

 HiRef



CATALOGUE

**SHELTER and TLC**



# Split unit

VERSIONS

REFRIGERANTS

RANGE

SPLIT UNIT FOR SHELTERS DESIGNED FOR IT EQUIPMENT



**HTS**



3-41  
(kW)

PAGE  
**10**

SPLIT UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EQUIPMENT



**NTS**



10-36  
(kW)

PAGE  
**12**

# Indoor monobloc unit

INDOOR MONOBLOC UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT



**HTD/U/X**



4-29  
(kW)

PAGE  
**16**

INDOOR MONOBLOC MODULATING UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT



**NTD/U/X**



9-28  
(kW)

PAGE  
**18**

MODULATING INDOOR MONOBLOCK UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT - DISPLACEMENT VERSION



**NTG**



7-9  
(kW)

PAGE  
**20**



Air/air system



Cold only



Free Cooling



Motocondensing



Indoor monobloc unit



Outdoor monobloc unit

Technical data are subject to change without notice. Do not use these data in the design stage.

# Outdoor monobloc unit

	VERSIONS	REFRIGERANTS	RANGE	PAGE
	<b>HTW HTWD</b>	     	4-40 (kW)	<b>24</b>
	<b>NTW NTWD</b>	   	8-20 (kW)	<b>26</b>

# Rooftop

	VERSIONS	REFRIGERANTS	RANGE	PAGE
	<b>HTR</b>	    	7-64 (kW)	<b>30</b>
	<b>NTR</b>	  	31-41 (kW)	<b>32</b>

# Free Cooling Box

	VERSIONS	REFRIGERANTS	RANGE	PAGE
	<b>FCB</b>	 	500 - 3500 (m³/h)	<b>36</b>



Technical data are subject to change without notice. Do not use these data in the design stage.



CATALOGUE  
SHELTER and TLC

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# TECHNOLOGIES FOR TLC INFRASTRUCTURE

## RELIABILITY AND CONTROL IN EVERY CONDITION

The units in the TLC range represent **HiRef excellence in the continuous and reliable cooling of telecommunications infrastructures.**

Manufactured with high-quality components and an optimized thermodynamic design, they ensure consistent performance even in the most demanding conditions. Thanks to HiRef technology and **advanced control software**, they provide precise and stable regulation of thermo-hygrometric conditions, making them **ideal for technical rooms or industrial shelters** where maximum operational reliability is essential.



## ROBUSTNESS AND CUSTOMIZATION

The range is available in different configurations to ensure optimal performance and adaptability to any application context, even in the most demanding climatic and environmental conditions:

- **Wide operating range:** outdoor temperatures from  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ .
- **Versions for aggressive environments:** stainless steel casing and double protective coating for installations in coastal or industrial areas.
- **Special executions for extreme environments** – such as desert areas – with condenser coils featuring increased fin spacing and opening panels to facilitate maintenance and the removal of dust or sand.
- **Reinforced versions designed** to withstand winds of up to 200 km/h and ensure operational continuity in any condition.



## EFFICIENCY AND OPERATIONAL CONTINUITY

The units can integrate **direct Free-Cooling and latest-generation inverter compressors**, ensuring high energy efficiency and optimized consumption management even at partial loads.

Each unit is designed to **ensure 24/7 operational continuity**, minimizing maintenance interventions and maximizing component lifespan.

For increased reliability, versions with dual power supply at 24 or 48 VDC are also available, keeping the electronic control and ventilation active even in the absence of the main power supply, thus ensuring **maximum system safety and stability**.

## APPLICATION VERSATILITY

Although the TLC range was originally developed for the telecommunications sector, its reliability and construction flexibility make it perfectly suitable for many other industries.

It can be applied in **industrial plants, mining operations, photovoltaic systems, energy storage stations**, and in all contexts requiring the cooling of electronic equipment, batteries, or inverters.

**Designed for intensive and continuous operation**, TLC units combine mechanical robustness, high performance, and ease of installation, making them ideal also for containerized solutions or limited technical spaces.

## INTELLIGENT CONTROL AND COMFORT FUNCTIONS

The TLC units adopt the same **advanced supervision software used in HiRef solutions for Data Centers**, ensuring continuous and proactive monitoring of thermo-hygrometric parameters, component efficiency, and overall operating conditions.

This level of intelligent control enables **predictive diagnostics, automatic performance optimization, and remote unit management**, ensuring maximum reliability and operational simplicity.

The integrated comfort functions guarantee ideal temperatures for operators and a safe, comfortable working environment even in shelters that are particularly hot, isolated, or subject to significant temperature fluctuations.

## A COMPLETE RANGE OF TLC SOLUTIONS

Within the catalog, all the main configurations of the TLC range are presented, designed to meet different plant and installation requirements:

- **Split** – units dedicated to shelters and telecom stations where precise control is required, with separate installation of indoor and outdoor units.
- **Indoor monoblock** – compact Plug&Play solutions, ideal for technical rooms and containers where space is limited and rapid installation is essential.
- **Outdoor monoblock** – units designed for external wall installation, freeing up space inside the shelter while maintaining high performance and ease of maintenance.
- **Rooftop** – systems installable on top of containers, with modular configurations and high performance.
- **Free Cooling Box** – units designed for direct free-cooling, capable of significantly reducing energy consumption by exploiting favorable environmental conditions.

Each configuration is developed according to the same HiRef quality standards: **maximum efficiency, reliability, and ease of management in any operating condition.**





# SPLIT UNIT

# HTS

## SPLIT UNIT FOR SHELTERS DESIGNED FOR IT EQUIPMENT

3-41 kW

-   
 MULTI-PROTOCOL COMMUNICATION INTERFACE
-   
 SCROLL COMPRESSORS
-   
 EC RADIAL FANS
-   
 CORROSION RESISTANT MATERIAL



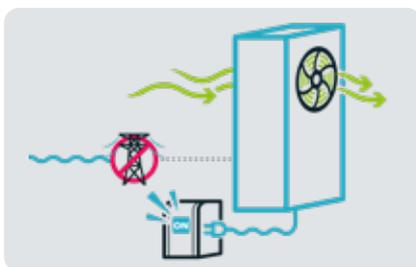
INDOOR UNIT



OUTDOOR UNIT

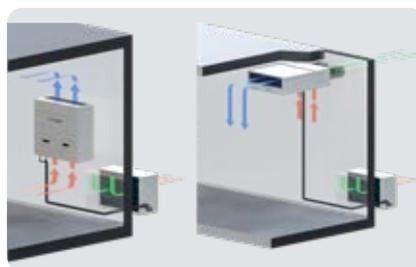
The air conditioners of the HTS series are units specially designed for telephone exchange facilities and shelters. Designed **for ceiling or wall mounting**, they are suitable for air conditioning of control centres with limited internal space or space entirely taken up by technological equipment. The rational layout of the internal components makes **unit installation easy**, also thanks to the many accessories available, making HTS **suitable for different shelter configurations**. The units have been accurately designed in **thermodynamic and aeraulic terms** to ensure **maximum energy efficiency**.

- Available refrigerants: R410A, R513A and R134a
- Version available with dual power supply for emergencies: 230/400 V network and 24/48 VDC backup supply
- Evaporating and condensing side fans available with EC motor
- Standard stainless steel condensate drain pan
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Dehumidification function (optional)
- Electronic expansion valve (optional)
- Epoxy powder painted structural metalwork supplied as standard
- Electric heating function (optional)
- Temperature control through heating and re-heating systems using electric resistances (optional)
- HiPro control with programmable microprocessor
- Unit connectable to LAN



### Maximised Redundancy

If **dual power supply** (mains + DC UPS) is provided, unit control and ventilation always remain active, **even in the event of a mains failure**. If the unit is configured as a Free-Cooling version (upon request), the damper will continue to operate too and this guarantees **operational continuity for the conditioning system**.



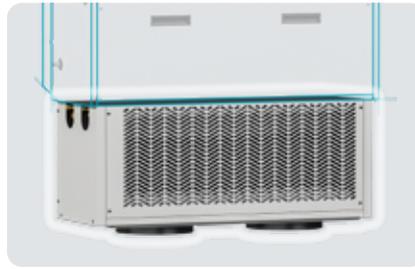
### Maximised shelter internal space

The units of the HTS series are designed for **ceiling or wall mounting**: in this way, all the available internal space can be **entirely and efficiently used** for IT equipment installation.



