MITSUBISHI ELECTRIC
HYDRONICS & IT COOLING SYSTEMS S.p.A.

COMFORT PROCESS

UNITS FOR SIMULTANEOUS AND INDEPENDENT PRODUCTION OF HOT AND COLD WATER

INTEGRA

NECS-CQ

AIR SOURCE UNITS FOR 4-PIPE SYSTEMS, WITH SCROLL COMPRESSORS AND EC FANS, FOR INDOOR INSTALLATION, FROM 36 TO 303 kW

R410A

melcohit.com

CLIMAVENETA®

INTEGRA

NECS-CQ

A TRULY UNIQUE SOLUTION FOR INDOOR INSTALLATIONS

Air source units for 4-pipe systems, with scroll compressors and EC fans for indoor installation. From 36 to 303 kW.

NECS-CQ is a on demand multi-purpose unit able to produce hot and cold water simultaneously and independently, in any load combination. This makes this unit ideal for comfort and process applications requiring hot and cold water at the same time and in two independent hydraulic circuits.

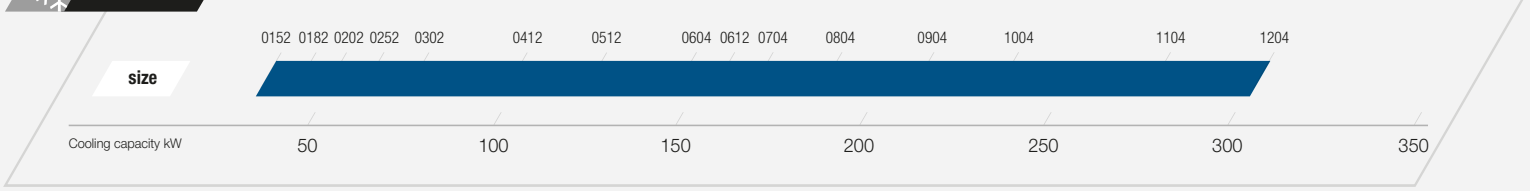
Traditionally, air condensed units with axial fans are designed for outdoor installations, requiring a minimum clearance space to ensure a proper airflow through the air heat exchanger.

NECS-CQ revolutionizes this paradigm. Thanks to the adoption of special EC fans, this unit is suitable for indoor installations. Available static pressure provided by the fans allows the use of long ducts for air discharge, thus making the unit installation quick and easy.

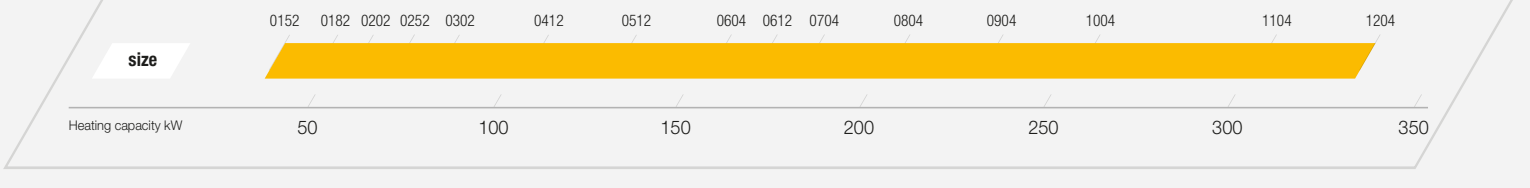
The advanced control logic, developed by Mitsubishi Electric Hydronics & IT Cooling Systems ensures that heating and cooling loads are perfectly met.

