HiRef

CATALOGUE
TLC

Split

	APPLICATIONS	SYSTEM TYPE	VERSIONS	RANGE	
 **HTS**	SPLIT UNIT FOR SHELTERS DESIGNED FOR IT EQUIPMENT TELECOMMUNICATIONS		MC	3-41 (kW)	PAGE 3
 **NTS**	SPLIT UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EQUIPMENT TELECOMMUNICATIONS		MC	9-38 (kW)	PAGE 4

Outdoor monobloc unit

	APPLICATIONS	SYSTEM TYPE	VERSIONS	RANGE	
 **HTW HTWD**	OUTDOOR MONOBLOC UNITS FOR SHELTERS DESIGNED FOR TECHNOLOGICAL EQUIPMENT TELECOMMUNICATIONS			4-40 (kW)	PAGE 10
 **NTW NTWD**	OUTDOOR MONOBLOC UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EQUIPMENT TELECOMMUNICATIONS			9-22 (kW)	PAGE 11

Indoor monobloc unit

	APPLICATIONS	SYSTEM TYPE	VERSIONS	RANGE	
 **HTD/U/X**	INDOOR MONOBLOC UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT TELECOMMUNICATIONS			4-29 (kW)	PAGE 6
 **NTD/U/X**	INDOOR MONOBLOC MODULATING UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT TELECOMMUNICATIONS			9-27 (kW)	PAGE 7
 **NTG**	INDOOR MONOBLOC UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EQUIPMENT - DISPLACEMENT VERSION TELECOMMUNICATIONS			7-9 (kW)	PAGE 8

Rooftop

	APPLICATIONS	SYSTEM TYPE	VERSIONS	RANGE	
 **HTR**	ROOFTOP FOR PRECISION AIR CONDITIONING TELECOMMUNICATIONS			7-63 (kW)	PAGE 13
 **NTR**	ROOFTOP AIR CONDITIONING UNIT WITH MODULATING COMPRESSORS FOR CONTAINERS TELECOMMUNICATIONS			31-41 (kW)	PAGE 14

Free-Cooling Box

	APPLICATIONS	SYSTEM TYPE	VERSIONS	RANGE	
 **FCB**	DIRECT FREE-COOLING UNIT FOR SHELTERS DESIGNED FOR TECHNOLOGICAL EQUIPMENT TELECOMMUNICATIONS			500-3500 (m3/h)	PAGE 16

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.

HiRef

Split

TELECOMMUNICATIONS

HTS

SPLIT UNIT FOR SHELTERS DESIGNED FOR IT EQUIPMENT

2.9-40.7 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

SCROLL COMPRESSORS

EC RADIAL FANS

CORROSION RESISTANT MATERIAL

Indoor unit

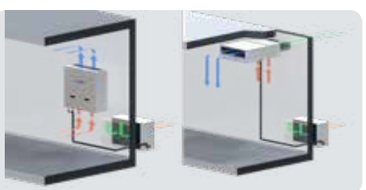
Outdoor unit

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.**

- R410A refrigerant, alternatively available with R513A and R134a
- Version available with dual power supply for emergencies: 230/400V network and 24/48VDC 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 on request
- Electric lamination valve with optional electronic control
- Epoxy powder painted structural metalwork supplied as standard
- Electric heating function on request
- Temperature control through heating and post-heating systems with electric heaters (on request)

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.**

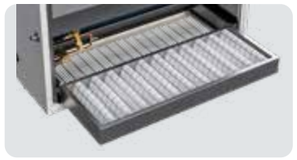


Maximised shelter internal space

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.

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.**



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.**

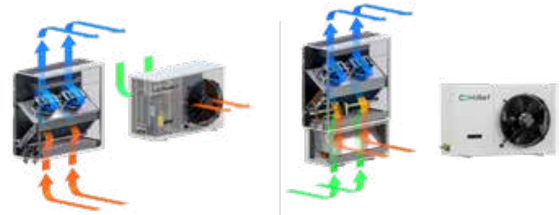
Maximised energy saving with direct Free-Cooling

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).**

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 refrigerant and specific condensing fan** is suitable for facilities or systems with outside air temperature above 45°C. The unit is capable of starting even in extreme 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.



