DESIGN AND ACCESS STATEMENT

INSTALLATION OF SOLAR COLLECTOR PANELS

AT

ROCHFORD HOSPITAL

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understanding efficiency

Local Authority: Rochford District Council

Reference: PP-02775812

1.1 Purpose of Development

The purpose of the proposed development is to provide a pre-heating element to the existing cold water feed to the calorifiers located within the plantroom of the Link building by installing a new solar thermal system. The development will include the installation of solar collectors mounted on the inside south facing pitch of the roof of the Donut Building located above the Beech Ward.

1.2 Design Statement

The Donut Building is a single storey building and of a traditional brick construction with pitched roofs. The Donut building consists of the beech/Maple Wards and contains a number of offices, wards and circulation spaces. The pitched roofs have traditional roof tiles and these will retained and reused as part of the development.

The Link Building is a two storey building located adjacent to the Donut Building and acts as a link between the therapy suite and the beech/Maple Wards. This building contains the plantroom located on the ground floor.

The visible development, i.e. the part of the proposed works that will be externally visible, comprises of the installation of solar collector panels mounted on the inner south facing pitched roof. These would be mounted over the existing tiled roof using a standard mounting frame.

1.3 Layout

The main entrance and exit points to and from the building are existing and will be unchanged by the works.

The internal layout the building will remain the same and be unchanged by the works.

The overall site layout drawing showing the location of the Donut Building can be found with the accompanying documentation to the planning application.

1.4 Scale and Appearance

The appearance of the site will not be significantly affected by the installation of the solar collector panels as they will be mounted on the inner pitched roof and shall only be seen from inside the courtyard also the panels shall be no more than 200mm from the tile surface.

The solar collectors will not be able to be seen from ground level or the surrounding area due to the construction of the roof. Examples of the roof and views form ground level are shown on the accompanying Photo montage.

1.5 Landscaping

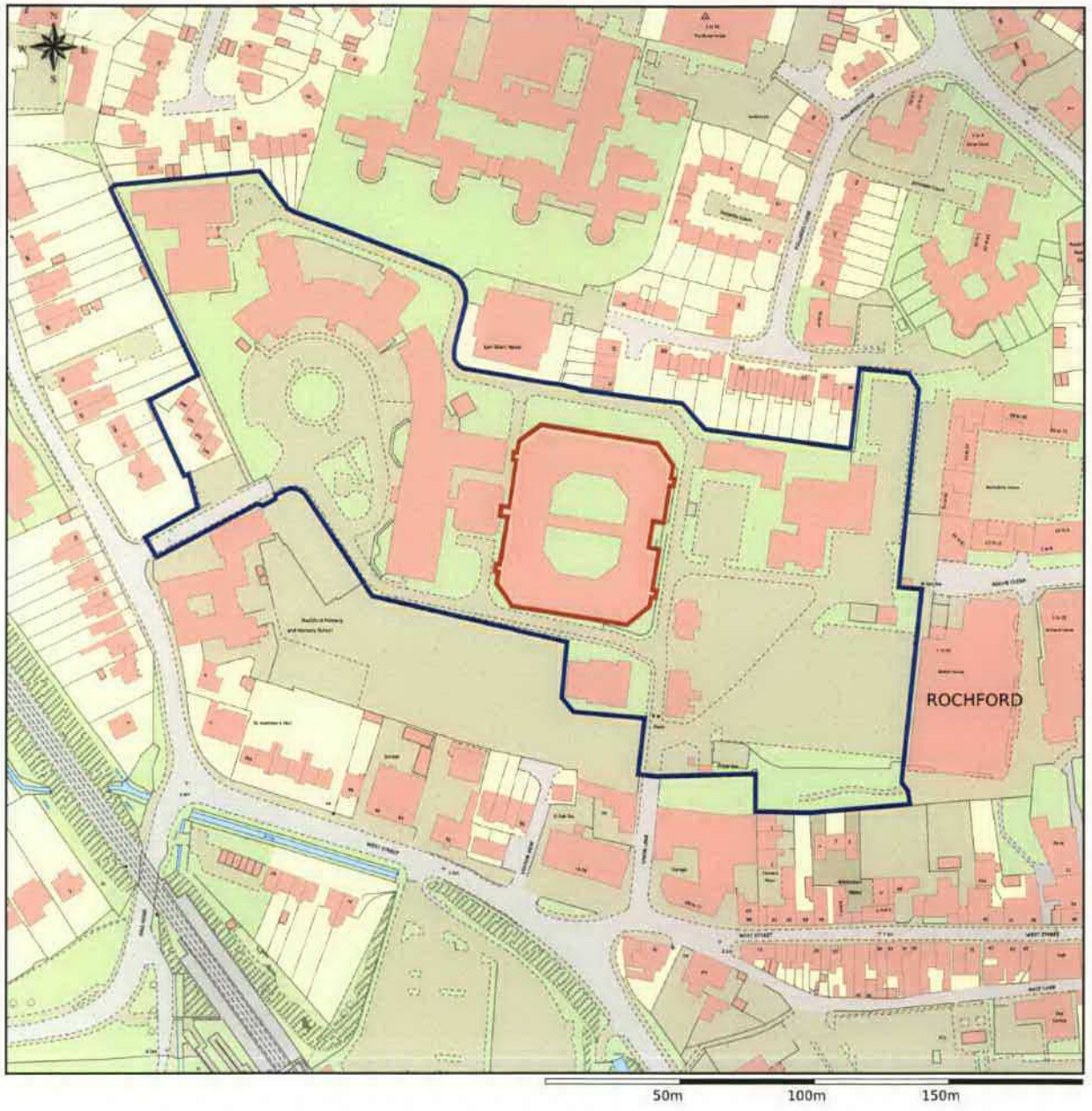
The landscape will be unchanged by this modification, any damage caused by the development works will be made good.

