

Chiller

Technical Data Book

DVM Chiller for North America (R410A, 60Hz, HP)



Model : AG010/015KSV***

History

Version	Modification	Date	Remark
Ver.1.0	Release DVM Chiller TDB for North America	'16. 05. 18.	
Ver.1.1	1) Modify heating COP of specification (4p) 2) Modify ΔT of capacity table (7p) 3) Add correction factor by altitude (9p)	'16. 05. 31.	
Ver.1.2	1) Modify - Specification (5p) : cooling capacity, cooling power input, cooling EER, IPLV, water flow and minimum water volume in the system (AG015KSV***) - Capacity table (7p) : model name, cooling capacity - Sound level (12p) : model name	'16. 06. 16.	
Ver.1.3	Modification for specifications (5p) - The unit for air pressure : Pa $\rightarrow$ Pa and inAq - Add data for water side heat exchanger q'ty and maximum operation pressure of water circuit (AG***KSVAJH/AA) - The unit for water pressure : kPa or MPa $\rightarrow$ ftAq and psi - Modification for 'Dimensions' title : Net $\rightarrow$ Shipping Add the note for 'Standard' type combination (6p)	'16. 07. 11.	
Ver.1.4	Modify - Dimensional Drawing (10p) - Piping Diagram (16p)	'16. 09. 02.	
Ver.1.5	Modified the Heating Capacity Table (7p)	'17. 09. 13.	
Ver.1.6	Revised the COP value unit to W/W (5p)	'19. 06. 20	
Ver.1.7	Modified the Heating Capacity Table and Specification page	'20. 09. 21	

Nomenclature

Model Name

AG	015	K	S	V	A	F	H	/	AA
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		Buyer

(1) Classification

AG	Chiller
AM	DVM

(2) Capacity

USRT (3 digits)

(3) Version

F	2013
H	2014
J	2015
K	2016

(4) Product Type

S	Set
X	Outdoor Unit
N	Indoor Unit

(5) Feature1

V	Inverter
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(6) Feature2

A	Standard + General Temp.+ Module
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(7) Rating Voltage

F	3Ø, 208~230V, 60Hz
H	3Ø, 380V, 60Hz
J	3Ø, 460V, 60Hz

(8) Mode

H	Heat Pump
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1 Specification

DVM Chiller

Type					DVM Chiller		DVM Chiller		DVM Chiller		DVM Chiller			
Model Name					AG010KSVAFH/AA		AG015KSVAFH/AA		AG010KSVAJH/AA		AG015KSVAJH/AA			
Power Supply					Φ, #, V, Hz	3,3,208~230,60		3,3,208~230,60		3,3,460,60		3,3,460,60		
Mode					-		HEAT PUMP		HEAT PUMP		HEAT PUMP		HEAT PUMP	
Performance	Ton				usRT	10		15		10		15		
	HP				HP	12		18		12		18		
	Capacity (Rated)	Cooling	Amb. 95°F, Entering/Leaving Temp 55/44°F		kBtu/h	120.0		168.0		120.0		168.0		
			Heating	Dry/Wet Bulb 47/43°F	Leaving Temp. 105°F	kBtu/h	128.0		182.0		128.0		182.0	
		Dry/Wet Bulb 17/15°F		Leaving Temp. 120°F	kBtu/h	120.0		171.0		120.0		171.0		
			Leaving Temp. 105°F	kBtu/h	84.0		90.0		84.0		90.0			
Leaving Temp. 120°F	kBtu/h	80.0		85.0		80.0		85.0						
Power	Power Input	Cooling	Amb. 95°F, Entering/Leaving Temp 55/44°F		kW	10.71		16.63		10.71		16.63		
			Heating	Dry/Wet Bulb 47/43°F	Leaving Temp. 105°F	kW	9.77		15.17		9.77		15.17	
		Leaving Temp. 120°F		kW	11.54		17.45		11.54		17.45			
			Dry/Wet Bulb 17/15°F	Leaving Temp. 105°F	kW	11.20		11.81		11.20		11.81		
	Leaving Temp. 120°F	kW		12.70		12.75		12.70		12.75				
	Current Input	Cooling	Amb. 95°F, Entering/Leaving Temp 55/44°F		A	29.59		47.24		15.81		25.25		
			Heating	Dry/Wet Bulb 47/43°F	Leaving Temp. 105°F	A	26.99		41.91		14.43		22.40	
		Leaving Temp. 120°F		A	31.88		48.20		17.04		25.77			
			Dry/Wet Bulb 17/15°F	Leaving Temp. 105°F	A	30.94		32.63		16.54		17.44		
	Leaving Temp. 120°F	A		35.08		35.22		18.75		18.82				
	MCA					A	52.0		70.0		24.0		40.0	
	MOP					A	70.0		90.0		30.0		50.0	
	Efficiency	Cooling EER				Btu/(W×h)	11.20		10.10		11.20		10.10	
		Heating COP		Dry/Wet Bulb 47/43°F	Leaving Temp. 105°F	Btu/(W×h)	3.84		3.52		3.84		3.52	
Leaving Temp. 120°F					Btu/(W×h)	3.05		2.87		3.05		2.87		
Dry/Wet Bulb 17/15°F		Leaving Temp. 105°F	Btu/(W×h)	2.2		2.23		2.2		2.23				
		Leaving Temp. 120°F	Btu/(W×h)	1.85		1.95		1.85		1.95				
IPLV				Btu/(W×h)	20.5		18.8		20.5		18.8			
Compressor	Type				-	Scroll Inverter		Scroll Inverter		Scroll Inverter		Scroll Inverter		
	Output				kW × n	6.45 × 2		6.45 × 2		6.76 × 2		6.76 × 2		
	Model Name				-	DS4GJ5066EVA		DS4GJ5066EVA		DS-GB070FAVA		DS-GB070FAVA		
	Oil			Type	-	PVE		PVE		PVE		PVE		
Fan	Type				-	Propeller		Propeller		Propeller		Propeller		
	Output x n				W	630 x 2		630 x 2		630 x 2		630 x 2		
	Air Flow Rate				CFM	12,855		12,855		12,855		12,855		
	External Static Pressure			Max.	Pa	78.5		78.5		78.5		78.5		
					inAq	0.315		0.315		0.315		0.315		
Water Side Heat Exchanger	Type				-	Brazing Plate		Brazing Plate		Brazing Plate		Brazing Plate		
	Water Flow	Minimum	Cooling	GPM	15.8		16.8		15.8		16.8			
				Heating	GPM	15.8		16.8		15.8		16.8		
		Nominal	Cooling	GPM	24.0		33.6		24.0		33.6			
				Heating	GPM	24.0		33.6		24.0		33.6		
		Maximum	Cooling	GPM	48.0		67.2		48.0		67.2			
				Heating	GPM	48.0		67.2		48.0		67.2		
	Quantity				EA	2		2		2		2		
	Water circuit	Connection Type				-	50A Cut Groove		50A Cut Groove		50A Cut Groove		50A Cut Groove	
Nominal water pressure drop				ftAq	12.38		23.42		12.38		23.42			
				psi	5.37		10.15		5.37		10.15			
Max. operation pressure				ftAq	335		335		335		335			
				psi	145		145		145		145			
Minimum water volume in the system			Cooling	gal	72.0		100.8		72.0		100.8			
				Heating	gal	72.0		100.8		72.0		100.8		
Refrigerant	Type				-	R410A		R410A		R410A		R410A		
	Factory Charging				lbs	40		40		40		40		
Sound	Sound Pressure				dB(A)	60		62		60		62		
	Sound Power				dB(A)	80		83		80		83		
External Dimension	Net Weight				lbs	959		959		959		959		
	Shipping Weight				lbs	1008		1008		1008		1008		
	Net Dimensions (WxHxD)				inch	70.67 x 66.73 x 30.12		70.67 x 66.73 x 30.12		70.67 x 66.73 x 30.12		70.67 x 66.73 x 30.12		
	Shipping Dimensions (WxHxD)				inch	74.80 x 74.29 x 36.18		74.80 x 74.29 x 36.18		74.80 x 74.29 x 36.18		74.80 x 74.29 x 36.18		
Operating Water Temp. Range	Cooling				°F	41 ~ 77		41 ~ 77		41 ~ 77		41 ~ 77		
	Cooling (If using brine)				°F	14 ~ 77		14 ~ 77		14 ~ 77		14 ~ 77		
	Heating				°F	77 ~ 131		77 ~ 131		77 ~ 131		77 ~ 131		
Operating Amb. Temp. Range	Cooling				°F	5 ~ 118		5 ~ 118		5 ~ 118		5 ~ 118		
	Heating				°F	-13 ~ 109		-13 ~ 109		-13 ~ 109		-13 ~ 109		

