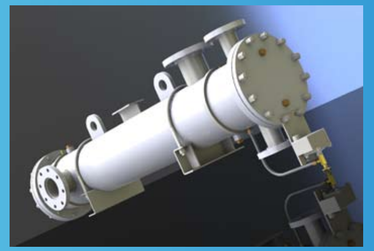
Shell & Tube Type OFW (Forced Oil and Water Flow)

Unifin's forced oil-water cooler is a shell & tube heat exchanger specifically designed for transformer cooling applications. This heat exchanger can be mounted in either vertical or horizontal positions. An optional design feature in this cooler is Unifin's unique Leak Detector design, which features "double walled" tubes that terminate at double tube sheets, allowing for any leaking water carried by the inside tube to be captured and contained by the outside tube, preventing water from mixing with the oil, there by protecting the transformer.



Features and Options

- Double concentric tubes with longitudinal grooves at tube interfaces which stop higher pressure water entering the oil through a split or holed tube. This design prevents oil entering the cooling water, thus protecting the transformer and the environment
- Robust design with stiff double concentric tubes which more readily withstands "flow induced vibration"
- Compact design made possible by an integral finned copper outer tube on oil side
- Ease of access to the waterside without disturbing the water connections permits inspection and maintenance for fouling and corrosion
- Long dependable life resulting from the right choice of waterside materials
- Enhanced coastal paint systems for severe duty installations

Type OFW Size Range

Sizes available range from 8" - 36" diameter. Lengths of 36" - 120" depending on diameter.
Nominal capacity range, 60 kW to 1,200 kW.

The Replacement Experts

For years Unifin has worked with End User's and OEM's to produce custom designed Type OFW cooling solutions. As the leader in Shell & Tube Type OFW coolers, Unifin can generate exact drop in replacement solutions, minimizing or eliminating site work while providing designs with greater cooling capacity.

Unifin
A Wabtec company

A World Leader

Who We Are

Service...Speed...Dependability

At Unifin the cooling of Electric Machines is our only business. Every resource in the company has been directed towards research and development to acquire world leading heat transfer technology and manufacturing processes. Today, this investment has established Unifin as a global leader in the supply of:

- Transformer Oil Coolers
- Transformer Oil Pumps
- Generator Coolers
- TEWAC Motor Coolers

Global Presence

Headquartered in London, Ontario, Canada, Unifin is a global organization with locations in Canada, the United States and China.

Our Brands

Unifin is a global company with worldwide recognized brands in transformer oil coolers, transformer oil pumps, generator coolers and TEWAC motor coolers.

- ***ForZair*** transformer oil coolers
- **HeatSink**™ portable transformer coolers
- **HARLEY**™ sleeve bearings
- *Tec**Sonics***™ bearing wear monitoring system
- *Weather**All***™ power cords
- **RCP**™ coolers

The Hottest Name in Cooling

Unifin
A Wabtec company

Corporate Head Office: 1030 Clarke Road,
London, Ontario, Canada N5V 3B2
Tel: (519) 451-0310
Fax: (519) 451-1732
unifin@wabtec.com

www.unifin.com

FZ-TC.09.12.3M PRINTED IN CANADA

Unifin
A Wabtec company

ForZair™
Transformer Coolers

Transformer Cooling Products

Cooling Solutions

ForZair™ Power Transformer Coolers

Forced Air, Forced Oil Transformer Coolers

Highlights:

Hot Dip galvanized finish

Optimum efficient fan blades

NEMA high temperature fan motors

Extruded tube or Plate-Fin heat transfer surfaces

Stainless steel hardware

Hinged cabinets

Accessible terminal box

Unifin
A Wabtec company

What we can do for you!

