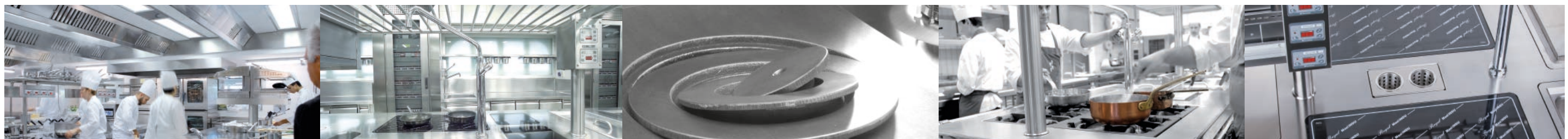
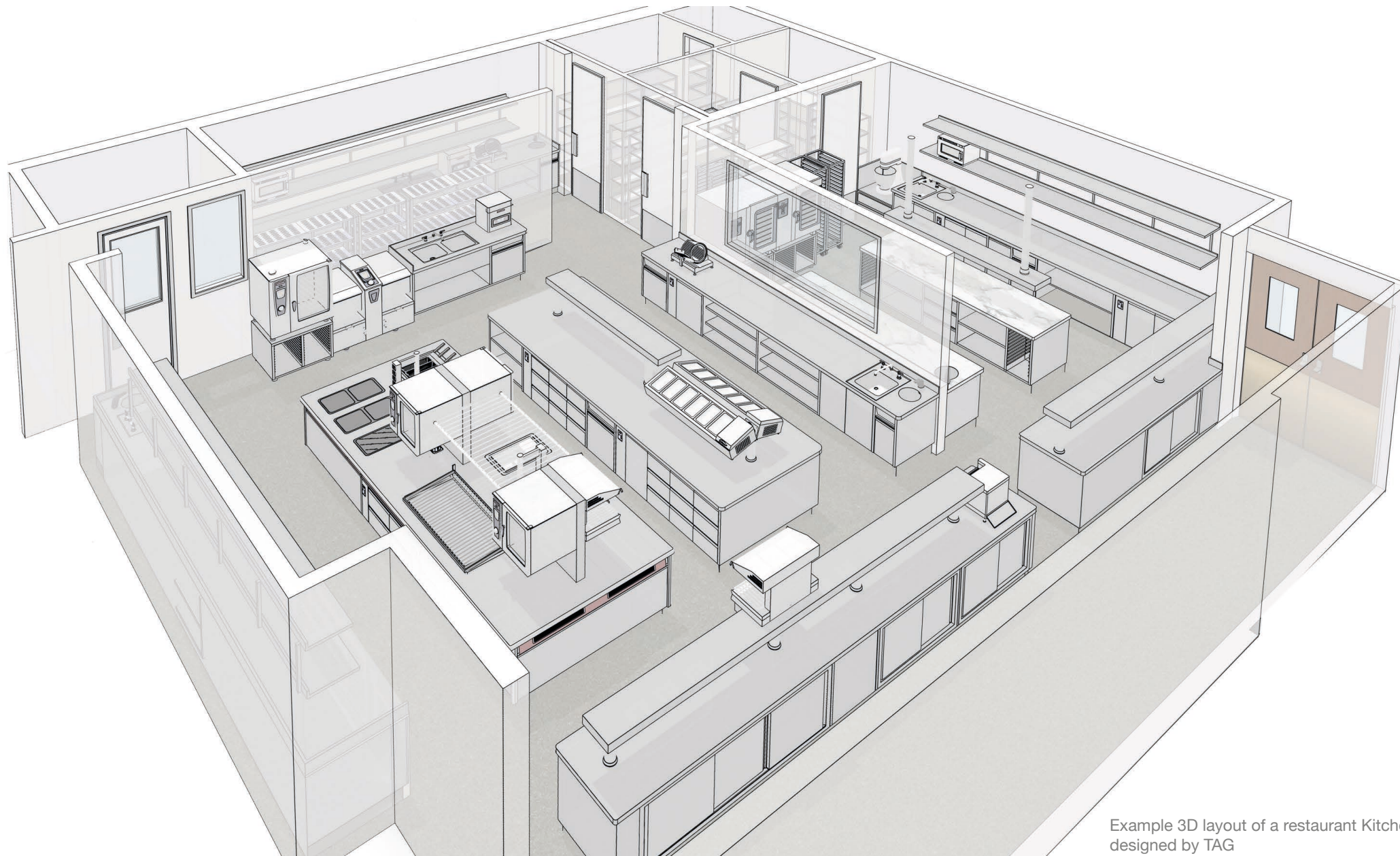


Efficient Design & Return on Investment

Example Project References

.TAG





Example 3D layout of a restaurant Kitchen designed by TAG

Introduction

The example projects show a full refurbishment for hotel and restaurant kitchens, focusing on improving the operation and efficiencies of the kitchen to offer financial savings that cover the investment in upgrading a modern design.

To achieve this return on investment we focus on four key efficiencies to reduce running costs and improve the operational capabilities of the kitchen.

Efficiencies in design & ergonomics

Improved ergonomics of the space through a considered design enables a reduction in operation times and potential labour cost reductions with everything within the kitchen designed in an efficient way.

The design basis allows for flexibility through services to grow and shrink with spaces overlapping to optimize all sections at all times, with no wasted space or equipment.

Efficiencies in fabrication specification

The fabrication is designed to be situated on plinths, with fully seamless counters and cupboards.

Rounded corners and a 'monocoque chassis' design means there are no dirt traps for a truly hygienic kitchen.

This reduces cleaning timescales, chemicals required and allows for an improved, more durable kitchen.

Efficiencies in equipment specification

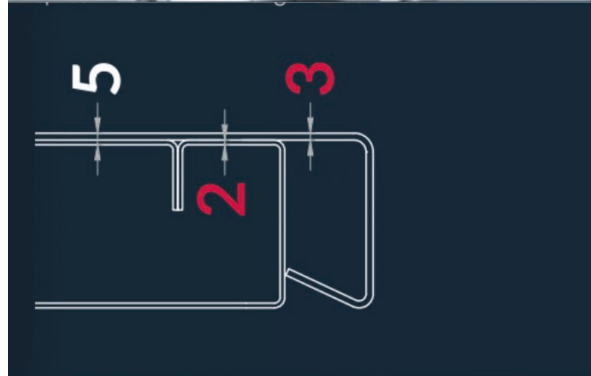
The equipment proposed uses the most technologically advanced units on the market.

Multi-cooking centres allow for flexibility in menus and development as well as improved accuracy, less wastage and a flexible kitchen that can cater for a multitude of operations and overlapping services from breakfast to dinner.

Efficiencies in energy consumption

Creating a connected kitchen the energy usage can be reduced on an intelligent system.

The equipment proposed all reduce heat by moving to a remote pack system and induction technologies, minimizing gas usage and creating low electricity bills.



Fabrication Specification

The fabrication is designed to be situated on plinths, with fully seamless counters and cupboards. Rounded corners and a 'monocoque chassis' design means there are no dirt traps for a truly hygienic kitchen.

This reduces cleaning timescales, chemicals required and allows for an improved, more durable kitchen.

The Equipment Specification

- Changed from gas to induction, to improve energy use, reduce heat and allow more equipment in a smaller footprint;
- Installed remotely monitored refrigeration locally sharing a pack and load over 3 compressors on in-verters to stop spikes in energy use;
- Fridges have an evaporator and sensor to every door, so each door is an insulated, sealed cabinet. Heat loss is reduced when doors are open compared with standard 3 door fridges, energy savings.
- Remote system allows smaller end cabinets maximizing counter storage space; built in, integral to the counter, easy to clean and hygienic;

- Induction and refrigeration all connected via DeManincor TCS monitoring system; the kitchen is running on only ..., ecological and providing an ROI in 5 years with savings on running costs and gives early, remote warnings of breakdowns and running issues of all equipment;
- Introduced smaller Rational Combi Ovens to each area has reduced walking needed between areas and saves energy of running a half empty large oven;
- Upgraded Bratt Pans that cook quicker, under pressure, reduce the amount of griddle space required and improve flexibility.

