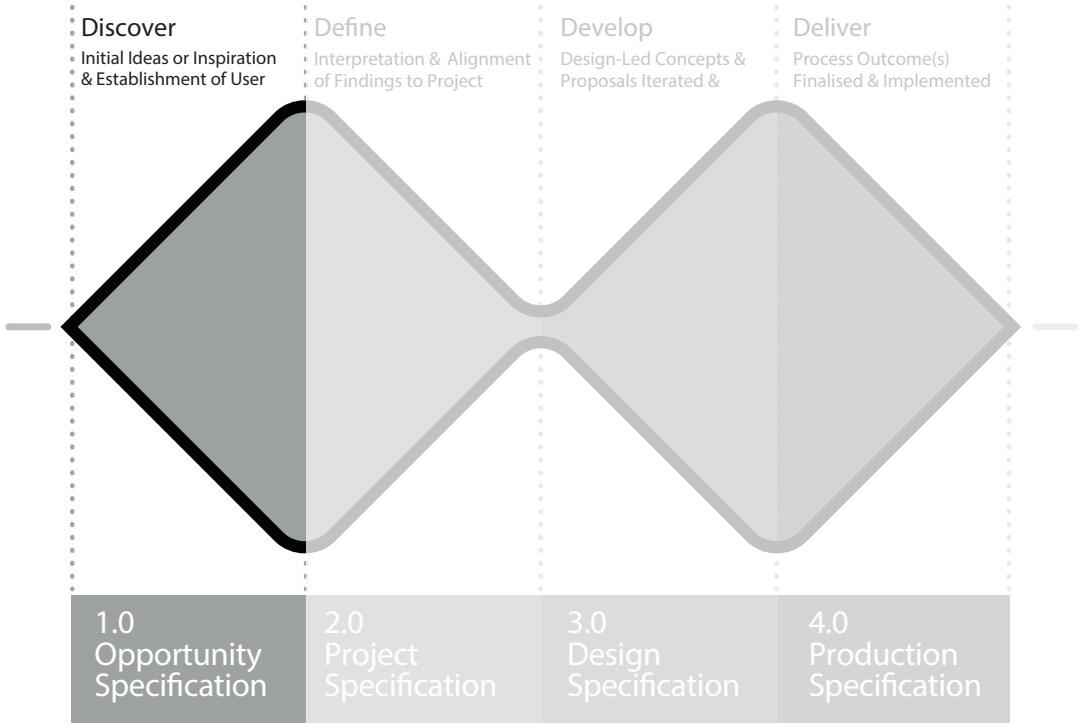
Form and Colour 2
3DD2065

William Woodford
13413807
PD2

Opportunity Specification

UK Design Council
Double Diamond Model 2009



User Persona

Name: Jane Steele

Job Title: Geography teacher.

Domographics

Age: 45.
DoB: 4/5/1970.
Gender: Femail.
Salary: £45k per annum.
Location: Exeter.
Education: University of Bristol,
Geography BSc (Hons).
Family: Spouce and two children.

Goals and Challenges:

Primary Goal: Janes primary goal is to reduce her families carbon footprint.

Comment from Jane:

Janes Product Content Needs.

-A product that doesnt leave much of a mark if we would like it uninstall it.
-A well designed exterior box that is visiable but at the same time blends in with its surroundings.
-There must also be a remote that allows the family to get involved and shows us how much money we are saving.
-We would also like to take part in the RHI(renewable heat incentive).

Market Potential using Mosaic UK groups and types

Group B: Professional Rewards.

9.54% of the population.

8.23% of houshoulds in the UK.

Total UK population: 63,738,104 people .
(14th March 2015)

Potential Users (UK): 5,245,645 housholds.

B	Professional Rewards	9.54	8.23	B05	Mid-Career Climbers	2.90	2.30
				B06	Yesterday's Captains	1.80	1.84
				B07	Distinctive Success	0.48	0.48
				B08	Dormitory Villagers	1.81	1.29
				B09	Escape to the Country	1.41	1.31
				B10	Parish Guardians	1.14	1.00

The sector that the heat pump is going to be designed for is the executive and managerial classes of the UK. This group of people are also know as the professional rewards sector comprises of people between the ages of 40 and 60. These people tend to have a large amount of disposable income making them the perfect target market.

The professional rewards tend to be married and live in detached houses with four or more bedrooms. These houses are usually situated in the outer suburbs of cities or semi-rural villages. They prefer to find products that are value for money and tend to go for products they have a good brand loyalty too. This coupled with the fact that they like to invest money in various possessions and property makes them the perfect market for a newly designed and marketed heat pump. This group of people also takes time to make an informed decision before purchasing expensive items.

Potential product environment:

SAMSUNG

Market Scenario

ANSOFF Matrix

	Existing Products	New Products
Existing Markets	Market Penetration	Product Development
New Markets	Market Development	Diversification

Market development is a business strategy whereby a business attempts to find new groups of buyers as potential customers for its existing products and services. These potential customer groups may already be served by competitors or may not be currently marketed by anyone for the product.

SWOT Analysis

Strengths

Samsung is a large company with excellent brand loyalty from there customers.

Huge market player in other sectors of the business.

