

Cold Store Unit Software
Genius version operation manual
From
Applied Engineering Solutions Co.

Setup procedure

Requirements

This software compatible with windows XP, Vista, Windows 7 & Windows 8

Setup

Installation our software is very easy, you only need follow the followings steps:

Many thanks for you're trusting with our products please follow the followings steps to install the attached software's:

- 1) You request put dongle on the request PC, then put Trend net (CD) in your PC to start the installing.
- 2) Then you request to remove the Trend net CD, & put Package CD, here you only request to making setup & then the software will installed by itself, after that icon will appear on your PC desktop, press double click, then select air cooled package simulation software.exe
Please note that you can install the software's multi times at multi PC'S, but only one PC will be operate for each software at same time that connected to attach dongle.

Important Notes:

Please read operation manual carefully before setup & running the software.

The software will not running without putting dongle in the PC.

Air Cooled Package Heat Pump Simulation Software Genius version

Software Which design all unit components Compressor, Condenser coil specifications, Evaporator coil specifications, Expansion valve, Discharge size, Liquid size, Mixture size, Suction size, with ability for Comprehensive Performance Catalogue with excel file extracting ability, in addition to calculate Energy saving & Low ambient kit at different conditions with annual running cost

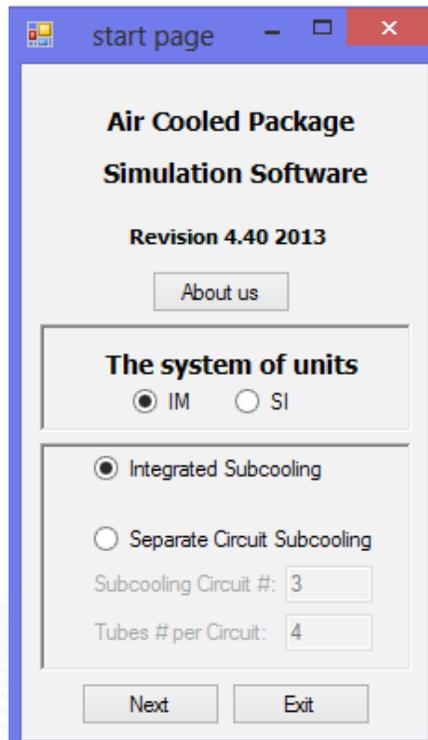
We would like to introduce Applied Engineering Solutions as an innovative software development company in the fields of Air conditioning, Refrigeration & Freezing. Our long experience and professionalism of about 20 years has enabled us to develop software for all tasks related to the fields above.

Air cooled package heat pump simulation software (Genius version) is done as complete LAB for technical, research, development (R&D), performance calculation, and design & optimizes selection for main refrigeration circuit components, configuration & specifications. All that by given the user the opportunity to select all specifications such as:

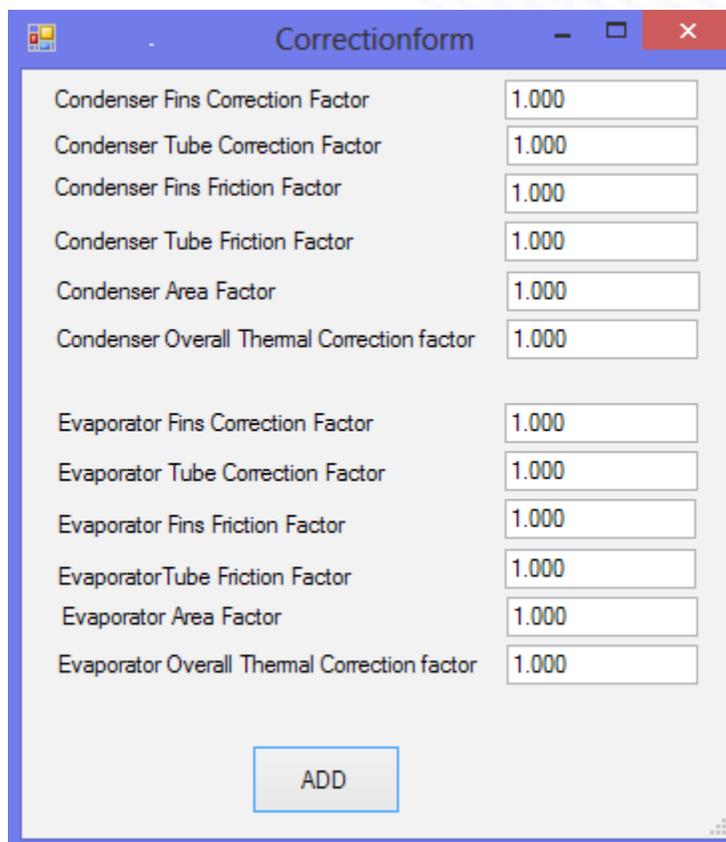
- Smart software which guide the designer for best & optimized selection by guiding him through many message & warning for selected unit specifications, in other words we advance the abstract of our experience in the software.
- Compressor optimized selection (Power supply, Type, Brand, Models & Quantity).
- Condenser & evaporator optimized configuration & specifications with details.
- The facility of study & sense all variables affect (rows #, fins type, fins material, fins number, fins thickness, air flow quantity, coil tube size, tube material, tube type, circuit #, ambient temp., coil area, refrigerant types...etc) & give very accurate result.
- All coil calculations are done according ARI 410 specifications.
- The possibility of making cooling design & calculations for summer & heat pump design & calculation for winter.
- All above facility are guiding the designer, & user all the probability & best optimization components selection for the unit, by control all the variables of the unit components selection.



Here you can select either integrated circuit sub cooling or Separate circuit sub cooling by determine circuit # & Pipe # per circuit.



Here you can select Correction factors which affect on unit performance, that help you to get data as same as lab, for whom concern in AHRI certificate.



Zeihl Axial Condenser Fan selection

FanSelectionCond... - [] [X]

Air Quantity 30000 CFM

Ziehl Fan Qty 4

Continue

Fan model: FN050-ZIA

Airflow volume: 5000

Static pressure / Total pressure: 50

Mains Supply: 1~ 230V 50Hz

Click

Close

Result

- 1
- 3
- 5
- 7

Print

article no	154387	Lw(5) (Db)	79.01
air density (kg/m ³)	1.16	Lw(A,5) (Db)	77.87
fan speed set value (%n soll)	68	Lw(6) (Db)	68.71
Psys (w)	247	Lw(A,6) (Db)	68.09
Minimum current (A)	3.2	Power supply	1~ 230V 50Hz
Max. Temp. °C	60	n (rpm)	981.97
Max. Volt (V)	277	PF (Pa)	80.02
Max. Current (A)	4.4	Psf (Pa)	50
Min. Temp. (C)	-35	Psys (w)	247.36
Minimum Voltage (V)	200	qv (m ³ /hr)	5000
Max. RPM	1440	PSFP (Ws/m ²)	181
UDP (V)	230	SEP	1
Fan size (mm)	500	UDP (V)	230
Nf, sys (%)	44.93	Weight (KG)	9.2
IDP (A)	1.16		

Graph: Pressure (Pa) vs. Air flow (m³/h). Curves are labeled with values: 500, 850, 1195, 1445 (1195), 1445 (1195).

Fan selection procedure:

Please note that you must fill data in cooling form then press calculate, new form will appear you can select Nicotra, Zeihl or air flow rate, if you select Nicotra, Zeihl new form will appear you must press Nicotra, Zeihl again .

That will let new form appear for Nicotra, Zeihl with Model selection bob up, Air flow rate in m³/hr & external static pressure in PA . If software give you ok that mean he accept data & selected fan is workable at request conditions otherwise you must select bigger or smaller fan.

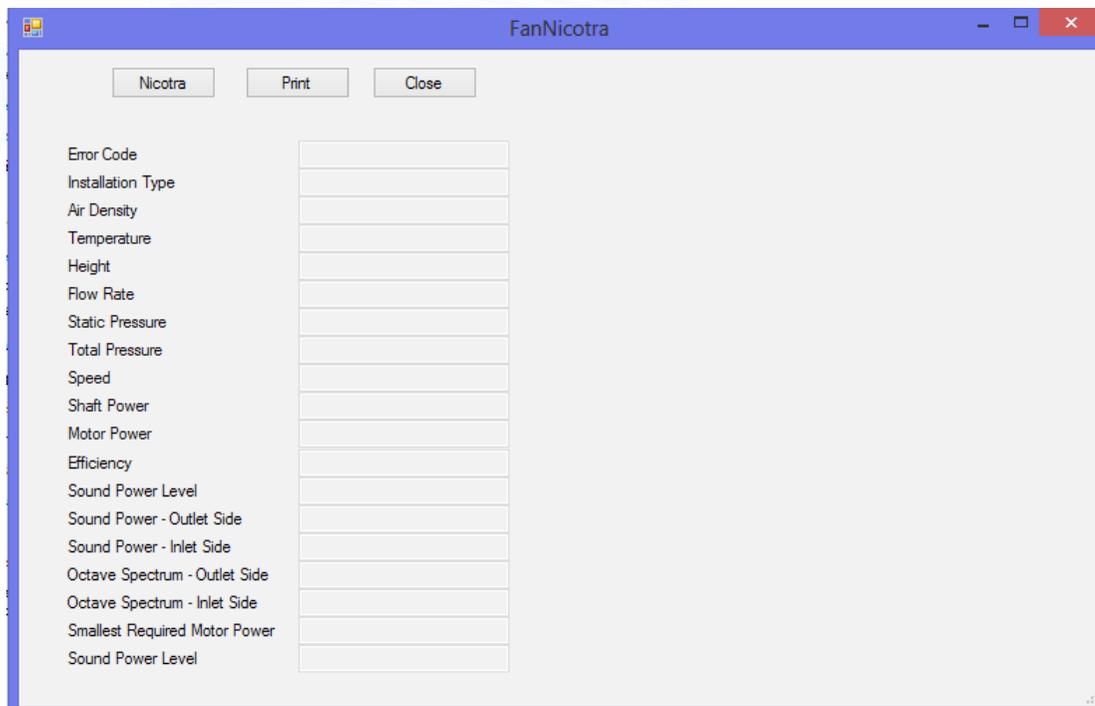
After that you must press close at Nicotra, Zeihl fan.