Details of the remote monitoring TCS system used on site through the equipment

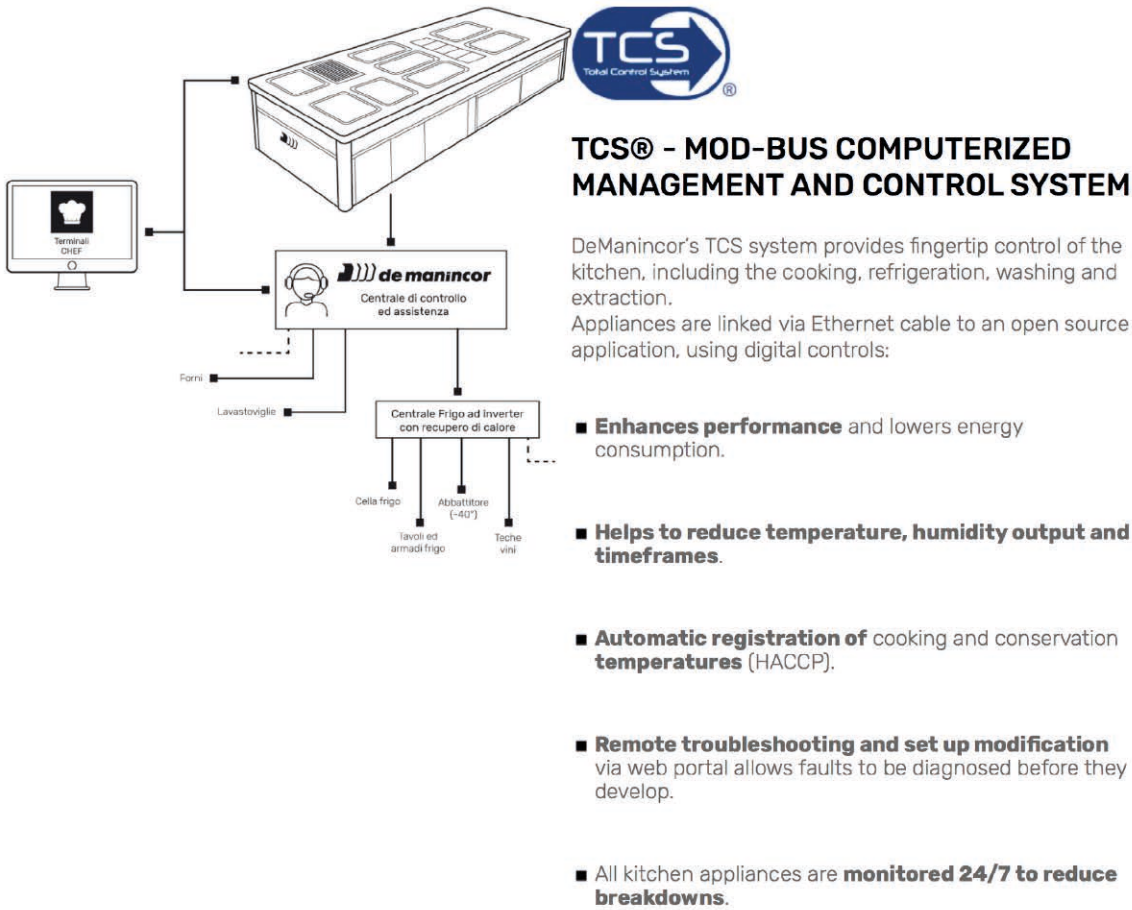
ENERGY MANAGEMENT

HI-TECH TECHNOLOGY

- Induction-driven for premium performance even at high temperatures.
- State-of-the-art electronic controls featuring **TCS® - Total Control System** - to optimise energy consumption.

REDUCED ENERGY CONSUMPTION

Innovative approaches, such as **induction-driven electric hob with 92% efficiency**, that offer 50% energy saving over traditional models (and 35% over gas). **Digital grills** that reach temperature extremely quickly: 0-300°C in ten minutes, compared to 25-30 minutes for gas. **Digital thermostats** ensure temperatures remain constant, reducing throughput times with absolute precision.



Reference Sites

Some example sites in London using the same design and technology for state of the art efficient kitchens.

ROSEWOOD
HOTELS & RESORTS

The Dorchester
Dorchester Collection

THE GROVE 
LONDON'S COUNTRY ESTATE

OXO
RESTAURANT · BAR · BRASSERIE

Frederick's



A .  . K
KITCHEN & BAKERY

Awards

The above sites have won or been shortlisted for the below awards for commercial kitchen design and/or awards for ecological and efficient projects.

- | | |
|-------------------------------------|------------------------------------|
| CEDA Best Project Winner 2015 | - (OXO Tower restaurant - London) |
| CEDA Overall Winner 2015 | - (OXO Tower restaurant - London) |
| CIBSE Building Performance Winner | - (Fredericks Restaurant - London) |
| CEDA Large Project Finalist 2018 | - (Rosewood Hotel- London) |
| CEDA Best Large Project Winner 2019 | - (The Dorchester Hotel - London) |



Reference Site 1.

The Dorchester Hotel
Basement Kitchen - Park Lane, London



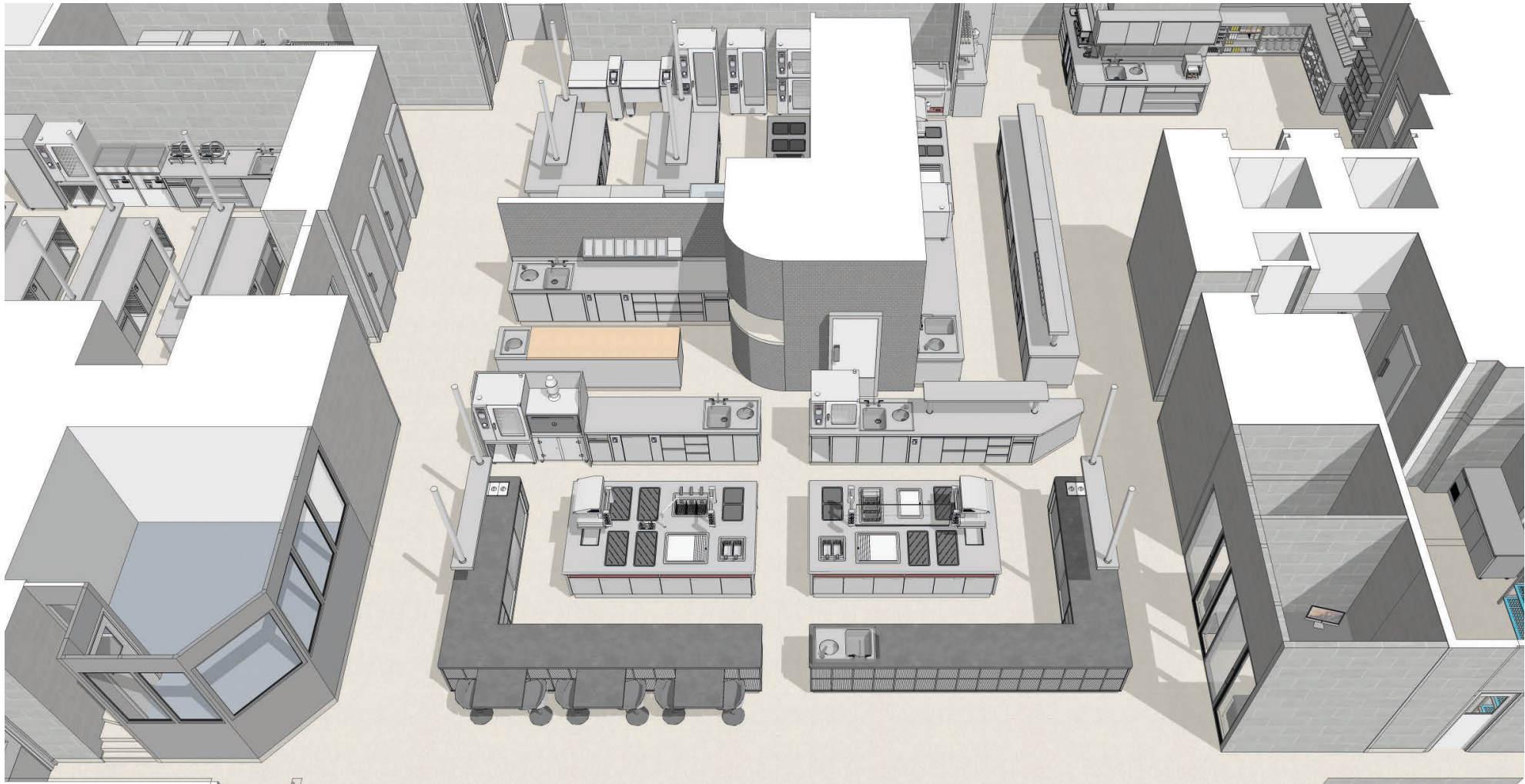
The Dorchester Hotel underwent a full refurbishment of the basement kitchen, after its previous being installed 30 years before. It was a priority that the new design would be durable and efficient, to ensure that it would last another 30 years.

Ergonomics were changed dramatically to improve service times and reduce walking across the kitchen, as well as reduce labour costs. Areas can expand into adjacent areas when needed but shrink when not, maximizing the flexibility of the space.

The latest induction technology has been used in addition to a refrigeration pack which is monitored remotely. Temperature, energy usage and faults are reported via the system for all the connected catering equipment.

As a result, the refrigeration uses on average 4 kW per hour for the entire kitchen.

