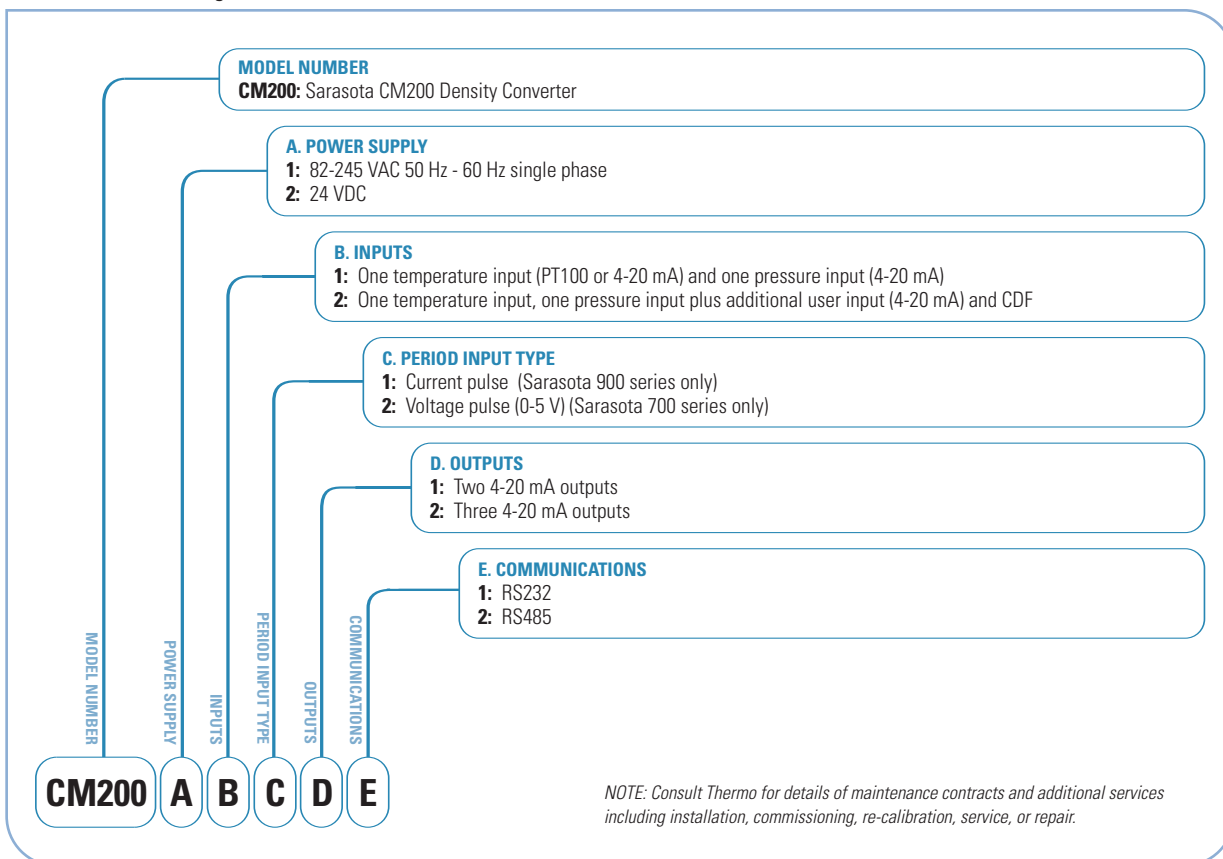
The front panel or infrared keypad allows the user to acknowledge alarms and interrogate both calculated results and some of the raw inputs. The red dot matrix alphanumeric display offers a wide viewing angle that ensures clear visibility in the field or control room. Parameters and calibration data can be monitored using either the RS232 or RS485 interface option.

The Sarasota CM200 density converter is best suited to applications that require a greater level of input/output flexibility than offered by the Sarasota HME900 electronics and when HART compatibility is not required.