1.6 Access Arrangements

The access arrangements to the site will be unchanged by this modification.

Access to the area of works and parking shall be arranged with the Hospital Estates Department to ensure the minimal disruption to the daily workings of the Hospital.

Despite the generous general works access, consideration will be given to maintaining clear routes on all the access roads around the Donut Building. Access for site vehicles, will be planned with specific consideration given for lorry and crane access.



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Scale: 1:2500, paper size: A4

plans ahead by emapsite

Prepared by: jason redfern, 18-07-20

Schüco MSE 500 on-roof installation system

The premium choice for sloping roofs

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For all sloping roofs with slopes from 22° to 60°

On-roof installation is suitable for sloping roofs with slopes between 22° and 60°. Suitable roof anchors can be supplied for all conventional roof cladding, slates, Kalzip, plain tiles or shafts. The subtle aesthetics of the Schüco premium PV modules and premium collectors gives the on-roof installation a particularly high-quality appearance. The frames and visible installation system components can be supplied in any RAL colour on request.

On-roof - quick and safe installation

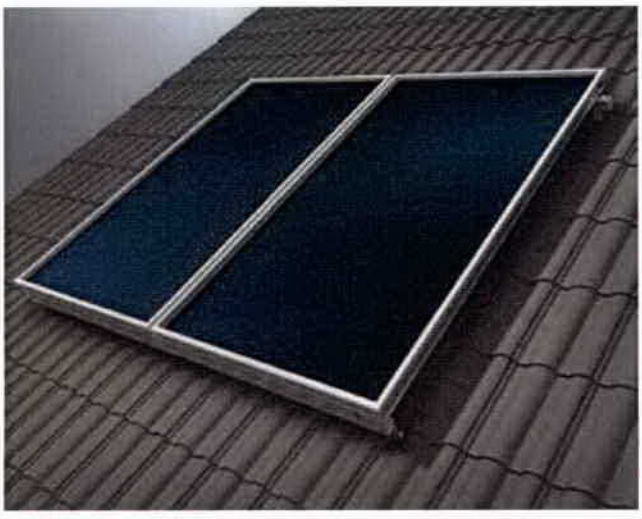
Schüco premium solar elements can be fixed to the roof extremely quickly and safely. Base sections are screwed onto the roof anchors, and the PV modules and collectors are then fixed onto these. OneTurn technology is used for this.

The premium solar elements are secured against slipping during assembly with a stop on the bottom base section. As a special feature, the MSE 500 on-roof installation system can also be installed with vertical or horizontal arrangement.

