



MuPT™

Ideal steam trapping solution for multi- utility reactors



Multi-utility reactors are widely used in pharmaceutical and chemical industries for processing of active pharmaceutical ingredients and chemical formulations.

Multiple utilities, i.e. cooling utilities like brine, cooling tower water, chilled water and heating utilities like steam and hot water are used in the reactor jacket to cater to different process cycles. These utilities must conform to product manufacturing SOP's.

Due to multiple usage of utilities in the jacket or coil the condensate gets contaminated and is drained to the cooling tower or ETP there by increasing the load on these sections. This leads to an overall reduction in the Condensate Recovery Factor of the plant and also energy loss. The steam traps are bypassed in most cases to overcome shortcomings of the load and inability to achieve the degree gradient required for the process.

For over 75 years, Forbes Marshall has provided innovative solutions to enhance process efficiency and environmental responsibility globally. Collaborating with industries, we enhance product quality and energy efficiency.

The Forbes Marshall Multi-Utility Process Trap (MuPT) is an integrated compact solution to detect and divert contaminated condensate based on TDS and temperature to evacuate uncontaminated condensate.

The system has an integrated diversion mechanism, contamination detection sensor and trap monitoring.

Features and Benefits

Digital Connectivity

- a. Monitor critical parameters on the go to establish real time benefits
- b. Cloud computation and on the go monitoring (24X7 availability of data)

Inbuilt LED indication

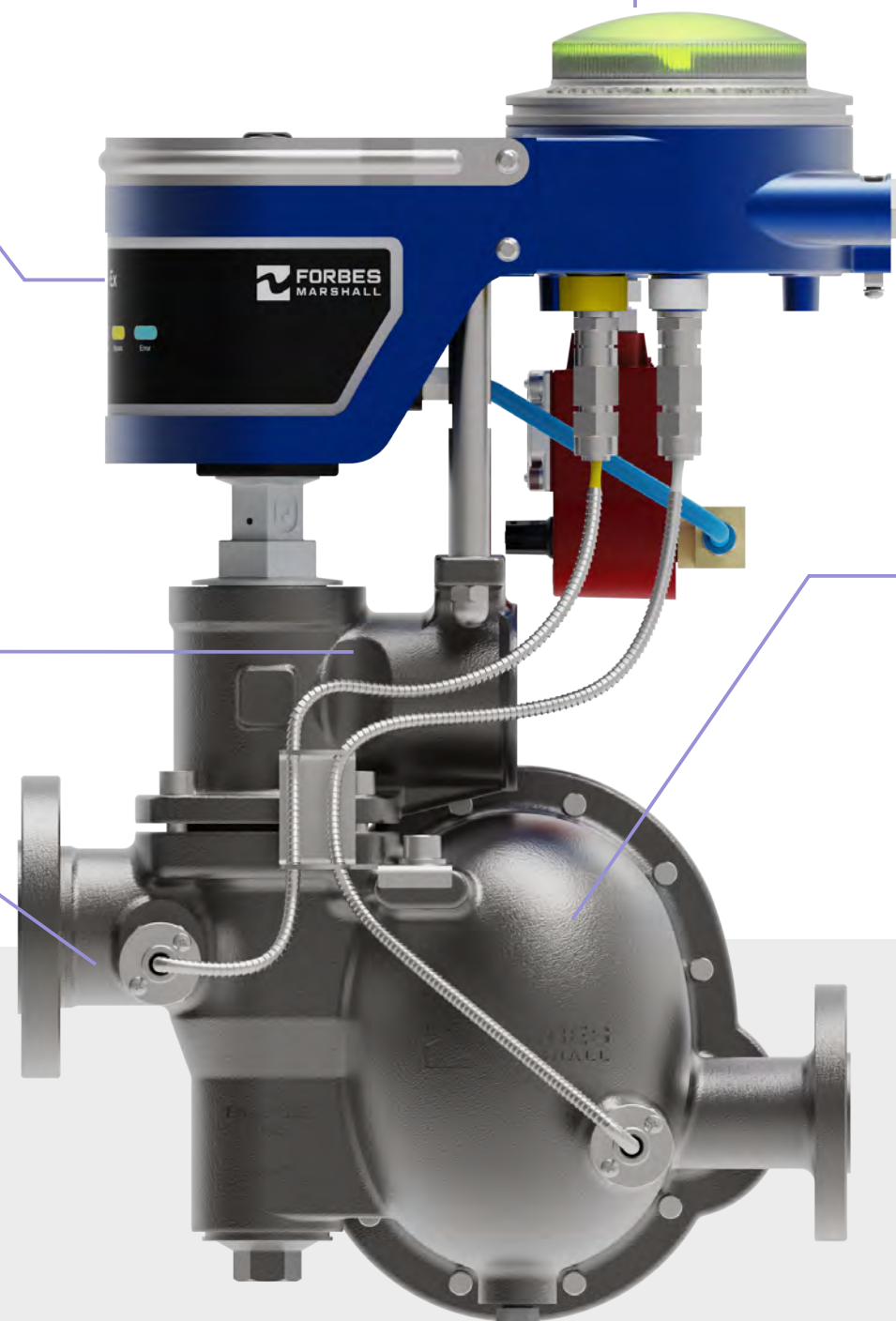
- a. Indicates health of the steam trap
- b. Indicates operating mode of the steam trap for optimum performance check and go to action points