Mechanical cooling

Free-Cooling + renewal

HTS		0251	0351	0451	0561	0731	0901	1051	1201	1451	3101	3811
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C										
Cooling capacity	kW	2.9	4	4.7	6.2	7.5	9.9	10.6	13.4	15.4	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	10.6	13
SHR		1	0.99	1	0.89	0.96	0.92	0.89	0.92	0.86	0.97	0.88
EER		4.44	3.38	4.62	3.78	3.28	3.77	3.82	3.29	2.84	3.45	3.57
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C										
Cooling capacity	kW	3.1	4.2	5	6.5	7.9	10.3	11	14.1	16	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	10.7	13.1
SHR		1	1	1	0.95	1	0.97	0.94	0.97	0.91	1	0.92
EER		4.65	3.47	4.88	3.93	3.44	3.92	3.99	3.41	2.93	3.6	3.69
Indoor unit air flow rate	m³/h	950	930	1400	1400	2300	2300	2300	3200	3200	7750	7750
Outdoor unit air flow rate	m³/h	2300	2050	3450	3350		5100		5580	5450	9300	16280
Power supply		230/1/50					400/3+N/50					
Sound pressure at 2 m in free field	dB	56	56	59	59	59	59	59	61	61	63	63
Sound pressure at 10 m in free field	dB	34	37	37	39	40	37	42	40	42	45	47
Indoor unit dimensions [LxHxD]	mm	650x350x936		1050x350x936					1150x410x1026		1585x685x1096	
Outdoor unit dimensions [LxHxD]	mm	624x541x410		1003x633x420					1121x1128x579		1565 x1275 x605	1965 x1490 x950

Performance data relating to versions with R410A refrigerant. | Also available with 60 Hz power supply. | Indoor unit can only be installed on the ceiling for sizes 3101-3811.

TELECOMMUNICATIONS

NTS

SPLIT UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

9-38 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

EC RADIAL FANS

CORROSION RESISTANT MATERIAL

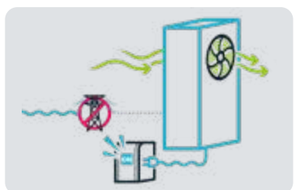
INVERTER DRIVEN COMPRESSORS

Indoor unit

Outdoor unit

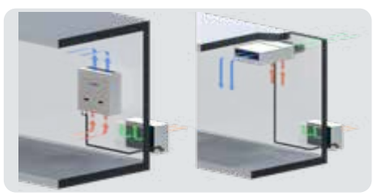
The air conditioners of the NTS series are units specially designed for telephone exchange facilities and shelters. Designed for **ceiling or wall mounting**, they are suitable for air conditioning of control centres with limited internal space or space entirely taken up by technological equipment. The 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 on request
- Electric lamination valve with optional electronic control
- Epoxy powder painted structural metalwork supplied as standard
- Electric heating function on request
- Temperature control through heating and post-heating systems with electric heaters (on request)



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.**

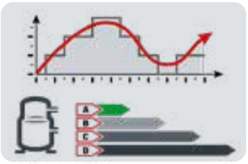
Maximised energy saving with direct Free-Cooling

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).**

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 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.

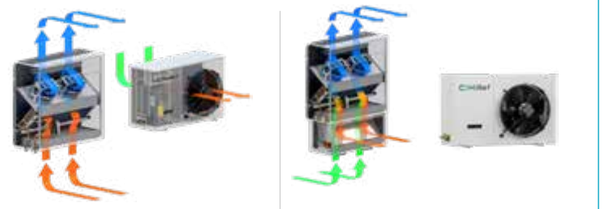


Efficiency and precision

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.**

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.**



Mechanical cooling | Free-Cooling + renewal

NTS		0851	1101	1601	3101
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C			
Cooling capacity	kW	9.4	11	18.5	36.3
Total absorbed power	kW	3.1	3.9	9.3	12.9
SHR		0.97	0.9	0.84	0.93
EER		3.86	3.32	2.15	3.36
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C			
Cooling capacity	kW	9.9	11.5	19.3	37.9
Total absorbed power	kW	3.2	3.9	9.4	13
SHR		1	0.95	0.89	1
EER		3.99	3.41	2.21	3.47
Indoor unit air flow rate	m^3/h	2300	2300	3200	7750
Outdoor unit air flow rate	m^3/h	5100	5580		16300
Power supply		230/1/50	400/3+N/50		
Sound pressure at 2 m in free field	dB	65	65	64	63
Sound pressure at 10 m in free field	dB	43	44	47	46
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.

