

design and technology
HIGHTECH AIR CONDITIONERS FOR CLOSE CONTROL

AIREF series



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The new Series of AIREF Close Control Air Conditioning units are designed to guarantee and respect all environment protection parameters; they represent the perfect answer to all technical requirements of different technological plant concepts (control rooms, EDP rooms, textile industry, metrological rooms etc.).

••DESIGN••

The exclusive design with rounded edges, the innovative graphite grey colour and the excellent performances of the AIREF series have become the new high quality standard in the close control air conditioning sector.

••EFFICIENCY AND RELIABILITY••

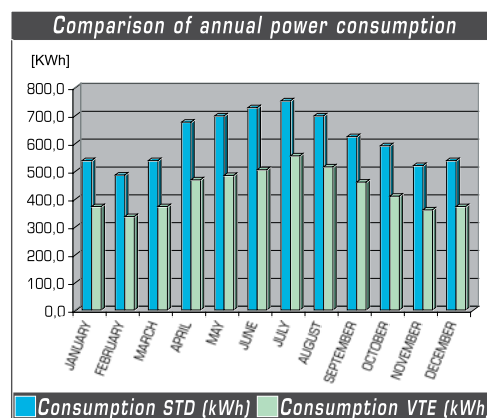
Highest energy efficiency, smallest dimensions and lowest noise levels: this were HiRef's targets when developing it's new CCAC series, units designed in order to operate 24 hours a day, 365 days a year. Only internationally well known quality components and newest technology devices are used in the Airef series in order to guarantee top efficiency and reliability.



••ELECTRONIC EXPANSION VALVE••



One of the most requested technical features today is the exclusive technology of the electronic expansion valves, which Hiref has registered the patent number n° B02002A000785. The extraordinary modulation capacity of this solution makes a reduction of the condensing temperature possible. Especially during middle and winter seasons energy saving values up to 51 % are possible and thus guarantees a shortest payback time for this solution.



••MICROPROCESSOR CONTROL••



The Microprocessor control, available in Standard or Advanced Graphic version, manages all functions of the AIREF series. This control offers the opportunity to connect up to 8 units together creating a local network (LAN) and allowing, among different options, to balance operation times in an automatic stand by and rotation function. The microprocessor controls are available with a LCD display (Standard version) or with a graphic display (Advanced version) and are compatible with the most widespread communication protocols.

HiRef's Software Development Team (HST) moreover, is able to develop control strategies according to customer's special requirements.

••EASY MAINTENANCE••

All main components are reachable from the front part of the unit in order to reduce technical spaces necessary for installation and maintenance: e-panel, compressor, fans, humidifier, electrical heaters, expansion valve and liquid flow filter can be easily reached by just opening the front panel. This guarantees fast and safe intervention. If necessary the front door panels can be removed quickly and easily in order to facilitate the technician's operations.

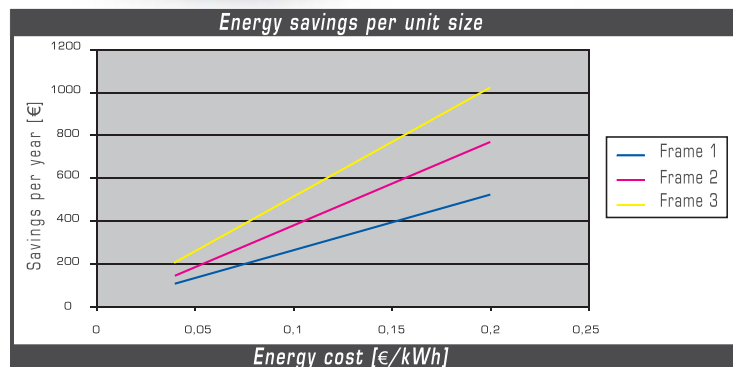
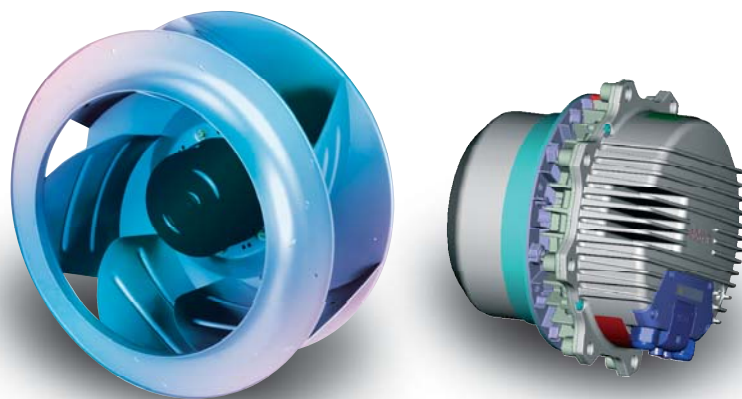


••EC-FAN TECHNOLOGY••

Radial fans with backward curved blades and electronically commutated DC motors are today the state of the art in Computer room Air Conditioning.

