

# Lufran DI Water Series Heater

Ultra-pure, ultra-reliable high purity water heater! Utilizing PTFE and PVDF wetted surfaces, the Lufran DI Series is the preferred and industry-leading heating solution for highly-critical semiconductor and flat panel display manufacturing processes. Featuring an advanced temperature control system and sizes up to 312kW, this is the ultimate in ultra-pure deionized water heating.



## BEST IN CLASS!

### FEATURES

#### Complete (turn-key) System

- Only plumbing and main power required
- Allows for fast and easy installation
- Space saving design minimizes footprint requirements

#### DAC™ (Demand Anticipation Control)

#### Temperature Control System







- Patented temperature/flow algorithm calculates exact heater output requirements for precise temperature control
- Responds instantly to changes in flow to minimize temperature fluctuations at the outlet
- Improves process consistency and yields
- Quick heat-up and recovery times reduce water consumption

#### Patented Purged PTFE-Covered Heating Element Design

- Maintains DI water cleanliness to decrease wafer defect
- Monitors integrity of element tubing for breach detection
- Removes permeation to extend element life expectancy
- Documented “mean time between failures” of nearly 10 YEARS!

#### Additional Benefits

- 99% efficient heating element reduces waste energy consumption
- No consumable halogen lamps to replace minimizes downtime and overall cost of ownership

 <p>Temperature: Up to 90°C</p>	 <p>Pressure: Up to 689 kPa</p>			
 <p>Watts: 24kW to 312kW</p>	 <p>Certifications: UL compliant, SEMI S2/S3 and CE optional</p>			
 <p>Volts: 200 to 600 V, three phase standard, single phase optional</p>				
 <p>Compatibility</p>				
<input type="checkbox"/> NO acids	<input checked="" type="checkbox"/> YES water	<input type="checkbox"/> NO bases	<input type="checkbox"/> NO solvents	<input type="checkbox"/> NO gases

### APPLICATIONS

- Semiconductor
- Flat Panel Display

# Lufran Ultra Pure Water Heater

## APPLICATIONS

- Semiconductor wet processes
- Filtration
- Sterilization/cleaning

## SPECIFICATIONS

Wattages	24 kw to 312 kW
Voltages	Up to 600 volts, 3 phase (single phase optional)
Temperature Range	Up to 95° C.
Temperature Accuracy	Lufran - (DAC) Temperature Accuracy: +/- 0.3°C, depending on operating conditions.  Lufran LT - (PID) Temperature Accuracy: +/- 3°C, depending on operating conditions.
Flow Rate	1 - 200 LPM
Standard Features	EMO Circuit (local and remote) Ground Fault Protection USB Data Logging Capacitive Liquid Level Sensor Protection on Elements System Pressure Monitor Purge Control Monitors Process High Pressure Alarm PVDF Pressure Relief Valve Heater Overtemp Circuitry

