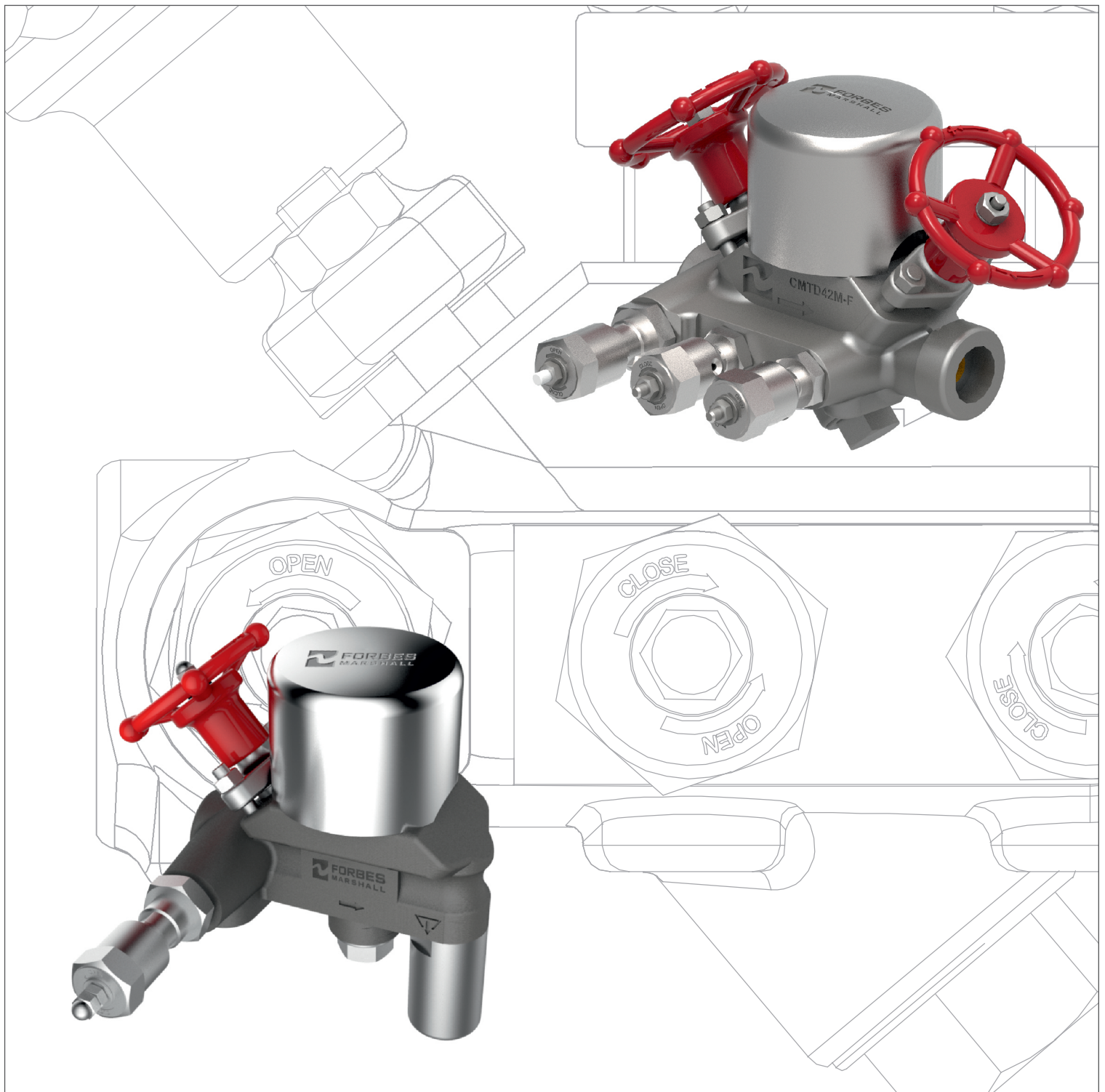


The Ideal Solution for Steam Mainline Trapping

Compact module thermodynamic trap



Compact Module Thermodynamic Trap

To ensure that plant KPIs of Productivity, Product Quality, Energy Efficiency, Safety and Reliability are met, the distribution network must transport steam from the point of generation to the point of use at the right pressure, in the right quantity, at the right quality, safely and with the lowest energy loss.