All the advantages at a glance

- Quick and safe installation thanks to OneTurn technology
- Roof anchors for all conventional roof cladding
- Appealing aesthetics through the subtle design of the solar element frame
- Vertical or horizontal installation possible
- Installation system made from aluminium or stainless steel for long-standing corrosion protection
- Backsquare on the bottom base section prevents the solar element from slipping during installation
- Dimensionally tolerant installation possible via a screw groove on the frame
- Frame and visible components of the installation system available in all RAL colours on request
- Pre-assembled installation sets
- Combination of premium PV modules and premium collectors

Technical data – Schüco MSE 500 on-roof installation system



Schüco MSE 500 on-roof installation

View Schüco MSE 500 on-roof installation

Contents of the sets:

- Base sections cut to length
- OneTurn clamp
- Screws
- Assembly board
- Installation and operating instructions

Designation	Schüco Item No.	Colour	Required number of roof anchors
MSE 500 1 s Al grey	259 751	Eloxal grey (similar to RAL 7035 light grey)	min. 4 items
MSE 500 2 s/n Al grey	259 752	Eloxal grey (similar to RAL 7035 light grey)	min. 6 items
MSE 500 3 s/n Al grey	259 753	Eloxal grey (similar to RAL 7035 light grey)	min. 6 items
MSE 500 4 s/n Al grey	259 754	Eloxal grey (similar to RAL 7035 light grey)	min. 8 items
MSE 500 2 s/ü Al grey	259 757	Eloxal grey (similar to RAL 7035 light grey)	min. 6 items
MSE 500 1 w Al grey	259 755	Eloxal grey (similar to RAL 7035 light grey)	min. 4 items
MSE 500 2 w/ü Al grey	259 758	Eloxal grey (similar to RAL 7035 light grey)	min. 6 items
MSE 500 3 w/ü Al grey	259 759	Eloxal grey (similar to RAL 7035 light grey)	min. 6 items
MSE 500 4 w/ü Al grey	259 760	Eloxal grey (similar to RAL 7035 light grey)	min. 8 items
MSE 500 2 w/n Al grey	259 756	Eloxal grey (similar to RAL 7035 light grey)	min. 8 items
MSE 500 1 s Al greyish brown	259 761	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 4 items
MSE 500 2 s Al greyish brown	259 762	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 6 items
MSE 500 3 s Al greyish brown	259 763	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 6 items
MSE 500 4 s Al greyish brown	259 764	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 8 items
MSE 500 1 w Al greyish brown	259 765	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 4 items
MSE 500 2 w Al greyish brown	259 766	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 8 items
MSE 500 2 s/ü Al greyish brown	259 767	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 6 items
MSE 500 2 w/ü Al greyish brown	259 768	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 6 items
MSE 500 3 w/ü Al greyish brown	259 769	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 6 items
MSE 500 4 w/ü Al greyish brown	259 770	Eloxal dark bronze (similar to RAL 8019 greyish brown)	min. 8 items
MSE 500 screening profile Al grey	259 771	Eloxal grey (similar to RAL 7035 light grey)	
MSE 500 screening profile Al greyish brown	259 772	Eloxal dark bronze (similar to RAL 8019 greyish brown)	
MSE 500 connector set/2	259 773		
MSE 500 spare part set Al grey	259 774	Eloxal grey (similar to RAL 7035 light grey)	
MSE 500 spare part set Al greyish brown	259 776	Eloxal dark bronze (similar to RAL 8019 greyish brown)	

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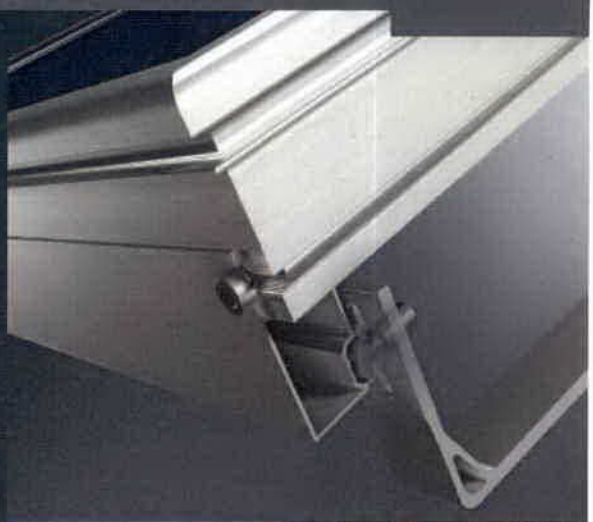
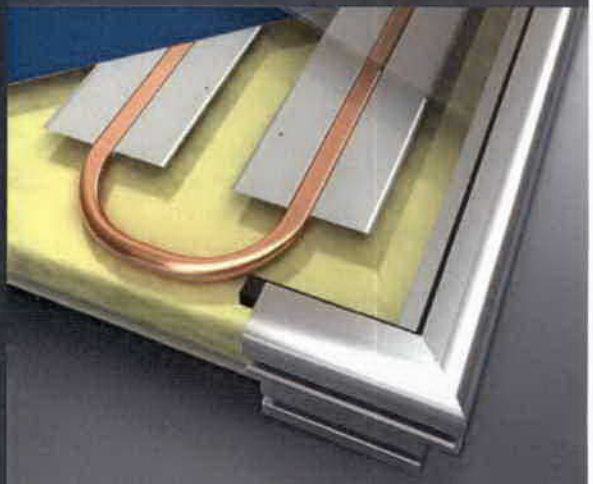
Schüco Premium Collectors

