

CB & Automatic Systems

TURBO ICE RAKE STORAGE & DELIVERY SYSTEMS

**From 20 to 400 ton
capacities**

USDA approvable

**Wider selection
with more options**

**Sturdier equipment
for heavier duty**

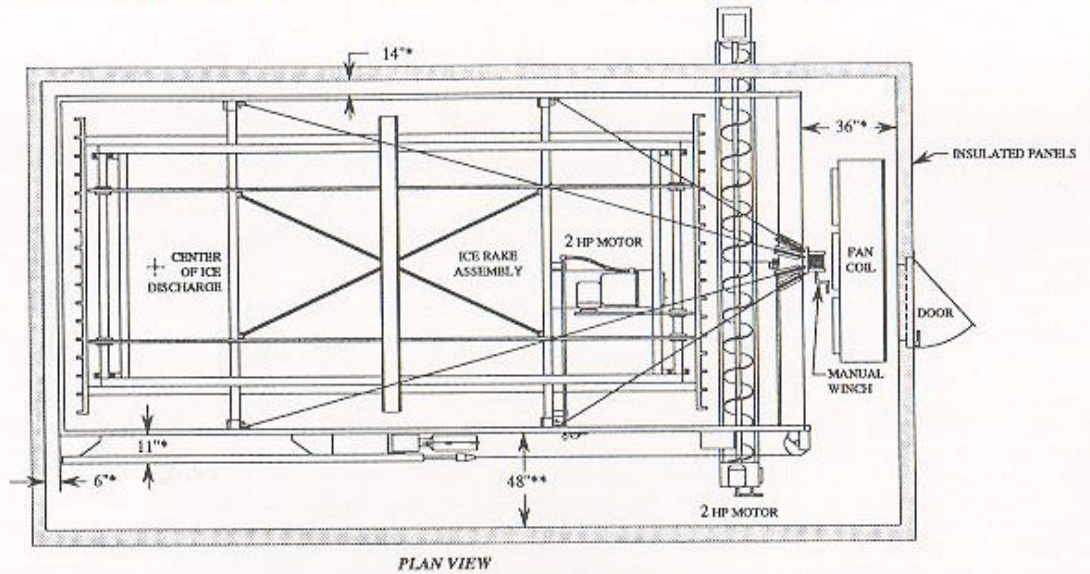


TURBO
REFRIGERATING

Features & benefits

CB-Rake Typical Layout

* Clearance dimensions are approximate. Not to scale.
 ** Hydraulic can be front mounted.

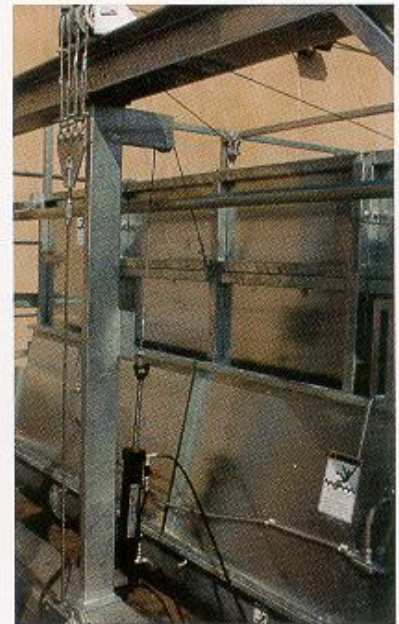


Stainless steel component options

- | | |
|----------------------|----------------|
| Drive & idler shafts | Flites |
| Rake flite chain | Bin liner |
| Rake flite sprockets | Bin door liner |
| Rake hoist cables | |



Pioneered flite design



Corrosion resistant bin supports



Rugged construction

The ice rake: a triumph of TURBO engineering

TURBO REFRIGERATING'S line of **AUTOMATED ICE STORAGE RAKES** improve the quality and reliability of any ice system while also making it safer and more sanitary. **TURBO** couples uniquely designed mechanical components, sanitary materials and the latest electronic controls in every ice rake. The result – an easy to install, operator friendly, clean and safe method to store and move ice.

Reputation

Since 1967, **TURBO** has provided ice rake systems for many different ice handling applications. The wide range of capacities, footprint dimensions and flexible controls have made these ice rakes the choice for ice storage and handling in many practical applications.

- Packaged ice
- Agricultural icing (produce)
- Concrete icing
- Poultry processing
- Chemical manufacturing
- Seafood icing

Sanitary construction

TURBO REFRIGERATING ICE RAKES are installed in USDA approved sites (on site approval is required for all USDA applications). Ice handling components are made of galvanized material (stainless steel material is optional), food grade plastic and aluminum materials to assure a clean product. Galvanized materials are used for non-contact, structural needs where corrosion resistance is mandatory.