* Certified efficiency data in accordance with AHRI Standard 550/590.

* Specification may be changed without further notification.

2 Modulation guide

DVM Chiller

HP	usRT	Standard			High Efficiency		
		AG010KSV***	AG015KSV***	Recommended pipe size [A]	AG010KSV***	AG015KSV***	Recommended pipe size [A]
12	10	1		2"			
18	15		1	2"			
24	20	2		2"			
36	30		2	2 1/2"	3		2 1/2"
48	40	4		2 1/2"			
54	45		3	3"			
60	50	5		3"			
72	60		4	3"	6		3"
84	70	7		3 1/2"			
90	75		5	3 1/2"			
96	80	8		4"			
108	90		6	4"	9		4"
120	100	10		4"			
126	105		7	4"			
132	110	11		4"			
144	120		8	4"	12		4"
156	130	13		4"			
162	135		9	4"			
168	140	14		5"			
180	150		10	5"	15		5"
192	160	16		5"			
198	165		11	5"			
216	180		12	5"			
234	195		13	5"			
252	210		14	5"			
270	225		15	5"			
288	240		16	5"			

Total capacity of modulated units = Σ capacity of each chiller unit

Total power input of modulated units = Σ power input of each chiller unit

'Standard' is compact combination type than 'High efficiency' for smaller installation space.

3 Capacity table

Cooling ($\Delta T = 10^{\circ}\text{F}$)

AG010KSV***

LWT	Outdoor Air Temperature ($^{\circ}\text{F}$, DB)																							
	55			65			75			85			95			105			115			118.4		
	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow
	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM
14 ²⁾	7.671	5.763	18.410	7.499	7.002	17.995	7.251	7.814	17.401	6.575	8.425	15.800	5.930	9.488	15.800 ³⁾	5.258	10.745	15.800 ³⁾	4.004	10.629	15.800 ³⁾	3.583	9.781	15.800 ³⁾
23 ²⁾	9.853	6.179	23.646	9.844	7.431	23.624	9.738	8.213	23.369	9.293	8.845	22.302	8.844	9.977	21.224	7.793	11.179	18.701	6.340	11.531	15.800 ³⁾	5.673	11.091	15.800 ³⁾
32 ²⁾	9.954	6.257	23.887	9.946	7.624	23.867	9.839	8.530	23.611	9.394	9.160	22.544	8.945	10.299	21.466	7.914	11.567	18.992	6.795	11.881	16.308	6.081	11.521	15.800 ³⁾
41	10.859	6.421	26.059	10.857	7.819	26.054	10.748	8.742	25.792	10.299	9.463	24.715	9.749	10.621	23.395	8.660	11.886	20.783	7.274	12.268	17.456	6.550	11.988	15.800 ³⁾
44	11.110	6.490	26.653	11.108	7.904	26.653	11.004	8.828	26.412	10.550	9.550	25.314	10.000	10.710	24.000	8.860	11.977	21.272	7.430	12.273	17.820	6.646	11.909	15.949
48	11.820	6.607	28.368	11.820	8.027	28.368	11.670	8.950	28.013	11.250	9.780	27.003	10.620	10.920	25.487	9.410	11.900	22.577	7.890	12.090	18.936	7.095	11.697	17.026
52	12.390	6.722	29.733	12.390	8.150	29.733	12.240	9.070	29.371	11.730	9.870	28.153	11.178	11.130	26.826	9.887	11.824	23.724	8.310	11.870	19.941	7.370	11.393	17.686
56	12.947	6.843	31.072	12.950	8.280	31.072	12.797	9.193	30.710	12.290	9.830	29.492	11.642	10.910	27.936	10.330	11.550	24.799	8.690	11.582	20.858	7.750	11.083	18.599
60	13.500	6.967	32.394	13.500	8.403	32.394	13.350	9.320	32.032	12.820	9.860	30.774	12.172	10.900	29.213	10.760	11.280	25.830	9.060	11.310	21.735	8.106	10.847	19.453
64.4	14.073	7.038	33.773	14.078	8.480	33.785	13.927	9.406	33.422	13.320	10.019	31.966	12.663	11.070	30.389	11.195	11.447	26.865	9.400	11.424	22.558	8.387	10.979	20.127

