MARSTAIR
REFRIGERATION AND SPECIALIST AIR CONDITIONING



# Upgrade to A2L SYSTEMATCH for the UK's most efficient cold room solution

DESIGNED AND BUILT IN THE UK

WWW.MARSTAIR.COM




We are your **trusted partner** for HVAC-R **product solutions**, with a proven ability to deliver bespoke designs for all project applications. Ensuring market leading **customer satisfaction** in our chosen HVAC-R sectors.

Experts in superior product quality, efficiency and innovation we deliver British designed and built manufacturing to the very highest standard with 50-years of proven expertise & excellence. We are your preferred partner for bespoke design and project applications. Using only quality & reliable A-grade components gives us the confidence to offer our 5 year warranty for total piece of mind.

MARSTAIR
5 Year
PARTS WARRANTY
AS STANDARD

# Introducing A2LsysteMatch

A2LsysteMatch challenges current thinking, providing a critically charged cold room solution, **engineered to keep the refrigerant charge to a minimum**.







## Key Features & Benefits

- ✓ Designed and developed to BS EN 378: 2016 Standard
- ✓ Delivering a 93% reduction in refrigerant GWP with huge environmental benefits
- ✓ 3% more efficient than current ECO/ETL Listed Product Range
- ✓ Up to 33% lower 'Total cost of ownership' VS CO2
- ✓ Simple skill level uplift required to install
- ✓ Can be set up using standard known controllers
- ✓ Suitable for standard general access cold room applications
- ✓ Up to 80m pipe runs available
- ✓ Simple system selection and easy installation
- ✓ Full compliance within the box
- ✓ DSEAR Risk Assessment Guidance Provided
- ✓ No requirement for extra safety measures such as emergency ventilation
- ✓ 5 year Parts Warranty as Standard

**UK 1st innovative A2L solution for cold room applications**

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# Development & Testing

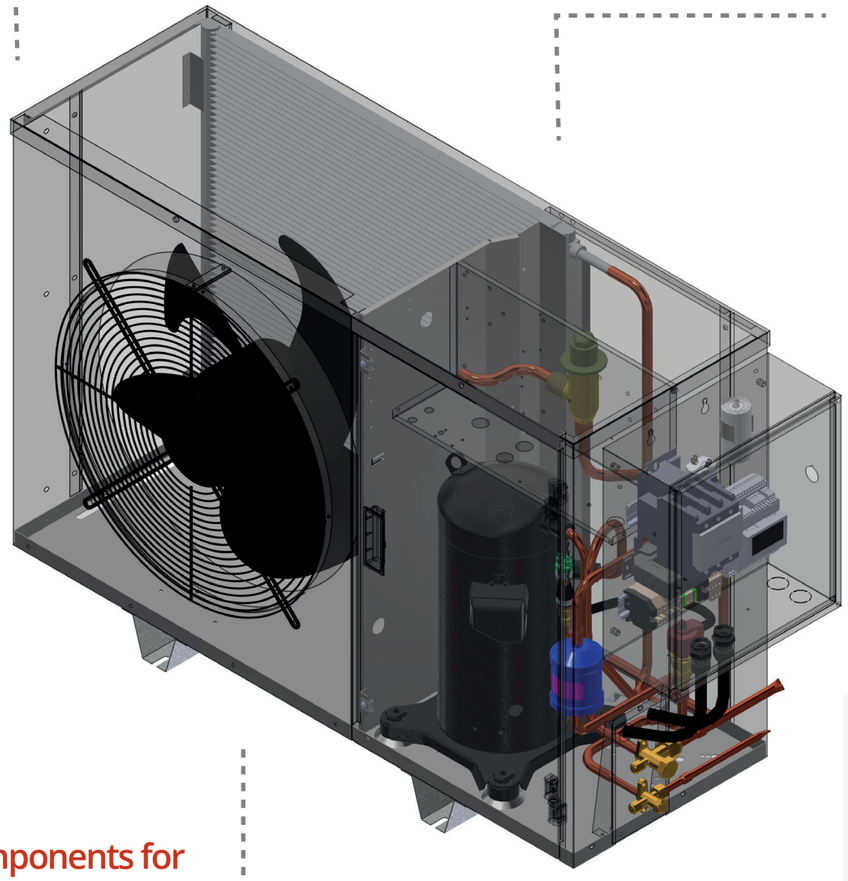
**Following recent investment in newly built R&D testing facilities at Marstair's UK manufacturing plant, eight months of comprehensive testing have been completed, ensuring A2LsysteMatch has been developed fully in accordance to BS EN 378: 2016 standards.**

## Testing different components to reduce the refrigerant charge

This is to ensure the refrigerant charge levels are low enough for the Marstair A2LsysteMatch to be suitable for reasonable pipe runs within the **stringent requirements** of the regulations.