TDS Sensor and 3 way valve

- a. TDS sensor ensures contamination detection through TDS measurement enabling efficient segregation of pure condensate
- b. 3 way valve ensures diversion based on condensate purity or contamination

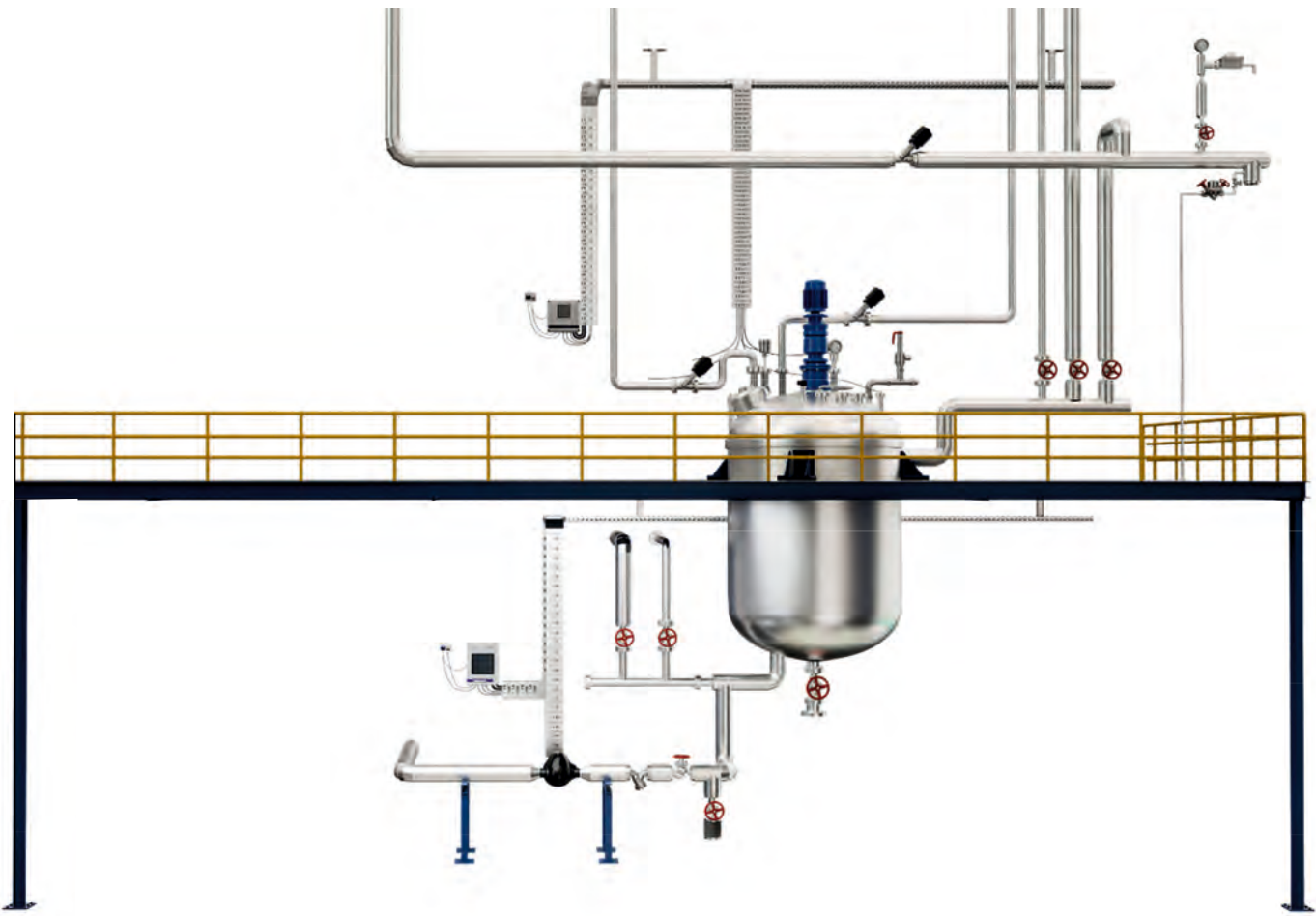
Two Orifice Technology

- a. Ensuring right temperature gradient to the process
- b. Avoids the opening of the steam trap bypass valve



Multi-utility Reactors (Batch / Continuous Process)

