# DESIGN CONDITIONS

## Alfa Laval SMART Turn 80-B Nominal Capacity: 80 Tons of Refrigeration Refrigerant: Ammonia Secondary Refrigerant: **21% Calcium Chloride** Evaporating Temperature: 11.0˚F Flow: 750 USGPM Calcium Chloride Inlet Temperature: 18.0˚F Calcium Chloride Outlet Temperature: 15.0˚F Power: 3/60/575V Power, 1/60/120V Control

# ALFA LAVAL SMART TURN 80-B The SMART Turn chiller shall consist of specified equipment, piping, valves controls, monitoring, insulation and wiring that is completely factory fabricated on a structural steel frame. The package must be factory assembled, tested and meet all codes and standards prior to delivery.

## One (1) Plate & Frame Chiller Alfa Laval Semi-Welded M10BW-FD Plate Heat Exchanger Plate Material: Titanium Calcium Chloride Inlet Temperature: 18.0˚F Calcium Chloride Outlet Temperature: 15.0˚F Evaporating Temperature: 11˚F

## One (1) U-Turn Ammonia Liquid Separator Alfa Laval UR/UL-8-4C-M10-12

## One (1) Cold Calcium Chloride Pump S.A. Armstrong Series 4030 5 x 4 x 10 NEMA Premium 20 HP ODP motor Flow: 750 USGPM @ 63 ft/hd

## One (1) Integrated SMART Rink Connect Monitoring Panel

### Monitoring panel to be furnished, assembled and wired in a NEMA12 enclosure.

### All equipment and material shall be from manufacturer's regular production, UL and/or ULC or CSA certified, manufactured to standard quoted plus additional specified requirements.

### System shall be Distech Controls ECLYPSE line or manufacturer approved equal.

### System shall be Web based and allow for simultaneous support of wired IP and Wi-Fi (Access point, client, hotspot, mesh) including support of Wi-Fi bridge.

### System shall have 2 Ethernet ports allowing controllers to be wired daisy-chain topology and enable an STP loop-free topology configuration for redundancy and reliability.

### System shall contain embedded support of BACnet MS/TP routing to IP and MODBUS.

### System shall be BTL Listed as BACnet Building Controllers with embedded schedules, alarms and trend logs.

### Advanced built-in security features and authentication services for robust IP-based implementation must be included.

### Controller shall have remote access capabilities.

### Monitoring panel shall be mounted directly on skid with all instrumentation factory wiring and installed prior to shipping.

### All instrumentation shall be 4-20mA type sensors and be factory wired to the control panel with Belden 8451 or equal for 2-wire devices and Belden 8771 or equal for 3-wire devices.

### Colour touch-screen PC shall be minimum 10” with latest version of Windows OS.

### Graphics shall be informative and intuitive describing current package operating conditions related to safety, reliability and efficiency.

### Controller shall be capable of automatically recognizing other Smart Connected products.

### Control system shall be designed by manufacturer. Sub-contracting of work is not permitted.

## Refrigerant Piping and Valves

### All Ammonia refrigerant piping shall conform to the latest edition of the ASME B31.5 Refrigeration Pressure Piping Code and CSA B52 Mechanical Refrigeration Code.

### All refrigerant piping 1" and larger shall be socket welded or butt-welded. All refrigerant piping up to and including 3/4" shall be threaded or socket welded

### All Ammonia pressure relief valves shall be sized and piped to a suitable location as defined in the CSA B52 Mechanical Refrigeration Code.

## Brine Piping and Valves

### Brine piping shall be schedule 40 ASTM A53 grade A or B ERW pipe

### Isolation valves for the glycol and brine pump for safe, convenient operation and maintenance. Butterfly valves shall be full lug type with trim selection compatible with fluid being handled. All butterfly valves shall have lever handle operator.

## Pressure Gauges and Thermometers

### Supply and install new pressure gauges for new pumps. Provide 2 ½" diameter pressure gauges. Gauges shall be constructed of material compatible with fluid being measured. All pressure gauges shall be liquid filled and come complete with isolation valves

### All thermometers shall be solar powered digital display, adjustable stem angle and separable wells

## Painting

### All insulated field fabricated steel shall be painted with a rust resistant primer prior to insulation.

### All un-insulated steel piping shall be painted with **two (2) coats** of industrial machinery enamel paint with colours to match accepted trade standards

## Electrical wiring

### Package must be Factory wired. All power and control electrical package wiring from the Integrated SMART Rink Connect Monitoring Panel to the refrigeration equipment motors, switches, controls and sensors. All electrical wiring must conform to CSA and local codes.

## Insulation

## 2.10.1 All pipes and pressure vessels which will have temperature loss of sweat during normal operation must be **factory insulated** with minimum 2” foam in place insulation.