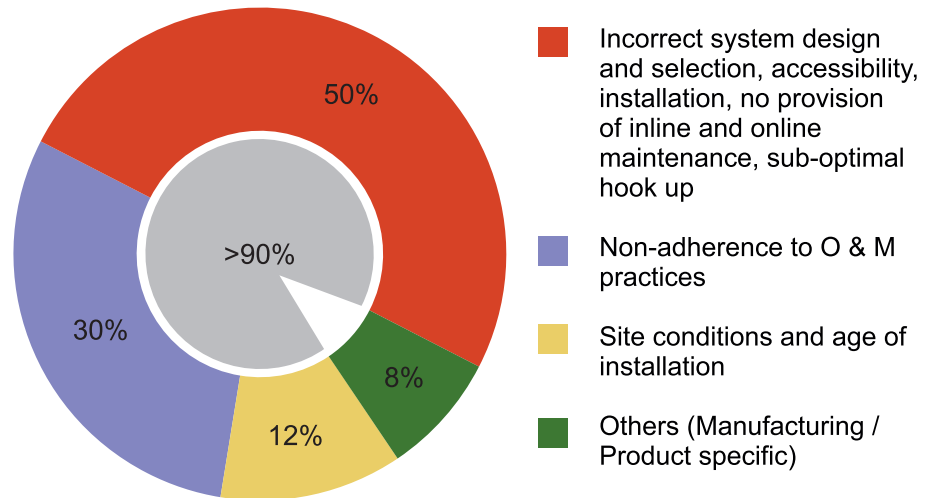
Across plants, we find that the average uptime of mainline distribution traps is only 71%. The balance 29% are either leaking resulting in energy losses in the range of 7-10%, or waterlogged resulting in water hammer, frequent leaks and wet steam. A single leaking trap can cause steam loss of 218 tons / year, increasing fuel consumption and CO₂ emissions.

For over 75 years Forbes Marshall has been providing innovative solutions to help businesses improve their process and energy efficiency and be more environmentally responsible. We work with Industry globally to improve production quality and energy efficiency.

Our compact module thermodynamic trap is an innovative trapping solution assuring an uptime of >95%, with zero leakage. It is easy to install, operate and maintain, and ensures safe steam distribution.

Common Performance Issues in Mainline Distribution Trapping (Why Traps Fail)

In mainline distribution trapping, more than 90% of distribution traps fail on account of accessibility, maintainability, incorrect installation, improper selection and non-adherence to operating practices.



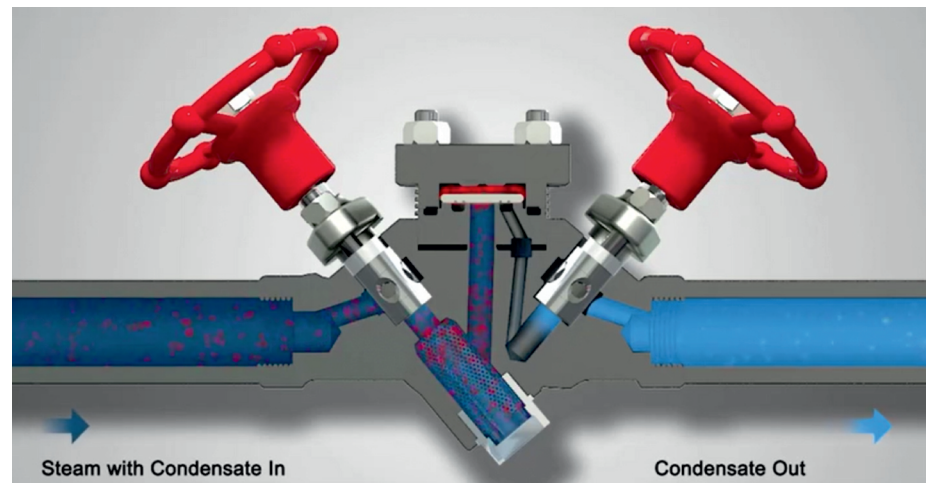
The Forbes Marshall compact module thermodynamic trap is the ideal solution for distribution trapping. It reduces plant downtime, maintenance costs and ensures zero leakage, while conforming to pertinent environment and pollution norms.

