

Customer Visit Report



Customer: Arneg	Date: October 11, 2016
Subject: Understand integrated display cases requirements and discuss horizontal scroll specification & update on new products	Location: Italy
Author: Sylvain Lamy / Alessandro Pianetti	
Attendees Emerson:	Name
<input checked="" type="checkbox"/> Application Engineering	Claudio Ferrandi
<input checked="" type="checkbox"/> Marketing	Sylvain Lamy
<input type="checkbox"/> Quality Engineering	
<input checked="" type="checkbox"/> Sales	Giovanni Lombardi, Alessandro Pianetti
<input type="checkbox"/> Others	

Attendees Customer:	Name
<input checked="" type="checkbox"/> Engineering / Product Development	Pierluigi Schiesaro (Direttore R&D), Igor Laudi (R&D Development display cases and plug-in), Francesco Ferrari (R&D Laboratory), Pietro Cavestro (Ref. Engineering racks)
<input type="checkbox"/> Purchasing	
<input type="checkbox"/> Marketing	
<input type="checkbox"/> Management	
<input type="checkbox"/> Others	

Additional information (optional)

Meeting Summary	
Meeting initiated by	<input type="checkbox"/> Customer <input checked="" type="checkbox"/> EMR <input type="checkbox"/> both <input type="checkbox"/> unclear
Major learnings & outcomes	
<input type="checkbox"/> Risk to existing business	<input type="checkbox"/> Technical / Quality <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Logistics
<input type="checkbox"/> Business potential	<input type="checkbox"/> Existing sales projects <input checked="" type="checkbox"/> Incremental growth opportunity
Description of offering:	<input type="checkbox"/> Solutions / Systems <input type="checkbox"/> Components <input type="checkbox"/> Engineering
Application & Business potential estimation:	Horizontal scroll for display cases with water loop
Chance to win	<input type="checkbox"/> <15% Low <input checked="" type="checkbox"/> 15% - 70% Medium <input type="checkbox"/> >70% High
Opportunity for other EMR BUs	<input type="checkbox"/> Therm-O-Disc <input type="checkbox"/> Fusite <input type="checkbox"/> Ridge Tools <input type="checkbox"/> Insinkerator
	<input type="checkbox"/> Pactrol <input type="checkbox"/> Retail Solutions <input type="checkbox"/> Transportation Solutions
<input checked="" type="checkbox"/> Market information obtained	Description and details in report
<input checked="" type="checkbox"/> Customer pain points understood	Description and details in report
<input type="checkbox"/> Technical support / solution provided	<input type="checkbox"/> System design <input type="checkbox"/> Component application
<input type="checkbox"/> No major learnings – routine visit to enhance relationship	

General

Target of the meeting was to present our latest product development and to have a focused conversation on the integrated display cases along with a review of our horizontal scroll program.

While Arneg will focus their strategy on CO2 for centralized system, they have chosen R290 for display cases until there is more clarity on synthetic refrigerants.

Arneg has repeated that they would like to be a partner in testing early horizontal scroll prototypes in their lab facilities and we should provide them with samples as soon as they are available.

We have visited their display cases lab facilities where we also were able to have a close look at CO2 modules provide by Sanden.

