



STULZ the natural choice

# Tel-Air-2 Series

## Telecom Line



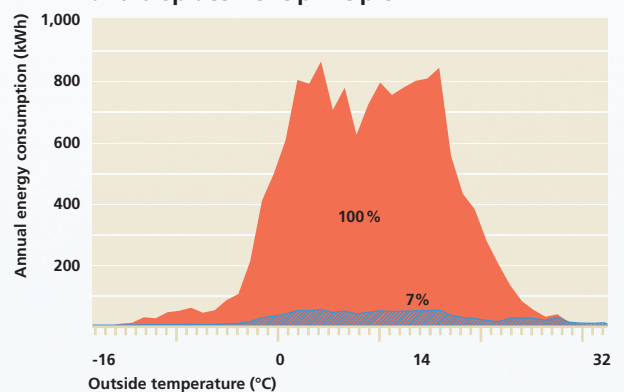
# STULZ precision air conditioners for indoor installation – the Tel-Air-2 series



	Telecom containers	Equipment rooms with raised floor
Tel-Air-2 Upflow	●	
Tel-Air-2 Displacement	●	
Tel-Air-2 Downflow		●

With its Telecom Line, STULZ offers a range of professional air-conditioning solutions for the telecommunications infrastructure and for switch cabinets. All units are designed for 24/7 operation, 365 days a year, and offer maximum reliability and availability. In the unlikely event that a problem does arise, STULZ's network of competent partners and branches guarantees fast, trouble-free service.

Up to 93% energy savings with mixed mode and displacement principle



■ Energy consumption with the use of free cooling and mixed mode  
 ■ Energy consumption without free cooling, using the example of a TLF 60, based on the temperature profile of the city of Hamburg

**Tel-Air-2** units are designed for installation in telecommunications containers and equipment rooms. As they are installed indoors, noise is kept to a minimum and the units are protected against environmental influences and vandalism. The Tel-Air-2 series is available in different versions: the Upflow and Downflow models and the especially energy-efficient Displacement version.

All Tel-Air-2 units also operate in mixed mode, which effectively combines free cooling with compressor operation, thereby considerably lowering energy consumption.

### Technical features of the Tel-Air-2 series

- Energy-saving operation thanks to proportional free cooling facility
- C2020 microprocessor control
- Automatic restart after power failure
- Speed-controlled condenser and evaporator fan
- 48V DC backup operation
- Contacts for various alarm signals for connection to a monitoring system
- Refrigerant R407C
- Operating range from -20°C to 45°C outside temperature
- Mixed mode for energy-saving operation
- G4 zigzag filter



Tel-Air-2 Upflow (TLU)

Tel-Air-2 Downflow (TLD)

Tel-Air-2 Displacement (TLF):  
The unit pictured here is equipped with the optional blow-out diffuser.

### Displacement principle

Displacement units blow out the cold air close to the ground at low speed (< 1 m/s). Due to the low speed at which the air is flowing, a "pool" of cold air forms on the floor. This cold air is drawn in by fans integrated in the server rack as a function of the heat load, and the heated air is then expelled upwards. Because this method prevents hot and cold air from mixing, the displacement unit can draw in the air at 30°C, instead of at 25°C as was previously the case. The enlarged temperature spread enables the displacement units to work more quietly and efficiently.

### Free cooling

At low outside temperatures, cooling is direct with outside air. The outside air is conveyed into the container when the air flap is open. Therefore, when outside temperatures are low, energy-intensive compressor cooling is not necessary.

### Mixed mode

Once the outside temperature exceeds a given threshold, free cooling alone is no longer sufficient. Then, in mixed mode, the runtimes of the compressor are kept to a minimum by the simultaneous use of free cooling and compressor cooling. In this way, depending on the local temperature profile, the annual energy costs can be cut by a further 10%. The partial load mode of the air conditioner produces further potential savings.

