

Air Cooled Condenser



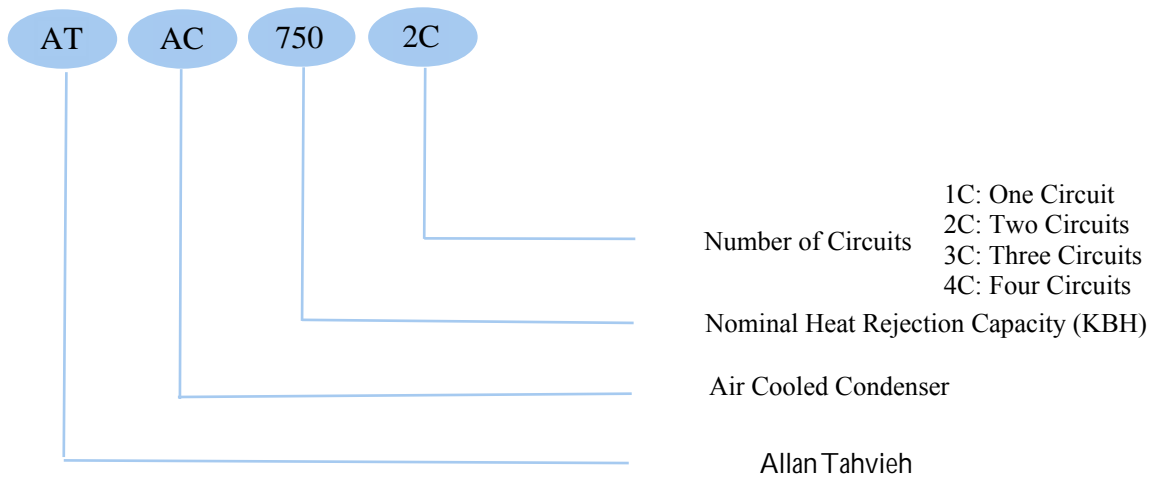
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Nomenclature



Features

General

Allan Tahviah Air Cooled Condensers are offered in 11 models with heat rejection capacity range of 29 to 2194 KBH, designed to accommodate a wide range of application in the A/C industry.

Casing

Suitable heavy gauge galvanized steel sheets are used in the manufacture of casing panels and mounting chassis formed from heavy gauge steel sheets offer maximum rigidity.

Coils

Condenser coils consist of seamless copper tubes mechanically expanded into die formed aluminum or copper fins with 8 to 12 FPI spacing. Coils are available in single and multi-circuits.

Fans

Directly Driven axial fans, deliver the required air flow rate at minimum sound levels. All fans are equipped with fan guard for maximum protection. Fan operation sequencing is performed based on the liquid refrigerant's pressure leaving the condenser.

Motors

Totally enclosed air cooled (air over body) electric motors equipped with permanently lubricated bearings, an IP-54 protection, winding insulation class of F plus thermal protection and B rise construction are mounted in vertical position. The motors are suitable for operation.

Electrical Panel

Consists of a drip proof enclosing all electric components such as contactors, over load protections and...

Testing

Condenser coils are leak tested at 450 psig after production and the entire condenser unit is tested at 350 psig working pressure after production.

Selection Procedure

Helpful Hints

- Maximum allowable condensing temperature for R407c: 130°F
- Maximum allowable condensing temperature for R22: 135°F
- Maximum allowable condensing temperature for R134a: 140°F
- Optimum condensing temperature for R22 & R407c: 120°F
- Optimum condensing temperature for R134a: 130°F
- TD: Condensing temperature - ambient dry bulb temperature
- THR= [System cooling capacity] + [Compressor motor power input × 3413]

Example

Given:

Refrigerant: R22
 System Cooling Capacity: 210000Btu/hr
 Condensing Temperature: 120°F
 Ambient Air Temperature: 100°F
 Compressor Power Input: 18.2 KW
 Design Altitude: 2000 ft
 Coil Fin per Inch: 12 FPI
 Fin Material: Aluminum

Select Matching Air Cooled Condenser

- Determine Total Heat Rejection:
 $THR = 210000 + (18.2 \times 3413) = 272117 \text{ Btu/hr}$
- From table2 for altitude adjustment factor (@2000ft) $AF_A = 1.05$
 $Adjusted \text{ THR} = 1.05 \times 272117 = 285723 \text{ Btu/hr}$
- T.D. (Design Temperature Difference) = $120 - 100 = 20^\circ\text{F}$
- From table3A and T.D. of 20°F , TIAC-225 with plate fins offers 343000 Btu/hr which satisfies the above required THR.

Note:

Extracted value of THR from Table3A to Table5B shall be 5% more than calculated amount (Calculated Total Heat Rejection is compressor's needed condenser load).

Coil Fin per Inch Correction Factor

Table1

No. of FPI	Correction Factor
8	0.78
10	0.90
12	1.00

Altitude Adjustment Factor (AFA)

Table2

Altitude(ft)	Adjustment Factor
0	1.00
1000	1.02
2000	1.03
3000	1.05
4000	1.07
5000	1.08
6000	1.10

Total Heat Rejection for R22 [KBH]

Aluminum Fin Table 3A

Model	TD (°F)				
	10	15	20	25	30
ATAC - 075	29.1	45.5	63.3	82.1	101.9
ATAC - 110	68.7	108.8	151.7	196.8	243.4
ATAC - 150	76.8	121.5	169.7	220.8	274.4
ATAC - 225	150.2	242.7	343.2	449.3	559.2
ATAC - 300	169.9	271.2	380	494.4	612.2
ATAC - 375	216.4	344.6	482.2	626.3	774.9
ATAC - 450	252.5	403.4	565.5	735.7	911.6
ATAC - 600	302.9	479.8	670.8	873.6	1085.9
ATAC - 750	432.6	689	964	1252.3	1549.7
ATAC - 900	504.9	806.5	1130.8	1471.3	1822.8
ATAC - 1150	609	963	1333	1733	2136.4

Copper Fin Table 3B

Model	TD (°F)				
	10	15	20	25	30
ATAC - 075	29.7	46.5	64.7	83.9	104.3
ATAC - 110	69.9	110.7	154.5	200.7	248.4
ATAC - 150	78	123.8	173.2	225.7	280.5
ATAC - 225	153.2	248.3	351.7	460.8	573.9
ATAC - 300	172.9	276.6	388.2	505.2	625.8
ATAC - 375	220.2	351.2	491.7	639.2	791.6
ATAC - 450	257.2	411.5	577.4	751.8	931.9
ATAC - 600	308.2	489	684.8	892.8	1110.7
ATAC - 750	440.2	702.2	983.6	1278.6	1583.3
ATAC - 900	513.9	822.5	1154.6	1503.4	1863.7
ATAC - 1150	618.6	979.5	1363.6	1764	2176.1

NOTE:

KBH=1000 Btu/hr

Max Condensing Temperature= 135°F

Above given values are based on sea level altitude and 12 Fins per Inch coil. For different altitude and coil FPI (8 and 10), multiply THR value by the appropriate correction factor in Table1 and divide by correction factor in Table2.

