HENCH CONTROL
Energy Management Systems

REFRIGERATION EQUIPMENT SCOPE - QUESTIONNAIRE

Please provide the following information to receive a no-cost estimate of how much money our control system could save your facility and to assist us in preparing our proposal for you.

This questionnaire is designed for only one interconnected refrigeration plant. If your facility has more than one refrigeration system or more equipment then our questionnaire has space for, please make multiple copies of the appropriate pages and include in submission.

Date: _____

Company/Plant: _____

Name: _____

Position: _____

Address: _____

_____

_____

Phone:_____ Fax: _____ E-mail:_____

Please Include:

1. **12 months of electric bills** - To enable us to calculate energy cost savings projections, we'll need to be able to review your current rate structure and charges. Please include at least 2 recent electrical utility bills representing a high and low usage months (last 12 months is strongly preferred). If not readily evident on that bill, please contact your electrical utility for a copy of the electrical charge rate structure.

2. **Site Layout** - To aide in project design, controller selection, placement and cost factors.

3. **P&ID** – This is highly desirable for us to better understand your refrigeration system.

Note: Our energy savings analysis and controller selection is determined based on the information provided. Analysis may not be sent back for further clarification if information is missing or erroneous. Inadequate or inaccurate information on this Questionnaire may result in inaccuracies in savings projections. In addition, omissions or inaccuracies may cause redesign or installation delays. If equipment or installation additions are beyond the scope of the quote provided, additional project charges may occur.

General Information:

1. What is the nature of the business? _____

_____

2. Plant's refrigerant:

☐ Ammonia (R717) ☐ Freon (R22) ☐ Other _____

3. Approximate time your refrigeration system was built:

☐ Prior to 1950 ☐ 1950s ☐ 1960s ☐ 1970s

☐ 1980s ☐ 1990s ☐ 2000s ☐ New Installation

4. Do you currently have a Central Refrigeration Control System(s)? ☐ Yes or ☐ No

   a. If yes, please describe _____

_____

_____

5. Do you currently have a Refrigeration Energy Management System? ☐ Yes or ☐ No

   a. If yes, please describe _____

_____

_____

   b. Pros/Cons _____

_____

_____

6. What is your primary Energy or CO_2 reduction concerns or goals? _____

_____

7. What time frame are you looking to install a Refrigeration Energy Management System?

☐ Next 3 months ☐ 3- 6 months ☐ 6-12 months ☐ 1-2 years ☐ Unsure

8. Are you planning any additions to your refrigeration's system in the next 2 years? ☐ Yes or ☐ No

   a. If yes, please describe _____

_____

_____

_____

9. Do you have any compatibility concerns or questions regarding the addition of a Hench Energy Management System?

   a. If yes, please describe _____

_____

_____

_____

_____

_____

Compressor:

Compressor ID Compressor Horsepower	Type (screw, recip, rotary) Operating Stage	Runtime (Hours per Year)
1. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
2. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
3. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
4. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
5. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
6. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
7. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
8. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
9. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
10. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr
11. _____ _____ hp	☐ Screw ☐ Rotary ☐ Recip - _____ # of Unloaders ☐ High ☐ Low ☐ Low-Low	☐ Actual ☐ Estimate Runtime _____ hr/yr

Compressor (con't):

1. Are any of the screw compressors without micros or slide valves? ☐ Yes or ☐ No
   Details: _____
   Plan to purchase/install: ☐ Hench Micro (Please add to quote) ☐ Other Micro
2. Are existing micros capable of remote control? ☐ Yes or ☐ No
3. Do any of the screw compressors have VFD or variable Vi? ☐ Yes or ☐ No
   Details: _____
4. Do any compressors swing between stages? ☐ Yes or ☐ No
   Details: _____
5. Please list compressors that are decommissioned and will never used: _____

Operating Pressures	High Stage	Low Stage	Low-Low Stage	Other _____
Suction – Winter range	_____to_____psig	_____to_____psig	_____to_____psig	_____to_____psig
Suction –Summer range	_____to_____psig	_____to_____psig	_____to_____psig	_____to_____psig
Discharge – Winter range	_____to_____psig	_____to_____psig	_____to_____psig	_____to_____psig
Discharge – Summer range	_____to_____psig	_____to_____psig	_____to_____psig	_____to_____psig