The standard version of the compact module thermodynamic trap, CMTD42M-S, is designed with an in built upstream isolation and bypass piston valve. It has a diffuser at the outlet that reduces the noise level and ensures smooth discharge of condensate.

The full version of the compact module thermodynamic trap, CMTD42M-F, has additional features such as piston valves for trap test, depressurisation and outlet isolation.

Principle of Operation

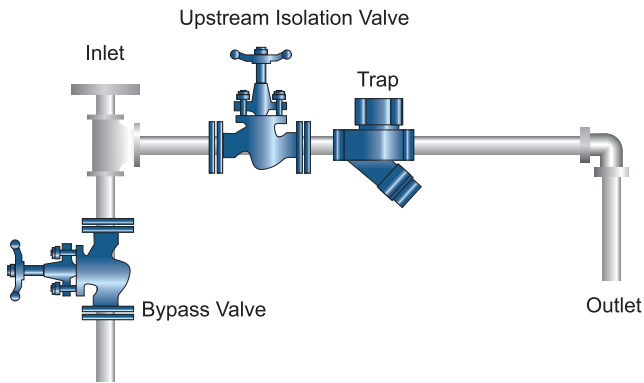
The compact module thermodynamic trap operates on thermodynamic principle using Bernoulli's Theorem, i.e. total pressure (static + dynamic) energy of a moving fluid is same at all points.