## MODEL NUMBER BREAKDOWN

LUF	-	105	-	6	U	U	5	-	SK-CE
Model Version	Wattage	Voltage	Inlet Plumbing	Outlet Plumbing	Flow Control	Options			
LUF (DAC Control)	024 = 1 column	1 = 208V	A = 1/2 inch Flared	A = 1/2 inch Flared	0 = Not Supplied (LLT version)	Blank = No Option			
LLT (PID Control)	036 = 1 column	2 = 240V	B = 3/4 inch Flared	B = 3/4 inch Flared	5 = Ultrasonic; 2-20 lpm (std for up to 52kW)	C1 = Ethernet communications			
	052 = 1 column	3 = 380V	C = 1 inch Flared	C = 1 inch Flared	6 = Ultrasonic; 10-70 lpm (std for >52kW)	C# = Other communications (see eng.)			
	065 = 1 column	4 = 400V	L = 25 mm Butt Fusion	L = 25 mm Butt Fusion	7 = Non-invasive; 0.5-20 lpm	RI = Expanded remote interface signals (LUF only)			
	072 = 1 column	5 = 415V	N = 32mm Socket Fusion Union	N = 32mm Socket Fusion Union	8 = Non-invasive; 1-50 lpm	R# = Other remote interface design (see eng.)			
	078* = 1 column	6 = 480V	P = 1/2 inch Pillar	P = 1/2 inch Pillar	9 = Ultrasonic; 15-150 lpm, 25.4mm	## = Custom design (see eng.)			
	105 = 2 columns	7 = 440V	Q = 3/4 inch Pillar	Q = 3/4 inch Pillar		UPS = Battery style backup			
	130 = 2 columns	9 = 220V	R = 1 inch Pillar	R = 1 inch Pillar		PS= Similar to UPS but with no batteries			
	144 = 2 columns	10 = 200V	S = 3/8 inch Flared	S = 3/8 inch Flared		EF = Flush mount EMO guard			
	156* = 2 columns	12 = 120V	T = 3/8 inch Super 300 Pillar	T = 3/8 inch Super 300 Pillar		LK = Leak Detect Switch			
	195 = 3 columns	14 = 600V	U = 25mm Socket Fusion Union (Standard)	U = 25mm Socket Fusion Union (Standard)		CE = CE certification			
	210* = 4 columns	15 = 230V	V = 1/2 inch Super 300 Pillar	V = 1/2 inch Super 300 Pillar		SK = Stack light			
	260* = 4 columns		W = 3/4 inch Super 300 Pillar	W = 3/4 inch Super 300 Pillar		MB = Monitor boards for SSRs included			
	288* = 4 columns		X = 1 inch Super 300 Pillar	X = 1 inch Super 300 Pillar					
	312* = 4 columns								

## PRODUCT DATA SHEET

## DAC™ DEMAND ANTICIPATION CONTROL available on Lufran only

Extremely precise temperature control and stability: Utilizes a patented temperature/flow algorithm to calculate exact heater output requirements. (DAC)

- Sterilization/Cleaning
- Required percentage power
- Flow Rate
- Actual Power Applied
- Low Temperature Boost
- High Temperature Shut-off

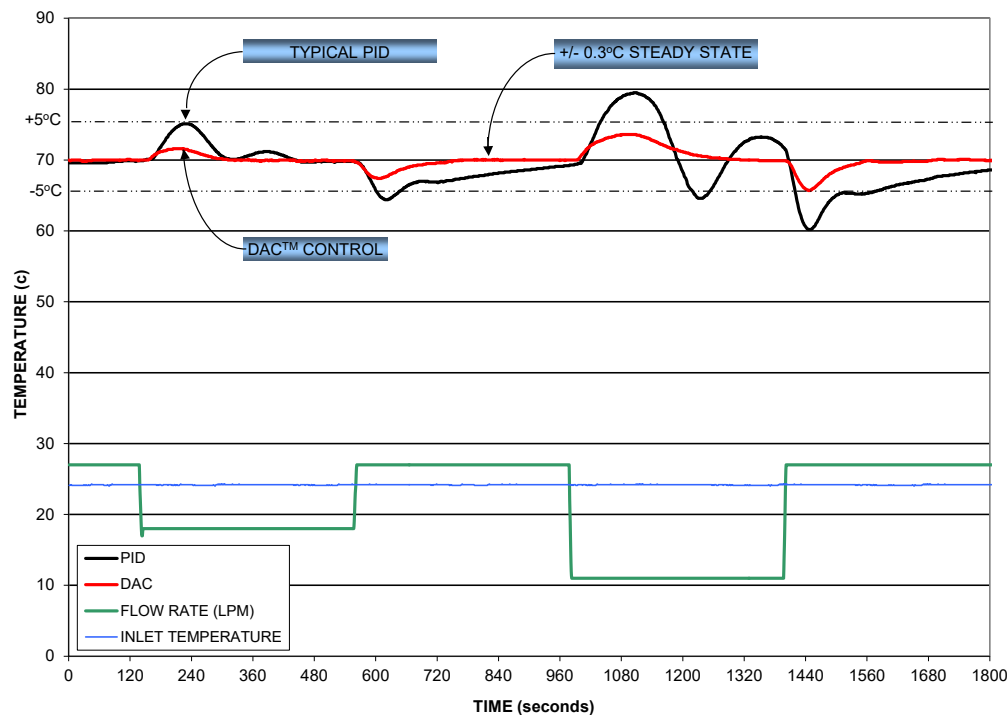
Quick reacting: Responds instantly to flow changes rather than simply monitoring outlet temperature.