6. Discharge pressure needed for hot gas defrost: _____ psig
7. When not defrosting, how low can the discharge pressure go? _____
8. How is your discharge pressure controlled? _____
   ☐ Set Point ☐ Floating on ambient temp ☐ Floating on wet bulb temp
9. Are there special processes that require the suction pressure to be lowered part of the time? (Examples: Glycol loop, Blast Freezers, Pre-cooler, Spiral Freezers, Plate freezers, tank cooling, ice rink, etc)
   What can the suction pressure be raised to when the process is not needed? _____
   Process: _____
   Pressure required for this process _____ Est. hr/wk _____ Est. wk/yr _____
   Process: _____
   Pressure required for this process _____ Est. hr/wk _____ Est. wk/yr _____
10. How is your suction pressure controlled? _____
    ☐ Fixed Suction Pressure Control ☐ Floating Suction Pressure Control

Condensers:

Condenser Number	#1	#2	#3
Condenser ID	_____	_____	_____
Hp of pump	_____@_____hp	_____@_____hp	_____@_____hp
	_____@_____hp	_____@_____hp	_____@_____hp
Fan speed	☐ 1-speed ☐ 2-speed ☐ Variable speed (VFD)	☐ 1-speed ☐ 2-speed ☐ Variable speed (VFD)	☐ 1-speed ☐ 2-speed ☐ Variable speed (VFD)
Number of fans and hp per fan. Circle fans that are bundled on to the same motor starter.	_____fans @_____hp each	_____fans @_____hp each	_____fans @_____hp each
	_____fans @_____hp each	_____fans @_____hp each	_____fans @_____hp each
	_____fans @_____hp each	_____fans @_____hp each	_____fans @_____hp each

1. Do you plan to modify any of the condenser fans to VFDs in the next 2 years? ☐ Yes or ☐ No
   a. If yes, please describe _____
   _____

Process Monitoring and Control:

Our system was designed to easily handle customer additions for monitoring and ladder logic control. We can monitor, control and alarm on your existing gas leak detectors, tank levels and vessel pressures (see page 8).

2. Would you like to be able to monitor, receive alarms or control other items? ☐ Yes or ☐ No
   a. If yes, please describe _____
   _____
   _____
   _____
   _____

3. Would you like us to supply gas detectors? ☐ Yes or ☐ No
   a. If yes, please list _____
   _____
   _____
   _____

Evaporators:

Room ID_____	Room ID_____	Room ID_____
Zone: # of Zones _____ Zone Temp _____^{0}F	Zone: # of Zones _____ Zone Temp _____^{0}F	Zone: # of Zones _____ Zone Temp _____^{0}F
Evaporator: # of Evaps _____ Fans/Evaps_____ Motor hp/fan_____ hp Speed: ☐ 1-speed ☐ 2-speed ☐ VFD	Evaporator: # of Evaps _____ Fans/Evaps_____ Motor hp/fan_____ hp Speed: ☐ 1-speed ☐ 2-speed ☐ VFD	Evaporator: # of Evaps _____ Fans/Evaps_____ Motor hp/fan_____ hp Speed: ☐ 1-speed ☐ 2-speed ☐ VFD
Defrost: ☐ Hot Gas ☐ Air ☐ None Minutes/cycle _____ Defrost Freq./day _____ Defrost Solenoid Valves: ☐ Liquid Supply ☐ Suction ☐ Hot Gas ☐ Suction Bleed ☐ Hot Gas Bleed ☐ Other_____	Defrost: ☐ Hot Gas ☐ Air ☐ None Minutes/cycle _____ Defrost Freq./day _____ Defrost Solenoid Valves: ☐ Liquid Supply ☐ Suction ☐ Hot Gas ☐ Suction Bleed ☐ Hot Gas Bleed ☐ Other_____	Defrost: ☐ Hot Gas ☐ Air ☐ None Minutes/cycle _____ Defrost Freq./day _____ Defrost Solenoid Valves: ☐ Liquid Supply ☐ Suction ☐ Hot Gas ☐ Suction Bleed ☐ Hot Gas Bleed ☐ Other_____