- Standardized designs for OEMs
- Reduced top oil temperature
- Increased cooling capacity
- Eliminate oil leaks and environmental concerns
- Plug and play transformer oil pump replacements
- Reliable transformer shutoff valves
- Plug and play replacement transformer coolers for:
  - — Westinghouse
  - — General Electric
  - — ABB
  - — Asea
  - — McGraw Edison
  - — Mobile substations

ForZair™ Product Features:

Rugged Design

First of many features is the ForZair™ standardized cooler design, which means we can manufacture and ship quickly.

Cleanliness

Unifin uses an an advanced flushing system to achieve ISO standards for cleanliness in the transformer industry.

Hinged Fan Panels

Maintenance is critical to optimizing the life of a transformer cooler, standard hinged panels make it easy to open the cooler and clean the fin surface.

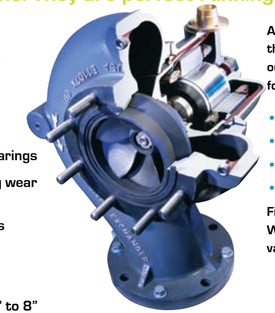
Fans and Motors

Fans and motors for ForZair™ coolers are based on exacting specifications for efficiency, long life and noise reduction.

Cardinal Pumps and Valves...

Compliment ForZair™ transformer oil coolers with exacting specifications. They are perfect running mates.

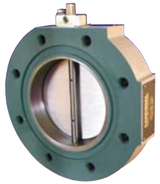
- Centrifugal and axial flow
- Extreme temperature range performance
- Long life, low maintenance
- Precision bearings
- Optional HARLEY® sleeve bearings
- Optional *TecSonics*® bearing wear monitoring system
- Thermo-siphon flow impellers
- Continuous duty operation
- Oil immersed motors
- Heavy duty oil valves from 2" to 8"
- Performance run-in testing
- Certified performance curves
- Rebuilt Pumps for any manufacturer



Avoid future forced outages by replacing the valves during your next transformer outage. Replacement valves have the following features:

- Viton elastomers
- Back-to-back lip seal packing design
- Strengthened valve stems
- In-service maintenance ability

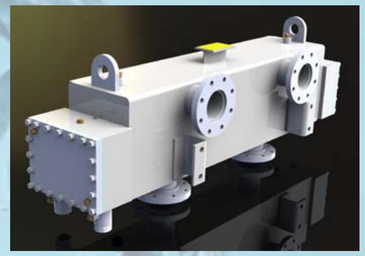
Field retrofit kits available for Westinghouse and McGraw Edison valves.



Unifin
A Wabtec company

Shell & Tube Type ONW (Natural Convection Oil Flow)

The most efficient transformer oil cooler is the water cooled "Type ONW". This shell & tube heat exchanger uses natural oil convection on the shell side and water through the tube. It is available with Unifin's exclusive leak detector feature which immediately detects any leak before water can get into the oil and endanger the apparatus.



Features and Options

- No internal water piping subjected to hazardous leaks, erosion of bends and corrosion inside the tank
- Cooler location high in the tank and piping to the bottom of the tank increases natural convection and prevents mixing of hot and cold oil
- Cooler arrangement of tubes and increased oil flow gives higher velocity and increased heat transfer and efficiency
- Double tube sheet construction eliminates the hazard of leaking tube joints
- Straight tubes reduce the risks of corrosion/erosion of bends
- Ease of access to the tube side allow for inspection and cleaning
- Coolers are water drainable to prevent damage during freezing weather shutdown
- ONW's design using double concentric Leak Detector Tubes removes the risk of a tube leak, a hazard always present when water pressure exceeds oil pressure

Type ONW Size Range

Size	Length	KW*
12"	3' to 6'	32 to 66
14"	4' to 6'	66 to 109
18"	5' to 7'	132 to 185
24"	5' to 8'	236 to 375

*Typical kW capacity for a Leak Detector Design with a 40°C Average Oil Rise using sufficient flow of 25°C water with a water temperature rise of 10°C, with tube passes arranged to achieve at least 3 feet per second velocity

Unifin
A Wabtec company