

# UNITHERM™ HEATED HOSE PRODUCTS

## SERIES 200 SELF-LIMITING 'SL' HEATED HOSES

*Designed to Maintain Minimum Operating Temperature Without Any Temperature Controller*

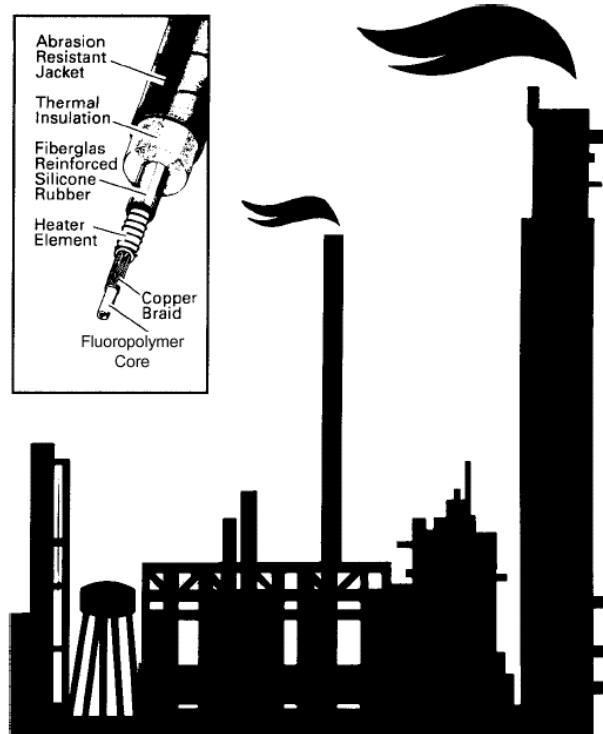
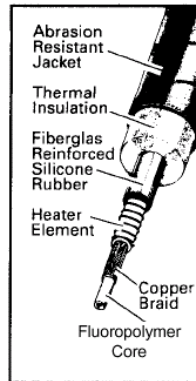
### Description

Our Self-Limiting 'SL' Heated Hoses are designed for use stack gas sampling applications where the prime objective is to keep the gas stream temperature above the dewpoint. The hose will maintain the minimum operating temperature specified by the customer in a sub-zero ambient and will not exceed the maximum operating temperature in a 130°F ambient.

Our hoses feature a resistance type heater with a positive temperature coefficient of resistance, which is spiral wound around the core(s) at extreme close tolerances, providing maximum temperature uniformity. As the hose temperature increases, the heater resistance also increases substantially, reducing the power density. The graph below is based on a single tube, size 4 (1/4") core with a power density of 23 watts at 72°F. The heater will draw only 14 watts/ft. at 300°F operating temperature.

Self-Limiting 'SL' designs are available for both 100 Series (stainless steel) and 200 Series hoses. Series 200 hoses can be build with multiple cores, providing for process, purge and heated or unheated calibration lines.

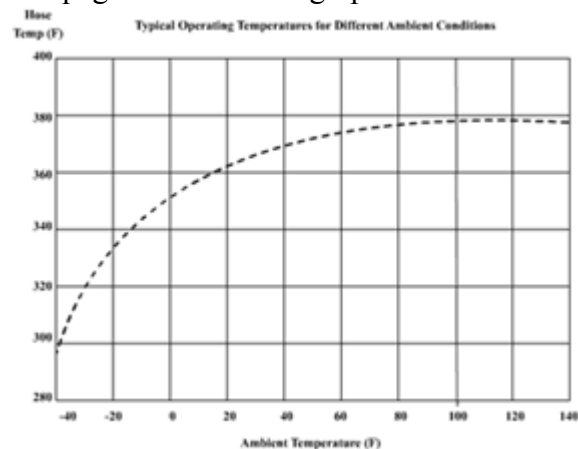
All hoses are build to customer specifications and are shipped electrically and hydraulically complete, and **cannot** be cut in the field.



### Electrical Specifications

Recommended Operating Voltage			
<b>Single Phase Power</b>			
Operating Voltage	Minimum Hose Length (ft)	Maximum Hose Length (ft)	
120	20	100	
208	40	200	
230	50	250	
277	60	300	
480	100	400	
<b>Three Phase Power</b>			
Operating Voltage	Minimum Hose Length (ft)	Maximum Hose Length (ft)	
230	80	300	
480	150	600	
<b>Nominal Power Density (Watts/ft)</b>			
Single Tube	Dual Tube	Triple Tube	Quad Tube
23	26	29	33

See page 4 for detailed graph



## UNITHERM™ HEATED HOSE PRODUCTS SERIES 200 SELF-LIMITING 'SL' HEATED HOSES

### Model 210 Low Pressure Single Tube Design

Tube Size	Tube		Nominal Finished Diameter	Maximum Operating Pressure*	Minimum Bend Radius	Nominal Weight Lb/Ft.
	I.D.	O.D.				
4	.150"	1/4"	1.70"	400 PSI	10"	.40
6	.251"	3/8"	1.75"	300 PSI	12"	.45
8	.375"	1/2"	1.85"	200 PSI	14"	.54