Innovation

Recent improvements in the electrical control components, drive train design and new manufacturing methods make both the **CB** and **AUTOMATIC ICE RAKES** the leader in solving storage and handling needs. Rake controls are sophisticated **AND** user friendly. While the rake is immediately protected as soon as operating problems are detected, the controls are easy to use and understand for the operator. A new girder liner design improves the wear surfaces of the rake, enhancing the cleanliness of the ice product. The ice flite, which is in direct contact with the ice, is now manufactured with an integral attachment for the chain.

Increased up time

The bottom line for all ice plant operations is reduced down time due to mechanical failures, structural problems, broken parts and extensive maintenance. **TURBO ICE RAKES** yield more

“up time” due to the robust design of all of the components. Just compare the weight and gauge of materials used in the ice flites, bin structure and door mechanisms and it is apparent that this equipment will handle the extreme loads created by moving ice. Whether it is delivering 30+ tons per hour to a pneumatic ice delivery system in a chemical plant or clearing the “blue” hard ice in the bottom of a packaged ice rake, the **TURBO RAKE** is the structurally superior solution.

Why use an ice rake?

- **PRODUCT QUALITY** – The use of one or more ice rakes allows the ice to “cure.” Ice delivered to a rake in a below freezing room can have residual moisture removed. The dryer (and colder) the ice, the easier it is to handle. Dry ice flows better, bridges less and does not experience problems found with handling wet ice.
- **STORAGE VOLUME** – Maximize the ice maker's capacity by providing ample storage space. Tons of ice can be stored over a period of time and delivered from the rake bin in a short period of time to meet high demands. In many cases, smaller ice makers can be used to satisfy large ice needs when coupled with the right storage.
- **REDUCE ENERGY COSTS** – Cheaper off-peak energy can be used to run the ice makers while the ice rakes are filled. During on-peak time, the ice makers can sit idle while ice is available from the rake bin. This type of electrical load shifting can mean large savings to plant operators.
- **REDUCE ICE HANDLING SAFETY ISSUES** – Remove the need to have humans in contact with the ice. The automatic nature of the ice rake takes personnel out of bins, away from screw conveyors and eliminates the need for manually clearing ice jams.

Turbo's system

TURBO ENGINEERS are specialists in the field of automatic ice manufacturing, ice storage and ice distribution systems. All of these outstanding qualifications make **TURBO SYSTEMS** the leaders in the industry. That's why we can safely say:

**TURBO is the LEADER...
PRODUCING, STORING AND
DISTRIBUTING ICE.**



CB Rakes 20-87 Tons

Model Number	Ice Capacity ¹ (U.S. tons of ice)	Maximum Delivery Rate (tons/hour)	Approximate Shipping Weight (pounds)	Floor Space Required ² (L x W x H)
CB-20	20	15	2,000	24'-9" x 11'-6" x 9'-0"
CB-30	30	15	2,100	24'-9" x 11'-6" x 11'-10"
CB-38	38	15	2,200	24'-9" x 11'-6" x 13'-6"
CB-50	50	15	2,300	24'-9" x 12'-0" x 16'-4"
CB-31	31	23	3,000	29'-9" x 14'-0" x 9'-0"
CB-49	49	23	3,150	29'-9" x 14'-0" x 11'-10"
CB-59	59	23	3,250	29'-9" x 14'-0" x 13'-6"
CB-75	75	23	3,350	29'-9" x 14'-6" x 16'-4"
CB-87	87	23	3,500	29'-9" x 16'-6" x 16'-4"

¹ Capacity based upon ice density of 40 pounds per cubic foot (640 kg/cu meter) for TURBO fragmented ice (CF & CAR models). For other ice products, derate capacity as follows:

	Correction Factor
Turbo TIG/TIGAR fragmented ice	0.90
Vogt Tube Ice (all diameters)	0.85

² Includes space required for mounting the hydraulic cylinder and power unit, vertical bin braces, control panel and rake bin door hand winch and a 24 inch clearance at the front to operate the door hand winch. Additional space is required for service access to the hydraulic unit, most electrical codes also require a 36 inch clearance in front of the electrical panel. Does not include space required for floor screw drive. Dimensions subject to change without notice. Reference data sheet for installation dimensions.