The so called "brushless motor" technology offers an enormous potential to reduce energy consumption particularly in part load operation. In comparison with traditional technologies saving figures reach values up to 50 %.

HiRef's TREF product range is standard equipped with this newest technology and therefore contributes to a high value of their customer's efforts for environment protection and energy saving.



••FLEXIBILITY••

Airef series units are available in a wide range of configurations:

BASIC UNIT

JREF (5,9 - 22,2 kW)
TREF (21,2 - 126,2 kW)

VERSIONS:

- Cooling only
- Cooling + re-heating
(electrical heaters / hot gas / hot water)
- Cooling + re-heating + humidity and temperature control

MODEL

- DX version:
direct expansion unit
- A: Direct expansion air cooled with remote condenser
- W: Direct expansion water cooled
- F: Free-Cooling (with remote dry cooler)
- D: Dual Cooling with Direct expansion (air cooled) and a separate chilled water circuit
- Q: Dual Cooling with Direct expansion (water cooled) and a separate chilled water circuit
- CW version:
chilled water unit
- C: basic configuration
- S: slave unit without control

AIR FLOW

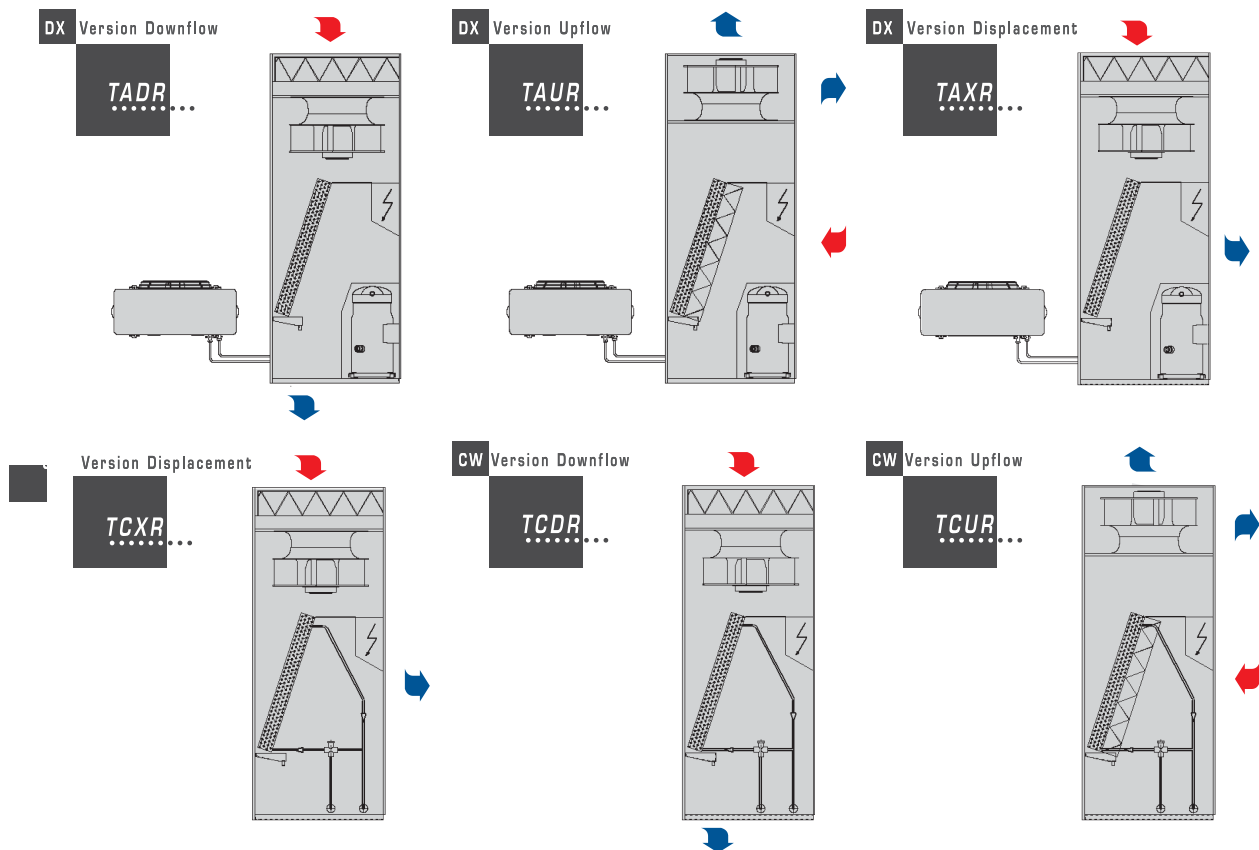
- D: downflow version
- U: upflow version
- X: displacement version

FANS

- C: centrifugal with forward curved blades (except TREF models)
- R: radial with backward curved blades

All versions can be integrated with a wide range of accessories: silent plenum, fire and smoke alarms, water alarm, adjustable base frame and many others. Moreover the units are available in single circuit version with tandem compressors for a COP improvement. Various configurations of the Airef series offer always the right unit suitable for all kind of installations.

