Carrier

United Technologies

turn to the experts



AQUAFORCE®

30XA/XQ

Air-Cooled Liquid Chiller
Reversible Air-to-Water Heat Pump

Nominal cooling capacity: 274–1518kW (30XA)

Nominal cooling capacity: 315–1471kW (30XQ)

Nominal heating capacity: 311–1412kW (30XQ)

Environmental sound

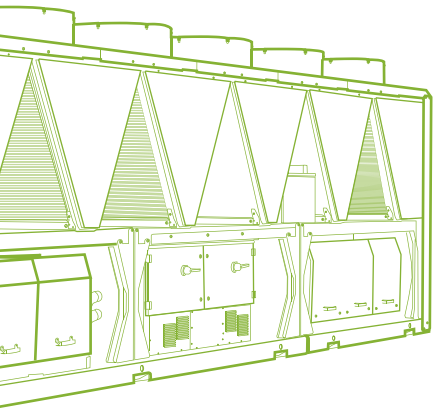
- HFC-134a refrigerant
  - Refrigerant of the HFC group with zero ozone depletion potential.
- Leak-tight refrigerant circuit
  - Reduction of leaks as no capillary tubes and flare connections are used.
  - Verification of pressure transducers and temperature sensors without transferring refrigerant charge.







Easy and fast installation



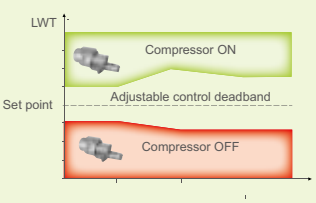
- Integrated hydronic module (option)
  - Single or dual pump (as required) with operating time balancing and automatic changeover to the back-up pump if a fault develops.
  - Water filter protecting the water pump against circulating debris.
  - High-capacity membrane expansion tank ensures pressurization of the water circuit.
  - Thermal insulation.
  - Pressure gauge to check filter pollution and measure the system water flow rate.
  - Water flow control valve.
- Simplified electrical connections
  - Main disconnect switch with high trip capacity.
  - Transformer to supply the integrated control circuit (400/24V).
- Fast commissioning
  - Systematic factory operation test before shipment.
  - Quick-test function for step-by-step verification of the instruments, expansion devices, fans and compressors.

Absolute reliability

- Screw compressors
  - Industrial-type screw compressors with oversized bearings and motor cooled by suction gas.
  - All compressor components are easily accessible on site minimizing down-time.
  - Electronic motor protection against overloads and power supply faults (loss of phase, phase reversal).
- Evaporator
  - Thermal insulation with aluminium cladding for perfect resistance against outside aggression(mechanical and UV protection).
- Exceptional endurance tests
  - Partnerships with specialised laboratories and use of limit simulation tools (finite element calculation) for the design of critical components.
  - Transport simulation test in the laboratory on a vibrating table. The test is based on a military standard and equivalent to 4000 km by truck.
  - Salt mist corrosion resistance test in the laboratory for increased corrosion resistance.