Outstanding quality, performance and design





SCHÜCO

Schüco Premium line collectors - The next generation

Since its entry into the solar thermal sector, Schüco has been driving technical progress forwards. For example, Schüco was the first to offer system ventilation in the basement. Schüco has established a great many new features for thermal collectors on the market. These include meander pipework, solar clear glass and the patented soldering process.

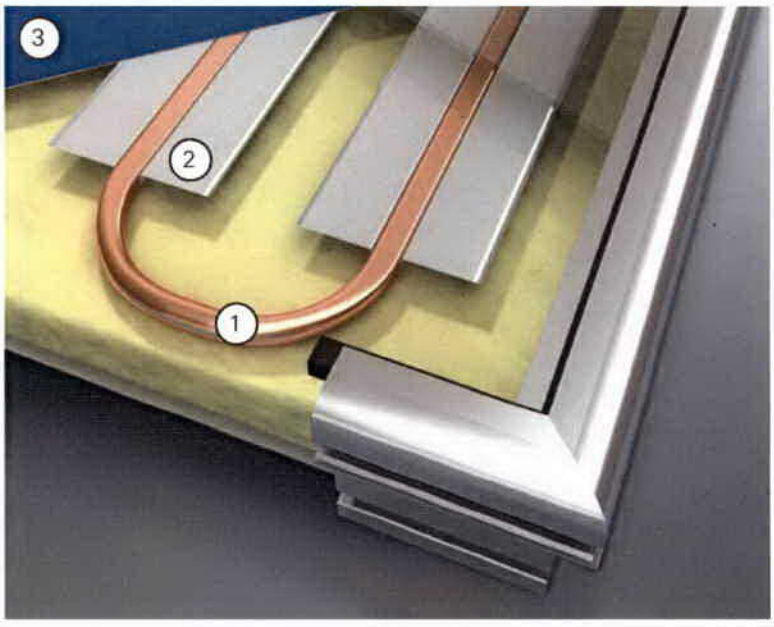
Schüco sets new standards with the latest generation of Schüco Premium collectors With this heat transfer technology, an innovative process and extremely high pressure are used to completely enclose the pipework at the back with heat conductor sheets and permanently join it to the absorber. The heat conductor sheets and the greater surface area of the pipework increase heat transfer and achieve high performance values. The absorber has exceptional dimensional stability, is extraordinarily smooth, and further enhances the attractive design of the Schüco collector.

The new Schüco Premium collector – a collector that is unrivalled in terms of quality and performance.

Schüco heat transfer technology

Key benefits

- Heat transfer technology with a 360° enclosed absorber pipe for highly efficient heat transfer
- Greater absorber pipe surface area
- Absorber with exceptional dimensional stability for an extraordinarily smooth look and the best design



① Meander pipework, ② Heat conductor sheet, ③ Highly selective absorber coating

Section detail of heat transfer technology with a 360° enclosed absorber pipe

Quality, performance and design

Renewable energy is gaining ever more importance in newbuild and renovation projects. The aim is to gain independence from fossil fuels to relieve the burden on the environment and to effectively counteract energy price increases. The quality and performance of the systems are of key importance to the sustainability of appropriate investments, as only systems that function reliably and efficiently are capable of producing high outputs in the long-term. In terms of design, increasing demands for harmonious building integration must be satisfied.