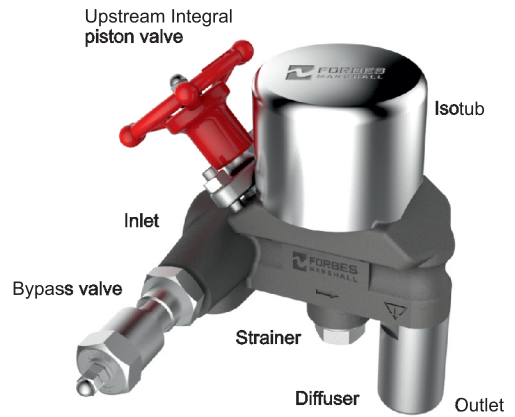
Compact Modules for mainline drainage

PMO : 42 bar (g) TMO : 425 °C

Conventional Installation

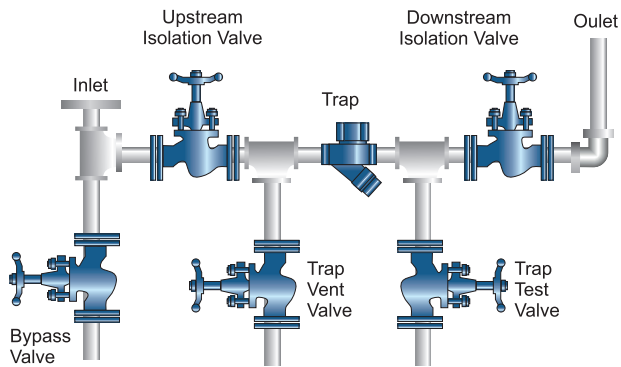


CMTD42M-S

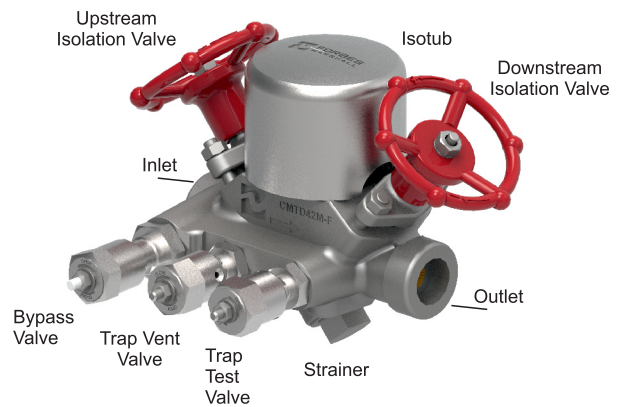


PMO : 42 bar (g) TMO : 425 °C

Conventional Installation

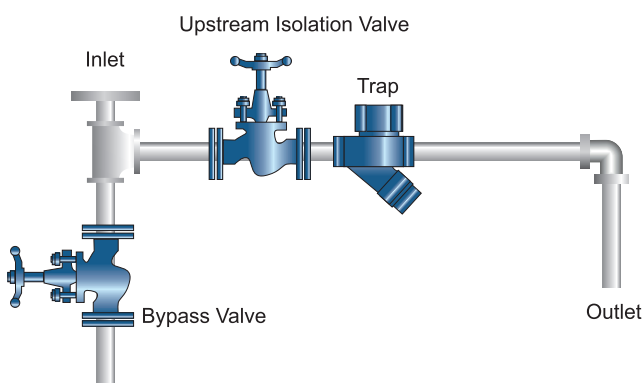


CMTD42M-F

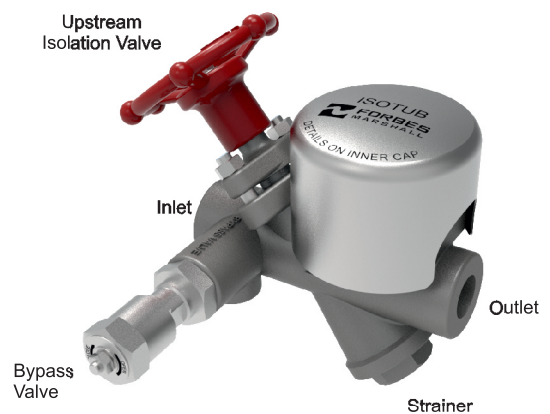


PMO : 62 bar (g) @ 482°C TMO : 525°C @ 37.2 bar (g)

Conventional Installation



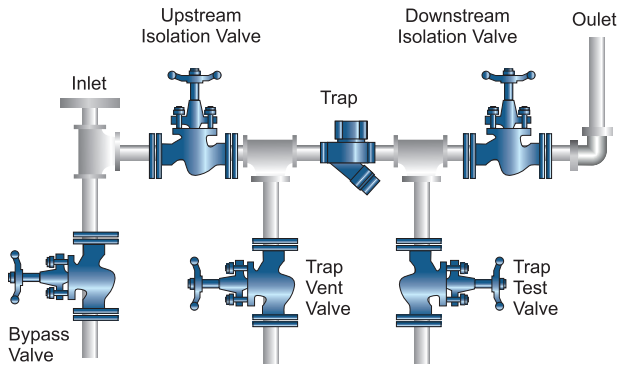
CMTD62M-S



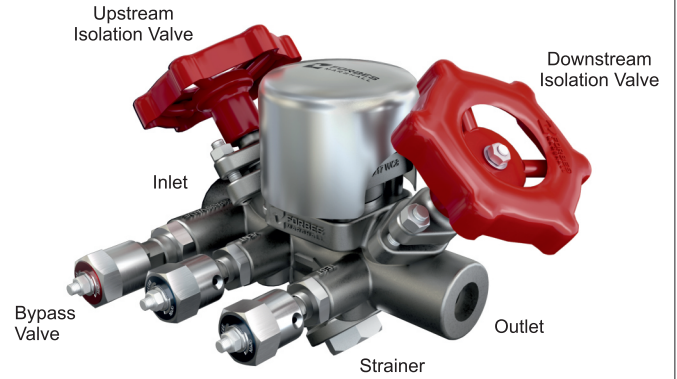
Compact Modules for mainline drainage

PMO : 62 bar (g) @ 482°C TMO : 525°C @ 37.2 bar (g)

