

# Cooling and Filtration Solutions for Machine Tools



Oil Chiller



Immersion Chiller



Coolant Filtration System



Panel Air Conditioner

## Oil Chiller

Sophisticated multi-tasking machines of today employ numerous hydraulic operations to achieve high productivity at desired quality levels. Hydraulic systems in turn employ special and specific oil with a wide viscosity range. These hydraulic oils store heats during it operation and the continuous addition of heat reduces the viscosity of these oils. AS the oil thins down, the hydraulic system starts to malfunction due to internal leaks. Therefore, it becomes essential to maintain specified temperature limits for this oil during operation. A hydraulic oil chiller is normally connected in parallel to the oil tank through a dedicated built in pump.

These chillers are complete systems fitted with refrigeration components, including the compressor, condenser, evaporator, refrigeration pipes, oil pump and electrical panel. Chillers help maintain the oil temperature to precise temperature levels which in turn maintains uniform physical and chemical properties of the oil in operation. This level of precise temperature control of fluids is not possible by any other method of cooling. Critical industrial hydraulics have special needs beyond mere cooling, such as round the year operation, precise temperature regulated lean circulating loop; which is only possible with equipment matched, factory tested hydraulic oil chillers.

Werner Finley understands these requirements and has come up with series of Oil Chillers specifically designed for such needs.

### Features of iHOC and iHOB series for hydraulic and Spindle oils:

- Air cooled heavy duty condensers
- BPHE type evaporator
- Internal gear pump for low noise
- Microprocessor based controller

### iDIP and iSAT series for Water based and Oil Based Machine Tool Coolants

#### Features of iDIP Series

- Seamless SS 304 evaporator coil, suitable for all coolants
- Stirrer in higher models for agitation
- Microprocessor based controller

#### Features iSAT Series:

- Shell and Tube type evaporator
- Centrifugal pump to handle coolants
- Microprocessor based control



iHOC – Without tank, suitable for hydraulic and lubricating oils



iHOB – With oil tank, suitable for Spindle and Hydraulic Oil



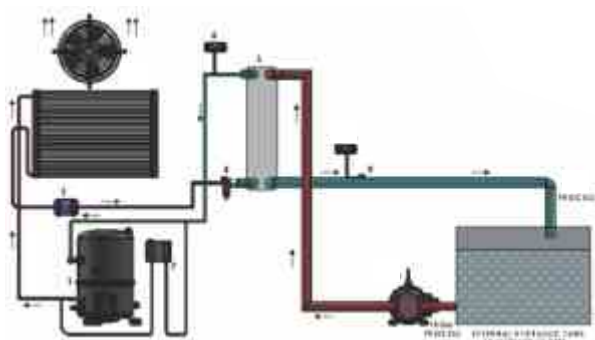
iDIP : Suitable for all machine tool coolant, water and oil based



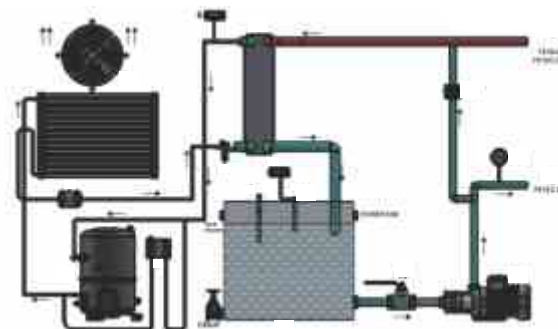
iSAT : Suitable for all machine tool coolant, water and oil based

**Applications:**

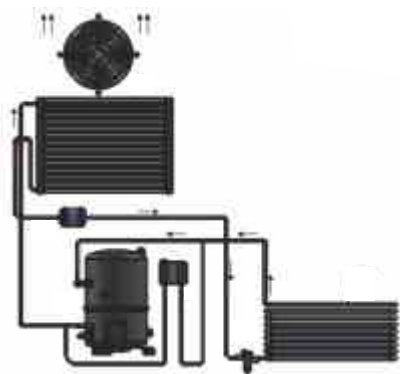
- Broaching
- Turning
- Drilling
- Super finishing EDM
- Cutting
- Milling
- Grinding
- Reaming
- Hobbing
- Shaping
- Thread cutting
- Press
- Lapping
- Slotting
- Jig Boring
- Moulding Machine
- Honing
- Planing
- Polishing