Centrifugal Fan selection



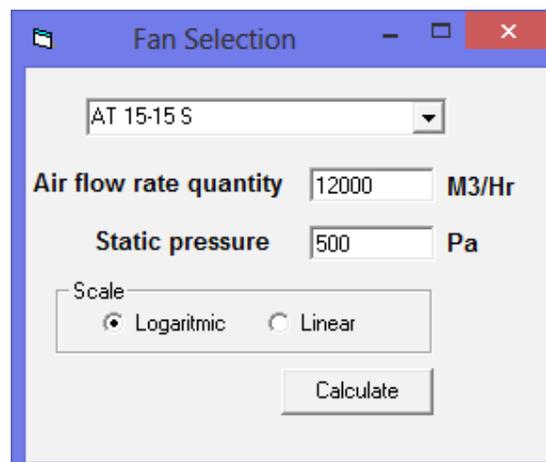
A dialog box titled "FanSelection" with a blue border. It contains a radio button selected for "Air Quantity" with a text input field containing "6500" and the unit "CFM". Below this are three unselected radio buttons: "Nicotra Fan", "Comfri Fan", and "Ziehl Fan". At the bottom is a "Continue" button.

Nicotra

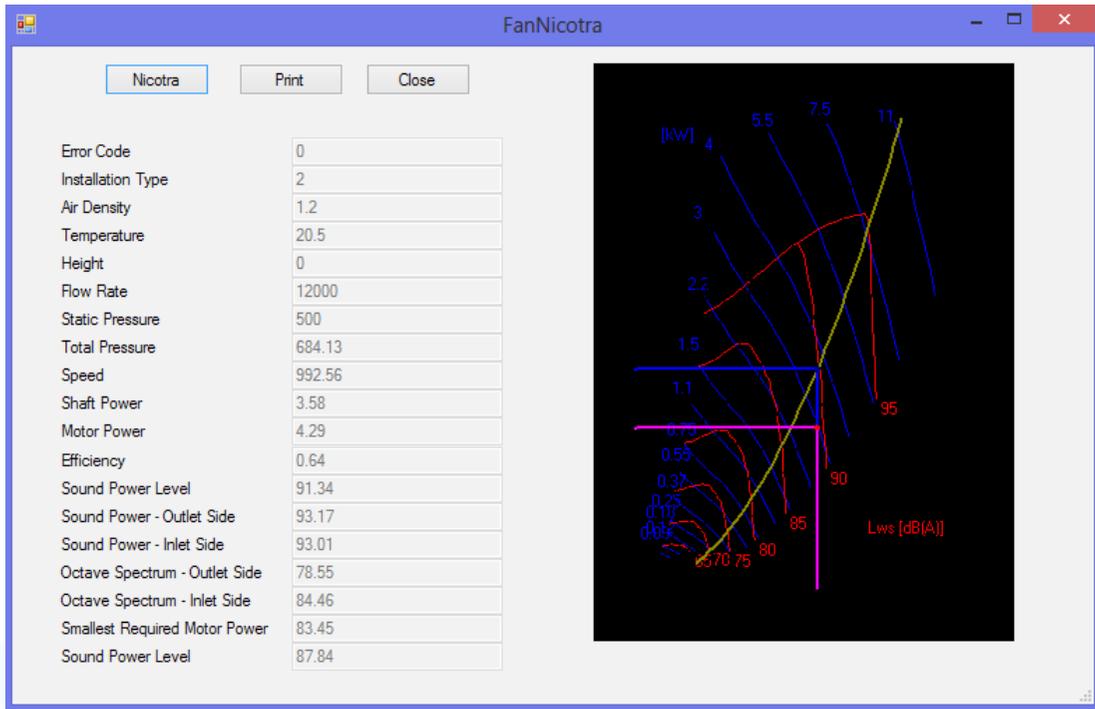


A dialog box titled "FanNicotra" with a blue border. At the top are three buttons: "Nicotra", "Print", and "Close". Below is a list of parameters on the left and a corresponding grid of empty input fields on the right:

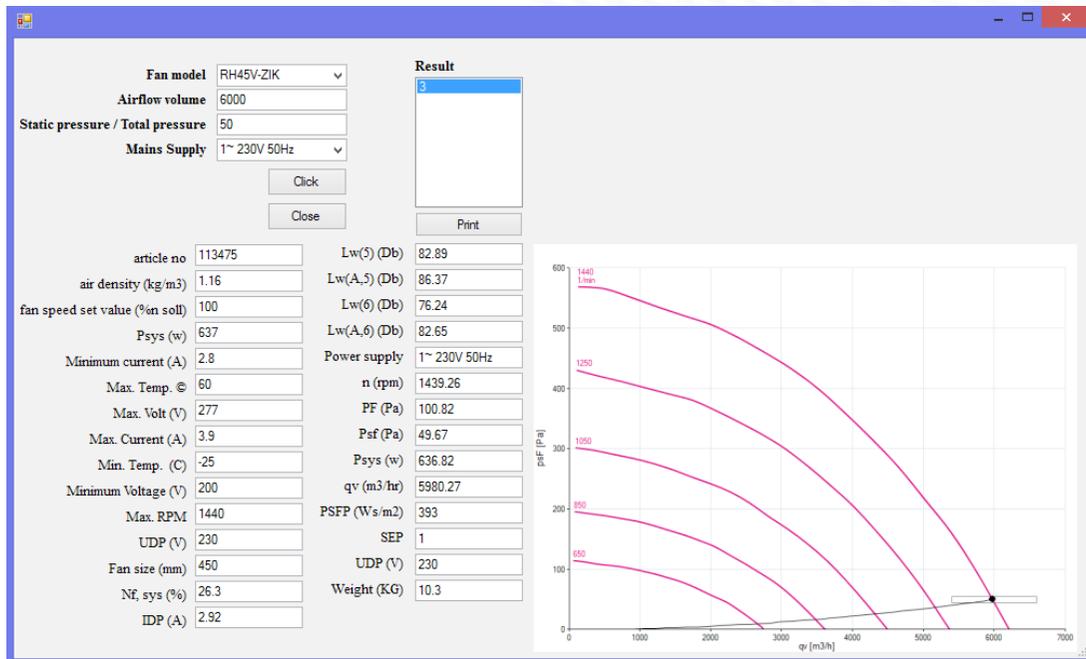
Error Code	
Installation Type	
Air Density	
Temperature	
Height	
Flow Rate	
Static Pressure	
Total Pressure	
Speed	
Shaft Power	
Motor Power	
Efficiency	
Sound Power Level	
Sound Power - Outlet Side	
Sound Power - Inlet Side	
Octave Spectrum - Outlet Side	
Octave Spectrum - Inlet Side	
Smallest Required Motor Power	
Sound Power Level	



A dialog box titled "Fan Selection" with a blue border. It features a dropdown menu showing "AT 15-15 S". Below are two input fields: "Air flow rate quantity" with "12000" and "M3/Hr", and "Static pressure" with "500" and "Pa". A "Scale" section has two radio buttons: "Logaritmic" (selected) and "Linear". At the bottom is a "Calculate" button.



Zeihl



Cooling Main Form

Air Cooled Package Simulation Software

Power Supply: 380-415/3/50Hz		Compressor Model 1: ZR72KCE # 1	
Compressor Type: Scroll		Compressor Model 2: ZR72KCE # 1	
Company Name: Copeland		Compressor Model 3: ZR72KCE # 1	
Refrigerant Type: R22			

Air Cooled Condenser		Air Cooled Evaporator	
Coil Size:	3/8	Coil Size:	3/8
Altitude:	0 ft	Dry on Coil Temp:	80 °F
Coil Length:	76 inch	<input checked="" type="radio"/> Wet on Coil Temp.:	67 °F
Coil Height:	45 inch	<input type="radio"/> Relative Humidity:	50.79 %
Coil #:	1	Coil Length:	64 inch
Ambient Temp:	95 °F	Coil Height:	28 inch
Tube Vertical Distance:	1 inch	Coil #:	1
Tube Horizontal Distance:	0.87 inch	Tube Vertical Distance:	1 inch
Circuit #:	24	Tube Horizontal Distance:	0.87 inch
Fins Material:	Aluminum	Circuit #:	28
Fins Type:	Wavy	Fins Material:	Aluminum
Fins Thickness:	0.0055 inch	Fins Type:	Wavy
Fins per Length:	12 fins/inch	Fins Thickness:	0.0055 inch
Tube Material:	Copper	Fins per Length:	12 fins/inch
Tube Shape:	Smooth	Tube Material:	Copper
Rows #:	4	Tube Shape:	Smooth
Air Quantity:	11771.68 CFM	Rows #:	6
Condenser Motor Power Input:	988 W	Air Quantity:	7063 CFM
		Evaporator Motor Power Input:	4290 W
		Capillary + Distributor Pressure Drop:	25 Psi

Calculate	Print	Back	Exit
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Catalogue	DX Piping	Energy Saving	Low Ambient Kit
Heat Pump	Psychrometric	Retrieve Data	

Output Data

Ambient Temp:	95	°F
Capacity:	202863.55	Btuh
Compressor Power Consumption:	14761.15	W
Fan Power Consumption:	5278	W
Condensing Temp:	124.02	°F
Evaporating Temp:	50.95	°F
Condenser Air Quantity:	11771.78	CFM
Condenser Static Pressure:	0.2	inch H2O
Evaporator Air Quantity:	7063.06	CFM
Evaporator Static Pressure:	1.1	inch H2O
Air Velocity Condenser:	495.65	ft/min
Air Velocity Evaporator:	567.56	ft/min
Dry Off Coil Temp.:	59.3	°F
Wet Off Coil Temp.:	58.1	°F
Sensible Capacity:	160949.84	Btuh
Cop:	2.97	
EER:	10.12	
Condenser Refrigerant Pressure Drop:	1.66	Psi
Evaporator Refrigerant Pressure Drop:	33.4	Psi
On Coil Humidity:	78.8	grain/lb
Off Coil Humidity:	70.51	grain/lb
Off Coil Relative Humidity:	92.94	%
Refrigerant Charge:	43.9	lb
Subcooling Temp.:	8.71	°F
Superheating Temp.:	7.2	°F

Reference Data Save

Heat Pump Form

Heat Pump Package Simulation Software

Power Supply: 380-415/3/50Hz		Compressor Model 1: ZR72KCE # 1	
Compressor Type: Scroll		Compressor Model 2: ZR72KCE # 1	
Company Name: Copeland		Compressor Model 3: ZR72KCE # 1	
Refrigerant Type: R22			