THE RANGE

COOLING



HEATING

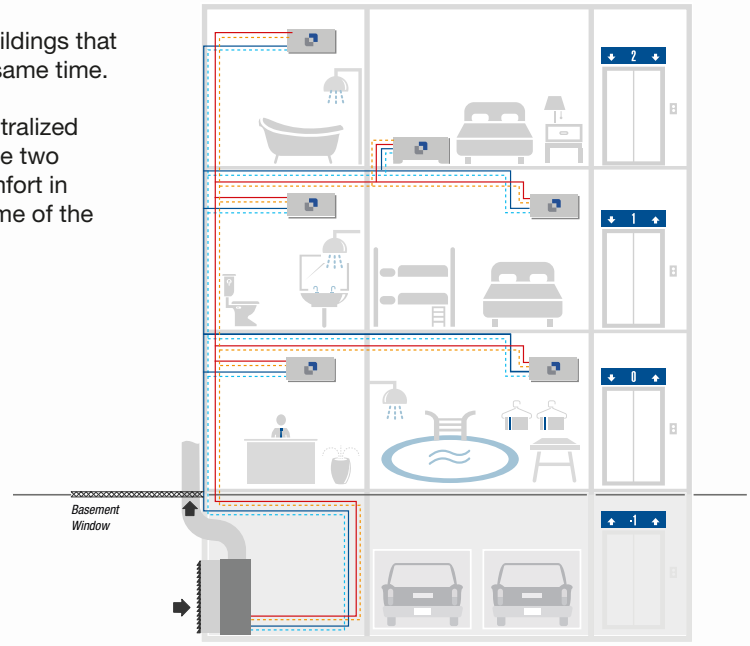


THE INTEGRA 4-PIPE SYSTEM

This type of system is suitable for air-conditioning in buildings that require separate areas to be heated and cooled at the same time.

Air conditioning distribution system is coupled with centralized solutions capable of producing hot and cold water in the two hydronic circuits of the system, assuring maximum comfort in every room of the building, independently and at any time of the year.

From today, a single intelligent unit is sufficient for the management of these complex systems: INTEGRA.



SELF-ADAPTABILITY WITH SIMULTANEOUS LOADS

Thanks to their advanced control logics, multi-purpose units are always able to respond to building climate control requirements, especially if overlapping loads occur.
The unit can independently produce heating and cooling simultaneously, according to the actual needs.

SYSTEM SIMPLIFICATION

The use of a unit that independently produces both heating and cooling eliminates the need for separate heating and cooling resources.
This significantly simplifies the system: plant areas are reduced, hydronic circuits are simplified, maintenance is reduced by half, and control is rationalized.

REDUCTION OF ON-SITE OPERATIONS

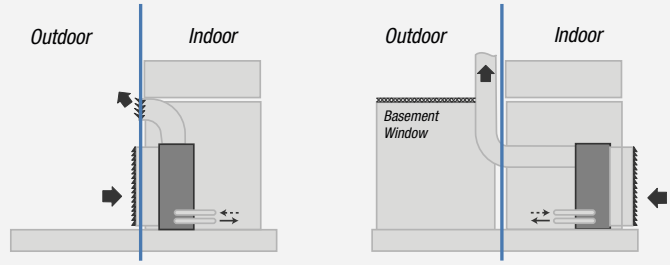
A simplified system results in a significant reduction in the operations to be carried out on site. In fact, it is no longer necessary to connect to the gas network, install and commission auxiliary boilers, or manage areas that were used for conventional heating units. This means substantial savings in terms of time and cost for the client.

IDEAL FOR INDOOR INSTALLATION

NECS-CQ is the ideal solution for indoor installations such as:

- In basement windows
- In service rooms, for instance, warehouses
- In the storage room, in a visible position

This unit is a truly unique solution for installations where you want a completely invisible solution.
The system is installed entirely indoors and only the grilles are visible.



TECHNOLOGICAL CHOICES

W3000TE CONTROL and USER-FRIENDLY USER INTERFACE

Fully in-house software developed by Mitsubishi Electric Hydronics & IT Cooling Systems.

- 19 supported languages.
- Optional serial cards with the most common protocols are available: ModBus, Bacnet MS/TP RS485, Bacnet Over IP, Echelon Lonworks.
- “QUICK MIND” logic: a self-adapting algorithm that activates or deactivates the compressors only when a change in the system load moves the flow temperature out of the setpoint neutral zone.
- Diagnostics: “BLACK BOX” function for saving more than 100 machine variables for a rapid trouble-shooting.

The keypad W3000 Compact, as standard equipment, features function controls and a complete LCD display for viewing data and activating the unit, via a multilevel menu, with settable display language.

Electrical panel:

- W3000TE control software, COMPACT keyboard.
- Numbered cables (std on 2 compressor units).
- Automatic circuit breakers (std on 2 compressor units).

Heat exchangers

- Brazed plate heat exchanger for both evaporator and recovery.
- Efficient heat exchange with a small footprint.
- Dual circuit design for all sizes.
- Low refrigerant charge.