HiRef

Monobloc for indoor use

TELECOMMUNICATIONS

HTD/U/X

INDOOR MONOBLOC UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

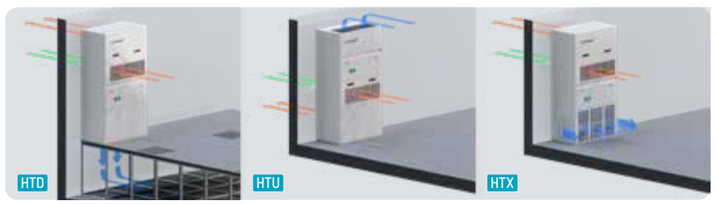
4–29 kW

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**.

- R410A refrigerant, also available with R134a and R513a
- 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 (on request)
- Optional electronically controlled electric lamination valve
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Epoxy powder painted structural metalwork supplied as standard
- Electric heating function (on request)
- Temperature control through heating and post-heating systems with electric heaters (on request)

Simple and fast installation

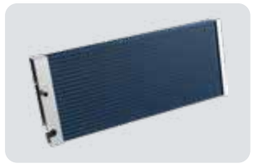
The monobloc construction ensures **fast unit installation** with no need to provide on-site refrigeration piping. Thanks to the **Plug&Play** configuration, wall mounting and electrical connection of the unit are **considerably simplified.** Rain shields are available on request for installation on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



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 refrigerant and specific condensing fan** is suitable for facilities with outside air temperature above 45°C. The unit is capable of starting even in extreme conditions (60°C indoors and 60°C outdoors).
- In the case of exposure to aggressive atmospheric agents such as sand, **an epoxy powder painted condensing coil is available.**
- 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."

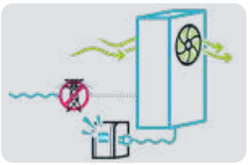


Shelter safety

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.**

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.**



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 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).**

HTD DOWNFLOW	HTU UPFLOW	HTX DISPLACEMENT
		
Mechanical cooling	Mechanical cooling	Mechanical cooling
		
Free-Cooling	Free-Cooling	Free-Cooling

HTD-HTU-HTX		0451	0561	0731	0901	1051	1201	1501	1701	1801	2001	2201	2501
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C											
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
SHR		1	0.9	0.95	0.99	0.98	0.92	0.98	0.94	1	0.99	0.99	0.95
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
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C											
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
SHR		1	0.95	1	1	1	0.96	1	0.99	1	1	1	0.99
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
Rated air flow	m^3/h	1450	1450	2100	3020	3020	3020	3800	3800	5500	5500	6500	6500
Power supply		230/1/50			400/3+N/50								
Sound pressure at 2 m in free field	dB	55	55	55	58	58	58	58	58	66	66	67	68
Dimensions [LxHxD]	mm	800x1850x550			1000x1850x550			1160 x1850 x550		1500x2050x800			

Performance data relating to Downflow versions with R410A refrigerant. | Also available with 60 Hz power supply.

TELECOMMUNICATIONS

NTD/U/X

INDOOR MONOBLOC MODULATING UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

9-27 kW

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**.

- 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
- Modulating brushless DC compressors
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Stainless steel condensate drain pan
- Dehumidification function (on request)
- Electric lamination valve with optional electronic control
- Epoxy powder painted structural metalwork supplied as standard
- Electric heating function (on request)
- Temperature control through heating and post-heating systems with electric heaters (on request)

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.

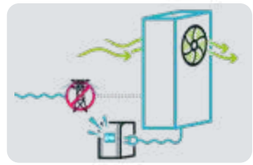
Unit suitable for any kind of climate and environment

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.