Better temperature stability: Responds quickly to recipe (flow and temperature) changes.

Water conservation: Faster heat up and recovery means less water usage.

Friendly operator interface (User friendly HMI): Touch pad display with easy to understand commands.

### DAC™ CONTROL COMPARED TO PID CONTROL

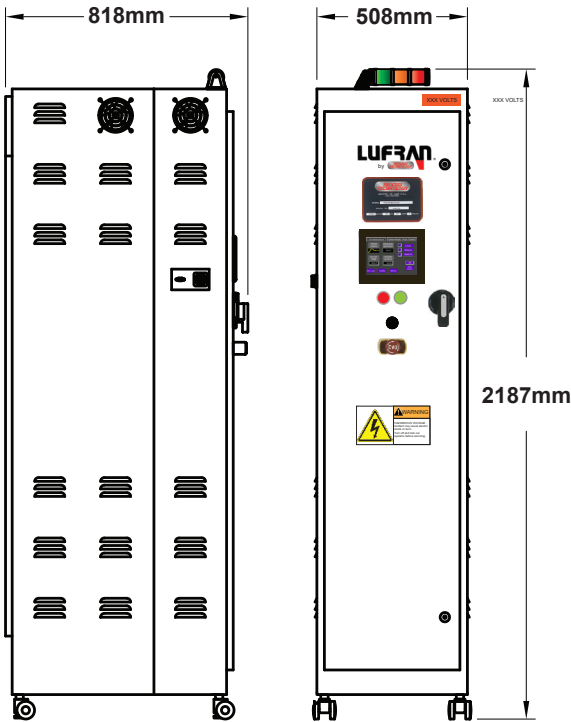


### ADVANTAGES OF DAC™ CONTROL OVER PID CONTROL

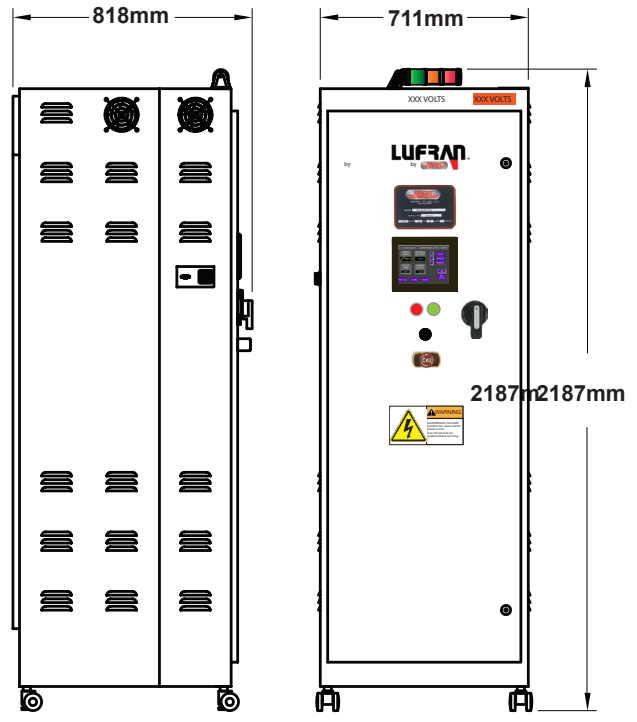
- PID controls only monitor one sensor input (monitors outlet temperature). The DAC responds instantly to flow changes rather than simply monitoring outlet temperatures.
- PID controls do not recognize changes in flow rate or inlet temperature. The DAC responds quickly to recipe (flow and temperature) changes.
- PID controls are much slower to respond to changes in operating conditions. DAC controls have quick heat-up and recovery times resulting in less water usage.