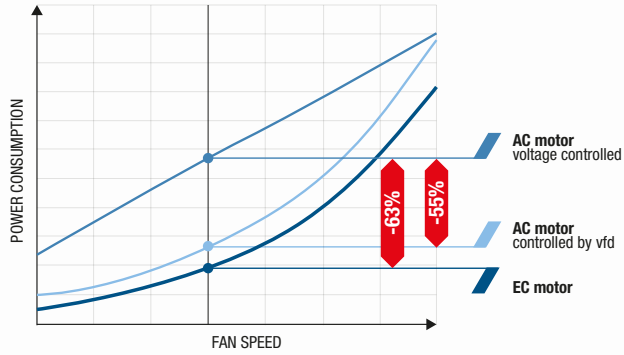
Fixed speed scroll compressors

- Designed for superior efficiency and performance.
- 2 independent refrigerant circuits for all sizes, to ensure reliable operation and precise control of the leaving water temperature in any load condition.

EC FANS

EC AXIAL

- More air flow at smaller diameter.
- Energy cost saving by highest efficiency at the operating point.
- Reduced sound levels at partial loads.
- Precise control of airflow.
- Lower consumption in every working condition to achieve a better seasonal efficiency in accordance with ErP Directive.
- No energy lost due to the transmission (belts and pulleys), thanks to the fan being directly coupled with the motor; economical because no maintenance needed.
- Continuous speed control by 0-10V signal, easy adaptation to varying operational conditions.

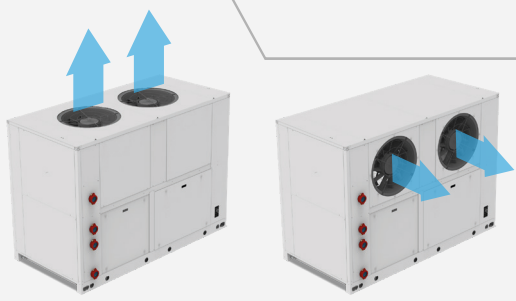


Smart defrost

Thanks to the extensive know-how in heat pump technology, a series of smart proprietary auto adaptive algorithms have been developed to manage the defrosting cycles in the smartest way.

- Reduction in defrosting time
- Minimum impact on leaving water temperature
- Reduction of energy required for defrosting
- Increase of COP

Horizontal or vertical air supply



NECS-CQ delivers customers the possibility of selecting the unit with air supply that best fits its installation needs (vertical / horizontal), thus reducing time and costs.

Horizontal and vertical air supply available for all sizes.

INTEGRA

NECS-CQ

Air source units for 4-pipe systems, with scroll compressors and EC fans, for indoor installation, from 36 to 303 kW