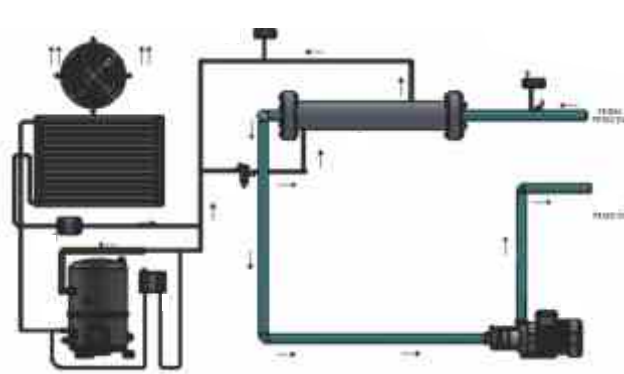
**iHOC**



**iHOB**



**iDIP**



**iSAT**

**Technical Details iHOC Oil Chiller without tank**

Model	Comp	Cooling Cap TR	Power Supply	Full Load Power (kw)	Full Load Current (A)	Ref	Dimension Overall	Flow Rate LPM	Inlet/Outlet
iHOC15HAX	Recip	0.5	1PH	2	11	134a	900*550*500	10	1/2" BSP
iHOC3TAX	Recip	1	1PH	2.6	12	134a	950*650*600	10	1/2" BSP
iHOC45HBY	Recip	1.5	3PH	3.6	7.7	R22	1100*800*700	20	3/4" BSP
iHOC6TBY	Recip	2	3PH	3.9	8	R22	1100*800*700	20	3/4" BSP
iHOC9TBY	Recip	3	3PH	4.85	10.3	407c	1100*900*850	30	1" BSP
iHOC15TBY	Recip	5	3PH	6.9	15	407c	1300*1050*1000	50	1" BSP

- All technical details are arrived by considering ambient of 35 deg C, oil temperature of 30 deg C and oil as ISO VG 32
- The above range can work from 10 CST to 68 CST oils
- The cooling units should be placed within 2 m from the oil tank
- Power supply considered is 230 V, 50 HZ for 1 PH and 415 V, 50 HZ for 3 PH
- Special Voltage and frequency package is available on request
- Higher capacity chiller is available on request

**Technical Details iHOB Oil chiller with tank**

Model	Comp	Cooling Cap TR	Power Supply	Full Load Power (kw)	Full Load Current (A)	Ref	Dimension Overall	Flow Rate LPM	Inlet/Outlet
iHOB15HAX	Recip	0.5	1PH	2	11	134a	900*550*500	10	1/2" BSP
iHOB3TAX	Recip	1	1PH	2.6	12	134a	950*650*600	10	1/2" BSP
iHOB45HBY	Recip	1.5	3PH	3.6	7.7	R22	1100*800*700	20	3/4" BSP
iHOB6TBY	Recip	2	3PH	3.9	8	R22	1100*800*700	20	3/4" BSP
iHOB9TBY	Recip	3	3PH	4.85	10.3	407c	1100*900*850	30	1" BSP
iHOB15TBY	Recip	5	3PH	6.9	15	407c	1300*1050*1000	50	1" BSP

- All technical details are arrived by considering ambient of 35 deg C, oil temperature of 30 deg C and oil as ISO VG 32
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- Higher capacity chiller is available on request

## Hydroband Filtration System

### Features:

- Gravity and coolant head replaces the need of an external pressure / energy
- Truly Compact-Saves invaluable Shop floor space.
- Guaranteed Fine filtration, No leakage.
- Reduces the use of filter media, as the cake replaces the media once it is formed
- Only energy consuming motor is that of the gear box, which is a fractional motor
- Very low maintenance

### Applications:

- Grinding
- Wire drawing
- Honing
- Rolling
- Lapping
- Other machining processes



**Hydroband filtration system**

## Rear earth type Filtration System

This is a primary filter, to filter ferrous particles from the coolant stream. A rear earth magnet is a powerful tool to separate ferrous particles as the coolant is flowing through this device. The installation is such that the coolant stream first flows through the magnetic separator and from here is made to flow into the media based system, where the non-ferrous particles are filtered.