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.**

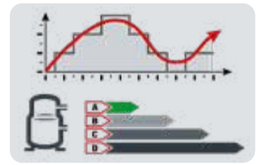


Maximised Redundancy

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 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).**



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.**

NTD DOWNFLOW	NTU UPFLOW	NTX DISPLACEMENT
		
Mechanical cooling	Mechanical cooling	Mechanical cooling
		
Free-Cooling	Free-Cooling	Free-Cooling

NTD-NTU-NTX		0851	1101	1701	2501
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C			
Cooling capacity	kW	8.8	11.3	17.1	25.3
Total absorbed power	kW	3.6	5.2	7.5	10.6
SHR		0.9	1	1	1
EER		3.23	3.11	3.16	3.58
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C			
Cooling capacity	kW	9.1	12	18.1	26.9
Total absorbed power	kW	3.6	5.3	7.6	10.7
SHR		1	1	1	1
EER		3.28	3.23	3.3	3.75
Rated air flow	m³/h	1800	3020	4000	6500
Power supply		230/1/50		400/3+N/50	
Sound pressure at 2 m in free field	dB	61	62	63	69
Dimensions [LxHxD]	mm	598x1850x550	1008x1850x550	1158x1850x551	1500x2050x805

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

TELECOMMUNICATIONS

NTG

INDOOR MONOBLOC UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EQUIPMENT - DISPLACEMENT VERSION

7-9 kW

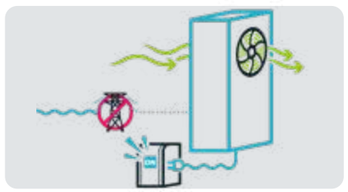
MULTI-PROTOCOL COMMUNICATION INTERFACE

EC RADIAL FANS

INVERTER DRIVEN COMPRESSORS

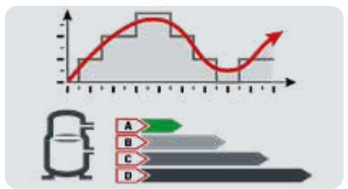
Our NTG series conditioners with inverter compressor are indoor monobloc units designed for small equipment rooms and telecom shelters. Their special configuration with **displacement air delivery** makes these units ideal **for spaces without double flooring**. Thanks to the various configurations available,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

- Refrigerant R410A
- Version available with dual power supply for emergencies: 230/400V network and 24/48VDC backup supply
- Electric lamination valve with optional electronic control
- Condensing side fans available with EC motor
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Control panel in separate enclosure
- Electric heating function (on request)
- Fans on evaporating side with standard EC motor
- Temperature control through heating and post-heating systems with electric heaters (on request)



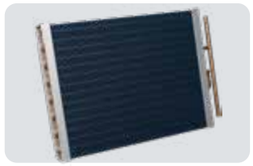
Maximised Redundancy

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.**



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.**



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.**

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.**

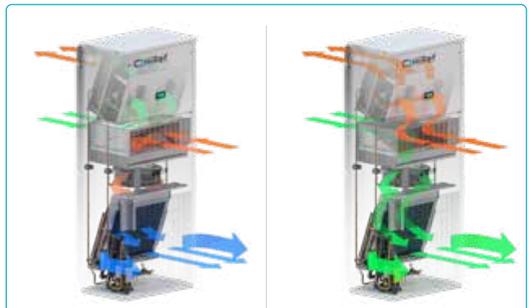
Unit suitable for any kind of climate and environment

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.

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).**



Mechanical cooling | Free-Cooling + renewal

NTG		0060	0085
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C	
Cooling capacity	kW	6.6	8.3
Total absorbed power	kW	2.5	3.4
SHR		0.9	0.89
EER		3.45	3.03
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C	
Cooling capacity	kW	6.9	8.6
Total absorbed power	kW	2.5	3.4
SHR		0.95	0.95
EER		3.54	3.09
Rated air flow	m^3/h	1500	1800
Power supply		230/1/50	
Sound pressure at 2 m in free field	dB	63	64
Dimensions [LxHxD]	mm	730x1640x400	930x1640x400

Also available with 60 Hz power supply.

HiRef

Monobloc for outdoor use

TELECOMMUNICATIONS

HTW-HTWD

OUTDOOR MONOBLOC UNITS FOR SHELTERS DESIGNED FOR TECHNOLOGICAL EQUIPMENT

4-40 kW

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 **accuratethermodynamic and aeraulic design enhances energy efficiency**.

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.

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.

- R410A refrigerant, alternatively available with 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 (on request)
- Electric lamination valve with optional electronic control
- Electric heating function (on request)
- Temperature control through heating and post-heating systems with electric heaters (on request)

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.**

Maximised energy saving with direct Free-Cooling

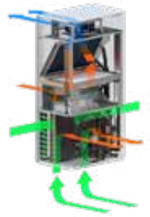
The units can, on request, be equipped with a **direct Free-Cooling** module. This system, which can also be retrofitted on site to a unit already in operation, reduces compressor work requirements and, under full Free-Cooling conditions, allows the compressor to be turned off, **with major benefits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

Unit suitable for any kind of climate and environment

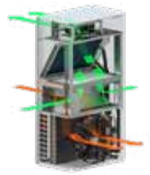
Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- **The high temperature version with R134a refrigerant and specific condensing fan** is suitable for facilities with outside air temperature above 45°C. The unit is capable of starting even in extreme 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 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.