AG015KSV***

LWT	Outdoor Air temperature ($^{\circ}\text{F}$, DB)																							
	55			65			75			85			95			105			115			118.4		
	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow	TC	PI	Water flow
	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM	Ton	kW	GPM
14 ²⁾	10.931	9.102	26.232	10.685	10.946	25.642	10.336	12.776	24.805	9.368	13.908	22.481	8.646	15.108	20.748	7.235	16.089	17.363	4.990	13.419	16.800 ³⁾	4.205	11.946	16.800 ³⁾
23 ²⁾	14.039	9.759	33.691	14.027	11.618	33.661	13.881	13.432	33.311	13.240	14.604	31.773	12.574	14.920	30.174	10.778	16.988	25.866	7.901	14.918	18.962	6.657	13.614	16.800 ³⁾
32 ²⁾	14.183	9.881	34.035	14.171	11.919	34.007	14.025	13.951	33.657	13.383	15.123	32.116	12.713	15.875	30.509	10.900	17.543	26.157	8.468	15.303	20.322	7.136	14.241	17.126
41	15.472	10.141	37.129	15.469	12.222	37.123	15.320	14.293	36.765	14.672	15.623	35.210	13.901	16.830	33.359	11.887	18.085	28.527	9.035	15.687	21.683	7.687	15.119	18.447
44	15.830	10.250	37.981	15.830	12.350	37.981	15.680	14.440	37.637	15.030	15.770	36.072	14.000	16.630	33.600	12.190	18.240	29.253	9.260	15.752	22.219	7.799	15.028	18.716
48	16.840	10.808	40.424	16.840	12.790	40.424	16.630	14.420	39.918	16.030	15.670	38.480	15.130	17.130	36.319	12.940	18.323	31.048	9.840	15.780	23.610	8.353	14.984	20.045
52	17.650	11.090	42.370	17.650	12.997	42.370	17.440	14.400	41.854	16.720	15.570	40.118	15.364	16.737	36.874	13.590	18.410	32.622	10.360	15.800	24.864	8.615	14.811	20.674
56	18.450	11.410	44.277	18.450	13.152	44.277	18.232	14.378	43.762	17.510	15.590	42.025	16.590	17.160	39.809	14.210	18.090	34.100	10.840	15.820	26.008	9.089	14.768	21.813
60	19.230	11.587	46.161	19.230	12.970	46.161	19.020	14.358	45.646	18.270	15.607	43.852	16.860	16.860	40.471	14.800	17.760	35.519	11.290	15.840	27.101	9.512	14.833	22.828
64.4	20.047	11.700	48.108	20.054	13.090	48.125	19.842	14.488	47.617	18.983	15.865	45.556	17.524	17.403	42.054	15.398	18.036	36.951	11.729	15.979	28.148	9.842	15.010	23.619

Heating ($\Delta T = 10^{\circ}\text{F}$)

AG010KSV***

LWT ($^{\circ}\text{F}$)	Outdoor Air temperature($^{\circ}\text{F}$, DB)																							
	-13.0			-4.0			5.0			14.0			17.0			19.4			28.4			35.6		
	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow
	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM
86	6.16	14.97	15.80	6.73	12.40	16.08	7.05	10.82	16.84	7.45	9.82	17.80	7.61	9.90	18.17	7.73	9.48	18.46	8.90	9.74	21.26	10.11	9.50	24.13
95	6.00	15.93	15.80	6.56	13.20	15.80	6.87	11.52	16.41	7.26	10.46	17.34	7.41	10.54	17.70	7.54	10.10	17.99	8.68	10.37	20.71	9.94	10.12	23.72
105	5.25	16.30	15.80	6.19	13.81	15.80	6.49	12.00	15.80	6.85	10.90	16.36	7.00	11.35	16.71	7.11	10.52	16.98	8.19	10.80	19.55	9.30	10.55	22.20
120	-	-	-	-	-	-	6.17	13.64	15.80	6.52	12.32	15.80	6.65	12.85	15.88	6.76	11.90	16.14	7.74	12.41	18.49	8.75	12.29	20.89
122	-	-	-	-	-	-	5.61	16.55	15.80	5.92	15.01	15.80	6.05	15.12	15.80	6.15	14.50	15.80	7.04	15.05	16.81	7.96	14.90	18.99
131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.61	12.75	15.80	6.34	12.59	15.80	7.26	11.77

AG015KSV***

LWT ($^{\circ}\text{F}$)	Outdoor Air temperature($^{\circ}\text{F}$, DB)																							
	-13.0			-4.0			5.0			14.0			17.0			19.4			28.4			35.6		
	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow	TC	PI	Water Flow
	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM	USRT	kW	GPM
86	6.60	15.79	16.80	7.22	13.08	17.23	7.56	11.41	18.05	7.99	10.36	19.07	8.16	10.44	19.47	8.51	10.38	20.31	10.88	12.35	25.98	13.61	13.73	32.49
95	6.43	16.81	16.80	7.03	13.92	16.80	7.37	12.15	17.59	7.79	11.04	18.59	7.95	11.12	18.97	8.29	11.05	19.79	10.60	13.15	25.32	13.38	14.63	31.94
105	5.63	17.20	16.80	6.64	14.56	16.80	6.95	12.69	16.80	7.35	11.50	17.54	7.50	11.81	17.91	7.82	11.52	18.67	10.01	13.70	23.89	12.52	15.24	29.88
120	-	-	-	-	-	-	6.57	13.83	16.80	6.94	12.49	16.80	7.08	12.75	16.80	7.39	12.54	17.65	9.44	15.24	22.54	11.79	17.26	28.14
122	-	-	-	-	-	-	5.97	16.86	16.80	6.31	15.22	16.80	6.44	15.34	16.80	6.72	15.25	16.80	8.58	18.48	20.49	10.72	20.92	25.58
131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.85	15.61	16.80	8.54	17.65	20.39	10.34	17.80

[NOTE]

* Capacity table may be subject to change without prior notice.

1) ΔT = Leaving water temperature - Entering water temperature

2) When using brine, refer to the capacity correction factors by brine %wt. (This capacity data is based on Ethylene glycol 50%wt.)

3) ΔT is comply with the condition of minimum flow-rate.

4) LWT : Leaving water temperature, TC : Total Capacity, PI : Power Input

4 Capacity correction

1) Correction factor by % glycol

Anti-freeze	Ethylene glycol					Propylene glycol				
%wt	Freezing point (°F)	Min. LWT (°F)	Correction factor			Freezing point (°F)	Min. LWT (°F)	Correction factor		
			Capacity	Power Input	Pressure drop			Capacity	Power Input	Pressure drop
0%	32.0	41.0	1.000	1.000	1.000	32.0	41.0	1.000	1.000	1.000
10%	24.8	33.8	0.989	0.995	1.010	26.6	35.6	0.988	0.994	1.029
20%	15.8	24.8	0.975	0.990	1.023	19.4	28.4	0.973	0.988	1.061
30%	3.2	14.0	0.960	0.985	1.041	8.6	17.6	0.955	0.982	1.098
40%	-9.4	14.0	0.943	0.980	1.064	-7.6	14.0	0.933	0.976	1.142
50%	-34.6	14.0	0.924	0.975	1.082	-31.0	14.0	0.910	0.970	1.193

2) Defrosting correction factor (Capacity coefficient)

Model	Outdoor Air Temperature (°F, DB)								
	14.0	17.6	21.2	24.8	28.4	32.0	35.6	41.0	44.6
AG010KSV***	0.99	0.99	0.99	0.98	0.94	0.91	0.89	0.94	1.00
AG015KSV***	0.99	0.99	0.98	0.97	0.92	0.90	0.88	0.93	1.00

Corrected heating capacity = Heating Capacity x Capacity coefficient

On heating operation, frost can be formed on heat exchanger according to outdoor temperature.