Air Cooled Evaporator		Air Cooled Condenser	
Coil Size:	3/8	Coil Size:	3/8
Return Room Temp:	10 °C	Dry on Coil Temp:	21 °C
Altitude:	0 m	<input checked="" type="radio"/> Wet on Coil Temp.:	15 °C
Coil Length:	1.6256 m	<input type="radio"/> Relative Humidity:	52.19 %
Coil Height:	0.7112 m	Coil Length:	1.6256 m
Tube Vertical Distance:	0.0254 m	Coil Height:	1.2192 m
Tube Horizontal Distance:	0.022 m	Tube Vertical Distance:	0.0254 m
Circuit #:	28	Tube Horizontal Distance:	0.022 m
Fins Material:	Aluminum	Circuit #:	24
Fins Type:	Wavy	Fins Material:	Aluminum
Fins Thickness:	0.0002 m	Fins Type:	Wavy
Fins per Length:	472 fins/m	Fins Thickness:	0.0002 m
Tube Material:	Copper	Fins per Length:	472 fins/m
Tube Shape:	Enhanced	Tube Material:	Copper
Rows #:	4	Tube Shape:	Enhanced
<input checked="" type="radio"/> Air Quantity:	3068 l/s	Rows #:	4
Evaporator Motor Power Input:	0 W	<input checked="" type="radio"/> Air Quantity:	5097 l/s
		Condenser Motor Power Input:	0 W

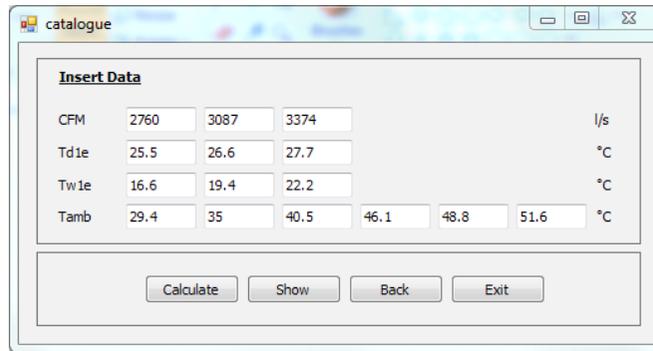
Calculate	Print	Back	Exit
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Work on your request

Return Room Temp:	10	°C
Capacity:	65457.4	W
Compressor Power Consumption:	13611.76	W
Fan Power Consumption:	0	W
Condensing Temp:	47.09	°C
Evaporating Temp:	11.3	°C
Supply Room Temp:	31.35	°C
Condenser Air Quantity:	3068	l/s
Condenser Static Pressure:	214.47	Pa
Evaporator Air Quantity:	5097	l/s
Evaporator Static Pressure:	56.53	Pa
Air Velocity Condenser:	2.65	m/s
Air Velocity Evaporator:	2.57	m/s
Dry Off Coil Temp.:	13.15	°C
Wet Off Coil Temp.:	11.98	°C
Sensible Capacity:	63459.61	W
Cop:	4.81	
EER:	16.41	
Condenser Refrigerant Pressure Drop:	5069.13	Pa
Evaporator Refrigerant Pressure Drop:	25840.41	Pa
On Coil Humidity:	8.24	g/kg
Off Coil Humidity:	8.29	g/kg
Off Coil Relative Humidity:	87.14	%

New for Ultimate version:

- Catalogue for unit with Excel extracting at request conditions 3 different air flow rate, 3 different air flow rate, 3 different dry on coil temp., 3 different wet bulb on coil temp., & 5 different ambient temperatures.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	
	AMB	OnDry	OnWet	E_AirQuan	OffDry	OffWet	Cap	CompPower	FanPower	CondTemp	EvapTemp	C_AirQuan	C_StaticPressure	C_StaticPressure	C_AirVel	E_AirVel	SensCap	COP	EER	C_PressuDrop	E_PressuDrop	OnHumid	OffHumid	OffRelatvHumid	
1																									
2	85	78	62	5850	58.31	55.61	202098.45	12866.39	0	112.17	45.46	10800.09	0.61	0.28	482.55	470.08	169377.22	4.6	15.71	1.61	2.28411	57.97	61.84	84.35	
3	85	80	62	5850	58.3	55.26	204554.06	12932.71	0	112.58	46.24	10800.09	0.61	0.3	482.55	470.08	197955.13	4.64	15.82	1.61	2.35884	54.82	60.48	82.48	
4	85	82	62	5850	58.29	54.91	207002.92	12998.5	0	112.99	47.01	10800.09	0.61	0.32	482.55	470.08	207002.92	4.67	15.93	1.61	2.42638	51.67	59.11	80.63	
5	85	78	67	5850	60.56	58.7	209592.35	13065.95	0	113.4	47.81	10800.09	0.61	0.28	482.55	470.08	112135.2	4.7	16.04	1.61	2.4572	81.99	71.07	89.48	
6	85	80	67	5850	60.59	58.39	212240.51	13136.68	0	113.84	48.63	10800.09	0.61	0.3	482.55	470.08	130295.01	4.73	16.16	1.61	2.52211	78.8	68.3	87.65	
7	85	82	67	5850	60.61	58.08	214875.2	13206.73	0	114.26	49.43	10800.09	0.61	0.32	482.55	470.08	150199.5	4.77	16.27	1.61	2.58076	75.62	68.33	85.84	
8	85	78	72	5850	62.6	61.58	216029.76	13227.55	0	114.38	49.76	10800.09	0.61	0.28	482.55	470.08	78508.06	4.79	16.33	1.61	2.4196	109	80.52	94.3	
9	85	80	72	5850	62.69	61.34	218851.82	13302.22	0	114.83	50.62	10800.09	0.61	0.3	482.55	470.08	91191.7	4.82	16.45	1.61	2.47627	105.77	79.27	92.51	
10	85	82	72	5850	62.78	61.09	221656.88	13376.12	0	115.27	51.46	10800.09	0.61	0.32	482.55	470.08	104822.85	4.86	16.57	1.61	2.52661	102.55	78.01	90.74	
11	95	78	62	5850	58.81	56.11	191924.13	14261.94	0	121.21	45.44	10800.09	0.44	0.28	482.55	470.08	165063.77	3.94	13.46	1.49	2.3063	57.97	63.06	84.48	
12	95	80	62	5850	58.85	55.82	194251.58	14333.19	0	121.62	46.21	10800.09	0.44	0.3	482.55	470.08	192913.87	3.97	13.55	1.49	2.38174	54.82	61.81	82.64	
13	95	82	62	5850	58.89	55.52	196572.91	14403.81	0	122.02	46.98	10800.09	0.44	0.32	482.55	470.08	196572.91	4	13.65	1.49	2.44991	51.67	60.55	80.82	
14	95	78	67	5850	61.01	59.15	199026.48	14476.02	0	122.43	47.78	10800.09	0.44	0.28	482.55	470.08	109279.5	4.03	13.75	1.49	2.48102	81.99	72.27	89.56	
15	95	80	67	5850	61.08	58.89	201536.86	14551.84	0	122.86	48.6	10800.09	0.44	0.3	482.55	470.08	126976.82	4.06	13.85	1.49	2.54554	78.8	71.03	87.75	
16	95	82	67	5850	61.15	58.62	204034.73	14626.89	0	123.28	49.4	10800.09	0.44	0.32	482.55	470.08	146334.4	4.09	13.95	1.49	2.60573	75.62	69.78	85.97	
17	95	78	72	5850	62.99	61.98	205189.23	14648.88	0	123.4	49.75	10800.09	0.44	0.28	482.55	470.08	76508.71	4.11	14.01	1.49	2.41933	109	81.68	94.33	
18	95	80	72	5850	63.13	61.78	207866.58	14728.79	0	123.84	50.6	10800.09	0.44	0.3	482.55	470.08	88869.32	4.14	14.11	1.49	2.47599	105.77	80.57	92.56	
19	95	82	72	5850	63.27	61.58	210257.97	14807.83	0	124.28	51.44	10800.09	0.44	0.32	482.55	470.08	102153.32	4.17	14.22	1.49	2.52634	102.55	79.44	90.81	
20	105	78	62	5850	59.31	56.61	180201.35	15999.42	0	131.21	45.42	10800.09	0.44	0.28	482.55	470.08	160750.04	3.3	11.26	1.49	2.33037	57.97	64.31	84.61	
21	105	80	62	5850	59.41	56.37	182382.5	16077	0	131.62	46.2	10800.09	0.44	0.3	482.55	470.08	182382.5	3.32	11.34	1.49	2.40657	54.82	63.17	82.8	
22	105	82	62	5850	59.5	56.12	184558.12	16153.85	0	132.02	46.97	10800.09	0.44	0.32	482.55	470.08	184558.12	3.35	11.43	1.49	2.47542	51.67	62.02	81.01	
23	105	78	67	5850	61.45	59.59	186859.75	16232.31	0	132.43	47.77	10800.09	0.44	0.28	482.55	470.08	106423.62	3.37	11.51	1.49	2.50685	81.99	73.49	89.63	
24	105	80	67	5850	61.58	59.38	189212.61	16314.7	0	132.86	48.58	10800.09	0.44	0.3	482.55	470.08	123658.45	3.4	11.6	1.49	2.57302	78.8	72.37	87.85	
25	105	82	67	5850	61.7	59.17	191553.9	16396.19	0	133.28	49.39	10800.09	0.44	0.32	482.55	470.08	142549.09	3.42	11.68	1.49	2.63279	75.62	71.24	86.09	
26	105	78	72	5850	63.38	62.37	192701.57	16419.74	0	133.4	49.75	10800.09	0.44	0.28	482.55	470.08	74509.25	3.44	11.74	1.49	2.41933	109	82.86	94.37	
27	105	80	72	5850	63.57	62.22	195021.97	16506.44	0	133.84	50.6	10800.09	0.44	0.3	482.55	470.08	86546.84	3.47	11.83	1.49	2.47599	105.77	81.89	92.62	
28	105	82	72	5850	63.76	62.07	197309.47	16592.13	0	134.28	51.44	10800.09	0.44	0.32	482.55	470.08	99403.67	3.49	11.92	1.49	2.52634	102.55	80.89	90.89	
29	115	78	62	5850	59.81	57.11	185026.89	17340.45	0	141.21	45.41	10800.09	0.44	0.28	482.55	470.08	156436.31	2.74	9.37	1.49	2.35767	57.97	65.57	84.74	
30	115	80	62	5850	59.96	56.92	187062.23	18024.61	0	141.62	46.18	10800.09	0.44	0.3	482.55	470.08	170062.23	2.77	9.44	1.49	2.43275	54.82	62.55	82.96	
31	115	82	62	5850	60.1	56.72	189292.58	18107.91	0	142.02	46.95	10800.09	0.44	0.32	482.55	470.08	172092.58	2.79	9.5	1.49	2.50231	51.67	63.52	81.2	
32	115	78	67	5850	61.89	60.04	174242.58	18192.86	0	142.43	47.75	10800.09	0.44	0.28	482.55	470.08	103567.75	2.81	9.58	1.49	2.53408	81.99	74.72	89.71	