Total Heat Rejection for R134a [KBH]

Aluminum Fin

Table 5A

Model	TD (°F)				
	10	15	20	25	30
ATAC - 075	32.5	50	68.2	87	106.5
ATAC - 110	74.6	115.2	157.6	201.6	246.8
ATAC - 150	85.1	131.2	180.2	230.1	282
ATAC - 225	162.2	254.3	351.9	454	559.9
ATAC - 300	183	284.6	391.3	501.8	615.8
ATAC - 375	233.2	361.8	496.6	636.6	780.6
ATAC - 450	272.4	423.4	582	747	916.9
ATAC - 600	335.6	518.3	709.8	909.3	1115.5
ATAC - 750	466	723.2	992.9	1272.8	1560.8
ATAC - 900	544.5	846.5	1163.9	1493.8	1833.7
ATAC - 1150	654.4	1010.4	1381.5	1763.9	2156.6

Copper Fin

Table 5B

Model	TD (°F)				
	10	15	20	25	30
ATAC - 075	33.1	50.9	69.5	88.8	108.8
ATAC - 110	45.9	70.5	95.9	121.5	148.8
ATAC - 150	86.8	133.8	183.4	234.8	287.9
ATAC - 225	165.8	260	360.5	465.4	574
ATAC - 300	186.5	290	398.9	512.4	629
ATAC - 375	237.4	368.9	506.6	649.9	796.9
ATAC - 450	277.7	431.9	594	763	937
ATAC - 600	342	529	724.9	928.9	1141
ATAC - 750	474.9	737	1012.9	1299	1593.8
ATAC - 900	554.9	863.5	1188	1525.6	1873.9
ATAC - 1150	665	1027.8	1405.5	1795.9	2195.9

NOTE:

KBH=1000 Btu/hr

Max Condensing Temperature= 145°F

Above given values are based on sea level altitude and 12 Fins per Inch coil. For different altitude and coil FPI (8 and 10), multiply THR value by the appropriate correction factor in Table1 and divide by correction factor in Table2.

Engineering Data

Table 6

Model	Propeller Fan				Coil		Refrigerant		No. of Circuits	Unit Weight (Kg)
	No.	Dia (mm)	RPM	Total CFM	Rows Deep	Total CFA (ft ²)	Charge (Kg)	Pump Down Capacity(Kg)		
AT AC - 075	1	630	900	6300	3	7.8	4	12	1	210
AT AC - 110	2	630	900	12600	3	19.2	7.2	22	1,2	325
AT AC - 150	2	700	900	16000	3	20.3	8.7	31	1,2	350
AT AC - 225	4	700	900	32000	3	34.8	13	46	1,2	540
AT AC - 300	4	700	900	32000	3	44.5	17	60	1,2	670
AT AC - 375	5	700	900	40000	3	58.1	21	71	1,2	1030
AT AC - 450	6	700	900	48000	3	65.8	25	90	1,2	1190
AT AC - 600	8	700	900	64000	3	79.4	33	120	1,2	1680
AT AC - 750	10	700	900	80000	3	116.2	42	150	1,2	2000
AT AC - 900	12	700	900	96000	3	131.7	50	185	1,2,4	2350
AT AC - 1150	12	700	900	81600	4	131.7	68	240	1,2,4	2690

NOTE:

System total operating charge = Chiller or Packaged Unit operating charge + Air Cooled Condenser operating charge + refrigerant lines operating charge (Table8)

Electrical Data

Refrigerant Weight in Copper Line(Kg/100ft)

Table 7

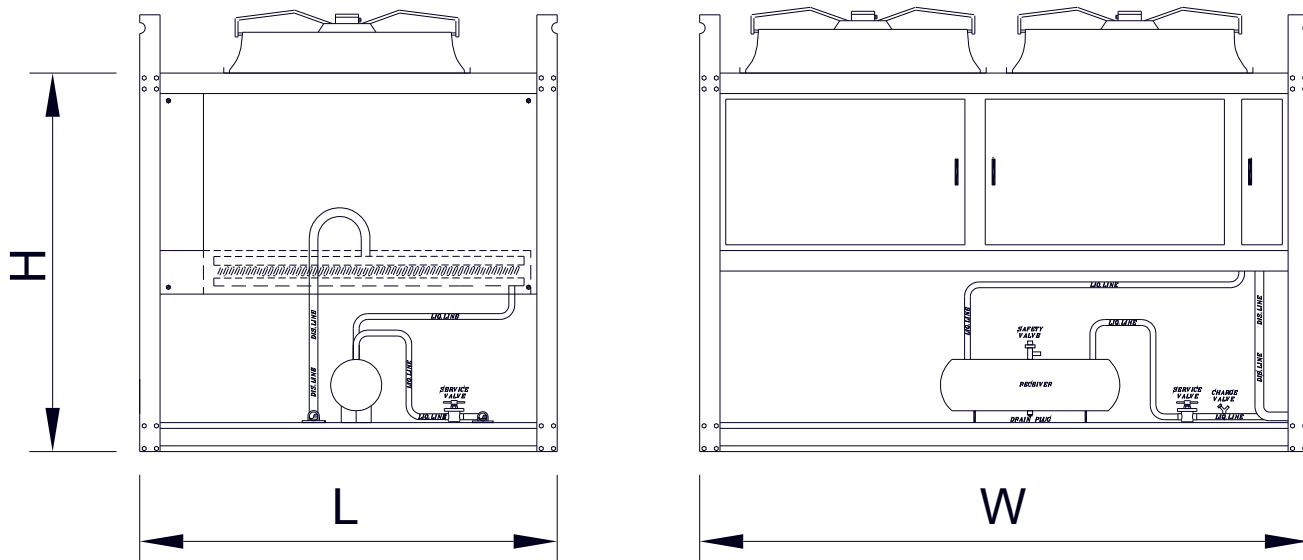
Table 8

Model	Motor			System				O.D Line Size (Inch)	Liquid @100°F	Hot Gas @120°F
	No.	Rated HP Output	Rated Load Amps	Rated KW Input	Total Load Amps	Starting Current Amps	Wire Size			
ATAC - 075	1	0.6	1.5	0.64	1.50	7.42	4×1	3/8	1.75	0.10
ATAC - 110	2	0.6	1.5	1.28	3.00	14.9	4×1.5	1/2	3.24	0.17
ATAC - 150	2	1.7	3.1	2.60	6.20	14.9	4×1.5	5/8	5.24	0.28
ATAC - 225	4	1.7	3.1	5.20	12.4	29.7	4×2.5	7/8	10.9	0.57
ATAC - 300	4	1.7	3.1	5.20	12.4	29.7	4×2.5	1 1/8	18.6	0.97
ATAC - 375	5	1.7	3.1	6.50	15.5	37.1	4×2.5	1 3/8	28.2	1.48
ATAC - 450	6	1.7	3.1	7.80	18.6	44.6	4×4	1 5/8	40.0	2.10
ATAC - 600	8	1.7	3.1	10.4	24.8	59.4	4×6	2 1/8	69.6	3.65
ATAC - 750	10	1.7	3.1	13.0	31.0	74.3	4×10	2 5/8	107.3	5.64
ATAC - 900	12	1.7	3.1	15.6	37.2	89.1	4×10	3 1/8	152.7	8.05
ATAC - 1150	12	1.7	3.1	15.6	37.2	89.1	4×10	3 5/8	207.3	10.9
								4 1/8	269.1	14.1

NOTE:

Recommended wire sizes are applicable for distances up to 50 meters and maximum ambient temperature of 50°C.

