

Split



Indoor monobloc unit





RESSORS FOR	SHELTERS DESIGNED FOR IT EQUIPMENT	- DISPLACEMENT VERSIO	N
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Outdoor monobloc unit

OHiRef		APPLICATIONS OUTDOOR MONOBLOC UNIT FOR SHELTERS	SYSTEM TYPE	VERSIONS	RANGE	
	HTW/ HTWD	TELECOMMUNICATIONS	್ರಾ	*: }	4 - 40 (kW)	PAGE 18
OHiRef		OUTDOOR MONOBLOC UNIT WITH MODULA	TING COMPRESSORS FO	DR SHELTERS DESIGNED FOR IT EQUI	IPMENT	
	NTW/ NTWD	TELECOMMUNICATIONS	ချာ	*: }	4 - 22 (kW)	PAGE 20

Rooftop



Free-Cooling Box





CHiRef

Split



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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.



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.

• R410A refrigerant, alternatively available with R513A and R134a

- Version available with dual power supply for emergencies: 230/400V mains 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
- Optional electronically controlled electric lamination valve
- 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)





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.



HTS		0251	0351	0451	0561	0731	0901	1051	1201	1451	3101	3811
					Insi	de air 27°C ·	- 40% r.h.;	Outside air	35°C			
Cooling capacity	kW	2.9	4.0	4.7	6.2	7.5	9.9	10.6	13.4	15.4	31.4	39.1
Total absorbed power	kW	1.0	1.5	1.4	2.1	2.7	3.1	3.5	4.9	6.2	10.6	13
SHR		1.0	0.99	1.0	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
			Inside air 30°C - 35% r.h.; Outside air 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	1.0	1.5	1.4	2.1	2.7	3.1	3.5	4.9	6.3	10.7	13.1
SHR		1.0	1.0	1.0	0.95	1.0	0.97	0.94	0.97	0.91	1.0	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	3350	5100	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 1585x685x10							85x1096			
Outdoor unit dimensions [LxHxD]	mm	624x5	i41x410			1003x633x420	I		1121x11	28x579	1565x 1275x 605	1965x 1490x 950

Performance data relating to versions with refrigerant R410A. Also available with 60 Hz power supply. Indoor unit for ceiling installation only for sizes 3101-3811.





Maximised energy saving with direct

Free-cooling

Effectiveness).

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

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.



Free-Cooling + renewal

NTS

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TELECOMMUNICATIONS

SPLIT UNIT WITH MODULATING COMPRESSORS FOR SHELTERS DESIGNED FOR IT EOUIPMENT



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 unit installation easy, also thanks to the many accessories available, making NTS suitable for different shelter configurations. The units have been accurately designed in thermodynamic and aeraulic terms to ensure maximum energy efficiency.



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.

Refrigerant R410A

- Version available with dual power supply for emergencies: 230/400V mains and 24/48VDC backup supply
- Fans on evaporating side with standard EC motor
- Fans available on condensing side with EC motor
- Standard stainless steel condensate drain pan
- Evaporating coils with hydrophilic coating supplied as standard equipment
- Dehumidification function on request
- Optional electronically controlled electric lamination valve
- 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)



Shelter safety

hydrophilic coating.

All models in the split range

feature evaporating coils with

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.



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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).

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.



NTS		0851	1101	1601	3101
			Inside air 27°C - 40%	s r.h.; Outside air 35°C	
Cooling capacity	kW	9.4	11.0	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
			Inside air 30°C - 35%	r.h.; Outside air 35°C	
Cooling capacity	kW	9.9	11.5	19.3	37.9
Total absorbed power	kW	3.2	3.9	9.4	13.0
SHR		1.0	0.95	0.89	1.0
EER		3.99	3.41	2.21	3.47
Air flow rate Indoor unit	m³/h	2300	2300	3200	7750
Air flow rate Outdoor unit	m³/h	2300	2300	3200	7750
Power supply		230/1/50		400/3+N/50	
Sound pressure at 2 m in free field Indoor unit	dB	65	65	64	63
Sound pressure at 10 m in free field Outdoor unit	dB	43	44	47	46
Indoor unit dimensions [LxHxD]	mm	1050x3	50x936	1150x410x1026	1585x685x1096
Outdoor unit dimensions $[LxHxD]$	mm	1305x648x490	1121x11	28x579	1965x950x1322

Also available with 60 Hz power supply. Indoor unit for ceiling installation only for size 3101.

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TLC CATALOGUE

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.