Included with the standard rake assembly: stainless steel girder liners, rake bin structure with aluminum bin liner, rake drive motor, hydraulic power unit and hoist assembly, hand winch for door, rake bin door, retaining wall for bin door assembly, installation drawings, Operating and Maintenance manuals, floor screw limit switch assembly and controls for loading and unloading ice. Floor screw conveyor for ice delivery is not included. Electrical control panel includes controls and motor starters for all motors supplied. Motor starter for floor screw is included. Load detector and electro-mechanical controls are standard. Rake assembly is factory assembled for testing. Rake components are "match marked" and disassembled prior to shipment.

CB Rake Options

- Power bin door operator (hydraulic)
- Rake drive soft start (required with plastic chain)
- Plastic chain & sprockets (soft start required)
- Front mounted hydraulics
- Split frame for shipment in 20' container (CB-20, 30, 38, 50 only)
- Programmable controller
- Rake bin empty & full limit switches
- 50 Hz application
- Single point power
- Rake flite failure limit switch
- Galvanized bin structure with aluminum liner
- Ice-delivery control systems
- Nylon girder liner

NOTE: The rake flite limit switch is a safety device that stops rake operation if a flite does not pass the switch as expected.

CB Rake General Motor Data

Motor	HP	FLA @ 60 Hz ¹ 208/3/60	FLA @ 60 Hz ¹ 230/3/60	FLA @ 60 Hz ¹ 460/3/60	FLA @ 50 Hz ¹ 380/3/50
Hydraulic pump	1	3.6	3.4	1.7	2.0
Rake drive	2	6.5	6.2	3.1	3.1

¹ Full load amps (FLA) may vary from the table above depending on the motor supplier and motor specifications.

Automatic Rakes 60-400 Tons

Model Number	Ice Capacity ¹ (U.S. tons of ice)	Maximum Delivery Rate (tons/hour)	Approximate Shipping Weight (pounds)	Floor Space Required ² (L x W x H)
15' x 30'	9.0 Tons/Ft x Ice Height	22	7,500	38'-2" x 17'-11" x 'H'
15' x 35'	10.5 Tons/Ft x Ice Height	25	8,250	43'-2" x 17'-11" x 'H'
20' x 35'	14.0 Tons/Ft x Ice Height	34	9,000	43'-2" x 22'-11" x 'H'
20' x 40'	16.0 Tons/Ft x Ice Height	39	9,750	48'-2" x 22'-11" x 'H'
20' x 45'	18.0 Tons/Ft x Ice Height	44	10,150	52'-9" x 22'-11" x 'H'
20' x 50'	20.0 Tons/Ft x Ice Height	49	10,900	58'-2" x 22'-11" x 'H'
20' x 55'	22.0 Tons/Ft x Ice Height	54	11,300	63'-2" x 22'-11" x 'H'

¹ Capacity based upon ice density of 40 pounds per cubic foot (640 kg/cu meter) for TURBD fragmented ice (CF & CAR models). For other ice products, correct capacity using the following multipliers:

Correction Factor	
Turbo TIG/TIGAR fragmented ice	0.90
Vogt tube ice (all diameters)	0.85

² Includes space required for mounting control panel and rake bin door hand winch, 24 inch clearance at the front to operate the door hand winch and base plate flanges on the vertical rake steel columns. In addition to the space listed above most electrical codes also require a 36 inch clearance in front of the electrical panel. Does not include space required for floor screw drive. Dimensions subject to change without notice. Reference data sheet for installation dimensions.

Included is the rake assembly, stainless steel girder liners, rake drive motor, hoist drive, hoist assembly, hand winch for door, rake bin door, limit tube assembly, installation drawings, Operating and Maintenance manuals, floor screw limit switch assembly and controls for loading and unloading ice. Floor screw conveyor for ice delivery is not included. Bin structure, bin liner and retaining wall for bin door are not included. Electrical control panel includes controls and motor starters for all motors supplied. Includes motor starter for floor screw provided by others. Load detector and programmable controller controls are standard. Rake assembly is factory assembled for testing. Rake components are "match marked" and disassembled prior to shipment.

³ Overall height 'H' is determined by adding 5'-3" to the ice height. Ice heights are available in one foot increments from 8 feet to 18 feet. Desired ice capacity (U.S. tons) divided by tons/ft. (above) equals ice height rounded to the nearest foot. Ideal ice height is 12 feet. Example: for a 20' x 45' rake with 210 U.S. desired tons storage capacity:

$$\begin{aligned} \text{Ice height} &= 210 \text{ U.S. tons} / 18.0 \text{ tons/ft.} \\ &= 11.67 \text{ ft.} \end{aligned}$$

Specify 12 feet ice height. Actual storage capacity = 216.0 U.S. tons

Automatic Rake Options

- Power automatic door
- Single point power (control transformer required)
- Rake flite failure limit switch (PLC required)
- Galvanized bin structure with aluminum liner
- Ice delivery control systems
- 50 Hz application
- Soft start (380V-460V)
- Soft start (200V-240V)
- Nylon girder liner

NOTE: The rake flite limit switch is a safety device that stops rake operation if a flite does not pass the switch as expected.