(Frost on heat exchanger results in decreasing the performance.)

To remove frost on heat exchanger of aircooled chiller unit, defrost operation is carried out periodically.

During defrost operation, capacity of aircooled chiller unit may decrease.

The decrement is not considered to the individual capacity tables.

4 Capacity correction

3) Correction factor by water flow rate

Correction	% of nominal water flow rate									
	50	56	67	78	89	100	111	133	167	200
Power input	0.981	0.981	0.985	0.990	0.995	1.000	1.005	1.015	1.030	1.044
ΔT (°F)	20.0	18.0	15.0	12.9	11.3	10.0	9.0	7.5	6.0	4.5

4) Quiet function correction factor

- Cooling

Quiet function	Outdoor Air Temperature (°F, DB)							
	32.0		68.0		95.0		113.0	
	Capacity	Power Input	Capacity	Power Input	Capacity	Power Input	Capacity	Power Input
Level 1	1.00	1.00	1.00	1.00	1.00	1.27	0.52	1.08
Level 2	1.00	1.00	1.00	1.00	1.00	1.36	0.51	1.07
Level 3	1.00	1.00	0.90	0.86	0.70	0.90	0.40	0.96

- Heating

Quiet function	Outdoor Air Temperature (°F, DB)							
	5.0		35.6		44.6		59.0	
	Capacity	Power Input	Capacity	Power Input	Capacity	Power Input	Capacity	Power Input
Level 1	0.47	1.08	0.88	1.21	1.00	1.24	1.00	1.00
Level 2	0.46	1.06	0.88	1.27	1.00	1.33	1.00	1.00
Level 3	0.34	0.96	0.60	0.92	0.67	0.91	1.00	1.00

5) Correction factor by altitude

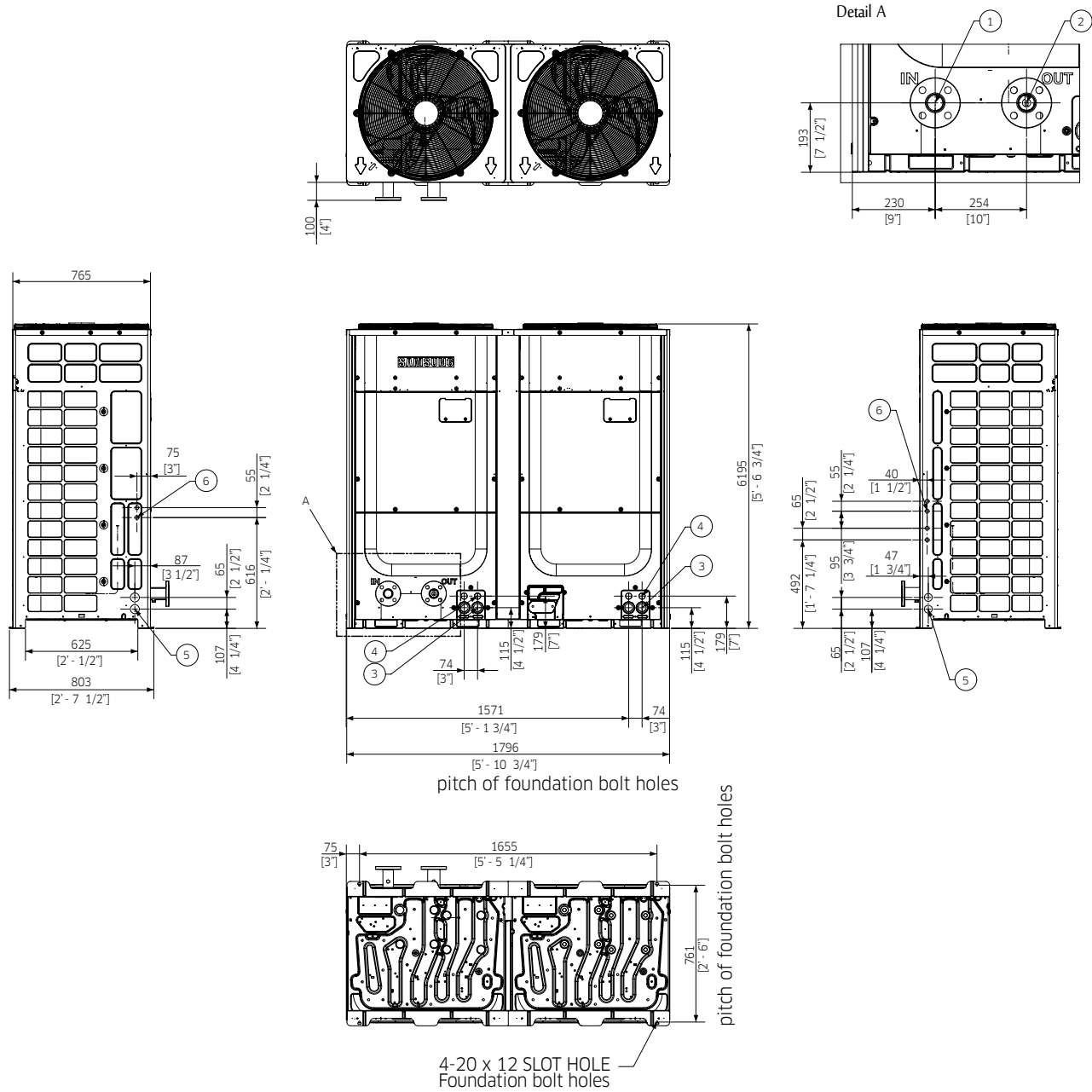
Altitude (m)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Power input	1.0000	1.0091	1.0185	1.0281	1.0380	1.0481	1.0585	1.0692	1.0801	1.0913	1.1029