Dimensions

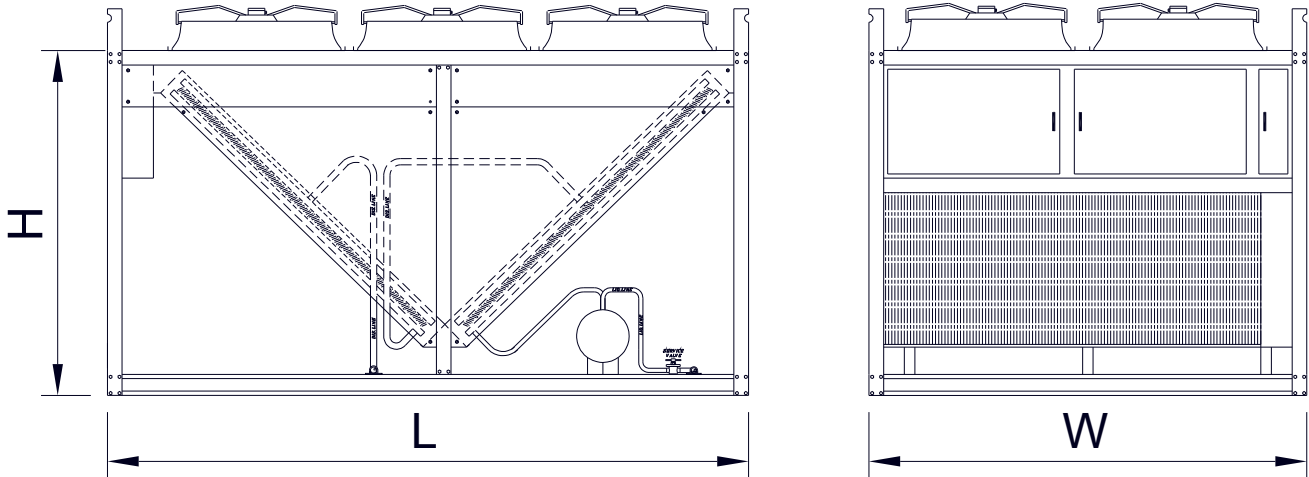


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Model	Dimension		
	L	W	H
ATAC - 075	1150	1200	1310
ATAC - 110	1450	2100	1310
ATAC - 150	1450	2100	1310

NOTE:
All dimensions are in mm.

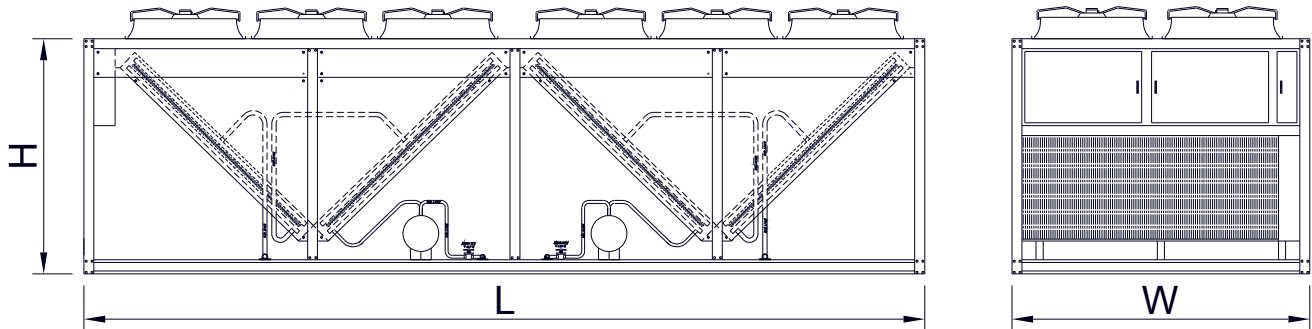
Dimensions



Model	Dimension		
	L	W	H
ATAC - 225	2130	2100	1360
ATAC - 300	2130	2100	1360
ATAC - 375	3020	2100	1360
ATAC - 450	3020	2100	1660
ATAC - 600	4110	2100	1610

NOTE:
All dimensions are in mm.