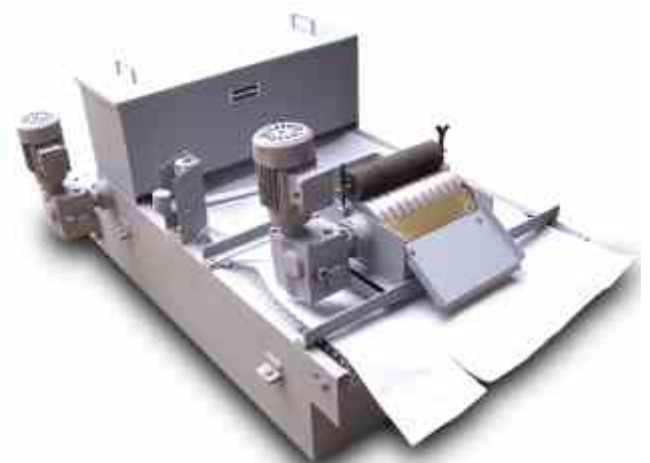
Magnetism is measured in a unit called gauss and a rare earth magnet has a gauss of 1000.00

Other filters for coolant / oil applications

- Centrifuge
- Hydro-cyclone
- Bag filters with housing
- Candle filter with housing

## Gravity band filtration

This is the previous generation to the above compact ban version. Here the advantage of the coolant head pressure is not present due to design constraints, the only pressure on the cake is that of gravity. This is used where ever the coolant outlet from machine is at a very low level and the client does not want to add a collection tank and a transfer pump. If the machine outlet height is above the inlet of a compact band filter system or if the client agrees to add a collection tank and transfer pump, compact band filter is a better choice



**Gravity band filtration**

All the above products are made to order and technical data will be provided on demand.

### Technical Details iDIP

Model	Comp	Cooling Cap TR	Power Supply	Full Load Power (kw)	Full Load Current (A)	Ref	Dimension Overall
IDIP15HAX	Recip	0.5	1PH	1.1	6.3	134a	500*250*550*500
IDIP3TAX	Recip	1	1PH	1.6	7	134a	600*250*600*600
IDIP45HBY	Recip	1.5	3PH	1.8	4	R22	600*250*600*600
IDIP6TBY	Recip	2	3PH	2.75	5.75	R22	800*300*780*750
IDIP9TBY	Recip	3	3PH	3.85	8	407c	900*300*850*850
IDIP15TBY	Scroll	5	3PH	5.8	12.5	407c	1100*450*1100*950

### Technical Details iSAT

Model	Comp	Cooling Cap TR	Power Supply	Full Load Power (kw)	Full Load Amps(A)	Ref	Required flow	Dimension Overall	Inlet/Outlet
ISAT15HAX	Recip	0.5	1PH	1.6	11	134a	10	950*550*500	3/4"BSP
ISAT3TAX	Recip	1	1PH	2.15	10.5	134a	10	1100*600*600	3/4"BSP
ISAT45HBY	Recip	1.5	3PH	2.3	5.5	R22	20	1200*800*750	1"BSP
ISAT6TBY	Recip	2	3PH	3.3	7.2	R22	20	1200*800*750	1"BSP
ISAT9TBY	Recip	3	3PH	4.6	10	407c	30	1350*850*800	1"BSP
ISAT15TBY	Scroll	5	3PH	7.65	16	407c	50	1400*1100*950	1"BSP

- All technical details are arrived by considering ambient of 35 deg C, oil temperature of 30 deg C
- The above range can work with sulphured coolant oils, water based and others
- Special Voltage and frequency package is available on request
- Higher capacity chiller is available on request

## Filtration Systems

Werner Finley has demonstrated leadership in manufacturing Industrial cooling systems since its inception in 1986. With the existing range of products Werner Finley provides solutions for almost all Industrial Cooling requirements. Since 2004, Filtration system has been added to our existing array of products to provide complete coolant management solutions.

Filtration is a treatment process for the separation of solid particles from fluid solids, under the control of qualified operators, by passage of most of the fluid through a membrane that retains most of the solids on or within itself is called filtration. The membrane is called a filter medium, and the equipment assembly that holds the medium and provides space for the accumulated solids is called a filter. The fluid may be a gas or a liquid. The solid particles may be coarse or very fine, and their concentration in the suspension may be extremely low (a few parts per million) or quite high (>50%).