Model	Evaporator CFM	Dry Bulb Temp. F	Wet Bulb Temp. F	Capacity Btu/h	95F			105F			115F			120F			125F			
					Sensible capacity Btu/h	Power Input Watt	Capacity Btu/h	Sensible capacity Btu/h	Power Input Watt	Capacity Btu/h	Sensible capacity Btu/h	Power Input Watt	Capacity Btu/h	Sensible capacity Btu/h	Power Input Watt	Capacity Btu/h	Sensible capacity Btu/h	Power Input Watt		
14000	78	62	5029716	384447.39	3900.9	469757.44	352974.01	44890.03	45564.74	360093.96	48949.01	456679.38	345955.18	55221.05	447024.6	337944.6	60902.2	437949.56	324365.7	6305.63
14000	80	62	512323.28	39327.07	38683.89	486386.48	384463.61	44937.56	47511.62	378778.07	49210.4	468340.59	370756.11	55667.74	452632.42	363286.14	60894.95	446849.56	357202.3	6382.68
14000	82	62	540795.07	42230.27	40234.52	517243.05	413397.83	45620.18	49293.71	407302.69	49655.29	487870.61	399400.32	56289.94	47894.6	391989.43	61683.73	468241.74	389351.21	6434.26
14000	78	67	508091.72	30322.39	38274.57	488032.61	282330.84	44705.55	46322.18	285001.55	48767.71	455277.39	277095.83	55064.91	440752.18	289390.11	60366.29	43094.34	24037.25	6307.36
14000	80	67	518024.31	33092.02	39587.47	495803.68	320030.68	44322.84	478808.58	33492.28	463380.92	302594.94	55472.41	459685.58	283977.06	60795.32	441283.69	28959.13	63473	
14000	82	67	538483.87	35821.81	40038.64	51098.18	347322.47	45428.38	488107.17	340784.06	46683.55	481892.7	332068.19	56056.31	473327.22	323488.32	61927.27	458288.32	38983.38	6427.95
14000	78	72	535924.89	38077.7	4013.83	513357.17	373621.24	45913.01	49028.94	370425.79	49774.96	483292.4	363258.18	56325.18	47182.12	368349.73	61524.71	467143.72	354994.42	64229.44
14000	80	72	542098.08	207432.04	40205.43	519445.81	206298.34	45727.82	486304.1	196731.5	50004.23	489235.87	389597.8	56399.27	47776.01	342473.53	61793.89	488968.54	380880.83	64003.5
14000	82	72	548627.16	236904.69	40595	525772.88	228193.23	45926.81	50263.1	224327.85	50242.78	492907.03	217642.79	56355.92	48434.35	232094.22	62062.63	474869.18	290310.4	64797.35
14000	78	62	526252.23	426293.39	29239.19	504123.28	419561.47	48958.48	491430.97	419589.3	49774.97	474702.21	418532.04	55908.27	462273.32	400437.56	60449.73	552982.26	294898.82	63289.63
14000	80	62	53626.98	487754.43	39605.65	500003.9	448921.75	44775.53	492755.59	443781.19	48994.63	480773.64	442973.7	55345.09	463401.32	433894.22	61073.24	470006.1	42636.18	63402.94
14000	82	62	548415.93	489814.64	39737.67	525804.29	498848.6	45323.56	502980.88	476088.96	49577.41	497104.11	469126.45	55974.24	488494.31	416804.75	61762.4	478602.1	36815.01	6400.38
14000	78	67	565028.19	352611.78	40486.15	542219.98	344301.77	45908.39	51985.04	338671.77	52021.16	51400.08	327891.76	568412.4	507835.27					

- Dx pipe sizing for discharge, liquid, mixture & suction with many fittings (elbow 90 short or long radius, U bend 180, enlargement, contraction, shut off valve, solenoid valve, filter drier, check valve...etc), at request vertical (up word or down word) & horizontal distances.

The screenshot shows the DX software interface with the following parameters:

- Refrigerant Type: R22, Refrigerant Circuit #: 3
- Evaporating Temp.: 9.86 °C, Condensing Temp.: 50.82 °C
- Subcooling Temp.: 5 K, Superheating Temp.: 5 K
- Isentropic Efficiency: 0.8, Capacity: 60098.48 W
- Copper Type: L (selected)

The interface is divided into four main sections for pipe sizing:

- Discharge Line:** Pipe Size: Design, Horizontal Length: 5 m, Vertical Length: 1 m, UpWard selected. Fittings: Elbows 90 Long Radius (0), Elbows 45 (0), U Bend 180 (0), Contraction (1/2, 0), Enlargment (1/2, 0), Shutt Off Valve (0), Tee (0).
- Liquid Line:** Pipe Size: Design, Horizontal Length: 5 m, Vertical Length: 1 m, UpWard selected. Fittings: Elbows 90 Long Radius (0), Elbows 45 (0), U Bend 180 (0), Contraction (1/2, 0), Enlargment (1/2, 0), Shutt Off Valve (0), Tee (0), Filter Drier (0), Check Valve (0), Solenoid Valve (0).
- Mixture Line:** Pipe Size: Design, Horizontal Length: 0.5 m, Vertical Length: 0 m, UpWard selected. Fittings: Elbows 90 Long Radius (0), Elbows 45 (0), U Bend 180 (0), Contraction (1/2, 0), Enlargment (1/2, 0), Shutt Off Valve (0), Tee (0).
- Suction Line:** Pipe Size: Design, Horizontal Length: 5 m, Vertical Length: 1 m, UpWard selected. Fittings: Elbows 90 Long Radius (0), Elbows 45 (0), U Bend 180 (0), Contraction (1/2, 0), Enlargment (1/2, 0), Shutt Off Valve (0), Tee (0).

Summary of calculated values:

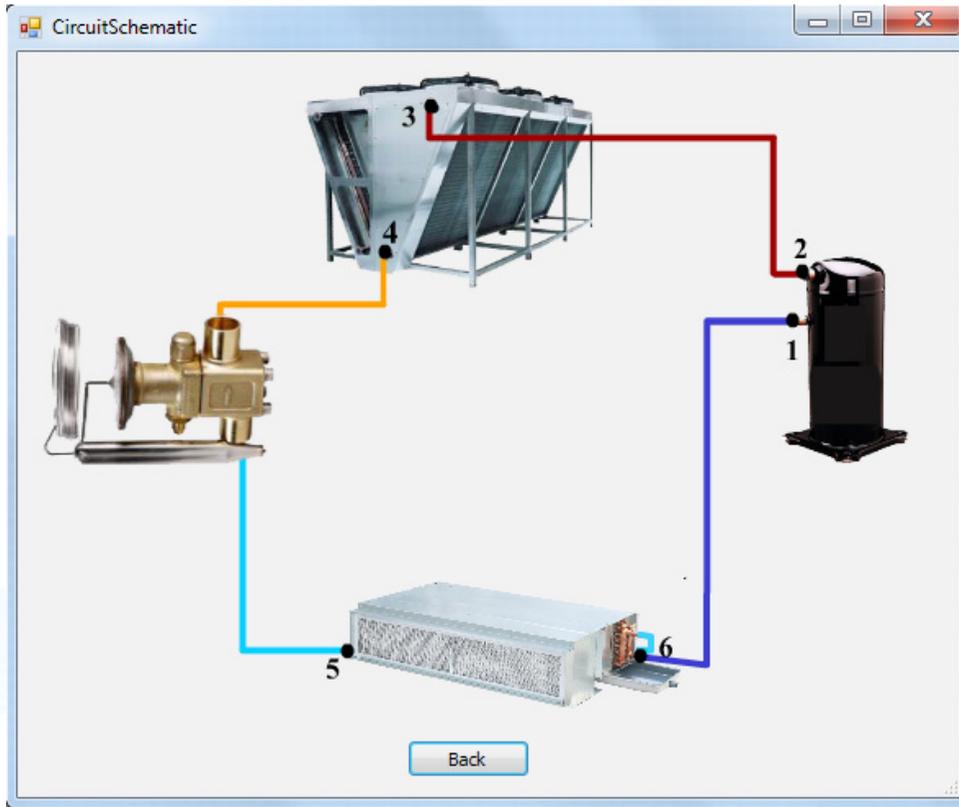
Line Type	Velocity (m/s)	Pressure Drop (Bar)	Pipe Size
Discharge Line	10.072	0.1	1/2
Liquid Line	1.248	0.091	3/8
Mixture Line	7.699	0.002	1/2
Suction Line	14.601	0.05	3/4

- Refrigeration circuit analysis at each point to know exact enthalpy, pressure, temperature, entropy, specific volume, & quality.