Customer Visit Report



Topics/Opportunities/Issues

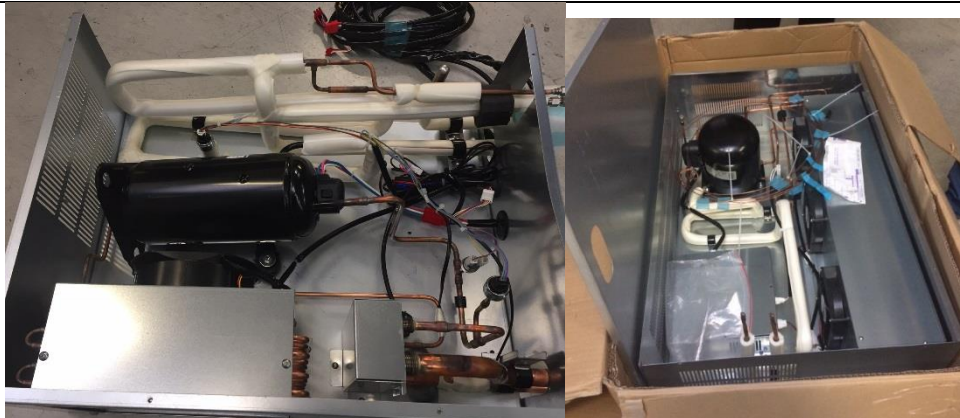
DISPLAY CASES - horizontal project

- Capacity needs:
 - Confirmed kW needs per length of display case but we need a smaller displacement than what we have in our plan.
 - Trend is for the kW to go down and will decrease further in the future - regulation, efficiency, Ecodesign, Glass doors will definitely a trend
 - We need to cover also the 1.25m.
 - Currently testing a high efficiency case - 1500W at 0/35°C R290 with doors 2,5m Class M1 and M2 1200W 3/35°C
- Interested to be a partner and test our horizontal solution
- Refrigerant
 - R290 is the right way to go
 - A2L should be consider per our specification
- Modulation
 - Understand our choice to go VSS but cost is key
 - VSS is more for open cases than closed cases.
 - If future goes to closed, as it seems, VSS may not be that essential if cost is high
 - Energy consumption with doors is more stable
 - Market is driven by cost:!
- Height:
 - 1cm is very important therefore the lower the better
 - Small Hitachi is 13cm high
 - Only reason to use scroll is its low profile and its noise level (very good with Hitachi.)
 - Efficiency is better than recip piston but not that critical to Arneg
 - Consider selecting the shortest grommets/mounting parts up in our design
- Driver
 - Clearly stated that key drivers for compressor selection are:
 - height
 - cost
 - R290
 - intelligence on board (parameters to communicate via Modbus)

DISPLAY CASES CO2

- Will test Sanden horizontal CO2
- Received a full module with horizontal CO2 scroll from Sanden at 2000€ without transport and from China or Japan
- Asked if I could get a sample but units were still in the cartons, that we opened later on together
- Problems of CO2 cases have been identified by Arneg:
 - High cost
 - Consumption expected to be twice as high as Embraco R290
 - Need to design evaporator side at 80 bars
 - Components for 80bar that small are difficult to find ex: 80bar safety valve in that size is hard to find
 - Issues during transport
 - Behavior of dry cooler in transcritical
 - Half a second to vent the 500gr charge
 - How do we vent CO2? Safety issue for the customers
- Testing a 2-stage rotary from Sanden & vertical rotary for food counter
 - In general efficiency not good
- Horizontal from Sanden is max 18cm on its high side-inclined design
- Wanted to show a CO2 case design at Euroshop but not certain any longer / likely to not display it

Customer Visit Report



Sanden CO2 Modules with Horizontal scroll and 2-stage rotary

Embraco:

- Would be compressor of choice but height restrictions for certain applications
- Used in multiple unit configurations when height is not an issue
- Cost is about 80euros
- Recently launched 3 more models with higher capacity
- Have inverter/compressor solution close in cost to the compressor only
- Height is 38cm so for water loop it is not feasible

Hitachi

- Does not guarantee R290 operation so it's a no go for Arneg - They have not tried R290 in their systems with Hitachi
- DS1836 300 euros-18cm
- DS1529 260 euros -18cm
- ZS7616 200euros-13cm

Carel

- Carel bought CRC (Components Refrigeration & AC) who distributes Toshiba CO2
- Could be expected to do a CO2 module for these applications but no information / rumours at this point

Action Plan

<u>Action</u>	<u>Owner & Department</u>		<u>Deadline</u>
Provide regular update to Arneg	SL / AP	Marketing	Click here to enter a date.
Provide prototypes when available	SL / AP	Marketing	July 20, 2016
Integrate Arnegs requirement in MSC for horizontal scroll	SL / VK	Marketing	Click here to enter a date.
		Please choose	Click here to enter a date.
		Please choose	Click here to enter a date.
		Please choose	Click here to enter a date.

<u>Administration:</u>	<u>Status</u>	<u>Date</u>
Visit report distributed to internal audience		November 18, 2016
Visit report uploaded to server space		November 18, 2016
Action items transferred to project tracking sheet		Click here to enter a date.