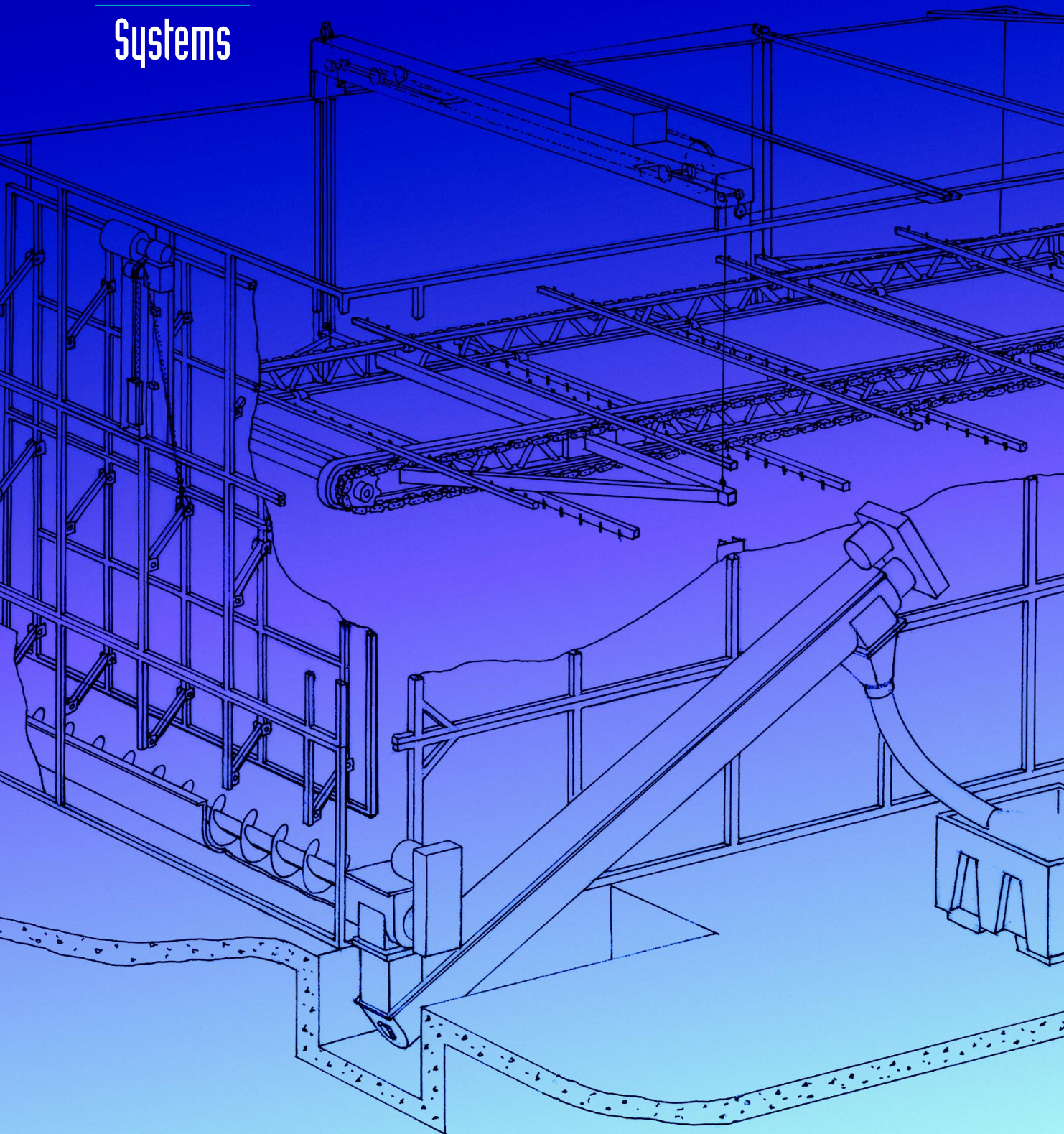


Modular Ice Rake Systems

North Star



North Star Modular Ice Rake Systems

Standard Features

- Galvanized tubular steel wall frames with 24 gauge galvanized steel bin liners
- Electric operated rake assembly with soft starting fluid drive coupling and low speed overload detection
- Electric operated hoist assembly with bin empty and bin full detection
- Electric operated bin door assembly with viewing panels and plastic liner. Linear actuator-type bin door operator on SMR and LMR, automatic winch-type bin door operator on JMR, HMR, GMR, and FMR.
- Manual control station for rake, hoist and bin door