NECS-CQ			0152	0182	0202	0252	0302	0412	0512	0612
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE										
COOLING ONLY (GROSS VALUE)										
Cooling capacity	(1)	kW	36,4	42,3	49,0	55,3	73,0	94,9	119	154
Total power input	(1)	kW	14,6	16,5	19,1	21,7	29,4	37,1	47	61
EER	(1)	kW/kW	2,49	2,56	2,57	2,55	2,48	2,56	2,56	2,52
COOLING ONLY (EN14511)										
Cooling capacity	(1)(2)	kW	36,1	42	48,7	54,9	72,5	94,4	119	154
EER	(1)(2)	kW/kW	2,59	2,6	2,6	2,56	2,46	2,53	2,49	2,49
HEATING ONLY (GROSS VALUE)										
Total heating capacity	(3)	kW	42,4	48,0	56,1	63,7	81,6	107,0	135	173
Total power input	(3)	kW	14,5	16,1	18,8	21,4	28,0	35,7	44	58
COP	(3)	kW/kW	2,92	2,98	2,98	2,98	2,91	3,00	3,05	2,96
HEATING ONLY (EN14511)										
Heating capacity	(3)(2)	kW	42,8	48,5	56,6	64,2	82,3	107	136	174
COP	(3)(2)	kW/kW	3,06	3,04	3,05	3,02	2,91	2,98	2,98	2,94
COOLING WITH TOTAL HEAT RECOVERY										
Cooling capacity	(4)	kW	37,2	43,6	50,6	57,2	76,3	97,7	123	160
Total power input	(4)	kW	12,8	14,2	16,6	18,9	24,5	31,9	39,6	51,3
Recovery heat exchanger capacity	(4)	kW	49,2	56,9	66,2	75	99,3	128	161	208
TER	(4)	kW/kW	6,75	7,08	7,04	6,99	7,17	7,08	7,17	7,17
ENERGY EFFICIENCY										
SEASONAL EFFICIENCY IN HEATING (Reg. EU 813/2013)										
Pdesign	(5)	kW	30	34	42	48	62	75	101	121
SCOP	(5)(9)		3,93	3,90	3,98	3,78	3,60	3,53	3,58	3,43
Performance ηs	(5)(10)	%	154	153	156	148	141	138	140	134
Seasonal efficiency class	(5)		A++	A++	A++	A+	A+	-	-	-
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN REFRIGERATION										
Water flow	(1)	l/s	1,74	2,02	2,34	2,64	3,49	4,53	5,69	7,36
Pressure drop	(1)	kPa	17	22	17	22	25	28	35	45
HEAT EXCHANGER USER SIDE IN HEATING										
Water flow	(3)	l/s	2,03	2,29	2,68	3,04	3,90	5,11	6,45	8,27
Pressure drop	(3)	kPa	22	29	22	29	31	36	44	57
REFRIGERANT CIRCUIT										
Compressors nr.		N°	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2
FANS										
Quantity		N°	2	2	2	2	2	2	2	3
Nominal air flow		m^3/s	4,17	4,72	4,72	4,72	8,33	8,33	9,72	13,33
ESP		Pa	120	120	120	120	120	120	120	120
NOISE LEVEL										
Sound power level in cooling	(6)(7)	dB(A)	80	80	81	82	86	87	89	90
Sound power level in heating	(6)(8)	dB(A)	80	80	81	82	86	87	89	90
SIZE										
A		mm	2200	2200	2200	2200	2602	2602	3602	3602
B		mm	1277	1277	1277	1277	1277	1277	1277	1277
H		mm	1900	1900	1900	1900	1900	1900	1900	1900

Notes:

1 ▸ Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
2 ▸ Values in compliance with EN14511
3 ▸ Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C - 87% R.H.
4 ▸ Plant (side) cooling exchanger water (in/out) 12°C/7°C; Plant (side) heat exchanger water (in/out) 40°C/45°C.
5 ▸ Parameter calculated for LOW-TEMPERATURE application in AVERAGE climate conditions according to [REGULATION (EU) N. 813/2013]
6 ▸ Total sound power of fans, as declared by the maker, at the rated speed of rotation and a useful static head of nominal on the delivery side.
7 ▸ Sound power level in cooling, outdoors.
8 ▸ Sound power level in heating, outdoors.
9 ▸ Seasonal performance coefficient
10 ▸ Seasonal space heating energy efficiency