Samsung has the funds and resorces to extend the current heat pumps into a blue ocean market.

Weaknesses

They haven't developed the heat pump to its fullest extent missing out on the opportunity.

The design of the current heat pump doesnt appeal to the target user.

Currently part of the red ocean market.

Opportunities

None of the key market players are attempting to go down this route.

A fundamental redesign would appeal more to the user and dramatically increase awarness of the technology therefore an increase in sales.

There is an opportunity to open up a new sector in the domestic market for renewable energy.

Threats

Other companies such as, Mitsubishi and Toyota are key market players and are the biggest threat to the success of the product.

Red Ocean

- Competing in an existing market sector.
- Beat the competition.
- Exploit existing demand.
- Make the value-cost tade off
- Align the whole system of a strategic firms activities with its choice of differentiation.

The aim of the project is to make the transition from a red ocean market to a blue ocean market.

Blue Ocean

- Creating an uncontested market sector.
- Making the key market players irrelevant.
- Creating and capturing new demand.
- Breaking the the value-cost trade off.
- Aligning the system of a firms activities in persuit of differentiation.

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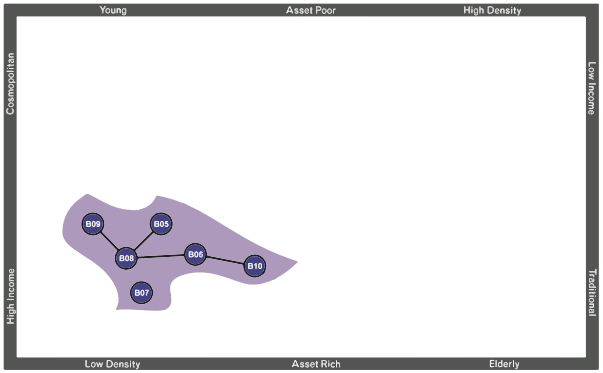

This graphic shows that the professional rewards population are a perfect user group for the new heat pump. Although it has a relitively low density of people they have more disposible income therefore they are more likely to purchase the heat pump.

		%	%
B05 -	Mid-career climbers.	2.90	2.30
B06 -	Yesterday's Captains.	1.80	1.84
B07 -	Distinctive Success.	0.48	0.48
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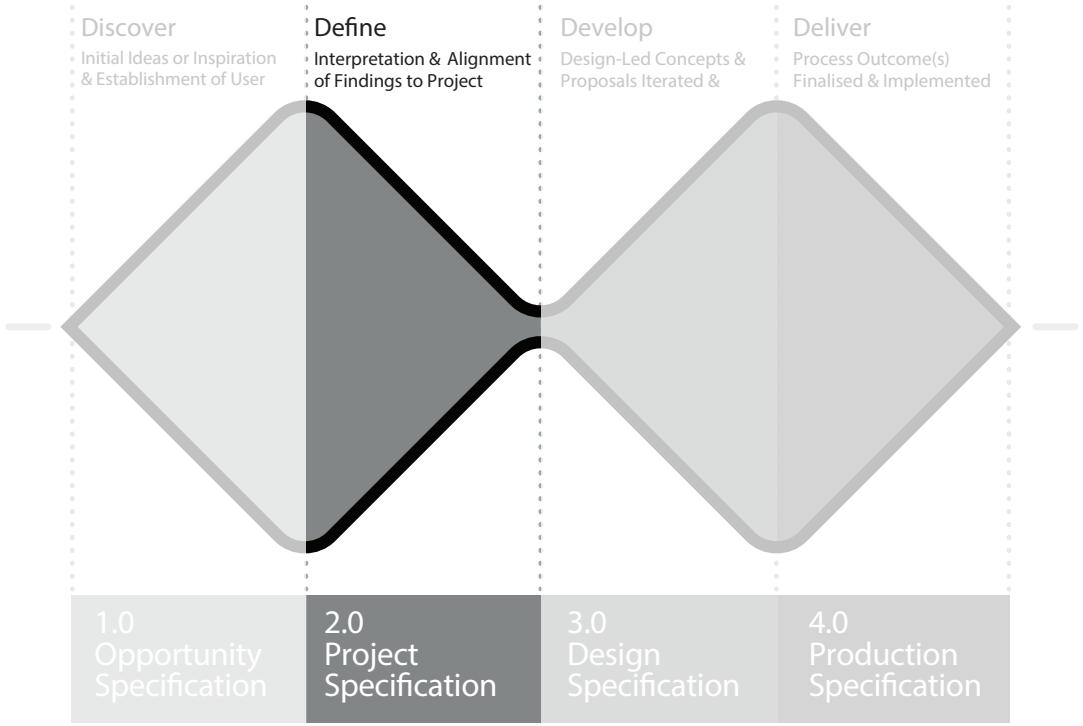

Situation

Less than 5% of UK residential properties benefit from the installation of a heat pump as a key source of energy for domestic heating. This technology can deliver a large reduction in energy consumption and carbon emissions at the level of a family dwelling, a community and globally.

The concept of a heat pump in the family home produces a 60% increased energy saving compared to comparable heating systems and a significant reduction in carbon emissions per property.