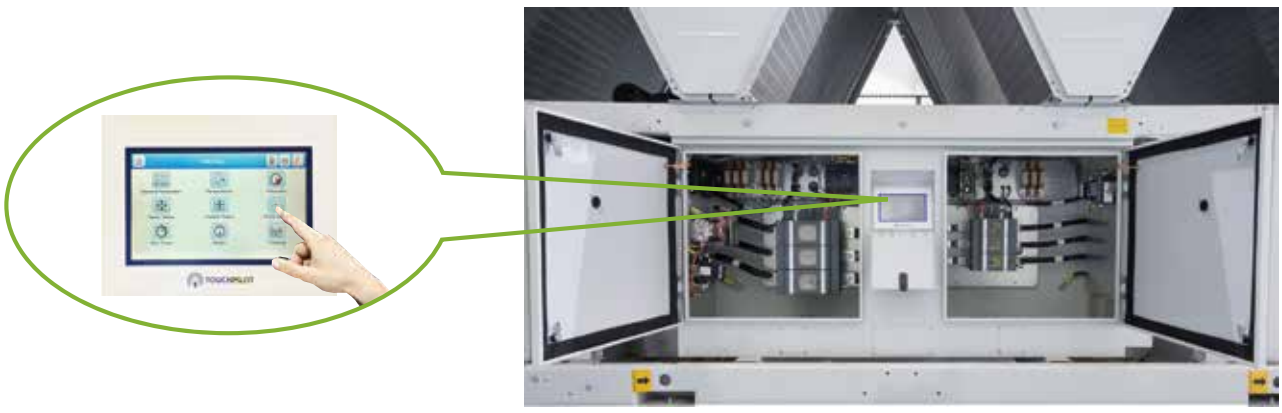
Cooler aluminium protective cladding





Technical Insight

Touch Pilot Control



General Features

- New innovative smart control features:
  - An intuitive and user-friendly, 5" colored interface (7" as option)
  - Screen-shots with concise and clear information in local languages
  - Complete menu, customized for different users (end user, service personnel and Carrier-factory technicians)
  - Easy access to the controller box with touch screen mounting to ensure legibility under any lighting conditions
  - Safe operation and unit setting: password protection ensures that unauthorized people cannot modify any advanced parameters
  - Simple and “smart” intelligence uses data collection from the constant monitoring of all machine parameters to optimise unit operation
  - Night-mode: Cooling capacity management for reduced noise level.
- Energy management:
  - Internal time schedule clock controls chiller on/off times and operation at a second set-point
  - The DCT (Data Collection Tool) records the alarms history to simplify and facilitate service operations

Remote Management (Standard)

- Units with Touch Pilot control can be easily accessed from the internet, using a PC with an Ethernet connection. This makes remote control quick and easy and offers significant advantages for service operations.
- Equipped with an RS485 serial port that offers multiple remote control, monitoring and diagnostic possibilities. When networked with other Carrier equipment through the CCN (Carrier Comfort Network - proprietary protocol), all components form a HVAC system fully-integrated and balanced through one of the Carrier’s network system products, like the Chiller System Manager or the Plant System Manager (optional).
  The 30XA/XQ also communicates with other building management systems via optional communication gateways.
- The following commands/visualizations are possible from remote connection:
  - Start/Stop of the machine
  - Dual set-point management: Through a dedicated contact is possible to activate a second set-point (example: unoccupied mode)
  - Demand limit setting: To limit the maximum chiller capacity to a predefined value
  - Water pump control: These outputs control the contactors of one/two evaporator water pumps
  - Operation visualization: Indication if the unit is operating or if it’s in stand-by (no cooling load)
  - Alarm visualization

Remote Management (EMM option)

- The Energy Management Module (EMM) offers extended remote control possibilities:
  - Room temperature: Permits set-point reset based on the building indoor air temperature (if Carrier thermostat are installed)
  - Set-point reset: Ensures reset of the cooling set-point based on a 4-20 mA or 0-10 V signal
  - Demand limit: Permits limitation of the maximum chiller power or current based on 0-10 V signal
  - Demand limit 1 and 2: Closing of these contacts limits the maximum chiller power or current to two predefined values
  - User safety: This contact can be used for any customer safety loop; opening the contact generates a specific alarm
  - Ice storage end: When ice storage has finished, this input permits return to the second set-point (unoccupied mode)
  - Time schedule override: Closing of this contact cancels the time schedule effects
  - Out of service: This signal indicates that the chiller is completely out of service
  - Chiller capacity: This analogue output (0-10 V) gives an immediate indication of the chiller capacity
  - Alert indication: This volt-free contact indicates the necessity to carry out a maintenance operation or the presence of a minor fault
  - Compressors running status : Set of outputs (as many as the compressors number) indicating which compressors are running.

Operating Range, 30XQ

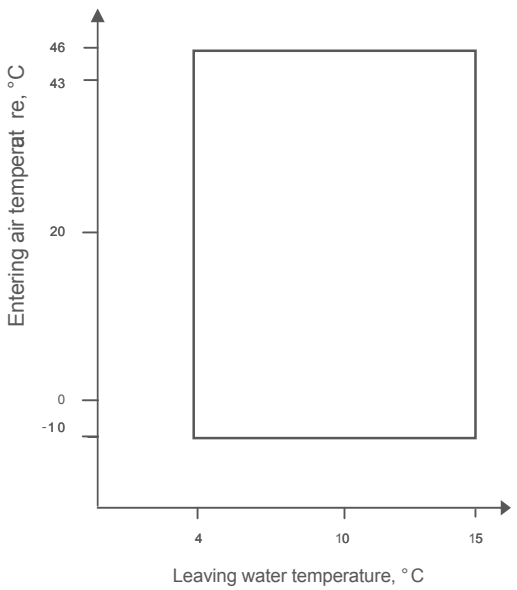
Cooling mode

Water heat exchanger (Evaporator)	Min.temperature	Max.temperature
Entering water temperature (at start)	-	45˚C
Entering water temperature (during operation)	6.8˚C	21˚C
Entering water temperature (during stop)	3˚C	55˚C
Leaving water temperature (during operation)	4˚C	15˚C
Air heat exchanger (Condenser)	Min.temperature	Max.temperature
Outdoor air temperature	-10˚C	46˚C