HTW UPFLOW



Mechanical cooling

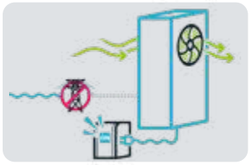


Free-Cooling

HTWD DOWNFLOW

Mechanical cooling

Free-Cooling



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 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.**

HTW-HTWD		0451	0561	0731	0901	1051	1201	1451	0902	1102	1302	2302	2902	3201
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C												
Cooling capacity	kW	4.3	5.9	7.1	10.1	10.8	12.7	14.4	8	11.1	14.2	22.8	28.2	37.8
Total absorbed power	kW	1.3	1.9	2.4	3.2	3.9	5.2	5.1	2.4	4.2	5.1	7.4	10.3	10.3
SHR		1	0.88	0.92	0.92	0.98	0.91	0.92	1	0.86	0.89	1	0.95	1
EER		4.18	3.52	3.55	3.54	3.4	2.84	3.28	3.84	3.2	3.28	3.44	2.95	4.7
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C												
Cooling capacity	kW	4.6	6.1	7.5	10.5	11.5	13.3	15	8.6	11.5	14.8	24.5	29.5	40.1
Total absorbed power	kW	1.3	2	2.4	3.2	3.9	5.3	5.2	2.5	4.2	5.1	7.4	10.4	10.4
SHR		1	0.93	0.98	0.97	1	0.96	0.96	1	0.9	0.94	1	0.99	1
EER		4.39	3.59	3.68	3.7	3.61	2.91	3.37	4.06	3.28	3.38	3.66	3.03	4.98
Rated air flow	m^3/h	1450	1450	2150	3020	3020	3020	3020	2800	2800	2800	6500	6500	10000
Power supply		230/1/50			400/3+N/50				230/1/50		400/3+N/50			
Sound pressure at 2 m in free field	dB	55	56	56	57	57	57	60	58	58	60	68	68	69
Dimensions [LxHxD]	mm	804x1580x498			999x1630x596		999x1790x596					1600x2100x600		2530 x2260 x975

Performance data relating to Upflow versions with R410A refrigerant. | Also available with 60 Hz power supply. | Units also available in Downflow models except sizes 0902-1102-1302-2302-2902-3201.

TELECOMMUNICATIONS

NTW-NTWD

OUTDOOR MONOBLOC UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

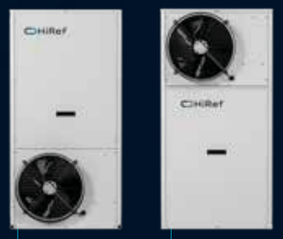
9-22 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

EC RADIAL FANS

INVERTER DRIVEN COMPRESSORS

CORROSION RESISTANT MATERIAL



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**.

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.

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.

- 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 on request
- Electric lamination valve with optional electronic control
- Electric heating function (on request)
- Temperature control through heating and post-heating systems with electric heaters (on request)

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.**

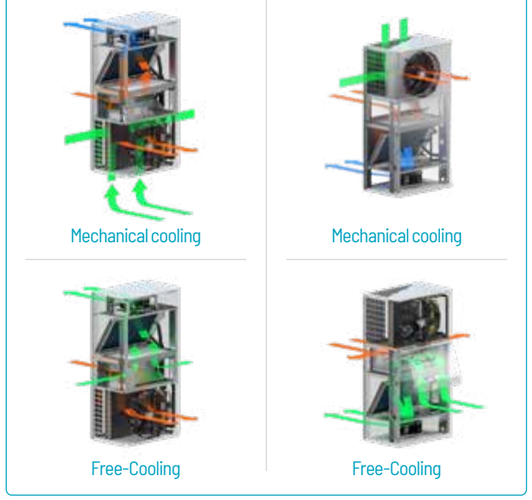
Maximised energy saving with direct Free-Cooling

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).**

Unit suitable for any kind of climate and environment

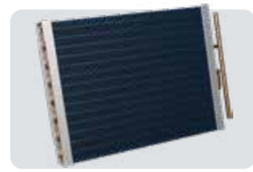
Different configurations and layouts are available, suitable for the setting in which the unit is to be installed.