In addition, the installation of heat pump technology makes funding from the RHI available. As well as the key energy savings and reduction in carbon emissions it contributes to satisfying the NHBC standards, again saving the user money.

A key design requirement is that the format of operation and function of the design proposal must respond to the customers: Lifestyle, behavioral and contextual factors.

Client

For the purpose of this project Samsung is the client and they require a new design for their range of heat pump products. Careful consideration must be taken when creating the design proposal it incorporate the companies design culture by researching there product in other fields as well as there heat pumps.

Brief

Given that only 5% of UK residential properties utilise the heat pump technology there is a huge gap in the market. This means there is the potential to expand the heat pump technology into 24million households. The market also spreads into other countries that need to reduce their carbon emissions. The countries with the highest carbon emissions are China, United States, India, Russia and Japan. The UK has high carbon emissions per capita as well as Saudi Arabia and Australia. The market for this product is global and there is very little competition.

Current products of a similar nature are sold by Mitsubishi, Toyota and Samsung. Their products are uninspiring and not a product that the domestic market wants to invest in. The brief is to create a design proposal for a heat pump in the domestic environment.

The design proposal will be Samsung orientated, as they are a major player in the market and need to expand it. Their current products will be taken into consideration and used as inspiration for the design of the external casing component and the remote.

After completing a short questionnaire of household owners it has become clear there is a need for a surreal yet understated external object to house the heat pump and an aesthetically pleasing internal remote that mirrors the design of the external component. The information gained from this survey also showed that the potential users where happy to have the heat pump on the side of there house if it wasn't to outlandish and somewhat blended in.

There are many factors that can affect the performance of the heat pump. These include the waterproofing of the external component, the function of the conduit, bracket and chassis, ease of installation and maintenance and the packaging and transportation of the product so the overall weight needs to be relatively low. This means standardised bolts and drill bit sizes as well as standard tubing sizes.

The product will be designed for the retrofit market as the RHI covers this. This means consideration must be given to the installation process and the removal of the conduit in order to reduce the amount of damage to the house.

Another major aspect to the design is sustainability. The materials and where the aspects are manufactured greatly affect the carbon footprint of the product. The key here is balancing the cost of manufacturing the product with the carbon footprint it leaves behind, e.g. The cost would be less if the manufacturing processes were carried out abroad (Asia) however the carbon footprint would be larger due to the transportation. However if it were to be manufactured locally (Europe) then the cost would be higher but the carbon footprint would be lower.

The Samsung EHS heat pump and there other products do not share the same product design culture.

Design Specification

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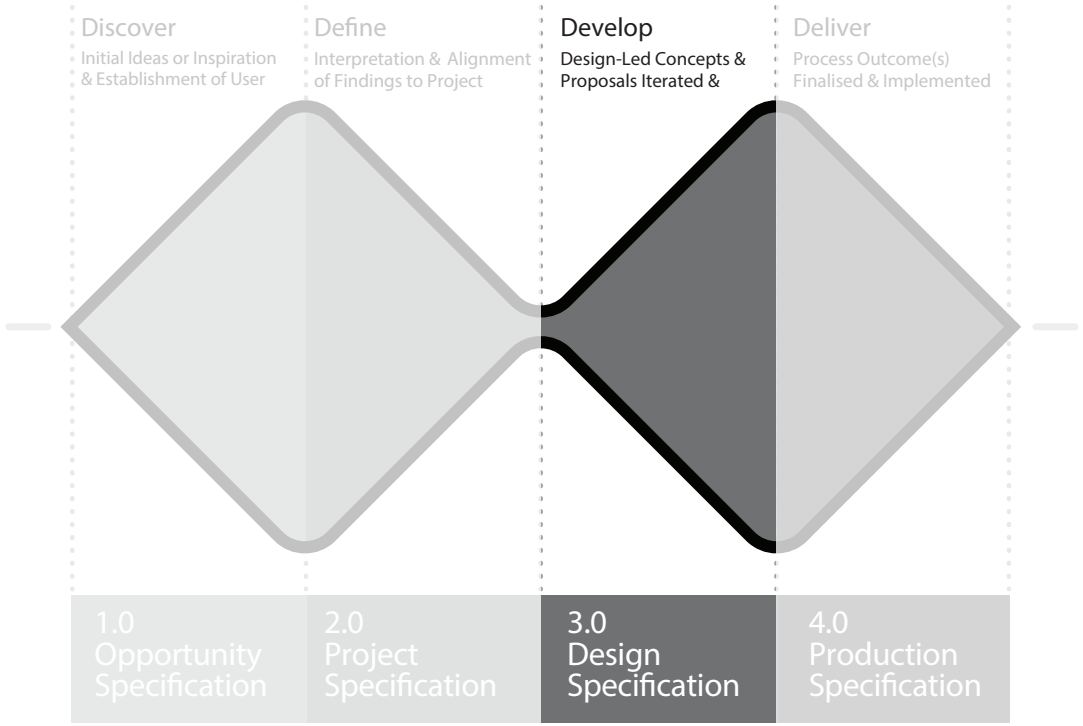


Concept Generation

Hand Drawings

Extruded screen.

Different to standard thermostats.

Contours.

Erganomic factors.

Soft touch materials.

