OPTIVIEW Control panel: The control panel shall include a 10.4 in. diagonal color liquid crystal display (LCD) surrounded by "soft" keys which are redefined based on the screen displayed at that time. This shall be mounted in the middle of a keypad interface and installed in a locked enclosure. The screen shall detail all operations and parameters, using a graphical representation of the chiller and its major components. Panel verbiage shall be available in other languages as an option with English always available. Data shall be displayed in either English or Metric units. Smart Freeze Point Protection shall run the chiller at 36.00°F leaving chilled water temperature, and not have nuisance trips on low water temperature. The sophisticated program and sensor shall monitor the chiller water temperature to prevent freeze up. When needed Hot Gas Bypass is available as an option. The panel shall display countdown timer messages so the operator knows when functions are starting and stopping. Every programmable point shall have a pop-up screen with the allowable ranges, so that the chiller can not be programmed to operate outside of its design limits.

The chiller control panel shall also provide:

1. System operating information including:
    a. return and leaving chilled water temperature
    b. return and leaving condenser water temperature
    c. evaporator and condenser saturation temperature
    d. differential oil pressure
    e. percent motor current
    f. evaporator and condenser pressure
    g. compressor discharge temperature
    h. oil reservoir temperature
    i. compressor thrust bearing positioning and oil temperature
    j. operating hours
    k. number of compressor starts

2. Digital programming of setpoints through the universal keypad including:
    a. leaving chilled water temperature
    b. percent current limit
    c. pull-down demand limiting
    d. six-week schedule for starting and stopping the chiller, pumps and tower
    e. remote reset temperature range

3. Status messages indicating:
    a. system ready to start
    b. system running
    c. system coastdown
    d. system safety shutdown-manual restart
    e. system cycling shutdown-auto restart
    f. system prelube
    g. start inhibit

4. The text displayed within the system status and system details field shall be displayed as a color coded message to indicate severity: red for safety fault, orange for cycling faults, yellow for warnings, and green for normal messages.

5. Safety shutdowns enunciated through the display and the status bar, and consist of system status, system details, day, time, cause of shutdown, and type of restart required. Safety shutdowns with a fixed speed drive shall include:
    a. evaporator – low pressure
    b. evaporator – transducer or leaving liquid probe
    c. evaporator – transducer or temperature sensor
    d. condenser – high pressure contacts open
    e. condenser – high pressure
    f. condenser – pressure transducer out of range
    g. auxiliary safety – contacts closed

h. discharge – high temperature
i. discharge – low temperature
j. oil – high temperature
k. oil – low differential pressure
l. oil – high differential pressure
m. oil – sump pressure transducer out of range
n. oil – differential pressure calibration
o. oil – variable speed pump – pressure setpoint not achieved
p. control panel – power failure
q. motor or starter – current imbalance
r. thrust bearing – proximity probe clearance
s. thrust bearing - proximity probe out – of – range
t. thrust bearing – high oil temperature
u. thrust bearing – oil temperature sensor
v. watchdog – software reboot

5.1 Safety shutdowns with a VSD Shall include:
a. VSD shutdown – requesting fault data
b. VSD – stop contacts open
c. VSD – 105% motor current overload
d. VSD – high phase A, B,C inverter heatsink temp.
e. VSD – high converter heatsink temperature

6. Cycling shutdowns enunciated through the display and the status bar, and consists of system status, system details, day, time, cause of shutdown, and type of restart required. Cycling shutdowns with a fixed speed drive shall include:
a. multiunit cycling – contacts open
b. system cycling - contacts open
c. oil - low temperature differential
d. oil – low temperature
e. control panel - power failure
f. leaving chilled liquid - low temperature
g. leaving chilled liquid - flow switch open
h. motor controller – contacts open
i. motor controller – loss of current
j. power fault
k. control panel - schedule
l. starter – low supply line voltage
m. starter – high supply line voltage
n. proximity probe – low supply voltage
o. oil - variable speed pump - drive contacts open

6.1 Cycling shutdowns with a VSD shall include:
a. VSD shutdown – requesting fault data
b. VSD – stop contacts open
c. VSD initialization failed
d. VSD - high phase A,B,C instantaneous current
e. VSD – phase A,B,C gate driver
f. VSD – single phase input power
g. VSD – high DC bus voltage
h. VSD – pre charge DC bus voltage imbalance
i. VSD – high internal ambient temperature
j. VSD – invalid current scale selection
k. VSD – low phase A, B, C inverter heatsink temp.
l. VSD – low converter heatsink temperature
m. VSD – pre-charge - low DC bus voltage

n. VSD – logic board processor
o. VSD – run signal
p. VSD – serial communications

7. Security access to prevent unauthorized change of setpoints, to allow local or remote control of the chiller, and to allow manual operation of the prerotation vanes and oil pump. Access shall be through ID and password recognition, which is defined by three different levels of user competence: view, operator, and service.

8. Trending data with the ability to customize points of once every second to once every hour. The panel shall trend up to 6 different parameters from a list of over 140, without the need of an external monitoring system.

9. The operating program stored in non-volatile memory (EPROM) to eliminate reprogramming the chiller due to AC power failure or battery discharge. Programmed setpoints shall be retained in lithium battery-backed RTC memory for a minimum of 11 years with power removed from the system.

10. A fused connection through a transformer in the compressor motor starter to provide individual over-current protected power for all controls.

11. A numbered terminal strip for all required field interlock wiring.

12. An RS-232 port to output all system operating data, shutdown / cycling message, and a record of the last 10 cycling or safety shutdowns to a field-supplied printer. Data logs to a printer at a set programmable interval. This data can be preprogrammed to print from 1minute to 1day.

13. The capability to interface with a building automation system to provide:
    a. remote chiller start and stop
    b. remote leaving chiller liquid temperature adjust
    c. remote current limit setpoint adjust
    d. remote ready to start contacts
    e. safety shutdown contacts
    f. cycling shutdown contacts
    g. run contacts