- 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.



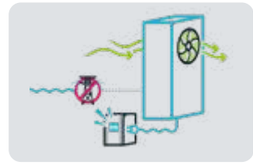
NTW-NTWD		0851	1101	1451	2001
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C			
Cooling capacity	kW	8.6	9.7	12.5	21.3
Total absorbed power	kW	2.7	3.3	4.5	8.8
SHR		1	0.92	1	0.91
EER		4.53	3.88	3.54	2.69
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C			
Cooling capacity	kW	9.1	10	13.3	22
Total absorbed power	kW	2.7	3.3	4.5	8.8
SHR		1	1	1	1
EER		4.69	3.96	3.69	2.75
Rated air flow	m³/h	2300	2300	3020	4400
Power supply		230/1/50		400/3+N/50	
Sound pressure at 2 m in free field	dB	66	66	66	65
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.



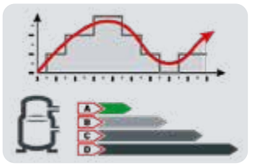
Shelter safety

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.**



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.**



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.**

HiRef

Rooftop

TELECOMMUNICATIONS

HTR

ROOFTOP FOR PRECISION AIR CONDITIONING

7-63 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

SCROLL COMPRESSORS

EC RADIAL FANS

CORROSION RESISTANT MATERIAL

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 tems of operating costs of the cooling system**.

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 refrigerant and specific condensing fan** is suitable for facilities or systems with outside air temperature above 45°C. The unit is capable of starting even in extreme 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.

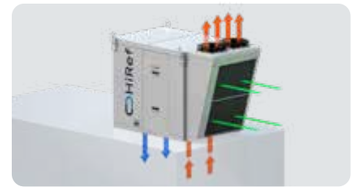
- R410A refrigerant, alternatively available with R513A and R134a
- Temperature control through heating and post-heating systems with electric heaters (on request)
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Electrical panel in overpressure for the utmost safety
- Configurable 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 (on request)
- Electric lamination valve with optional electronic control
- Configurabile con aspirazione e mandata laterali
- Evaporating side fans with EC motor as standard

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.**

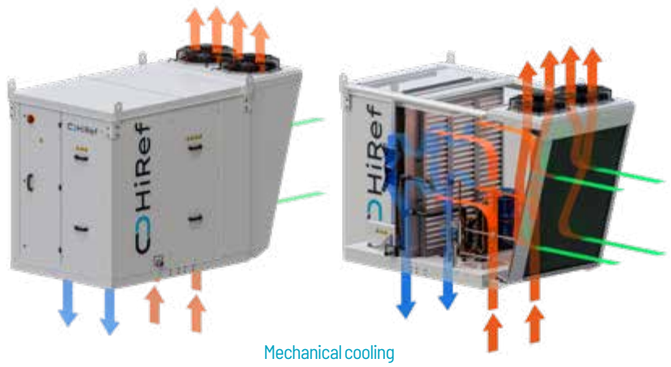
Complete accessibility

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



Maximised shelter internal space

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



Mechanical cooling

HTR		0701	1201	1601	1801	2501	3201	5602
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C						
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
SHR		1	1	1	1	1	0.99	1
EER		4.24	3.54	3.48	4.25	3.73	3.73	3.97
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C						
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
SHR		1	1	1	1	1	1	1
EER		4.4	3.77	3.64	4.48	3.9	3.89	4.16
Rated air flow	m³/h	2500	4000	4800	6000	8000	9000	17000
Power supply					400/3+N/50			
Sound pressure at 2 m in free field	dB	59	67	73	64	72	74	74
Dimensions [LxHxD]	mm	910x1630x2300			1200x1630x2300			2060x1630x2300

Performance data relating to versions with R410A refrigerant. | Also available with 60 Hz power supply.

TELECOMMUNICATIONS

NTR

ROOFTOP AIR CONDITIONING UNIT WITH MODULATING COMPRESSORS FOR CONTAINERS

31–41 kW

MULTI-PROTOCOL COMMUNICATION INTERFACE

SCROLL COMPRESSORS

EC RADIAL FANS

CORROSION RESISTANT MATERIAL

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 tems of operating costs of the cooling system**.