### Principal:

The principal if a compact band filter is where both gravity and the static head of coolant works as a pressure on the dirt cake that forms on the filter paper (media). The dirt cake later becomes a secondary filter, which is very effective in purifying the coolant upto 10 microns.

### Advantages of Filtration system

- Increased Tool life
- Improved Surface Finish of Components

- Extending Coolant Life
- Reduces Hazardous waste
- Cleaner working environment
- Reduces machine down time
- Increased machine out put
- Eliminates bad smell & microbial growth



Principal

### Hydroband Filtration System



## Panel Air Conditioners

Werner Finley Panel Air Conditioners are designed to cool and condition sensitive electronic enclosure for various applications, meeting or exceeding all manufacturers expectations. Werner Finley air conditioners are universal in terms of its adaptability owing to a portfolio of models that has emerged as a result of rich and long experience in the field of thermal engineering. These air conditioners are designed, manufactured and tested at the factory and at sophisticated 3rd party laboratory to ensure efficient operation and customer satisfaction. These air conditioners are easy to install and are supported with factory trained experts with immediate access to common spare parts. The units feature a rugged design durable for inside and outside applications. Built in quality along with Werner Finley's leadership role in after sales support, make the panel air conditioner a logical choice for the specific cooling of sensitive electronic/electrical enclosures.



**iVAC – Vertical mount**

### Necessity of a Panel Air Conditioner

Sensitive electronic/electrical enclosure used for machine tools and other industrial applications are installed in shop floors, which are laden with oil mist and conductive dust in its atmosphere. Protecting the electronic devices and operation them at highest efficiency levels becomes mandatory to maintain high productivity. Mounting a panel air conditioner to such enclosure will ensure controlled temperature levels, low relative humidity, freedom from oil mist and dust.



**iDAC – Duct / hose connecting**

### Standard Panel air conditioners come in two variants and suits most industrial panel cooling applications:

- iVAC – Vertical mount : Cooling cap : 400 – 6000 kcal/hr (photos)
- iDAC – Duct / hose connecting: Cooling cap : 900 – 9000 kcal/hr (photos)

Various other applications like medical equipments, robotics, analytical equipment, food processing equipment, etc, are also driven and controlled by sensitive electronics that require an equally sensitive air conditioner. We are able to provide thermal solutions to a wide gamut of applications owing to our broad portfolio of air conditioners and constant R&D efforts to provide a unique solution each time.



**Range**

### Applications:

- Machine tool
- Automation
- Textile machine
- Furnace control
- Elevator control
- Plastics
- Metal working
- Drive panel
- Baggage X ray
- Computer / Server

### Technical details : iVAC – Vertical mount

Model	Cooling Cap (Kcal/H)	Ref	Dimension	Pwr (kw)	Amp
IVAC04HAX	400	R134a	650*275*195	0.3	2
IVAC06HAX	600	R134a	650*275*195	0.44	3.1
IVAC09HAX	900	R134a	950*330*215	0.6	3.5
IVAC14HAX	1400	R134a	950*330*215	0.9	5
IVAC02TAX	2000	R134a	1400*395*275	1.5	7.5
IVAC03TAX	3000	R134a	1400*395*275	1.9	8.5
IVAC45HBX	4500	R407C	1550*550*550	2.5	12
IVAC06TBX	6000	R407C	1550*550*550	2.5	12

### iDAC – Duct / Hose connecting

Model	Cooling Cap (Kcal/H)	Ref	Dimension	Pwr (kw)	Amp
IVAC09HAX	900	R134a	650*350*485	0.65	3
IVAC14HAX	1400	R134a	750*450*500	0.9	5
IVAC02TAX	2000	R134a	750*450*500	1.01	7.5
IVAC03TAX	3000	R134a	750*450*500	1.8	8.5
IVAC45HBX	4500	R407C	1225*750*750	2.5	12
IVAC06TBX	6000	R407C	1225*750*750	2.5	12
IVAC09TBY	9000	R407C	1350*900*750	3.33	6.2