Quality

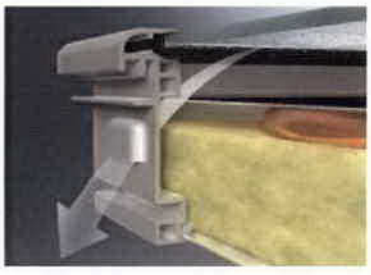
- Aluminium frame and rear panel provide optimum corrosion protection and stability
- The 4 mm solar glass, tested in accordance with DIN EN 12975-2, increases hail-resistance
- Long service life as absorbers are tested for temperature and corrosion resistance
- Continuous system screw channel for quick installation and to take up tolerances

Performance

- Meander pipework guarantees operational reliability and high performance
- Outstanding rated thermal output of 2.0 kW
- Also available as non-reflective glass or double-glazed collector with non-reflective glass for increased solar output (output equivalent of 2.4 kW)
- Drainage groove and ventilation slots to prevent condensation forming and therefore ensure high output

Design

- A unique variety of integration possibilities with six mounting options
- An elegant look with the option of flush-fitted, in-roof mounting
- Perfectly matched with the colour of the roofing with the option of selecting from anodised silver and bronze and powder coatings in RAL colours (optional)
- Thermal collectors, roof windows and photovoltaic modules in the same module size can be combined



Ventilation slots to prevent condensation forming

Schüco Double-Glazed Collector CTE 524 DH for up to 20% greater solar output

Premium collector, roof window and a Premium photovoltaic module in the same module size

Options for every application

Schüco Collector CTE 520 CH and CTE 520 CH 1

The Premium collectors with meander pipework are preferable for smaller and medium-sized installations to heat domestic hot water and for auxiliary heating in modernisation projects and newbuilds. For maximum flexibility of installation, this Schüco Premium collector is available with meander pipework for portrait and landscape installation. Six mounting options permit a unique level of design freedom.

Key benefits

- Meander pipework for maximum operation reliability with system ventilation and a high level of system efficiency
- High solar outputs with excellent rated thermal output of 2.0 kW

Schüco Collector CTE 520 CH 2

The Premium line CTE 520 CH 2 collector is suitable for portrait installation, especially for large collector arrays. The meander pipework has collector pipes and four connectors. The Schüco CTE 520 CH 2 collector combines minimal hydraulic resistance with optimised stagnation behaviour.

Key benefits

- Optimum suitability for large installations due to meander pipework with minimal hydraulic resistance for up to 16 collectors in series
- Very high level of operational reliability with good ventilation and outstanding stagnation behaviour
- Long-term weathertightness of the metallic sealing compensator connector

Schüco Collector CTE 524 DH

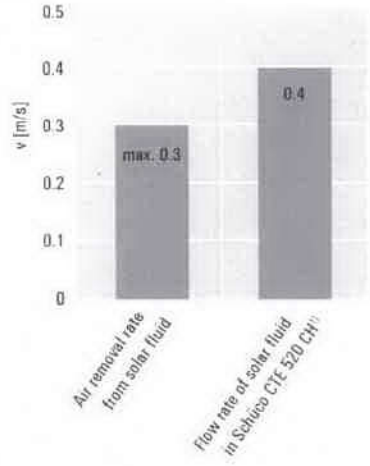
For the most highly efficient installations, Schüco supplies Premium double-glazed collectors, which reduce the roof area required by up to 20%. They are also particularly recommended for high temperature applications, such as process heating or solar cooling.

Key benefits

- Non-reflective double glazing reduces heat loss - for even higher solar outputs
- Reduces the roof area required by up to 20%
- Significantly increased resistance to hail stones compared with vacuum tube collectors

Perfect ventilation with meander pipework

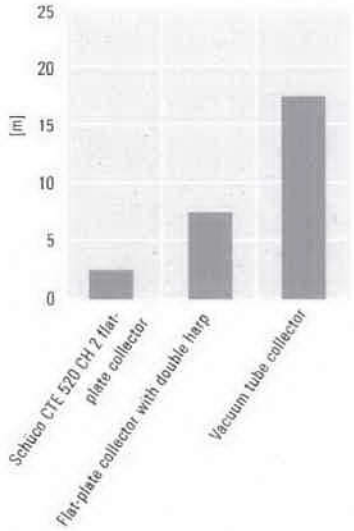
Transfer of air to the solar station air separator with resulting speed of min. 0.1 m/s