**Easier scheduled maintenance**

The unit has been accurately designed to ensure **frontal access to components**. This aspect, combined with full extractability of filters and Free-Cooling damper (if any), **facilitates routine maintenance operations**.



**Maximised energy saving with direct Free-Cooling**

The units can, on request, be equipped with a **direct Free-Cooling** module. This system, which can also be retrofitted on site on units already in place, reduces compressor work requirements (partial Free-Cooling) and, under full Free-Cooling conditions, allows the compressor to be turned off, **with major benefits for the system's PUE (Power Usage Effectiveness)**.



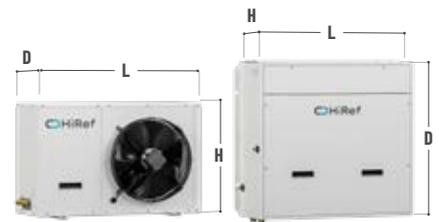
**Shelter safety**

All models in the split range feature evaporating coils with hydrophilic coating. This special coating - together with adequate adjustment of air through-flow speeds - **helps condensate collection during the dehumidification process, preventing any dripping on the inside and outside of the unit**.

**Unit suitable for any kind of climate and environment**

Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- **The high temperature version with R134a or R513A refrigerant and specific condensing fan** is suitable for facilities or systems with outside air temperature above 45°C. The unit configured with an EC fan and an electronic expansion valve is able to start up even under extreme temperature conditions (60°C indoors and 60°C outdoors).
- In the case of extremely cold climates (down to -40°C) **a version for low external temperatures is available**. In this option, the outdoor unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system.
- In case of exposure to aggressive atmospheric agents such as sand or sunlight, the **outdoor unit metalwork can be ordered with double 160 µm paint finishing layer or in AISI 304 stainless steel alloy**. An epoxy powder painted condensing coil is also available.



HTS		0251	0351	0451	0561	0731	0901	1051	1201	1451	2001	3101	3811
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>													
Cooling capacity	kW	2.9	4	4.7	6.2	7.5	9.9	10.6	13.4	15.4	28.2	31.4	39.1
Total absorbed power	kW	1	1.5	1.4	2.1	2.7	3.1	3.5	4.9	6.2	9.4	10.6	13
EER		4.44	3.38	4.62	3.78	3.28	3.77	3.82	3.29	2.84	3.88	3.45	3.57
SHR		1	0.99	1	0.89	0.96	0.92	0.89	0.92	0.86	0.86	0.97	0.88
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>													
Cooling capacity	kW	3.1	4.2	5	6.5	7.9	10.3	11	14.1	16	29.4	33.1	40.7
Total absorbed power	kW	1	1.5	1.4	2.1	2.7	3.1	3.5	4.9	6.3	9.4	10.7	13.1
EER		4.65	3.47	4.88	3.93	3.44	3.92	3.99	3.41	2.93	4.03	3.6	3.69
SHR		1	1	1	0.95	1	0.97	0.94	0.97	0.91	0.92	1	0.92
<b>R513A - Indoor air 27°C - 40% / Outdoor air 35°C</b>													
Cooling capacity	kW	-	-	5.3	6.2	7.2	8.7	10.4	12.5	13.3	25.2	31.1	-
Total absorbed power	kW	-	-	1.6	2	2.4	2.8	3.5	3.9	4.5	8.1	10.8	-
EER		-	-	4.34	3.83	3.71	4.29	3.87	4.02	3.62	4.19	3.33	-
SHR		-	-	0.98	0.89	0.99	0.99	0.93	0.97	0.94	0.93	0.98	-
<b>R513A - Indoor air 30°C - 35% / Outdoor air 35°C</b>													
Cooling capacity	kW	-	-	5.5	6.5	7.7	9.3	10.8	13.2	13.9	26.3	32.9	-
Total absorbed power	kW	-	-	1.6	2	2.4	2.8	3.5	3.9	4.5	8.2	11	-
EER		-	-	4.5	3.98	3.92	4.49	3.99	4.21	3.75	4.33	3.47	-
SHR		-	-	1	0.95	1	1	0.95	1	0.98	0.95	1	-
Indoor unit air flow rate	m <sup>3</sup> /h	950	930	1400			2300		3200		5000	7750	
Outdoor unit air flow rate	m <sup>3</sup> /h	2300	2050	3450		3350		5100	5580	5450	14000	9300	16280
Power supply	V/ph/Hz	230/1/50							400/3+N/50				
Indoor unit dimensions [LxHxD]	mm	650x350x936			1050x350x936				1150x410x1026		1340x450x1240	1585x685x1096	
Outdoor unit dimensions [LxHxD]	mm	624x541x410			1003x633x420				1121x1128x579		1452x1700x723	1565x1275x605	1965x1490x950

Also available with 60 Hz power supply. | Indoor unit can only be installed on the ceiling for sizes 2001-3101-3811.

INVERTER lineup

# NTS

## SPLIT UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

10-36 kW



INDOOR UNIT

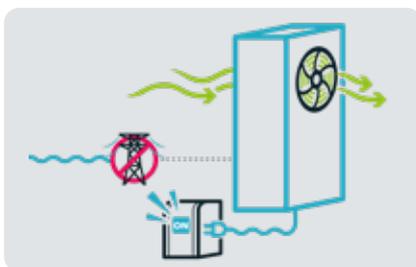


OUTDOOR UNIT

MULTI-PROTOCOL COMMUNICATION INTERFACE	EC RADIAL FANS	CORROSION RESISTANT MATERIAL
SCROLL COMPRESSORS	INVERTER DRIVEN COMPRESSORS	

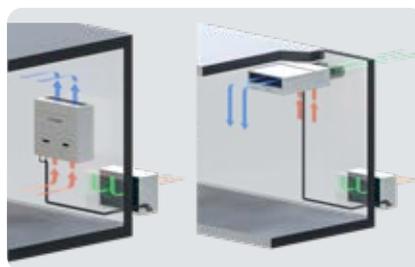
The air conditioners of the NTS series are units specially designed for telephone exchange facilities and shelters. Designed for **ceiling or wall mounting**, they are suitable for air conditioning of control centres with limited internal space or space entirely taken up by technological equipment. The rational layout of the internal components makes **installation easy**. Thanks to the wide range of available accessories, the NTS units are **suitable for different shelter configurations**. The **meticulous thermodynamic and aeraulic design boosts energy efficiency**.

- Refrigerant R410A
- Version available with dual power supply for emergencies: 230/400V network and 24/48VDC backup supply
- Fans on evaporating side with standard EC motor
- Condensing side fans available with EC motor
- Standard stainless steel condensate drain pan
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Dehumidification function (optional)
- Electronic expansion valve (optional)
- Epoxy powder painted structural metalwork supplied as standard
- Electric heating function (optional)
- Temperature control through heating and re-heating systems using electric resistances (optional)
- HiPro control with programmable microprocessor
- Unit connectable to LAN



### Maximised Redundancy

If **dual power supply** (mains + DC UPS) is provided, unit control and ventilation always remain active, **even in the event of a mains failure**. If the unit is configured as a Free-Cooling version (upon request), the damper will continue to operate too and this guarantees **operational continuity for the conditioning system**.



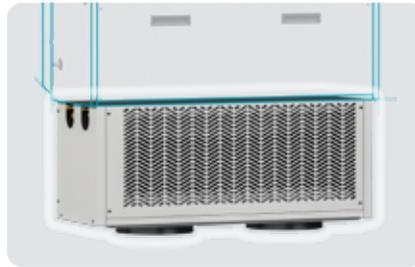
### Maximised shelter internal space

The units of the NTS series are designed for **ceiling or wall mounting**: in this way, all the available internal space can be **entirely and efficiently used** for IT equipment installation.



### Easier scheduled maintenance

The unit has been accurately designed to ensure **frontal access to components**. This aspect, combined with full extractability of filters and Free-Cooling damper (if any), **facilitates routine maintenance operations**.