••Main configurations available••



••JREF CW chilled water unit••

Model		JCDC0080 JCUC0080	JCDC0110 JCUC0110	JCDC0140 JCUC0140	JCDC0160 JCUC0160	JCDC0200 JCUC0200	JCDC0230 JCUC0230
Total cooling capacity ⁽¹⁾	kW	7,6	10,6	13,9	15,6	19,3	22,2
SHR		0,83	0,83	0,84	0,83	0,84	0,83
Nominal air flow	m³/h	1.785	2.150	3.530	3.470	5.115	4.990
Coil frontal surface	m²	0,29	0,29	0,47	0,47	0,65	0,65
Coil rows	nr	3	4	3	4	3	4
No. of fans	nr	1	1	2	2	2	2
AESP	Pa	30	30	30	30	30	30
Water flow	l/s	0,36	0,50	0,66	0,74	0,92	1,06
Sound pressure level ⁽³⁾	dB(A)	48	50	51	51	52	52
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Dimensions LxHxD	mm	600x1.875x449	600x1.875x449	900x1.875x449	900x1.875x449	1.200x1.875x449	1.200x1.875x449
Weight	kg	125	135	150	160	170	175

••JREF DX direct expansion unit••

Model		JADC0060 JAUC0060	JADC0080 JAUC0080	JADC0100 JAUC0100	JADC0110 JAUC0110	JADC0130 JAUC0130	JADC0160 JAUC0160	JADC0190 JAUC0190	JADC0205 JAUC0205
Total cooling capacity ⁽²⁾	kW	5,9	7,7	9,3	10,6	12,6	15,6	18,2	19,9
SHR		1	1	1	1	0,96	0,98	0,98	0,93
Compressor absorbed power	kW	1,5	1,9	2,3	2,6	3,2	4,1	4,7	5,55
EER		3,93	4,05	4,04	4,04	3,93	3,80	3,87	3,62
No. of compressors	nr	1	1	1	1	1	1	1	1
Nominal air flow	m³/h	1.785	2.150	3.530	3.530	3.470	5.115	4.990	4.990
Coil frontal surface	m²	0,29	0,29	0,47	0,47	0,47	0,65	0,65	0,65
Coil rows	nr	3	4	3	3	3	3	4	4
No. of fans	nr	1	1	2	2	2	2	2	2
AESP	Pa	20	20	20	20	20	20	20	20
Sound pressure level ⁽³⁾	dB(A)	46	48	48	49	51	52	53	53
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C	R407C	R407C
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/5
Dimensions LxHxD	mm	600x1.875x449	600x1.875x449	900x1.875x449	900x1.875x449	900x1.875x449	1.200x1.875x449	1.200x1.875x449	1.200x1.875x449
Weight	kg	150	157	195	210	230	245	255	256

(1) Water in/out: 7/12°C, Room conditions: 24°C 50% U.R.

(2) Room conditions: 24°C 50% r.h., condensing T: 50°C

(3) At 1,5 meters height, 2 meters frontal distance in free field – downflow units

••TREF CW chilled water unit••

Model		TCDR0300 TCUR0300	TCDR0380 TCUR0380	TCDR0400 TCUR0400	TCDR0500 TCUR0500	TCDR0850 TCUR0850	TCDR0750 TCUR0750	TCDR0900 TCUR0900	TCDR1000 TCUR1000
Total cooling capacity ^(1a) /SHR	kW	32,4/0,83	47,6/0,77	43,5/0,84	57,3/0,83	69,1/0,82	83,1/0,80	88,7/0,84	107,6/0,82
Total cooling capacity ^(1b) /SHR	kW	36,4/0,85	58,0/0,78	49,4/0,87	64,2/0,85	82,8/0,83	101,1/0,81	103,6/0,87	126,2/0,83
Total cooling capacity ^(1c) /SHR	kW	23,1/0,99	30,7/0,92	33,2/1,00	41,8/1,00	47,9/0,95	50,4/0,92	64,1/0,98	74,4/0,94
Total cooling capacity ^(1d) /SHR	kW	28,3/1,00	37,9/0,94	39,5/1,00	50,2/1,00	58,1/0,97	66,6/0,95	76,7/0,99	88,9/0,96
Nominal air flow	m³/h	8.120	8.120	14.500	14.500	14.500	14.500	22.450	22.450
Maximum air flow	m³/h	10.450	10.450	18.615	18.615	18.615	18.615	28.145	28.145
Coil surface	m²	1,05	1,05	1,85	1,85	1,85	1,85	2,80	2,80
Coil rows ⁽⁵⁾	nr	3	6	2	3	4	6	3	4
No. of fans	nr	1	1	2	2	2	2	3	3
AESP (maximum speed)	Pa	380	330	430	405	385	350	405	405
Water flow	l/s	1,55	2,27	1,80	2,47	3,05	3,97	4,17	4,84
Sound pressure level ^(3a)	dB(A)	58	60	60	61	61,5	62	63	63,5
Sound pressure level ^(3b)	dB(A)	62	64	64	65	65,5	66	67	67,5
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Dimensions LxHxD	mm	1.000x1.998x795	1.000x1.998x795	1.750x1.998x795	1.750x1.998x795	1.750x1.998x795	1.750x1.998x795	2.500x1.998x795	2.500x1.998x795
Weight	kg	310	350	370	410	430	475	490	510