Small base means it could fall over easily.

Enhanced erganomics.

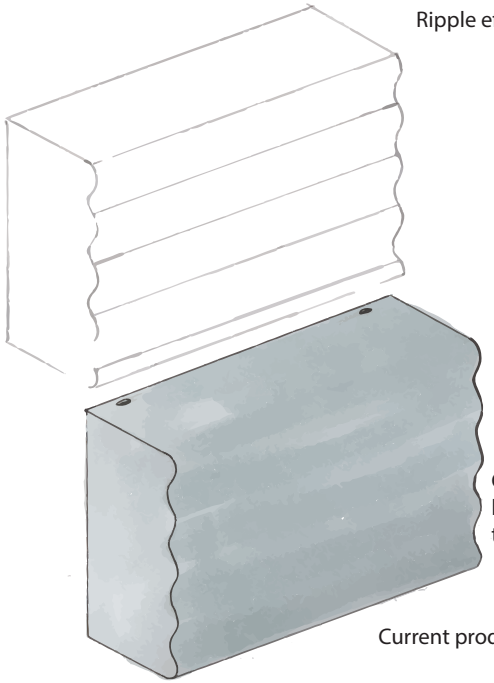
Wall mounted using magnets and a wireless charger.

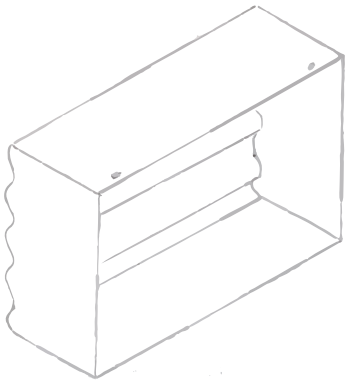
Circular screen.

Transportable.

Concept Generation

Ripple effect distorts the casings surroundings.

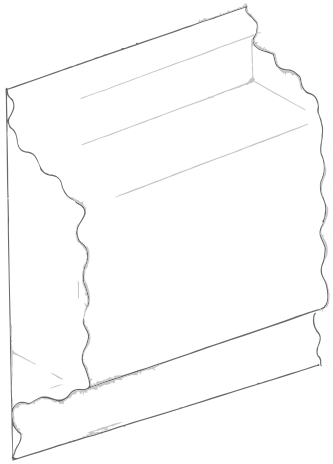


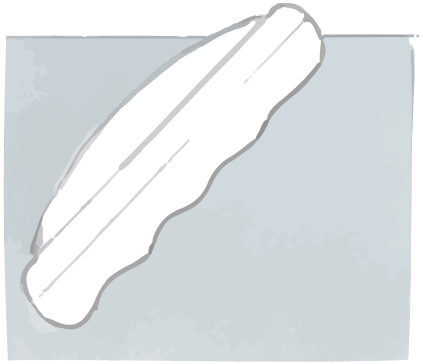


Cold manufacturing techniques lower the carbon footprint of the product.

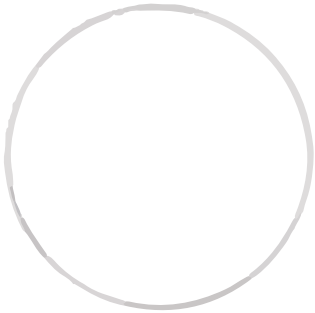
Current production techniques can be used.

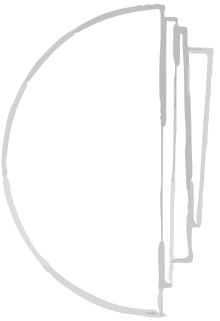
Reduces tooling costs.





This is a remote concept that uses a simular rippling effect as the casing to the left. This is the concept that will be developed further.





Simular concept to the design above: The casing uses a reflective material such as stainless steel reflects and distorts its surroundings.

Although there might not be enough space to house the heat pump internals.

The concept directly to the left is taken directly from to form of a samsung TV.

This links the companies design culture to the Samsung EHS sector of the company.

Final Designs for Remote and Outer Casing

Figure 1: Final design of the remote, incorperating a domed screen, high gloss material and a soft touch material for the grip.

Figure 2: Remote in its wall mounted position.

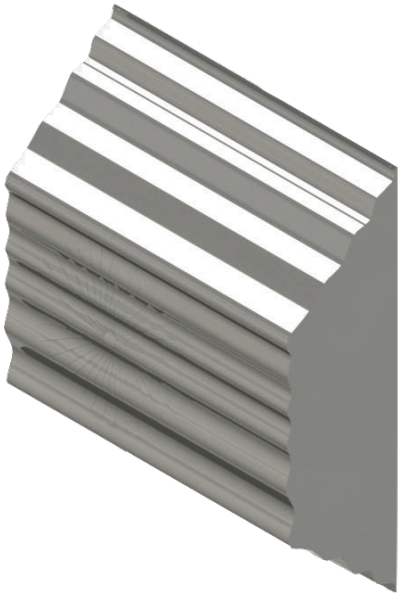


Figure 3: External casing housing the heat pump.