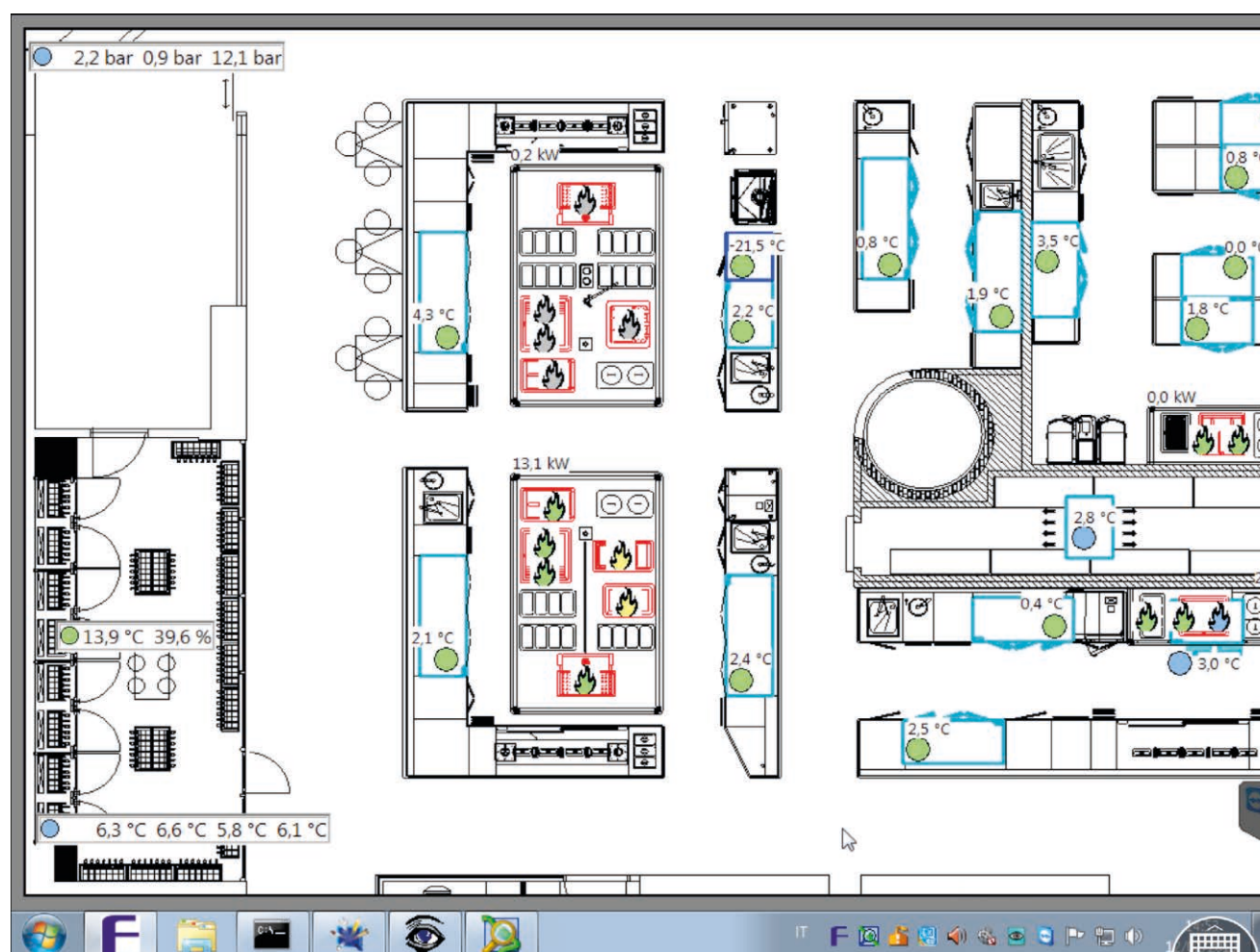
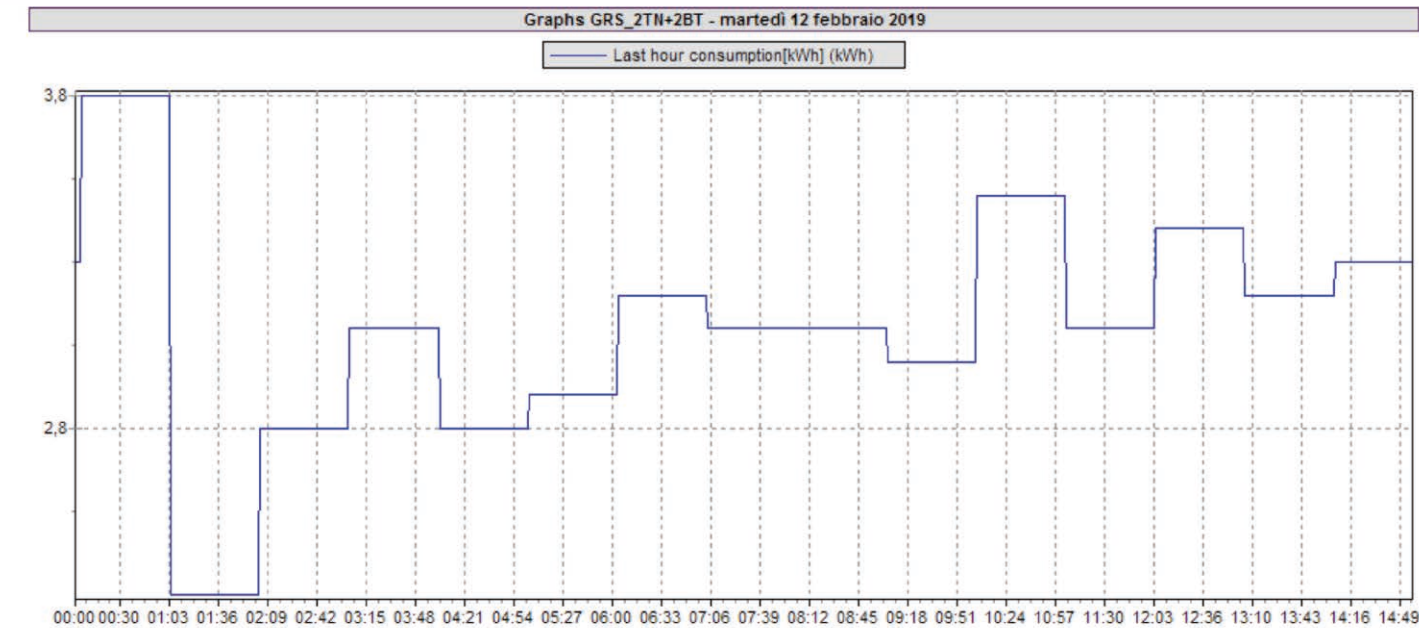
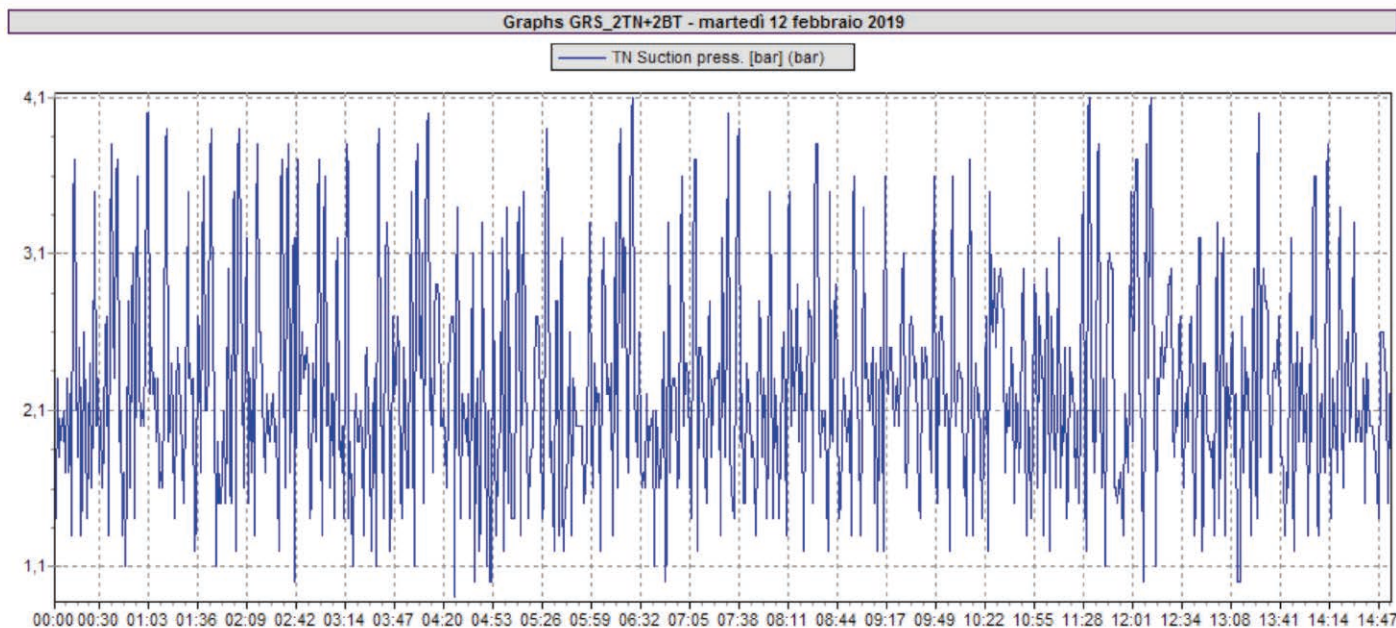
The hotel has reported a reduction of energy bills if up to £75,000 per year as well as further running costs with greater staff efficiencies and fluidity in the whole kitchen, by reducing chef footprint.



