

SMART TMS

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Designed to provide custom process solutions, utilizing Edwards global presence and industry experience to increase system yields.

Edwards SMART Thermal Management Solutions provides reliable and accurately controlled heating of forelines and process exhaust pipes to prevent blockage by condensed by-products or residual process materials.

The complete SMART TMS package comprises electrical pipeline heaters, high-efficiency insulation jackets, a SMART TMS control unit with optional HMI (touch screen interface), and access to Edwards highly-trained and experienced Applications Specialists. Designed for simplicity of installation, SMART TMS provides repeatable, controlled temperature management to ensure consistent process performance and safe pipeline maintenance.



Reliable and Stable Performance

Comprehensive Integrated and Standalone Solutions

Global Application and Product Support

Features and benefits

- 1 Maximizes tool uptime and production yields
- 2 Rapid tool startups through standardized and easy to install parts
- 3 Best solution for every application based on access to Edwards global Application Specialists
- 4 Ultra-safe operation through double thermal protection every 225mm on average
- 5 Up to 9 configurable zones of pipe heating solutions
- 6 Temperature set-points from ambient to ~180°C with adjustable alert bands
- 7 Maximum output of 1.2kW per zone (up to 8m of 40mm pipe coverage in each zone)
- 8 Zone control through Solid State Relays for maximum reliability
- 9 "Fail on" configuration capability to safely maintaining high pipe temperature on critical chemistries
- 10 Separate heaters and insulation jackets for maximum configurability, flexibility, and efficiency
- 11 Custom shaped parts for pipe components and parts
- 12 "One-handed" design simplifies installation and ensures proper fit
- 13 Low particulate, highly efficient, flame retardant insulation
- 14 Fabworks 3.2 and EdCentra™
- 15 Expert install inspection and commissioning

WHY THERMAL MANAGEMENT SOLUTIONS ARE IMPORTANT

- Vapour pressure and temperature relationships can have an effect on condensation.
- Temperature control helps minimize condensation that can lead to:
 - Blocked pipes
 - Fire risk from highly reactive condensates
 - Personnel risk from acidic condensates
 - Violent reactions when certain condensed materials are exposed to air or other process gases

