Kälte Klima

SCAEY-FC

Air cooled liquid chiller
Free-Cooling from 45 kW to 365 kW

Free Cooling
R 410A
Scroll Compressors

Series: **SCAEY-FC**		Leaflet:	**DE 98**
Issue:	**12/13**	Supersedes:	**5/13**

Identification code

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1	**S**	Small series < 360 kW
2	**C**	Chiller unit
3	**A**	Air cooled
4	**E**	Axial fans
5	**Y**	Refrigerant R410A
6	**11**	Power factor
7	**1**	Number of circuits
8	**–**	Cooling only version
9	**FC**	Free-Cooling
10	**PAC**	Storage tank + Pump
	P1	1 pump
	P2	2 pumps
	RCP	Heat recovery mounted in parallel (100%)
	LN	Low noise

SCAEY - FREE COOLING

GENERAL FEATURES
The SCAE/FC free-cooling units are particularly suitable where chilled water all year long is required, so also by low ambient air temperature. The free-cooling system utilises the low outside temperature for chilling water in the coil starting from 15 °C ambient air temperature.

THE FREE-COOLING PRINCIPLE
The units series SCAEY/FC are designed to cool down water/glycol fluid.
This units are equipped, further to the chiller components such as compressors, condensers, evaporator, thermostatic valves, with a water free-cooling coil. The control system consists of a modulating three-way valve and of a certain number of probes allowing the water coil functioning and therefore the "free-cooling" operation. In the standard chiller the return water/glycol fluid is cooled down through the shell and tube evaporator. In the SCAEY/FC units working in free-cooling mode, the water/glycol fluid runs through the free-cooling coil which is cooled by means of the external air, thus reducing the load on the compressors or even completely substituting them. The control system consists of a microprocessor, an inlet water temperature probe, an external air temperature probe, a working probe and a no-freezing probe.

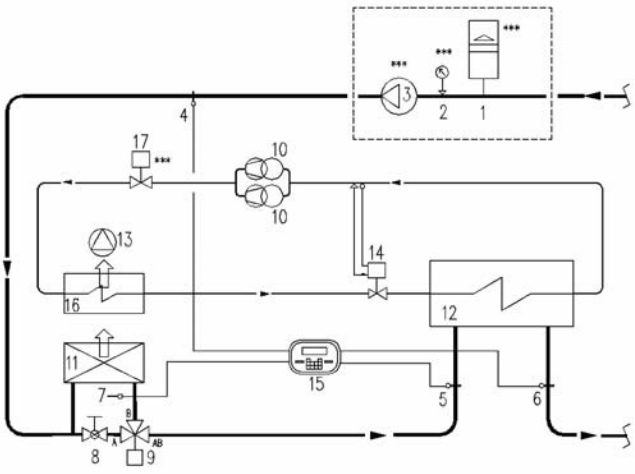
OPERATION IN SUMMER
When the ambient air temperature is higher than the return water/glycol temperature the cooling capacity is guaranteed by the compressors (10); the 3-way valve (9) allows the water/glycol to go into the evaporator (12); the free-cooling coil (11) is not working. The absorbed power is the same as a traditional electric air cooled chiller.

OPERATION IN WINTER
When the ambient air has a temperature lower or around 0 °C, the chiller operates in free cooling mode: the 3-way valve (9) allows the water/glycol to go into the free-cooling coil (11), the probe (5) switch off the compressors (10). The fans (13) keep working to guarantee the air flow through the free-cooling coil (11). By the external air decreasing, the microprocessor (15) activates, by reaching the set point, the fans modulate.

OPERATION IN MID SEASON
It's a combination of free-cooling and traditional electric chiller. The free-cooling operation starts when the external air temperature is at least 2 °C lower than the return liquid temperature; so, normally at 15-10 °C. The liquid is pre-cooled in the free-cooling coil (11). The performance is completed by the compressors. The water temperature probe (5) controls the compressor (10) capacity steps.

BENEFITS
- Your overheads would reduce in the mid season.
- Your free cooling system could run automatically when required.
- There would be less wear and tear due to the reduced hours of operation.
- Your maintenance costs would reduce.

Free-cooling circuits



General features

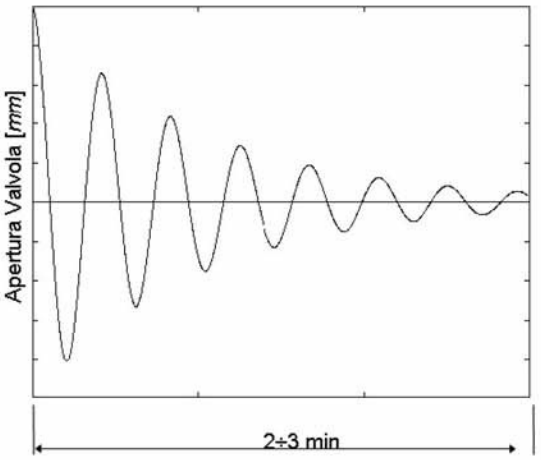
1 = Expansion vessel
2 = Gauge
3 = Pump
4 = Inlet water probe
5 = Probe
6 = Antifreeze probe
7 = External air temperature
8 = Shut-off valve
9 = 3-way valve
10 = Compressor
11 = Free-cooling coil
12 = Evaporator
13 = Fan
14 = Thermostatic valve
15 = Microprocessor
16 = Condenser
17 = Compressor pressure control valve

***** = Options**

TECHNICAL FEATURE

TECNICHAL FEATURES

A electronic expansion valve managed by software, can allow the refrigerant circuit to work very efficiently and reduce the power consumption. When the heating load changes suddenly, a traditional expansion valve experiences a 2-3 minute hunting period before achieving a state of equilibrium. On the contrary we have an immediate action of an **electronic expansion valve.**



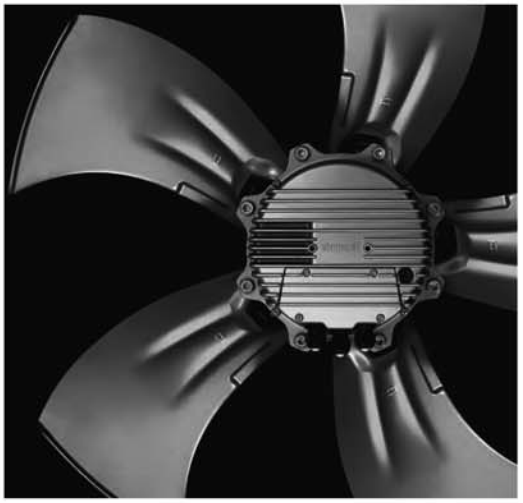
When a compressor starts or stops:

- The electronic driver pre-positions the valve at a point that is very close to the final equilibrium point
- The state of equilibrium is quickly achieved with few adjustments.
- The expansion valve becomes an active part within the system instead of just a passive part.
- Hunting lasts hardly any time at all.

FAN INVERTERS

The inverter technology employed on axial fans (optional extra) continuously adjusts automatically and the fans power and operating speed based on condensing pressure. This means the unit can even be used when the outside air temperature is below zero.

Furthermore, in free-cooling mode, the inverter controls the speed of the fans depending on water temperature.



CAPACITY CONTROL

The option of producing different cooling circuit configurations on the same size unit (in terms of capacity) means we can customize efficiency levels at full or part load.

The multi-compressor models favour high efficiency values at full load (EER). Having a number of compressors allows the unit to deliver its output based on a number of capacity reduction steps, thus adjusting capacity to suit the system's actual heating load perfectly reducing inrush currents.

INTERCONNECTIVITY

An advanced microprocessor enable:

- LAN network
- Programming Key
- All the parameters can be configured by the key pad on the front or by a hardware key and / or a serial line.