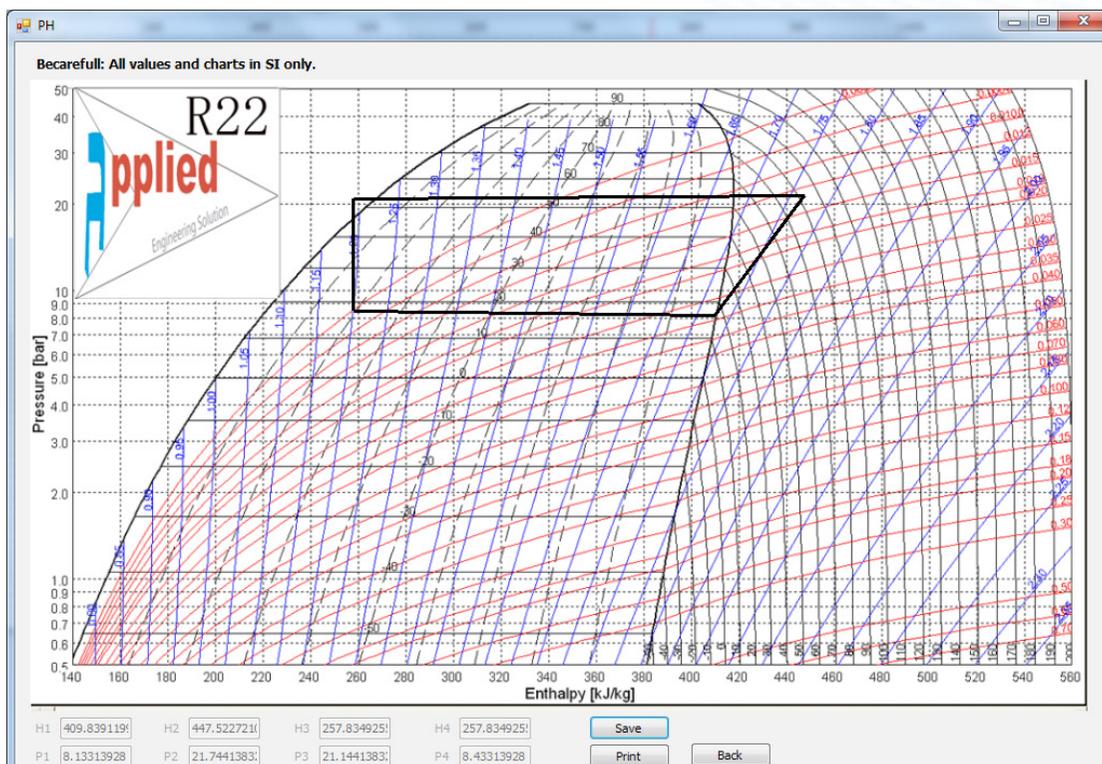
Becarefull: All values and charts in SI only.

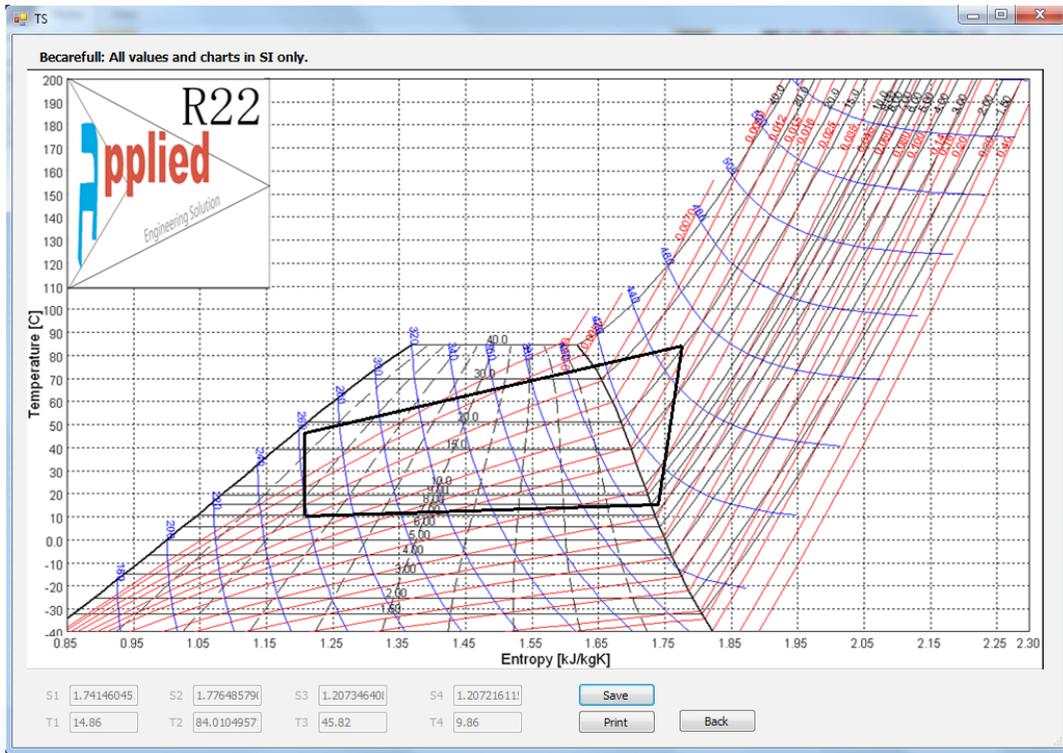
Point	T	P	V	H	S	X
1	14.86	7.83313928	0.0357370203	410.33601990	1.7447767117	0
22	76.524363114	21.74413832	0.0105514342	440.08538080	1.7447767117	0
2	84.010495718	21.74413832	0.0115064467	447.52272103	1.7764857908	0
3	84.010495718	21.44413832	0.0117855620	447.54542623	1.7791796963	0
4	45.82	21.14413832	0.0008873693	257.83492556	1.2073464080	0
5	9.86	8.43313928	0.0087959213	257.83492556	1.2072161153	0.2346765045
6	14.86	8.13313928	0.0346062012	409.83911996	1.7414604517	0

- Refrigeration circuit schematic as per selected components.

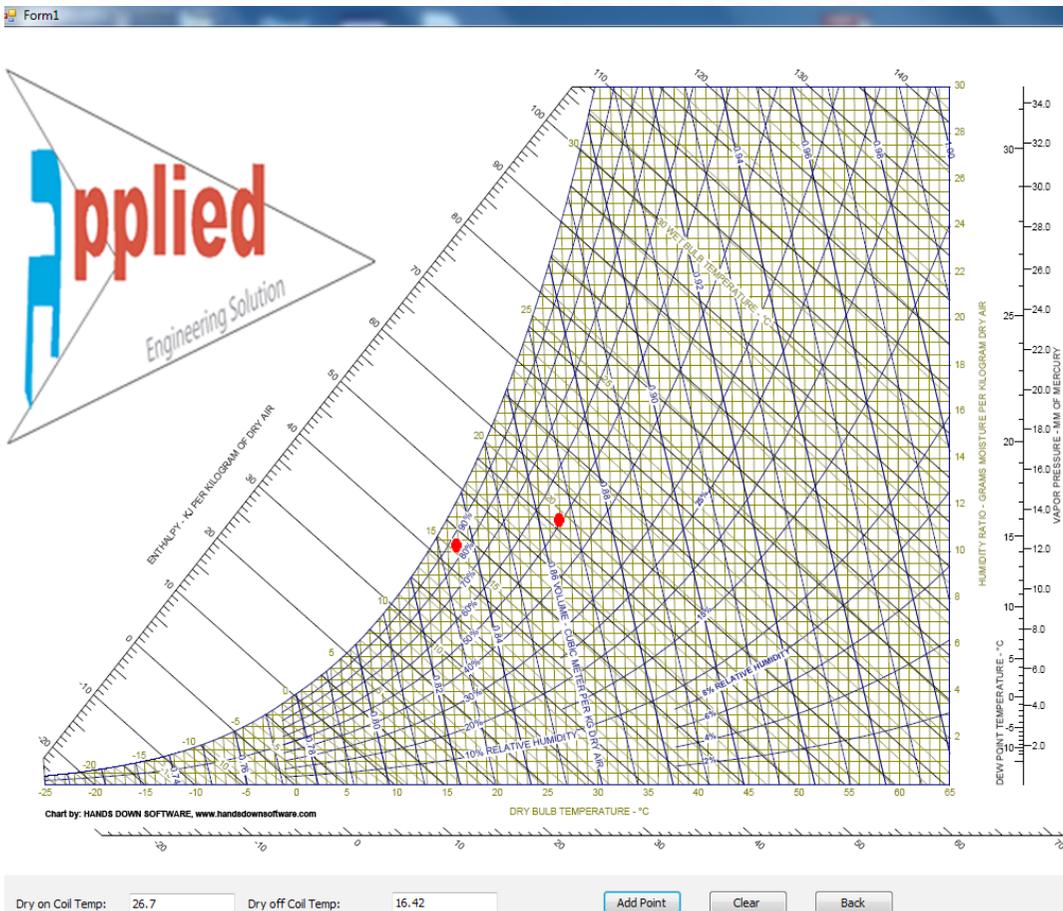


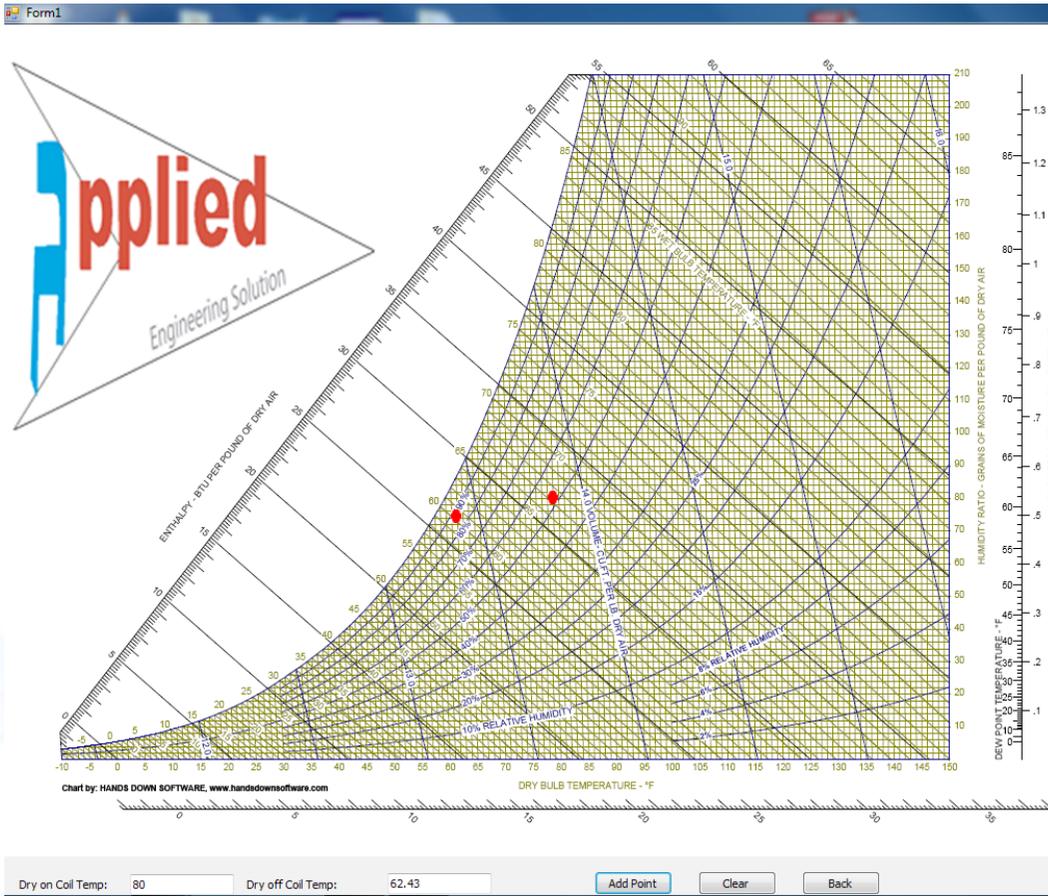
- T-S chart & P-H chart at calculated conditions.