5 Dimensional drawing

DVM Chiller

AG010/015KSV***

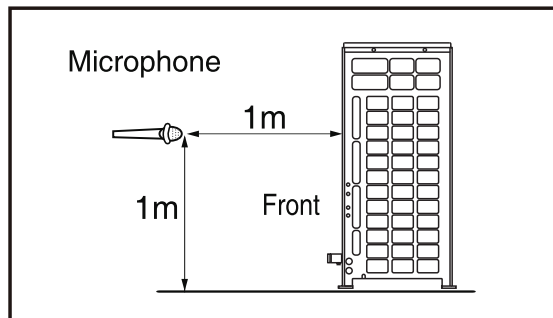
Units : mm [inches]



NO	ITEM	SPEC
1	INLET WATER FLANGE	15/20 HP 50A CUT Grooved Type (Use the Coupling in ASME standredized product)
2	OUTLET WATER FLANGE	15/20 HP 50A CUT Grooved Type (Use the Coupling in ASME standredized product)
3	POWER WIRING CONDUIT	KNOCK OUT HOLE (FRONT)
4	COMMUNICATION WIRING CONDUIT	KNOCK OUT HOLE (FRONT)
5	POWER WIRING CONDUIT	KNOCK OUT HOLE (SIDE)
6	COMMUNICATION WIRING CONDUIT	KNOCK OUT HOLE (SIDE)

6 Sound level

1) Sound pressure level



Unit: dB(A)	
Model	Pressure
AG010KSV***	60
AG015KSV***	62

Note

* Specifications may be subject to change without prior notice

1) These operation values were obtained in an anechoic room.

2) Sound pressure level will vary depending on a range of factors such as the construction of the particular room.

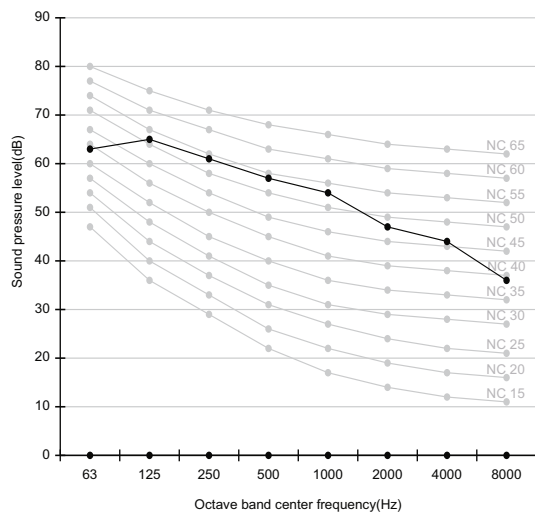
3) Operation sound level may differ depending on operation and ambient conditions.

2) Quiet function

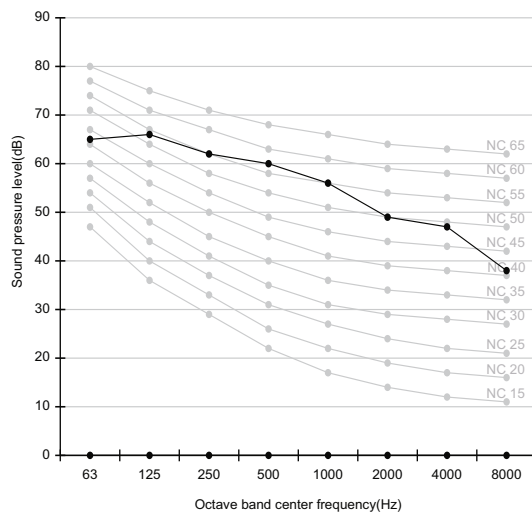
Model	Sound pressure level for quiet function [dB(A)]		
	Level 1	Level 2	Level 3
AG010KSV***	57	54	51
AG015KSV***	59	56	53

3) NC curves

a. AG010KSV***



b. AG015KSV***



6 Sound level

4) Sound power level

Note

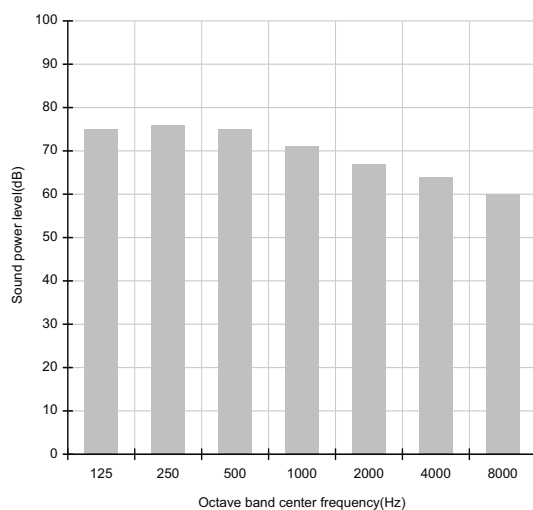
* Specifications may be subject to change

- 1) dBA = A-weighted sound power level.
- 2) Reference power : 1pW.
- 3) Measured according to ISO 3741.

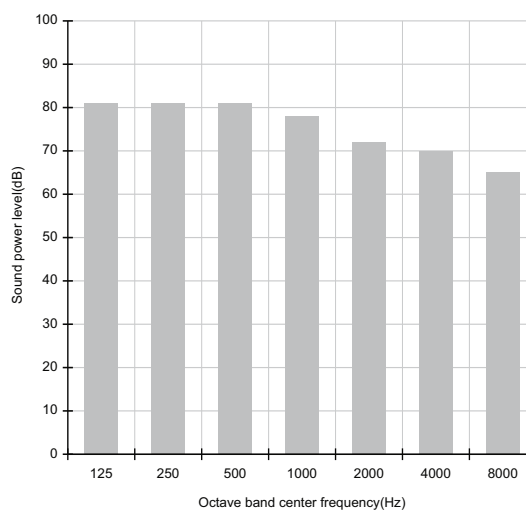
Unit: dB(A)