Current Scenario

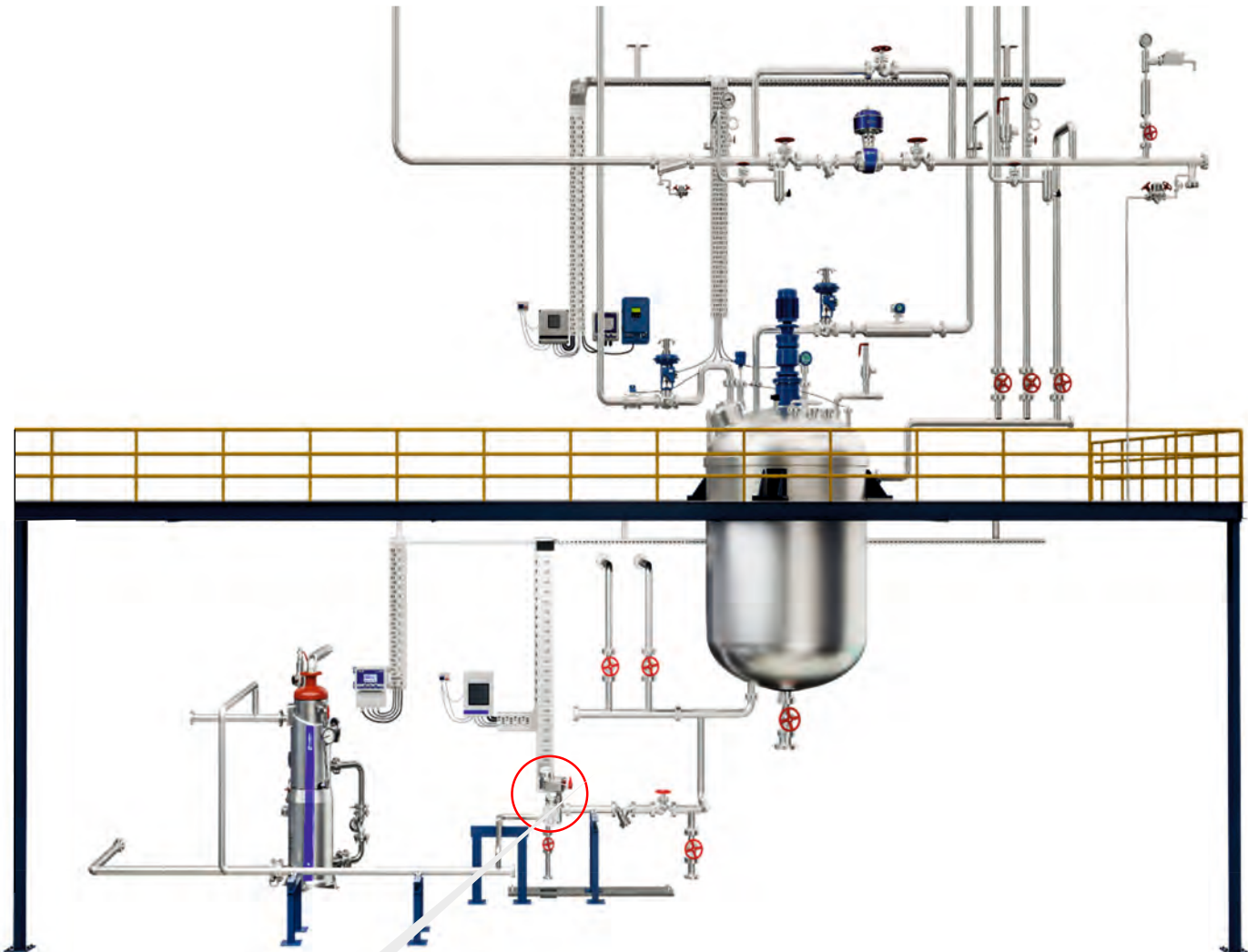


- Glass or SS lined (as per process requirements), typically operating at 3-3.5 bar g steam pressure
- High boil up time leading to extended batch times
- Incorrect trap selection leads to improper condensate evacuation and frequent bypass opening
- Condensate contamination due to multiple utilities being used in the same jacket due to which condensate is drained (non stall applications - product boiling temperatures >100°C)

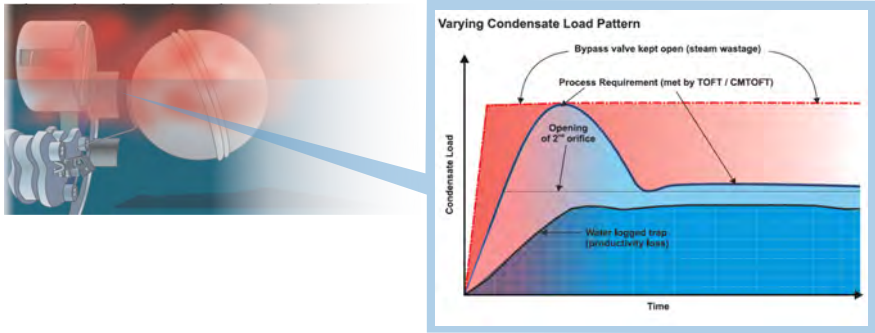
Impact

- Higher ETP/cooling tower load
- Live steam loss due to bypass valve opening
- Jacket/coil failures due to water hammer
- Production loss due to improper condensate evacuation
- Inconsistency in process temperature/hampered product quality