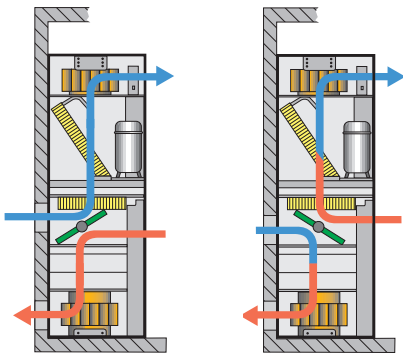
# The standard air-conditioning solution: Tel-Air-2 Upflow



Tel-Air-2 Upflow (TLU)

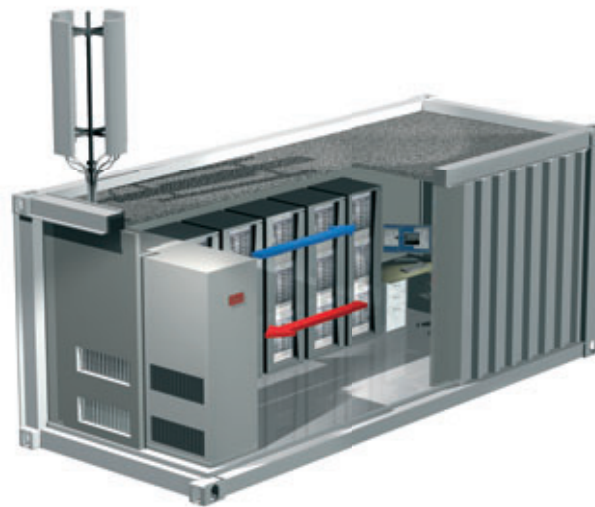
## Options

- High temperature operation up to 55°C with R134a
- Compressor soft start
- Electric heating
- Aluminium housing
- Condenser with anti-corrosive finish
- Serial interface RS485 for connection to BMS systems
- Electrical cables ready to plug in
- Winter kit up to -40°C
- Operator terminal for C2020



Free cooling

Cooling with compressor



Tel-Air-2 Upflow installation example

TLU							
Unit type		TLU40	TLU60	TLU80	TLU90	TLUA2	TLUA4
Cooling capacity (total) <sup>1) 2)</sup>	kW	4.4	5.4	7.4	8.4	10.0	11.3
Cooling capacity (sensible) <sup>1) 2)</sup>	kW	4	5.4	7.4	8.4	10.0	11.3
Noise level (internal/external) <sup>2) 3)</sup>	dB (A)	53/64	55/64	61/64	62/67	63/67	63/67
Air flow (DX)	m <sup>3</sup> /h	1,000	1,500	2,000	2,200	3,000	3,200
Air flow (free cooling)	m <sup>3</sup> /h	800	1,200	1,600	1,800	2,400	2,600
Max. heating capacity	kW	1.5	1.5	4.5	4.5	4.5	4.5
Height	mm	1,990	1,990	1,990	1,990	1,990	1,990
Width	mm	600	600	900	900	900	900
Depth	mm	650	650	700	700	700	700
Weight	kg	170	190	250	260	270	280

<sup>1)</sup> Operating conditions: Inside temperature 25 °C/relative humidity 40 %/outside temperature 35 °C