Model	Power
AG010KSV***	80
AG015KSV***	83

a. AG010KSV***



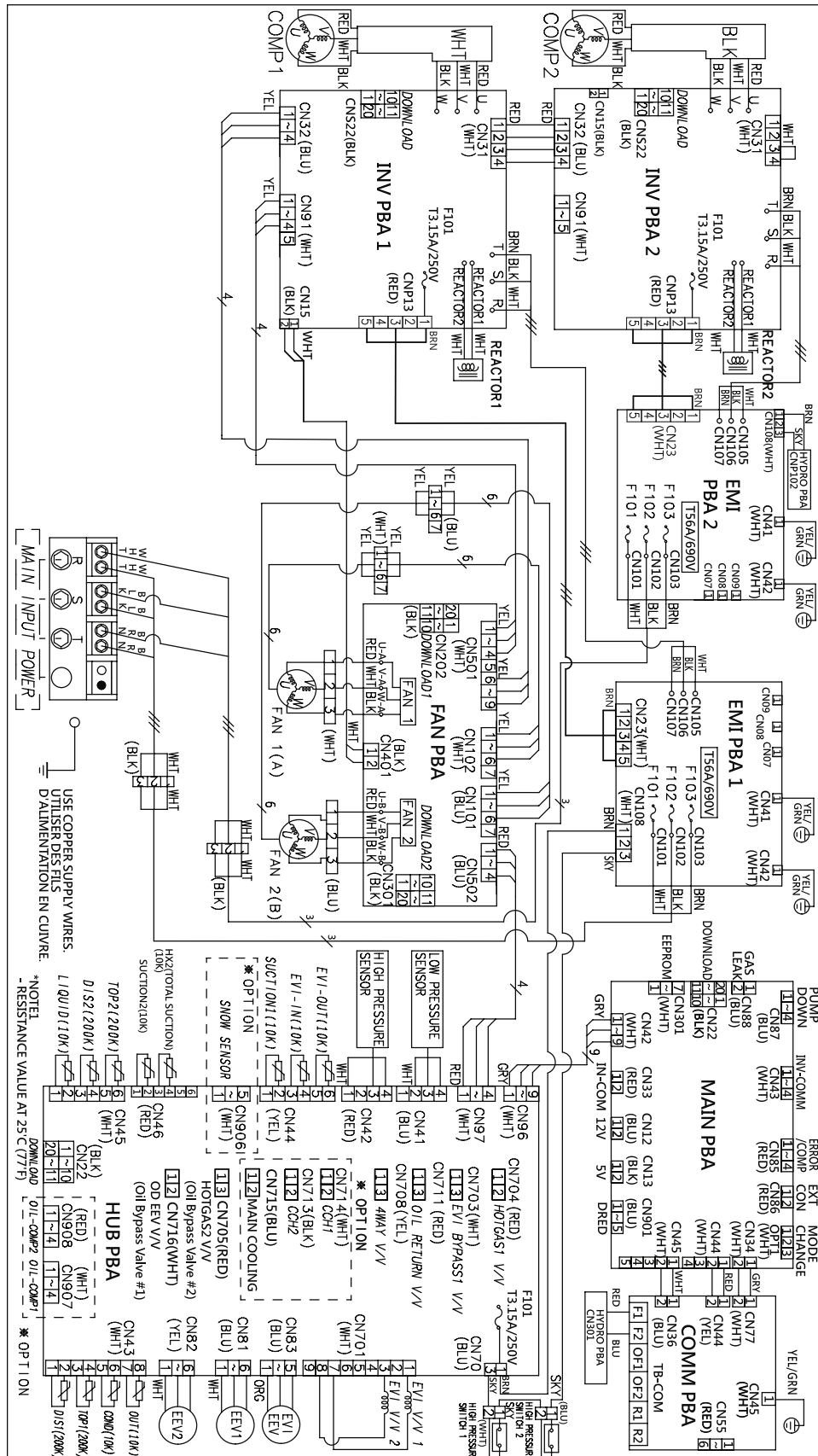
b. AG015KSV***



7 Electrical wiring diagram

1) Inverter controller

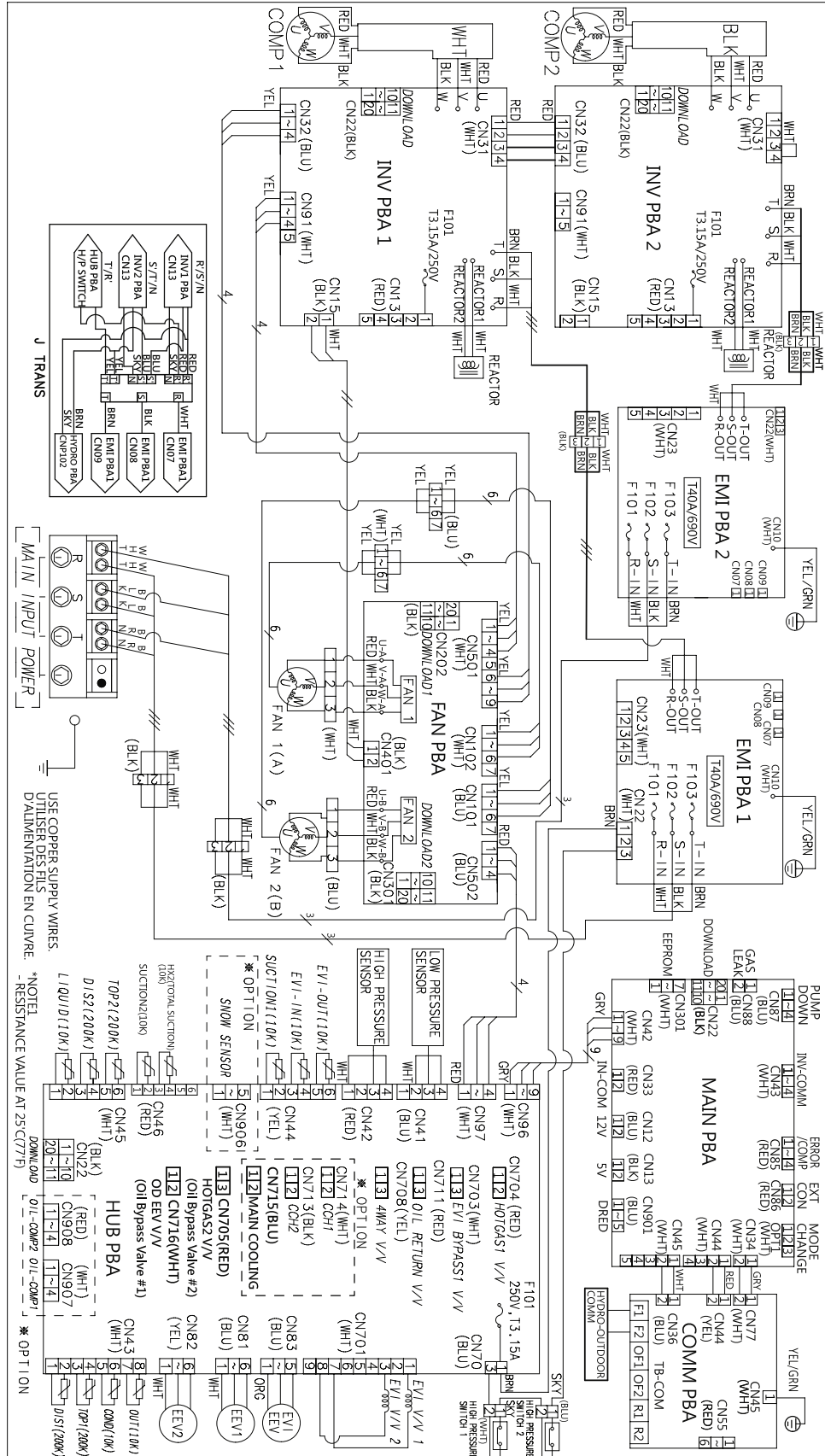
AG010/015KSVAFH