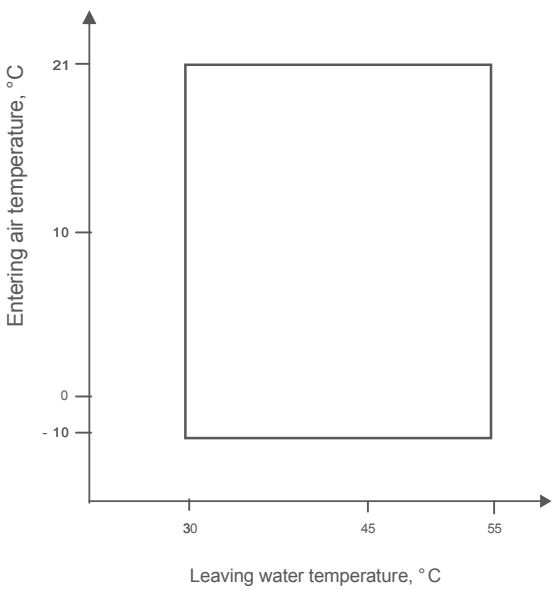
Heating mode

Water heat exchanger (Condenser)	Min.temperature	Max.temperature
Entering water temperature (at start)	3.4˚C	50˚C
Entering water temperature (during operation)	25˚C	50˚C
Entering water temperature (during stop)	3˚C	55˚C
Leaving water temperature (during operation)	30˚C	55˚C
Air heat exchanger (Evaporator)	Min.temperature	Max.temperature
Outdoor air temperature	-10˚C	21˚C