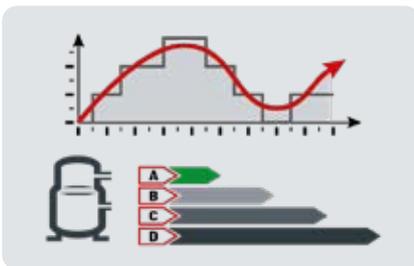
### Maximised energy saving with direct Free-Cooling

The units can, on request, be equipped with a **direct Free-Cooling** module. This system, which can also be retrofitted on site on units already in place, reduces compressor work requirements (partial Free-Cooling) and, under full Free-Cooling conditions, allows the compressor to be turned off, **with major benefits for the system's PUE (Power Usage Effectiveness)**.



### Shelter safety

All models in the split range feature evaporating coils with hydrophilic coating. This special coating - together with adequate adjustment of air through-flow speeds - **helps condensate collection during the dehumidification process, preventing any dripping on the inside and outside of the unit**.



### Unit suitable for any kind of climate and environment

Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- In the case of extremely cold climates (down to  $-40^{\circ}\text{C}$ ) **a version for low external temperatures is available**. In this option, the outdoor unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system.
- In case of exposure to aggressive atmospheric agents such as sand or sunlight, **the outdoor unit metalwork can be ordered with double 160  $\mu\text{m}$  paint finishing layer or in AISI 304 stainless steel alloy. An epoxy powder painted condensing coil is also available**.

### Efficiency and precision

The range includes compressors with Brushless DC motors. As the thermal load changes, the integrated microprocessor allows combined modulation of air flow - via control of the EC fans and cooling capacity, by managing the speed of the DC inverter compressors (supplied as standard). This ensures **not only accurate adjustment of ambient hygrothermal parameters, but also maximised energy savings at partial loads, particularly if in combination with direct Free-Cooling**.



NTS		0851	1101	1601	3101
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>					
Cooling capacity	kW	9.5	10.9	18.3	34.4
Total absorbed power	kW	3.1	3.9	6.8	11
EER		3.9	3.29	2.97	3.81
SHR		0.99	0.9	0.85	0.95
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>					
Cooling capacity	kW	10	11.4	19.1	36.2
Total absorbed power	kW	3.2	3.9	6.9	11.1
EER		4.03	3.38	3.07	3.98
SHR		1	0.94	0.92	1
Indoor unit air flow rate	$\text{m}^3/\text{h}$	2300		3200	7750
Outdoor unit air flow rate	$\text{m}^3/\text{h}$	5100	5580		16300
Power supply	V/ph/Hz	230/1/50		400/3+N/50	
Indoor unit dimensions [LxHxD]	mm	1050x350x936		1150x410x1026	1585x685x1096
Outdoor unit dimensions [LxHxD]	mm	1305x648x490	1121x1128x579		1965x950x1322

Also available with 60 Hz power supply. | Indoor unit that can only be installed on the ceiling for size 3101.



# **INDOOR MONOBLOC UNIT**

# HTD/U/X

## INDOOR MONOBLOC UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

4-29 kW



HTD



HTU



HTX

Our HTD, HTU and HTX series conditioners are indoor monobloc units designed for equipment rooms and low power telecom shelters. Thanks to their three different air flow configurations, they are suitable for installation in multiple ways. Thanks to the various configurations available, the range is **very versatile and thus suited to many system set-ups**, plus the **accurate thermodynamic and air distribution design enhances energy efficiency**.

- Available refrigerants: R410A, R513A and R134a
- Version available with dual power supply for emergencies: 230/400V network and 24/48VDC backup supply
- Evaporating side fans with EC motor available on request
- Stainless steel condensate drain pan
- Dehumidification function (optional)
- Electronic expansion valve (optional)
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Epoxy powder painted structural metalwork supplied as standard
- Electric heating function (optional)
- Temperature control through heating and re-heating systems using electric resistances (optional)
- HiPro control with programmable microprocessor
- Unit connectable to LAN

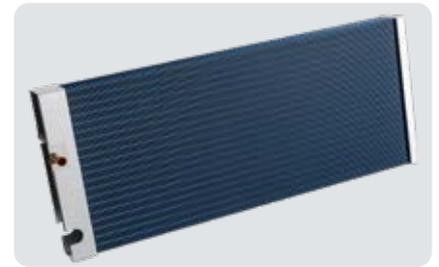
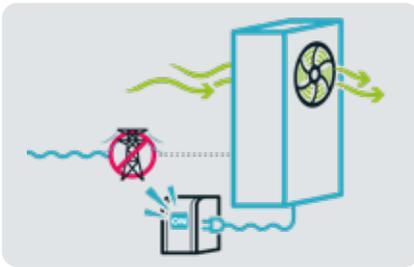


### Simple and fast installation

The monobloc construction ensures **fast unit installation** with no need to provide on-site refrigeration piping. Thanks to the **Plug&Play** configuration, wall mounting and electrical connection of the unit are **considerably simplified**. Rain shields are available on request for installation on the external wall.

### Maximised energy saving with direct Free-Cooling

The units can, on request, be equipped with a **direct Free-Cooling** module. This system, which can also be retrofitted on site to a unit already in operation, reduces compressor work requirements and, under full Free-Cooling conditions, allows the compressor to be turned off, **with major benefits for the system's PUE (Power Usage Effectiveness)**.



**Maximised Redundancy**

If **dual power supply** (mains + DC UPS) is provided, unit control and ventilation always remain active, **even in the event of a mains failure**. If the unit is configured as a Free-Cooling version (upon request), the damper will continue to operate, too, and this guarantees **operational continuity for the conditioning system**.

**Easier scheduled maintenance**

The unit has been accurately designed to ensure **frontal access to components** even with the unit running. This aspect, combined with full extractability of filters and Free-Cooling damper (if any), **facilitates routine maintenance operations**.

**Shelter safety**

All models in the monobloc indoor range feature evaporating coils with hydrophilic coating. This special coating - together with adequate adjustment of air through-flow speeds - **helps condensate collection during the dehumidification process, preventing any dripping on the inside and outside of the unit**.

**Unit suitable for any kind of climate and environment**

Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- **The high temperature version with R134a or R513A refrigerant and specific condensing fan** is suitable for facilities or systems with outside air temperature above 45°C. The unit configured with an EC fan and an electronic expansion valve is able to start up even under extreme temperature conditions (60°C indoors and 60°C outdoors).
- In the case of extremely cold climates (down to -40°C) **a version for low external temperatures is available**. In this option, the outdoor unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system.
- In case of exposure to aggressive atmospheric agents such as sand or sunlight, the **outdoor unit metalwork can be ordered with double 160 µm paint finishing layer or in AISI 304 stainless steel alloy**. An **epoxy powder painted condensing coil** is also available.



HTD-HTU-HTX	0451	0561	0731	0901	1051	1201	1501	1701	1801	2001	2201	2501	
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>													
Cooling capacity	kW	4.4	6	7	10.7	10.9	12.7	15	16.4	18.4	22.1	24.9	27.6
Total absorbed power	kW	1.9	2.5	3.2	4.8	4.4	6	6.4	7.6	7.1	9	10	11.4
EER		4.26	3.54	3.26	3.28	3.71	2.81	3.39	2.93	4.71	3.79	3.84	3.5
SHR		1	0.9	0.95	0.99	0.98	0.92	0.98	0.94	1	0.99	0.99	0.95
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>													
Cooling capacity	kW	4.6	6.2	7.4	11.4	11.6	13.3	15.9	17.2	19.6	23.5	26.3	28.9
Total absorbed power	kW	1.9	2.5	3.2	4.8	4.5	6	6.5	7.7	7.1	9.1	10	11.4
EER		4.47	3.61	3.38	3.45	3.88	2.91	3.54	3.02	4.99	3.99	4.03	3.63
SHR		1	0.95	1	1	1	0.96	1	0.99	1	1	1	0.99
<b>R513A - Indoor air 27°C - 40% / Outdoor air 35°C</b>													
Cooling capacity	kW	5.2	6.1	7	9.4	11	12.1	14.4	15.7	21.1	23.5	25.8	27.6
Total absorbed power	kW	2.1	2.5	3	3.7	4.4	4.9	5.7	6.5	7.9	8.8	10	11
EER		4.11	3.62	3.41	4.38	3.88	3.66	3.87	3.52	4.48	4.18	3.97	3.65
SHR		0.98	0.93	0.99	0.99	0.99	0.96	0.99	0.98	1	1	1	0.99
<b>R513A - Indoor air 30°C - 35% / Outdoor air 35°C</b>													
Cooling capacity	kW	5.5	6.4	7.3	10	11.6	12.7	15.4	16.6	22.5	24.8	27.2	28.9
Total absorbed power	kW	2.1	2.5	3.1	3.8	4.5	5	5.8	6.6	7.9	8.9	10.1	11.2
EER		4.3	3.73	3.57	4.62	4.04	3.77	4.07	3.63	4.71	4.35	4.12	3.75
SHR		1	0.95	1	1	1	1	1	1	1	1	1	1
Air flow rate	m³/h	1450		2100		3020		3800		5500		6500	
Power supply	V/ph/Hz	230/1/50				400/3+N/50							
Dimensions [LxDxH]	mm	800x1850x550				1000x1850x550				1160x1850x550		1500x2050x800	