Monobloc for indoor use

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TELECOMMUNICATIONS

HTD/U/X INDOOR MONOBLOC UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT 4 - 29 kW 0 (\mathfrak{F}) CHiRef SCROLL COMPRESSORS EC RADIAL FANS HTD HTU HTX

The HTD, HTU and HTX series conditioners are indoor monobloc units designed for equipment rooms and low power telecom shelters. The three available air configurations ensure **application** versatility for this range in different systems. The units have been accurately designed in thermodynamic and aeraulic terms to ensure maximum energy efficiency.

Simple & 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).

- R410A refrigerant, also available with R134a and R513a
- Version available with dual power supply for emergencies: 230/400V mains and 24/48VDC backup supply
- Evaporating side fans available with EC motor
- 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)
- 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





Easier scheduled maintenance

indoor range feature evaporating The unit has been accurately coils with hydrophilic coating. designed to ensure frontal access This special coating - together to components even with the unit with adequate adjustment of running. This aspect, combined air through-flow speeds - **helps** with full extractability of filters condensate collection during and Free-Cooling damper the dehumidification process, (if any), facilitates routine preventing any dripping on the maintenance operations. inside and outside of the unit.



T	¥*					JE							
Free-Co		Free-Cooling					Free-Cooling						
HTD-HTII-HTX		0451	0561	0731	0901	1051	1201	1501	1701	1801	2001	2201	2501
					Insid	le air 27	°C - 40%	r.h.: Out	tside air	35°C			
Cooling capacity	kW	4.4	6.0	7.0	10.7	10.9	12.7	15.0	16.4	18.4	22.1	24.9	27.6
Total absorbed power	kW	1.9	2.5	3.2	4.8	4.4	6.0	6.4	7.6	7.1	9.0	10.0	11.4
SHR		1.0	0.9	0.95	0.99	0.98	0.92	0.98	0.94	1.0	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
					Insid	le air 30'	°C - 35%	r.h.; Out	tside air	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	6.0	6.5	7.7	7.1	9.1	10.0	11.4
SHR		1.0	0.95	1.0	1.0	1.0	0.96	1.0	0.99	1.0	1.0	1.0	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	m³/h	1450	1450	2100	3020	3020	3020	3800	3800	5500	5500	6500	6500
Power supply			230/1/50					L	+00/3+N/5	0			
Sound pressure at 2 m in free field	dB	55	55	55	58	58	58	58	58	66	66	67	68
Dimensions [LxHxD]	mm	80	00x1850x5	50	10	00x1850x5	50	1160x18	50x550		1500x20)50x800	

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

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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 quarantees **operational** continuity for the conditioning svstem.

Maximised energy saving with direct Free-Cooling

On request, the units can 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).





NTD/U/X 9 - 27 kW 0 (\mathbf{F}) CHiRef SCROLL Compressors FC RADIAL FANS

The NTD, NTU and NTX series conditioners are indoor monobloc units designed for equipment rooms and low power telecom shelters. The three available air configurations ensure **application** versatility for this range in different systems. The units have been accurately designed in thermodynamic and aeraulic terms to ensure maximum energy efficiency.

Simple & 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,

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INDOOR MODULATING MONOBLOC UNITS FOR SHELTERS DESIGNED FOR IT EQUIPMENT

TELECOMMUNICATIONS



• Refrigerant R410A

NTU

NTD

• Version available with dual power supply for emergencies: 230/400V mains and 24/48VDC backup supply

NTX

- 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
- Optional electronically controlled electric lamination valve
- 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)

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

The unit has been accurately

designed to ensure frontal

even with the unit running.

This aspect, combined with

full extractability of filters

and Free-Cooling damper

(if any), facilitates routine

maintenance operations.

access to components

maintenance





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 quarantees operational continuity for the conditioning system.



NTD-NTU-NTX		0851	1101	1701	2501						
			Inside air 27°C - 40% r.h.; Outside air 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	1.0	1.0	1.0						
EER		3.23	3.11	3.16	3.58						
			nside air 30°C - 35%	r.h.; Outside air 35°(;						
Cooling capacity	kW	9.1	12	18.1	26.9						
Total absorbed power	kW	3.6	5.3	7.6	10.7						
SHR		1.0	1.0	1.0	1.0						
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 for Upflow versions. Also available with 60 Hz power supply.

TLC CATALOGUE

Maximised energy saving with direct free-cooling

On request, the units can 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

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.





Free-Cooling



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TELECOMMUNICATIONS

NTG





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





The 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 suitable for installation in areas without double flooring. The many available air configurations ensure application versatility for this range in different systems. The units have been accurately designed in **thermodynamic** and **aeraulic** terms to ensure maximum energy efficiency.