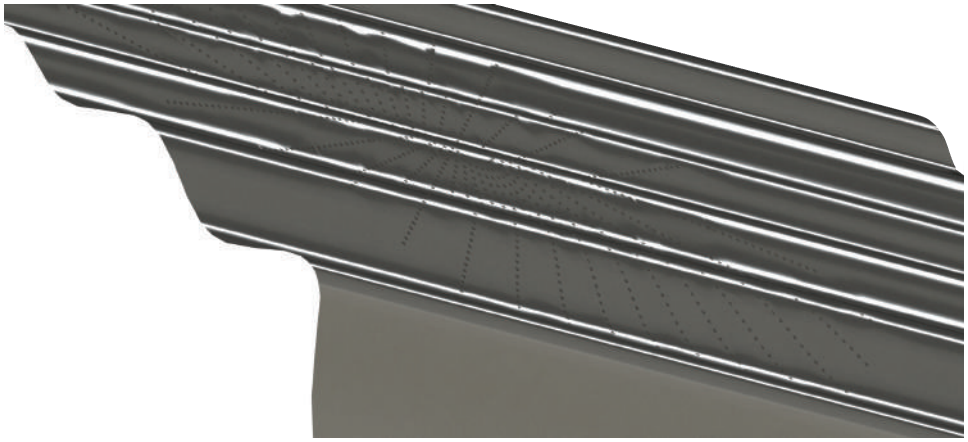


Figure 4: Close-up of the external casing showing the perforations for air flow

Interface Controls

Welcome Screen

Shows vital information such as inside temperature, outside temperature and the time/date.

Physical button pressed.
Backlight on.
Company name and logo.
Copyright details.
Loading bar.

Start-up Tutorial

Guided steps through the set up of the heater.

Run though of how to use the system in the form of a short video.

During first time of use pop ups will prompt the user making the process as easy as possible.

First time use only.

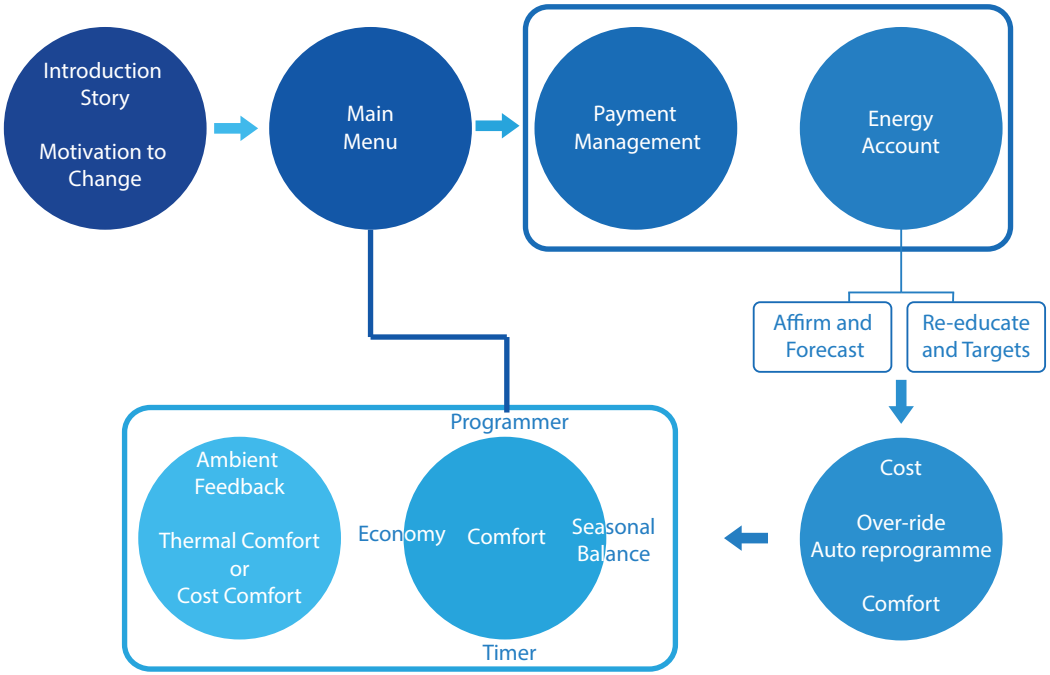
Home Screen
(concepts shown on the left)

Shows basic information such as internal temperature or external weather.

This requires an internet connetion therefore a wifi module must be installed.

Menu
(tap home screen to get here)

This screen consists the funtions required to operate the system. Including how much money can be saved, (incentives and rewards).



Timer- According to users settings. The heating can come on at pre-set times.

Quick Selection- Pre-set options- Comfort, economy...

Manual- User can adjust accordingly.

Booster- At the click of a button the user can rapidly heat water.

Savings and Rewards- The user is rewarded for saving energy in the form of money incentives or goods. Provides constant update about how much money the user has saved.

Help and Support- Provides the user with contact information or troubleshooting advice.

External Temperature Moderator (Seasonal Balance)- Keeps the internal temperature 5°C above the external temperature.

Settings- Timer and comfort settings, time and date, wifi connections....