Conventional Installation

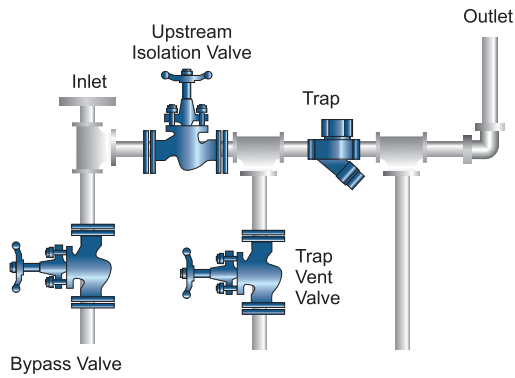


CMTD62M-F

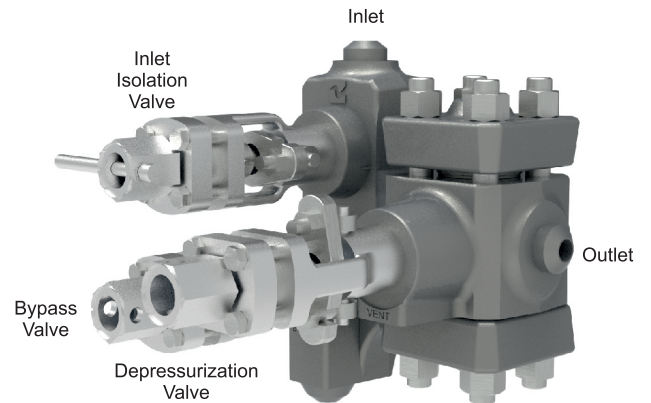


PMO : 220 bar (g) @ 374°C TMO : 550°C @ 80 bar (g)

Conventional Installation



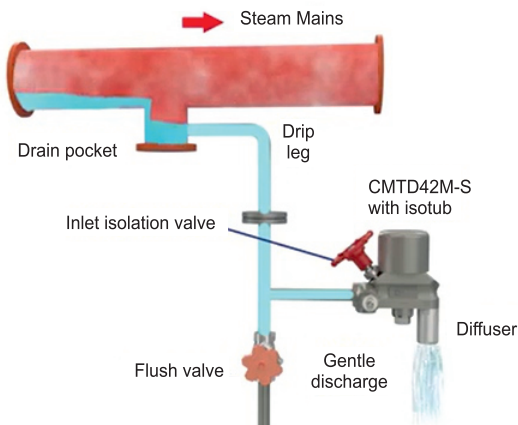
CMTD250M



Compact Module Thermodynamic Trap Variant Installations

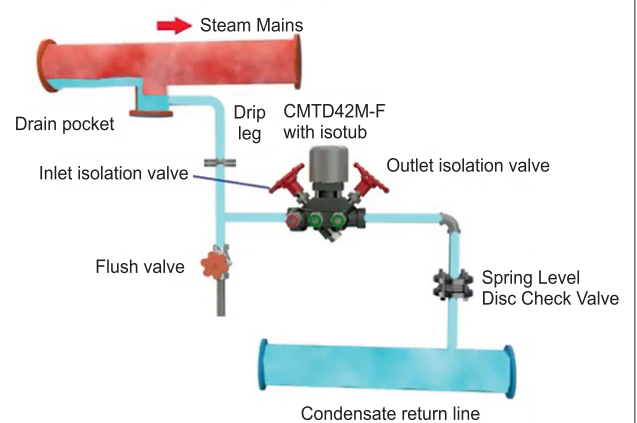
CMTD42M-S (Standard Version)






Recommended for open to atmosphere installations



CMTD42M-F (Full Version)