Old view of the pass from the Krug room



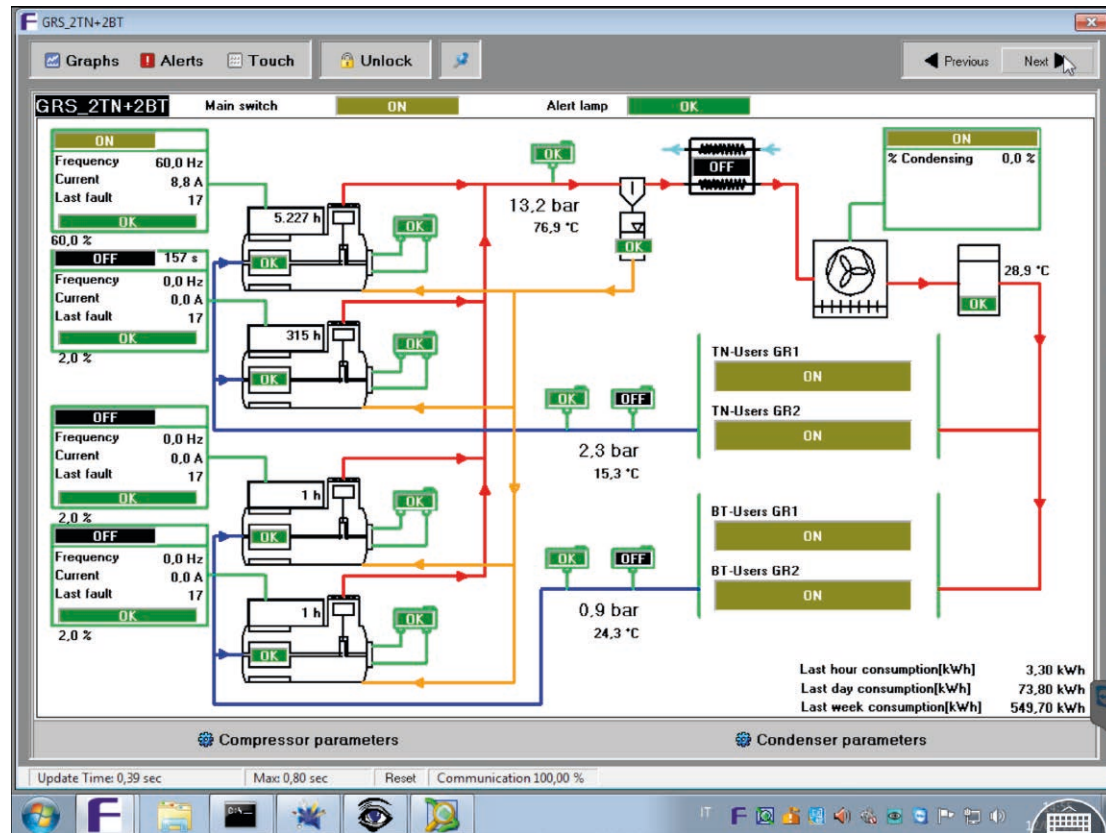
New view of the pass from the Krug room



Graphs showing total KW running power of the refrigeration pack system over a full day (LH side) and an hour (RH side) .

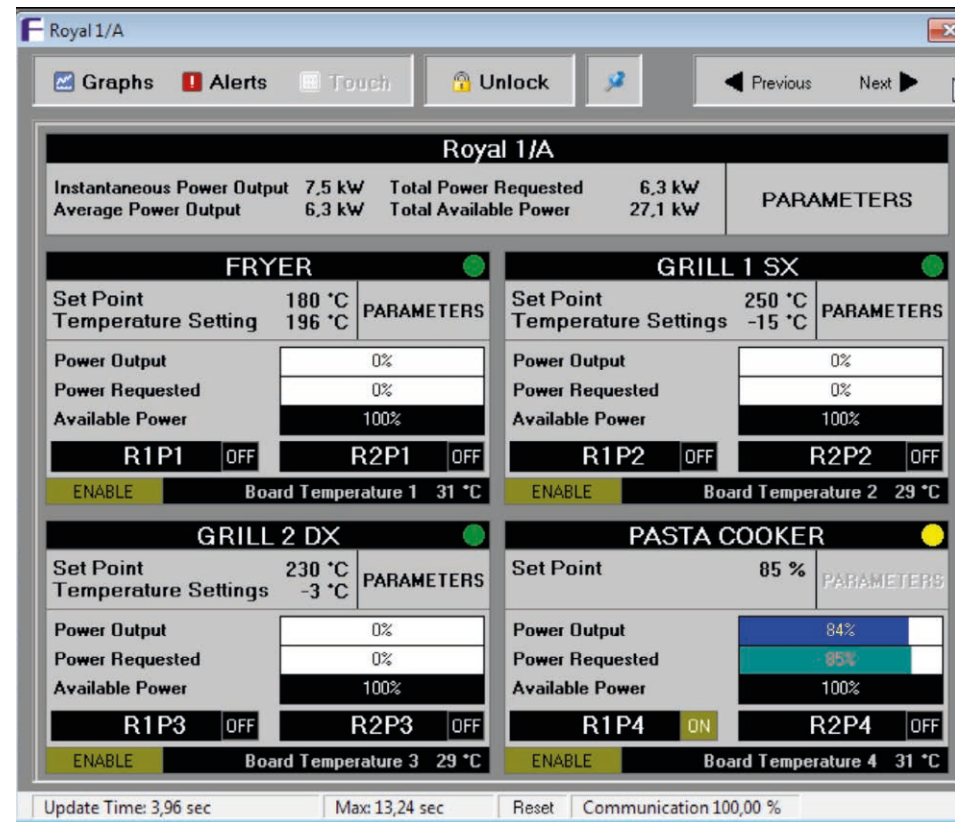
Both of these show an average of only 3KW for the whole pack system running every fridge in the kitchen, cold room and wine room (this is around the same as 2 counter fridges!).

Screenshot of monitoring software, showing each item of equipment and its running without fault as well as temperature and if its in use. This will alarm and flag if any fridge rises in temperature or any fault on equipment.



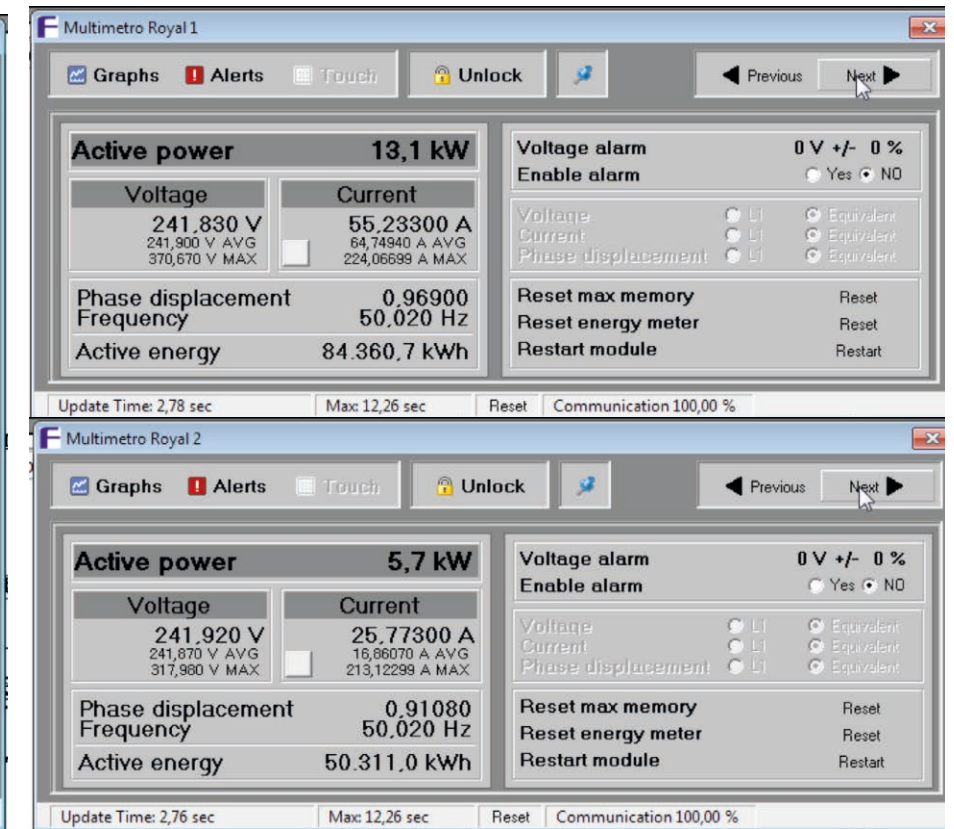
Breakdown of refrigeration pack system us-

Showing: the pressure, KW running, Usage, Running time, Faults for each compressor and condenser which work together on inverters.