Performance data relating to Downflow versions. | Also available with 60 Hz power supply.

INVERTER lineup

# NTD/U/X

## INDOOR MONOBLOC MODULATING UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

9-28 kW



NTD



NTU



NTX

Our NTD, NTU and NTX series conditioners are indoor monobloc units designed for small equipment rooms and low power telecom shelters. Thanks to their three different air flow configurations, they are suitable for installation in multiple ways. Thanks to the various configurations available, the range is **very versatile and thus suited to many system set-ups, plus the accurate thermodynamic and air distribution design enhances energy efficiency.**



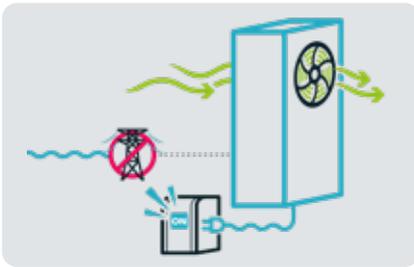
### Simple and fast installation

The monobloc construction ensures **fast unit installation** with no need to provide on-site refrigeration piping. Thanks to the **Plug&Play** configuration, wall mounting and electrical connection of the unit are **considerably simplified**. Rain shields are available on request for installation on the external wall.

### Maximised energy saving with direct Free-Cooling

The units can, on request, be equipped with a **direct Free-Cooling** module. This system, which can also be retrofitted on site to a unit already in operation, reduces compressor work requirements and, under full Free-Cooling conditions, allows the compressor to be turned off, **with major benefits for the system's PUE (Power Usage Effectiveness).**

- Refrigerant R410A
- Version available with dual power supply for emergencies: 230/400 V network and 24/48 VDC backup supply
- Fans on evaporating side with standard EC motor
- Modulating brushless DC compressors
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Stainless steel condensate drain pan
- Dehumidification function (optional)
- Electronic expansion valve (optional)
- Epoxy powder painted structural metalwork supplied as standard
- Electric heating function (optional)
- Temperature control through heating and re-heating systems using electric resistances (optional)
- HiPro control with programmable microprocessor
- Unit connectable to LAN



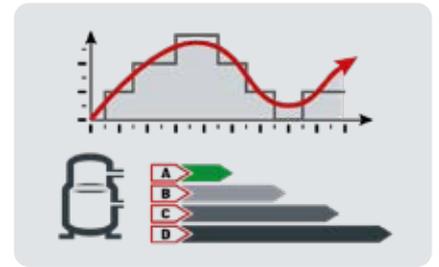
### Maximised Redundancy

If **dual power supply** (mains + DC UPS) is provided, unit control and ventilation always remain active, **even in the event of a mains failure**. If the unit is configured as a Free-Cooling version (upon request), the damper will continue to operate, too, and this guarantees **operational continuity for the conditioning system**.



### Easier scheduled maintenance

The unit has been accurately designed to ensure **frontal access to components** even with the unit running. This aspect, combined with full extractability of filters and Free-Cooling damper (if any), **facilitates routine maintenance operations**.



### Efficiency and precision

The range includes compressors with Brushless DC motors. As the thermal load changes, the integrated microprocessor allows combined modulation of air flow - via control of the EC fans and cooling capacity, by managing the speed of the DC inverter compressors (supplied as standard). This ensures **not only accurate adjustment of environmental hygrothermal parameters, but also maximised energy savings at partial loads, particularly if in combination with direct Free-Cooling**.

### Unit suitable for any kind of climate and environment

Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- In the case of extremely cold climates (down to -40°C) **a version for low external temperatures is available**. In this option, the unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system.
- In the case of **exposure to aggressive atmospheric agents** such as sand, **an epoxy powder painted condensing coil is available**.



NTD-NTU-NTX		0851	1101	1701	2501
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>					
Cooling capacity	kW	8.5	11.2	16.1	26.4
Total absorbed power	kW	3.2	4.5	6.2	9
EER		3.1	3.15	3.23	3.66
SHR		0.92	1	1	1
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>					
Cooling capacity	kW	8.9	11.8	17.1	27.9
Total absorbed power	kW	3.2	4.6	6.2	9.1
EER		3.17	3.28	3.38	3.81
SHR		0.99	1	1	1
Air flow rate	m <sup>3</sup> /h	1800	3020	4000	6500
Power supply	V/ph/Hz	230/1/50		400/3+N/50	
Dimensions [LxHxD]	mm	598x1850x550	1008x1850x550	1158x1850x551	1500x2050x805

Performance data relating to Downflow versions. | Also available with 60 Hz power supply. | Units also available in Upflow models except sizes 0851-1701.

INVERTER lineup

NTG

MODULATING INDOOR MONOBLOCK UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT - DISPLACEMENT VERSION

7-9 kW



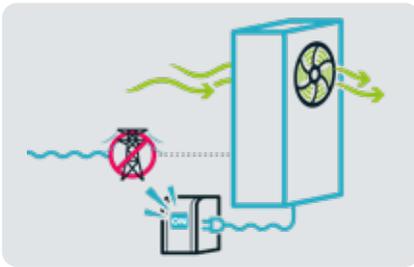
Our NTG series conditioners with inverter compressor are indoor monobloc units designed for small equipment rooms and telecom shelters. Their special configuration with **displacement air delivery** makes these units ideal **for spaces without double flooring**. Thanks to the various configurations available, the range is **very versatile and thus suited to many system set-ups**; additionally, the **accurate thermodynamic and aeraulic distribution design enhances energy efficiency**.



Simple and fast installation

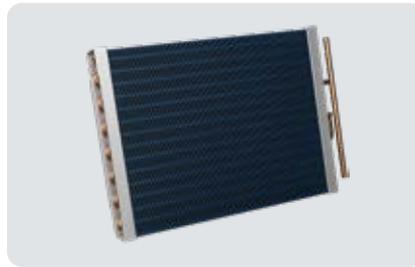
The monobloc construction ensures **fast installation** with no need to provide on-site refrigeration connecting piping. Thanks to the **Plug&Play** configuration, wall mounting and electrical connection of the unit are **considerably simplified**. The unit has been designed to be installed directly on the door or on the wall of the shelter. The special internal design **facilitates front access to the components, even with the unit running**. This aspect, combined with full extractability of filters and Free-Cooling damper (if any), **facilitates routine maintenance operations**.

- Refrigerant R410A
- Version available with dual power supply for emergencies: 230/400V network and 24/48VDC backup supply
- Electronic expansion valve (optional)
- Condensing side fans available with EC motor
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Control panel in separate enclosure
- Electric heating function (optional)
- Fans on evaporating side with standard EC motor
- Temperature control through heating and re-heating systems using electric resistances (optional)
- HiPro control with programmable microprocessor
- Unit connectable to LAN



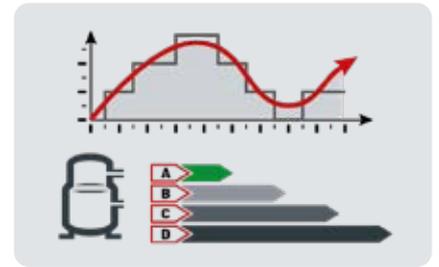
### Maximised Redundancy

If **dual power supply** (mains + DC UPS) is provided, unit control and ventilation always remain active, **even in the event of a mains failure**. If the unit is configured as a Free-Cooling version (upon request), the damper will continue to operate, too, and this guarantees **operational continuity for the conditioning system**.