Operating range - cooling mode



Operating range - heating mode



Technical Specifications

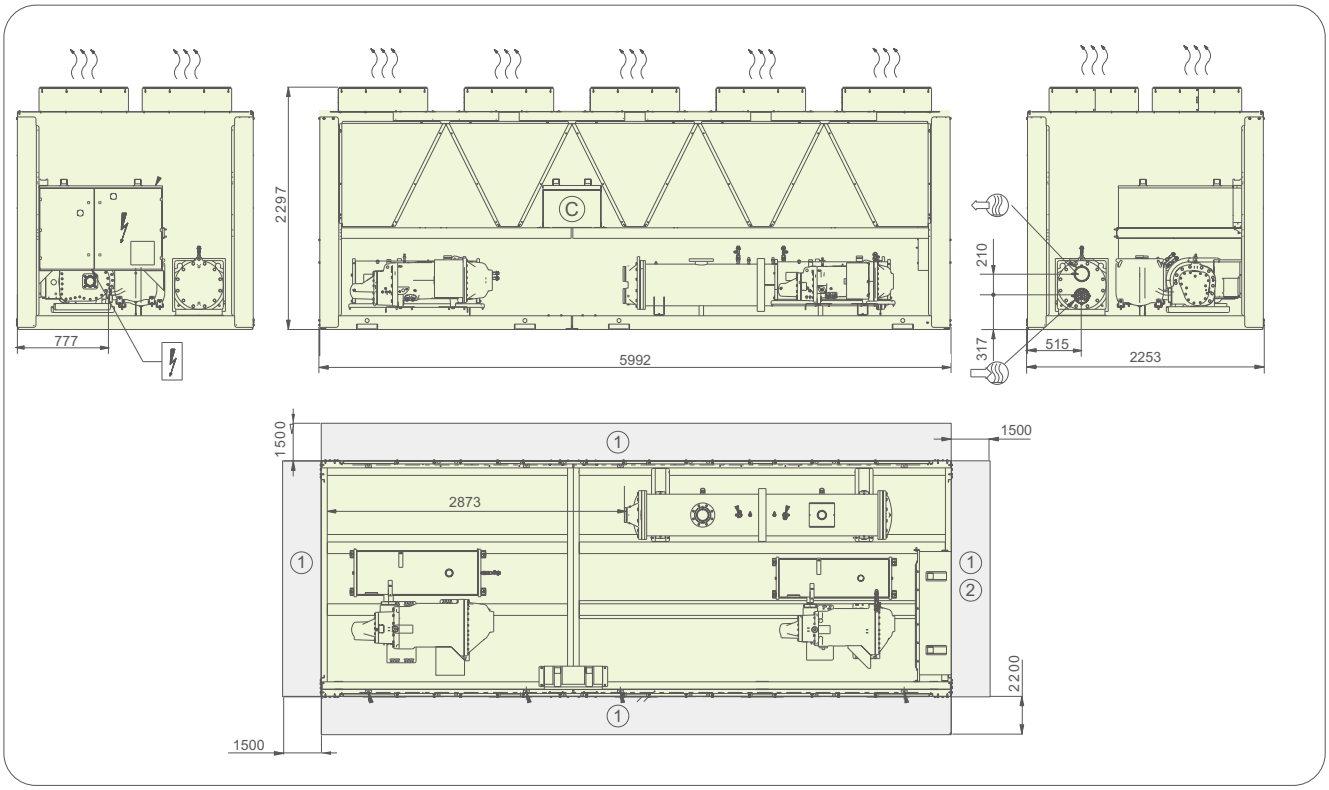
Unit with Cu/Al condenser coil

30XA		0252	0282	0302	0342	0352	0402	0442	0452	0482	0502	0602	0652	0702
Nominal cooling capacity*	kW	274	278	299	328	327	391	444	452	493	503	619	644	674
Compressor input power	kW	80.5	78.8	87.9	90.5	93.0	113.7	133.7	129.8	143.3	141.3	175.3	187	188.8
EER		3.05	3.19	3.08	3.27	3.20	3.11	3.05	3.19	3.12	3.24	3.22	3.14	3.24
Refrigerant		HFC-134a												
Circuit A	kg	60	97	64	102	70	85	113	85	119	102	102	180	100
Circuit B	kg	64	-	64	-	56	56	-	56	-	56	88	-	95
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-	-
Compressor		Semi-hermetic screw compressor												
Circuit A		1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit B		1	-	1	-	1	1	-	1	-	1	1	-	1
Circuit C		-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum capacity	%	15	30	15	30	15	15	30	15	30	15	15	30	15
Control		Touch Pilot™ control system, electronic expansion valve (EXV)												
Condenser		Cu/Al heat exchanger												
Fans		Axial Flying Bird with rotating shround												
Quantity		6	5	6	6	7	8	7	8	8	9	11	10	12
Total air flow	l/s	27083	22570	27083	27084	31597	36111	31598	36111	36112	40625	49653	45140	54167
Fan speed	rpm	950	950	950	950	950	950	950	950	950	950	950	950	950
Evaporator		Flooded multi-pipe												
Water content	l	58	49	61	54	61	66	76	70	77	77	79	78	94
Nominal water flow	l/s	13.1	13.3	14.2	15.6	15.6	18.6	21.2	21.5	23.5	24.0	29.5	31	32.1
Nominal water pressure drop	kPa	15	22	15	29	18	34	34	38	41	36	46	37	37
Max. water-side pressure without hydronic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Integrated hydronic module (option)		Pump, victaulic screen filter, safety valve, expansion tank, purge valves etc.												
Water pump		Centrifugal pump												
Water head external to chiller (single pump at nominal water flow rate)	kPa	188	198	198	169	181	196	254	247	214	213	-	-	-
Expansion tank	l	50	50	50	50	50	50	50	50	50	50	-	-	-
Max. water-side pressure with hydronic module	kPa	400	400	400	400	400	400	400	400	400	400	-	-	-
Water connection		Victaulic												
Nominal Diameter	DN	125	125	125	125	125	125	125	125	125	125	125	150	150
Electrical data														
Nominal power supply		400V-3Ph-50Hz												
Start-up method		Star-delta start												
Control power supply		24V via internal transformer												
Nominal unit current draw Circuit A+B	A	151	147	167	173	182	210	262	238	273	264	320	336	346
Circuit C	A	-	-	-	-	-	-	-	-	-	-	-	-	-
Maximum unit current draw Circuit A+B	A	208	180	226	229	243	284	314	316	367	350	423	415	457
Circuit C	A	-	-	-	-	-	-	-	-	-	-	-	-	-
Maximum start-up current Circuit A+B	A	274	275	274	308	292	407	504	510	587	510	583	629	616
Circuit C	A	-	-	-	-	-	-	-	-	-	-	-	-	-
Fan and control power	kW	9.2	8.4	9.1	9.8	9.3	12.2	11.8	11.8	14.6	14.0	16.8	18.0	19.0
Unit length	mm	3604	3604	3604	3604	4798	4798	4798	4798	4798	5992	7186	5992	7186
Unit width	mm	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253
Unit height	mm	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297
Unit weight	kg	3764	3523	3793	3820	4317	4761	4571	4823	4900	5393	6392	5250	6544
Operating weight	kg	3830	3578	3860	3875	4380	4830	4641	4900	4984	5470	6480	5328	6640

