

Weir Power & Industrial

The key to the success of Weir Power & Industrial is our capability to deliver engineering solutions that add value to the customer's process. We offer a total package of products to meet end-to-end project requirements. Using our own analysis and configuration system, we will design and deliver the optimum valves and controls solution to protect the value of the production process.

A rigorous programme of information management means that the division is able to take a more anticipatory role in defining the future needs and expectations of the market by fully utilising the organisation's critical resources to provide whole process isolation and control valve solutions for the global **Energy** sector.

With a comprehensive range of engineered valve products Weir Power & Industrial have developed an extensive global installed base and expertise across a wide range of industry sectors:

- Power Generation
- General Industrial
- Oil & Gas Production
- Refining
- Petrochemical
- Chemical
- Pulp & Paper
- Desalination

Quality assurance

Weir Power & Industrial operates quality programmes to cover the full scope of their activities. Comprehensive quality systems have been developed to serve the power, oil and gas and industrial markets which they serve.

The company holds approvals to:

- ASME Section III 'N', 'NPT', 'NV'
- ASME Section I 'V'
- BS EN ISO 9001:1994
- API Q1 TO API LICENCES API 6D (6D-0182) AND API 6A (6A-0445)
- TUV - AD MERKBLATT WRD HP 0



The Quality systems have been approved for the supply of products to meet the requirements of the Pressure Equipment Directive (PED) and compliance modules A,D1,H,B&D have been applied in categories I through IV respectively.

The company is committed to compliance with legislation and has an established environment and health and safety policy.

An ongoing commitment to customer care is met through the process of continuous improvement and the further development of our systems and processes towards meeting ISO 9001:2000.

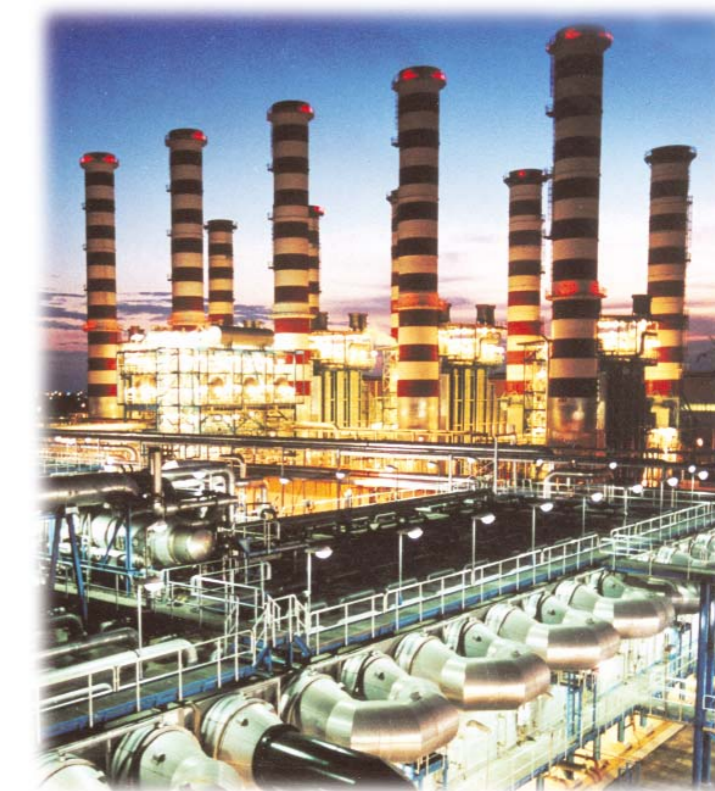
Weir Power & Industrial

Excellent
Power & Industrial
Solutions



Multi Stage Flash Desalination Plant System

Leaders in Critical Service and Isolation applications



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Multi Stage Flash Desalination Plant for producing 150,000 cubic metres of drinking water per day.

A Multi Stage Flash Distillation Plant is designed to produce potable water from sea water. The plant normally operates on low pressure steam such as turbine exhaust and consequently is often designed to operate in conjunction with a Combined Cycle Gas Turbine Power Generation Unit.