### Shelter safety

All models in the NTG range feature evaporating coils with hydrophilic coating. This special coating - together with adequate adjustment of air through-flow speeds - **helps condensate collection during the dehumidification process, preventing any dripping on the inside and outside of the unit**.



### Efficiency and precision

As the thermal load changes, the integrated microprocessor allows for combined modulation of the air flow - via standard EC fans and cooling capacity control, by adjusting the speed of the DC inverter compressors supplied as standard. This ensures **accurate adjustment of environmental hygrothermal parameters and maximised energy savings at partial loads**.

### Maximised energy saving with direct Free-Cooling

The units can, on request, be equipped with a **direct Free-Cooling** module. This system, which can also be retrofitted on site to a unit already in operation, reduces compressor work requirements and, under full Free-Cooling conditions, allows the compressor to be turned off, **with major benefits for the system's PUE (Power Usage Effectiveness)**.

### Unit suitable for any kind of climate and environment

Different configurations and layouts are available, according to the setting in which the unit is to be installed:

- In the case of extremely cold climates (down to -40°C) **a version for low external temperatures is available**. In this option, the unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system.
- In the case of **exposure to aggressive atmospheric agents** such as sand, **an epoxy powder painted condensing coil is available**.



NTG		0060	0085
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>			
Cooling capacity	kW	6.6	8.3
Total absorbed power	kW	2.5	3.4
EER		3.45	3.03
SHR		0.9	0.89
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>			
Cooling capacity	kW	6.9	8.6
Total absorbed power	kW	2.5	3.4
EER		3.54	3.09
SHR		0.95	0.95
Air flow rate	m <sup>3</sup> /h	1500	1800
Power supply	V/ph/Hz	230/1/50	
Dimensions [LxHxD]	mm	730x1640x400	930x1640x400

Also available with 60 Hz power supply.



# OUTDOOR MONOBLOC UNIT

# HTW/HTWD

## OUTDOOR MONOBLOC UNITS FOR SHELTERS DESIGNED FOR TECHNOLOGICAL EQUIPMENT

4-40 kW



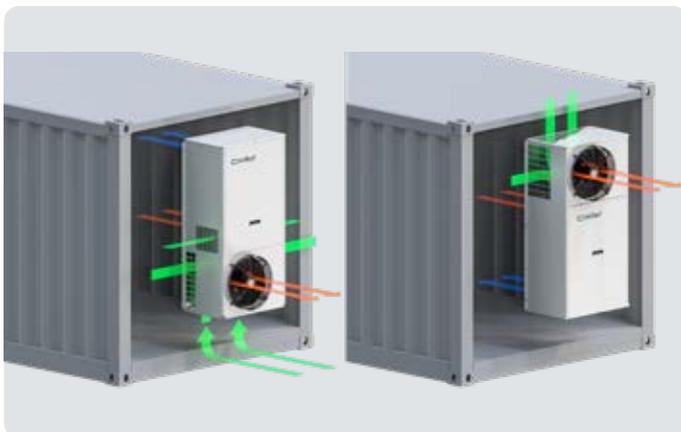
HTW



HTWD

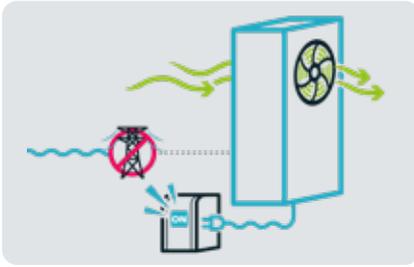
The conditioners of the HTW-HTWD series are monobloc units designed for the air conditioning of small- and medium-sized telephone exchange centres. Designed for **external wall mounting**, they are suitable for conditioning control centres with limited internal space or space entirely taken up by technological equipment. The rational layout of the components, combined with the wide range of accessories available, make the units **easy to install** and **suitable for different shelter configurations**; the **accurate thermodynamic and aeraulic design enhances energy efficiency**.

- Available refrigerants: R410A, R513A and R134a
- Version available with dual power supply for emergencies: 230/400V network and 24/48VDC backup supply
- Stainless steel condensate drain pan
- Evaporating and condensing side fans available with EC motor
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Epoxy powder painted structural metalwork supplied as standard on HTWD. Peraluman 5005 aluminium alloy metalwork supplied as standard with HTW
- Dehumidification function (optional)
- Electronic expansion valve (optional)
- Electric heating function (optional)
- Temperature control through heating and re-heating systems using electric resistances (optional)
- HiPro control with programmable microprocessor
- Unit connectable to LAN



### Maximised shelter internal space

The HTW-HTWD series units are designed to be installed **outside the shelter**. In this way it is possible to make **the most of the internal space** which can thus be used entirely for IT equipment installation.



**Maximised Redundancy**

If **dual power supply** (mains + DC UPS) is provided, unit control and ventilation always remain active, **even in the event of a mains failure**. If the unit is configured as a Free-Cooling version (upon request), the damper will continue to operate, too, and this guarantees **operational continuity for the conditioning system**.

**Easier scheduled maintenance**

The unit has been accurately designed to ensure **frontal access to components- even with the units running**. This aspect, combined with full extractability of filters and Free-Cooling damper (if any), **facilitates routine maintenance operations**.

**Shelter safety**

All models in the monobloc outdoor range feature standard evaporating coils with hydrophilic coating. This special coating - together with adequate adjustment of air through-flow speeds - **helps condensate collection during the dehumidification process, preventing any dripping on the inside and outside of the unit**.

**Unit suitable for any kind of climate and environment**

Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- **The high temperature version with R134a or R513A refrigerant and specific condensing fan** is suitable for facilities or systems with outside air temperature above 45°C. The unit configured with an EC fan and an electronic expansion valve is able to start up even under extreme temperature conditions (60°C indoors and 60°C outdoors).
- In the case of extremely cold climates (down to -40°C) **a version for low external temperatures is available**. In this option, the outdoor unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system.
- In case of exposure to aggressive atmospheric agents such as sand or sunlight, the **outdoor unit metalwork can be ordered with double 160 µm paint finishing layer or in AISI 304 stainless steel alloy**. An epoxy powder painted condensing coil is also available.

**Maximised energy saving with direct Free-Cooling**

The units can, on request, be equipped with a **direct Free-Cooling** module. This system, which can also be retrofitted on site to a unit already in operation, reduces compressor work requirements and, under full Free-Cooling conditions, allows the compressor to be turned off, **with major benefits for the system's PUE (Power Usage Effectiveness)**.

**Simple and fast installation**

The monobloc construction ensures **fast installation** with no need to provide on-site refrigeration connecting piping. Thanks to the **Plug&Play** configuration, wall mounting and electrical connection of the unit are **considerably simplified**. Rain shields are available on request for installation on the external wall.