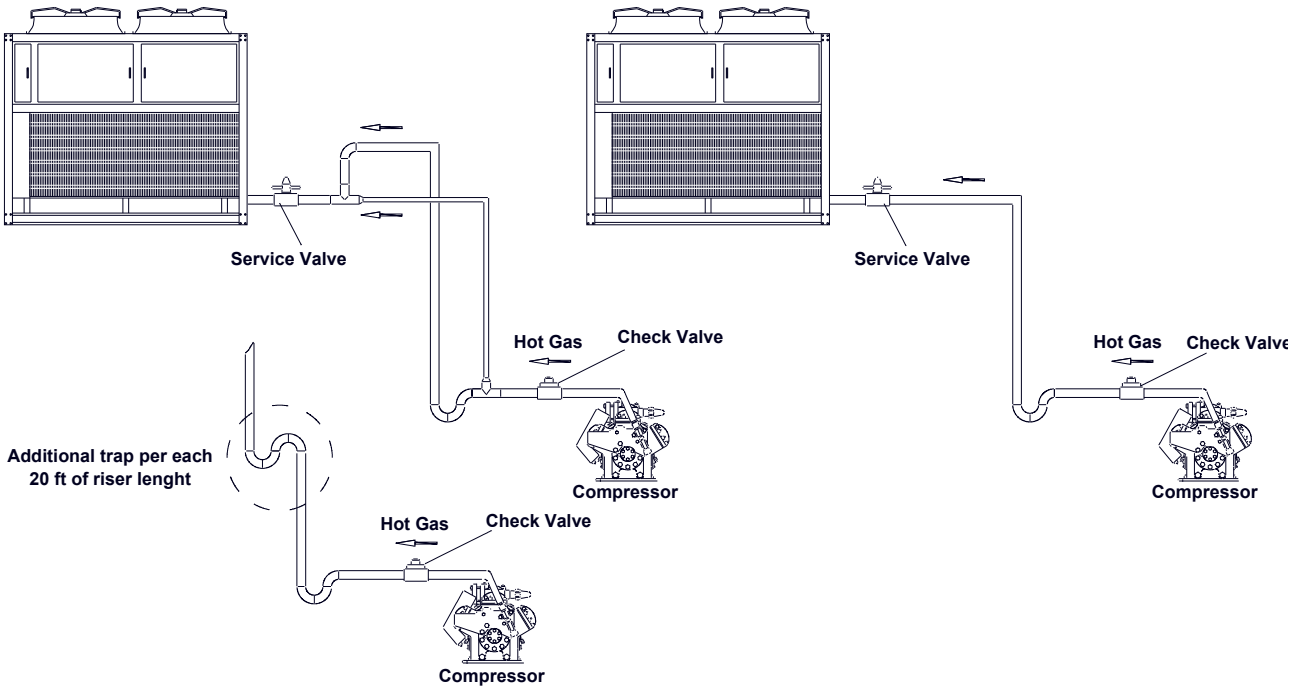
Dimensions



Model	Dimension		
	L	W	H
ATAC - 750	5940	2100	1660
ATAC - 900	5940	2100	1660
ATAC - 1150	5940	2100	1310

NOTE:
All dimensions are in mm.

Piping Recommendations



Notes:

- 1- All horizontal piping segments must be sloped 1/2 Inch per each 10ft of length in the direction of flow.
- 2- For proper oil return back to compressor, install air cooled condenser a minimum of 1m above the compressor.

Recommended Refrigerant Line Size O.D. (Inch)

Table 9

Evaporator Cooling Capacity (Btu/hr)	Inlet				Outlet			
	Discharge Line Equivalent Length (ft)				Liquid Line Equivalent Length (ft)			
	50	100	150	200	50	100	150	200
18000	5/8	5/8	5/8	7/8	3/8	3/8	1/2	1/2
24000	5/8	7/8	7/8	7/8	3/8	1/2	1/2	1/2
36000	7/8	7/8	7/8	7/8	1/2	1/2	1/2	1/2
48000	7/8	7/8	7/8	1 1/8	1/2	5/8	5/8	5/8
60000	7/8	1 1/8	1 1/8	1 1/8	1/2	5/8	5/8	5/8
75000	7/8	1 1/8	1 1/8	1 1/8	1/2	5/8	5/8	5/8
100000	1 1/8	1 3/8	1 3/8	1 3/8	5/8	7/8	7/8	7/8
150000	1 1/8	1 3/8	1 3/8	1 3/8	7/8	7/8	7/8	7/8
200000	1 3/8	1 5/8	1 5/8	1 5/8	7/8	7/8	1 1/8	1 1/8
300000	1 3/8	1 5/8	1 5/8	2 1/8	1 1/8	1 1/8	1 1/8	1 1/8
400000	1 5/8	2 1/8	2 1/8	2 1/8	1 1/8	1 1/8	1 3/8	1 3/8
500000	2 1/8	2 1/8	2 1/8	2 1/8	1 1/8	1 3/8	1 3/8	1 3/8
600000	2 1/8	2 1/8	2 1/8	2 5/8	1 3/8	1 3/8	1 3/8	1 5/8
750000	2 1/8	2 5/8	2 5/8	2 5/8	1 5/8	1 5/8	1 5/8	1 5/8

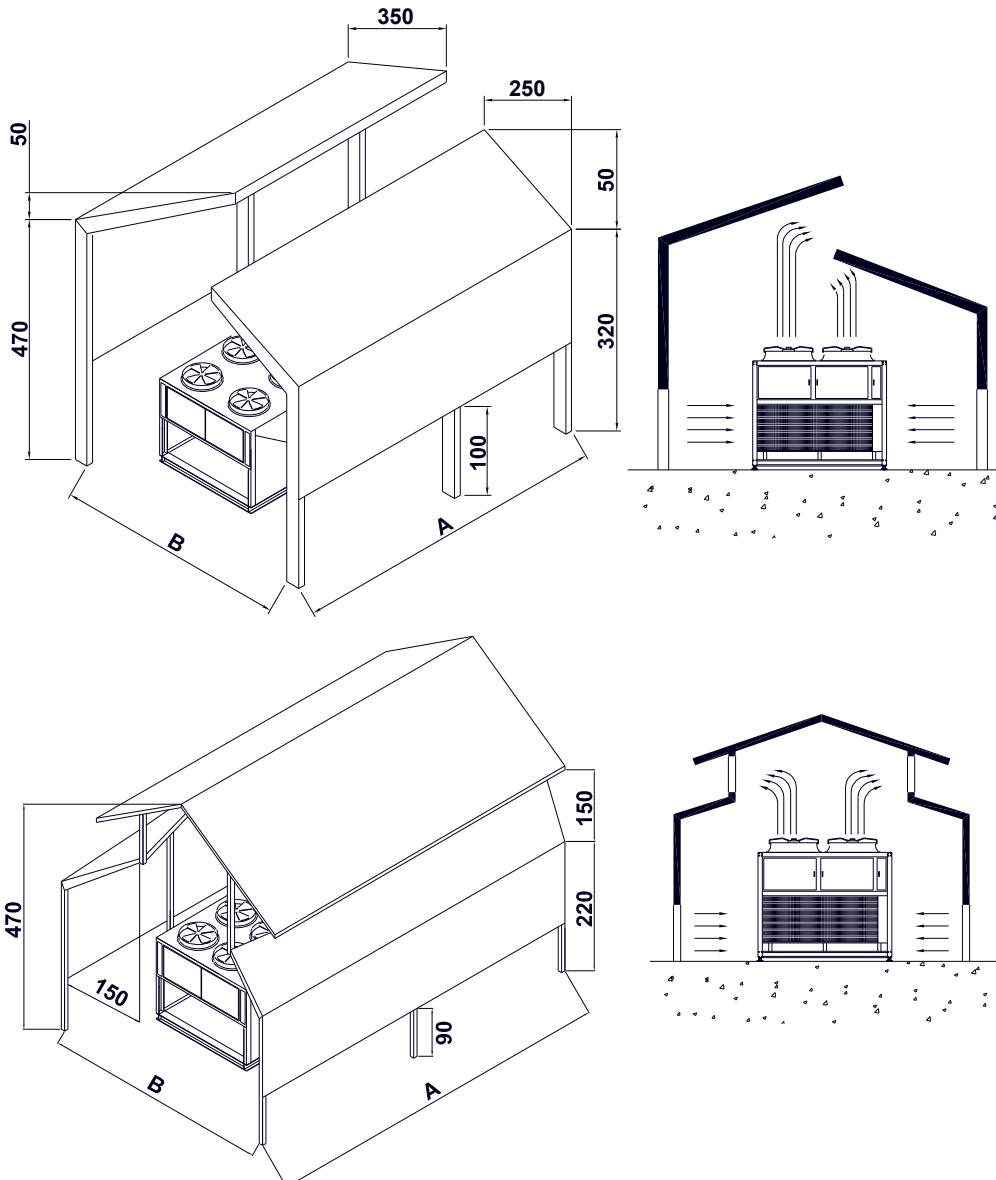
NOTES:

- 1- Table values are applicable for condensing temperatures of 80°F to 135°F
- 2- Given sizes are nominal and may be modified with design condition and the physical characteristics used

Schematic Drawing of Suggested Shelter

The following points must be observed:

- 1- The unit is to be installed where adequate amount of fresh air is available for circulation over the unit and the least amount of direct exposure and air obstructions are present where necessary a shelter shall be constructed.
- 2- Sufficient free space must be considered for air intake and air discharge of each installed unit.
- 3- Adequate space for servicing must also be available (see Recommended Service Area).