-Psychrometric chart at calculated conditions.





- Expansion valve selection from Danfoss depending on conditions & calculated data.

ExpansionDevice

Capillary

Restrictor

Expansion Valve

Back

Restrictor

For Cooling

Size 1: 0.06 inch

Size 2: 0.062 inch

Size 3: 0.064 inch

Back

RestrictorHeat

For Cooling

Size 1 inch

Size 2 inch

Size 3 inch

For Heating

Size 1 inch

Size 2 inch

Size 3 inch

ExpansionValve

Expansion Valve Brand Name Evaporating Temp. °C

Refrigerant Condensing Temp. °C

Expansion Valve Model

Discharge Pressure kPa Suction Pressure kPa

Discharge Line Pressure Drop kPa Mixture Line Pressure Drop kPa

Condenser Coil Pressure Drop kPa Evaporator Line Pressure Drop kPa

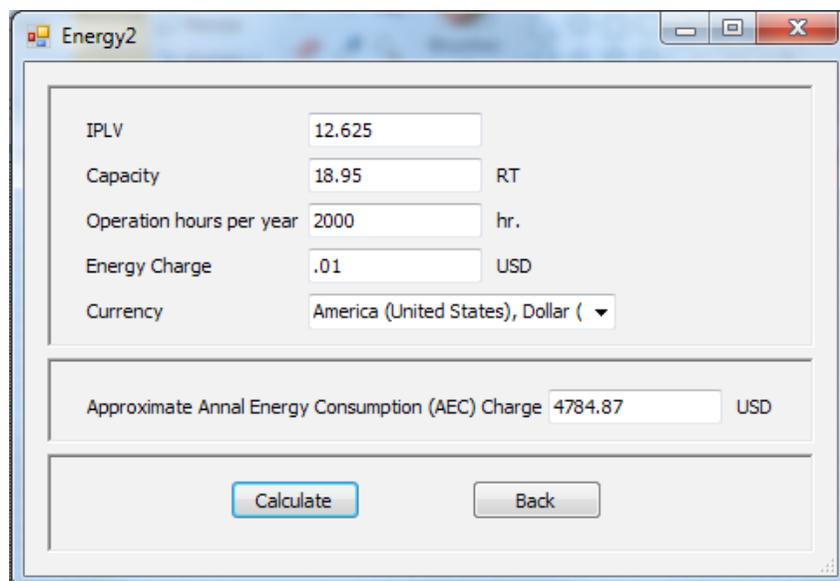
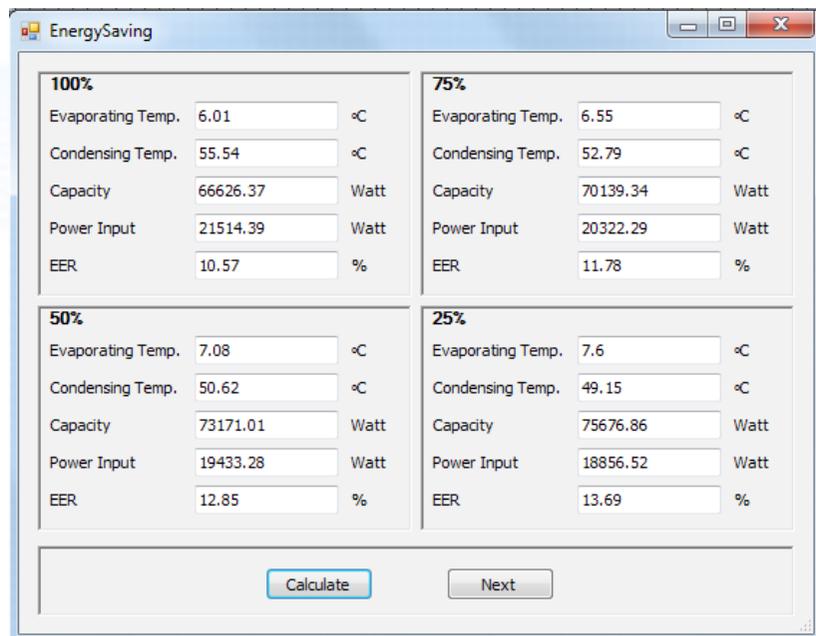
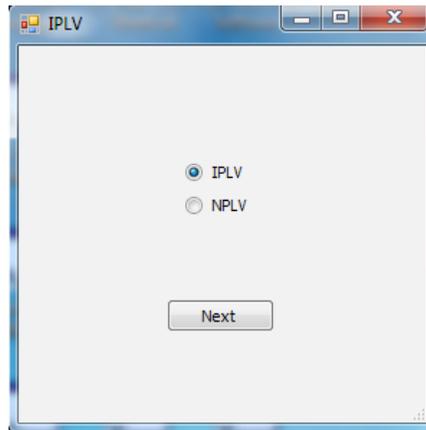
Evaporator Coil Pressure Drop kPa High Pressure Drop kPa

Liquid Line Pressure Drop kPa Low Pressure Drop kPa

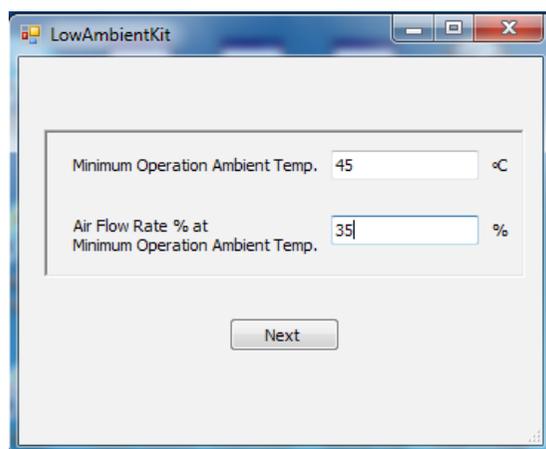
Pressure Drop through Expansion Valve kPa

Capacity W

- Energy saving with IPLV, or NPLV, & energy costing per year at request currency.



- Minimum ambient temp. That unit could be running & show you how to control through fan on off or adding frequency inverter depending on enters the percentage of air flow rate which suitable for this minimum ambient & check unit affect on unit running.



New for Genius version:

- Adding separate circuits sub cooling affect on performance calculation in addition integrated sub cooling.
- Give designer the ability to select either Fan selection “Nicotra or Comfri” or select air flow rate.
- Save customer & project data & ability to retrieving its.
- Energy saving with adding part load data for Screw Compressors from BITZER brand name.

Features:

Input data:

- Power supply selection (380-415/3/50HZ, 460/3/60HZ, 380/3/60HZ, 230/3/60HZ, 220/1/50HZ & 240/1/60HZ).
- Compressor type selection (Screw, Scroll, Hermetic Reciprocating & Semi Hermetic Reciprocating).
- Company brand name selection (Copeland, Danfoss, Bitzer, and Hanbell & Refcomp).
- Refrigerant type selection (R134A, R22, R407C & R410A).
- Compressor model selection & quantity either same compressors model or different.
- Condenser coil configurations & specifications selection such as:
 - Coil tube size (5/16”, 3/8”, 1/2” & 5/8”).
 - Altitude above sea level.
 - Coil length.
 - Coil height.
 - Ambient temp.
 - Tube vertical distance.
 - Tube horizontal distance.
 - Circuit #.
 - Fins material (Aluminum or Copper).
 - Fins type (Flat, Wavy, Lanced or Louvered).
 - Fins thickness.

- Fins per length.
 - Tube material (Aluminum or Copper).
 - Tube shape (Smooth or enhanced).
 - Rows # (1, 2, 3, 4 & 6)
 - Air flow quantity.
 - Motor power consumption.
- Evaporator data such as:
- Coil tube size (5/16", 3/8", 1/2" & 5/8").
 - Altitude above sea level.
 - Coil length.
 - Coil height.
 - Ambient temp.
 - Tube vertical distance.
 - Tube horizontal distance.
 - Circuit #.
 - Fins material (Aluminum or Copper).
 - Fins type (Flat, Wavy, Lanced or Louvered).
 - Fins thickness.
 - Fins per length.
 - Tube material (Aluminum or Copper).
 - Tube shape (Smooth or enhanced).
 - Rows # (1, 2, 3, 4 & 6)
 - Air flow quantity.
 - Motor power consumption.

Output:

- Total capacity.
- Compressor power consumption.
- Fan power consumption.
- Condensing temp.
- Evaporating temp.
- Off coil dry bulb temp.
- Off wet coil bulb temp.
- Condenser air static pressure.
- Condenser air velocity.
- Condenser refrigerant pressure drop.
- Evaporator air static pressure.
- Evaporator air velocity.
- Evaporator refrigerant pressure drop.
- COP.
- EER.

Summary:

- The possibility to calculate depending on your preferred unit measurement SI or Imperial.
- Optimized selection of all unit main components.
- Specify exactly all configurations or specifications of unit components after checking all variables affect to match the designer (user) requirements.
- Saving time & money for assemble many prototypes with many variables for checking & testing to get the result, so this software will show you the affect of all variables on the unit directly only by one press.
- Increase your competitive by give you the ability to get the result in very short time, which increase your plant flexibility.
- Add for manufacturer the facility of making & design the custom made unit which match special customer requirements.
- Give the consultant & contractor the possibility of checking the unit operation conditions.
- Checking the unit at high & low ambient.
- Checking the summer conditions for cooling & winter conditions for heating.
- Depending on the result the designer & engineer can select the optimized expansion valve.
- Training your staff with all variables & its affect on the unit.
- All above that with very accurate data & very competitive price.
- Dx pipe sizing for discharge, liquid, mixture & suction line.
- Refrigeration circuit analysis
- Refrigeration circuit schematic
- Expansion valve selection
- IPLV or NPLV calculation
- Calculation of running cost depending on yearly hour operation is any request currency.
- Catalogue at many different conditions dry & wet on coil bulb temp., air flow rate & ambient temp. At one press.
- Low ambient kit study possibility, to determine the minimum ambient that your design unit could be run.
- Professional report with all required data.
- Separate circuit sub cooling in addition to integrated sub cooling.
- Save performance & customers data & ability for retrieving its
- Adding Part load for Compressor Screw from BITZER.
- The ability to select either Evaporator air flow rate or Centrifugal Fan either Comfri & Nicotra.