SCAEY - FREE COOLING

General features

FRAME
Self-supporting, galvanized steel frame protected with polyester powder painting. Panels are easily removable for maintenance and service activities.

COMPRESSORS
Hermetic «scroll» type with overload protection by a klixon and complete with oil sight glass. They are installed on vibration absorbing rubber and placed within a *closed compartment to reduce sound level and to allow service and maintenance activities while unit is in operation*.

EVAPORATOR
Braze-welded plate type with one or two independent refrigerant circuits and one water circuit.
The circuit are made to guarantee an homogeneous cooling of all the water flow even during partial load. The insulation is made of flexible closed-cells lining.
As protection, a *flow switch* is recommended to mount to stop the unit in case of no water circulation.

CONDENSER / FREE-COOLING
Condenser: one or two condensers made of copper tubes and aluminium finned coils.
Water free-cooling coil: one or two coils made of copper tubes and aluminium finned coils.

FANS
Axial fans with aerodynamic outline blade section directly coupled to a three phase electric motor with external rotor.
A safety fan guard is fitted on air flow discharge.

REFRIGERANT CIRCUIT
Each unit is supplied with one or two independent refrigerant circuits; each one includes: filter dryer, sight glass, electronic thermostatic expansion valve, service valve.
To protect the refrigerant circuit the following devices are installed: man. reset HP-switch, aut. reset LP-switch and antifreeze thermostat. Besides, if necessary: man. reset safety pressure switch and safety valve.

ELECTRICAL BOARD
With protection grade IP54 the el. board is mounted in the compressor chamber. Service activities can be done while the unit is in operation. It includes: main circuit automatic breaker with locking door device, compressors and fans contactors and relé, auxiliary circuit transformer.
Microprocessor to control automatically the unit with a visual system to display the function as well as failures.

Versions

RCP
100% condensing heat recovery. Each refrigerant circuit includes: a heat exchanger insulated and mounted in parallel to the condenser. Moreover the relevant solenoid valves.

P
This version is equipped with hydraulic kit. It includes: one or two pumps (one as stand-by), expansion vessel, gauge, flow switch, safety valve, air purger, shut off valve and hydraulic circuit insulated. In case of stand-by pump a non-return valve is mounted. Relevant electrical circuit. As option, pumps with higher ESP are available.

PAC
This version is equipped with hydraulic kit and inertial storage tank insulated and installed on the return line.

LN
Low noise version, it includes fan speed control and special soundproofing for the compressors chamber.

Options

- Power factor correction.
- Fan speed control.
- Remote control panel.
- Clock card.
- RS 485 card.
- Evaporator el. heater
- El. heater PAC version.
- Compressor shut off valves.
- HP/LP gauges.
- Cu/Cu or Epoxy Protection Coils
- Flow switch (STD in P and PAC versions)
- Pump shut off valve.
- Pumps with higher ESP.
- Protection grid condenser
- Rubber AV mounts.
- Spring AV mounts.
- Inverter for axial fans
- Wooden crate.

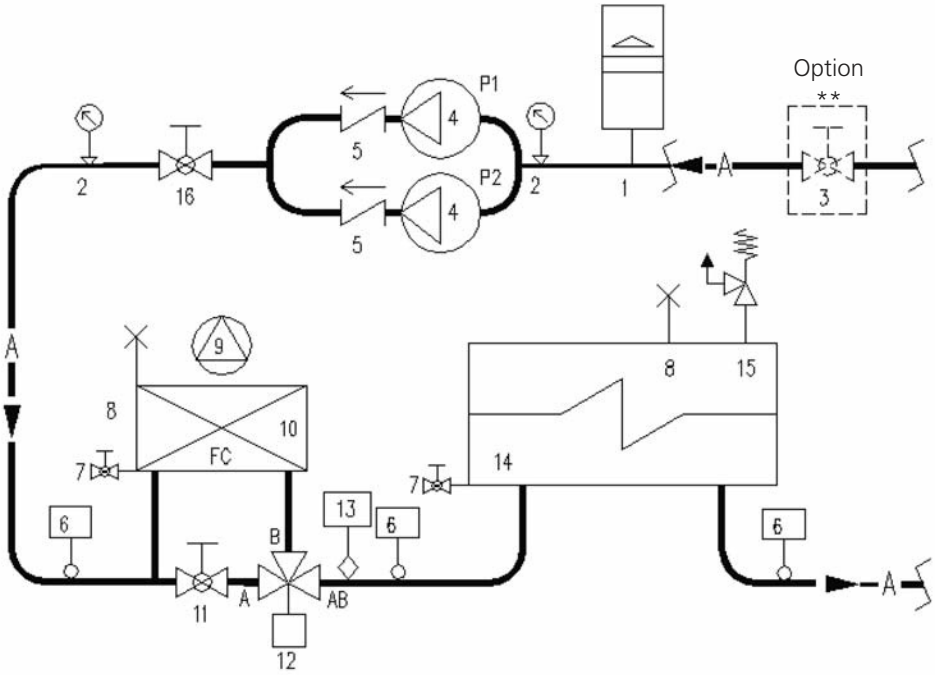
WORKING CONDITIONS
The technical data are referred to the following working conditions :

SUMMER OPERATION
- Inlet water temperature +16°C
- Outlet water temperature +10°C
- Ambient air temperature +32°C

FREE-COOLING OPERATION
- Inlet water temperature +16°C
- Outlet water temperature +10°C

SOUND PRESSURE LEVEL
Free field sound pressure level taken at 1 m from the unit and 1,5 m from its base, compressors side and full operating unit. The sound pressure level may change according to the various installation and has a + / - 3 dB(A) tolerance according to ISO3744.
The electrical power supply is 400V/3Ph/50Hz; the auxiliary electrical supply is 230V/1Ph/50Hz.

Hydraulic circuit SCAEY / FC... PAC 2 (PAC 1)



1 = Expansion vessel
2 = Gauge
3 = Shut-off valve**
4 = Pump
5 = Non-return valve
6 = Temperature probe
7 = Drain/fill up valve
8 = Bleed valve
9 = Fan
10 = Free-cooling coil
11 = Shut-off valve
12 = 3 way valve
13 = Flowswitch
14 = Tank
15 = Safety valve
16 = Balancing valve

Operating range

INLET WATER TEMPERATURE	Max °C	25
	Min °C	10
OUTLET WATER TEMPERATURE	Max °C	18
	Min °C	5
AMBIENT AIR TEMPERATURE	Max °C	40
	Min °C	-15

Technical data SCAEY - FREE COOLING

SIZE			61	71	81	91	101	121
COOLING MODE								
Nominal cooling capacity	(1)	kW	50	55	67	71	87	100
Abs. power	(2)	kW	17	20.6	21.6	24.6	28.4	33.7
EER		-	2.9	2.66	2.31	2.8	3	2.96
FREE-COOLING								
Amb. temp. (50% FC-capacity)		°C	8	7.6	8	7.6	7.3	7.9
Amb. temp. (100% FC-capacity)		°C	0.2	-1.0	0	-0.9	-2.5	-1.5
Abs. spower	(3)	kW	2	2	2	2	2	4
COMPRESSOR (scroll)								
Quantity		n°	2					
Refrigerant circuit		n°	1					
Capacity steps		n°	2					
Refrigerant		-	R410A					
Carica refrigerante		kG.	15	16	17	19	21	25
HYDRAULIC CIRCUIT – PLATE-TO-PLATE EVAPORATOR								
Water flow - 30% glycol		m^3/h	7.8	8.4	10.3	11	13.6	15.5
Pressure drop		kPa	60	73	57	65	77	96
Water/glycol volume		l	36	37	38	55	56	72
PAC - VERSION								
Tank volume		l	200	200	200	200	300	300
Pump abs. power		kW	2.2	2.2	2.2	3	2.2	4
Pump abs. current		A	4.2	4.2	4.2	6.2	4.6	7.6
ESP pump		kPa	120	100	100	150	135	140
CONDENSING SECTION / FREE-COOLING								
Axial fans		n°	2	2	2	2	2	2
Max abs. power		kW	1.95	1.95	1.95	1.95	1.95	4
Max abs. current		A	3.5	3.5	3.5	3.5	3.5	7
UNIT EL. DATA		(4)						
Max operating abs. current		A	43	49	54	59	69	79
Max LRC		A	136	147	149	174	213	267
El. supply		V/f/Hz	400/3/50					
SOUND PRESSURE LEVEL @ 1 m (5)								
STD Version		dB(A)	70	72	72	72	74	77
LN Version		dB(A)	67	69	69	69	71	74