[1] Typical flow rate for 5 Schüco CTE 520 CH collectors and a volume flow of 150 l/min

Minimum system loading in the event of stagnation

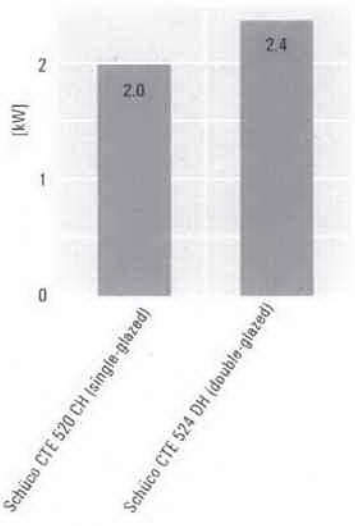
Steam build-up in pipework[2]



[2] Calculation basis: 5 m² aperture area, losses from pipework in the event of stagnation = 27.6 W/m

Maximum solar outputs

Comparison of collector output[3]



[3] Rated thermal output in kW or output equivalent for Schüco CTE 524 DH double-glazed collector based on a T-Sol simulation of a typical auxiliary heating system with five collectors

Unique versatility using the MSE 500 mounting system

Premium line for individual design
The Schüco Premium line offers almost unlimited freedom for individual design with six different mounting options. Thermal collectors, photovoltaic modules and Schüco roof vents from the Premium line can be combined in any combination due to the uniform modular size.

On-roof mounting
With the new Schüco MSE 500 on-roof mounting system, the mounting rails are attached to the roof anchors on the front or the side. This means that all the relevant sections and components are visible when mounting the system. Fixing the system is made particularly simple and easy using Schüco OneTurn technology. Just one tool is required for every installation step.

Flat-roof mounting
The Schüco MSE 500 flat-roof mounting system has significantly fewer components for even simpler and quicker installation. The collectors and PV modules can be very quickly mounted using the new pre-assembled folding system.

In-roof mounting
The in-roof design of Schüco MSE 500 replaces the roof covering and all its functions. Unlike other systems, it does not require a watertight roofing membrane. It is suitable for the modernisation of all existing roofs – irrespective of the existing roofing membrane.
The system can be extended horizontally and vertically and is therefore suitable for any in-roof application.

Complete roof mounting
The Schüco Premium line allows the combination of thermal collectors, Premium modules and Schüco roof windows in the same module size. This makes it possible to create a synergy roof without any conventional roof covering.

Canopy mounting
Interesting alternative for awkward roof configurations. Provides protection against weathering and solar radiation.

Façade mounting
Collector installation as partial or complete façade. Also possible as a small façade, C4 façade for large collector arrays or a non-ventilated façade for simultaneous thermal insulation.

Key benefits
- Six mounting options for every building: on-roof, flat-roof, in-roof, complete roof, canopy and façade
- Profiles and collector frames in anodised silver or anodised dark bronze. All RAL colours are also available
- Corrosion protection using unmixed materials (such as aluminium and stainless steel)
- Collectors, PV modules and roof lights in the same module size can be used in any combination
- Schüco MSE 500 with OneTurn technology for very simple and quick installation
- Fewer components
- In-roof mounting replaces the roof covering and all its functions


Premium line, on-roof


Premium line, flat-roof

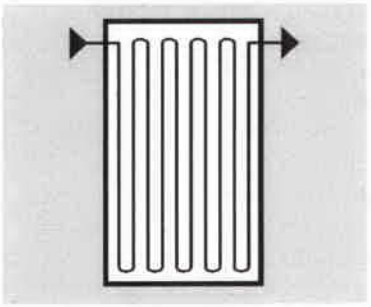

Premium line, in-roof


Premium line, canopy

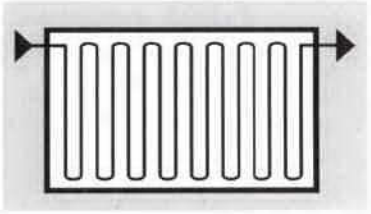
Technical data – Schüco Collector CTE 520 CH, CTE 520 CH 1