7 Electrical wiring diagram

1) Inverter controller

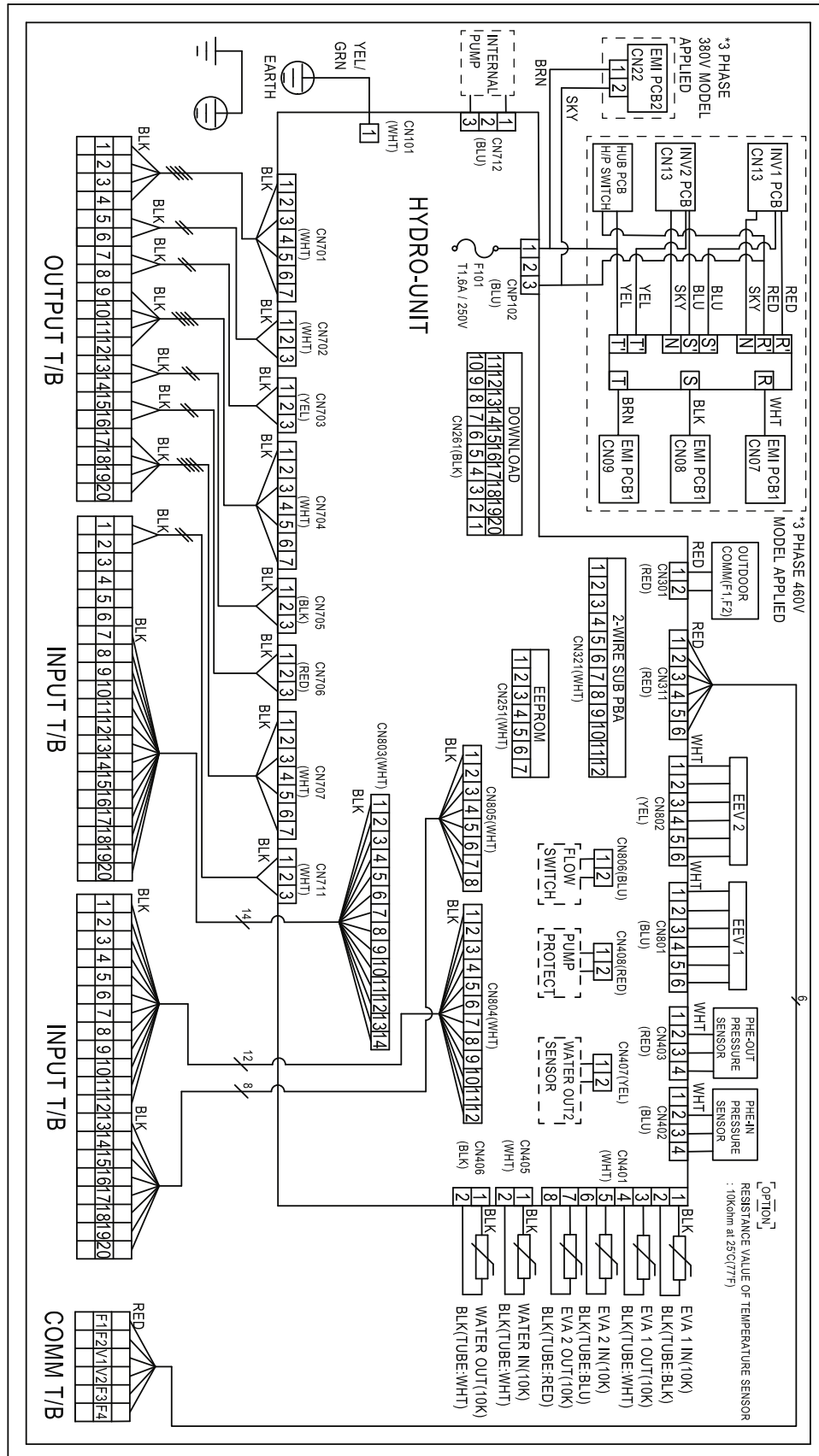
AG010/015KSVAJH



7 Electrical wiring diagram

2) Hydro controller

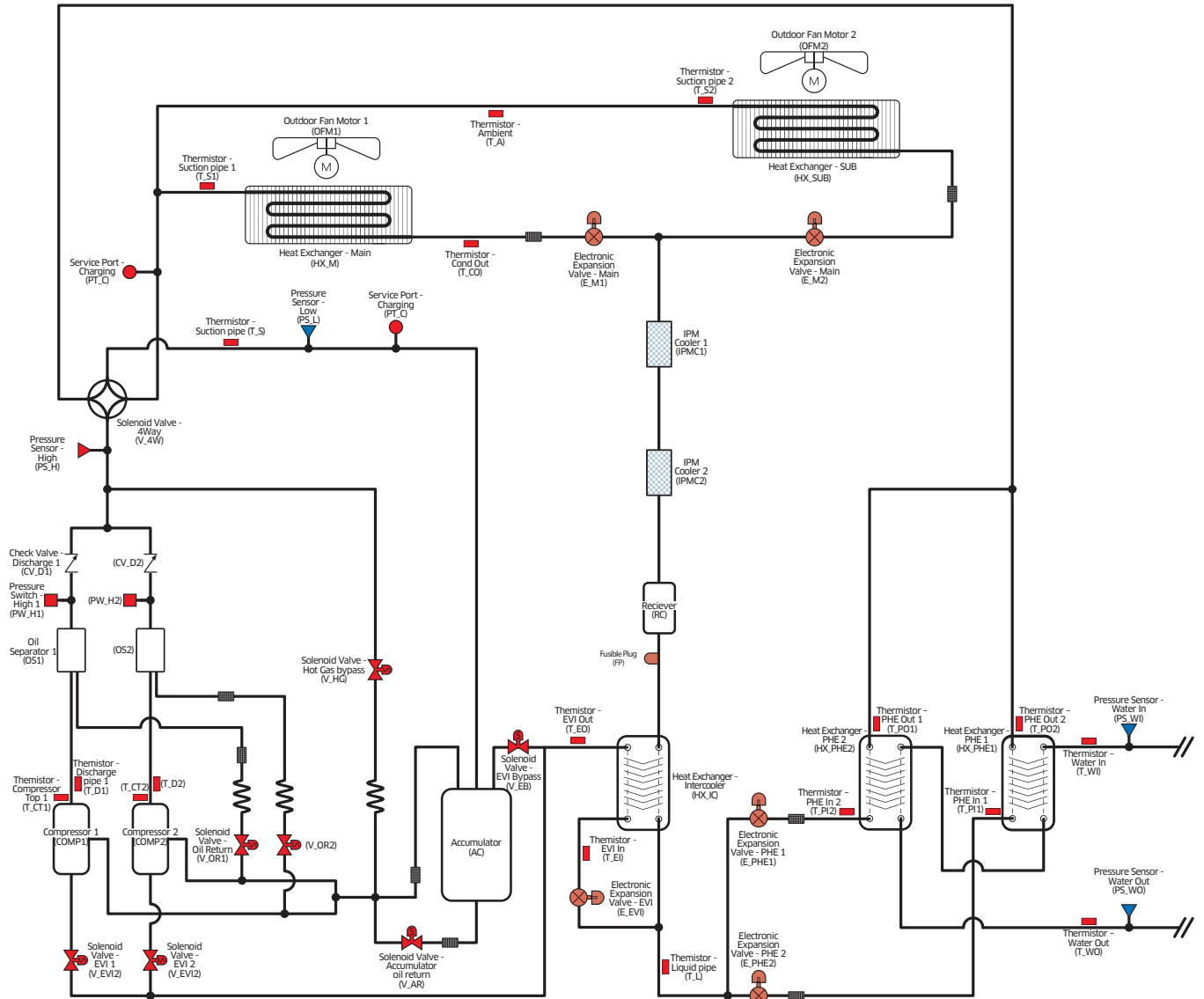
AG010/015KSVAFH, AG010/015KSVAJH