R410A

NECS-CQ			0604	0704	0804	0904	1004	1104	1204
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	kW	146,0	164,0	187,0	213,0	237,0	274,0	303,0
Total power input	(1)	kW	57,6	68,2	75,3	83,4	93,0	107,0	122,0
EER	(1)	kW/kW	2,53	2,40	2,48	2,55	2,55	2,56	2,48
COOLING ONLY (EN14511)									
Cooling capacity	(1)(2)	kW	146	163	186	212	236	273	302
EER	(1)(2)	kW/kW	2,52	2,37	2,47	2,53	2,46	2,52	2,4
HEATING ONLY (GROSS VALUE)									
Total heating capacity	(3)	kW	165,0	185,0	208,0	235,0	261,0	302,0	336,0
Total power input	(3)	kW	55,0	62,8	70,8	78,8	87,5	102,0	114,0
COP	(3)	kW/kW	3,00	2,95	2,94	2,98	2,98	2,96	2,95
HEATING ONLY (EN14511)									
Heating capacity	(3)(2)	kW	166	185	209	236	262	304	337
COP	(3)(2)	kW/kW	2,99	2,91	2,94	2,97	2,89	2,94	2,86
COOLING WITH TOTAL HEAT RECOVERY									
Cooling capacity	(4)	kW	151	173	194	220	246	280	317
Total power input	(4)	kW	49,79	57,1	64,5	72,1	79,8	92,8	105
Recovery heat exchanger capacity	(4)	kW	197,8	226	255	288	321	368	415
TER	(4)	kW/kW	7,01	6,99	6,96	7,05	7,11	6,98	6,97
ENERGY EFFICIENCY									
SEASONAL EFFICIENCY IN HEATING (Reg. EU 813/2013)									
Pdesign	(5)	kW	118	128	156	178	199	228	254
SCOP	(5)(9)		3,53	3,53	3,50	3,80	3,55	3,75	3,75
Performance ηs	(5)(10)	%	135	138	138	137	149	139	147
Seasonal efficiency class	(5)		-	-	-	-	-	-	-
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow	(1)	l/s	6,98	7,84	8,93	10,18	11,32	13,09	14,48
Pressure drop	(1)	kPa	40	42	45	46	46	46	46
HEAT EXCHANGER USER SIDE IN HEATING									
Water flow	(3)	l/s	7,88	8,84	9,94	11,23	12,47	14,43	16,05
Pressure drop	(3)	kPa	50	53	56	57	55	50	56
REFRIGERANT CIRCUIT									
Compressors nr.		N°	4	4	4	4	4	4	4
No. Circuits		N°	2	2	2	2	2	2	2
FANS									
Quantity		N°	3	3	4	4	5	5	6
Nominal air flow		m^3/s	12,50	13,33	16,67	16,67	18,89	22,22	23,61
ESP		Pa	120	120	120	120	120	120	120
NOISE LEVEL									
Sound power level in cooling	(6)(7)	dB(A)	90	90	90	90	90	92	92
Sound power level in heating	(6)(8)	dB(A)	90	90	90	90	90	92	92
SIZE									
A		mm	3602	3602	4602	4602	4602	5602	5602
B		mm	1277	1277	1277	1277	1277	1277	1277
H		mm	1900	1900	2235	2235	2235	2235	2235

Notes:

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10 ▸ Seasonal space heating energy efficiency

“BY FAR THE BEST PROOF IS EXPERIENCE”

Sir Francis Bacon
British Philosopher (1561 - 1626)

DALLARA ACADEMY

2017-2019 Varano de’ Melegari, Parma – Italy

Applications:
Museum

Plant type:
Hydronic System

Cooling capacity:
500 kW

Heating capacity:
400 kW

Installed machines:
1x NECS-CQ/B/S 0804,
1x EW-HT 0152

PROJECT

The Dallara Academy is the embodiment of a dream of engineer Dallara, who with this building, wanted to give something back to this territory, to the people who shared 46 working years with him, and to the bright young minds of the world.

CHALLENGE

From a plant engineering point of view of the customer’s requests have clearly been satisfied, the building, captivating from an architectural point of view, also had to be equipped with innovative mechanical and technological systems.

SOLUTION

The production of hot and cold fluids takes place thanks to a NECS-CQ/B/S 0804 air source heat pump Climaveneta branded, located in the basement, to avoid a visible installation. For the production of hot water at a very high temperature, an EW-HT 0152 heat pump, also Climaveneta branded, has been installed

TO LEARN MORE ABOUT THIS PROJECT
https://www.melcohit.com/EN/Projects/6265/Dallara-Academy.html

RESCHIO CASTLE

Perugia - Italy

Period: 2019
Application: Institutions
Plant type: Hydronic System
Cooling capacity: 231 kW
Heating capacity: 260 kW
Installed machines:
2x NECS-CQ 0904,
1 EW-HT 0152

VILLA BLANK

Rome - Italy

Period: 2015
Application: Institutions
Plant type: Hydronic System
Cooling capacity: 600 kW
Installed machines:
2x NECS-CQ/B/S 1204,
1x MANAGER 3000

ALLIANZ RIVIERA (SPORTS MUSEUM)

Nice – France

Period: 2015 - 2016
Application: Sport structures
Plant type: Hydronic System
Cooling capacity: 166 kW
Heating capacity: 185 kW
Installed machines:
1x NECS-CQ/B/S 0704

FILODIVINO WINERY

San Marcello (AN) - Italy

Period: 2017
Application: Wine
Mixed-Use Development
Plant type: Hydronic System
Cooling capacity: 315 kW
Heating capacity: 107 kW
Installed machines:
1x NECS-CQ/B/S 0412,
1x NECS-C/B 0302

TO LEARN MORE ABOUT THIS PROJECT
https://www.melcohit.com/EN/Projects/6255/Filodivino-Winery.html

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CLIMAVENETA®

eco Changes for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

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