Use	Schüco CTE 520 CH	Schüco CTE 520 CH 1
Heating domestic hot water	Yes	
Auxiliary heating solar installations (family home)	Yes	
Mounting type		
On-roof mounting	Yes	
Flat-roof mounting	Yes	
In-roof mounting	Yes	
Canopy/façade mounting	2009 model	
Installation type / alignment	Portrait, adjacent Landscape, one above the other	Landscape, adjacent Portrait, one above the other
Max. number of collectors in series	5	
Dimensions and weights		
Gross surface area	2.71 m²	
Absorber surface area	2.52 m²	
Aperture surface area	2.50 m²	
Outer dimensions	2156 × 1256 × 93 mm	
Weight (empty)	49 kg	
Performance values		
Rated thermal output	2.0 kW	1.9 kW
Efficiency	79.6 %	77.1 %
Coefficient of heat loss a1	4.021 W/m²K	3.589 W/m²K
Coefficient of heat loss a2	0.011 W/m²K²	0.014 W/m²K²
Angle of radiation correction factor k50	0.92	0.96
Hydraulics / pipework		
Pipework	Meander	
Alignment	Portrait	Landscape
Hydraulic connections on copper pipe	12 mm	
Type of connector	Clamping ring fitting	
External compensation	Not required	
Position of hydraulic connection	See hydraulics diagram	
Absorber		
Absorber coating	Highly selective	
Absorption	95 %	
Emission	5 %	
Absorber material	Aluminium*	
Absorber pipe	Copper	
Bonding technology for absorber plate/pipe	Heat transfer technology	
Hydraulic values		
Permitted heat transfer fluid (water-glycol mixture)	Schüco solar fluid	
Heat transfer fluid volume	1.75 l	1.79 l
Minimum volume flow	2.5 l/min	2.5 l/min
Pressure loss (2.5 l/min solar fluid)	135 mbar	152 mbar
Permitted operating excess pressure	10 bar	10 bar
Stagnation temperature for climate class A	211°C	213°C
Stagnation temperature for climate class B	236°C	238°C
Front cover		
Solar glass	Clear glass, low-iron, high transparency	
Transmittance	> 91 %	
Thickness	4.0 mm	
Thermal insulation		
Insulating material	Mineral wool	
Insulation thickness	40 mm	
Housing		
Frame material / rear panel	Aluminium*	
Gaskets	EPDM	
Art. No.		
Anodised silver frame	Art. No. 271 620	Art. No. 271 623
Anodised bronze frame	Art. No. 271 360	Art. No. 271 624
Frame, light grey, RAL 7035 (Frame and rear panel powder-coated)	Art. No. 271 621	Art. No. 271 625

* Aluminium with a recycling proportion of approx. 40 %



Hydraulics diagram for Schüco Collector CTE 520 CH



Hydraulics diagram for Schüco Collector CTE 520

Collector output table	
Average fluid temperature	Collector output Schüco CTE 520 CH (Schüco CTE 520 CH 1)
20°C	1990 W (1928) W
40°C	1778 W (1734) W
60°C	1544 W (1513) W
80°C	1288 W (1263) W
100°C	1010 W (986) W
120°C	710 W (680) W

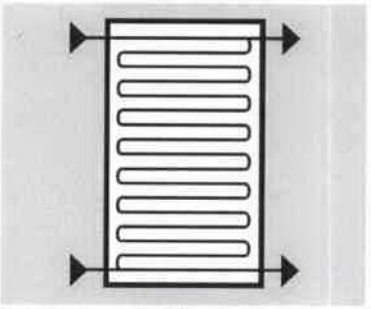
Certified in accordance with Solar Keymark