Sarasota CM200 Features

- Suitable for all Sarasota density meters/SG analyzers
- Flexible input/output
- Control room mounting
- High accuracy calculations
- High visibility dot matrix front panel display
- Selectable hardware configuration options

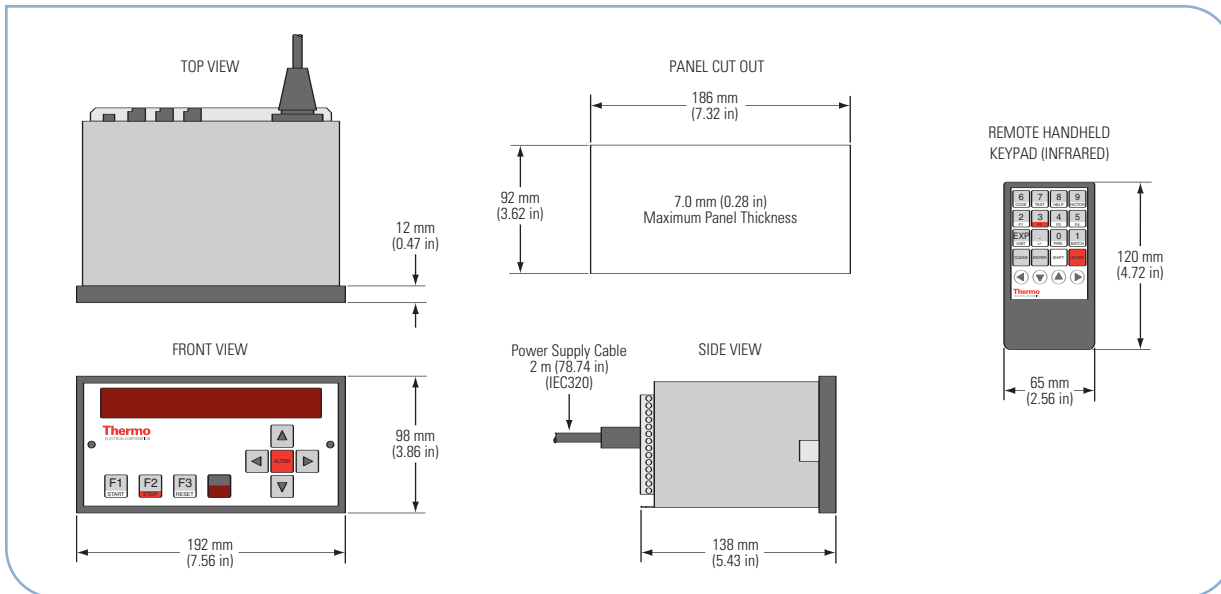
Sarasota CM200 Ordering Information



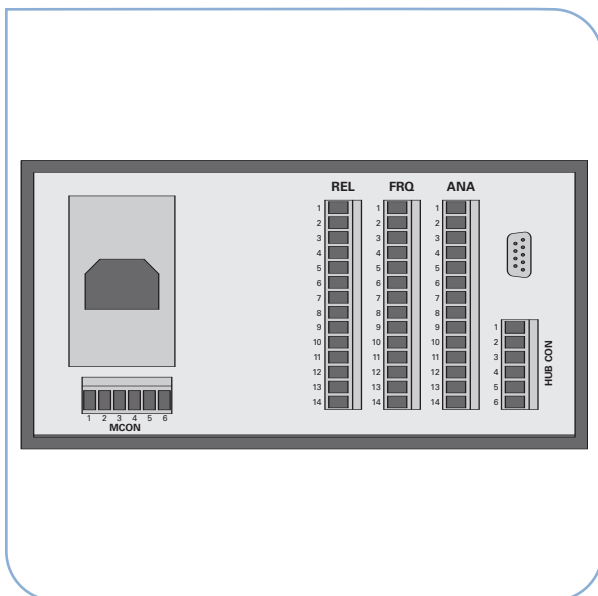
Available Calculations for Sarasota Density Converter Electronics

Measurements /Calculations Performed	Sarasota HME900		Sarasota CM200	
	Liquid	Gas	Liquid	Gas
Temperature	●	●	●	●
Pressure	●	●	●	●
Line Density	●	●	●	●
Reference Density (density at reference temperature and pressure)	●	●	●	●
Specific Gravity (SG) / Relative Density	●	●	●	●
°Brix	●	—	●	—
°Baume	●	—	●	—
°API	●	—	●	—
%solids	Via CDF	—	Via CDF	—
%alcohol	Via CDF	—	Via CDF	—
%fat	Via CDF	—	Via CDF	—
%mass	●	—	●	—
%volume	●	—	●	—
Molecular Weight (MW)	—	●	—	●
Gas Compressibility (Redlich Kwong)	—	●	—	●
Estimated Calorific Value (CV)	—	Via CDF	—	Via CDF
Estimated Wobbe Index	—	Via CDF	—	Via CDF