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.

Refrigerant R410A

- Version available with dual power supply for emergencies: 230/400V mains and 24/48VDC backup supply
- Optional electronically controlled electric lamination valve
- Fans available on condensing side 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)

Shelter safety

All models in the NTG range

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.

feature evaporating coils





Simple & 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.



NTG		0060	0085
		Inside air 27°C - 40%	r.h.; Outside air 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
		Inside air 30°C - 35%	r.h.; Outside air 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	m³/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.

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).





Monobloc for outdoor use

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The HTW-HTWD series conditioners are monobloc units designed for the air conditioning of smalland 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 arrangement of the components, combined with the wide range of accessories available, **facilitates the installation** of the units which can **adapt to different shelter configurations**. The meticulous thermodynamic and aeraulic design boosts energy efficiency. The units have been accurately designed in **thermodynamic** and **aeraulic** terms to ensure **maximum 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 & 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.

CHiRef

Easier scheduled

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.

even with the units running.

maintenance

Maximised energy saving with direct free-cooling

On request, the units can 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).



HTW-HTWD		0451	0561	0731	0901	1051	1201	1451	0902	1102	1302	2302	2902	3201
			Inside air 27°C - 40% r.h.; Outside air 35°C											
Cooling capacity	kW	4.3	5.9	7.1	10.1	10.8	12.7	14.4	8.0	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	0.88	0.92	0.92	0.98	0.91	0.92	1.0	0.86	0.89	1.0	0.95	1.0
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
			Inside air 30°C - 35% r.h.; Outside air 35°C											
Cooling capacity	kW	4.6	6.1	7.5	10.5	11.5	13.3	15.0	8.6	11.5	14.8	24.5	29.5	40.1
Total absorbed power	kW	1.3	2.0	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	0.93	0.98	0.97	1.0	0.96	0.96	1.0	0.9	0.94	1.0	0.99	1.0
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	m³/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	80)4x1580x4	98	999x16	30x596		99	99x1790x59	96		1600x21	00x600	2530x2260x975

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

• R410A refrigerant, also available with R513A and R134a

- Available version with dual power supply for emergency back-up: mains 230/400 V and emergency 24/48 VDC
- 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
- Optional electronically controlled
 electric lamination valve
- Electric heating function (on request)
- Temperature control through heating and post-heating systems with electric heaters (on request)

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



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.** 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.



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.



TELECOMMUNICATIONS OUTDOOR MONOBLOC UNIT WITH NTW/NTWD MODULATING COMPRESSORS FOR SHELTERS **DESIGNED FOR IT EOUIPMENT** CHiRef 0 INVERTER DRIVEN FC RADIAL FANS 10

The NTW-NTWD series conditioners 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 arrangement of the components, combined with the wide range of accessories available, facilitates the installation of the units which can adapt to different shelter configurations. The meticulous thermodynamic and aeraulic design boosts energy efficiency. The units have been accurately designed in **thermodynamic** and aeraulic terms to ensure maximum 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 & 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.

www.hiref.it

4 - 22 kW

CORROSION Resistant material

NTWD

• Available version with dual power

supply for emergency back-up:

Stainless steel condensate drain

• Fans available on condensing side

and emergency 24/48 VDC

NTW

• Refrigerant R410A

mains 230/400 V

with EC motor

compressors

equipment

request

request)

standard with NTW

• Dehumidification function on

electric lamination valve

• Electric heating function (on

• Temperature control through

heating and post-heating systems

with electric heaters (on request)

Optional electronically controlled

• Modulating brushless DC

• Fans on evaporating side with standard EC motor

• Evaporating coils with hydrophilic coating supplied as standard

 Epoxy powder painted structural metalwork supplied as standard on NTWD. Peraluman 5005 aluminium alloy metalwork supplied as

pan

Easier scheduled

The unit has been accurately

designed to ensure frontal

even with the units running.

This aspect, combined with

full extractability of filters

and Free-Cooling damper

(if any), facilitates routine

maintenance operations.

access to components

maintenance

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).



NTW-NTWD		0851	1101	1451	2001
		Ir	nside air 27°C - 40%	r.h.; Outside air 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	0.92	1.0	0.91
EER		4.53	3.88	3.54	2.69
		Insi	de air 30°C - 35%	r.h.; Outside air 3	^{15°} C
Cooling capacity	kW	9.1	10.0	13.3	22.0
Total absorbed power	kW	2.7	3.3	4.5	8.8
SHR		1.0	1.0	1.0	1.0
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	847x15	80x500	1047x1840x605	1150x2250x655

Performance data for Upflow versions Also available with 60 Hz power supply. Units also available in the Downflow models, with the exception of size 2001.