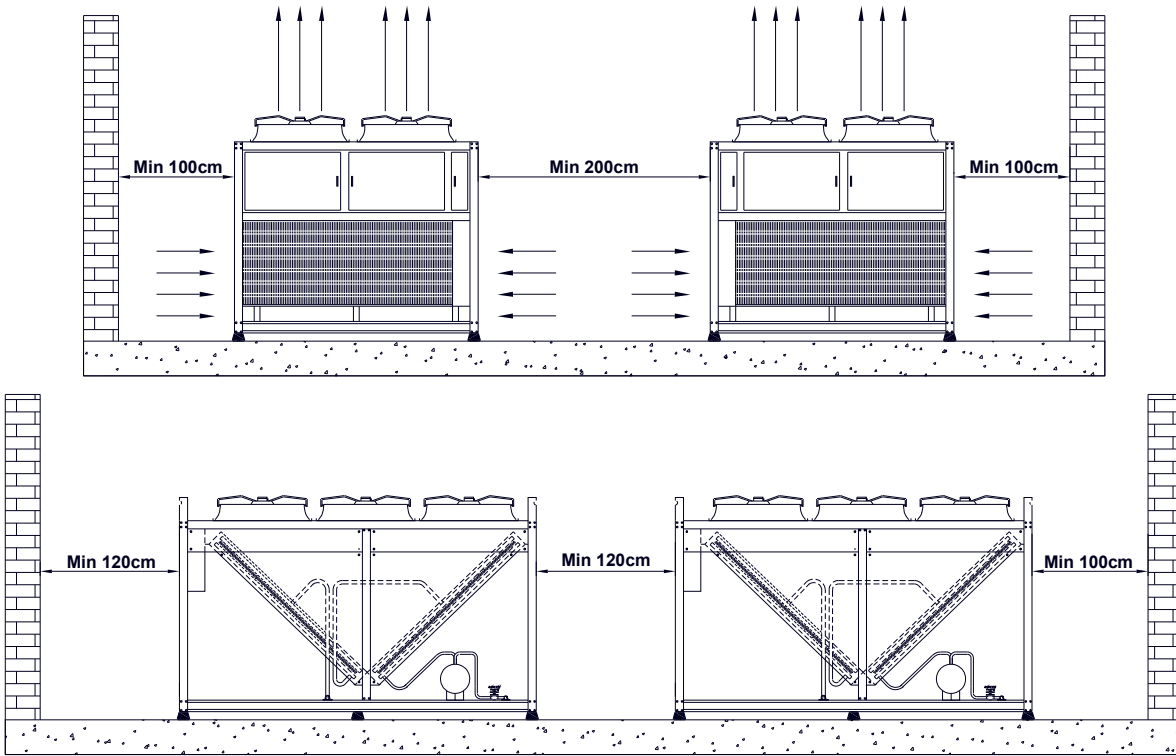
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Model	ATAC-075	ATAC-110	ATAC-150	ATAC-225	ATAC-300	ATAC-375	ATAC-450	ATAC-600	ATAC-750	ATAC-900	ATAC-1150
A	214	340	340	412	412	500	500	610	700	700	700
B	320	410	410	410	410	410	410	410	410	410	410

NOTE:

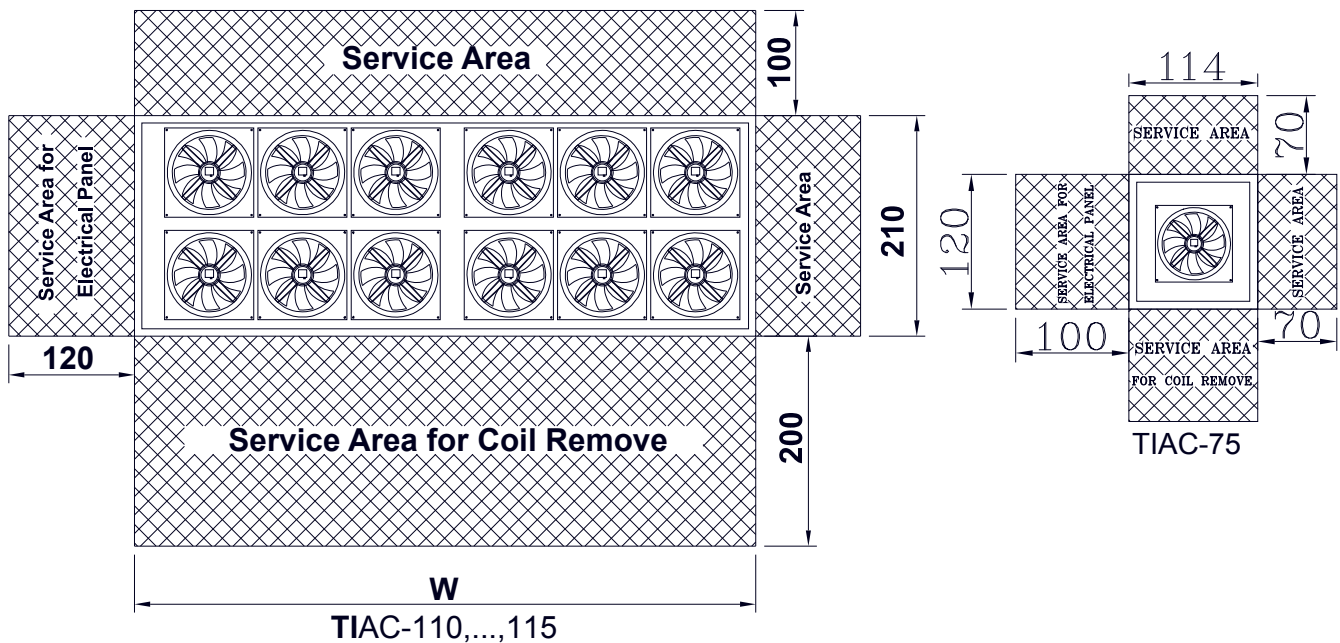
All Dimensions are in cm

Installation Recommendations



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Service Area Recommendations