- Electrical control panel with programmable logic controller with motor starters for rake, hoist, bin door and discharge screw, door mounted operator interface panel, consolidated power supply wiring with main disconnect, circuit breakers, power conditioner, and control power transformer.

Stainless Steel Options

- Rake flights, chain, sprockets, drive shaft and guard
- Wear and thrust plates
- Bin liners

Control Panel Options

- Motor starters for additional conveying equipment
- Variable delivery rate hoist controller
- Enhanced operator interface with status and fault message display
- Modem communication

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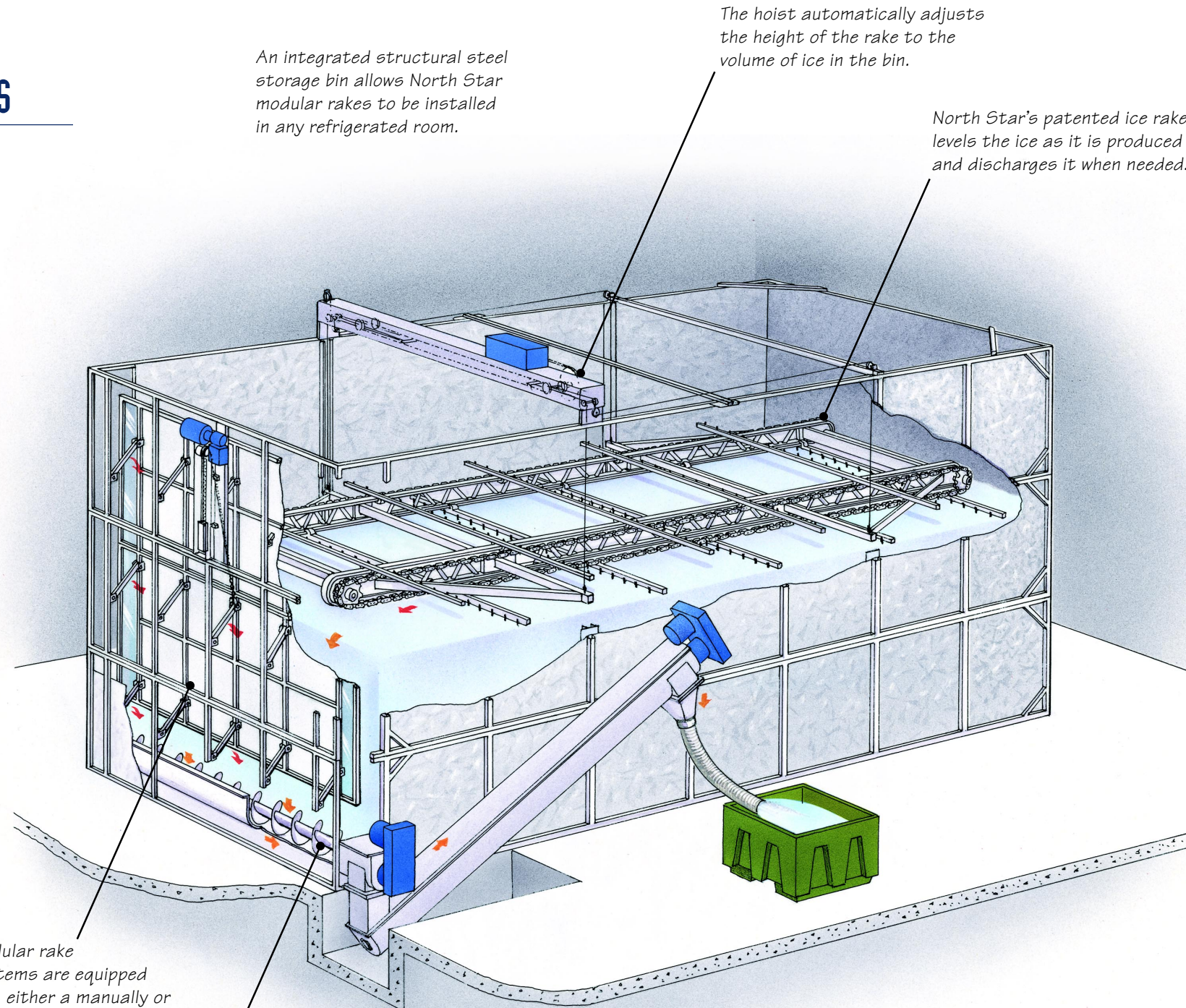
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Modular Ice Rake Systems