	HTW	HTW / HTWD								HTW						
	0351	0451	0561	0731	0901	1051	1201	1451	0902	1102	1302	2302	2902	2001	3201	
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>																
Cooling capacity	kW	4.2	4.3	5.9	7.1	10.1	10.8	12.7	14.4	8	11.1	14.2	22.8	28.2	19.9	37.8
Total absorbed power	kW	1.5	1.3	1.9	2.4	3.2	3.9	5.2	5.1	2.4	4.2	5.1	7.4	10.3	7.6	10.3
EER		3.81	4.18	3.52	3.55	3.54	3.4	2.84	3.28	3.84	3.2	3.28	3.44	2.95	3.03	4.7
SHR		1	1	0.88	0.92	0.92	0.98	0.91	0.92	1	0.86	0.89	1	0.95	0.94	1
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>																
Cooling capacity	kW	4.5	4.6	6.1	7.5	10.5	11.5	13.3	15	8.6	11.5	14.8	24.5	29.5	20.8	40.1
Total absorbed power	kW	1.5	1.3	2	2.4	3.2	3.9	5.3	5.2	2.5	4.2	5.1	7.4	10.4	7.7	10.4
EER		3.99	4.39	3.59	3.68	3.7	3.61	2.91	3.37	4.06	3.28	3.38	3.66	3.03	3.13	4.98
SHR		0.99	1	0.93	0.98	0.97	1	0.96	0.96	1	0.9	0.94	1	0.99	0.98	1
<b>R513A - Indoor air 27°C - 40% / Outdoor air 35°C</b>																
Cooling capacity	kW	-	5.3	6.2	7.1	8.7	11.1	12.9	13.7	-	-	-	25.6	27	17	34.8
Total absorbed power	kW	-	1.5	2	2.3	2.8	3.7	4.2	4.8	-	-	-	8.7	10	5.5	9.4
EER		-	4.16	3.66	3.66	4.28	4.08	4.03	3.63	-	-	-	3.75	3.33	3.91	4.93
SHR		-	0.99	0.91	0.97	0.99	0.98	0.98	0.98	-	-	-	0.99	0.98	1	1
<b>R513A - Indoor air 30°C - 35% / Outdoor air 35°C</b>																
Cooling capacity	kW	-	5.6	6.4	7.5	9.3	11.8	13.6	14.3	-	-	-	27.1	28.5	18	37.2
Total absorbed power	kW	-	1.5	2	2.4	2.8	3.7	4.2	4.8	-	-	-	8.8	10.1	5.6	9.5
EER		-	4.38	3.78	3.85	4.51	4.27	4.2	3.76	-	-	-	3.92	3.46	4.06	5.18
SHR		-	1	0.93	1	1	1	1	1	-	-	-	0.99	1	1	1
Air flow rate	m³/h	1400	1450		2150	3020				2800		6500		4400		10000
Power supply	V/ph/Hz		230/1/50			400/3+N/50				230/1/50		400/3+N/50				
Dimensions [LxHxD]	mm	770x1315x585	804x1580x498			999x1630x596				999x1790x596		1600x2100x600		1150x2250x655	1150x2260x655	2530x2260x975

Performance data relating to HTW versions. | Also available with 60 Hz power supply. | Units also available in HTWD models except sizes 0351-0902-1102-1302-2302-2902-2001-3201.

INVERTER lineup

# NTW/NTWD

## MODULATING OUTDOOR MONOBLOCK UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

8-20 kW



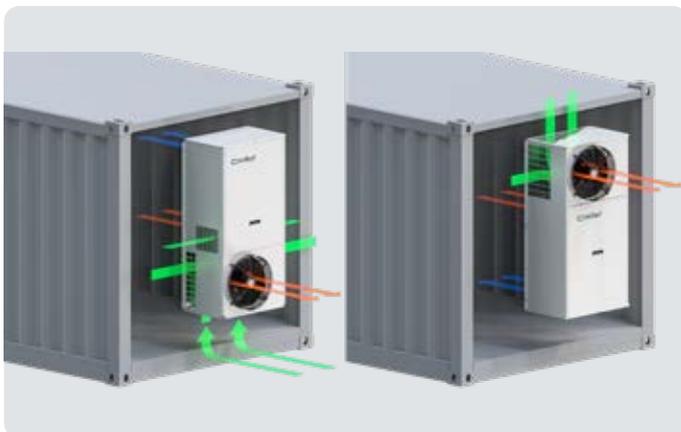
NTW



NTWD

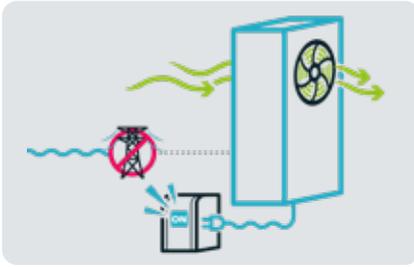
The conditioners of the NTW-NTWD series are monobloc units designed for the air conditioning of small- and medium-sized telephone exchange centres. Designed for **external wall mounting**, they are suitable for conditioning control centres with limited internal space or space entirely taken up by technological equipment. The rational layout of the components, combined with the wide range of accessories available, make the units **easy to install** and **suitable for different shelter configurations**; the **accurate thermodynamic and aeraulic design enhances energy efficiency**.

- Refrigerant R410A
- Version available with dual power supply for emergencies: 230/400V network and 24/48VDC backup supply
- Stainless steel condensate drain pan
- Condensing side fans available with EC motor
- Modulating brushless DC compressors
- Fans on evaporating side with standard EC motor
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Epoxy powder painted structural metalwork supplied as standard on NTWD. Peraluman 5005 aluminium alloy metalwork supplied as standard with NTW
- Dehumidification function (optional)
- Electronic expansion valve (optional)
- Electric heating function (optional)
- Temperature control through heating and re-heating systems using electric resistances (optional)
- HiPro control with programmable microprocessor
- Unit connectable to LAN



### Maximised shelter internal space

The NTW-NTWD series units are designed to be installed **outside the shelter**. In this way it is possible to make **the most of the internal space** which can thus be used entirely for IT equipment installation.



**Maximised Redundancy**

If **dual power supply** (mains + DC UPS) is provided, unit control and ventilation always remain active, **even in the event of a mains failure**. If the unit is configured as a Free-Cooling version (upon request), the damper will continue to operate, too, and this guarantees **operational continuity for the conditioning system**.



**Easier scheduled maintenance**

The unit has been accurately designed to ensure **frontal access to components- even with the units running**. This aspect, combined with full extractability of filters and Free-Cooling damper (if any), **facilitates routine maintenance operations**.



**Shelter safety**

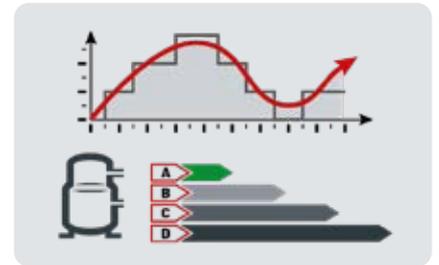
All models in the monobloc outdoor range feature standard evaporating coils with hydrophilic coating. This special coating - together with adequate adjustment of air through-flow speeds - **helps condensate collection during the dehumidification process, preventing any dripping on the inside and outside of the unit**.

**Simple and fast installation**

The monobloc construction ensures **fast installation** with no need to provide on-site refrigeration connecting piping. Thanks to the **Plug&Play** configuration, wall mounting and electrical connection of the unit **are considerably simplified**. Rain shields are available on request for installation on the external wall.

**Maximised energy saving with direct Free-Cooling**

The units can, on request, be equipped with a **direct Free-Cooling** module. This system, which can also be retrofitted on site to a unit already in operation, reduces compressor work requirements (partial Free-Cooling) and, under full Free-Cooling conditions, allows the compressor to be turned off, **with major benefits for the system's PUE (Power Usage Effectiveness)**.



**Efficiency and precision**

As the thermal load changes, the integrated microprocessor allows for combined modulation of the air flow - via standard EC fans and cooling capacity control, by adjusting the speed of the DC inverter compressors supplied as standard. This ensures **accurate adjustment of environmental hygrothermal parameters and maximised energy savings at partial loads**.

**Unit suitable for any kind of climate and environment**

Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- In the case of extremely cold climates (down to -40°C) **a version for low external temperatures is available**. In this option, the unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system. The Free-Cooling damper heated by electric heaters and equipped with a specific servomotor is also available.
- In case of exposure to aggressive atmospheric agents such as sand or sunlight, dedicated **external metalwork can be ordered with double 160 µm paint finishing layer or in AISI 304 stainless steel alloy**. An **epoxy powder painted condensing coil is also available**.