## Extensive testing on multiple condensing units and evaporators

Ensuring the published refrigerant charge level information is **accurate** for every Marstair A2LsysteMatch.



## Testing different components for improved efficiency

These new Marstair A2LsysteMatch **solutions** are even better with more efficient condensers and evaporators supplied with EEV's as standard.

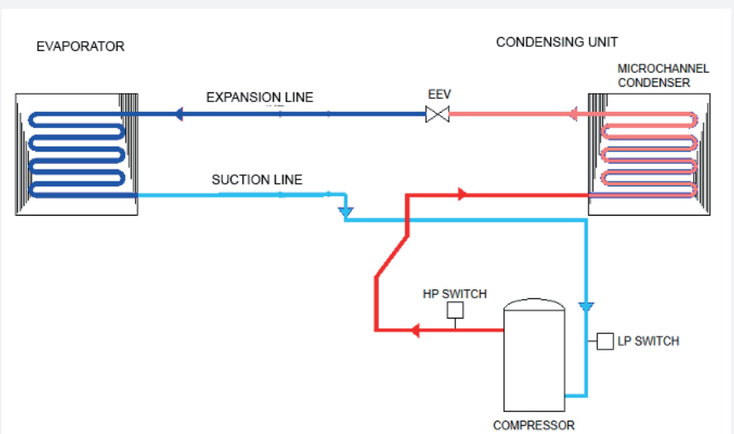
## Testing with multiple refrigerants such as R454A, R454C & R455A

To give **maximum choice** to the customer and ensure that the new systems are as widely available as possible.

Duties from 1-6kW

**0.2 seasonal energy efficiency improvement based on BS EN 14825:2008 Seasonal calculation for condensing units**

Critically charged system schematic with expansion lines




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# Selection made easy

A2LsysteMatch is the **only solution** which provides a complete system solution on A2L refrigerant for cold rooms. Installed using standard controllers, it is also suitable for applications with up to 80m pipe runs, and which requires no extra safety measures.

The refrigerant charge for any system match with a known pipe run can **easily be calculated**, meaning A2LsysteMatch can easily be selected giving clients **complete confidence** their selection can be applied both safely and in compliance with regulations.

## A2LsysteMatch Selection tool

| Medium Temperature - R454C (-8°C Evaporating temperature / 0°C return Air / 32°C External) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cooling kW | Condensing unit | Box Evaporator | System charge 0m | 5m Pipe Run | | | 10m Pipe Run | | | 20m Pipe Run | | |
| | | | | System charge | BS EN 378 Min. Room Size m³ | Dsear ass. Req. Free area m³ | System charge | BS EN 378 Min. Room Size m³ | Dsear ass. Req. Free area m³ | System charge | BS EN 378 Min. Room Size m³ | Dsear ass. Req. Free area m³ |
| 1.3 | SMC+15 | MBMTE125A | 0.28 | 0.36 | 6.1 | 3.34 | 0.440 | 7.5 | 3.61 | 0.6 | 10.2 | 4.16 |
| 1.6 | SMC+20 | MBTME125B | 0.295 | 0.375 | 6.4 | 3.39 | 0.455 | 7.8 | 3.66 | 0.615 | 10.5 | 4.21 |
| 1.9 | SMC+30 | MBMTE130B | 0.350 | 0.430 | 7.3 | 3.58 | 0.510 | 8.7 | 3.85 | 0.67 | 11.4 | 4.40 |
| 2.4 | SMC+40 | MBMT130E | 0.460 | 0.540 | 9.2 | 3.95 | 0.620 | 10.6 | 4.23 | 1.060 | 18.1 | 5.73 |
| 3.2 | SMC+45 | MBMT230B | 0.654 | 0.734 | 12.5 | 4.62 | 0.814 | 13.9 | 4.89 | 1.254 | 21.4 | 6.39 |
| 4.6 | SMC+50 | MBMT230C | 0.738 | 0.818 | 14.0 | 4.90 | 1.038 | 17.7 | 5.65 | 1.338 | 22.8 | 6.68 |
| 5.7 | SMC+80 | MBMT230E | 0.955 | 1.035 | 17.7 | 5.64 | 1.255 | 21.4 | 6.39 | 1.555 | 26.5 | 7.42 |
| 6.5 | SMC+90 | MBMT230BE | 1.280 | 1.430 | 24.4 | 6.99 | 1.580 | 27.0 | 7.50 | 1.880 | 32.1 | 8.53 |