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TLC CATALOGUE

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 um paint finishing layer or in AISI 304 stainless steel alloy. An epoxy powder painted condensing coil is also available.





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.



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.



HTR

www.hiref.it

7 - 63 kW

CORROSION Resistant material

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TELECOMMUNICATIONS

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EC RADIAL FANS

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SCROLL Compressors

CHiRef

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Maximised 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.



HTR		0701	1201	1601	1801	2501	3201	5602		
		Inside air 27°C - 40% r.h.; Outside air 35°C								
Cooling capacity	kW	6.8	11.6	15.2	17.6	24.8	33.0	59.8		
Total absorbed power	kW	2.5	4.2	5.5	5.5	8.5	11.1	20.6		
SHR		1.0	1.0	1.0	1.0	1.0	0.99	1.0		
EER		4.24	3.54	3.48	4.25	3.73	3.73	3.97		
				Inside air 30	°C - 35% r.h.; Out	side air 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		1.0	1.0	1.0	1.0	1.0	1.0	1.0		
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 refrigerant R410A. Also available with 60 Hz power supply.

ROOFTOP AIR CONDITIONING UNIT FOR CONTAINERS

MULTI-PROTOCO Communication Interface

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The HTR range Rooftop units are air cooled direct expansion units developed and designed for container climate control. They offer the simplest solution for cooling IT equipment housed in containers, thanks to their positioning outside the shelter and easy installation, typical of monobloc systems. The internal design and careful selection of components, designed to optimise the unit energy efficiency, ensure maximum savings in terms of cooling system running costs.

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, also 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
- Overpressure electrical panel for maximum safety
- Configurable with side intake and delivery
- Epoxy powder painted structural metalwork supplied as standard
- Fans available on condensing side with EC motor
- Fans on evaporating side with standard EC motor
- Dehumidification function on request
- Optional electronically controlled electric lamination valve
- Configurable with side intake and delivery
- Fans on evaporating side with standard EC motor



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.



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TELECOMMUNICATIONS

NTR

ROOFTOP AIR CONDITIONING UNIT WITH MODULATING COMPRESSORS FOR CONTAINERS



The NTR range Rooftop units are air cooled direct expansion units developed and designed for container climate control. They offer the simplest solution for cooling IT equipment housed in containers, thanks to their **positioning outside the shelter and easy installation**, typical of monobloc systems. The internal design and careful selection of components, designed to optimise the unit energy efficiency, ensure maximum savings in terms of cooling system running costs.

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.

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
- Overpressure electrical panel for maximum safety
- Epoxy powder painted structural metalwork supplied as standard
- Fans available on condensing side with EC motor
- Dehumidification function on request
- Optional electronically controlled electric lamination valve



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.





NTR		2501	3201				
		Inside air 27°C - 40% r.h.; Outside air 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				
NTR		2501	3201				
		Inside air 30°C - 35	% r.h.; Outside air 35°C				
Cooling capacity	kW	32.9	41.3				
Total absorbed power	kW	12.9	15.8				
SHR		1.0	1.0				
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	1200x	1630x2300				

Also available with 60 Hz power supply.



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.



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.

CHiRef



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TELECOMMUNICATIONS FCB **DIRECT FREE-COOLING UNIT FOR SHELTERS DESIGNED FOR TECHNOLOGICAL EQUIPMENT** 500 - 3500 m³/h $\langle \boldsymbol{\mathfrak{F}} \rangle$ 1ULTI-PROTOCO Communication EC RADIAL FANS ◯HiRef

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

With damper ON REQUEST

• Optional modules (on request)

Simple & 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.





Recirculation only with damper

Rear external air intake with recirculation



Maximised internal configurability

Depending on the conditions of the external environment, the available operation modes are Free-Cooling only, Free-Cooling with recirculation via an overpressure damper, or activating a mechanical cooling/heating system.

FCB		0036
		Inside air 27°C - 40% r.h.; (
Cooling capacity	kW	1.6 - 11.4
		Inside air 27°C - 40% r.h.; (
Cooling capacity	kW	2.4 - 17.1
		Inside air 27°C - 40% r.h.;
Cooling capacity	kW	3.2 - 22.8
Air flow rate	m³/h	500-3500
Power supply		48 VDC
Dimensions [LxHxD]	mm	670x870x610

Also available with 230/1/50 and 60 Hz power supply.



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.



Rear side external air intake

side air 17°C

side air 12°C

tside air 7°C



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



INNOVATORS above the standards





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