NTW-NTWD		0851	1101	1451	2001
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>					
Cooling capacity	kW	8.2	9.4	15.2	19.4
Total absorbed power	kW	2.8	3.4	5.8	7.1
EER		4.17	3.63	3.08	3.24
SHR		1	0.94	0.96	0.99
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>					
Cooling capacity	kW	8.8	9.8	15.8	20.4
Total absorbed power	kW	2.8	3.4	5.9	7.2
EER		4.41	3.76	3.17	3.36
SHR		1	1	0.99	1
Air flow rate	m³/h	2300		3020	4400
Power supply	V/ph/Hz	230/1/50		400/3+N/50	
Dimensions [LxHxD]	mm	847x1580x500		1047x1840x605	1150x2250x655

Performance data relating to Upflow versions. | Also available with 60 Hz power supply. | Units also available in Downflow models except size 2001.





# ROOFTOP

# HTR

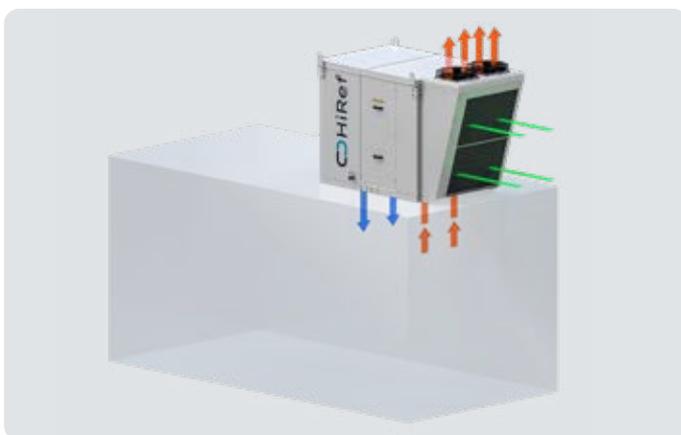
## ROOFTOP UNITS FOR CONTAINER AIR CONDITIONING

7-64 kW



HTR rooftops are direct expansion air-cooled units developed and designed for container air conditioning. They represent the simplest solution for the air conditioning of CEDs inside containers; this is thanks to the **external positioning** of the shelter and the **easy installation** typical of single-block versions. The internal design and the careful choice of components are designed to provide the unit with **maximum energy efficiency**, to obtain **the highest savings in terms of operating costs of the cooling system**.

- Available refrigerants: R410A, R513A and R134a
- Temperature control through heating and re-heating systems using electric resistances (optional)
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Electrical panel in overpressure for the utmost safety
- Configurable with side intake and delivery
- Epoxy powder painted structural metalwork supplied as standard
- Condensing side fans available with EC motor
- Fans on evaporating side with standard EC motor
- Dehumidification function (optional)
- Electronic expansion valve (optional)
- Evaporating side fans with EC motor as standard
- HiPro control with programmable microprocessor
- Unit connectable to LAN



### Maximised shelter internal space

HTR Rooftop units are designed to be installed **outside shelters**. This translates into **optimisation of internal space** that can be used exclusively for installation of the server racks.



### Maximum efficiency

The use of EC electronic switching fans (as part of the standard equipment) in the evaporating section **minimises ventilation costs, helping boost the unit energy efficiency.**

### Complete accessibility

All Rooftop HTR components are easily accessible by removing the unit's removable side panels. This solution greatly **facilitates all scheduled and unscheduled maintenance operations.**

### Unit suitable for any kind of climate and environment

Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- **The high temperature version with R134a or R513A refrigerant and specific condensing fan** is suitable for facilities or systems with outside air temperature above 45°C. The unit configured with an EC fan and an electronic expansion valve is able to start up even under extreme temperature conditions (60°C indoors and 60°C outdoors).
- In the case of extremely cold climates (down to -40°C) **a version for low external temperatures is available.** In this option, the outdoor unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system.
- In case of exposure to aggressive atmospheric agents such as sand or sunlight, the **outdoor unit metalwork can be ordered with double 160 µm paint finishing layer or in AISI 304 stainless steel alloy.** An epoxy powder painted condensing coil is also available.



HTR		0701	1201	1601	1801	2501	3201	5602
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>								
Cooling capacity	kW	6.8	11.6	15.2	17.6	24.8	33	59.8
Total absorbed power	kW	2.5	4.2	5.5	5.5	8.5	11.1	20.6
EER		4.24	3.54	3.48	4.25	3.73	3.73	3.97
SHR		1	1	1	1	1	0.99	1
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>								
Cooling capacity	kW	7.3	12.4	16.1	18.8	26.3	34.9	63.4
Total absorbed power	kW	2.6	4.2	5.5	5.6	8.5	11.2	20.7
EER		4.4	3.77	3.64	4.48	3.9	3.89	4.16
SHR		1	1	1	1	1	1	1
<b>R513A - Indoor air 27°C - 40% / Outdoor air 35°C</b>								
Cooling capacity	kW	8.3	12.6	15.4	17.4	24.9	30.5	60.5
Total absorbed power	kW	2.7	3.6	4.8	4.9	7.7	10	20.3
EER		4.47	4.62	4.18	4.91	4.25	3.89	4.08
SHR		0.99	1	0.99	0.99	0.99	1	1
<b>R513A - Indoor air 30°C - 35% / Outdoor air 35°C</b>								
Cooling capacity	kW	8.8	13.3	16.4	18.6	26.6	32.4	64.3
Total absorbed power	kW	2.8	3.7	4.8	5	7.8	10.2	20.6
EER		4.71	4.83	4.4	5.18	4.45	4.03	4.27
SHR		1	0.99	1	0.99	1	0.99	0.99
Air flow rate	m <sup>3</sup> /h	2500	4000	4800	6000	8000	9000	17000
Power supply	V/ph/Hz				400/3+N/50			
Dimensions [LxHxD]	mm	910x1630x2300			1200x1630x2300		2060x1630x2300	

Also available with 60 Hz power supply.

INVERTER lineup

# NTR

## MODULATING ROOFTOP UNITS FOR CONTAINER AIR CONDITIONING

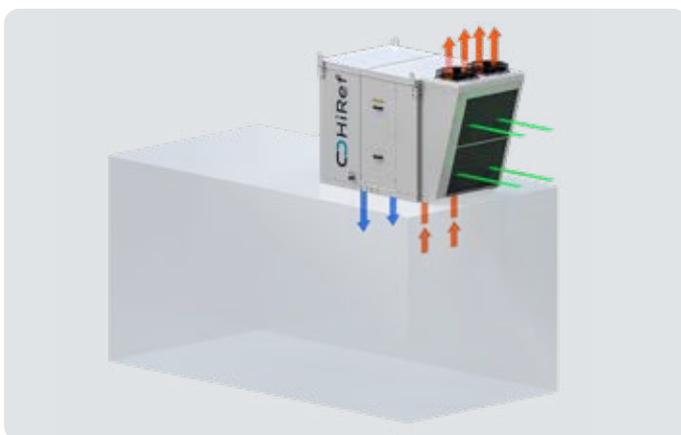
31-41 kW



 MULTI-PROTOCOL COMMUNICATION INTERFACE	 CORROSION RESISTANT MATERIAL	 EC RADIAL FANS
 SCROLL COMPRESSORS	 INVERTER DRIVEN COMPRESSORS	

NTR rooftops are direct expansion air-cooled units developed and designed for container air conditioning. **They represent the simplest solution for the air conditioning of CEDs inside containers;** this is thanks to the **external positioning of the shelter and the easy installation typical of single-block versions.** The internal design and the careful choice of components are designed to provide the unit with **maximum energy efficiency, so as to obtain the highest savings in terms of operating costs of the cooling system.**

- Refrigerant R410A
- Configurable with side intake and delivery
- Version for low outdoor temperatures (-40°C) available
- Modulating brushless DC compressors
- Temperature control through heating and re-heating systems using electric resistances (optional)
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Fans on evaporating side with standard EC motor
- Electrical panel in overpressure for the utmost safety
- Epoxy powder painted structural metalwork supplied as standard
- Condensing side fans available with EC motor
- Dehumidification function (optional)
- Electronic expansion valve (optional)
- HiPro control with programmable microprocessor
- Unit connectable to LAN



### Maximised shelter internal space

NTR Rooftop units are designed to be installed **outside shelters.** This translates into **optimisation of internal space** that can be used exclusively for installation of the server racks.