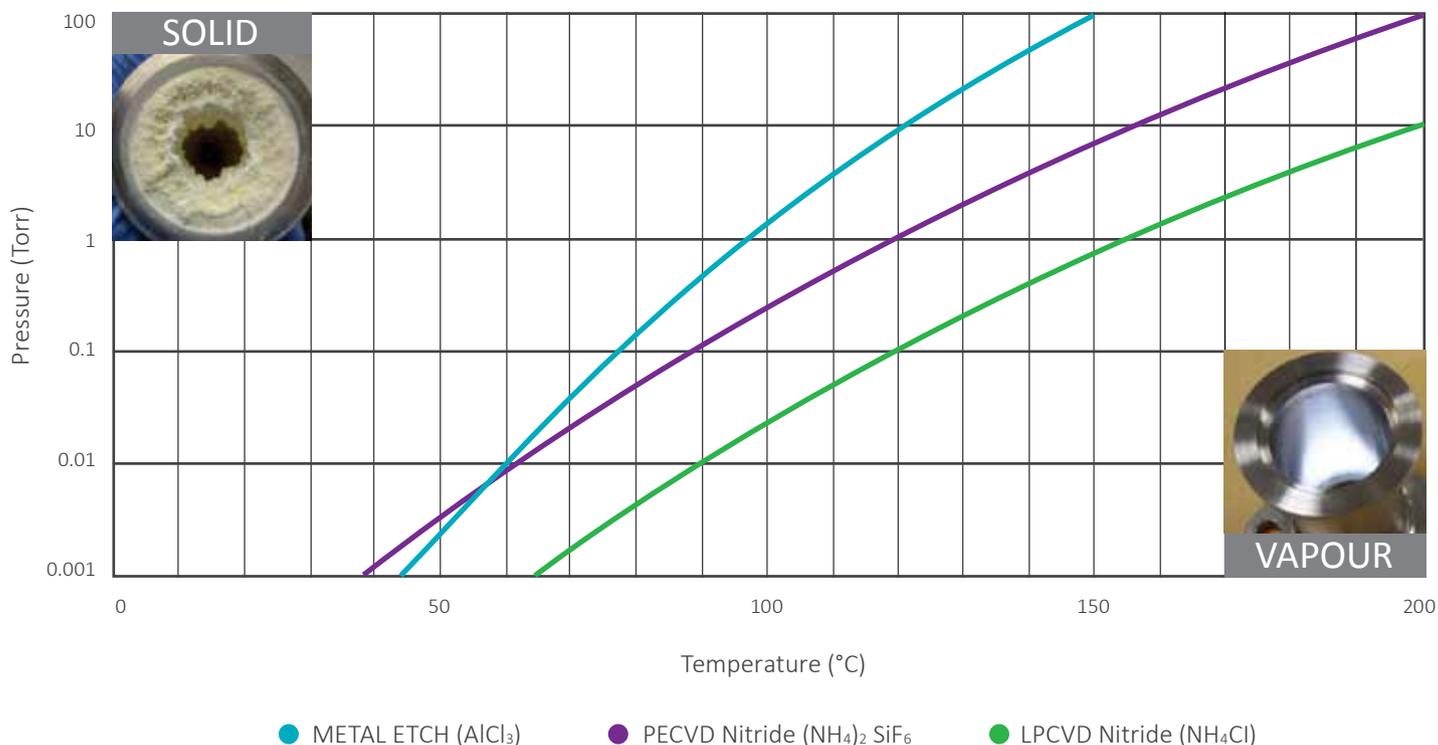


WHY CORRECT TEMPERATURE SELECTION IS IMPORTANT

- Temperature set-point matches specific process materials and reaction by-products
- Temperature-sensitive precursors may react if pipe temperature is too high
- Reduces pipe blockage rate
- Reduces pipe cleaning frequency and extends MTBS
- Improves process reliability
- Eliminates exhaust pipe service hazards



VAPOUR PRESSURE CHARACTERISTICS OF COMMON REACTION BY-PRODUCTS



Edwards Global Applications Group can advise correct SMART TMS set-up for each chemistry need

SMART TMS PRODUCT DATA

SMART TMS Operating and Storage Conditions	
Operating environment	Suitable for indoor use only
Operating / storage ambient temperature range	5 to 40°C
Maximum operating / storage ambient humidity	80% relative humidity for ambient temperatures lower than 31°C, decreasing linearly to 50% relative humidity for an ambient temperature of 40°C
Maximum operating altitude	2,000 m
Installation category	Class 2
Pollution category	2

SMART TMS Control Unit Electrical Data	
Electrical supply data	
Phases	3-phase + neutral + earth (ground)
Voltage	208 V ac
Voltage tolerance	+/- 8%
Frequency	50 / 60 Hz
Full load current	30 A

Heater power output	
Voltage	120 V ac
Number of heating zones	9 (max.)
Maximum current per zone	10 A

Circuit breaker protection	
Maximum current per 3 zones	32 A (per 3 zones)
Maximum earth leakage current	30 mA
Thermal overload protection circuit breakers	10 A (per zone)

SMART TMS Pipe Heater Data	
Materials of construction:	
Heater mat	Silicone-coated nylon
Heater cable insulation	PTFE (polytetrafluoroethylene), Vidaflex
Thermal switch and fuse patch cover	Silicone-coated nylon,
Connectors	Polyamide
Heater retaining straps	Silicone-coated nylon
Heater cable label	Polyolefin
Electrical supply	120 V
Nominal heater power density	0.1 W/cm ² and 0.2 W/cm ²
Thermal switch set-point	190°C
Thermal fuse fail temperature	235°C

SMART TMS STRAIGHT PIPE HEATER POWER

Heater Power Density - 0.1 W/cm²

Pipe Diameter	Heater Length					
	50mm	80mm	100mm	200mm	300mm	500mm
40 mm	6 W	10 W	12 W	24 W	36 W	60 W
50 mm	8 W	13 W	16 W	31 W	47 W	78 W
63 mm	10 W	16 W	18 W	40 W	60 W	99 W
80 mm	12 W	19 W	24 W	48 W	72 W	120 W
100 mm	16 W	26 W	32 W	64 W	96 W	160 W
160 mm	25 W	40 W	51 W	101 W	151 W	252 W

Heater Power Density - 0.2 W/cm²

Pipe Diameter	Heater Length					
	50mm	80mm	100mm	200mm	300mm	500mm
40 mm	13 W	21 W	26 W	51 W	76 W	126 W
50 mm	16 W	25 W	31 W	63 W	94 W	157 W
63 mm	Contact Edwards					
80 mm						
100 mm						
160 mm						

