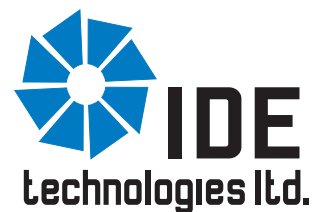




IDE Thermal Desalination Solutions Multi-Effect Distillation (MED)

Technology • Experience • Leadership



Efficient, Cost-Effective Multi-Effect Distillation (MED) Solutions

Four decades ago, IDE introduced its pioneering Thermal Distillation technologies for a world in need of better desalination solutions. Hundreds of deployments later, IDE has emerged as the desalination industry's most experienced provider - and the source of its most advanced technologies.

IDE's MED units are the industry's most reliable, robust and cost-efficient seawater desalination solutions. With capacities ranging from 600 to 25,000 m³/day per unit, the MED units produce a reliable, low-cost stream of high purity water for power plants and industries that can provide low-grade steam as an energy source.

IDE customizes its MED solutions for the needs of each customer, including the site specific characteristics of seawater and steam inputs. IDE has installed some of the world's largest MED installations, including the Reliance Oil Refinery in Gujarat, India, with a capacity of 160,000 m³/day, and the Tianjin SDIC, 100,000 m³/day plant in China, the most efficient of its kind in the world.

IDE's MED: The World's Most Advanced Desalination Technology

The MED utilizes the advanced technologies and know-how developed by IDE over the past 45 years to achieve exceptional thermal efficiency and reliability. Its underlying concept is a multi-stage process in which a spray of seawater is repeatedly evaporated and then condensed, with each stage at a lower temperature and pressure. This highly efficient process multiplies the quantity of pure water that can be produced using a given quantity of energy, resulting in a significant reduction in cost.

Benefits

- **Customized for economic, reduced-cost performance over the long term.** Modular design allows the number of process stages to be optimized for the plant's specific environment and site conditions.
- **Superior reliability and availability** through numerous proprietary design innovations.
- **Highest flexibility**, due to the system's modular design and steam regulation capability, used to adjust production rates.
- **Guaranteed product quality** - Boiler Feed Water (BFW) with less than 5 ppm TDS.
- **Highly energy efficient** - ability to re-use low-cost waste steam to generate electricity during non-peak hours.
- **Low maintenance and operational costs** due to its simple process and few-moving-parts design.
- **Minimized desalination costs** due to use of proprietary low temperature process.
- **Short delivery and installation time.**

Why IDE

- **Leadership in the field:** IDE has deployed dozens of MED units for diverse customers throughout the world. Many of the plants have been operational for a more than a decade - and some for 30 years.
- **Technology leadership:** IDE is internationally recognized for breakthrough desalination technologies that maximize performance and flexibility while minimizing energy consumption and operating costs.
- **Global support:** IDE's global engineering and support staff work closely with customers to make each solution work optimally in local conditions and to assure reliable, trouble-free performance.