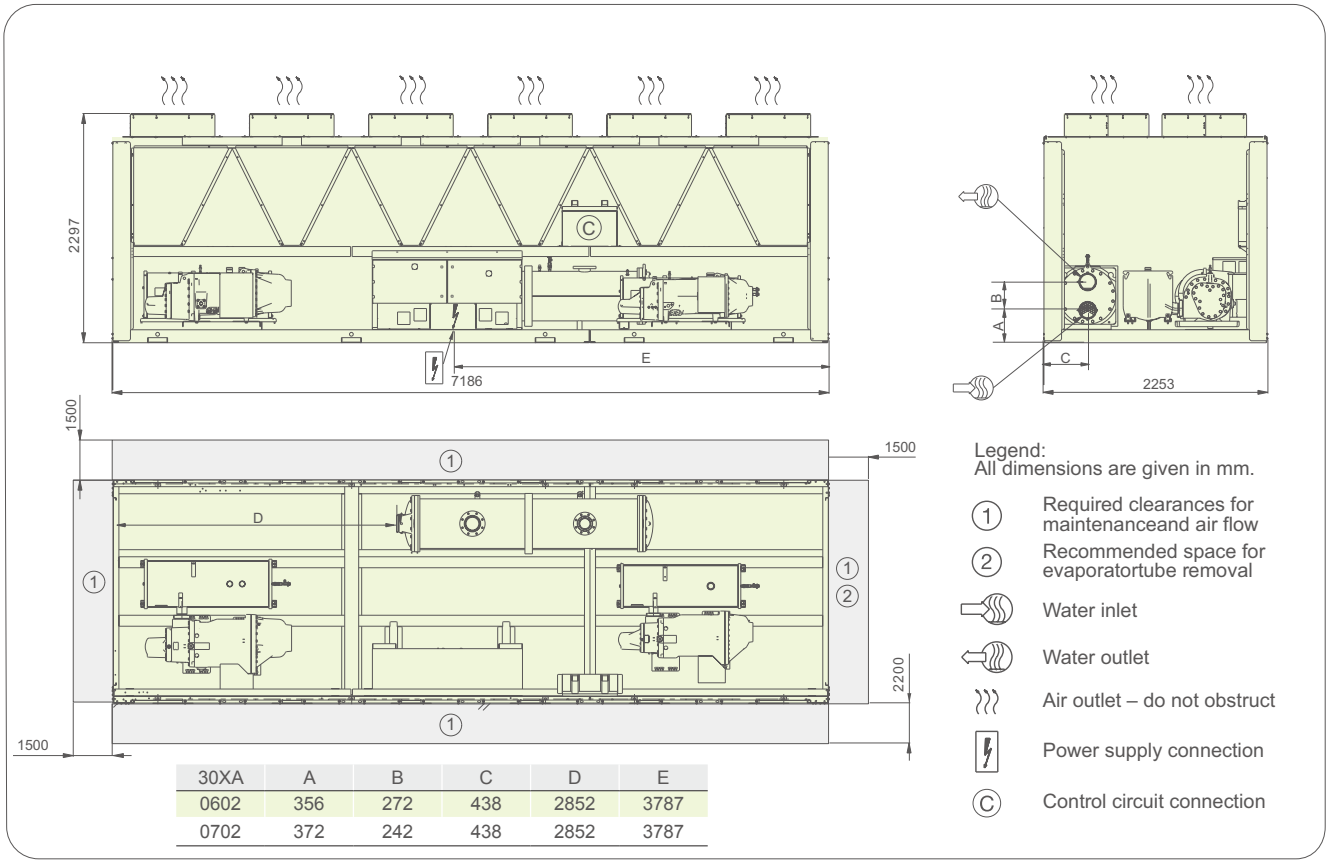
* Nominal conditions - evaporator entering/leaving water temperature 12/7°C, outdoor air temperature 35°C;
Evaporator fouling factor 0.018m²K/kW