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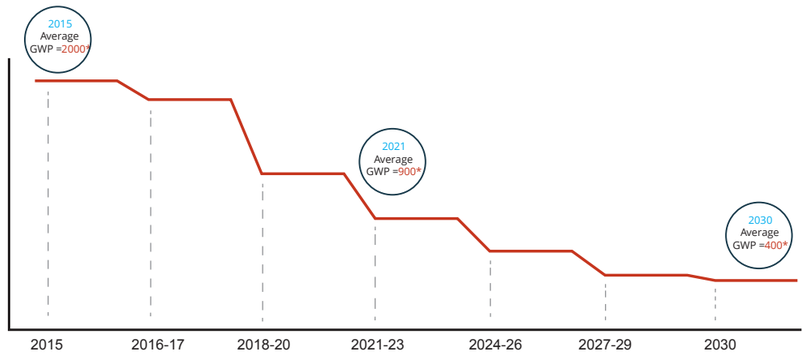
A2LsysteMatch

# Environmental 'Step-Change'

Marstair's A2LsysteMatch provides the **solution** to accelerate the step-change needed in the cold room sector, allowing a major shift in refrigerant GWP reduction. Critically this will also give end user clients seeking greener future-proof alternatives, confidence for better total cost of ownership during this challenging economic time.

**93%**
**Reduction in GWP**

F-gas phase-down & average GWP




These new systems are also **3% more efficient** than the already highly efficient Marstair ECO design certified and ETL listed range of condensing units and come with a 5 year parts warranty as standard for total piece of mind.

**3%**
**More Efficient**

A2LsysteMatch delivers the **lowest 10 year life cycle cost** (LCC) and **total cost of ownership** for end users than any other technology.

**33%**
**Lower TCO**

### CO2 reduction for the increased energy efficiency for the Marstair A2LsysteMatch

| System type | Annual energy usage based on BS EN 14825: 2018 seasonal calculation for condensing units kW Hour / Annum | 1kW Hour in kg CO2 | Annual CO2 from energy usage kg | 20yr life CO2 from energy usage kg |
|---|---|---|---|---|
| Original 3.0kW R449A system | 5508 | 0.352 | 1939 | 38776 |
| New equivalent R454C system | 5333 | 0.352 | 1877 | 37544 |
| **Saving** | **175** | **0** | **61.6** | **1232** |

### Potential kg CO2 reduction for reduced refrigerant charge and refrigerant GWP for the critically charged Marstair A2LsysteMatch per system

| System type | Typical refrigerant charge kg | Refrigerant GWP per kg | Total Kg CO2 per system |
|---|---|---|---|
| Regular system R449A | 2.5 | 1282 | 3205 |
| A2LsysteMatch R454C | 1.5 | 148 | 222 |
| **Saving** | **1** | **1134** | **2983** |

# Engineered Quality & Reliability

A2LsysteMatch

**This new A2LsysteMatch provides peace of mind for the safety, efficiency and ease of installation needed to ensure a positive switch to much lower GWP cold room solution.**