Notes:

1) Water temp. 16 °C / 10 °C; ambient air temp. 32 °C; glycol 30%;
2) Compressor + fans; except pumps.
3) Abs. Power in free-cooling operation; except pumps.
4) Except pumps.
5) Compressor side according to ISO 3744.

Technical data SCAEY - FREE COOLING

SIZE			131	141	151	161	191	222
COOLING MODE								
Nominal cooling capacity	(1)	kW	109	123	131	151	167	201
Abs. power	(2)	kW	39	41.8	47.8	56.7	66.4	67.6
EER		-	2.8	2.9	2.7	2.6	2.5	2.97
FREE-COOLING								
Amb. temp. (50% FC-capacity)		°C	7.1	7.6	7.1	7.6	6.9	6.8
Amb. temp. (100% FC-capacity)		°C	2,6	-0.9	-1.9	-0.9	-2.3	-2.6
Abs. spower	(3)	kW	4	3	3	6	6	8
COMPRESSOR (scroll)								
Quantity		n°			2		4	
Refrigerant circuit		n°			1		2	
Capacity steps		n°			2		4	
Refrigerant					R410A			
Carica refrigerante		kG.	25	30	31	35	36	23+23
HYDRAULIC CIRCUIT – PLATE-TO-PLATE EVAPORATOR								
Water flow - 30% glycol		m^3/h	17.02	19.08	20.44	23.78	26.06	31.40
Pressure drop		kPa	103	95	102	126	132	105
Water/glycol volume		l	67	100	115	145	130	130
PAC - VERSION								
Tank volume		l	300	500	500	500	500	500
Pump abs. power		kW	4	3	3	4	4	5.5
Pump abs. current		A	7.6	6	6	7.6	7.6	10.4
ESP pump		kPa	130	110	110	140	120	110
CONDENSING SECTION / FREE-COOLING								
Axial fans		n°	2	3	3	3	3	4
Max abs. power		kW	4	3	3	6	6	8
Max abs. current		A	7	5.2	5.2	12	12	16
UNIT EL. DATA		(4)						
Max operating abs. current		A	81	92	100	120	134	155
Max LRC		A	270	319	327	371	385	343
El. supply		V/f/Hz			400/3/50			
SOUND PRESSURE LEVEL @ 1 m(5)								
STD Version		dB(A)	77	75	75	75	79	82
LN Version		dB(A)	74	72	72	72	76	79

Notes:

1) Water temp. 16 °C / 10 °C; ambient air temp. 32 °C; glycol 30%;
2) Compressor + fans; except pumps.
3) Abs. Power in free-cooling operation; except pumps.
4) Except pumps.
5) Compressor side according to ISO 3744.

Technical data SCAEY - FREE COOLING

SIZE		242	262	282	312	342	382
COOLING MODE							
Nominal cooling capacity (1)	kW	214	247	258	286	327	354
Abs. power (2)	kW	77.6	84	85.6	91.6	103.4	120.4
EER	-	2,.7	2.9	3	3.1	3.16	2.9
FREE-COOLING							
Amb. temp. (50% FC-capacity)	°C	7.2	7.5	8.6	7.2	7.6	6.9
Amb. temp. (100% FC-capacity)	°C	-2.7	-1.1	-1.2	-2.8	-1	-2.3
Abs. spower (3)	kW	8	6	12	12	12	12
COMPRESSOR (scroll)							
Quantity	n°	4					
Refrigerant circuit	n°	2					
Capacity steps	n°	4					
Refrigerant	-	R410A					
Carica refrigerante	kG.	25+25	29+29	31+31	34+34	42+42	42+42
HYDRAULIC CIRCUIT – PLATE-TO-PLATE EVAPORATOR							
Water flow - 30% glycol	m^3/h	33.45	38.53	40.31	45.04	51.08	55.33
Pressure drop	kPa	103	109	109	80	86	95
Water/glycol volume	l	175	200	130	165	240	260
PAC - VERSION							
Tank volume	l	500	500	500	500	750	750
Pump abs. power	kW	5.5	5.5	5.5	5.5	7.5	7.5
Pump abs. current	A	10.4	10.4	10.4	10.4	14	14
ESP pump	kPa	100	120	110	100	100	90
CONDENSING SECTION / FREE-COOLING							
Axial fans	n°	4	6	6	6	8	8
Max abs. power	kW	8	6	12	12	8	8
Max abs. current	A	16	15	24	24	16	16
UNIT EL. DATA (4)							
Max operating abs. current	A	166	180	191	207	236	265
Max LRC	A	355	408	419	435	487	516
El. supply	V/f/Hz	400/3/50					
SOUND PRESSURE LEVEL @ 1 m (5)							
STD Version	dB(A)	82	78	83	83	81	81
LN Version	dB(A)	79	76	80	80	78	78

Notes:

1) Water temp. 16 °C / 10 °C; ambient air temp. 32 °C; glycol 30%;
2) Compressor + fans; except pumps.
3) Abs. Power in free-cooling operation; except pumps.
4) Except pumps.
5) Compressor side according to ISO 3744.

SCAEY - FREE COOLING - R410 performances:

COOLING CAPACITY AND ABSORBED POWER

MOD.	EVAP	CONDENSER Ambient air temperature °C										FREE-COOLING amb. air °C			
	Tw °C	36		34		32		30		28		10	5	0	-5
	out	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
61	6	42	15,7	43	15,0	44	14,3	45	13,7	47	13,1	-	24,2	41,7	59,2
	8	45	16,0	46	15,3	47	14,7	48	14,1	50	13,4	9,5	29,5	46,0	62,5
	10	47	16,4	48	15,7	**50**	**15,0**	51	14,4	53	13,8	19,2	35,0	50,8	66,7
	12	50	16,8	52	16,1	53	15,4	55	14,8	56	14,1	24,0	39,0	54,0	69,5
	14	53	17,3	55	16,5	56	15,8	58	15,1	60	14,5	29,2	43,3	58,3	72,5
	16	56	18,0	58	17,2	60	16,5	61	15,8	63	15,1	33,5	47,5	62,0	76,0
71	6	46	19,4	47	18,6	49	17,7	50	17,0	51	16,3	-	26,6	45,8	65,1
	8	49	19,9	50	19,0	52	18,2	53	17,4	55	16,7	10,5	32,5	50,6	68,8
	10	52	20,3	53	19,5	**55**	**18,6**	57	17,8	58	17,1	21,1	38,5	55,9	73,3
	12	55	20,9	57	20,0	58	19,1	60	18,3	62	17,5	26,4	42,9	59,4	76,5
	14	58	21,4	60	20,5	62	19,6	64	18,8	66	17,9	32,1	47,6	64,1	79,8
	16	62	22,3	64	21,4	66	20,4	68	19,6	70	18,7	36,9	52,3	68,2	83,6
81	6	56	20,5	57	19,6	59	18,7	61	17,9	63	17,1	-	32,4	55,8	79,3
	8	59	20,9	61	20,0	63	19,1	65	18,4	67	17,6	12,7	39,5	61,6	83,8
	10	63	21,4	65	20,5	**67**	**19,6**	69	18,8	71	18,0	25,7	46,9	68,1	89,3
	12	67	22,0	69	21,1	71	20,1	73	19,3	75	18,4	32,2	52,3	72,4	93,1
	14	71	22,6	73	21,6	76	20,6	78	19,8	80	18,9	39,1	58,0	78,1	97,2
	16	75	23,5	78	22,5	80	21,5	82	20,6	85	19,7	44,9	63,7	83,1	101,8
91	6	59	23,6	61	22,6	63	21,6	64	20,7	66	19,8	-	34,3	59,1	84,0
	8	63	24,2	65	23,1	67	22,1	69	21,2	71	20,2	13,5	41,9	65,3	88,8
	10	67	24,7	69	23,7	**71**	**22,6**	73	21,7	75	20,7	27,2	49,7	72,1	94,6
	12	71	25,4	73	24,3	75	23,2	78	22,2	80	21,3	34,1	55,4	76,7	98,7
	14	75	26,0	78	24,9	80	23,8	82	22,8	85	21,8	41,4	61,5	82,8	103,0
	16	80	27,1	82	26,0	85	24,8	87	23,8	90	22,8	47,6	67,5	88,0	107,9
101	6	72	27,6	75	26,4	77	25,2	79	24,2	81	23,1	-	39,2	66,6	94,2
	8	77	28,2	79	27,0	82	25,8	84	24,7	87	23,7	14,8	47,0	73,1	99,2
	10	82	28,9	84	27,6	**87**	**26,4**	89	25,3	92	24,2	30,5	55,1	81,2	105,9
	12	87	29,6	90	28,4	92	27,1	95	26,0	98	24,8	38,3	61,8	86,1	109,6
	14	92	30,4	95	29,1	98	27,8	101	26,6	104	25,5	46,4	69,6	92,7	114,6
	16	98	31,7	101	30,3	104	29,0	107	27,8	110	26,6	53,9	76,6	98,3	120,1
121	6	83	31,0	86	29,7	88	28,3	91	27,2	93	26,0	-	43,0	75,0	105,0
	8	89	31,7	91	30,4	94	29,0	97	27,8	99	26,6	16,0	52,0	82,0	111,0
	10	94	32,5	97	31,1	**100**	**29,7**	103	28,5	106	27,2	33,3	61,6	90,0	118,3
	12	100	33,3	103	31,9	106	30,5	109	29,2	112	27,9	42,0	68,0	95,0	123,0
	14	106	34,2	110	32,7	113	31,2	116	30,0	119	28,7	51,7	76,6	101,6	128,0
	16	113	35,7	116	34,1	120	32,6	123	31,3	126	29,9	59,0	84,0	108,0	134,0

Notes:
Tw - Outlet water temperature (30% ethylene glycol) deltaT=6°C
kWf - Cooling capacity
kWa - Abs. power (compressors only)
Shaded areas are referred to free-cooling operation only

SCAEY - FREE COOLING - R410 performances:

COOLING CAPACITY AND ABSORBED POWER

MOD.	EVAP	CONDENSER Ambient air temperature °C										FREE-COOLING amb. air °C			
	Tw °C	36		34		32		30		28		10	5	0	-5
	out	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
131	6	91	36,5	93	35,0	96	33,4	99	32,0	102	30,6	-	52,6	90,8	128,9
	8	97	37,4	100	35,8	103	34,2	105	32,8	108	31,4	20,7	64,3	100,3	136,3
	10	103	38,3	105	36,6	**109**	**35,0**	112	33,6	115	32,1	41,7	76,3	110,7	145,3
	12	109	39,3	113	37,6	116	35,9	119	34,4	123	32,9	52,3	85,0	117,7	151,5
	14	116	40,3	119	38,6	122	36,8	126	35,3	130	33,8	63,5	94,4	127,1	158,1
	16	123	42,0	127	40,2	130	38,4	134	36,9	138	35,2	73,0	103,6	135,2	165,7
141	6	102	40,5	105	38,8	109	37,0	112	35,5	115	33,9	-	59,4	102,5	145,5
	8	109	41,5	112	39,7	116	37,9	119	36,4	122	34,8	23,4	72,6	113,2	153,8
	10	116	42,4	119	40,6	**123**	**38,8**	126	37,2	130	35,6	47,1	86,1	125,0	164,0
	12	123	43,6	127	41,7	130	39,8	135	38,2	138	36,5	59,0	95,9	132,8	171,0
	14	131	44,7	135	42,7	139	40,8	143	39,1	147	37,4	71,7	106,5	143,4	178,4
	16	139	46,6	143	44,6	147	42,6	151	40,9	155	39,1	82,4	116,9	152,5	187,0
151	6	109	46,8	112	44,7	116	42,7	119	41,0	122	39,2	-	63,3	109,1	155,0
	8	116	47,9	120	45,8	123	43,8	127	42,0	130	40,1	24,9	77,3	120,5	163,8
	10	123	49,0	127	46,9	**131**	**44,8**	135	43,0	138	41,1	50,2	91,7	133,1	174,6
	12	131	50,3	135	48,1	139	46,0	143	44,1	147	42,1	62,9	102,2	141,5	182,1
	14	139	51,6	143	49,3	148	47,1	152	45,2	156	43,2	76,4	113,4	152,7	190,0
	16	148	53,8	152	51,5	157	49,2	161	47,2	166	45,1	87,8	124,5	162,4	199,1
161	6	126	52,9	129	50,6	133	48,4	137	46,4	141	44,4	-	72,9	125,8	178,6
	8	134	54,2	138	51,9	142	49,5	146	47,5	150	45,4	28,7	89,1	138,9	188,8
	10	142	55,5	147	53,1	**151**	**50,7**	155	48,6	160	46,5	57,8	105,7	153,4	201,3
	12	151	56,9	156	54,5	160	52,0	165	49,9	170	47,7	72,5	117,8	163,1	209,9
	14	160	58,4	165	55,8	170	53,3	175	51,1	180	48,9	88,0	130,8	176,1	219,0
	16	170	60,9	175	58,3	181	55,7	186	53,4	191	51,0	101,2	143,5	187,2	229,5
191	6	139	63,0	143	60,3	147	57,6	152	55,3	156	52,8	-	75,2	127,9	180,9
	8	148	64,6	153	61,8	157	59,0	162	56,6	166	54,1	28,4	90,2	140,3	190,4
	10	157	66,1	162	63,2	**167**	**60,4**	172	57,9	177	55,4	58,5	105,7	155,8	203,2
	12	167	67,8	173	64,9	177	62,0	183	59,4	188	56,8	73,5	118,6	165,3	210,4
	14	177	69,5	183	66,5	188	63,5	194	60,9	199	58,3	89,0	133,6	178,0	219,9
	16	188	72,6	194	69,4	200	66,3	205	63,6	211	60,8	103,5	147,0	188,7	230,5
222	6	167	62,2	172	59,5	177	56,9	182	54,5	188	52,1	-	86,4	150,8	211,1
	8	178	63,7	184	61,0	189	58,2	194	55,8	200	53,4	32,2	104,5	164,8	223,1
	10	189	65,2	195	62,4	**201**	**59,6**	207	57,2	212	54,7	66,9	123,8	180,9	237,8
	12	201	66,9	208	64,0	213	61,1	220	58,6	226	56,1	84,4	136,7	191,0	247,2
	14	214	68,6	220	65,6	227	62,7	233	60,1	240	57,5	103,9	154,0	204,2	257,3
	16	226	71,6	233	68,5	240	65,4	247	62,8	254	60,0	118,6	168,8	217,1	269,3