Technical data – Schüco Collector CTE 520 CH 2 and CTE 524 DH

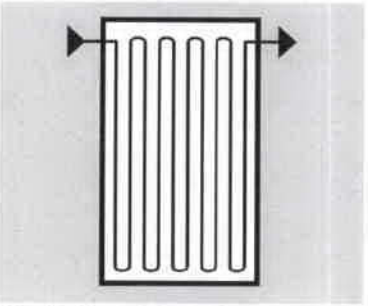
Use	Schüco CTE 520 CH 2	Schüco CTE 524 DH
Heating domestic hot water	Yes	
Auxiliary heating solar installations (family home)	Yes	
Large installations	Yes	No
Solar cooling, process heating	No	Yes
Mounting type		
On-roof mounting	Yes	
Flat-roof mounting	Yes	
In-roof mounting	Yes	2009 model
Canopy/façade mounting	2009 model	No
Installation type / alignment	Portrait, adjacent	
Max. number of collectors in series	16	5
Dimensions and weights		
Gross surface area	2.71 m²	2.69 m²
Absorber surface area	2.52 m²	2.52 m²
Aperture surface area	2.50 m²	2.48 m²
Outer dimensions	2156 × 1256 × 93 mm	2152 × 1252 × 108 mm
Weight (empty)	50 kg	74 kg
Performance values		
Rated thermal output	1.9 kW	2.4 kW [1]
Efficiency	77.9 %	78.9 %
Coefficient of heat loss a1	3.718 W/m²K	2.880 W/m²K
Coefficient of heat loss a2	0.018 W/m²K²	0.013 W/m²K²
Angle of radiation correction factor k50	0.95	
Hydraulics / pipework		
Pipework	Meander with collector piping	Meander
Alignment	Portrait	Portrait
Hydraulic connections on copper pipe	18 mm	12 mm
Number of hydraulic connections	4	2
Type of connector	Clamping ring connector	Clamping ring connector
External compensation	With compensator connector	Not required
Position of hydraulic connection	See hydraulics diagram	
Absorber		
Absorber coating	Highly selective	
Absorption	95 %	
Emission	5 %	
Absorber material	Aluminium*	
Absorber pipe	Copper	
Bonding technology for absorber plate/pipe	Heat transfer technology	
Hydraulic values		
Permitted heat transfer fluid (water-glycol mixture)	Schüco solar fluid	Schüco solar fluid HT
Heat transfer fluid volume	2.20 l	1.75 l
Minimum volume flow	2.5 l/min	2.5 l/min
Pressure loss (2.5 l/min solar fluid)	See table	135 mbar
Permitted operating excess pressure	10 bar	10 bar
Stagnation temperature for climate class A	209°C	232°C
Stagnation temperature for climate class B	234°C	257°C
Front cover		
Solar glass	Clear glass, low-iron, high transparency	Double glazing with non-reflective coating, filled with inert gas
Transmittance	> 91 %	
Thickness	4.0 mm	4.0 mm inside and outside
Thermal insulation		
Insulating material	Mineral wool	
Insulation thickness	40 mm	
Housing		
Frame material / rear panel	Aluminium*	
Gaskets	EPDM	
Art. No.		
Anodised silver frame	Art. No. 271 627	Art. No. 271 631
Anodised bronze frame	Art. No. 272 628	Art. No. 271 356

[1] Output equivalent compared with single-glazed Schüco CTE 520 CH

* Aluminium with a recycling proportion of approx. 40 %



Hydraulics diagram for Schüco Collector CTE 520 CH 2



Hydraulics diagram for Schüco Collector CTE 524 DH

Collector output table	
Average fluid temperature	Collector output Schüco CTE 520 CH 2 (Schüco CTE 524 DH)
20°C	1948 W (1953 W)
40°C	1744 W (1797 W)
60°C	1504 W (1615 W)
80°C	1228 W (1407 W)
100°C	916 W (1173 W)
120°C	568 W (913 W)

Collector pressure loss table (Water/glycol mixture (60/40), average temperature 25°C, volume flow 15 l/m²h)	
Number of collectors in series	Pressure loss [mbar] Schüco CTE 520 CH 2
4	71
6	75
8	81
10	89
12	99
14	117
16	145

Certified in accordance with Solar Keymark

Schüco – Your partner for windows and solar products

As leading innovator in system-based construction, Schüco supplies components for the entire building envelope, including specialised software solutions for design, construction, calculation and fabrication.

- Aluminium systems
- Steel systems
- PVC-U systems
- Solar products
- Schüco Design

Schüco Premium line collectors with innovative heat transfer technology

Heat transfer technology for improved heat transfer
In the past, Schüco solar products have made headlines time and again with their technical innovations. Schüco is now presenting another outstanding development with the unique heat transfer technology. The heat transfer between the absorber plate and the meander pipework has increased markedly. The collectors have an exceptionally smooth absorber surface for the best design.

A unique variety of designs for attractive building integration
A total of six mounting options and the option of an individual frame colour offer a unique variety of designs. The Schüco Premium system presents a unique combination of thermal collectors, residential roof windows and photovoltaic modules.

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