Forbes Marshall Solution



Working of the Two Orifice Float Mechanism



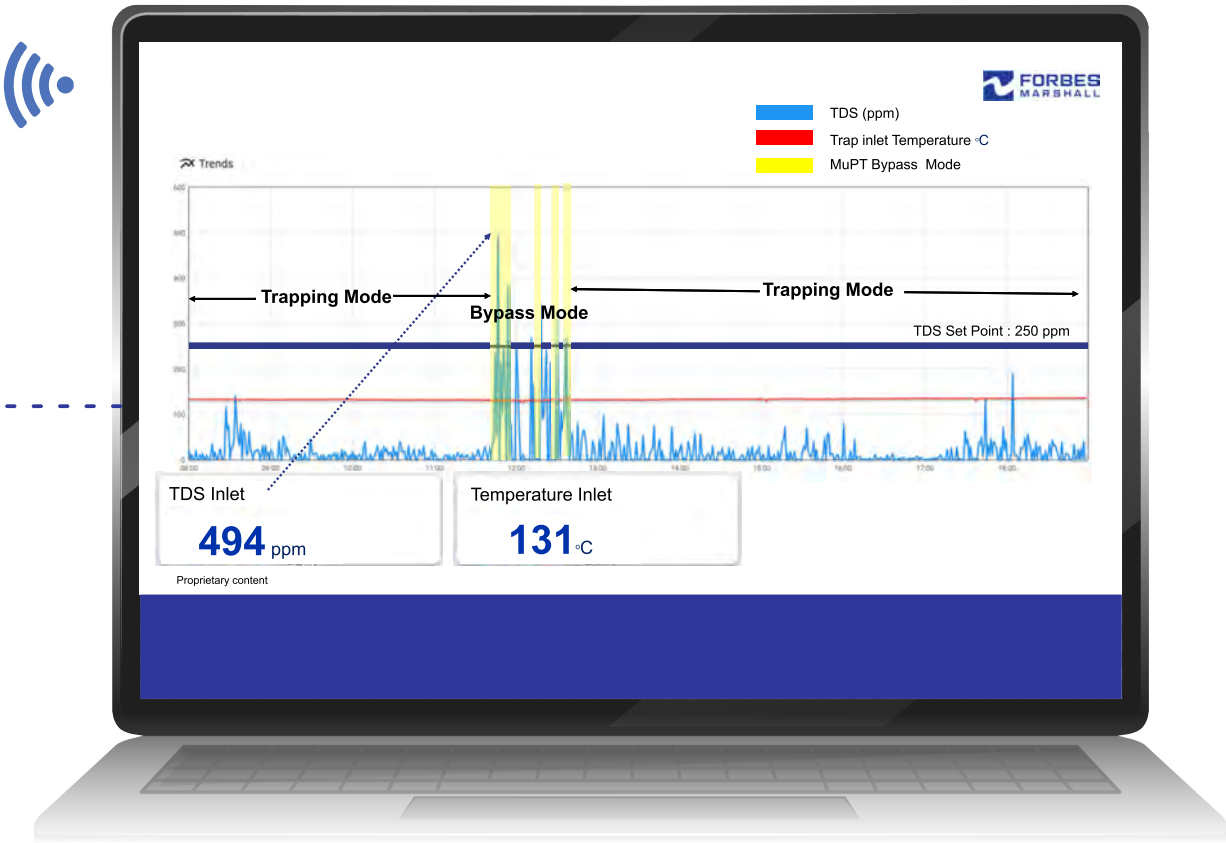
Benefits							
	Consistent temperature - enabling desired gradient	3-5% reduction in steam consumption	50% reduction in start up time	>80% condensate recovery	No steam loss due to bypass valve opening	Higher uptime and throughput	ETP / cooling tower load reduction

Sustaining Performance
Parameters

Critical parameters, real-time insights, and
on-the-go analysis - seamlessly at your fingertips.