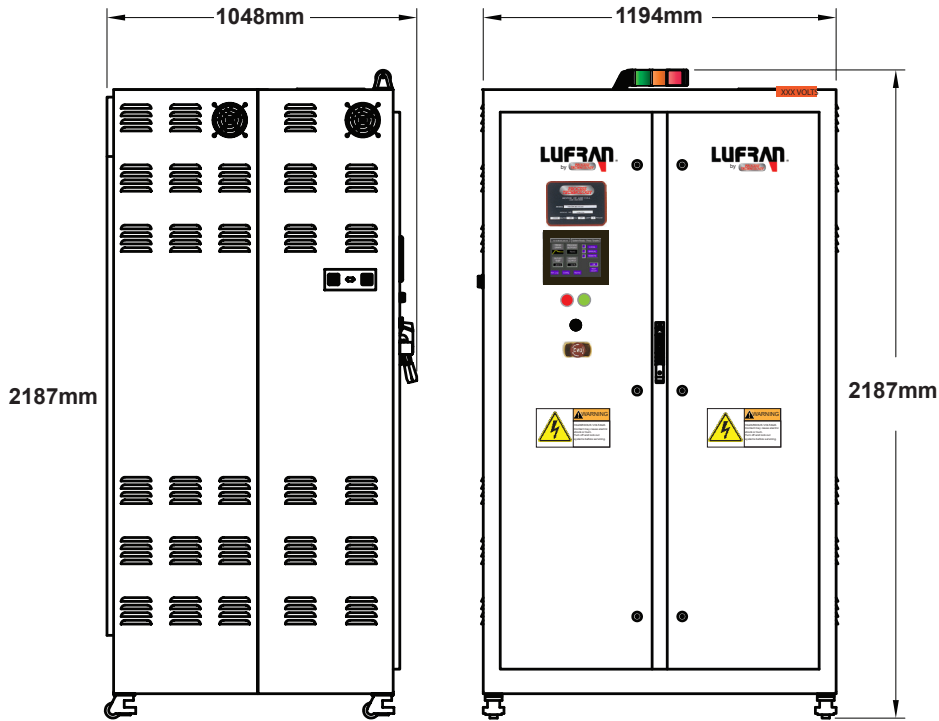
## DIMENSIONS



**FIGURE A: 24kW - 78kW  
HEATER CABINET**  
(For standard 380V-600V models)



**FIGURE B: 90kW - 156kW  
HEATER CABINET**  
(For standard 380V-600V models)



**FIGURE C: 157kW - 312kW  
HEATER CABINET**  
(For standard 380V-600V models)



# Tytan In-line Water Heater

Safest and most reliable industrial water heater on the market! Compact and complete (turn-key) heating system designed with commercially-pure titanium heating elements for exceptionally clean and corrosion-free performance. Suitable for either single pass or recirculating flow demands for a variety of precision water heating applications.