Tough - Versatile - Economical

In addition to its full line of custom automatic ice rakes and delivery systems, North Star also offers modular fixed dimension rake systems with integrated self-supporting steel storage bins and liners.

Based on North Star's popular rectangular rake, this modular system can be installed as a free standing unit in an existing refrigerated room. Originally designed to serve the packaged ice industry, North Star modular rake systems can now be used in almost any application to store and automatically discharge any type of ice — flake, plate, shell or tube. Because these systems do not require the construction of a refrigerated building with wooden support columns, they are increasingly popular for retrofitting older plants or for new plants where wood construction is not practical.



An integrated structural steel storage bin allows North Star modular rakes to be installed in any refrigerated room.

The hoist automatically adjusts the height of the rake to the volume of ice in the bin.

North Star's patented ice rake levels the ice as it is produced and discharges it when needed.

Modular rake systems are equipped with either a manually or automatically controlled bin door depending on the model and application.

The discharge screw and external screw conveyors (optional lengths) are not included in the standard system package, but can be quoted separately.

Optional screw conveyor or pneumatic delivery systems can be added to any modular rake.

Note: Consult North Star for optional materials for ice rake components and bin and door liners.

The Right System for Your Application

North Star modular rake systems are designed to fixed length and width dimensions with variable wall heights in four-foot increments. The two smaller modular systems (models SMR and LMR) are equipped with either zinc-plated or plastic rake chain and are capable of delivering up to 15 U.S. tons (13.6 MT) of ice per hour. The larger systems (models JMR, HMR, GMR and FMR) are equipped with zinc-plated rake chain. The maximum delivery rate of the JMR and HMR systems is 30 U.S. tons (27.3 MT) of ice per hour, while the GMR and FMR systems are capable of delivering up to 40 U.S. tons (36.4 MT) per hour.

Ice When You Need It

Depending on the model, North Star modular ice systems are offered with one of two types of bin door operators. The SMR and LMR systems are equipped with a linear actuator-type bin door operator. These systems are suitable for manual control operation such as is typically required in the packaged ice industry, where the bin door is opened in the morning and then closed after all the ice in the bin has been delivered and packaged. The larger systems (models JMR, HMR, GMR and FMR) are provided with a winch-type bin door operator which can be controlled manually for packaged ice applications or automatically for batch-type "ice-on-demand" applications. The automatic bin door operator is available as an added cost option on the SMR and LMR systems. However, automatic control is only suitable for installations that store flake or plate ice, both of which form a stable ice wall when the bin door is opened. Automatic bin door operation required for "ice-on-demand" applications is not possible with shell or tube ice because these types of ice will not form a stable ice wall when the bin door is opened.

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