The basic desalination plant is divided into three main sections:-

1. Heat Input Section
2. Heat Recovery Section
3. Heat Rejection Section

A typical Multi Stage Flash plant works on a cyclic process, the description of which can be readily understood by referring to the diagram at the location where the recirculating brine leaves the tubes of the Heat Recovery Section of the evaporator and enters the Heat Input Section.

Heat Input Section

The temperature of the brine is raised by heating it in a conventional shell and tube type heat exchanger. When steam is used it is condensed by giving up its heat to the brine and the condensate is extracted from the brine heater by means of condensate extraction pumps and returned to the boiler feed system.

	ATWOOD & MORRILL	BATLEY VALVE	BLAKEBOROUGH	HOPKINSONS	SARASIN	TRICENTRIC
1 ASME Section VIII Relief Valve						
2 Distillate Isolation Valve						
3 Brine Blowdown Pump Inlet Isolation Valve						
4 Cooling Water Recycling Pump Inlet Isolation Valve						
5 Sea Water Supply Control Valve						
6 Reject Discharge Control Valve						
7a Distillate Dump Isolation Valve						
7b Distillate Forwarding Isolation Valve						
8 Distillate Extraction Pump Isolation Valve						
9 Brine Recirculation Pump Isolation Valve						
10 Brine Blowdown Control Valve						
11 Feed Make Up Control Valve						
12 Brine Recirculation Flow Control Valve						
13 Condensate Forwarding Isolation Valve						
14 Condensate Dump Isolation Valve						
15 Condensate Flow Control Valve						
16 Sea Water Recycling Isolation Valve						
17 Brine Recirculation Control Valve						
18 Distillate Discharge Control Valve						
19 Brine Blowdown Emergency Isolation Valve						
20 Pressure Control & Desuperheating Valve						
21 Distillate Extraction Suction Isolation Valve (Gate)						
22 Desuperheater Water Check Valve						
23 Condensate Pump Non Return Valve						
24 Brine Blowdown Pump Non Return Valve						
25 Cooling Water Recycle Pump Non Return Valve						
26 Distillate Extraction Pump Non Return Valve						
27 Brine Recirculation Pump Non Return Valve						
28 M. P. Steam Header Isolation Valve						
29 M. P. Steam Isolation Valve						
30 Non-Condensable Gas Vent Isolating Valve (Hot)						
31 Non-Condensable Gas Vent Isolating Valve (Cold)						
32 Desuperheater Water Isolation Valve						
33 Ejector Discharge Isolation Valve (Butterfly)						
34 Condensate Pump Isolation Valve (Gate)						
35 Condensate Pump Inlet Isolation Valve (Gate)						

Heat Recovery Section

The heated brine passes to the first of a series of flash chambers forming the Heat Recovery Section, where flash heat is transferred to the recirculating "cooling" brine, which condenses the vapour to form distillate. Each stage of the Recovery Section comprises:-

1. A condenser in the upper section.
2. A vapour drier/distillate collector in the central section.
3. A flash chamber in the bottom section.
4. A non condensable gas extraction system above the condenser.

Heat Rejection Section

A desalination plant does no external work so heat supplied to the brine in the Heat Input Section must be rejected to waste. This is effected in the Heat Rejection Section. The flashing brine passes through the stages of the Heat Rejection Section

and the vapour released during flashing is condensed on surface condensers through which cooling sea water is circulated. The total fresh water so produced is extracted from the last flash chamber and pumped to storage by the distillate extraction pumps.

Make up feed is introduced into the recycle brine stream after being deaerated and chemically treated. The combined make-up and brine is then pumped

through the tubes of the Heat Recovery Section stage condensers where it recovers heat from the flashing brine vapour.

Brine is continuously discharged from the brine blowdown connection to waste to maintain the concentration of the brine in the recirculation system at the design figure.

In order to prevent the blanketing effect of non-condensable gases on the heat exchange surfaces, provision is made so that non-condensable gases released after the first few stages can be vented from stage to stage and removed from the last

stage of the Heat Rejection Section. These vents are led to an air ejector system which extracts the non-condensable gases and exhausts them to atmosphere.