Room ID_____	Room ID_____	Room ID_____
Zone: # of Zones _____ Zone Temp _____^{0}F	Zone: # of Zones _____ Zone Temp _____^{0}F	Zone: # of Zones _____ Zone Temp _____^{0}F
Evaporator: # of Evaps _____ Fans/Evaps_____ Motor hp/fan_____ hp Speed: ☐ 1-speed ☐ 2-speed ☐ VFD	Evaporator: # of Evaps _____ Fans/Evaps_____ Motor hp/fan_____ hp Speed: ☐ 1-speed ☐ 2-speed ☐ VFD	Evaporator: # of Evaps _____ Fans/Evaps_____ Motor hp/fan_____ hp Speed: ☐ 1-speed ☐ 2-speed ☐ VFD
Defrost: ☐ Hot Gas ☐ Air ☐ None Minutes/cycle _____ Defrost Freq./day _____ Defrost Solenoid Valves: ☐ Liquid Supply ☐ Suction ☐ Hot Gas ☐ Suction Bleed ☐ Hot Gas Bleed ☐ Other_____	Defrost: ☐ Hot Gas ☐ Air ☐ None Minutes/cycle _____ Defrost Freq./day _____ Defrost Solenoid Valves: ☐ Liquid Supply ☐ Suction ☐ Hot Gas ☐ Suction Bleed ☐ Hot Gas Bleed ☐ Other_____	Defrost: ☐ Hot Gas ☐ Air ☐ None Minutes/cycle _____ Defrost Freq./day _____ Defrost Solenoid Valves: ☐ Liquid Supply ☐ Suction ☐ Hot Gas ☐ Suction Bleed ☐ Hot Gas Bleed ☐ Other_____

Evaporator (con't):

1. Do you plan to modify any evaporator fans to VFDs in the next 2 years? ☐ Yes or ☐ No
   a. If yes, please describe _____
   _____
2. Are any of the rooms or docks not operated 24 hr/day, 7days/week? ☐ Yes or ☐ No
   a. If yes, please describe _____
   _____
3. Are any of the rooms or docks hot gas defrost capable, but not currently used? ☐ Yes or ☐ No
   a. If yes, please describe _____
   _____

Electrical Usages:

1. Annual electric energy consumption? _____ kWh/yr
2. What is your average cost of power? _____ cents/ kWh?
3. How many power mains or meters supply electrical power to this facility? _____
4. Highest and lowest month kWh use: (H) _____ (L) _____
5. Busy season months_____
6. Do you have Current Meter(s)? ☐ Yes or ☐ No
   a. If yes, how many? _____
   b. What areas of your facility or equipment do they measure (Compressor, engine room, whole plant, etc) ? _____
7. Do you have Pulse Power Meter(s)? ☐ Yes or ☐ No
   a. If yes, how many? _____
   b. What areas of your facility or equipment do they measure (Compressor, engine room, whole plant, etc) ? _____

Controls (optional): These items can be added to any system for additional refrigeration safety, monitoring, alarming or control:

Vessel ID_____

☐ High Pressure Receiver ☐ Intermediate Pressure Receiver
☐ Low Pressure Receiver ☐ Other_____

Pressure

☐ Vessel Pressure Pressure Range: _____
Is Hench to supply pressure sensor? ☐ Yes ☐ No

Level

☐ High Level Switch ☐ Tank Level Sensor (continuous)
☐ Low Level Switch ☐ Level Other: _____

Miscellaneous

☐ Temperature
Is Hench to supply temperature sensor? ☐ Yes ☐ No

☐ Solenoid Valve, SV Name: _____
☐ Solenoid Valve, SV Name: _____

☐ Pump Auxiliary Pump Name: _____
☐ Pump Auxiliary Pump Name: _____
Pump fail over logic? ☐ Yes ☐ No

Additional vessel monitoring, control or logic needs:

_____
_____
_____

Vessel ID_____

☐ High Pressure Receiver ☐ Intermediate Pressure Receiver
☐ Low Pressure Receiver ☐ Other_____

Pressure

☐ Vessel Pressure Pressure Range: _____
Is Hench to supply pressure sensor? ☐ Yes ☐ No

Level

☐ High Level Switch ☐ Tank Level Sensor (continuous)
☐ Low Level Switch ☐ Level Other: _____

Miscellaneous

☐ Temperature
Is Hench to supply temperature sensor? ☐ Yes ☐ No

☐ Solenoid Valve, SV Name: _____
☐ Solenoid Valve, SV Name: _____

☐ Pump Auxiliary Pump Name: _____
☐ Pump Auxiliary Pump Name: _____
Pump fail over logic? ☐ Yes ☐ No

Additional vessel monitoring, control or logic needs:

_____
_____
_____

Additional items for monitoring or control:

_____
_____
_____
_____
_____
_____
_____
_____
_____