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 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.

- 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 post-heating systems with electric heaters (on request)
- 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 (on request)
- Electric lamination valve with optional electronic control

Maximum efficiency at partial loads

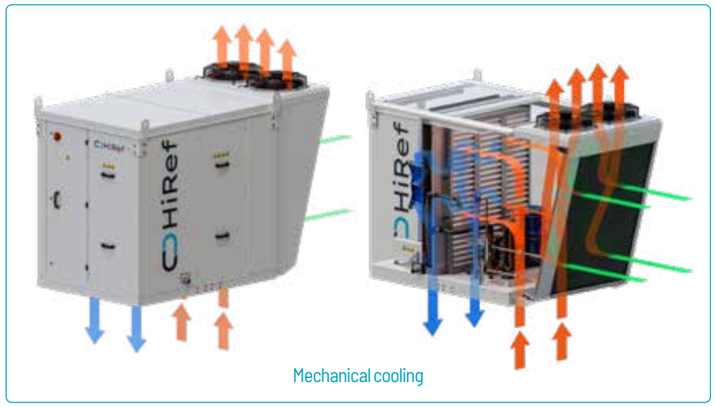
The use of EC electronic switching fans (as part of the standard equipment) in the evaporating section **minimises ventilation costs, helping boost the unit energy efficiency, particularly at partial loads.**

Complete accessibility

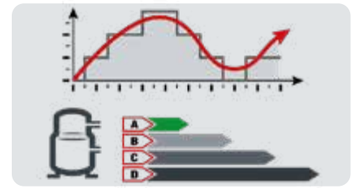
All Rooftop NTR components are easily accessible by removing the unit's removable side panels. This solution greatly **facilitates all scheduled and unscheduled maintenance operations.**

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.



Mechanical cooling



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.**

NTR		2501	3201
		Air temperature 27°C - Relative humidity 40% / Outdoor Air Temperature 35°C	
Cooling capacity	kW	31.2	39.6
Total absorbed power	kW	12.7	15.6
SHR		0.94	0.95
EER		2.86	2.95
		Air temperature 30°C - Relative humidity 35% / Outdoor air Temperature 35°C	
Cooling capacity	kW	32.9	41.3
Total absorbed power	kW	12.9	15.8
SHR		1	1
EER		2.97	3.03
Rated air flow	m³/h	8000	9000
Power supply		400/3+N/50	
Sound pressure at 2 m in free field	dB	77	77
Dimensions [LxHxD]	mm	1200x1630x2300	

Also available with 60 Hz power supply.

HiRef

Free-Cooling Box

TELECOMMUNICATIONS

FCB

DIRECT FREE-COOLING UNIT FOR SHELTERS DESIGNED FOR TECHNOLOGICAL EQUIPMENT

500-3500 m³/h

MULTI-PROTOCOL COMMUNICATION INTERFACE

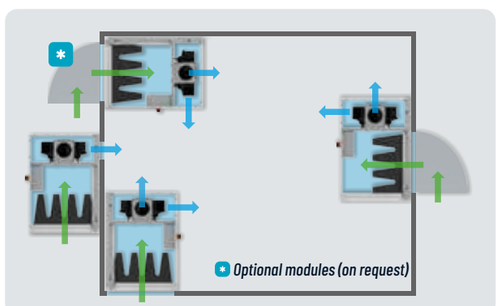
EC RADIAL FANS

With damper
ON REQUEST

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

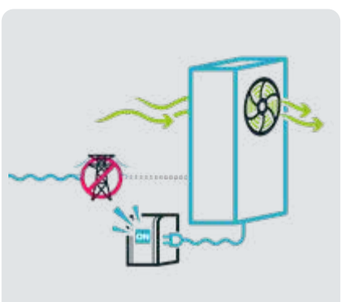
Designed **for ceiling or wall mounting**, it is suitable for air conditioning of control centres with limited internal space or space entirely taken up by technological equipment. The rational arrangement of the components across the machine makes FCB **easy to install and suitable for different configurations 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



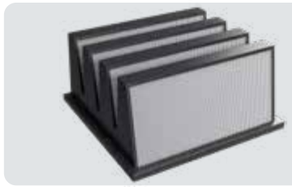
Simple and fast installation

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

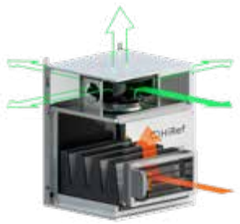
As standard, FCB units are equipped with **high efficiency F7 filters,** essentially important to prevent dust and pollutants from entering the shelter when using Direct Free-Cooling as the main source of cooling.