User Interface

Welcome Screen

Welcome
to

SAMSUNG
EHS

(Touch)

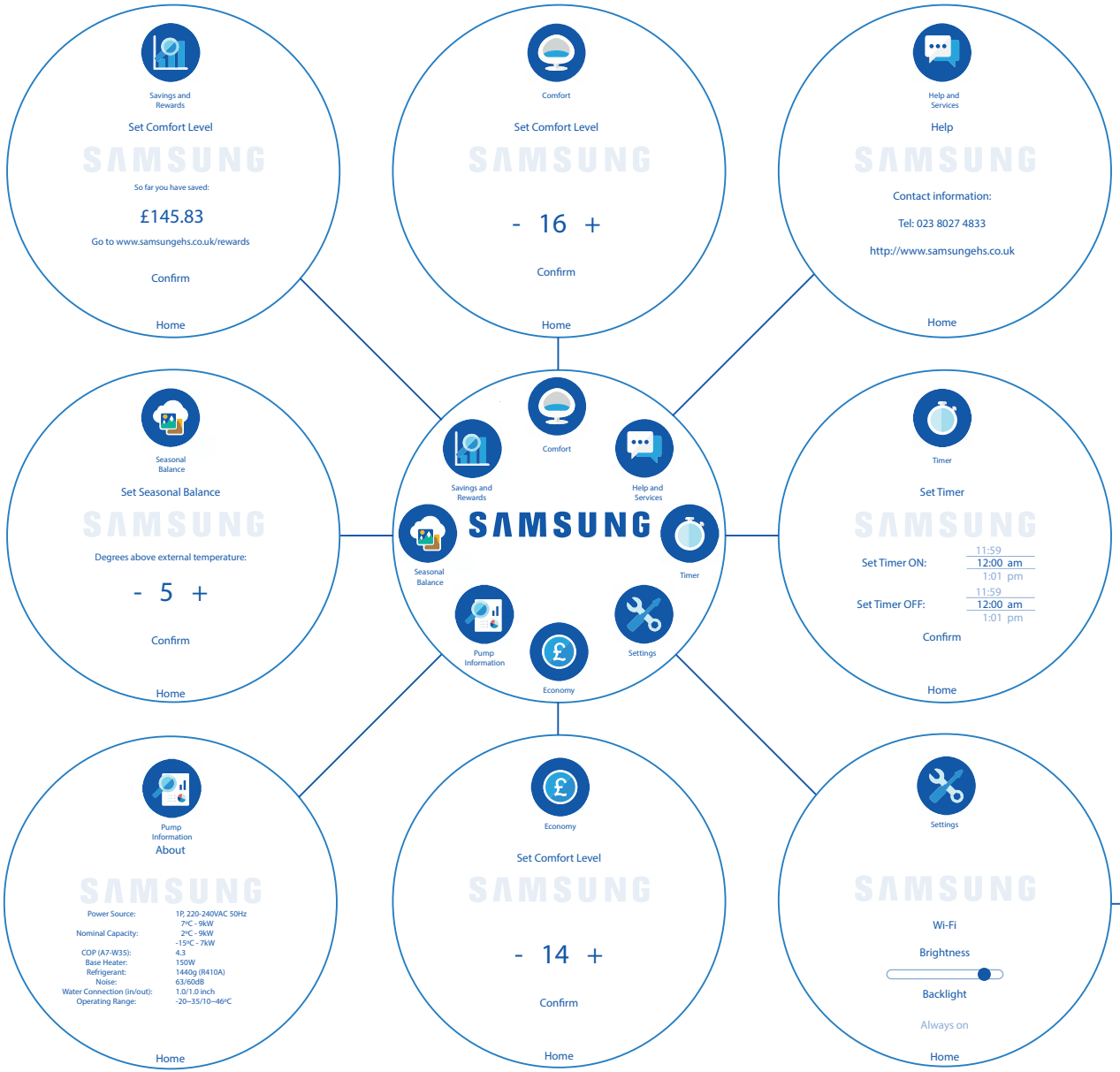
v1.0 2015

Tutorial Screen

SAMSUNG
EHS

Tutorial Screen

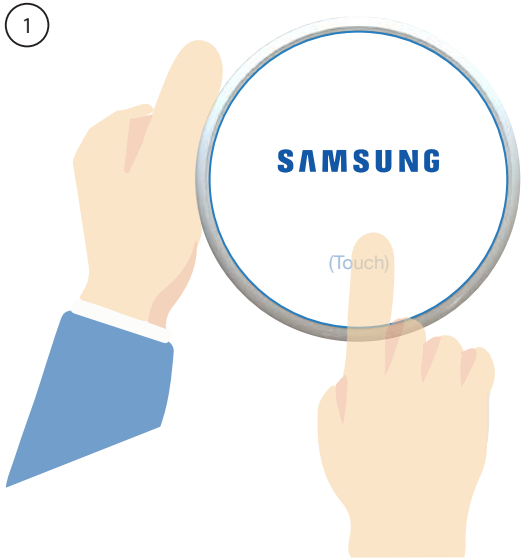
v1.0 2015



User Experiance Narrative Remote Control Interface

This narrative provides an example of how the user would change the comfort temperatures in there house.