Sarasota CM200 Dimensional Diagram



Sarasota CM200 Basic Connection Detail



Sarasota CM200 Basic Connection Detail Legend

Relay (REL)	Frequency In (FRE)	Analog In (ANA)
1. R1 (NO) High	1.	1. +PT100 Supply
2. R1 (C) High	2.	2. +PT100 Sense
3. R2 (NO) Low	3. Ex Volts 20 VDC	3. -PT100 Sense
4. R2 (C) Low	4. +Signal 1	4. -PT100 Supply
5. R3 (NO) Fault	5. -Signal 1 or 0 V	5.
6. R3 (C) Fault	6. 0 V	6.
7.	7.	7.
8.	8.	8.
9.	9.	9. 4-20 mA Output 1
10.	10.	10. 4-20 mA Output 2
11.	11.	11. 0 V
12.	12.	12. 4-20 mA Temp
13.	13.	13. 4-20 mA Pres
14.	14.	14. 0 V
MCON	HUB CON	
1. +24 VDC Input	1. Fused 5 VDC	
2. 0 V	2. Open Collector Output	
3. 0 V	3. SW1 Input	
4. +24 VDC Output	4. SW2 Input	
5. Optional Relay C	5. SW3 Input	
6. Optional Relay NO	6. 0 V	

Sarasota HME900 Density Converter

Specification		
Physical Specifications		
Dimensions /Weight	Fits into the standard Sarasota density meter terminal / amplifier enclosure	
Local Display (Optional)	4½ digit 7.6mm (0.3 in) 7-segment LCD display; Resolution 0.1% or 0.01% depending on display variable	
Cable	Without pressure option: two pairs; With pressure option: three pairs	
Environmental Rating	As density meter: IP65 (NEMA 4X)	
Ambient Temperature Range	-20°C to +60°C (-4°F to +140°F)	
Ambient Humidity	Up to 95% non-condensing	
Data Storage	Configurations settings and data retained in e ² non-volatile storage	
Connections	Screw terminals suitable for wire sizes to 1.5 mm ² (0.06 in ²)	
Communications	Uses HART communications protocol; WinHME900 PC configuration program; Handheld communicator (e.g. Emerson 375 Field Communicator)	
Power	Without pressure option: two loops 24 V 23 mA; With pressure option: maximum three loops 24 V 23 mA	
Functional Specifications		
Inputs	Temperature (PT100 RTD)	Range: -200°C to +200°C (-328°F to 392°F); Resolution: better than 0.0015%; Accuracy at +20°C (+68°F) reference: ±0.1°C (±0.18°F); -200°C to +200°C (-328°F to +392°F) ±0.05°C (±0.09°F); 0°C to +200°C (+32°F to +392°F); Drift -20°C to +50°C (-4°F to +122°F): ±0.05°C (±0.09°F) typical, ±0.01°C (±0.018°F) max
	Pressure (4-20mA)	Resolution: better than 0.01%; Accuracy at 20°C (68°F) reference: better than 0.1% point; Drift -20°C to +50°C (-4°F to +122°F): ±0.1% typical, ±0.2% max
	Period (current pulse 6-18mA)	Range: 10 ms to 250 µs (100 Hz to 4000 Hz); Standard range: 2500 µs to 250 µs (400 Hz to 4000 Hz); Resolution: ±2 ns; Accuracy at reference +20°C (+68°F): as resolution; Drift -20°C to +50°C (-4°F to +122°F): ±25 ppm typical; ±50 ppm max
Outputs	4-20mA HART	Operating voltage: 8-28 VDC at terminals; Resolution: 0.015% span; Accuracy at reference +20°C (+68°F): ±0.1% of point; Drift -20°C to +50°C (-4°F to +122°F): ±0.08% full scale typical; ±0.175% full scale max
	Local Display	Selection of engineering units only, or engineering units and percent full scale switching every 5 seconds
Other Input/ Output	Density Supply	Operating voltage: 10-28 VDC at terminals; Current: modulated at density meter frequency 6–18 mA
	Enclosure Temperature (PCB mounted 100 ohm PRT)	Accuracy: ±0.5% point; Range: -40°C to +80°C (-40°F to +176°F); Alarm points: -20°C to +60°C (-4°F to +140°F)
Compliance		
Quality Assurance	ISO 9001:2000	
CE Mark	Compliant	
Electromagnetic Compatibility (EN61326:1997)	Compliant	
Low Voltage Directive	Compliant	
Safe Area Use	As standard	
ATEX Conformance: Intrinsically Safe (94/9/EC)	Ex II 1 G EEx ia IIC T ₄ (-20°C ≤ T _{amb} ≤ to +60°C)	
ATEX Conformance: Flameproof (94/9/EC)	Sarasota FD910 / Sarasota FD950 / Sarasota FD960 only: Ex II 2 G EEx d IIC T ₄ (T _{amb} = -20°C to +60°C) or T ₃ (T _{amb} = -20°C to +60°C) Temperature classification of T ₄ or T ₃ for use with maximum process fluid temperature of +115°C or +180°C respectively	
Canadian Standards Association (CSA): Flameproof	Class 1 Div 1 Groups B, C and D	
Calibration Certification	Calibration traceable to national standards. Calibration certificates supplied as standard. Optional traceable calibration equipment listing available	