Air Cooled Package Software Simulation Software

Project Name

Date 7/18/2013 5:26:54 AM

INPUT DATA

Page (1/2)

Power Supply: 380-415/3/50Hz	Compressor Model 1: ZR72KCE	#	1
Compressor Type: Scroll	Compressor Model 2: ZR72KCE	#	1
Company Name: Copeland	Compressor Model 3: ZR72KCE	#	1
Refrigerant Type: R22			

Integrated Subcooling:

Condenser

Coil Size: 3/8		Fins Material: Aluminum	
Height: 0	ft	Fins Type: Wavy	
Coil Length: 76	inch	Fins Thickness: 0.0055	inch
Coil Height: 45	inch	Fins per Length: 12	fins/inch
Coil #: 1		Tube Material: Copper	
Ambient Temp.: 95	°F	Tube Shape: Smooth	
Tube Vertical Distance: 1	inch	Rows #: 4	
Tube Horizontal Distance: 0.87	inch	Air Quantity: 30000	CFM
Circuit #: 24		Condenser Motor Power Input: 0	W

Evaporator

Coil Size: 3/8		Fins Material: Aluminum	
Dry On Coil Temp.: 80	°F	Fins Type: Wavy	
Wet On Coil Temp.: 67	°F	Fins Thickness: 0.0055	inch
Relative Humidity: 50.79	%	Fins per Length: 12	fins/inch
Coil Length: 64	inch	Tube Material: Copper	
Coil Height: 28	inch	Tube Shape: Smooth	
Coil #: 1		Rows #: 6	
Tube Vertical Distance: 1	inch	Air Quantity: 6500	CFM
Tube Horizontal Distance: 0.87	inch	Evaporator Motor Power Input: 0	W
Circuit #: 28			



Air Cooled Package Software Simulation Software

OUTPUT DATA

Ambient Temp.:	95	°F	Air Velocity Condenser:	1263.16	ft/min
Capacity:	206265.86	Btuh	Air Velocity Evaporator:	522.32	ft/min
Compressor Power Consumption:	12645.15	W	Condenser Air Quantity:	30000.25	CFM
Fan Power Consumption:	0	W	Evaporator Air Quantity:	6500.06	CFM
Sensible Capacity:	155847.61	Btuh	Condenser Refrigerant Pressure Drop:	1.71	Psi
Dry off Coil Temp.:	58.22	°F	Evaporator Refrigerant Pressure Drop:	33.28	Psi
Wet off Coil Temp.:	57.02	°F	EER:	16.31	
Condensing Temp.:	110.36	°F	COP:	4.78	
Evaporating Temp.:	49.6	°F	On Coil Humidity:	78.8	grain/lb
Condenser Static Pressure:	1.09	inch H2O	Off Coil Humidity:	67.72	grain/lb
Evaporator Static Pressure:	0.94	inch H2O	Relative Humidity:	92.81	%
Subcooling Temp.:	1.8	°F	Refrigerant Charge:	35.4	lb
Superheating Temp.:	7.2	°F			

Prepared By

Checked By

Approved By



Package Simulation Software

Heat Pump

Project Name

Date

7/18/2013 5:38:35 AM

INPUT DATA

Page (1/2)

Power Supply: 380-415/3/50Hz	Compressor Model 1: ZR72KCE	#	1
Compressor Type: Scroll	Compressor Model 2: ZR72KCE	#	60.67
Company Name: Copeland	Compressor Model 3: ZR72KCE	#	1
Refrigerant Type: R22			

Evaporator

Coil Size: 3/8	Fins Material: Aluminum
Height: 0 ft	Fins Type: Wavy
Coil Length: 64 inch	Fins Thickness: 0.0055 inch
Coil Height: 28 inch	Fins per Length: 12 fins/inch
Return Room Temp.: 50 °F	Tube Material: Copper
Tube Vertical Distance: 1 inch	Tube Shape: Smooth
Tube Horizontal Distance: 0.87 inch	Rows #: 6
Circuit #: 28	Air Quantity: 6500 CFM
	Evaporator Motor Power Input: 0 W

Condenser

Coil Size: 3/8	Fins Material: Aluminum
Dry On Coil Temp.: 69.8 °F	Fins Type: Wavy
Wet On Coil Temp.: 59 °F	Fins Thickness: 0.0055 inch
Relative Humidity: 52.19 %	Fins per Length: 12 fins/inch
Coil Length: 76 inch	Tube Material: Copper
Coil Height: 45 inch	Tube Shape: Smooth
Tube Vertical Distance: 1 inch	Rows #: 4
Tube Horizontal Distance: 0.87 inch	Air Quantity: 30000 CFM
Circuit #: 24	Condenser Motor Power Input: 0 W



Package Simulation Software

Heat Pump

OUTPUT DATA

Page (2/2)

Return Room Temp.:	50	°F	Air Velocity Condenser:	522.32	ft/min
Capacity:	235559.71	Btuh	Air Velocity Evaporator:	1263.16	ft/min
Compressor Power Consumption:	11139.38	W	Condenser Air Quantity:	6500.06	CFM
Fan Power Consumption:	0	W	Evaporator Air Quantity:	30000.25	CFM
Sensible Capacity:	235559.71	Btuh	Condenser Refrigerant Pressure Drop:	3.15	Psi
Dry off Coil Temp.:	56.82	°F	Evaporator Refrigerant Pressure Drop:	4.47	Psi
Wet off Coil Temp.:	54.72	°F	EER:	21.15	
Condensing Temp.:	98.53	°F	COP:	6.2	
Evaporating Temp.:	50.22	°F	On Coil Humidity:	57.7	grain/lb
Supply Room Temp.:	88.97	°F	Off Coil Humidity:		grain/lb
Condenser Static Pressure:	1.2	inch H2O	Relative Humidity:	87.4	%
Evaporator Static Pressure:	1.2	inch H2O			

Prepared By

Checked By

Approved By



DX Pipe Sizing Software

Project Name

Date 7/18/2013 5:31:49 AM

Refrigerant Type: R22	Evaporating Temp.: 49.6	°F
Refrigerant Circuit #: 1	Condensing Temp.: 110.36	°F
Copper Type: L	Subcooling Temp.: 1.8	°F
Capacity: 206265.86 Btuh	Superheating Temp.: 7.2	°F
Isentropic Efficiency: 0.8		

Discharge Line

Pipe Size: Design	U Bend 180: 0
Horizontal Length: 16.4 ft	Contraction: 1/2 0
Vertical Length: 3.3 ft	Enlargment: 1/2 0
UpWard	Shutt Off Valve: 0
Elbows 90: Long Radius 0	Tee: 0
Elbows 45: 0	

Velocity: 1970.746 ft/min	Pressure Drop: 0.631 Psi
Pipe Size: 1 1/8	

Liquid Line

Pipe Size: Design	Contraction: 1/2 0
Horizontal Length: 16.4 ft	Enlargment: 1/2 0
Vertical Length: 3.3 ft	Shutt Off Valve: 0
UpWard	Tee: 0
Elbows 90: Long Radius 0	Filter Drier: 0
Elbows 45: 0	Check Valve: 0
U Bend 180: 0	Solenoid Valve: 0

Velocity: 447.548 ft/min	Pressure Drop: 3.033 Psi
Pipe Size: 1/2	



DX Pipe Sizing Software

Mixing Line

Page (2/2)

Pipe Size: Design	U Bend 180: 0
Horizontal Length: 1.6 ft	Contraction: 1/2 0
Vertical Length: 0 ft	Enlargment: 1/2 0
UpWard	Shutt Off Valve: 0
Elbows 90: Long Radius 0	Tee: 0
Elbows 45: 0	

Velocity: 1157.722 ft/min	Pressure Drop: 0.006 Psi
Pipe Size: 1 1/8	

Suction Line

Pipe Size: Design	U Bend 180: 0
Horizontal Length: 16.4 ft	Contraction: 1/2 0
Vertical Length: 3.3 ft	Enlargment: 1/2 0
UpWard	Shutt Off Valve: 0
Elbows 90: Long Radius 0	Tee: 0
Elbows 45: 0	

Velocity: 3250.161 ft/min	Pressure Drop: 0.558 Psi
Pipe Size: 1 3/8	

DATA

Point	T	P	V	H	S	X
1	13.778	7.811	0.036	409.531	1.743	0.0
2'	66.484	18.828	0.013	435.41	1.743	0.0
2	72.541	18.828	0.014	441.88	1.773	0.0
3	72.541	18.528	0.014	441.308	1.776	0.0
4	42.533	18.228	0.001	253.404	1.194	0.0
5	9.778	8.411	0.008	253.404	1.192	0.213
6	13.778	8.111	0.034	409.031	1.739	0.0

Prepared By _____

Checked By _____

Approved By _____

Limitation Messages in Cooling & heat pump form

Ambient temperature values must be between (65F – 130F) in imperial, and (18.33C – 54.4C) in SI. Otherwise the following message will appear:

("Note: The Maximum and Minimum Ambient Temp. is 130°F and 32°F, respectively.") In Imperial

("Note: The Maximum and Minimum Ambient Temp. are 54.4°C and 18.33°C, respectively.") In SI

On coil dry bulb temperature value must be between (65F - 115F) in imperial and (18.33C – 46.1C) in SI. Otherwise the following message will appear:

("Note: The Maximum and Minimum On Coil Dry Temp. is 115°F and 65°F, respectively.") In Imperial

("Note: The Maximum and Minimum On Coil Dry Temp. is 46.1°C and 18.33°C, respectively.") In SI

On coil wet bulb temperature value must be between (65F - 90F) in imperial and (18.33C – 32.2C) in SI. Otherwise the following message will appear:

("Note: The Maximum and Minimum On Coil Wet Temp. is 90°F and 65°F, respectively.") In Imperial

("Note: The Maximum and Minimum On Coil Wet Temp. is 32.22°C and 18.33°C, respectively.") In SI

On coil Relative Humidity (RH%) must be between (0% – 100%) in. Otherwise the following message will appear:

("Note: The Maximum and Minimum Relative Humidity is 100% and 0%, respectively.")