<sup>2)</sup> 400V/3Ph/V/50Hz + 48V DC

<sup>3)</sup> 2 m distance, free-field

# The energy-efficient solution: Tel-Air-2 Displacement and Downflow

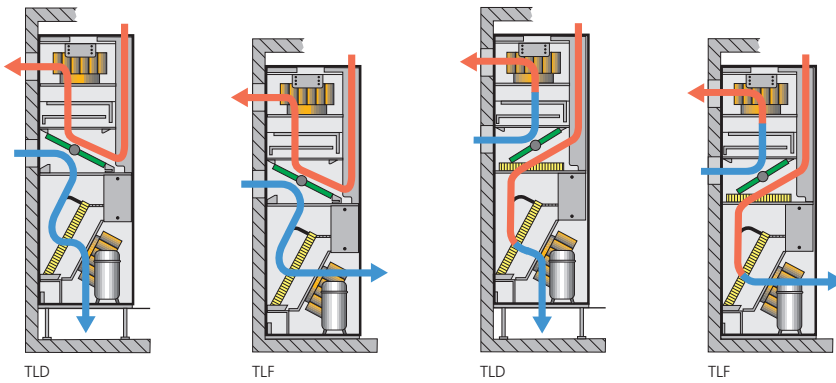
## Options

- High temperature operation up to 55 °C with R134a
- Compressor soft start
- Electric heating
- Aluminium housing
- Condenser with anti-corrosive finish
- Serial interface RS485 for connection to BMS systems
- Winter kit
- Operator terminal for C2020



Tel-Air-2 Downflow (TLD)

Tel-Air-2 Displacement (TLF)



TLD

TLF

TLD

TLF

Free cooling and mixed mode

Cooling with compressor

TLF/TLD		TLF/TLD40	TLF/TLD60	TLF/TLD80	TLF/TLD90	TLF/TLDA2	TLF/TLDA4
Unit type							
Cooling capacity (total) <sup>1) 2)</sup>	kW	4.5	6.0	8.3	9.2	11.0	12.5
Cooling capacity (sensible) <sup>1) 2)</sup>	kW	4.5	6.0	8.3	9.2	11.0	12.5
Noise level (internal/external) <sup>2) 3)</sup>	dB (A)	53/64	55/64	61/64	62/67	63/67	63/67
Air flow (DX)	m <sup>3</sup> /h	1,000	1,500	2,000	2,200	3,000	3,200
Air flow (free cooling)	m <sup>3</sup> /h	800	1,200	1,600	1,800	2,400	2,600
Max. heating capacity	kW	1.5	1.5	4.5	4.5	4.5	4.5
Height	mm	1,990	1,990	1,990	1,990	1,990	1,990
Width	mm	600	600	900	900	900	900
Depth	mm	650	650	700	700	700	700
Weight	kg	170	190	250	260	270	280

<sup>1)</sup> Operating conditions: Inside temperature 30 °C / relative humidity 30 % / outside temperature 35 °C

<sup>2)</sup> 400V/3Ph/N/50Hz + 48V DC

<sup>3)</sup> 2 m distance, free-field

# The C2020 control system

The C2020 consists of an IO controller inside the unit and an optional operator terminal. The IO controller controls all the functions, the operator terminal (keypad) displays the most important operating states and alarms. The keypad, which also features an LCD, is able to configure and monitor up to 5 units.

## Sequencing

- Using the C2020, any desired number of standby units can be configured in an air-conditioning system. A system has a maximum number of 5 units. If an individual unit drops out or the heat load rises, inactive standby units are switched in for additional support.
- The operating times of all connected air conditioners are compared to ensure that each one is used to an equal extent.

## Controlling the various operating modes

- Compressor operation
- Free cooling function dependent on temperature and enthalpy
- Mixed mode management
- Backup ventilation upon failure of the main power supply
- Heating
- Humidification and dehumidification (humidification requires an external humidifier)

## Step-by-step operator guidance via keypad

- Operator
- Service (password-protected)
- Manufacturer (password-protected)

## Multilingual display

- The keypad can offer a choice of seven languages for the display of general menus, alarms and setpoints.

## Flash EPROM for simple configuration and software updates

- Central configuration of units via laptop
- Hardware key for uploading and downloading software without a laptop and for copying the configuration to other units



## Individual forwarding of alarms

- Via bus system/BMS systems (optional)
  - Via voltage free contact (standard)
- 9 off-load contacts are available. Alarms can be assigned a high or low priority.

## High-pressure alarm management

- In order to avoid making unnecessary service calls, high-pressure alarms are initially reset three times automatically. Then, after the fourth error message, the alarm must be deleted manually after 4 hours.

## Night mode

- Condenser and evaporator fan speed is limited in a time-controlled manner, to ensure quiet operation e.g. at night or the weekend.