Notes:

Tw - Outlet water temperature (30% ethylene glycol) deltaT=6°C
kWf - Cooling capacity
kWa - Abs. power (compressors only)
Shaded areas are referred to free-cooling operation only

SCAEY - FREE COOLING - R410 performances:

COOLING CAPACITY AND ABSORBED POWER

MOD.	EVAP	CONDENSER Ambient air temperature °C										FREE-COOLING amb. air °C			
	Tw °C	36		34		32		30		28		10	5	0	-5
	out	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
242	6	178	72,6	183	69,5	189	66,4	194	63,7	200	60,9	-	23,9	178,3	253,2
	8	190	74,4	196	71,2	201	68,0	207	65,2	213	62,4	10,4	31,3	196,9	267,5
	10	201	76,1	206	72,9	**214**	**69,6**	220	66,7	226	63,8	20,9	38,7	217,4	285,3
	12	214	78,1	221	74,8	227	71,4	234	68,5	241	65,5	28,9	46,9	231,1	297,5
	14	227	80,1	234	76,7	240	73,2	248	70,2	255	67,1	36,7	55,1	249,5	310,3
	16	241	83,6	249	80,0	255	76,4	263	73,3	271	70,1	44,3	62,8	265,4	325,3
262	6	205	81,4	212	77,9	218	74,4	224	71,4	231	68,2	-	119,3	205,8	292,2
	8	219	83,4	226	79,8	232	76,2	239	73,1	246	69,9	46,9	145,7	227,2	308,8
	10	233	85,3	240	81,7	**247**	**78,0**	254	74,8	261	71,5	94,6	172,9	251,0	329,3
	12	248	87,6	255	83,8	262	80,0	270	76,7	278	73,4	118,6	192,7	266,8	343,3
	14	262	89,8	271	85,9	279	82,1	286	78,7	294	75,2	144,0	213,9	288,0	358,2
	16	278	93,7	287	89,7	295	85,6	304	82,1	312	78,5	165,5	234,7	306,3	375,4
282	6	215	76,8	221	73,5	228	70,2	234	67,3	241	64,4	-	25,1	214,9	305,2
	8	229	78,7	236	75,3	243	71,9	250	69,0	257	65,9	12,5	35,4	237,4	322,5
	10	243	80,5	251	77,1	**258**	**73,6**	265	70,6	273	67,5	25,1	45,6	262,1	343,9
	12	259	82,6	267	79,1	273	75,5	282	72,4	290	69,2	46,2	50,3	278,6	358,6
	14	274	84,7	283	81,1	291	77,4	299	74,3	308	71,0	38,6	57,9	300,8	374,1
	16	291	88,4	300	84,6	309	80,8	317	77,5	326	74,1	46,5	65,8	319,9	392,2
312	6	238	83,1	245	79,5	253	75,9	260	72,8	267	69,6	-	138,1	238,2	338,3
	8	254	85,1	261	81,4	269	77,8	277	74,6	284	71,3	54,3	168,7	263,1	357,5
	10	269	87,1	278	83,3	**286**	**79,6**	294	76,3	302	73,0	109,5	200,2	290,6	381,2
	12	287	89,3	295	85,5	303	81,7	313	78,3	322	74,9	137,3	223,1	308,9	397,5
	14	304	91,6	313	87,7	323	83,7	332	80,3	341	76,8	166,7	247,7	333,5	414,7
	16	322	95,6	332	91,5	342	87,4	352	83,8	362	80,1	191,6	271,7	354,6	434,7
342	6	272	99,6	280	95,3	289	91,0	297	87,3	305	83,5	-	147,2	250,5	354,1
	8	290	102,0	299	97,6	308	93,2	316	89,4	325	85,5	55,6	176,6	274,7	372,8
	10	308	104,4	318	99,9	**327**	**95,4**	336	91,5	346	87,5	114,5	207,0	305,1	398,0
	12	328	107,1	338	102,5	347	97,9	358	93,9	368	89,8	143,9	232,2	323,7	412,0
	14	347	109,8	358	105,1	369	100,4	379	96,2	390	92,0	174,3	261,6	348,6	430,7
	16	368	114,6	380	109,7	391	104,7	402	100,5	413	96,1	202,7	287,8	369,5	451,3
382	6	294	117,3	304	112,3	313	107,2	321	102,8	330	98,3	-	152,2	265,5	371,7
	8	314	120,1	323	115,0	333	109,8	342	105,3	352	100,7	56,6	184,1	290,3	392,9
	10	333	123,0	344	117,7	**354**	**112,4**	364	107,8	374	103,1	117,9	218,1	318,6	418,8
	12	355	126,2	366	120,7	375	115,3	387	110,6	398	105,8	148,7	240,7	336,3	435,4
	14	376	129,4	388	123,8	399	118,2	410	113,4	422	108,4	183,0	271,2	359,7	453,1
	16	399	135,0	411	129,2	423	123,4	435	118,4	448	113,2	208,9	297,4	382,3	474,4

Notes:
Tw - Outlet water temperature (30% ethylene glycol) deltaT=6°C
kWf - Cooling capacity
kWa - Abs. power (compressors only)
Shaded areas are referred to free-cooling operation only

UNITS DIMENSIONS:

Fig. A
Mod. from **61** to **91**

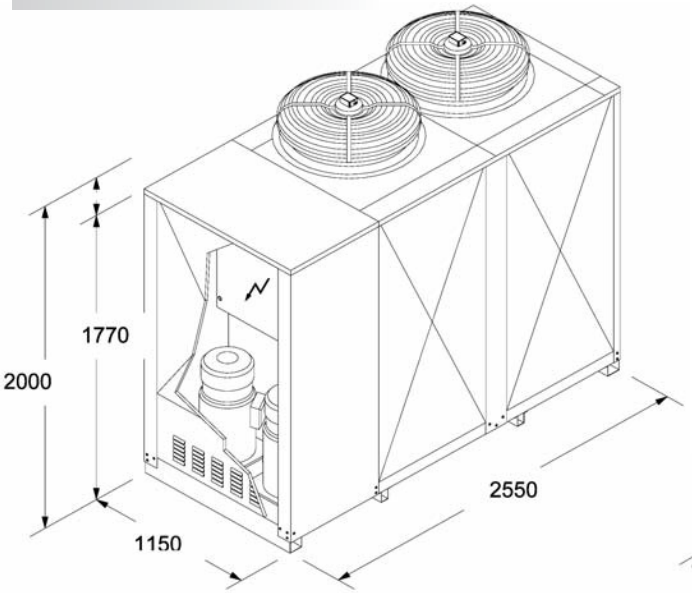
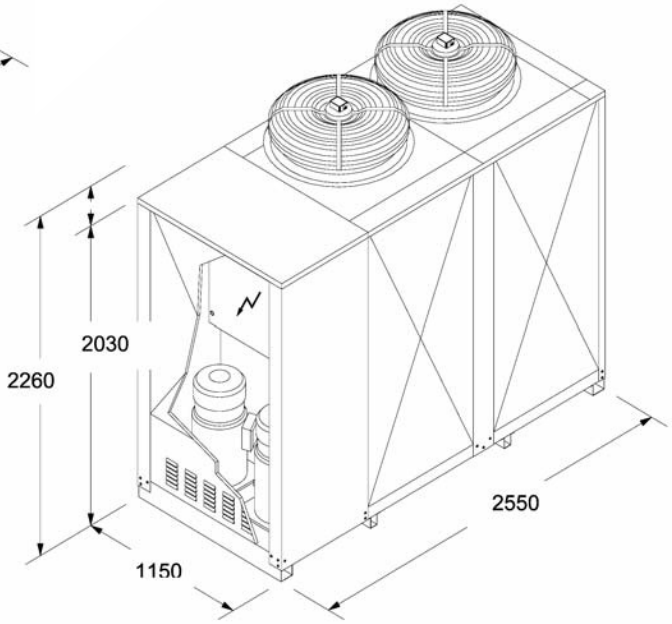