1



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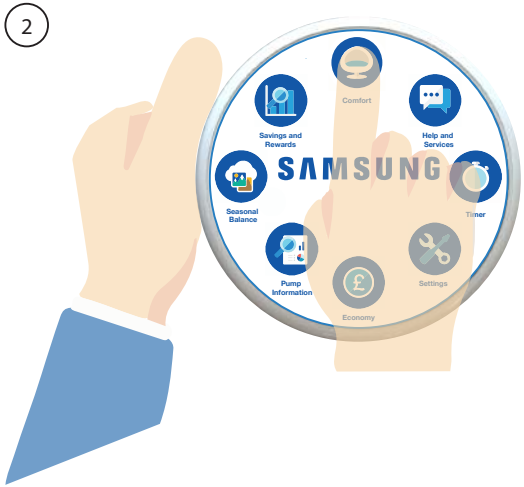

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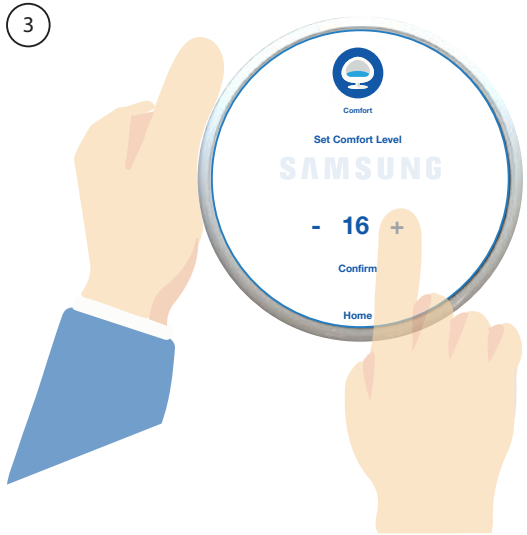

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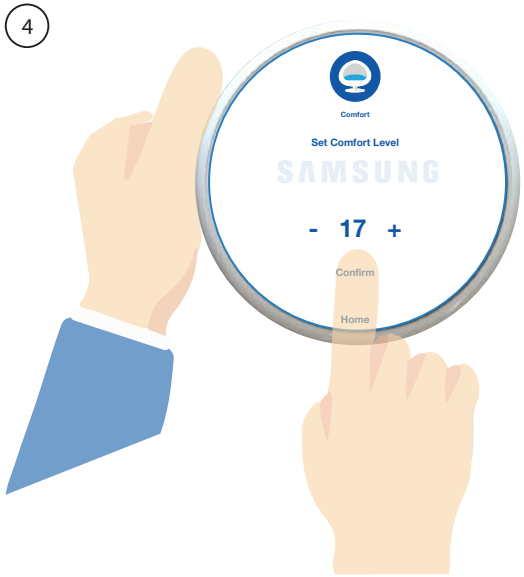
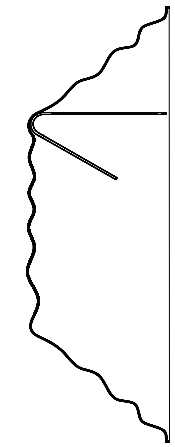


5

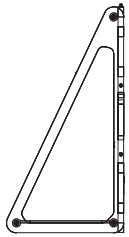
6

SAMSUNG

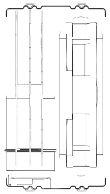
Components and User Experience Narrative Heat Pump Array (Installation)



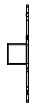
x1 Outer casing.



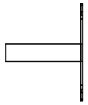
x1 Chassis.



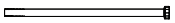
x1 Heat pump.



x1 External conduit.



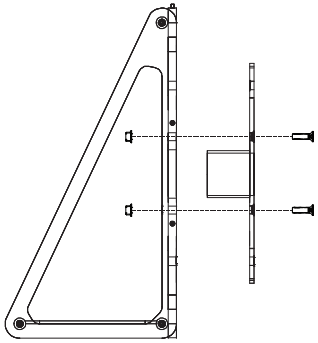
x1 Internal conduit.



x4 Conduit bolts.
x4 Conduit nuts.
x4 Chassis bolts.
x4 Chassis nuts.
x4 Casing bolts.

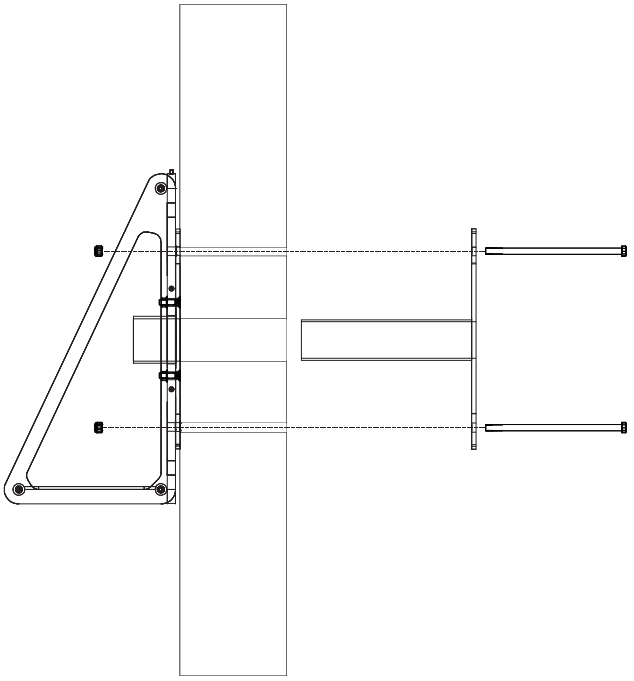
1

Stage 1 involves the connection of the **chassis** and the **external conduit** using the **chassis nuts** and **bolts**.