Low temperature design

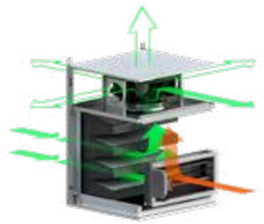
If the unit needs to be installed in environments characterised by very low outside temperatures, it is possible to install **an additional damper for mixing the air flows.** When the supply air temperature falls below a given threshold, the extra damper opens, recirculating part of the internal ambient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

Easier scheduled maintenance

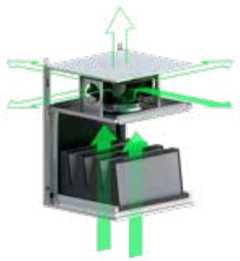
The unit has been accurately designed to ensure **frontal access to components.** This aspect, combined with full extractibility of filters and of the mixing damper (if available), makes **routine maintenance operations easier.**



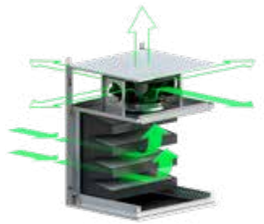
Recirculation only with damper



Rear external air intake with recirculation



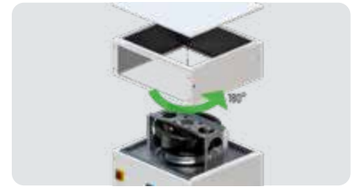
Lower side external air intake



Rear side external air intake

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.**



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.

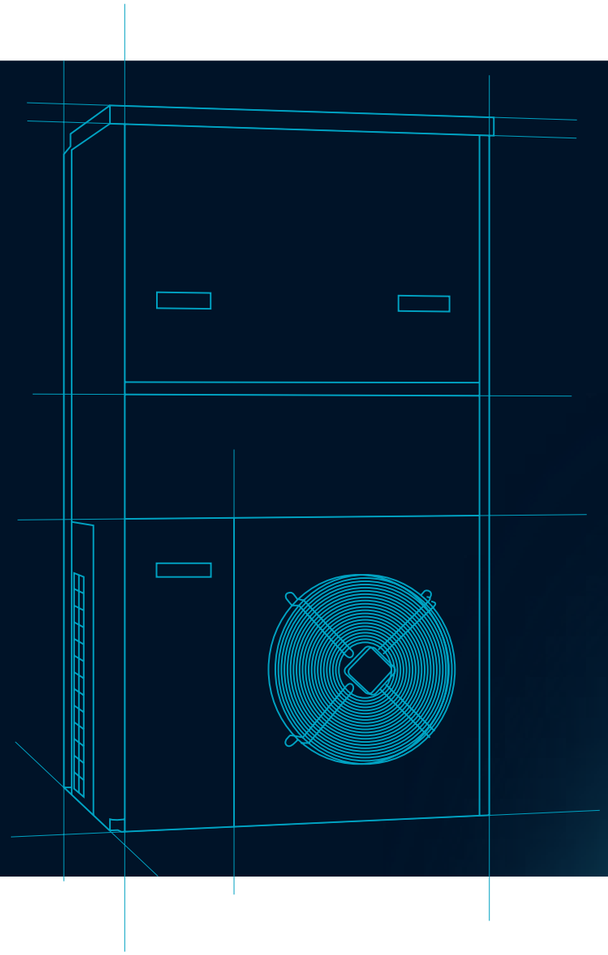
Integration in the mechanical system

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

FCB		0036
		Indoor air 27°C - 40% / Outdoor air 12°C
Cooling capacity	kW	2.4 - 17.1
		Indoor air 27°C - 40% / Outdoor air 17°C
Cooling capacity	kW	1.6 - 11.4
		Indoor air 27°C - 40% / Outdoor air 7°C
Cooling capacity	kW	3.2 - 22.8
Rated air flow	m³/h	500 - 3500
Power supply		48 VDC
Dimensions [LxHxD]	mm	670x870x610

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



CATALOGUE
TLC

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