Dimensions/Clearances

30XA0502 - Cu/Al Condenser coils (option 254)



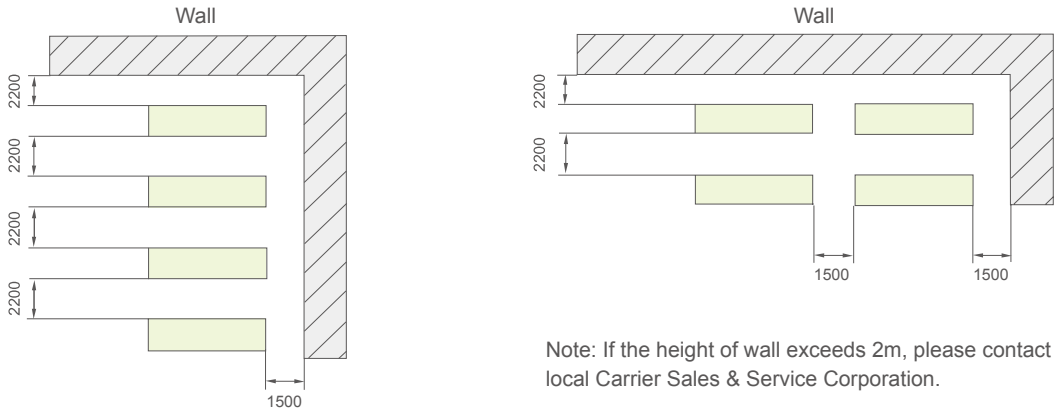
30XA 0602/0702 - Cu/Al Condenser coils (option 254)



30XA	A	B	C	D	E
0602	356	272	438	2852	3787
0702	372	242	438	2852	3787

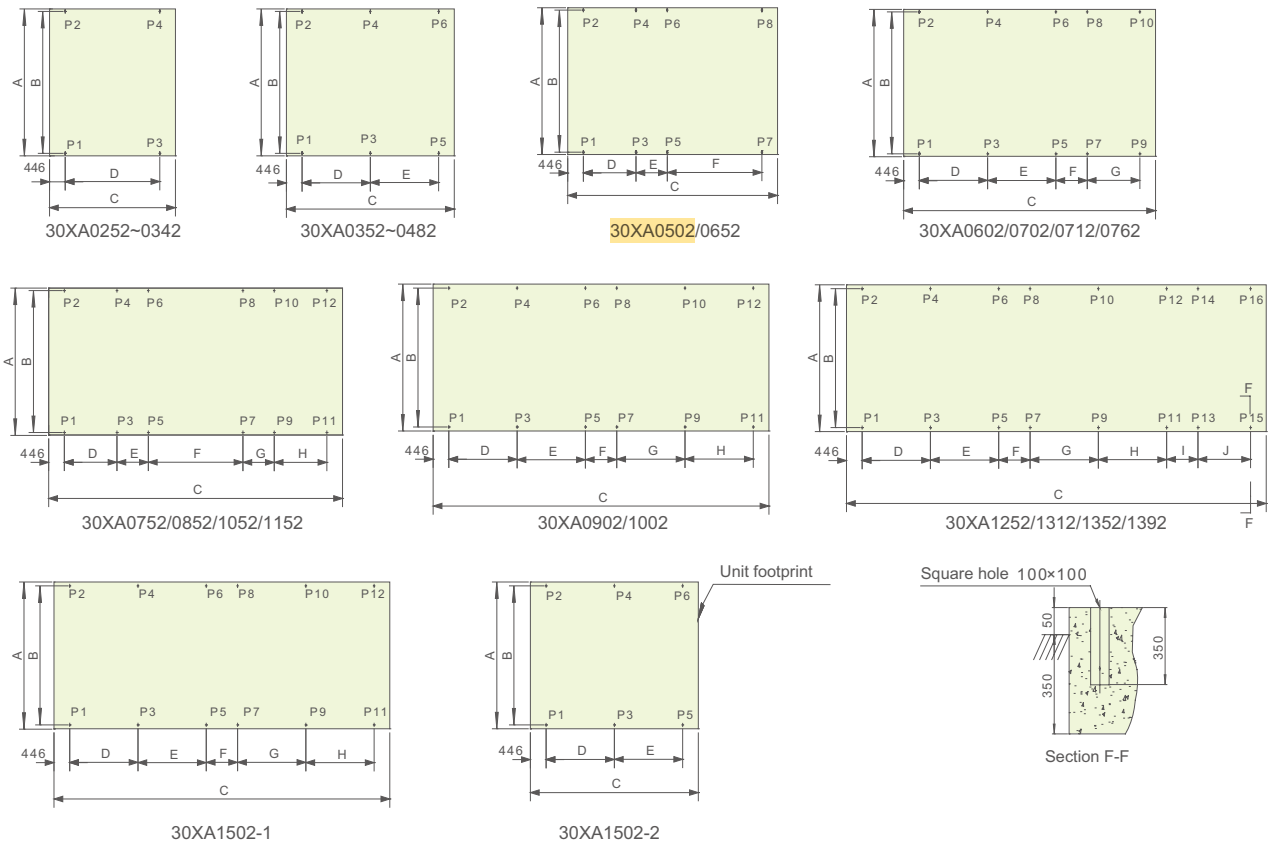
Note: Single point power connection, power cable arrive from bottom of electrical box, reserve at least 120mm height space below unit for 30XA0602~0702 power supply connection (unit aerial installation or cable slot)