## Improved Aesthetics

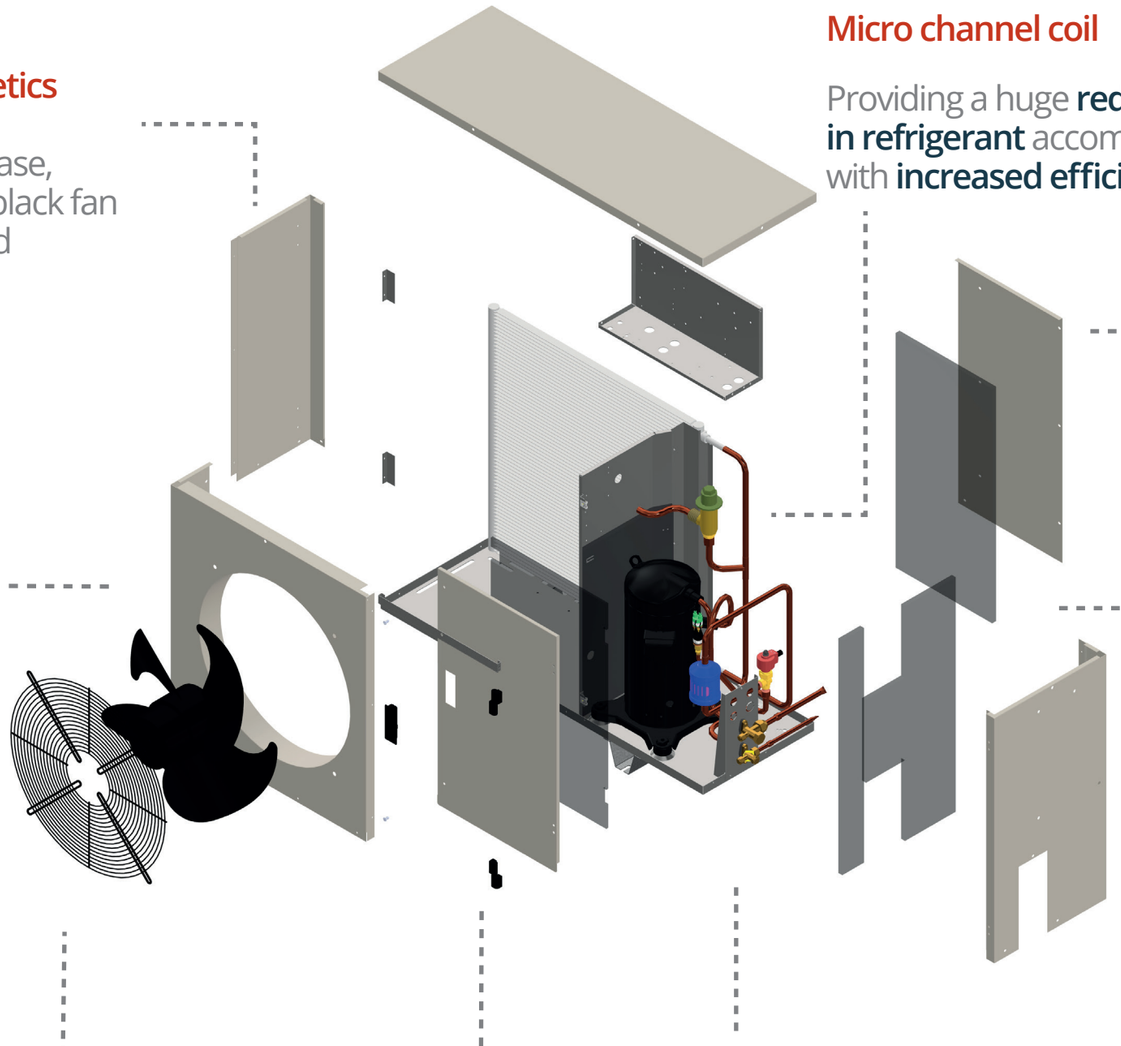
Including a new case, smaller feet and black fan guard as standard

## Micro channel coil

Providing a huge **reduction in refrigerant** accompanied with **increased efficiency**

## Fan Speed controller

As standard



## Pressure Release Valve

For improved safety and **complete peace of mind** if high pressure is detected refrigerant is released

## Electronic Expansion Valve

The **most advance valve** available to maintain efficiency and control superheat.

