

# THE WHIRLER

## ECO-FRIENDLY

### ONLINE CONDENSER CLEANING SYSTEM

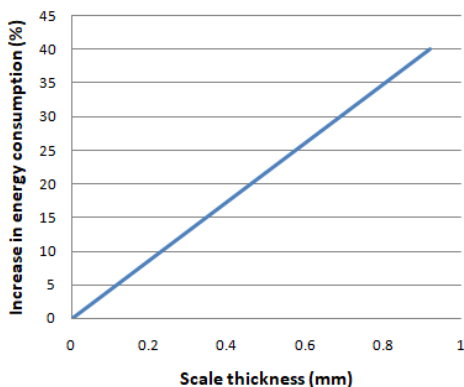
\*patent pending

**USE THE WHIRLER™! FORGET CONDENSER DE-SCALING!**

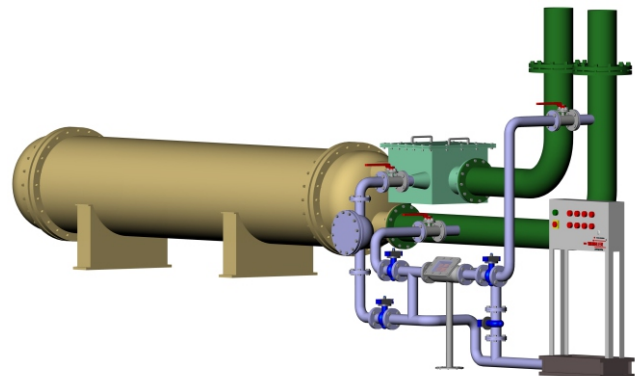
Fouling and scale formation waste energy and can ultimately cause unscheduled system shutdown. Effective water treatment can minimize the possibility of high head pressure and excessive energy consumption caused by condenser deposition.

Fouled condenser tubes are a common cause of high head pressures. Fouling increases the resistance to heat transfer from the refrigerant to the cooling water. In order to maintain the same heat transfer rate, the temperature of the refrigerant must be increased. The compressor fulfills this need by increasing the pressure at which the refrigerant is condensed. With a centrifugal chiller, a 1°F increase in condensing temperature increases compressor energy consumption by approximately 1.7%.

| Effect of Variation in Condenser Temperature on Compressor Power Consumption |                               |                                      |                       |
|------------------------------------------------------------------------------|-------------------------------|--------------------------------------|-----------------------|
| Condensing Temperature (°C)                                                  | Refrigeration Capacity (tons) | Specific Power Consumption (kW / TR) | Increase in kW/TR (%) |
| 26.7                                                                         | 31.5                          | 1.17                                 | -                     |
| 35.0                                                                         | 21.4                          | 1.27                                 | 8.5                   |
| 40.0                                                                         | 20.0                          | 1.41                                 | 20.5                  |



Effect of Scale on Energy Consumption



## Introduction

A K Associates has developed THE WHIRLER online condenser cleaning system which is fully automated. THE WHIRLER ensures fully clean condenser tubes which results in excellent improvement in plant efficiency and reduction in power consumption.



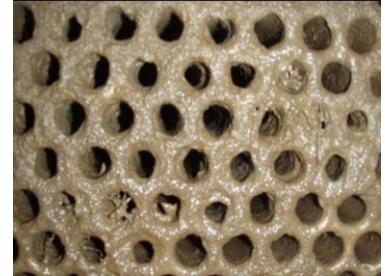
## Operation

SPONGE BALLS injects into the condenser water inlet when the injection valve opens. As the balls pass through the condenser tubes they clean the inner surface of the tubes. Balls are trapped into the BALL ARRESTER at the condenser water outlet when they pass out the condenser.

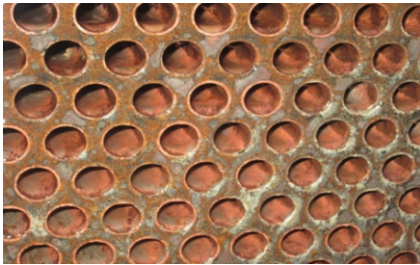
Trapped balls are recovered in the BALL STORAGE TANK when the drain valve gets open. PLC BASED CONTROL PANEL ensures automation.

### Salient Feature of THE WHIRLER

- ▶ Patent filed for its unique design.
- ▶ No High pressure pump. Uses system pressure for Ball injection & Ball recovery.
- ▶ Own Ball Arrestor design which makes lesser modifications in existing system.
- ▶ Zero pressure drop in ball arrester
- ▶ Zero water loss from the system
- ▶ Zero ball loss system, no balls can escape to cooling tower.



WITHOUT THE WHIRLER



WITH THE WHIRLER

### THE WHIRLER benefits

- ▶ Eliminates condenser de-scaling completely.
- ▶ Maintains condenser approach.
- ▶ Improves plant efficiency.
- ▶ Reduces plant power consumption by 10-25 %.
- ▶ Increases life of tubes due to reduction in the de-scaling frequency.
- ▶ Return On Investment within One Year.

## Applications

HVAC | commercial complex | Condenser | Shell & Tube Heat Exchanger  
Chemical | Fertilizer Industries | Pharmaceutical | Petrochemical | Refinery



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