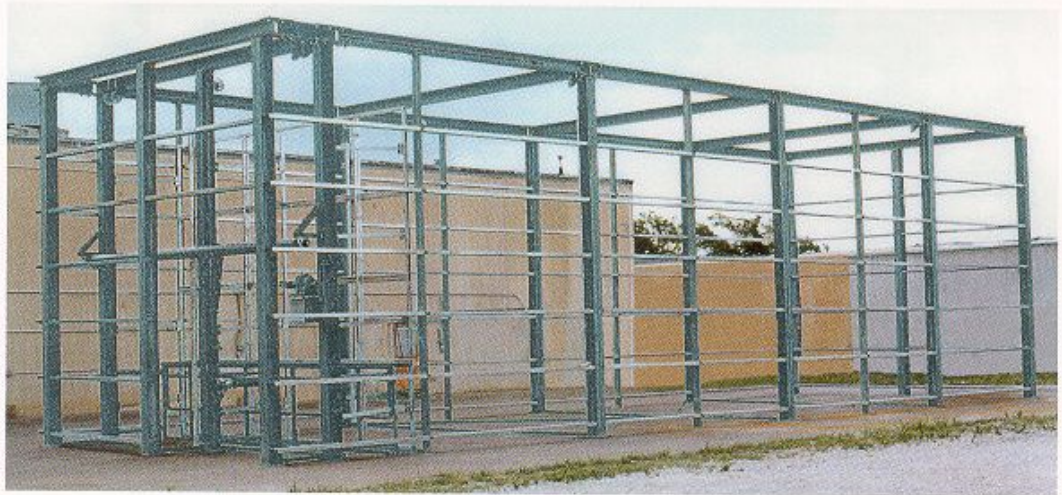
Automatic Rake General Motor Data

Motor	HP	FLA @ 60 Hz ¹ 208/3/60	FLA @ 60 Hz ¹ 230/3/60	FLA @ 60 Hz ¹ 460/3/60	FLA @ 50 Hz ² 380/3/50
Hoist pump	1/2	2.3	2.0	0.98	1.1
Rake drive	5	17.5	15.2	7.6	8.9
Rake drive	7-1/2 ³	19.2	18.1	9.0	9.0

¹ Full load amps (FLA) may vary from the table above depending on the motor supplier and motor specifications.

² All current standard models use 7-1/2 horsepower rake drive motor. Older models and some 15 foot wide rakes may be supplied with 5 horsepower depending on delivery and loading requirements.