Altitude above sea level value must be between (0 ft – 20000ft) in imperial and (0m – 6096m) in SI.

Otherwise the following message will appear:

("Note: The Maximum and Minimum Altitude is 20000ft and 0ft, respectively.") In Imperial

("Note: The Maximum and Minimum Altitude is 6096m and 0m, respectively.") In SI

Compressor qty for first compressor must be between (1 up to 12), otherwise the following message will appear:

("Note: The Maximum and Minimum Compressor number is 12 and 1, respectively.")

Compressor qty for second & third compressor must be between (0 up to 12), otherwise the following message will appear:

("Note: The Maximum and Minimum Compressor number is 12 and 0, respectively.")

Fan motor consumption limitation is between (0w – 100000w) for both evaporator & condenser, otherwise the following message will appear

("Note: The Maximum and Minimum Motor Fan Consumption is 100000W and 0, respectively.")

Fins thickness value must be between (0.001 inch – 0.01 inch) in imperial and (0.000254m – 0.00254m) in SI. Otherwise the following message will appear:

("Note: The Maximum and Minimum Fins Thickness is 0.01 inch and 0.001 inch, respectively.") In Imperial

("Note: The Maximum and Minimum Fins Thickness is 0.000254m and 0.00254m, respectively.") In SI

Fins quantity per length must be one of the following:

(6, 8, 10, 12, 14, 16 FPI in imperial or 236, 315, 394, 472, 551, 630 FPM in SI), for both evaporator & condenser, otherwise the following message will appear

("Sorry, Fins per Length accepted # as following for SI 236, 315, 394, 472, 551, 630 For IMP 6, 8, 10, 12, 14, 16")

Fins quantity per length must be one of the followings:

(6, 8, 10, 12, 14, 16 FPI in imperial or 236, 315, 394, 472, 551, 630 FPM in SI), for both evaporator & condenser, otherwise the followings message will appear

("Sorry, Fins per Length accepted # as following for SI 236, 315, 394, 472, 551, 630 For IMP 6, 8, 10, 12, 14, 16")

For coil tube size 5/8" you must follow the followings message `MessageBox.Show("Please note Tube Vertical Distance must be bigger or equal 0.038 and Tube Horizontal Distance must be bigger or equal 0.033")` for SI, & `MessageBox.Show("Please note Tube Vertical Distance must be bigger or equal 1.5 and Tube Horizontal Distance must be bigger or equal 1.3")` for imperial

Errors message in Cooling & heat pump form

You must follow the following procedure exactly, otherwise software will not complete calculation

Please be sure that you select power supply, compressor type, compressor brand, refrigerant type, then compressor model in same arrangement to prevent the followings message appearing
("Please reselect Refrigerant Type, Compressor Type, Compressor Model, Power Supply or Company Name")

When condenser coil is very big related to selected compressor model & qty, the followings message will appear
("Please change condenser input data")

We recommed here to increase compressor size or qty, or decrease conednser size (length, height, rows, air flow rate, circuiting..etc)

When calculated condensing temperature higher than compressor envelope condensing temperature, the followings message will appear ("Please enlarge condenser input data")

When calculated RH% & found less than 0%, the followings message will appear
("Please increase wet bulb on coil temp. or decrease dry bulb on coil temp.")

On coil wet bulb temperature must be less than on coil dry bulb temperature, otherwise the followings message ("Please reinter On Coil Wet Bulb Temp.")

Circuit number must be bigger than Zero, otherwise the followings message will appear ("Please note the circuit number must be above zero")

When calculated off coil wet bulb temperature less than -24 C, the followings message will appear ("Please increase dry and wet bulb on coil temperture")

When calculated evaporating temperature higher than off coil wet bulb temperature the followings message will appear
("Please increase wet bulb on coil temperture or increase evaporator coil dimension, rows or air flow rate")

When calculated evporating temperature less than -25 C, the followings message will appear
("Please enlarge Evaporator input data")

When calculated evporating temperature higher than 30 C, the followings message will appear ("Please reduce Evaporator input data")

When face velocity less than 1.062 m/s or higher than 5.08 m/s for condenser coil, the followings message
("Reinter Condenser Air Quantity")

When face velocity less than 1.062 m/s or higher than 3.048 m/s for evaporator coil, the following message ("Reinter evaporator Air Quantity")

Warning messages in cooling & heat pump form

This type of message will appear, when user press ok or enter the software will complete calculation & will showing all results.

When calculated condensing temperature less than 27 C, the following warning will appear ("Please increase compressor size or decrease condenser size", "Warning",

When calculated evaporating temperature less than -28 C, the following warning will appear ("Please decrease compressor size or increase evaporator size", "Warning",

Please note that the recommended face velocity less than 0.762 m/s or higher than 4.064 m/s for condenser coil, the following message ("Please note the recommended air velocity for condenser coil between 150 ft/min. and 800 ft/min.", "Warning" in imperial

("Please note the recommended air velocity for condenser coil between 0.762 m/s and 4.064 m/s", "Warning" in SI

Please note that the recommended face velocity less than 0.762 m/s or higher than 3.048 m/s for evaporator coil, the following message ("Please note the recommended air velocity for condenser coil between 150 ft/min. and 600 ft/min.", "Warning" in imperial

("Please note the recommended air velocity for condenser coil between 0.762 m/s and 3.048 m/s", "Warning" in SI

Please note that the recommended refrigerant pressure drop in condenser coil between 2 Psi up to 15 Psi in imperial, 13600 kpa up to 100000 kpa in SI, otherwise the following message will appear ("Please note the recommended condenser refrigerant pressure drop between 2 Psi and 15 Psi", "Warning", in imperial ("Please note the recommended condenser refrigerant pressure drop between 13600 Pa and 100000 Pa", "Warning", in SI.

Please note that the recommended refrigerant pressure drop in evaporator coil between 2 Psi up to 15 Psi in imperial, 13600 kpa up to 100000 kpa in SI, otherwise the following message will appear Please note the recommended evaporator refrigerant pressure drop between 2 Psi and 15 Psi", "Warning", in imperial ("Please note the recommended evaporator refrigerant pressure drop between 13600 Pa and 100000 Pa", "Warning", in SI.

When calculated condensing temperature less than 27 C, the following message will appear to decrease condenser coil or increase compressor size or quantity.

("Please increase compressor size or decrease condenser size", "Warning",)

When calculated evaporating temperature less than -28 C, the following message will appear to increase evaporator coil or decrease compressor size or quantity.

("Please decrease compressor size or increase evaporator size", "Warning",)

Errors message in DX Cooling & DX heat pump form

For DX pipe sizing form either cooling or heat pump, the followings errors and message may appear, please read carefully

Refrigerant circuit must be between (1 up to 20), otherwise the followings message will appear ("Please Refrigeration Circuit # must be larger than one and less than 20")

Evaporating temperature must be higher than -25 C up to 15 C in SI & -13 F up to 59 F in imperial, otherwise the followings message will appear ("Please note evaporating temp. must be between -25°C and 15°C") in SI & ("Please note evaporating temp. must be between -13°F and 59°F") in imperial.

Condensing temperature must be higher than 30 C up to 65 C in SI & 86 F up to 149 F in imperial, otherwise the followings message will appear ("Please note condensing temp. must be between 30°C and 65°C") in SI & ("Please note condensing temp. must be between 86°F and 149°F") in imperial

Subcooling must be between 0 up to 30 K in SI & 0 F up to 54 F in imperial, otherwise the followings message will appear ("Please note subcooling temp. must be between 0K and 30K") in SI & ("Please note subcooling temp. must be between 0°F and 54°F") in imperial.

Superheating must be between 0 up to 30 K in SI & 0 F up to 54 F in imperial, otherwise the followings message will appear ("Please note superheating temp. must be between 0K and 30K") in SI & ("Please note superheating temp. must be between 0°F and 54°F") in imperial.

Isentropic efficiency must be between 0.5 up to 0.99, otherwise the followings message will appear ("Please note Isentropic Efficiency must be between 0.5 and 0.99")

Capacity range to can use DX pipe sizing between 100 w up to 1000000 watt in SI & 341 btuh up to 3412190 btuh in imperial, otherwise the followings message will appear ("Please note Capacity must be between 100 W and 1000000 W") in SI & ("Please note Capacity must be between 341 BTUH and 3412190 BTUH") in imperial

For Discharge line the follwoigs message may appear
("No Data for Discharge line because the range of velocity and pressure drop, respectively, are: 984ft/min to 2952ft/min , 0 to 14.7Psi")

Or

("No Data for Discharge line because the range of velocity and pressure drop, respectively, are: 5m/s to 15m/s , 0 to 1Bar")

For Liquid line the followings message may appear

("No Data for Liquid line because the range of velocity and pressure drop, respectively, are: 149ft/min to 500ft/min , 0 to 29.4Psi")

Or

("No Data for Liquid line because the range of velocity and pressure drop, respectively, are: 0.76m/s to 2.54m/s , 0 to 2Bar")

For Mixture line the following message may appear

("No Data for Mixture line because the range of velocity and pressure drop, respectively, are: 196ft/min to 4921ft/min , 0 to 5.88Psi")

Or

("No Data for Mixture line because the range of velocity and pressure drop, respectively, are: 0.1m/s to 25m/s , 0 to 0.4Bar")

For Suction line the following message may appear

("No Data for Suction line because the range of velocity and pressure drop, respectively, are: 984ft/min to 4921ft/min , 0 to 2.94Psi")

Or

("No Data for Suction line because the range of velocity and pressure drop, respectively, are: 5m/s to 25m/s , 0 to 0.2Bar")

For capillary or restrictor either cooling or heatpump in expansion valve device selection, please note that the maximum capacity for both capillary & restrictor is 64500 BTUH in imperial, and 18.9 kw in SI, otherwise you must select expansion valve.

("No Data for Capacity more than 64500 Btuh, please select Expansion Valve")

When Unit capacity higher than expansion valve capacity the following message will appear ("Please select Bigger Expansion Valve Model")

When Unit capacity less than 60% of expansion valve capacity the following message will appear ("Please select Smaller Expansion Valve Model")

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