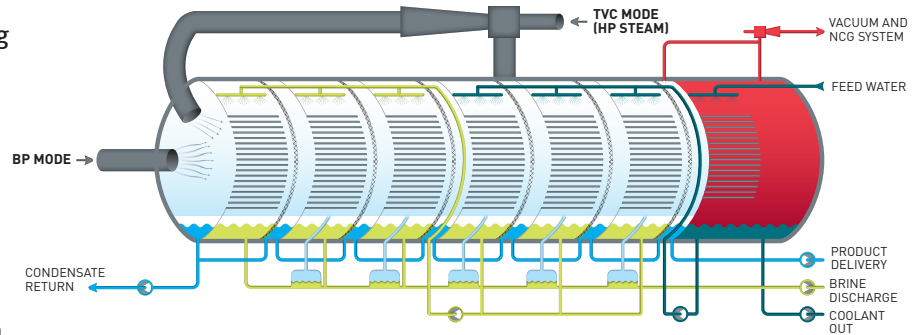
*4 x MED 25,000 Units,
Tianjin, China*



Key Features

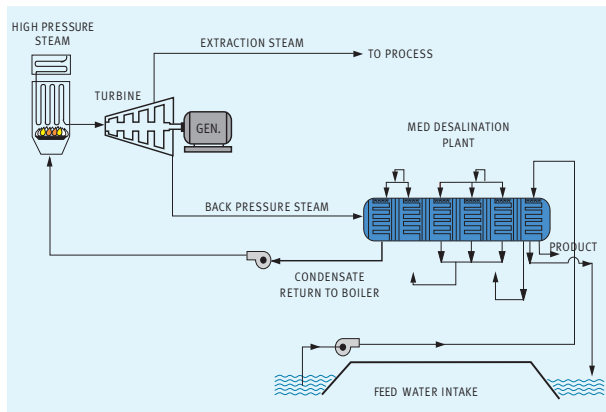
- **Heat transfer tubes' large wetting areas** help avoid scaling and fouling.
- **Large pitch design** for reliable, non-clogging wetting operations.
- **On-line ion trap** prevents heavy metal ions from entering the plant.
- **De-aeration of the incoming feed (seawater) within the falling film condenser** eliminates the corrosion phenomena.
- **Use of rubber grommets to seal all heat transfer tubes** provides electrical insulation and protects against galvanic corrosion.
- **Use of non-erosive titanium condenser components** extends lifecycle.

MED Process Schematic (TVC & BP Modes)



Steam Cogeneration Schemes

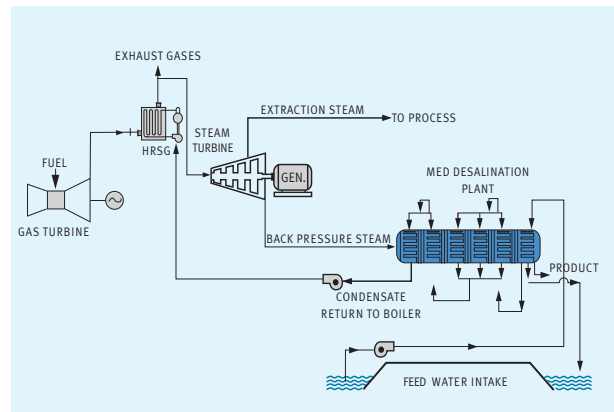
The MED is ideal for use with co-generation schemes such as Back Pressure Steam, Combined Cycle, Diesel Engine or Gas Turbine, re-cycling waste heat while enabling highly ecological chain models (power → water → salt).



Low Grade Steam Operation - Back Pressure Steam (0.25-0.35 Bara)

Designed for very large, dual purpose applications ranging from 50-500MW and 200,000 tons/day of water.

Low temperature MED plants allow further expansion of the steam in the turbine and minimize heat loss, in contrast with high temperature distillation plants that require motive steam of 2-3 ata.



Back Pressure Steam from Combined Cycle or Thermal Vapor Compression (TVC) Applications (2-10 Ata)

The optional solution for IPP and/or re-powering projects. When combined cycles ranging from 50-600MW are applicable, installations of 10,000-160,000 tons/day of water are possible.

This scheme is designed for projects where relatively high steam pressure of 2-10 Ata is available.

About IDE

IDE Technologies is a world leading desalination company. Since 1965, we have built 400 desalination plants throughout the world, with a cumulative installed capacity of over 2,000,000 m³/day - projects that have honed our technologies, our engineering know-how, our project management/operation skills and our financial expertise.

Our technologies for optimized, high-end thermal and membrane (Reverse Osmosis) desalination are recognized as the most advanced in the world, and we have designed, built and currently operate most of the world's mega-sized SWRO desalination plants. In addition, we are leading providers of advanced thermal distillation solutions used for industrial applications.

Our customized desalination plants and self-contained desalination units provide high-quality water for use in industries, mines, refineries, and power stations, as well as for potable water applications and agriculture. IDE is jointly owned by two of Israel's largest industrial enterprises: ICL Group (50%), one of the world's leading fertilizer and specialty chemicals companies, and Delek Group (50%), the leading energy & infrastructure group based out of Israel.

**4 x MED 24,000 Units,
Reliance, India**



**2 x MED 6,000 Units,
MAEK, Kazakhstan**