Fig. B
Mod. from **101** to **131**



WEIGHTS (KG)

VERSIONS	STD							LN						
Mod.	**61**	**71**	**81**	**91**	**101**	**121**	**131**	**61**	**71**	**81**	**91**	**101**	**121**	**131**
Fig.	A	A	A	A	B	B	B	A	A	A	A	B	B	B
Kg. Operation (1)	710	750	790	870	1050	1105	1200	730	775	810	888	1075	1140	1240
Kg. Transport	710	750	790	870	1050	1105	1200	730	775	810	888	1075	1140	1240
"P1" Vers.														
Kg. Operation (1)	725	775	815	895	1080	1155	1260	745	795	830	910	1105	1190	1300
Kg. Transport	725	775	815	895	1080	1155	1260	745	795	830	910	1105	1190	1300
"PAC1 Vers.														
Kg. Operation	1035	1070	1150	1210	1505	1595	1710	1085	1120	1200	1260	1555	1645	1760
Kg. Transport	795	835	920	990	1180	1260	1380	845	885	970	1040	1230	1310	1430

(1) The data has to be added to the evaporator water volume with regard to the selected model.

Fig. C
Mod. from **141** to **191**

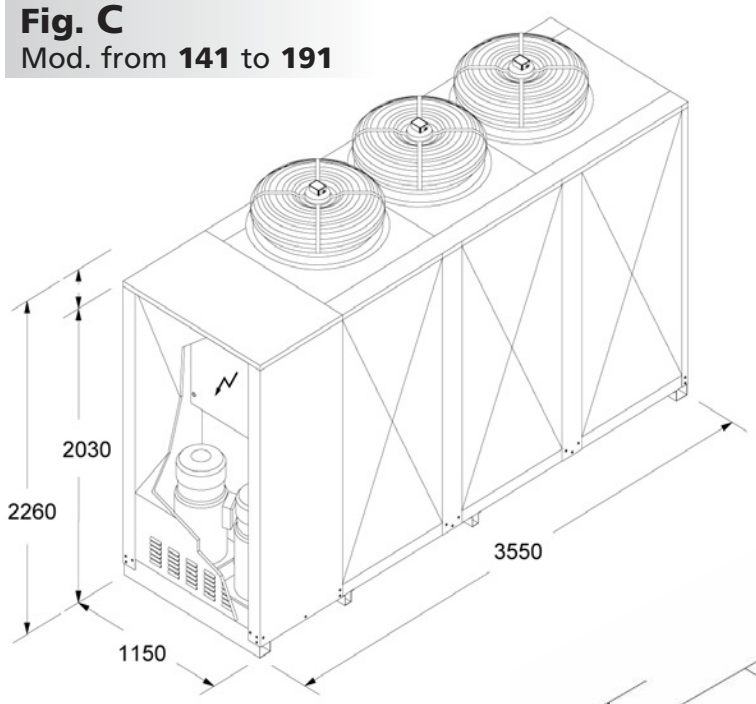
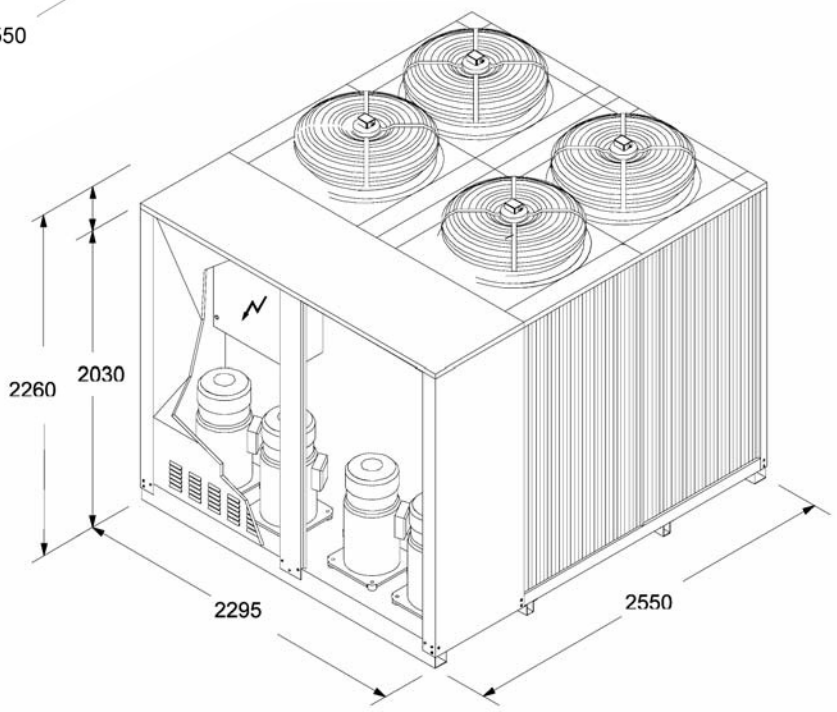


Fig. D
Mod. from **222** to **242**



WEIGHTS (KG)

VERSIONS	STD						LN					
Mod.	**141**	**151**	**161**	**191**	**222**	**242**	**141**	**151**	**161**	**191**	**222**	**242**
Fig.	C	C	C	C	D	D	C	C	C	C	D	D
Kg. Operation (1)	1280	1355	1490	1580	1970	2190	1320	1395	1530	1620	2050	2260
Kg. Transport	1280	1355	1490	1580	1970	2190	1320	1395	1530	1620	2050	2260
"P1" Vers.												
Kg. Operation (1)	1320	1395	1540	1620	2030	2260	1360	1435	1580	1660	2100	2330
Kg. Transport	1320	1395	1540	1620	2030	2260	1360	1435	1580	1660	2100	2330
"PAC1" Vers.												
Kg. Operation	1790	2065	2190	2300	2700	2960	1840	2115	2240	2350	2750	3010
Kg. Transport	1450	1515	1660	1770	2180	2410	1500	1565	1710	1820	2230	2460

(1) The data has to be added to the evaporator water volume with regard to the selected model.