### Model 210 Low Pressure Dual Tube Design – One Process and one Calibration Gas Tube

Tube Size	Process Tube O.D.	Calibration Tube O.D.	Nominal Finished Diameter	Maximum Operating Pressure*	Minimum Bend Radius	Nominal Weight Lb/Ft.
4/4	1/4"	1/4"	1.90"	400 PSI	13"	.50
6/4	3/8"	1/4"	2.00"	300 PSI	14"	.56
8/4	1/2"	1/4"	2.15"	200 PSI	16"	.62

### Model 210 Low Pressure Triple Tube Design – Dual Process tube and one Calibration Gas Tube

Tube Size	Process Tube O.D.	Calibration Tube O.D.	Nominal Finished Diameter	Maximum Operating Pressure*	Minimum Bend Radius	Nominal Weight Lb/Ft.
44/4	(2) 1/4"	1/4"	2.10"	400 PSI	14"	.54
66/4	(2) 3/8"	1/4"	2.20"	300 PSI	16"	.60
88/4	(2) 1/2"	1/4"	2.40"	200 PSI	18"	.66

\* At 400°F (204°C)

**PLEASE NOTE:** Heated Hoses are available in any configuration as specified by customer.

The above specifications are the most popular models currently manufactured for Stack Gas Sampling.

Series 100 stainless steel core and Series 220 medium pressure are also available with our self-limiting SL heater design.

### Construction (210 Series)

Core Material	Smooth bore (PFA) Fluoropolymer core
Reinforcement	Nickel-plated, Copper Braid 85% Coverage
Heating Element	Resistance Heater, Self-Limiting Design
Electrical Insulation	Fiberglass reinforced silicone rubber
Temperature Sensor	None Required NOTE: Sensor(s) may be installed at customer's request for monitoring purpose.
Thermal Insulation	1/2" reinforced fiberglass
External Jacket	<b>Indoor Service</b> – Abrasion resistant braided polyester sleeving <b>Outdoor Service</b> – tough, extruded flame-retardant polyurethane
Fittings	Bare Tubing (for use with Compression Fitting)
Power/Control Cable	Standard length is six (6) feet with Copper Over-braid (Grounded). Longer length are available. Optional electrical connectors can be provided.

Form Series210SLHH – 040903

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## UNITHERM™ Heated Hose Part Number Derivation

EXAMPLE: **210-6/4-100ft-J-115-8'-2/18M**

Digits: (1) (2) (3) (4) (5) (6) (7) (8)

- (1) **The first digits represent the DEKORON/UNITHERM product family number**  
210= Low Pressure, tinned copper braided, low density coverage process **tube** (0/300 PSI)  
220= Medium Pressure, stainless steel braided, 100% coverage process **hose** (1000/1500 PSI)  
230= High Pressure, multiple layers of stainless steel braided 100% coverage process hose (3000 PSI)
- (2) **The next digits represent the process tube size(s) stated in 16<sup>th</sup> of an inch**  
*Example:* 4= 4/16<sup>th</sup> or 1/4"                      6= 6/16<sup>th</sup> or 3/8"                      8= 8/16<sup>th</sup> or 1/2"  
There can be more than one tube. Process tubes are heated tubes. The number of tubes is indicated by listing the representative digit sequentially.  
*Example:* 44 for (2) 1/4" tubes; 46 for (1) 1/4" and (1) 3/8" tube ; 666 for (3) 3/8" tubes etc.  
The forward slash (/) also has significance. In the part number listing, numbers at the left of the / dictate heated tube(s) (process tube(s). Numbers at the right of the / dictate unheated tube(s) (calibration tube(s). The part number listed above (6/4) represents one –6(3/8") heated process tube and one –4 (1/4") unheated tube.
- (3) **The next digits will determine the heated length of the hose bundle. Bare tube ends (addressed later) are not to be included in the length determination.**
- (4) **The next digits represents the heat sensor to be used**  
J= Type J Thermocouple              K= Type L Thermocouple                      R= RTD Type sensor
- (5) **The next three represents the operating voltage**  
115= 115 volts              120= 120 volts                      208= 208 volts  
220= 220 volts              230= 230 volts                      240= 240 volts
- (6) **The next digit represents the length of bare tube(s) ends extension out of the hose (for hook up purpose)**  
2= 2" of bare tubing (all end)                      4= 4" of bare tubing (all end)  
4/12= 4" of bare tube on the process tube and 12" of bare tube on the unheated tube  
8 FT= 8 feet of bare tubing (all ends)
- (7) **The next digit (2) indicates the number of messenger wires in the bundle**  
Messenger wires are wires incorporated into the construction of the hose bundle but are used for external hook up of support equipment and are not part of the heating circuit. Messenger wires will exit the hose in a six-foot long sleeve along with the power wires and Thermocouple wires on the power end. The messenger wires will exit the fleet end (non powered) in a three-foot long sleeve. The forward slash (/) is used here as a separator only.
- (8) **The next digits (18M) represent the gauge of the messenger wires**  
*Example:*                      2/18M= 2/18 gauge messenger wires  
   2/16M= 2/16 gauge messenger wires  
   2/18M/1/JM= 2/18 gauge messenger wires and (1) Type J Thermocouple messenger wire

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