Wall Unit Shown

## FEATURES

### Complete (turn-key) System

- Space saving design minimizes footprint requirements
- Allows for fast and easy installation
- Only plumbing and main power required

### Long-Lasting Titanium Element Construction

- Resistant to corrosion
- Minimizes ionic contamination
- Compatible with seawater

### PID Temperature Control

- Provides precise and stable temperature for improved process consistency and yields
- Minimizes temperature fluctuations with flow rate changes

### Engineered for Safe Operation

- Meets cULus safety standards
- Built-in ground-fault protection
- Independent and redundant over-temperature protection
- Internal pressure relief valve

Temperature: Up to 90C	Pressure: Up to 689 kPa			
Watts: 12,000 to 144,000	Certifications: cULs, SEMI S2, CE (optional)			
Volts: 208 to 600, Three phase standard, single phase (optional)				
Compatibility				
<input checked="" type="checkbox"/> NO	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input checked="" type="checkbox"/> NO	<input checked="" type="checkbox"/> NO
acids	water	bases	solvents	gases

## APPLICATIONS

- Solar/Photovoltaic Wafer and Flat Panel Display Rinsing
- Medical Device Cleaning (ultrasonic) and Sanitizing
- RO/DI Water Treatment (filtration)
- Batch Mixing
- Aquaculture (fresh and seawater aquaria exhibits, hatcheries and research facilities)
- Potable Water Heating

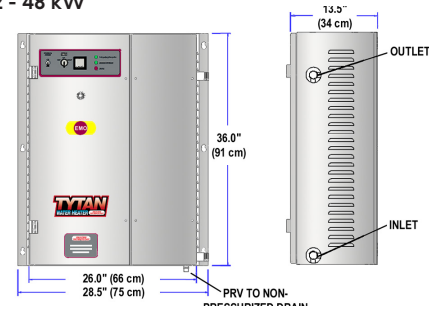
# Tytan Inline Water Heater

## SPECIFICATIONS

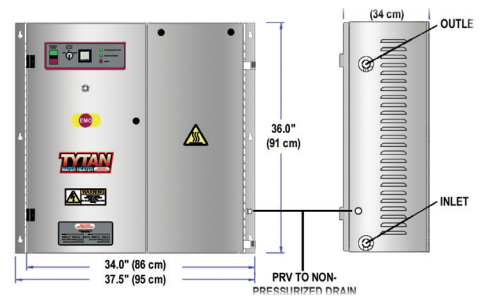
Wattages	12 kW to 144 kW
Voltages	208 volts to 480 volts, 3 phase
Temperature Range	Up to 90° C  PID microprocessor based digital control
Pressure Range	Up to 689 kPa (100PSIG)
Fluid Connections	25.4mm (1 inch) through 72 kW, 50.8mm (2 inch) MNPT 96 kW and higher
Safety Features	Grounded construction  EMO emergency stop button  Fluid overtemperature detection (bi-metallic snap switches)  Control fusing and ground fault protection

## DIMENSIONS

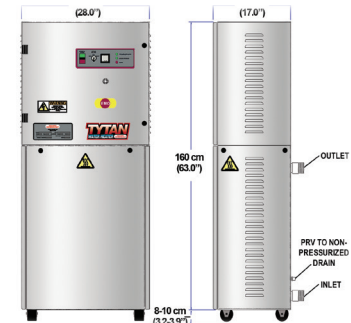
### 12 - 48 kW



### 72 kW



### 96 - 144 kW



## MODEL NUMBER BREAKDOWN

TY	12	240	3	SC
<b>Series</b>	<b>Wattage (kW)</b>	<b>Voltage</b>	<b>Phase</b>	<b>Options</b>
TY = Tytan	-012 = 12kW -018 = 18kW -024 = 24kW -036 = 36kW -048 = 48kW -072 = 72kW -096 = 96kW -120 = 120kW -140 = 140kW -144 = 144kW	-240 -480 -specify other	-1 = single phase (not available in all kW) -3 = three phase	-SC = SEMI S2 and CE compliant -CB = Include disconnect and circuit breaker -RI = Remote control interface -RI2 = 2-Bit control -RC1 = Remote Communications, RS485 -RC2 = Remote Communications, RS232 -RC3 = Remote Communications, 4-20 mA -MA = 4-20mA output for recording -PLC = PLC based control system -S = Stainless steel heating columns -FM1 = Digital Flow Meter -FS = Flow switch (external to enclosure)