Fig. E
Mod. from **262** to **312 STD**

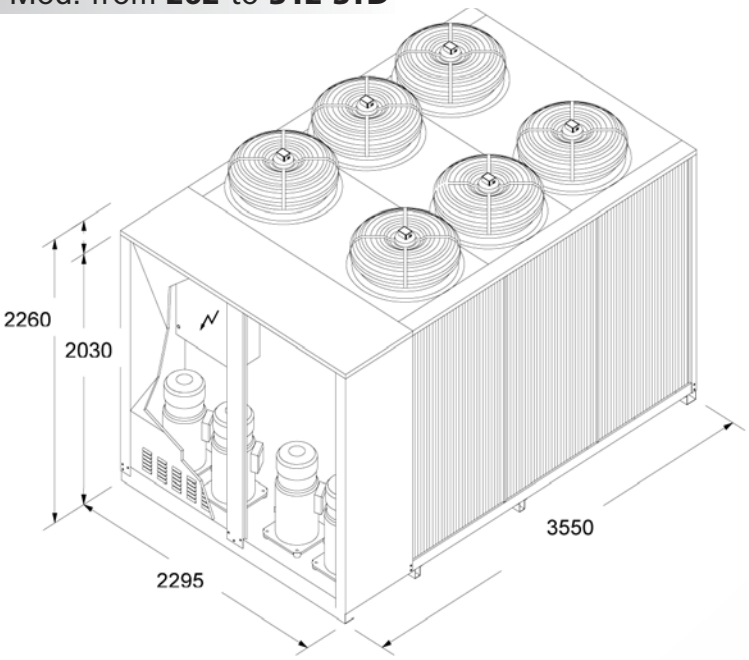
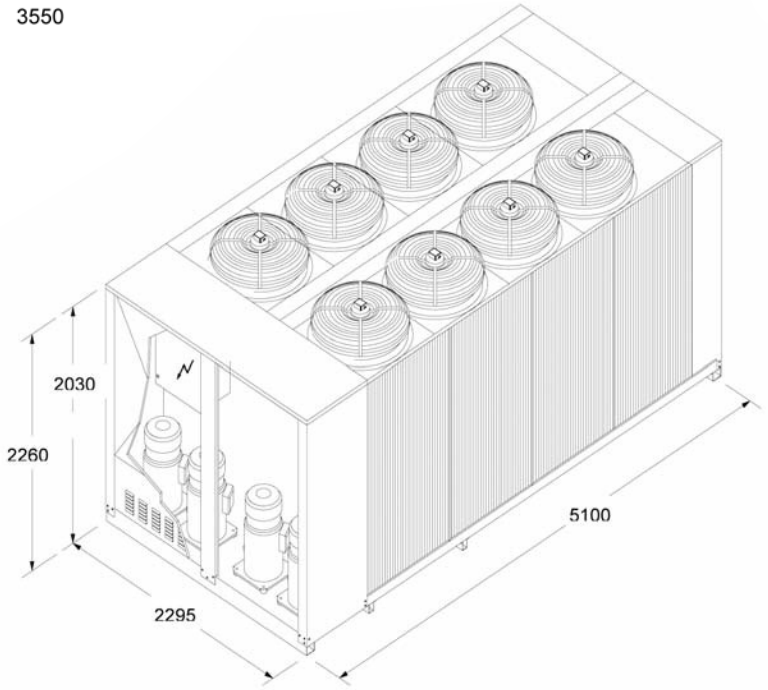


Fig. F
Mod. from **342** to **382 STD**



WEIGHTS (KG)

VERSIONS	STD					LN				
Mod.	**262**	**282**	**312**	**342**	**382**	**262**	**282**	**312**	**342**	**382**
Fig.	E	E	E	F	F	E	E	E	F	F
Kg. Operation (1)	2230	2340	2590	2750	2970	2300	2410	2660	2820	3050
Kg. Transport	2230	2340	2590	2750	2970	2300	2410	2660	2820	3050
"P1" Vers.										
Kg. Operation (1)	2300	2410	2670	2840	3090	2370	2470	2730	2910	3170
Kg. Transport	2300	2410	2670	2840	3090	2370	2470	2730	2910	3170
"PAC1" Vers.										
Kg. Operation	3020	3100	3620	3780	3990	3070	3150	3690	3860	4050
Kg. Transport	2470	2550	2820	2980	3200	2520	2600	2890	3060	3260

(1) The data has to be added to the evaporator water volume with regard to the selected model.

FREE SPACES AND SUPPORT POINTS:

Fig. A
Mod. from **61** to **131**

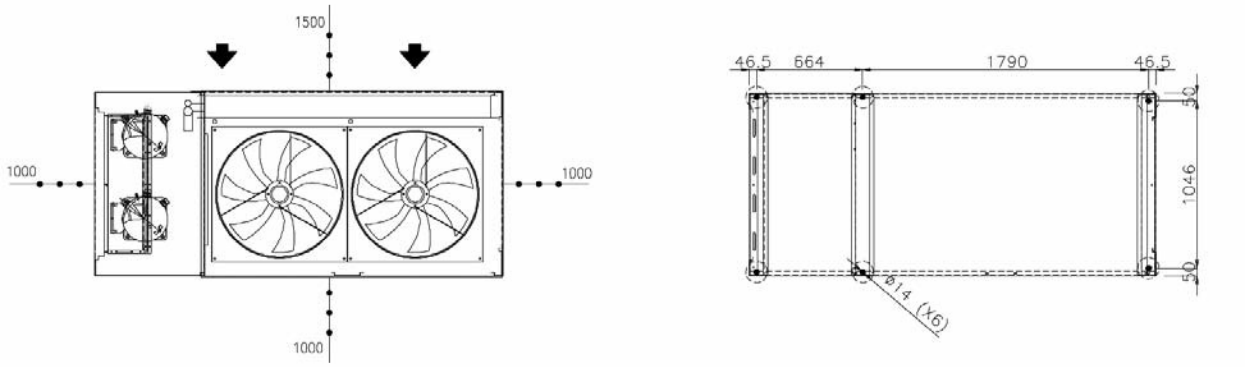
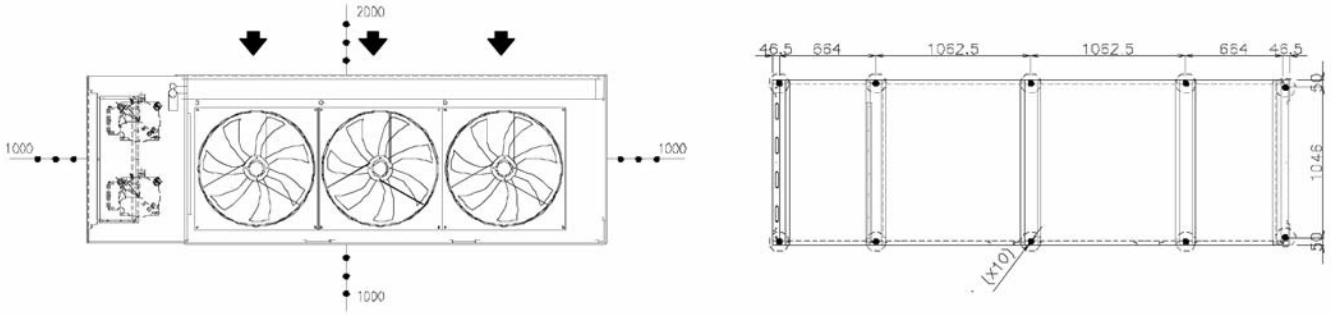


Fig. B
Mod. from **141** to **191**



HYDRAULIC CONNECTIONS - Ø -

Mod.	**61**	**71**	**81**	**91**	**101**	**121**	**131**	**141**	**151**	**161**	**191**
Fig.	A	A	A	A	A	A	A	B	B	B	B
Plate-to-plate version	1"1/2	1"1/2	2"	2"	2"	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2
PAC version with tank	1"1/2	1"1/2	2"	2"	2"	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2