Breakdown of Cooking Range Usage

Showing: the KW running, Usage, Running time, Faults on each item within the range



Total loads of the Cooking Ranges

Showing: the KW running at 13.1KW and 5.7KW for each range which is extremely low at lunch service (1pm)

Reference Site 2.

The Grove Hotel & Spa
Glasshouse Restaurant - Hertfordshire



The Grove had a full re-development of their main Glasshouse Restaurant. This included both back of house and front of house areas.

TAG were appointed for the design of this due to the integrated crossover between the kitchen and restaurant, with multiple foodstations located in the restaurant area.

Due to the buffet style offering it required a lot of display refrigeration and which is now run on a remote pack system to maximize its energy efficiency, as well as a remote monitoring system for maintenance support.

The Grove Glasshouse - ROI Actual Connected Loads 12/08/2019

Refrigeration Pack System

	Price per per KWH (a)	Operational time (hours) (b)	Running time (hours) (b)	KWH Usage (c)	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10
BOH Equipment compressors								
Operational Running Costs	£	0.0978	15	7.5	£	19.25	£	70,278.47
Out of operation Running Costs (Day KW fee)	£	0.0978	3	1.5	£	3.85	£	14,055.69
Out of operation Running Costs (Night KW fee)	£	0.0701	6	1	£	1.84	£	6,714.54
Sub Total						£	£	91,048.70
FOH Equipment compressors (enclosed units)								
Operational Running Costs	£	0.0978	15	5	£	15.40	£	56,222.78
Out of operation Running Costs (Day KW fee)	£	0.0978	3	0.5	£	1.54	£	5,622.28
Out of operation Running Costs (Night KW fee)	£	0.0701	6	1	£	2.21	£	8,057.45
Sub Total						£	£	69,902.50
FOH Equipment compressors (open units)								
Operational Running Costs	£	0.0978	15	15	£	77.02	£	281,113.88
Out of operation Running Costs (Day KW fee)	£	0.0978	3	0	£	-	£	-
Out of operation Running Costs (Night KW fee)	£	0.0701	6	0	£	-	£	-
Sub Total						£	£	281,113.88
Individual Condensers Total (option 1)				110.25		£	£	442,065.08
BOH Equipment Pack								
Operational Running Costs	£	0.0978	15	7.5	£	10.41	£	37,992.57
Out of operation Running Costs (Day KW fee)	£	0.0978	3	1.5	£	2.08	£	7,598.51
Out of operation Running Costs (Night KW fee)	£	0.0701	6	1	£	0.99	£	3,629.88
Sub Total						£	£	49,220.96
FOH Equipment Pack (enclosed units)								
Operational Running Costs	£	0.0978	15	5	£	17.02772	£	26,772.75
Out of operation Running Costs (Day KW fee)	£	0.0978	3	0.5	£	0.15	£	535.46
Out of operation Running Costs (Night KW fee)	£	0.0701	6	1	£	0.42	£	1,534.75
Sub Total						£	£	28,842.96
FOH Equipment Pack (open units)								
Operational Running Costs	£	0.0978	15	15	£	22.01	£	80,318.25
Out of operation Running Costs (Day KW fee)	£	0.0978	3	0	£	-	£	-
Out of operation Running Costs (Night KW fee)	£	0.0701	6	0	£	-	£	-
Sub Total						£	£	80,318.25
Multi Pack Total (option 2)				59.6		£	£	158,382.17
Maximum rated load								
Actual Running loading average (10% of load based on figures from existing sites +additional allowance)				49.45				
Operational Running Costs	£	0.0978	15	15	£	4.945	£	26,478.25
Out of operation Running Costs (Day KW fee)	£	0.0978	3	3	£	4.945	£	5,295.65
Out of operation Running Costs (Night KW fee)	£	0.0701	6	6	£	4.945	£	7,589.35
Cibin Total (option 3)						£	£	39,363.25
Cibin Total Actual Running Load	£	0.0978	24	4.46	£	10.47	£	38,218.64
Savings With Option 3 System over option 1						£	£	402,701.83
Savings With Option 3 System over option 2						£	£	119,018.92

Equipment Monitoring & Power Control System - De Manincor TCS

	Price per per KWH (a)	Running time (hours) (b)		Maximum Total Estimated Kitchen KWH Usage (c)	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10		
New Kitchen Without TCS energy control management (maximum connected load)	£	0.0978	15		243	£	356.48	£	1,301,155.65	
New Kitchen Without TCS energy control management (maximum diversity load)	£	0.0978	15	(30% diversity)	170.1	£	249.54	£	910,808.96	
New Kitchen With TCS energy control management	£	0.0978	15	(30% diversity +70% on range and pack system)	119.636	£	175.51	£	640,596.94	
Additional Electrical Infrastructure not required	Sub Main Cable Increase					£	20,000.00			
	Individual supplies to units					TBC				
	Panel Upgrade					£	10,000.00			
Savings With System							£	27,021.20	£	270,212.01
Additional First Year Savings							£	30,000.00		

* Additional Infrastructure PC costs from Anderson Green
**Pack & Range total load 107.6KW, TCS Load 25KW

Cooking Range - Induction

	Cost of Power (Per KWH) (a)	Running time (Hours) (b)	KWH Usage (c)	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years) (10
Existing Range Gas	£ 0.01666	18	163	£ 48.88	£ 17,841.36	£ 178,413.61
Existing Range Electrical	£ 0.09780	18	20	£ 35.21	£ 12,850.92	£ 128,509.20
Total Connected Load For New DeManincor Induction Range	£ 0.0978	4	74	£ 28.95	£ 10,566.31	£ 105,663.12
Savings Compared to Gas					£ 20,125.97	£ 201,259.69
Actual Running Load	£ 0.0978	24	12.36	£ 29.01	£ 10,589.16	£ 105,891.58

*4 Hour running time is based on an average pan contact with induction hobs over gas which is running continually

Potwash

	Estimated cost of chemicals and gloves (per day)	Litre capacity (per sink)	m3 Water/Waste (per day)	Water/Waste Cost (per day)	Labour Cost (per day)	Sink Running Cost (per day) *	Annual Running Cost	Running cost years)	(10
Daily Sink Volume (pot washing)	£ 2.1600	171	4.104	£ 6.85	£ 43.20	£ 81.82	£ 29,864.30	£	298,643.00
	KW Cost per day	Detergent used for 25 cycles	Water softening	Labour Cost (per day)**		Running Cost (per day)			
Potwash Machine	£ 11.74	1.04	0.32	£ 14.40		£ 27.50	£ 10,036.04	£	100,360.40
Savings Compared to existing							£ 19,828.26	£	198,262.60

Price of water £0.97 per m3, Cost of sewerage £0.70 per m3, Cost of energy to heat water £0.0978 per kWh, Cost of chemicals / gloves / cleaning utensils £2.16, Cost of labour £7.20PH
** Labour cost reduced due to being able to work in other dish wash areas whilst machine is running so not dedicated to this area

Summary of Cost Savings (refrigeration option1 Compared To option3)

		Total Estimated Annual Saving		Projected 3 Year Saving		Projected 10 Year Saving		
(1) Refrigeration pack system	£	40,270.18	£	120,810.55	£	402,701.83		
(2) TCS Energy control	£	27,021.20	£	81,063.60	£	270,212.01		
(3) Additional infrastructure savings	£	30,000.00	£	30,000.00	£	30,000.00		
(4) Cooking Range	£	20,125.97	£	60,377.91	£	201,259.69		
(5) Potwash	£	19,828.26	£	59,484.78	£	198,282.60		
Total Estimated Saving of Project	£	137,245.61	£	351,736.84	£	1,102,456.13		
Total Estimated Saving of Cibin Pack over Multi Compressor system		(item 1,2 & 3 combined)	£	97,291.38	£	231,874.15	£	702,913.84

Summary of Cost Savings (refrigeration option2 Compared to Option 3)

		Total Estimated Annual Saving		Projected 3 Year Saving		Projected 10 Year Saving
(1) Refrigeration pack system	£	11,901.89	£	35,705.68	£	119,018.92
(2) TCS Energy control	£	27,021.20	£	81,063.60	£	270,212.01
(3) Additional infrastructure savings	£	30,000.00	£	30,000.00	£	30,000.00
(4) Cooking Range	£	20,125.97	£	60,377.91	£	201,259.69
(5) Potwash	£	19,828.26	£	59,484.78	£	198,282.60
Total Estimated Saving of Project	£	108,877.32	£	266,631.97	£	818,773.22
Total Estimated Saving of Cibin Pack over Multi Pack system (Item 1,2 & 3 combined)	£	68,923.09	£	146,769.28	£	419,230.93

The yellow sections are actual recorded data after 6 months of running, compared to our estimated figures. Showing the accuracy of the ROI document.