Recommended for closed loop installations



Conventional Steam Trapping V/s Compact Steam Trapping		
	Conventional Steam Trapping Station	Compact Steam Trap Station
Features 	Approx 750mm assembly length and weight over 14 kgs	Robust, compact and light weight design; 190mm assembly length and weight approx. 6 kg
	Traditional isolation valves prone to leakages and seize up	Integral bypass valves and class VI piston type isolation valves
	Trap needs to be replaced in case of damage to the seat	Only internals need to be replaced due to replaceable seat and disc design
	Intermittent, noisy and scattered discharge of hot condensate causing erosion of surface onto which the condensate is discharged	Inbuilt diffuser enables reduction in noise level and gentle discharge of condensate for open to atmosphere applications thus ensuring safety
	Frequent condensation of flash steam due to direct atmospheric contact causes repeated unnecessary opening-closing of the disc thereby reducing life of the trap	Isotub fitted onto the trap acts as an insulator thereby enhancing life of the trap
	>15 weld joints	2 weld joints
	Over 16 components with five valves	Single forged body - only one component with 5 integral piston valves
Benefits		
 Uptime / Reliability of Performance	Low Less reliability of performance	High Robust performance
 Ease of installation	Multiple components requiring on-site fabrication and welding	Single unit with integral components providing ease of installation
 Ease of Maintenance	Cumbersome to maintain due to welded joints	Quick and easy to maintain
	Potential steam leaks through inline leakages, glands and weld joints	Zero steam leakage
	Screwed-on main cap; difficult to open, frequent damage of internal threading	External bolted design of top cover, easy to lubricate and open
	Testing not possible in a closed loop (to ascertain if the trap is working or not)	Inbuilt trap test valve
	Trap depressurisation not possible, safety hazard during maintenance	Integrated trap vent valve to evacuate steam locked inside the trap body ensuring safety during maintenance
 Vendor Co-ordination cycle	Complex because of multiple vendor engagement Cumbersome documentation	Single point responsibility of supply Ease of documentation

Advantages of CMTD : Test Case at 5 bar g Pressure

Sr.No.	Description	Inverted bucket trap	Compact module thermodynamic trap
1	Energy loss (through trap)		
	Steam loss in kg / year	3485	1584
	Steam loss in kg / 5 years	17424	7920
2	Radiation losses from trap		
	Steam loss in kg / year	6178	2915
	Steam loss in kg / 5 years	30888	14573

Customer Speak

We were facing a problem of water hammering and leakage from the steam main line to the hand ironing and steam press machine. Forbes Marshall engineer recommended Compact Module Thermodynamic Trap and moisture separator to address this issue. After installation the problem of water hammer at start-up has been completely resolved. Water leakage has stopped and the clothes are now not getting stained. The speed of ironing has also significantly increased.

A 350 room 5-star hotel in UAE

Forbes Marshall team identified issues in steam trapping during a survey and recommended Compact Module Thermodynamic Steam Trap (CMTD) to arrest steam leak at CIP and Filler mainline. This has enabled a steam saving of 0.4 TPD and also safer operations. The CMTD includes inlet, outlet and bypass valve hence we are also able to carry out inline maintenance easily.

A leading beverage manufacturer in Thailand

After a detailed study of our plant, Forbes Marshall suggested corrections in the steam system design and trapping methods to achieve higher uptime of mainline traps. With replacement of conventional traps with compact module thermodynamic traps, and implementation of proper drain modules we were able to avert steam loss of approximately 1.5 TPD. Outlet temperature was reduced by >34 degC and > 50 degC at Mainline 1 & 2 respectively. We were able to achieve 100% uptime of mainline traps, which was earlier at only 20%.

A leading manufacturer of beverages in Indonesia

Our Services

Consistent supply of steam at the optimum pressure, temperature and quality ensures safe and efficient steam distribution. Leaking traps not only impact steam consumption, but can also result in cascading effects like pressure drop, or inadequate steam supply to the process, or both. Ineffective condensate removal in distribution leads to water hammer, which can damage critical equipment and prove costly.

Our comprehensive range of services help to achieve high uptime of steam trapping to ensure sustained performance.

Improvement of Trap and Trap Accessories Uptime and Sustenance Service

Zero Leak Trap Management



Design Improvement and Debottlenecking for Large Complex With higher Trap Population



Trap Maintenance Management



Digital Services for Trap Management



Trap Repair Services



Forbes Marshall Pvt. Ltd.
Opp 106th Milestone, CTS No. 2220,
Mumbai-Pune Road, Kasarwadi, Pune- 411034 INDIA
Tel: +91(0)20-68138555
Fax: +91(0)20-68138402

Forbes Marshall International Pte. Ltd.
16A, Tuas Avenue 1,
#05-21, JTC Space @Tuas
Singapore - 639533
Tel: +65 6219 3890

Forbes Marshall
Krohne Marshall
Forbes Marshall Arca
Codel International
Forbes Vyncke
Forbes Marshall Steam Systems

CIN No.: U28996PN1985PTC037806

Email : enquiries@forbesmarshall.com

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