Operator Interface



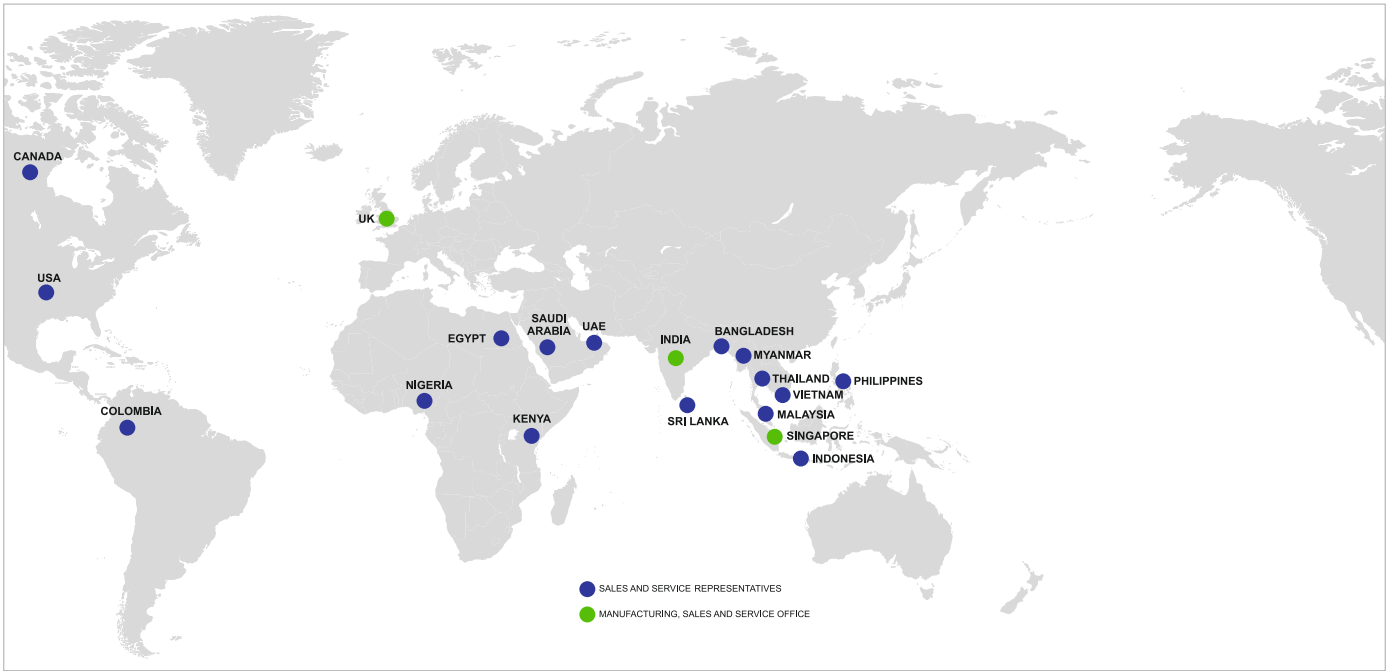
On Site



Control Room



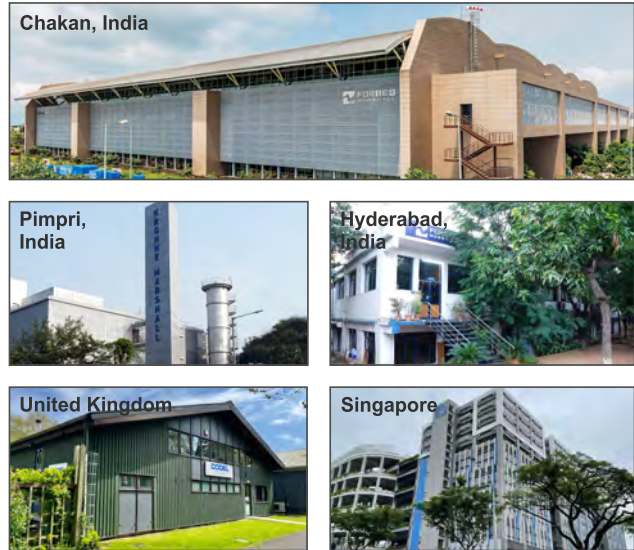
Energising Businesses and Communities Worldwide



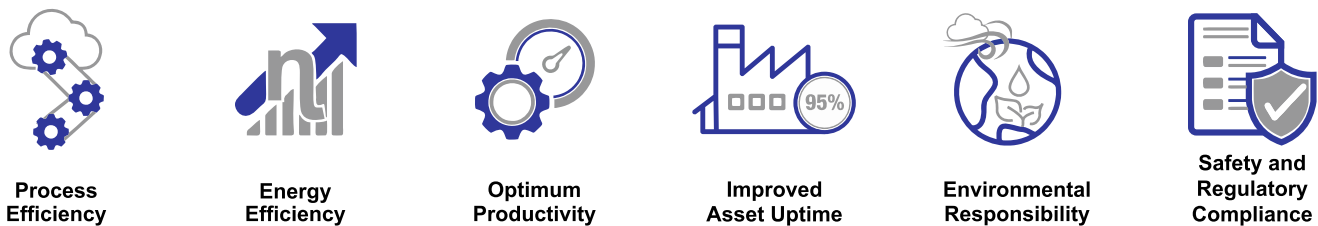
A Multinational with Indian Roots

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33	Distribution Centres
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World Class Technology from World Class Facilities



Enabling Results



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