Including the added benefit of a **digital driver** with display

## 450mm Fan

The use of a larger fan means the system is both **more efficient and quieter**

## Hinged door for easy access

Giving **easy installation**, access and maintenance for all components

## Unique Compressor

Specifically manufactured for an A2L system

## Enclosed electrics

All electrics are external to give **total protection** against any sparks

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# Step by Step Cold Room Selection

## Inputs

1. Establish Duty requirement
2. Confirm Internal Room Temperature
3. Estimate External Ambient
4. Confirm Evaporating temperature
5. Measure Pipe run length
6. Confirm Room Volume
7. Choose Refrigerant type

## Outputs

1. Evaporator Selection
2. Condensing unit selection
3. Suction Pipe Size
4. Expansion Pipe size
5. Refrigerant charge
6. Minimum room size BS EN 378
7. Dsear Free volume Assessment
8. Free area proportion

A2LsysteMatch

# DSEAR Risk Assessment Guidance

To support your with pre-sales advice, Marstair also provide a DSEAR risk assessment template as standard covering the key areas within its technical instructions, ensuring best practice installation and maintenance guidance for both installers and end users.

- ✓ Risk assessment template questionnaire covering the following steps
  - Installation
  - Pressure Testing
  - Evacuation
  - Charging of refrigerant
  - Refrigerant recovery
- ✓ Free volume assessment for prevention of a flammable atmosphere through overloading of the cold room
- ✓ Information on the relevant installation standards
- ✓ Guidance on the use of refrigerant leak detection if required
- ✓ Safety information on what to do in the event of a leak of refrigerant
- ✓ End user safety guidance

TRUSTED GUIDANCE

# Our Project Support



ENQUIRY

DEFINE REQUIREMENTS

PROJECT SCOPE

ACCURATE RESPONSE



SELECTION ADVICE

EXPERT ADVICE

BESPOKE DESIGN

COMPLIANT SOLUTION




QUOTATION PROPOSAL

DISTRIBUTOR NETWORK

PRICE & LEAD TIME

LEAD TIME SCHEDULING



ORDERING PROCESS

ORDER PLACED

TECHNICAL SUBMISSION

UNRIVALLED SUPPORT

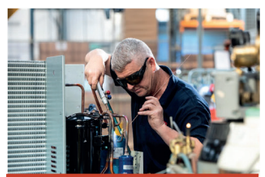


FOLLOW UP

PROJECT QUERIES

SITESUPPORT

PEACE OF MIND



MANUFACTURING

BRITISH DESIGNED & BUILT

EXCELLENCE IN TESTING

QUALITY ACCREDITATION



PRODUCT DELIVERY

NATIONWIDE DISTRIBUTORS

STOCK AVAILABILITY

ON TIME IN FULL



COMPLETION MEETING

PROJECT CLOSE OUT

ENCOURAGE FEEDBACK

CONTINUOUS IMPROVEMENT



AFTERSALES SUPPORT

GENERAL QUERIES

TECHNICAL BACKUP

ENGINEER SUPPORT

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# Client Testimonials

## Wave Refrigeration

"ASDA, CBES, City FM and WAVE have been working closely in the development and implementation of A2L refrigeration system solutions. Our first aim was the development of systems to operate display cases – which we successfully landed in 2019. Arriving at a solution for cold rooms was always going to add layers of complexity due the environment in which they operate and the allowable charge volume. The team were delighted to find out that Marstair had developed a bespoke A2LsysteMatch solution that includes the supply of an A2L condensing unit and complimentary room cooler; all within the guidance and best practise as prescribed by BS EN 378. The team have worked closely with Marstair and are looking forward to implementing the first A2L cold room solution at ASDA Blantyre in 2020. Marstair have had great vision in seeing the benefits of A2L refrigerants and their client facing approach will ensure that they continually develop their A2L offering as an alternative option for the refrigeration industry"

**James Bailey CEng MA MIET MInstR, Founder and Director – WAVE**

## Keep it Cool Refrigeration

"Having worked closely for Riverford for some time, it was clear that a requirement for a greener, more cost effective solution for a cold store application to house their own organically farmed produce was needed.

Selecting Marstair's A2LsysteMatch solution was simple, utilising an SMC+40 condensing unit and matched evaporator for the duty required. The service and support from Marstair through their local Distributor Heronhill  was first class, and I'm pleased to say this A2L split-system solution is the first to be successfully installed within the UK"

**Charlie Patt, Managing Director - Keep it Cool Refrigeration Ltd**