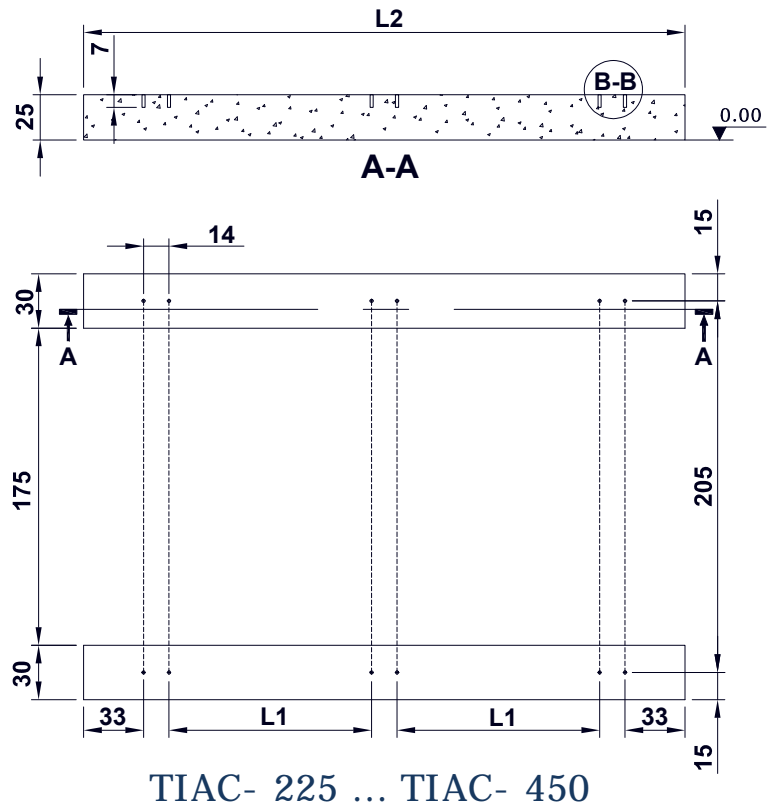
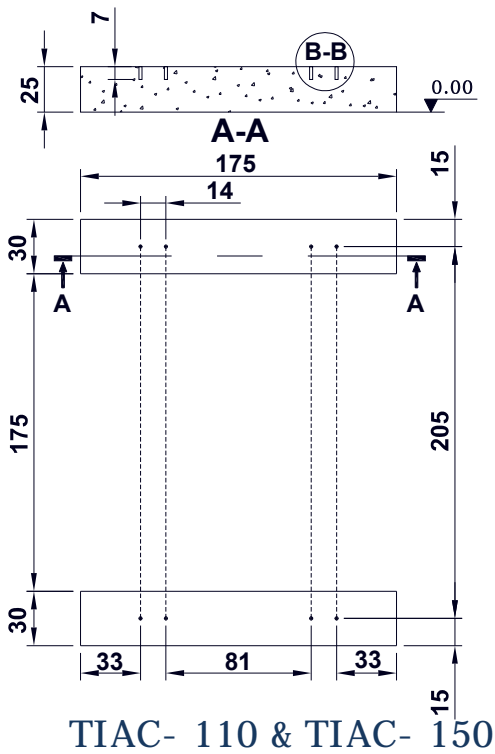
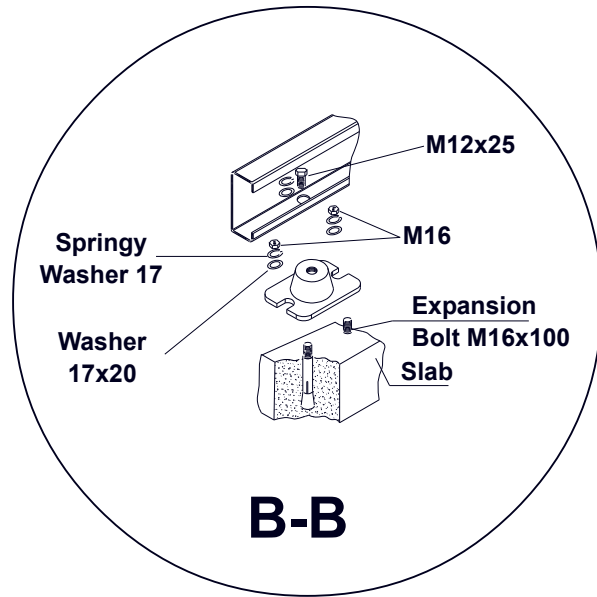
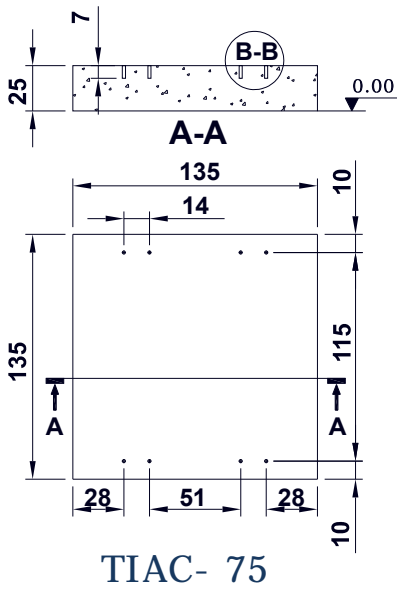


Model	TIAC-110	TIAC-150	TIAC-225	TIAC-300	TIAC-375	TIAC-450	TIAC-600	TIAC-750	TIAC-900	TIAC-1150
W	145	145	213	213	302	302	411	594	594	594

NOTES:

- All dimensions are in cm.
- Do not place units near hot air or steam exhaust.
- Place units so that condenser air is not re-circulated.
- All Dimensions are in cm