Reference Site 3.

AOK

Restaurant and Bakery - Baker Street, London



This site had extremely limited power, but a lot of equipment required to operate a bakery and restaurant, including a full induction bespoke cooking suite and deck ovens.

The footprint of the kitchen itself was also very limited which meant all of the equipment had to be as efficient as possible.

A well designed layout and ergonomics to maximize the usable space of the basement.

To maximise the usable space of the basement, a well design layout and ergonomics were crucial,



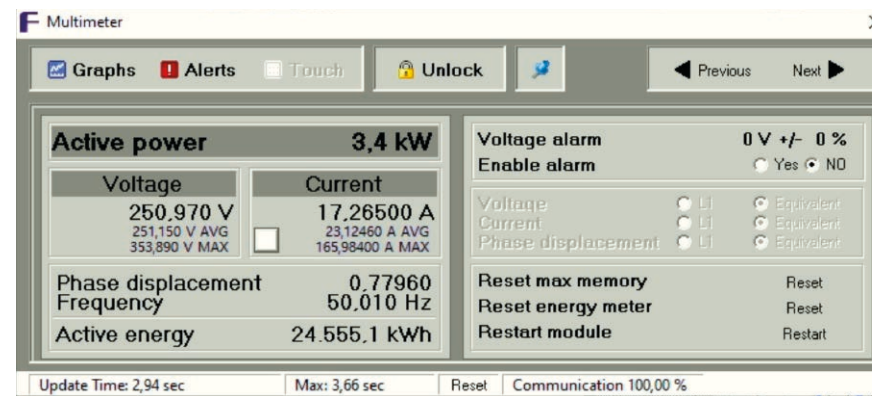
Reduced Electrical KW usage

The loading schedule of the electrical equipment at AOK

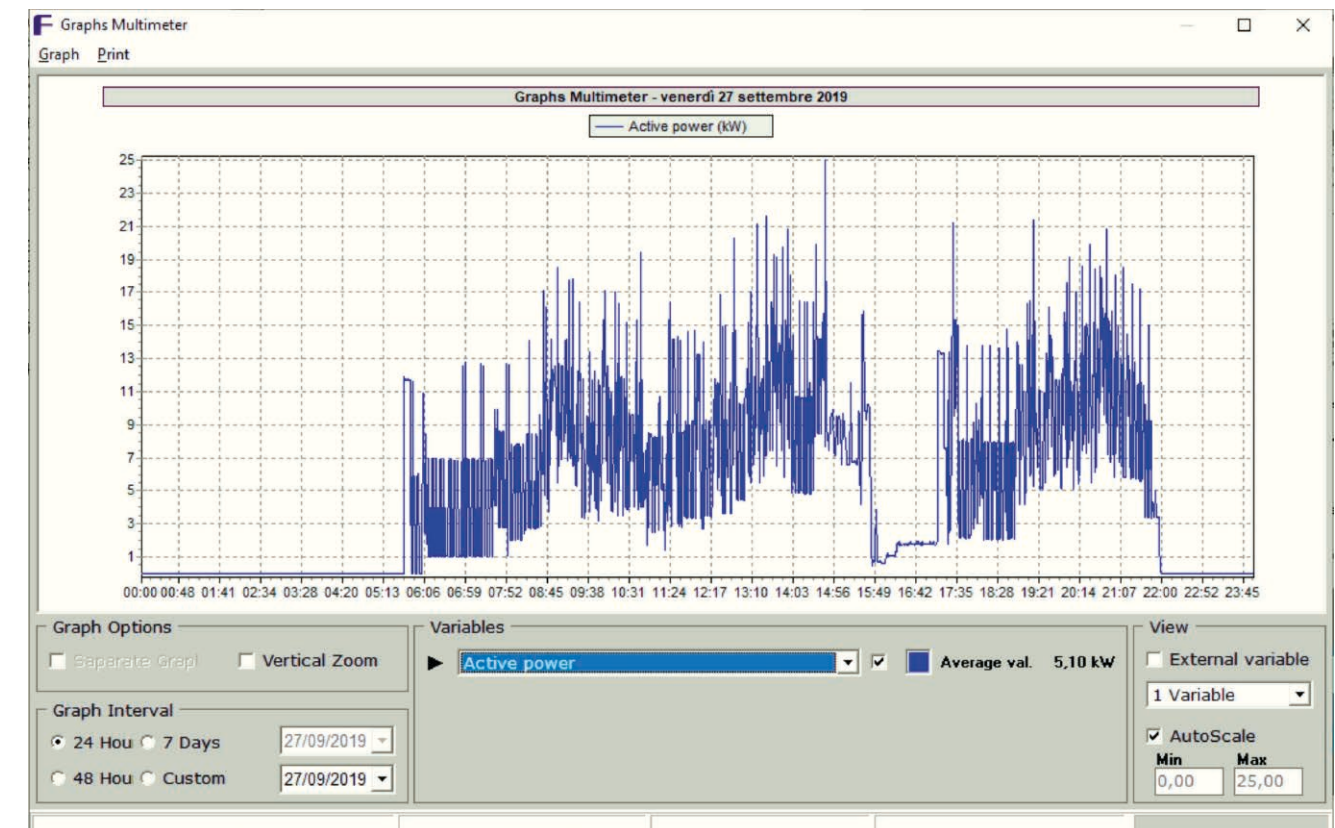
Showing the usual running load of **82.5KW** over the **235.1KW** usually required.

This is due to the energy management system and efficient equipment, allowing us to set a diversity / maximum load to the equipment with it then load sharing between items through data connections.