## Energy-saving mode

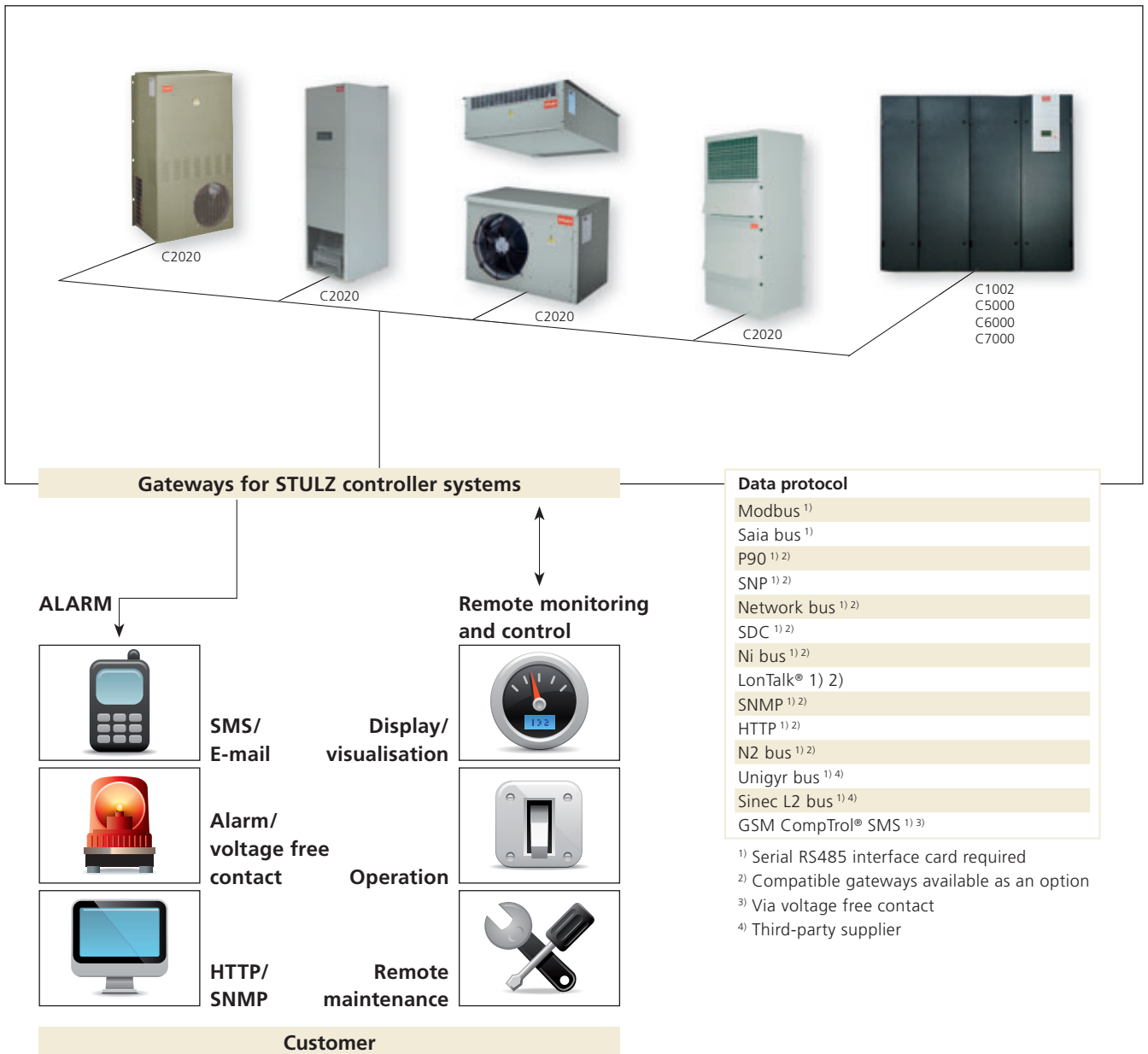
- The fan speed is automatically reduced (adjustable) at times when neither heating nor cooling is required.