SMART TMS SHAPED PIPE HEATER POWER

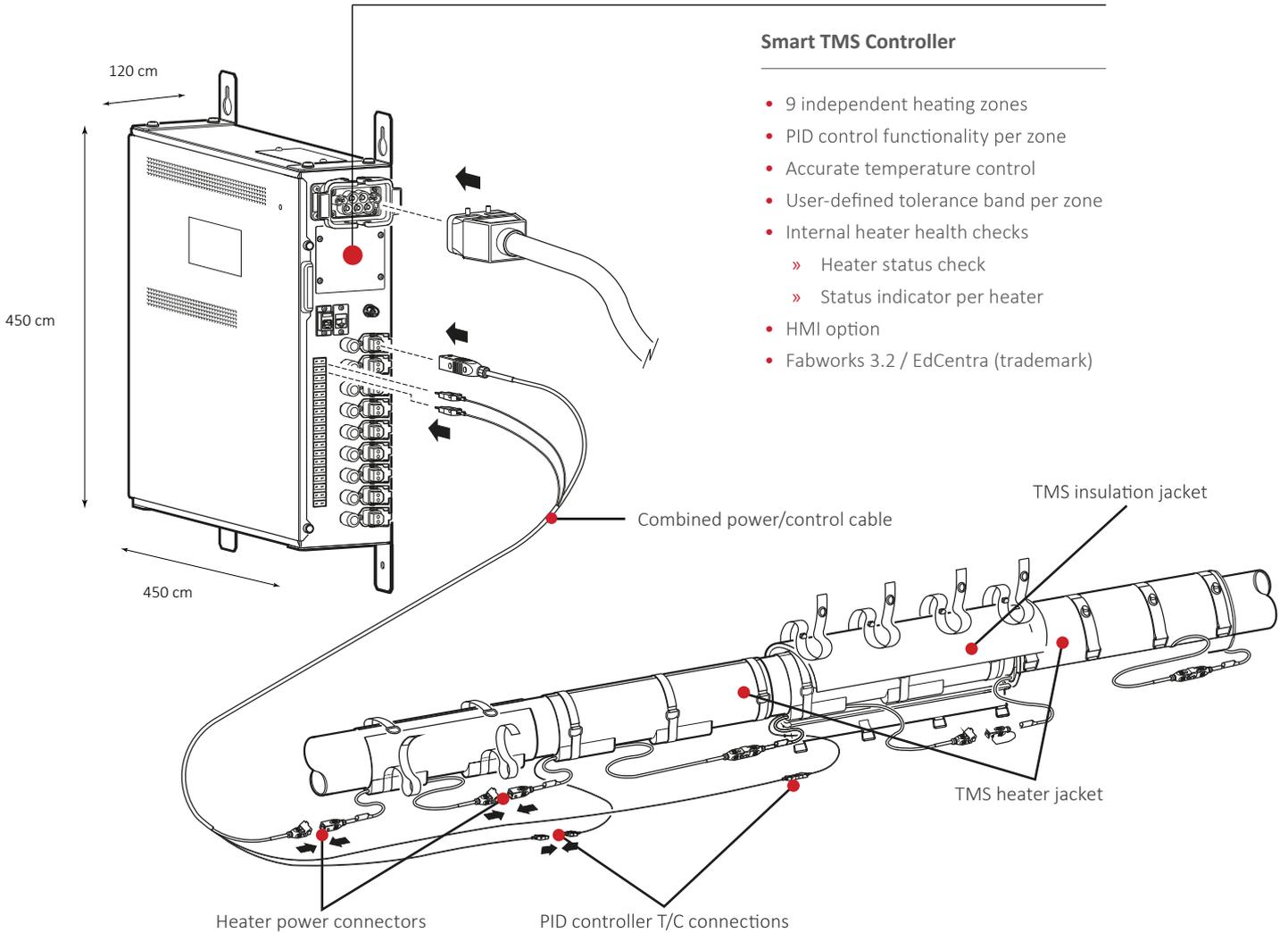
Heater Power Density - 0.1 W/cm²

Pipe Diameter	Elbow Heater	Bellows Heater		T-piece Heater	Gate Valve Heater
		50 mm	80 mm		
40 mm	9 W	9 W	15 W	11 W	
50 mm	13 W	11 W	18 W		
63 mm	23 W	12 W	19 W		
80 mm	30 W	14 W	23 W		
100 mm	55 W	20 W	32 W		30 W
160 mm	125 W	27 W	42 W		36 W

Heater Power Density - 0.2 W/cm²

Pipe Diameter	Elbow Heater	Bellows Heater		T-piece Heater	Gate Valve Heater
		50 mm	80 mm		
40 mm	18 W			23 W	
50 mm	26 W				
63 mm					
80 mm					
100 mm					Contact Edwards
160 mm					Contact Edwards

THE MODULAR SMART TMS SYSTEM



Smart TMS Controller

- 9 independent heating zones
- PID control functionality per zone
- Accurate temperature control
- User-defined tolerance band per zone
- Internal heater health checks
 - » Heater status check
 - » Status indicator per heater
- HMI option
- Fabworks 3.2 / EdCentra (trademark)

GLOBAL CONTACTS

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