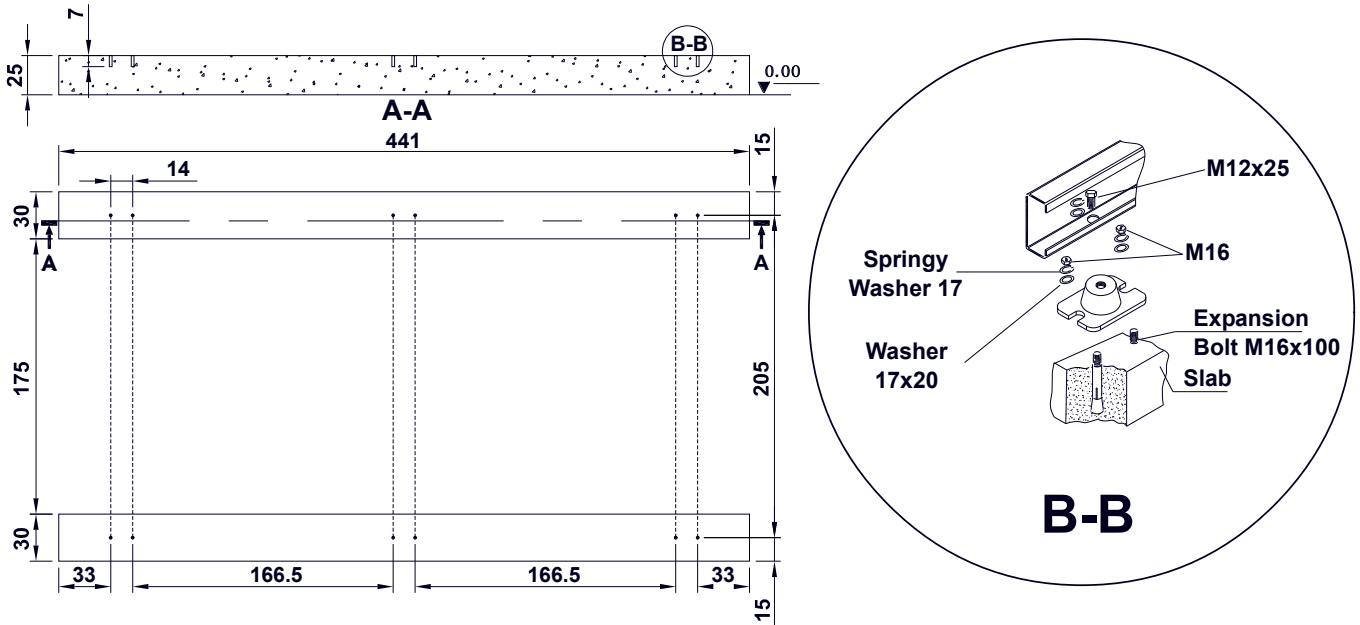
Armored Cement Foundation



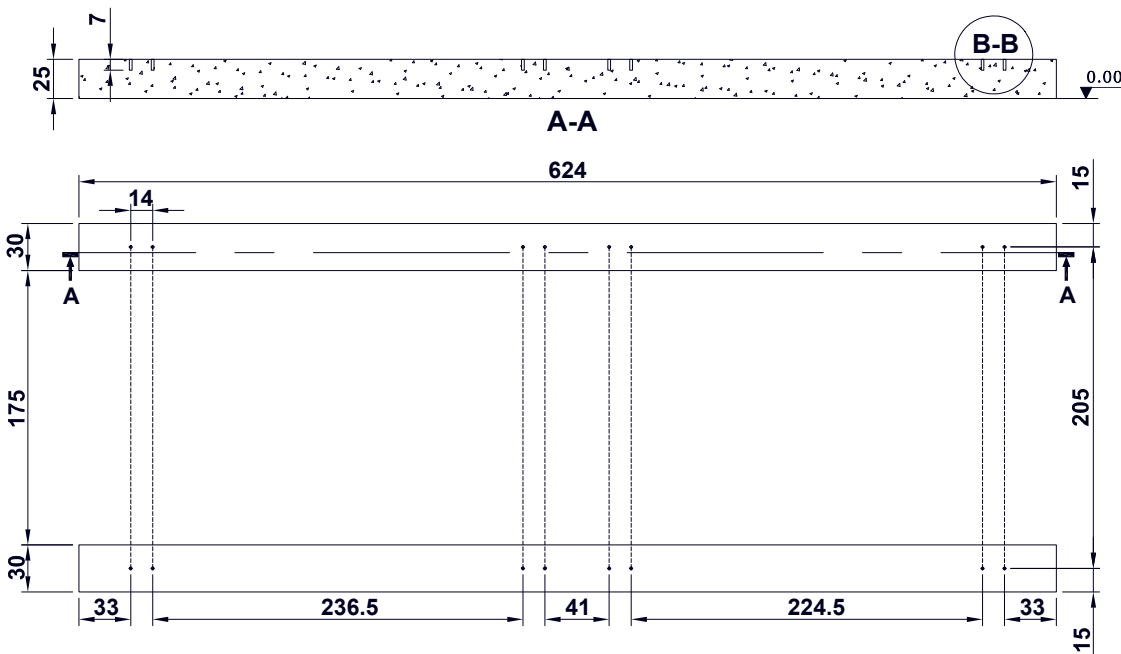
NOTE:
All dimensions are in cm.

Model	L1	L2
TIAC-225&300	67.5	243
TIAC-375&450	112	332

Armored Cement Foundation (Cont.)



TIAC- 600

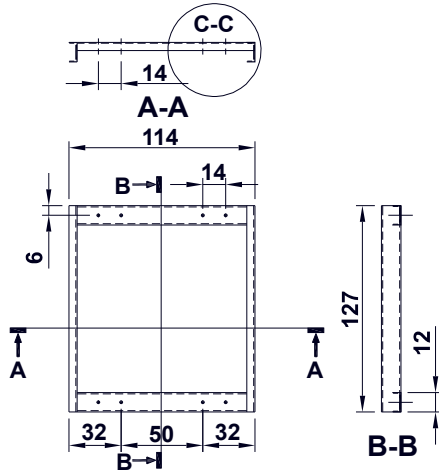


TIAC- 750 ... TIAC- 1150

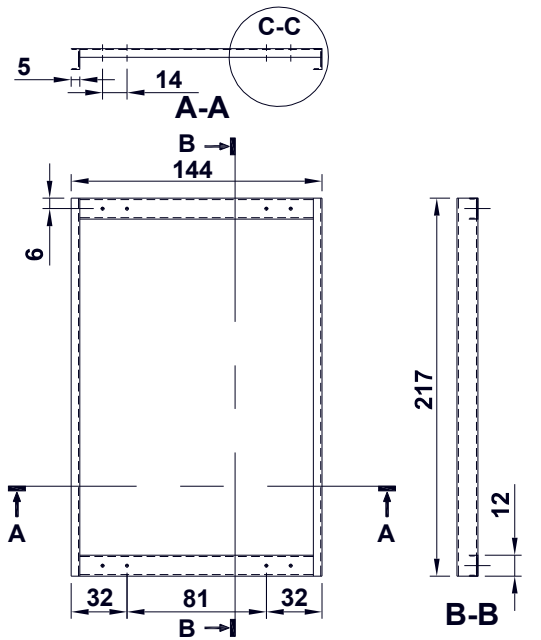
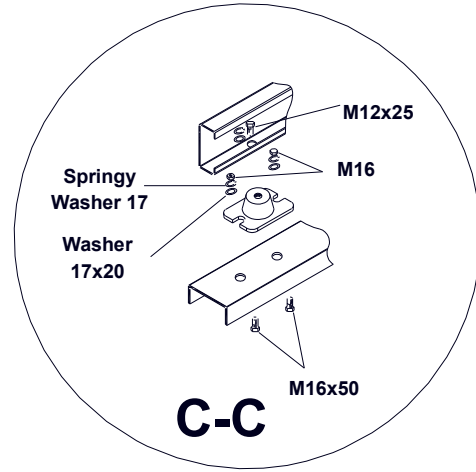
NOTE:

All dimensions are in cm.