## Integration in existing air-conditioning systems

- The comfort air conditioners commonly installed in base stations can be activated by the C2020 control. Air conditioning becomes more reliable and considerably more efficient.

# Network solutions for communication without limits

- Compatible with all common BMS systems
- Communication using SNMP and HTTP IP protocols
- STULZ TeleCompTrol monitoring system as a bus and modem version



## STULZ Company Headquarters

**D** **STULZ GmbH**  
Holsteiner Chaussee 283 · 22457 Hamburg  
Tel.: +49(40)55 85-0 · Fax: +49(40)55 85-352 · products@stulz.de

## STULZ Subsidiaries

**AUS** **STULZ AUSTRALIA PTY LTD**  
34 Bearing Road · Seven Hills NSW 21 47  
Tel.: +61(2)96 74 47 00 · Fax: +61(2)96 74 67 22 · sales@stulz.com.au

**CN** **STULZ AIR TECHNOLOGY SYSTEMS (SHANGHAI) CO., LTD.**  
No. 999 Shen Fu Road, Min Hang District · Shanghai 201108 · P.R. China  
Tel.: +86(21) 54 83 02 70 · Fax: +86(21)54 83 02 71 · info@stulz.cn

**E** **STULZ ESPAÑA S.A.**  
Calle Lluvia Nº 1 · 28918 Leganés (Madrid)  
Tel.: +34(91)517 83 20 · Fax: +34(91)517 83 21 · info@stulz.es

**F** **STULZ FRANCE S. A. R. L.**  
107, Chemin de Ronde · 78290 Croissy-sur-Seine  
Tel.: +33(1)34 80 47 70 · Fax: +33(1)34 80 47 79 · info@stulz.fr

**GB** **STULZ U. K. LTD.**  
First Quarter · Blenheim Rd. · Epsom · Surrey KT 19 9 QN  
Tel.: +44(1372)74 96 66 · Fax: +44(1372)73 94 44 · sales@stulz.co.uk

**I** **STULZ S.P.A.**  
Via Torricelli, 3 · 37067 Valeggio sul Mincio (VR)  
Tel.: +39(045)633 16 00 · Fax: +39(045)633 16 35 · info@stulz.it

**IN** **STULZ-CHSPL (INDIA) PVT. LTD.**  
006, Jagruti Industrial Estate · Mogul Lane, Mahim · Mumbai - 400 016  
Tel.: +91(22) 56 66 94 46 · Fax: +91(22) 56 66 94 48 · info@stulz.in

**NL** **STULZ GROEP B. V.**  
Postbus 75 · 1180 AB Amstelveen  
Tel.: +31(20)54 51 111 · Fax: +31(20)64 58 764 · stulz@stulz.nl

**NZ** **STULZ NEW ZEALAND LTD.**  
Office 71, 300 Richmond Rd. · Grey Lynn · Auckland  
Tel.: +64(9)360 32 32 · Fax: +64(9)360 21 80 · sales@stulz.co.nz

**PL** **STULZ POLSKA SP. Z O.O.**  
Budynek Mistral · Al. Jerozolimskie 162 · 02 – 342 Warszawa  
Tel.: +48(22)883 30 80 · Fax: +48(22)824 26 78 · info@stulz.pl

**USA** **STULZ AIR TECHNOLOGY SYSTEMS (SATS), INC.**  
1572 Tilco Drive · Frederick, MD 21704  
Tel.: +1(301)620 20 33 · Fax: +1(301)662 54 87 · info@stulz-ats.com

**ZA** **STULZ SOUTH AFRICA PTY. LTD.**  
P.O.Box 15687 · Lambton 1414 · Gauteng  
Tel.: +27(11)873 68 06 · Fax: +27(11)873 31 3 · dudley@stulz.co.za

## STULZ the natural choice

### Close to you all over the world.

... With specialist, competent partners in our subsidiaries and exclusive sales and service partners around the world. Our five production sites are in Europe, North America and Asia.