Sarasota CM200 Density Converter

Specification		
Physical Specifications		
Sarasota CM200 Unit Dimensions	192 mm x 186 mm x 92 mm (7.6 in x 7.3 in x 3.6 in) (width x height x depth)	
Handheld IR Unit Dimensions	65 mm x 120 mm x 15 mm (2.5 in x 4.7 in x 0.6 in) (width x length x depth)	
Shipping Dimensions	280 mm x 190 mm x 350 mm (11 in x 7.5 in x 14 in)	
Net Weight	Typically 2.7 kg (6 lb)	
Shipping Weight	Typically 3 kg (7 lb)	
Materials	Painted steel case	
Display	152 x 18 mm (0.71 in) dot matrix LED display	
Mounting	Panel cut-out 186 mm x 92 mm (7.32 in x 3.6 in) (width x height); Note: maximum panel thickness 7 mm (0.27 in)	
Environmental Rating	IP52	
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)	
Ambient Humidity	Up to 95% non condensing	
Data Storage	Configurations settings and data retained in non-volatile storage	
Connections	Flying mains lead and plug in screw terminals (at rear of panel)	
Communications	RS485 serial communications port (standard 9 pin 'D' connector); Optional RS232	
Power	82-245 VAC 50-60 Hz single phase; 24 VDC 60 watts max	
Functional Specifications		
Inputs	Temperature (4-wire PT100)	Range: -200°C to +200°C (-328°F to +392°F); Accuracy at +20°C (+68°F) reference: ±0.1°C (+0.18°F) or 0.1% span (greatest); Drift -20°C to +50°C (-4°F to +122°F): 0.02% /°C (0.011% /°F)
	Temperature (4-20mA)	Resolution: 16 bits; Range: as transmitter; Accuracy at +20°C (+68°F) reference: 0.1% full scale
	Pressure (4-20mA)	Resolution: 16 bits; Accuracy at +20°C (+68°F) reference: better than 0.1% point; Drift -20°C to +50°C (-4°F to +122°F): ±0.1% typical, ±0.2% max
	Period (current pulse 6-18mA)	Range: 10 ms to 250 µs (100 Hz to 4000 Hz); Resolution: ±2 ns; Accuracy at +20°C (+68°F) reference: as resolution; Drift -20°C to +50°C (-4°F to 122°F): ±25 ppm typical, ±50 ppm max
	Optional User Input / CDF (4-20mA)	Resolution: 16 bits; Accuracy at +20°C (+68°F) reference: better than 0.1% point; Drift -20°C to +50°C (-4°F to +122°F): ±0.1% typical, ±0.2% max
Outputs	Two 4-20mA outputs as standard, with optional additional 4-20mA output	Resolution: 0.025% span; Accuracy at +20°C (+68°F) reference: 0.1% full scale (4-20 mA) 900 ohm load; Drift -20°C to +50°C (-4°F to +122°F): ±0.08% full scale typical; ±0.175% full scale max
	Display	152 x 18 mm (0.71 in) dot matrix LED display
	Transducer PSU supply	24 VDC 200 mA (fixed) and 12-22 VDC 100 mA (adjustable)
	Volt Free Contacts (up to 3 available)	Alarm/fault relays 0.25 A at 240 VAC; Relay 1=fault alarm; relay 2=high alarm, relay 3=low alarm
Compliance		
Quality Assurance	ISO 9001:2000	
CE Mark	Compliant	
Electromagnetic Compatibility (EN61326:1997)	Compliant	
Low Voltage Directive	Compliant	

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