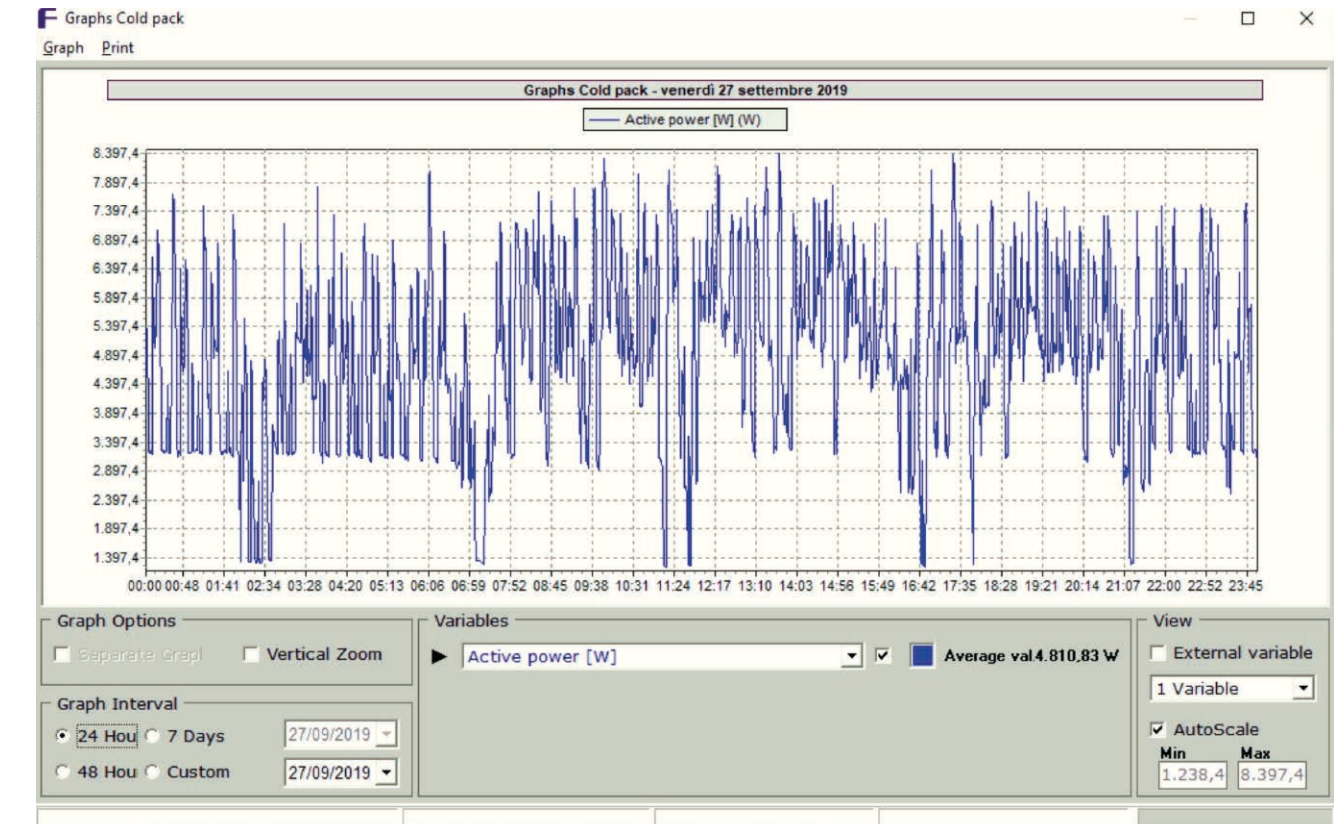
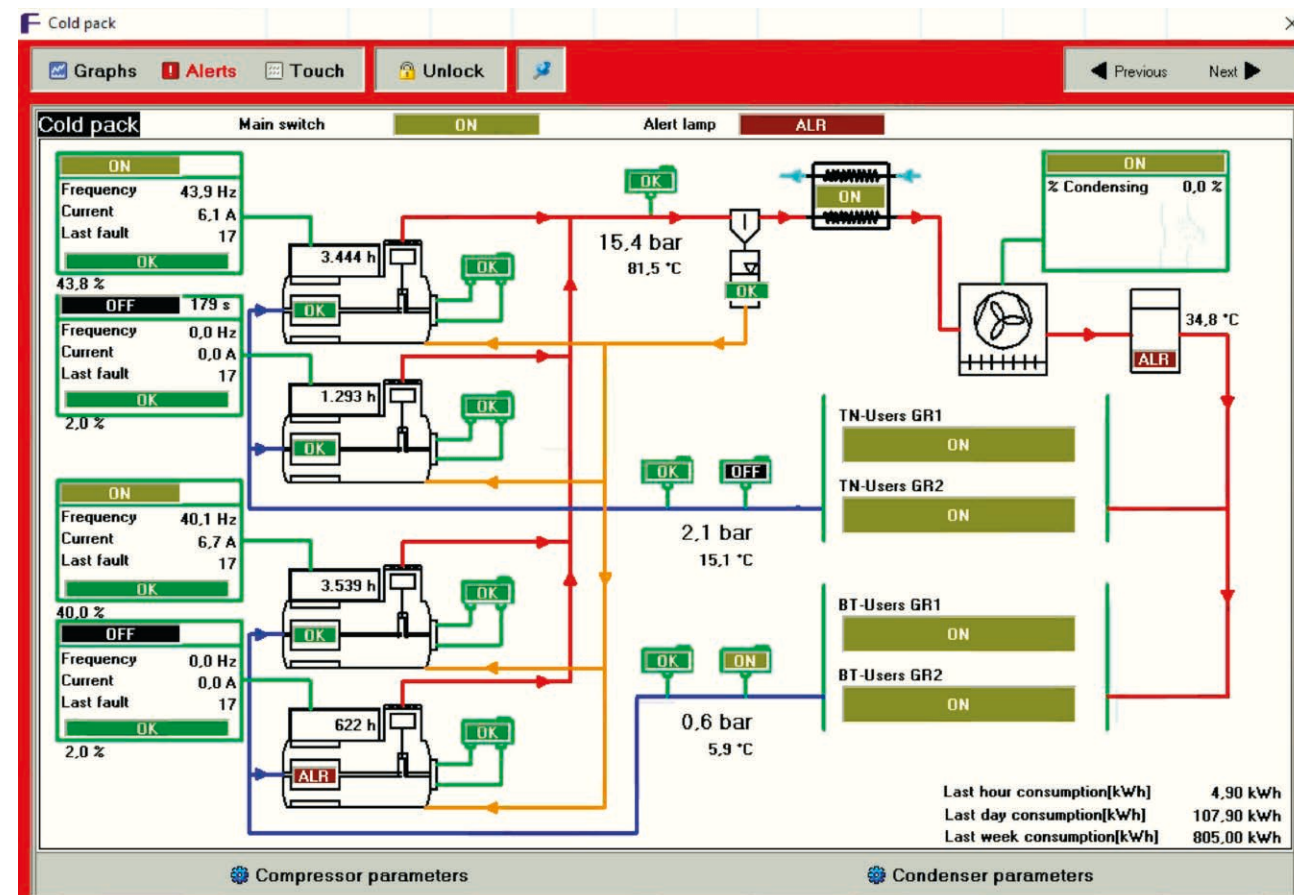
Reference	Qty	Description		Electrical Load	Diversity Load	Rating	Connection	V
E1	23	Wall Connection (<i>Wall Double Socket</i>)	Electrical	3	3	240V 1PHN+E	Twin Switched Socket	
E2	3	Wall or Floor Connection (<i>Sockets in Gantry</i>)	Electrical	3	3	240V 1PHN+E	Twin Switched Socket	
E3	1	Wall or Floor Connection (<i>Hot Cupboard</i>)	Electrical	2	2.2	240V 1PHN+E	Flex outlet	
E4	2	Wall or Floor Connection (<i>Heated Gantry</i>)	Electrical	4.5	2.47	240V 1PHN+E	Flex outlet	
E5	1	Wall Connection (<i>Salamander</i>)	Electrical	4.5	2.47	400V 3PHN+E	Flex outlet	
E6	10	Floor Connection (<i>Counter Fridges</i>)	Electrical	1.6	0.88	240V 1PHN+E	Flex outlet wired to switched fused spur within fridge compartment	
E9	2	Wall mounted connection (<i>Combi Oven 10 grid</i>)	Electrical	38	15.2	400V 3PHN+E	Outlet plate	
E10	1	Wall mounted connection (<i>Combi Oven 6 grid</i>)	Electrical	11	4.4	400V 3PHN+E	Outlet plate	
E11	1	Wall mounted connection (<i>Combi Oven XS</i>)	Electrical	5.7	2.28	400V 3PHN+E	Outlet plate	
E14	4-5 TBC	Ceiling Connection (<i>Cold Room</i>)	Electrical	3	1.5	240V 1PHN+E	Cable outlet	
E15	6	Wall mounted connection (<i>LED Lights</i>)	Electrical	0.5	0.2	240V 1PHN+E	Flex outlet	
E16	3	Wall Connection (<i>Fly Killer</i>)	Electrical	1	0.45	240V 1PHN+E	Switched fused spur	
E17	1	Wall Connection (<i>Dishwasher</i>)	Electrical	11.3	4.6	400V 3PHN+E	Commando Outlet & IP65 Rotary Isolator (including plug)	
E21	1	Wall mounted connection (<i>Upright Fridge</i>)	Electrical	1.6	1	240V 1PHN+E	Single switched socket	
E30	1	Wall mounted connection (<i>Induction Hob</i>)	Electrical	10	3	400V 3PHN+E	Outlet plate	
E31	1	Wall mounted connection (<i>Potwash Machine</i>)	Electrical	11.3	4.6	400V 3PHN+E	Commando Outlet & IP65 Rotary Isolator (including plug)	
E32	1	Wall mounted connection (<i>Mixer</i>)	Electrical	2.2	1	400V 3PHN+E	IP65 Isolated Commando Outlet (including plug)	
E33	1	Wall mounted connection (<i>Mixer</i>)	Electrical	2.2	1	400V 3PHN+E	IP65 Isolated Commando Outlet (including plug)	
E34	1	Wall mounted connection (<i>Dough Sheeter</i>)	Electrical	1.1	0.45	400V 3PHN+E	IP65 Isolated Commando Outlet (including plug)	
E35	1	Wall mounted connection (<i>Deck Oven</i>)	Electrical	21.6	9	400V 3PHN+E	Outlet plate	
E36	1	Ceiling connection (<i>LED Lights</i>)	Electrical	0.5	0.2	240V 1PHN+E	Flex outlet	
E37	1	Floor mounted connection (<i>LED Lights</i>)	Electrical	0.5	0.2	240V 1PHN+E	Flex outlet	
E38	1	Wall mounted connection (<i>Prover</i>)	Electrical	1.5	1.5	240V 1PHN+E	Single switched socket	
E38	2	Wall mounted connection (<i>Table Top Fryer</i>)	Electrical	3	1.2	240V 1PHN+E	Single switched socket	
E50		Floor Connection (<i>Cooking range</i>)	Electrical	52	25.6	400V 3PHN+E	Cable outlet	
E55	1	Floor Connection (<i>Refrigeration Pack</i>)	Electrical	36	5.8	400V 3PHN+E	Cable outlet	
E56	1	Floor Connection (<i>Refrigeration Condenser</i>)	Electrical	2	0.6	400V 3PHN+E	Cable outlet	
E57	6	Wall mounted connection (<i>LED Lights</i>)	Electrical	0.5	0.15	240V 1PHN+E		
Total:				235.1	82.5			



Cooking suite 24Hour KW usage chart (right), showing an average of 5.10KWH over a 24 hour period.



Refrigeration System 24Hour KW usage chart (below right), showing an average of 4.8KWH over a 24 hour period.



Return On Investment & Savings

Based on electrical and gas costs, the below ROI calculations show the potential savings that the efficient equipment and TCS energy management system can offer the site.

Returning the investment in under 3 years for the equipment.