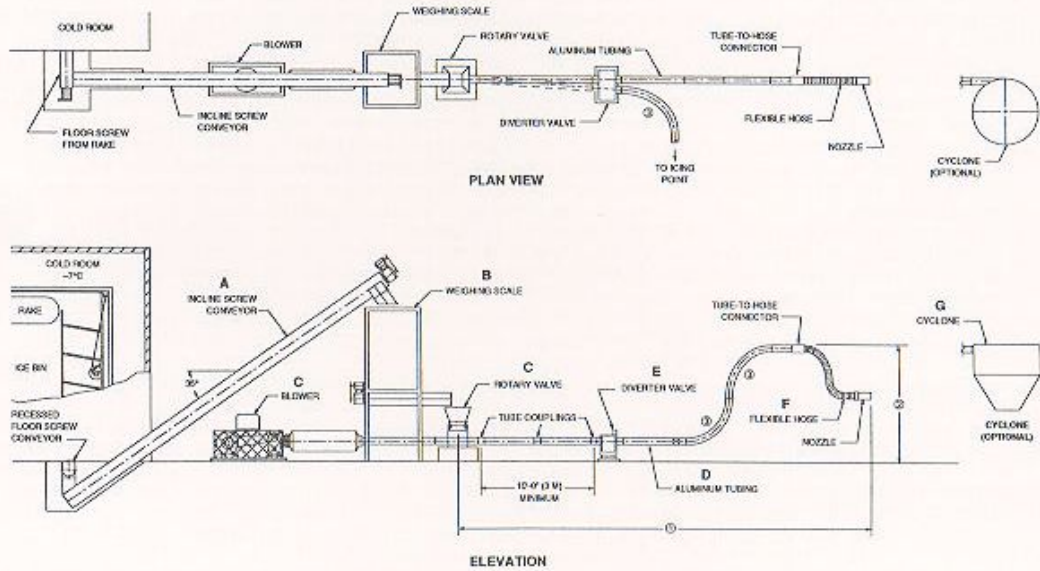
Options



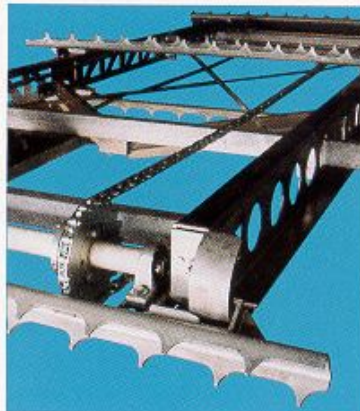
Bin Structure and Liner (auto rake option only): Galvanized bolt together steel bin structure with corrugated aluminum bin liner. Pricing covers ice heights from minimum of eight (8) feet to the maximum of eighteen (18) feet. For ice heights out of this range, please consult factory.

Pneumatic Ice Delivery System

Not to scale.



CB rake assembly with bin structure



Auto rake assembly



Rotary valve for pneumatic system

Q. What are the benefits of using an ice rake?

A. Labor costs can be reduced.

Automatic delivery to process.

Eliminates manual handling of ice.

Management supervision has greater control of ice delivery.

Large capacity of ice storage allows for greater flexibility of the ice machine operation.

Sanitation.

Off peak production of ice.

Q. What are the benefits of a two rake system?

A. Ice can cure/dry in bin prior to bagging.

Flexibility in packaging.

Economic insurance policy... for having greater storage, dryer product, preventive maintenance during down time.

Q. Will a TURBO RAKE work with other types of ice and different conditions?

A. Yes, a **TURBO RAKE** will store many types of ice. The **TURBO RAKE** works as well at 70°F as at 32°F or at 15°F. Depending on your need and application, the **TURBO RAKE** can and will deliver to you, fragmented ice from a 15°F room or tube ice from a 40°F room, depending on dryness or wetness of ice as per your need. **TURBO RAKES** can deliver.

Q. What safety features and controls does a TURBO RAKE offer?

A. Electrical controls monitor all motor operations to control delivery and protect equipment. Other choices (as options) are the power automatic door, plastic chain and sprockets, soft start and rake flite limit switch.

Q. What capacity ice rake storage bins does TURBO offer?

A. Over 16 standard models are offered with varied ice heights. They range in size from 20 to 400 tons. **TURBO** can and will customize to meet specific requirements.

Q. What type of construction is available with TURBO RAKES?

A. Interior components are provided with a standard hot-dipped galvanized finish. In critical sanitary situations, all ice contact components can be stainless steel. Our bin liners are corrugated aluminum (standard) and as an option, we can provide stainless steel liner or UHMW poly liner. Chain is zinc plated (standard) with plastic or stainless steel as an option.





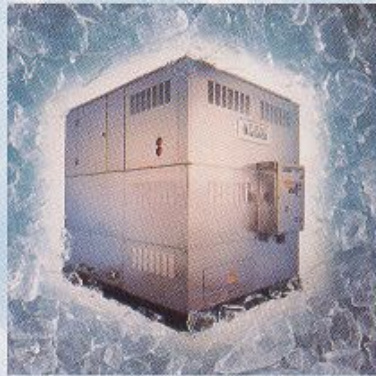
D-Line Ice Maker



C-Line Self-Contained Ice Making Systems



Ice Sizer



TIG Ice Maker

Company profile

TURBO began manufacturing specialized ice making and industrial refrigeration systems in 1952. Our business philosophy has been a simple one: offering equipment that increases output and reduces operating costs for the industries that require ice systems. **TURBO** has been the pioneer in industrial ice harvesting and consumer packaged ice all these years. **TURBO** has become a world leader in ice generating equipment and ice handling equipment.

**TURBO...innovative solutions
to tough cooling problems.**



Consider these facts

- Over 8,500 ice harvester units installed and operating worldwide.
- Over 80 years experience designing and manufacturing ice making equipment.
- Complete packaged systems available up to 340 tons.
- Fast and easy installation.
- Single source responsibility.
- Standard product line as well as custom designs available.
- Multiple refrigerant based systems: R-22, ammonia and propane.
- All system components readily accessible.
- Use utilities lowest rate structures.