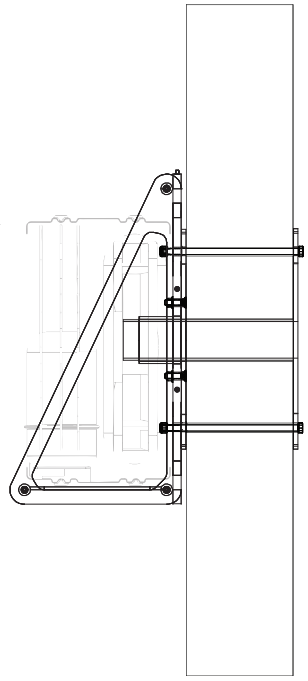
2

Stage 2 is a **two person** job. Once the 5 holes have been drilledthe **internal conduit must be inserted first**. As the bolts are being pushed through from the inside the chassis and externalconduit can be placed over.The tube protruding from the inside should pass through the external conduit and then **the bolts must be fully tightened before releasing**.



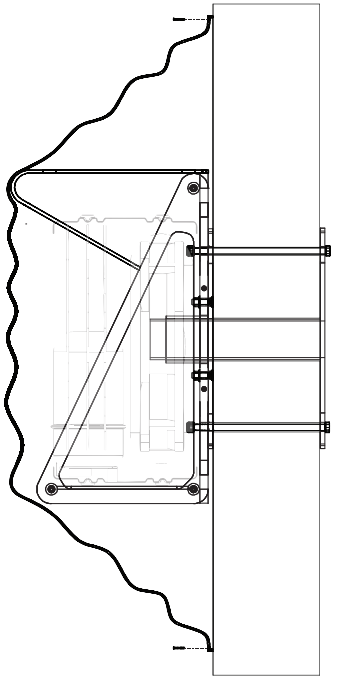
3

Once stages 1 and 2 are complete the heat internals can be installed. As soon as this is complete a silicon cap will be inserted on the internal conduit to seal the gap only allowing the cabling to come through.



4

As soon as instalation is complete the outer casing can be placed over the heat pump. Once the outer casing is in place sucure with the 4 casing bolts and apply a clear sillicon seal around the edges.



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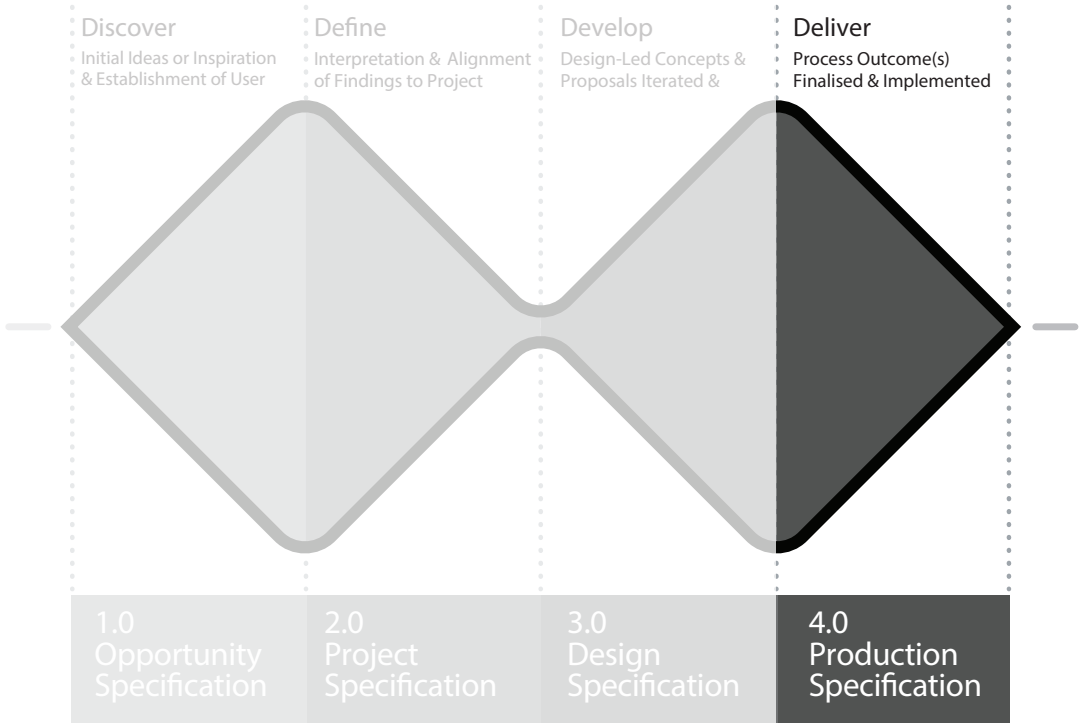

Product Culture

Product Culture