Multiple Chiller Installation



Note: If the height of wall exceeds 2m, please contact local Carrier Sales & Service Corporation.

Weight Distribution, 30XA0252~1502

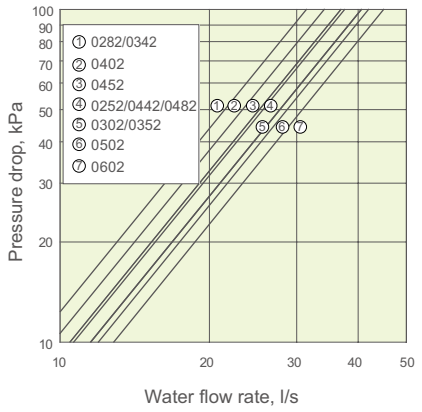


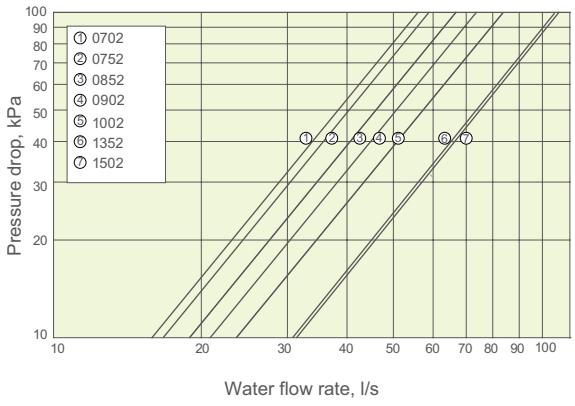
Weight Distribution, 30XA0252~1502

Models	Dimensions, mm										Weight distribution, kg																Operating weight kg
	A	B	C	D	E	F	G	H	I	J	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	
30XA0252	2231	2157	3582	2690							930	901	1016	983													3830
30XA0282	2231	2157	3582	2690							865	775	1015	923													3578
30XA0302	2231	2157	3582	2690							942	835	1103	980													3860
30XA0342	2231	2157	3582	2690							930	840	1100	1005													3875
30XA0352	2231	2157	4776	1942	1942						737	665	768	692	798	720											4380
30XA0402	2231	2157	4776	1942	1942						859	739	865	745	871	751											4830
30XA0442	2231	2157	4776	1942	1942						991	887	784	701	665	612											4640
30XA0452	2231	2157	4776	1942	1942						876	751	880	753	884	756											4900
30XA0482	2231	2157	4776	1942	1942						1080	976	874	790	663	601											4984
30XA0502	2231	2157	5970	1496	892	2690					716	628	724	635	730	639	744	654									5470
30XA0602	2231	2157	7164	1942	1942	892	1496				698	601	697	599	697	599	697	599	695	598							6480
30XA0652	2231	2157	5970	1496	892	2690					915	739	796	643	725	586	511	413									5328
30XA0702	2231	2157	7164	1942	1942	892	1496				709	615	709	618	710	618	711	618	713	619							6640
30XA0712	2231	2157	7164	1942	1942	892	1496				599	526	622	546	645	565	655	575	672	589							5994
30XA0752	2231	2157	8358	1496	892	2690	892	1496			704	600	691	588	682	580	656	558	647	552	633	539					7430
30XA0762	2231	2157	7164	1942	1942	892	1496				591	542	616	565	641	588	652	598	671	616							6080
30XA0852	2231	2157	8358	1496	892	2690	892	1496			739	644	724	631	716	622	687	598	678	591	662	578					7870
30XA0902	2231	2157	9552	1942	1942	892	1942	1942			865	764	820	723	773	683	752	664	707	624	661	584					8620
30XA1002	2231	2157	9552	1942	1942	892	1942	1942			899	793	847	749	796	704	772	683	722	639	671	595					8870
30XA1052	2231	2157	10746	1496	892	2690	2834	1942			846	711	844	709	842	708	837	703	831	699	827	695					9252
30XA1152	2231	2157	10746	1496	892	2690	2834	1942			862	707	858	705	857	704	853	701	848	697	845	695					9332
30XA1252	2231	2157	11940	1496	892	1942	1942	892	1942	1942	605	541	618	553	626	560	643	575	661	590	668	597	686	613	703	628	9867
30XA1312	2231	2157	11940	1496	892	1942	1942	892	1942	1942	800	626	782	612	771	601	747	585	724	566	713	558	689	539	666	521	10500
30XA1352	2231	2157	11940	1942	1942	892	1942	1942	892	1496	792	711	793	712	794	712	796	713	794	713	797	713	796	714	796	714	12060
30XA1392	2231	2157	11940	1496	892	1942	1942	892	1942	1942	800	626	782	612	771	601	747	585	724	566	713	558	689	539	666	521	10500
30XA1502/1	2231	2157	9552	1942	1942	892	1942	1942			906	802	853	754	803	709	780	688	727	642	676	599					8939
30XA1502/2	2231	2157	4776	1942	1942						981	877	785	701	590	527											4461