Fig. C
Mod. from **212** to **222**

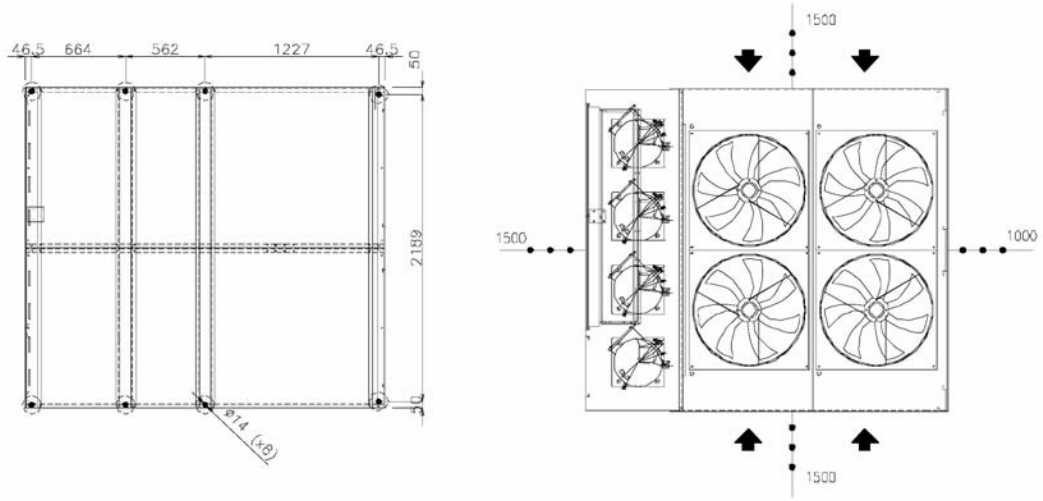
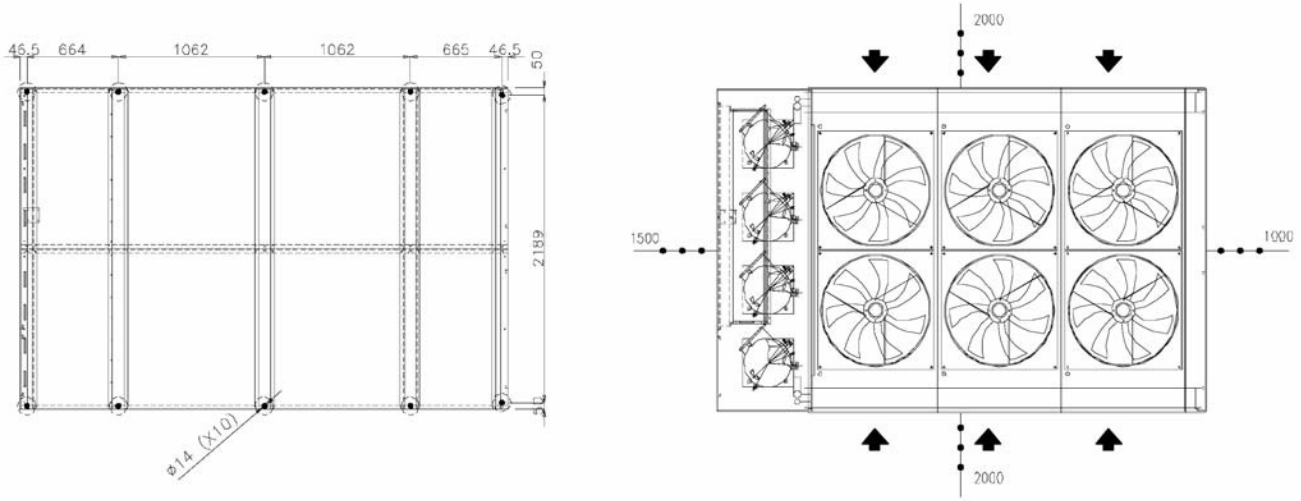


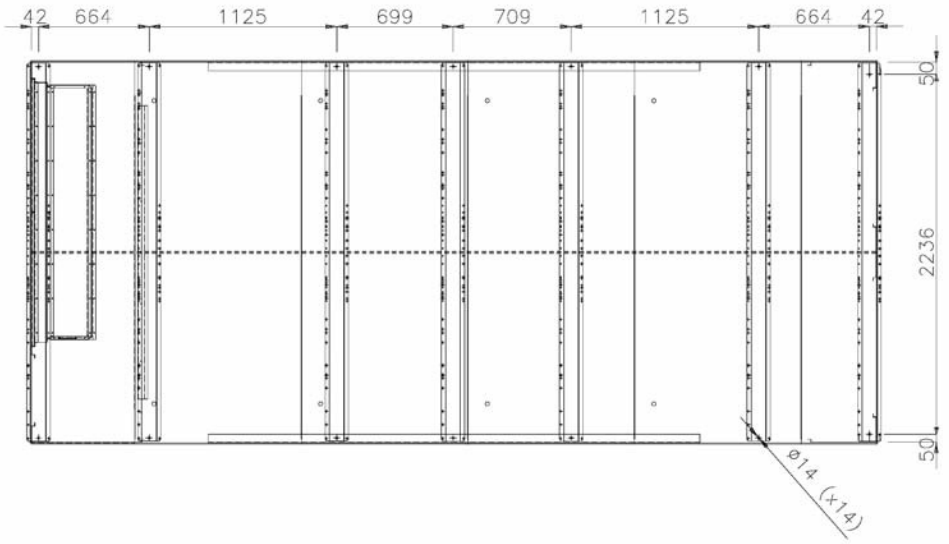
Fig. D
Mod. from **262** to **312**

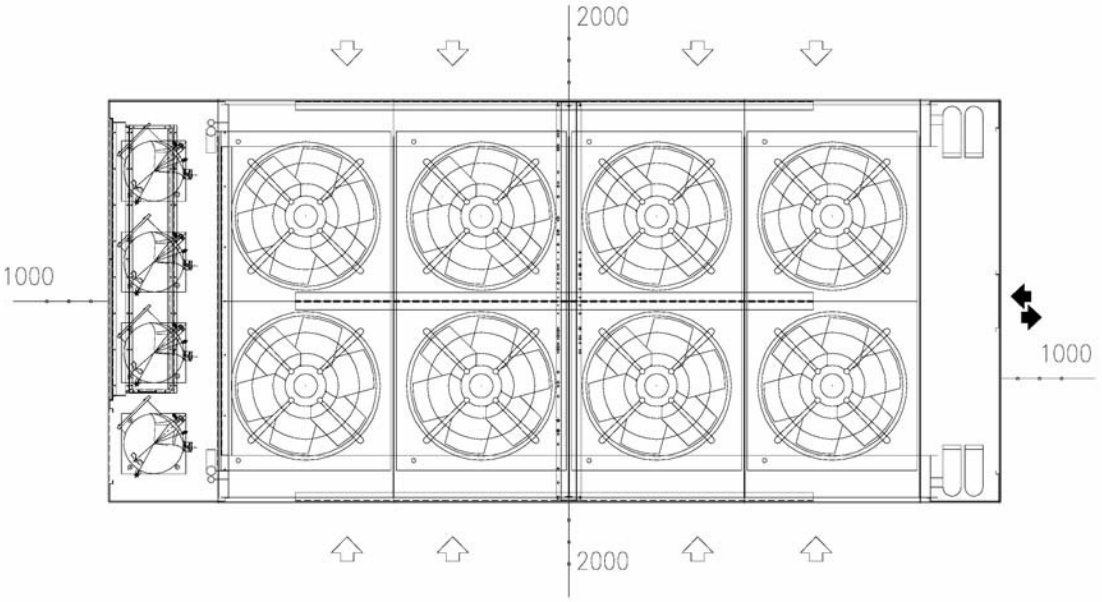


HYDRAULIC CONNECTIONS - Ø -

Mod.	**222**	**242**	**262**	**282**	**312**
Fig.	C	C	D	D	D
Plate-to-plate version	3″	3″	3″	3″	4″
PAC version with tank	3″	3″	3″	3″	4″

Fig. E
Mod. from **342** to **382**





HYDRAULIC CONNECTIONS - Ø -

Mod.	**342**	**382**
Fig.	E	E
Plate-to-plate version	4″	4″
PAC version with tank	4″	4″

Technical data shown in this booklet are not binding. ACM Kälte Klima Srl reserves the right to modify data without prior notice.

NOTES:

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