- The above cooling capacities are rated at site of + 35 deg C and panel temp of + 30 deg C
- Panel air conditioners can maintain 5 deg C less than site temperature
- Set temperature of 30 – 35 deg C is ideal for most panels
- RH of 50 is achievable within the panel
- Panel needs to be completely sealed
- Max operating ambient temperature at site is 45 deg C

### Tutorials

Formula for calculating required cooling capacity:

$$Q = Q_1 + Q_2$$

Q = Total heat load (watts)

Q<sub>1</sub> = Heat load due to exposed area of panel (watts)

Q<sub>2</sub> = Internal heat load due to electrical / electronics devices (watts)

$$Q_1 = \text{Area (sqm)} \times 5.5 \times \Delta T (^{\circ}\text{C})$$

Area - Exposed surface area of enclosure in square meter

5.5 - Heat transfer co-efficient for metal surface

ΔT - Temperature difference between Max. ambient and Max. allowable panel temperature

Q<sub>2</sub> - Contact factory for more information on internal

heat load calculation

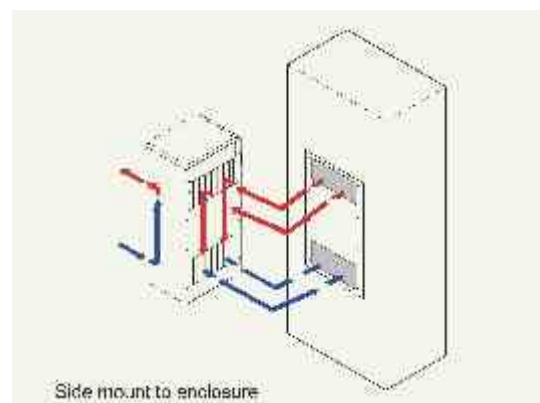
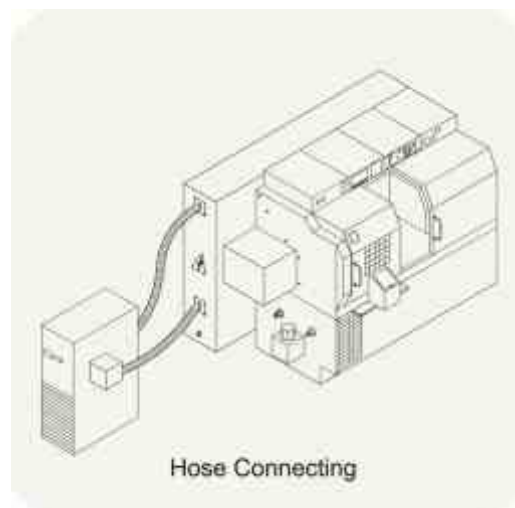
### Conversion:

$$1\text{KW} = 1000 \text{ W}$$

$$1\text{KW} = 860 \text{ Kcal/h}$$

$$1\text{TR} = 3000 \text{ Kcal/h}$$

$$1\text{TR} = 12000 \text{ BTU/h}$$





Packaged Water Chiller 0.5TR - 120TR



Screw Chiller 40TR to 300TR



Low Temperature Chiller 10HP to 100HP (-40°C)

**About:**

Since 1986 Werner Finley has been dedicated in providing process cooling solutions to the industry and this has organically led us to manufacture a wide range of cooling and related products. We also offer customized systems like the constant temperature bath ( $\pm 0.1^{\circ}\text{C}$ ), air to fluid and fluid to fluid heat exchanger systems. Owing to our wide range of process cooling products, we have been able to cater to major market segments like the Auto, Pharma, Chemical, Plastics, Food and beverages, Breweries, Laboratory, Defense, etc. Werner Finley is a vision that stands for ethical business practice, high quality product offerings and enhanced customer satisfaction. We are an ISO 9001 – 2008 certified company for quality and have been rated highly by CRISIL and D&B for our financial health. Being pioneers in this field in India, we have a strong and well established Sales and Service Network across the length and breadth of the country. We are a professionally managed and organised company engaged in developing newer cooling products for new and existing markets within and outside India. We are doing our bit to the environment by phasing out the use of ozone harmful refrigerant and substances and adapting our technology to use the new eco-friendly refrigerants.

**Werner Finley Pvt. Ltd.,**

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