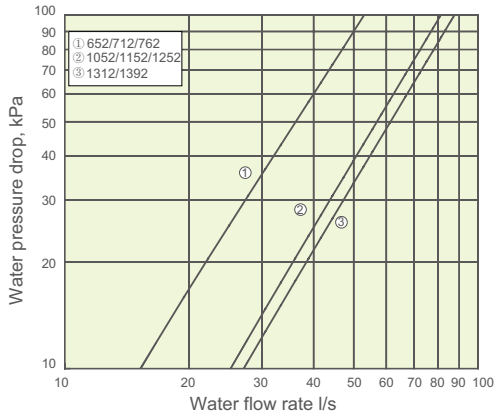
Note: (1) foot screw even hole number (far side) represent for evaporator side
(2) foot screw, M20X300

Evaporator Water Pressure Drop, 30XA0252~1502

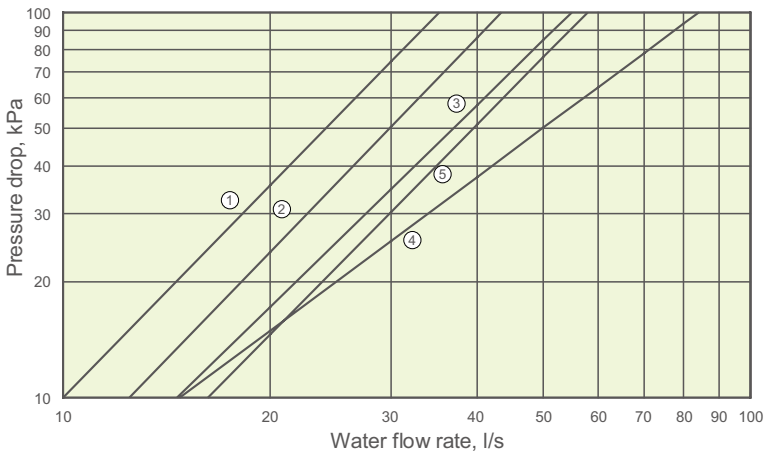




Evaporator Water Pressure Drop, 30XA0652~1392



Heat exchanger Water Pressure Drop, 30XQ0330~1500



1. 30XQ0330
2. 30XQ0430, 30XQ0860 ModuleA/B, 30XQ0930 ModuleB, 30XQ1090 ModuleB
3. 30XQ0500, 30XQ0930 ModuleA, 30XQ1000 ModuleA/B, 30XQ1160 ModuleB, 30XQ1250 ModuleB
4. 30XQ0660, 30XQ1090 ModuleA, 30XQ1160 ModuleA, 30XQ1320 ModuleA/B, 30XQ1410 ModuleB
5. 30XQ0750, 30XQ1250 ModuleA , 30XQ1410 ModuleA , 30XQ1500 ModuleA/B