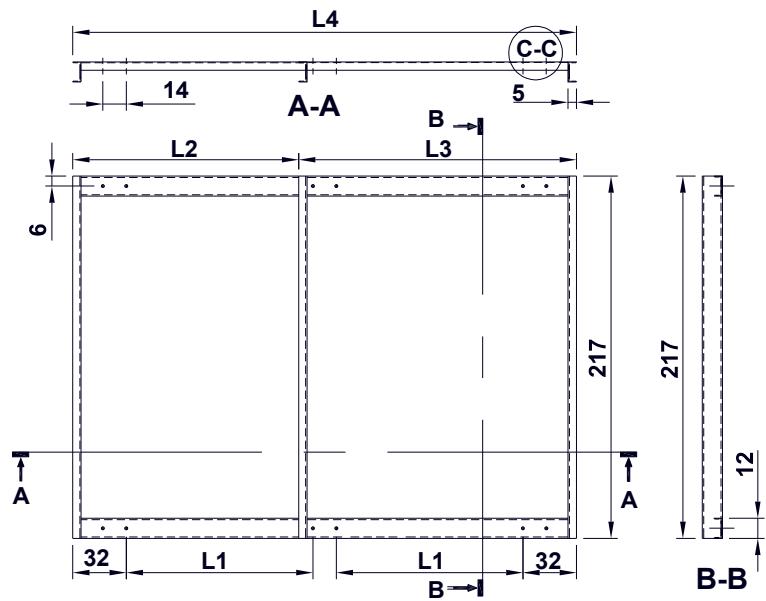
Steel Foundation



TIAC- 75



TIAC- 110 & TIAC- 150



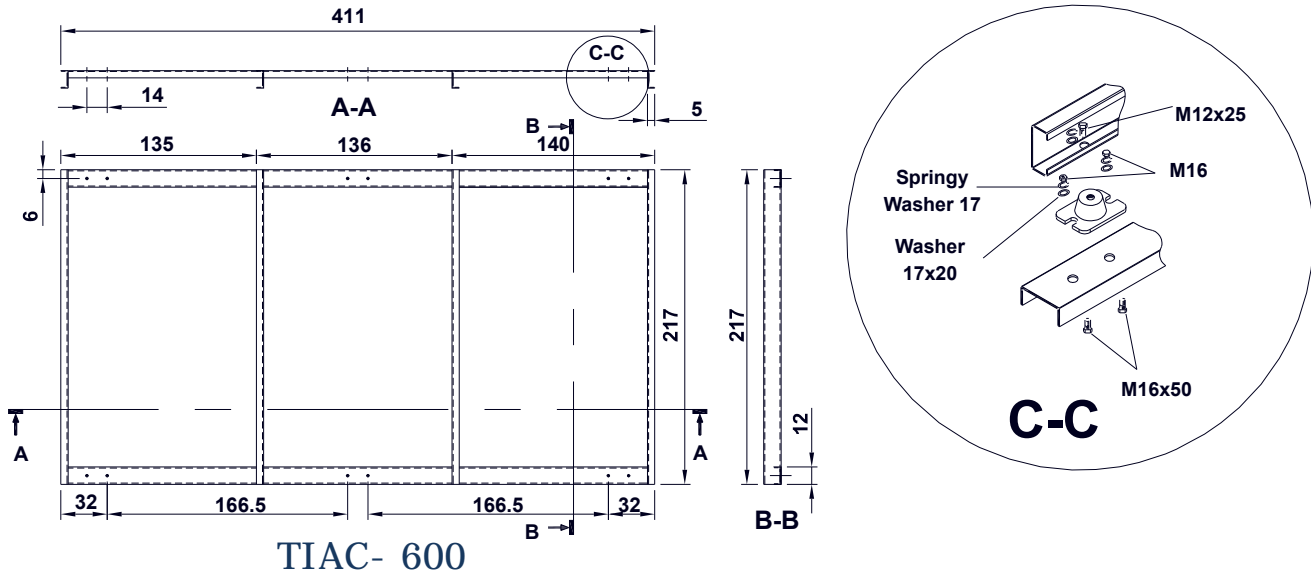
TIAC- 225 ... TIAC- 450

Model	L1	L2	L3	L4
TIAC-225&300	67.5	117.5	95.5	213
TIAC-375&450	112	135.5	166.5	302

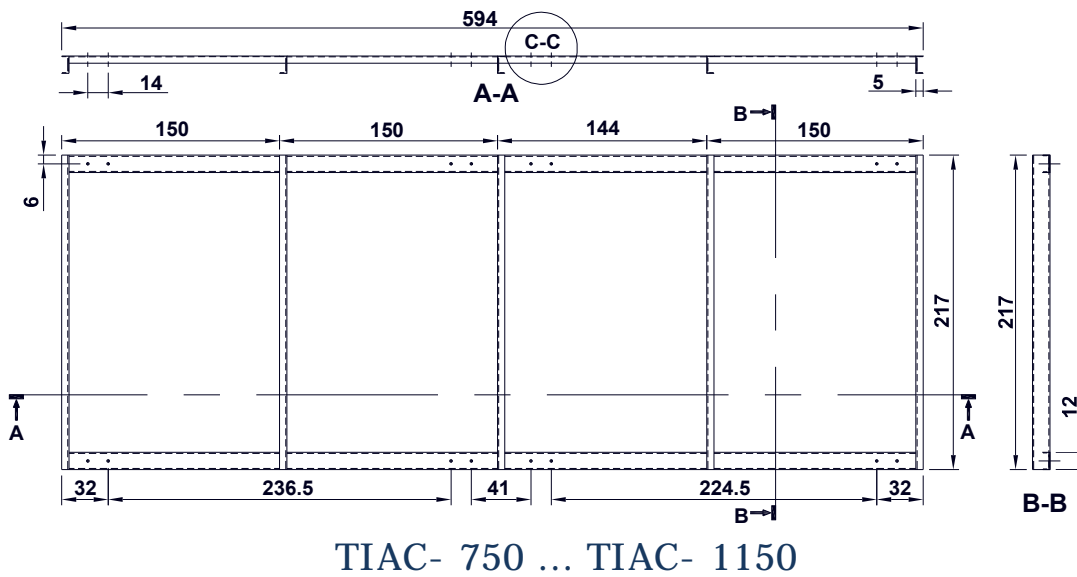
NOTE:

- All dimensions are in cm.
- Each unit must be installed completely level by itself and with respect to other connecting unit when installed on the ground suitable concrete pad is mandatory to account for possible unit settling there by damaging related piping.
- For roof installation sufficient structural strength of building is required rubber vibration dampers are recommended beneath the feet to prevent possible vibration transmission to the building structure.
- Considering the installation location conditions foundation or metal frame support is available upon request

Steel Foundation (cont.)



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NOTE:

- All dimensions are in cm.
- Each unit must be installed completely level by itself and with respect to other connecting unit when installed on the ground suitable concrete pad is mandatory to account for possible unit settling there by damaging related piping.
- For roof installation sufficient structural strength of building is required rubber vibration dampers are recommended beneath the feet to prevent possible vibration transmission to the building structure.
- Considering the installation location conditions foundation or metal frame support is available upon request.