••TREF DX direct expansion unit••

Model		TADRO201 TAURO201	TADRO251 TAURO251	TADRO261 TAURO261	TADRO271 TAURO271	TADRO272 TAURO272	TADRO301 TAURO301	TADRO302 TAURO302	TADRO362 TAURO362
Total cooling capacity ⁽²⁾	kW	21,2	23,2	26,7	27,3	26,9	31,5	31,9	35,9
SHR		1	1	0,95	1	1	0,99	0,99	0,98
Compressor absorbed power	kW	5,8	6,1	7,1	7,3	6,8	8,4	8,5	9,8
EER		3,65	3,80	3,71	3,74	3,95	3,75	3,75	3,66
No. of compressors	nr	1	1	1	1	2	1	2	2
Nominal air flow	m³/h	7.280	7.280	7.280	12.950	12.950	12.950	12.950	12.950
Coil frontal surface	m²	0,75	0,75	0,75	1,34	1,34	1,34	1,34	1,34
Coil rows	nr	4	4	5	3	3	3	3	3
No. of fans	nr	1	1	1	2	2	2	2	2
AESP (maximum speed)	Pa	380	380	348	425	425	425	425	425
Sound pressure level ^(3a)	dB(A)	52	53	54	55	56	56,5	58	59
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C	R407C	R407C
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Dimensions LxHxD	mm	1.000x1.998x795	1.000x1.998x795	1.000x1.998x795	1.750x1.998x795	1.750x1.998x795	1.750x1.998x795	1.750x1.998x795	1.750x1.998x795
Weight	kg	375	385	405	570	565	585	580	590

••TREF DX direct expansion unit••

Model		TADRO401 TAURO401	TADRO422 TAURO422	TADRO452 TAURO452	TADRO512 TAURO512	TADRO552 TAURO552	TADRO602 TAURO602	TADRO692 TAURO692	TADRO762 TAURO762
Total cooling capacity ⁽²⁾	kW	41,2	41,9	44,3	51,1	54,4	61,4	68,7	76,2
SHR		0,97	0,97	0,98	0,92	1	0,96	0,95	0,93
Compressor absorbed power ⁽²⁾	kW	11,1	11,6	12,2	14,6	14,6	16,9	19,7	22,4
EER		3,71	3,61	3,63	3,51	3,72	3,63	3,49	3,41
No. of compressors	nº	1	2	2	2	2	2	2	2
Nominal air flow	m³/h	12.950	12.950	12.950	12.950	19.415	19.415	19.415	19.415
Coil frontal surface		1,34	1,34	1,34	1,34	2,00	2,00	2,00	2,00
Coil rows	m²	4	4	4	4	3	4	4	4
No. of fans	nº	2	2	2	2	3	3	3	3
AESP (maximum speed)	Pa	355	355	355	355	405	378	378	378
Sound pressure level ^(3a)	dB(A)	60	62	62	63	64	65	65	65
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C	R407C	R407C
Power supply	V/Ph/Hz	400/ 3+N/50	400/ 3+N/50	400/ 3+N/50	400/ 3+N/50	400/ 3+N/50	400/ 3+N/50	400/ 3+N/50	400/ 3+N/50
Dimensions LxHxD	mm	1.750x 1.998x 595	1.750x 1.998x 795	1.750x 1.998x 795	1.750x 1.998x 795	2.500x 1.998x 795	2.500x 1.998x 795	2.500x 1.998x 795	2.500x 1.998x 795
Weight	kg	595	605	615	632	905	940	958	979

(4) "Extended Range" available in versions with 5 und 6 rows for technological applications with high thermal loads and specified water conditions of 10/15°C