Refrigeration - Remote Pack system									
	Price per per KWH (a)	Operational time (hours)	Running time (hours) (b)	KWH Usage (c)	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10	
Refrigeration costs (local compressor units)	£ 0.1500	18	24	30	£ 108.00	£ 39,420.00	£	394,200.00	
				*Ref1					
Maximum rated load				36					
Cabin Pack system Running Costs	£ 0.1500	18	18	4.8	£ 12.96	£ 4,730.40	£	47,304.00	
				*Ref2					
Savings With pack system over local compressor units					£ 34,689.60		£	346,896.00	
* [Ref 1] total fridges 10 at an average of 3kw per 24Hr each * [Ref 2] pack system running connected load									
Extraction & Supply Air - Reduced Load due to Induction / electric appliances									
	Price per per KWH (a)	Operational time (hours)	Running time (hours) (b)	Maximum Total Estimated Kitchen KWH	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10	
Existing Extraction & Supply Air system running Load With Gas Equipment	£ 0.1500	18	24	60	£ 216.00	£ 78,840.00	£	788,400.00	
				estimated.					
Existing Extraction & Supply Air system running Load with electric equipment	£ 0.1500	18	18	48.00	£ 129.60	£ 47,304.00	£	473,040.00	
Savings Compared to existing						£ 31,536.00	£	315,360.00	
* 20% reduction in Fan Motors Load based in reduced airflows of induction and electric units									
Cleaning - Reduction in cleaning chemicals and labour time									
	Chemical & Cleaning equipment cost	labour Cost (b)			Price Per Day = a + b	Annual Running Cost	Running cost years)	(10	
Gas equipment cleaning cost	£ 114.29	£ 431.57			£ 545.86	£ 199,237.86	£	1,992,378.57	
Induction cleaning cost	£ 71.43	£ 230.29			£ 301.71	£ 110,125.71	£	1,101,257.14	
Savings Compared to existing						£ 89,112.14	£	891,121.43	
* based in a reduction in labour time and chemicals used to clean induction with no risidual heat compared to Gas with burnt on food									
Cooking Range & Equipment - Induction & Electric									
	Cost of Power (Per KWH) (a)	Operational time (hours)	Running time (hours) (b)	KWH Usage (c)	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10	
Gas Equivelant	£ 0.02000	18	18	150	£ 54.00	£ 19,710.00	£	197,100.00	
Electric (non induction) equivelant	£ 0.1500	18	18	70	£ 189.00	£ 68,985.00	£	689,850.00	
Combined totals average						£ 44,347.50	£	443,475.00	
New DeManincor Induction Range (electric)	£ 0.1500	18	24	5.1	£ 18.36	£ 6,701.40	£	67,014.00	
			* Ref 3						
Savings Compared to Gas						£ 37,646.10	£	376,461.00	
* [Ref 3] 4 Hour running time is based on an average pan contact with induction hobs & Inverters over gas which is running continually *									

Equipment Monitoring & Power Control System - De Manincor TCS									
	Price per per KWH (a)	Operational time (hours)	Running time (hours) (b)	Maximum Total Estimated Kitchen KWH Usaode (c)	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10	
1 New Kitchen Without TCS energy control management (maximum connected load)	£ 0.1500	18	18	235	£ 634.50	£ 231,592.50	£	2,315,925.00	
2 New Kitchen Without TCS energy control management (maximum diversity load)	£ 0.1500	18	18	164.5	£ 444.15	£ 162,114.75	£	1,621,147.50	
				* Ref 7					
3 New Kitchen With TCS energy control management	£ 0.1500	18	18	82.5	£ 222.75	£ 81,303.75	£	813,037.50	
				* Ref 5					
				* Ref 6					
Savings With System						£ 80,811.00	£	808,110.00	
* [Ref 5] 30% maximum diversity usually applied to kitchens * [Ref 6] 370% diversity can be controlled and applied to units * [Ref 7] Items included in the total KW are the units that can be controlled on the TCS system * [Ref 8] item 2-item 3 * Ref 8									

Summary of Cost Savings				
	Total Estimated Annual Saving	Projected 3 Year Saving	Projected 10 Year Saving	
Refrigeration pack system	£ 34,689.60	£ 104,068.80	£ 346,896.00	
Extraction & Air Supply	£ 31,536.00	£ 94,608.00	£ 315,360.00	
Cleaning & Chemicals	£ 89,112.14	£ 267,336.43	£ 891,121.43	
Cooking Equipment Gas / Electric	£ 37,646.10	£ 112,938.30	£ 376,461.00	
Total Estimated Saving of Project	£ 192,983.84	£ 578,951.53	£ 1,929,838.43	

The Example Restaurant Refurbishment ROI

The following figures are based on the electrical and gas supply costs per KWH of the hotel, as well as information on existing equipment and bills of the site.

The proposed calculations are based on the new energy usage, as well as savings in labour and chemicals based on the hotels figures.

Refrigeration - Remote Pack system

	Price per per KWH (a)	Operational time (hours)	Running time (hours) (b)	KWH Usage (c)	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10
Existing Refrigeration costs (local compressor units)	£ 0.1213	18	24	60	£ 174.67	£ 63,755.28	£ 637,552.80	
				*Ref1				
Maximum rated load				49				
Actual Running loading average				4.9				
Cibin Pack system Running Costs	£ 0.1213	18	18	4.9	£ 10.70	£ 3,905.01	£ 39,050.11	
				*Ref2				
Savings With pack system over local compressor units						£ 59,850.27	£ 598,502.69	

* [Ref1] total fridges 20 at an average of 3kw per 24Hr each

* [Ref2] pack system running on inverters averages 10% of its fully connected load on reference sites

Cooking Range & Equipment - Induction & Electric

	Cost of Power (Per KWH) (a)	Operational time (hours)	Running time (hours) (b)	KWH Usage (c)	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10
Existing Range Gas	£ 0.02000	18	18	400	£ 88.77	£ 32,400.00	£ 324,000.00	
New DeManincor Induction Range (electric)	£ 0.1213	18	4	90	£ 43.67	£ 15,938.82	£ 159,388.20	
New DeManincor Induction Range (gas items)	£ 0.02000	18	8	17	£ 2.72	£ 992.80	£ 9,928.00	
			* Ref 3 & Ref 4					
Savings Compared to Gas						£ 15,468.38	£ 154,683.80	

* [Ref3] 4 Hour running time is based on an average pan contact with induction hobs & Inverters over gas which is running continually

* [Ref4] Heat up time of gas appliances reducing time required to be on and only used for 2 services in a day

Extraction & Supply Air - Reduced Load due to Induction / electric appliances

	Price per per KWH (a)	Operational time (hours)	Running time (hours) (b)	Maximum Total Estimated Kitchen KWH	Price Per Day = (a*c)*b	Annual Running Cost	Running cost years)	(10
Existing Extraction & Supply Air system running Load With Gas Equipment	£ 0.1213	18	24	80	£ 232.90	£ 85,007.04	£ 850,070.40	
Existing Extraction & Supply Air system running Load with electric equipment	£ 0.1213	18	18	64.00	£ 139.74	£ 51,004.22	£ 510,042.24	
Savings Compared to existing						£ 34,002.82	£ 340,028.16	

Cleaning - Reduction in cleaning chemicals and labour time

	Chemical & Cleaning equipment cost	labour Cost (b)	Price Per Day = a + b	Annual Running Cost	Running cost years)	(10
Existing night cleaning cost	£ 114.29	£ 431.57	£ 545.86	£ 199,237.86	£ 1,992,378.57	
New night cleaning cost	£ 71.43	£ 230.29	£ 301.71	£ 110,125.71	£ 1,101,257.14	
Savings Compared to existing				£ 89,112.14	£ 891,121.43	

Maintenance & Servicing - Reduction in parts & labour time

	Labour Cost (per year)	Labour Cost (over 3 years) (a)	Parts & Materials (over three years) (b)	Price Per Day = a + b / 1095 days	Annual Running Cost	Running cost years)	(10
Current Gas Kitchen	£ 10,000.00	£ 30,000.00	£ 35,000.00	£ 59.36	£ 21,666.67	£ 216,666.67	
New Electric Kitchen	£ 8,000.00	£ 24,000.00	£ 16,500.00	£ 36.99	£ 13,500.00	£ 135,000.00	
Savings Compared to existing					£ 8,166.67	£ 81,666.67	

Summary of Cost Savings

	Total Estimated Annual Saving	Projected 4 Year Saving	Projected 10 Year Saving
Refrigeration pack system	£ 59,850.27	£ 239,401.08	£ 598,502.69
Cooking Range	£ 15,468.38	£ 61,873.52	£ 154,683.80
Extract & Supply fans	£ 34,002.82	£ 136,011.26	£ 340,028.16
Cleaning & Chemicals	£ 89,112.14	£ 356,448.57	£ 891,121.43
Maintenance & Servicing	£ 8,166.67	£ 32,666.67	£ 81,666.67
Total Estimated Saving of Project	£ 206,600.27	£ 826,401.10	£ 2,066,002.75
Total Estimated Project ROI	3.65 Years		

Thank you