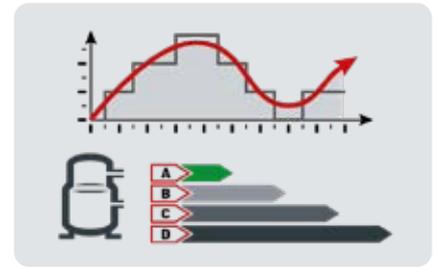
### Maximum efficiency at partial loads

The use of EC electronic switching fans (as part of the standard equipment) in the evaporating section **minimises ventilation costs, helping boost the unit energy efficiency, particularly at partial loads.**



### Complete accessibility

All Rooftop NTR components are easily accessible by removing the unit's removable side panels. This solution greatly **facilitates all scheduled and unscheduled maintenance operations.**



### Efficiency and precision

As the thermal load changes, the integrated microprocessor allows for combined modulation of the air flow - via standard EC fans and cooling capacity control, by adjusting the speed of the DC inverter compressors supplied as standard. This ensures **accurate adjustment of environmental hygrothermal parameters and maximised energy savings at partial loads.**

### Unit suitable for any kind of climate and environment

Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- In the case of extremely cold climates (down to  $-40^{\circ}\text{C}$ ) **a version for low external temperatures is available.** In this option, the unit is equipped with special condensing fans to be able to operate at low temperatures, an electrically heated switchboard, double compressor casing heaters, and condenser coil flooding system.
- In case of exposure to aggressive atmospheric agents such as sand or sunlight, **the outdoor unit metalwork can be ordered with double 160  $\mu\text{m}$  paint finishing layer or in AISI 304 stainless steel alloy.** An epoxy powder painted condensing coil is also available.



NTR		2501	3201
<b>R410A - Indoor air 27°C - 40% / Outdoor air 35°C</b>			
Cooling capacity	kW	31.2	39.6
Total absorbed power	kW	12.7	15.6
EER		2.86	2.95
SHR		0.94	0.95
<b>R410A - Indoor air 30°C - 35% / Outdoor air 35°C</b>			
Cooling capacity	kW	32.9	41.3
Total absorbed power	kW	12.9	15.8
EER		2.97	3.03
SHR		1	1
Air flow rate	m <sup>3</sup> /h	8000	9000
Power supply	V/ph/Hz	400/3+N/50	
Dimensions [LxHxD]	mm	1200x1630x2300	

Also available with 60 Hz power supply.



# FREE COOLING BOX

# FCB

## DIRECT FREE-COOLING UNIT FOR SHELTERS DESIGNED FOR TECHNOLOGICAL EQUIPMENT

500 - 3500 m<sup>3</sup>/h

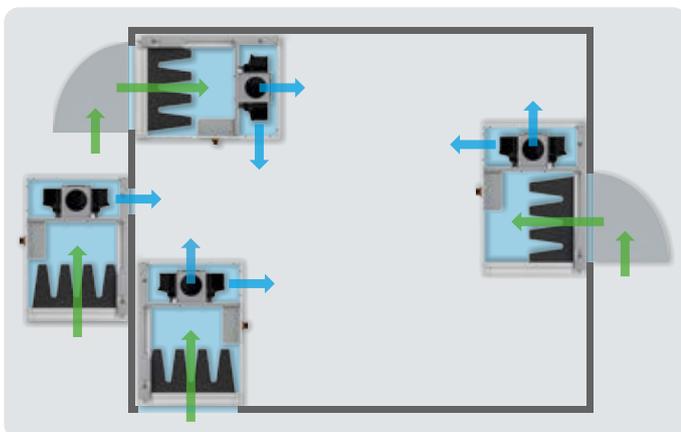


**With damper ON REQUEST**

FCB is a ventilating unit for the air conditioning of telephone exchange facilities and shelters.

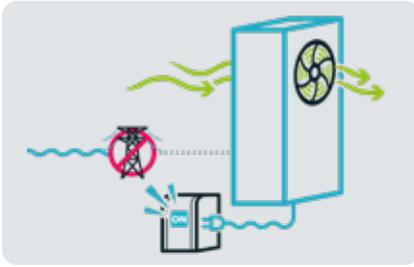
Designed **for ceiling or wall mounting**, it is suitable for air conditioning of control centres with limited internal space or space entirely taken up by technological equipment. The rational arrangement of the components across the machine makes FCB **easy to install and suitable for different configurations of the shelter**. The unit can interface with pre-existing air conditioning units in order **to increase the energy efficiency of the system and make the most of the advantages offered by direct Free-Cooling**.

- Modbus RTU interface
- Rigid pocket air filters with high filtering power



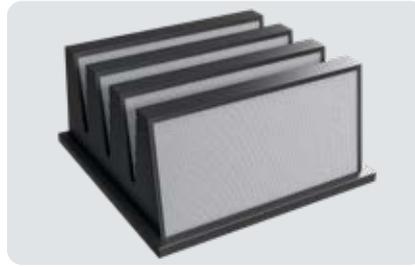
### Simple and fast installation

FCB is designed to ensure **maximum installation flexibility inside and outside the shelter**. Regardless of its configuration, it can be installed on the walls, floor and ceiling of the facility or, alternatively, outside the shelter. In any case, **installing the unit is fast and easy**.



**Maximised Redundancy**

Depending on the electrical specifications of the system, the unit can be set up with **230/1/50 power supply or with 24VDC or 48VDC direct current power supply.**



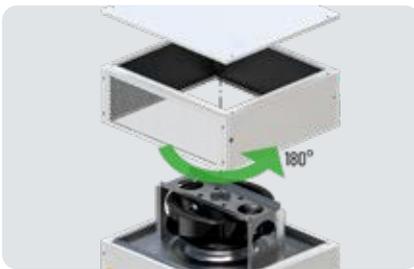
**Shelter safety**

As standard, FCB units are equipped with **high efficiency F7 filters**, essentially important to prevent dust and pollutants from entering the shelter when using Direct Free-Cooling as the main source of cooling.



**Easier scheduled maintenance**

The unit has been accurately designed to ensure **frontal access to components.** This aspect, combined with full extractability of filters and of the mixing damper (if available), makes **routine maintenance operations easier.**



**Maximised configurability of the air flow**

The FCB range has been designed to allow **customization of the air flows to meet any system requirement.** By rotating the upper unit module, the direction of the air delivery flow can be changed as desired, while intake can be obtained from the bottom or from the rear, based on the positioning of the grilled panel.



**Low temperature design**

If the unit needs to be installed in environments characterised by very low outside temperatures, it is possible to install **an additional damper for mixing the air flows.** When the supply air temperature falls below a given threshold, the extra damper opens, recirculating part of the internal ambient air.

**Integration in the mechanical system**

FCB allows users **to implement or enhance the Free-Cooling function in air conditioning systems that do not feature it,** interfacing with all units, including non-HiRef brands. In this way, the unit energy consumption is significantly reduced.

Standard FCB interfaces:

- air conditioning systems
- overpressure dampers
- electric heating systems

**Highest internal configurability**

Depending on the ambient conditions, it is possible to operate **Free-Cooling only, Free-Cooling with recirculation by means of a pressure relief damper,** or to operate a **mechanical cooling/heating system.**

FCB	0036	
	<b>Indoor air 27°C - 40% / Outdoor air 12°C</b>	
Cooling capacity	kW	2.4   17.1
	<b>Indoor air 27°C - 40% / Outdoor air 17°C</b>	
Cooling capacity	kW	1.6   11.4
	<b>Indoor air 27°C - 40% / Outdoor air 7°C</b>	
Cooling capacity	kW	3.2   22.8
Air flow rate	m <sup>3</sup> /h	500   3500
Power supply	V/ph/Hz	48 Vdc
Dimensions [LxHxD]	mm	670x870x610

Also available with alimентация 230/1/50 and 60 Hz



 HiRef

The background features a complex, abstract pattern of glowing, fiber-optic-like lines that swirl and radiate outwards from a central dark circular void. The lines are composed of numerous fine, parallel strands, creating a sense of depth and movement. The overall color palette is a range of blues, from deep navy to bright cyan, with the glowing lines providing a high-contrast, ethereal effect.

# INNOVATORS

above the standards



CATALOGUE  
**SHELTER and TLC**



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