8 Piping diagram

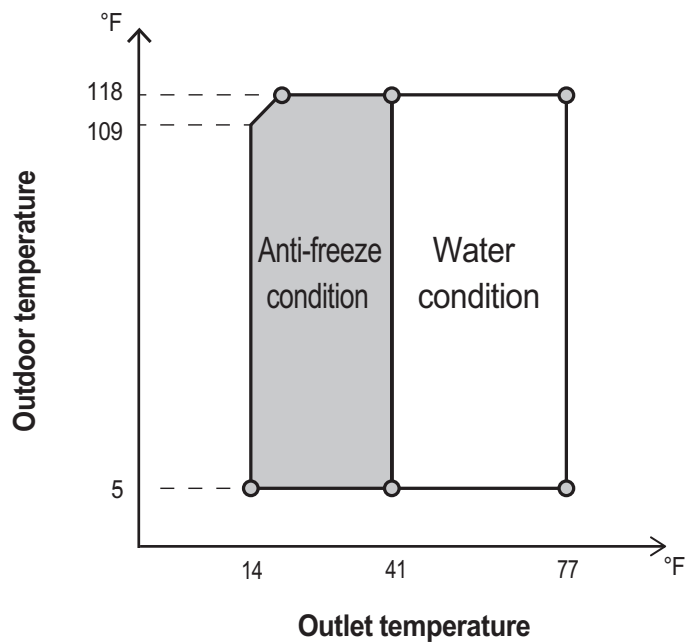
DVM Chiller

AG010/015KSV***

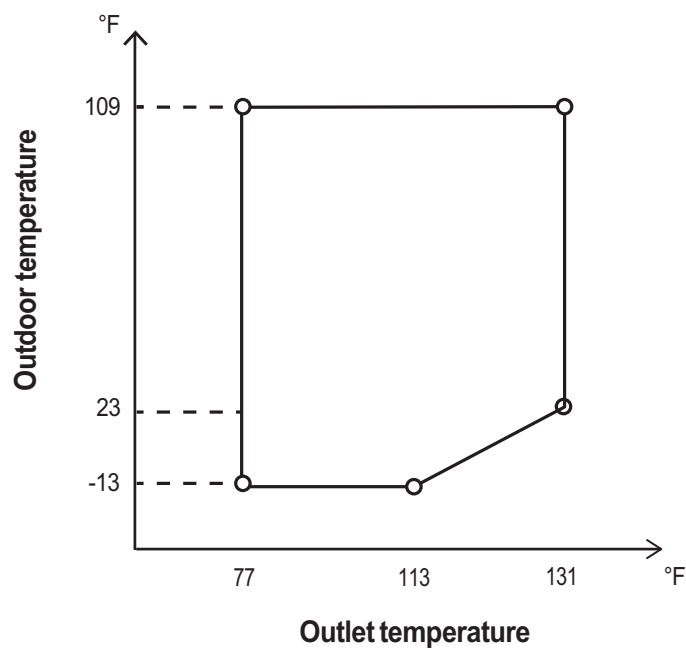


9 Operation limit

1) Cooling

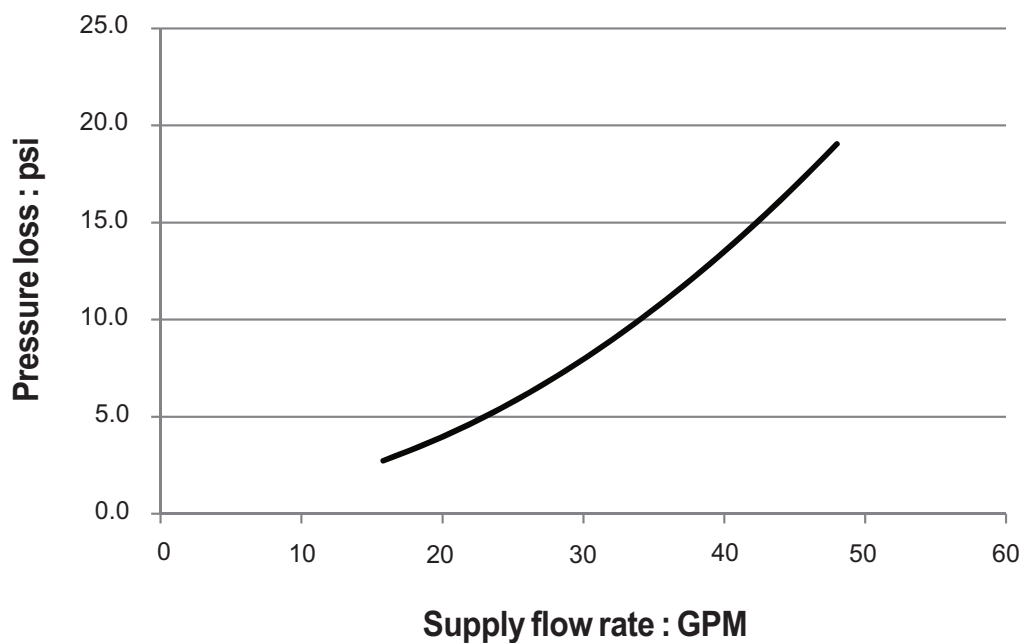


2) Heating

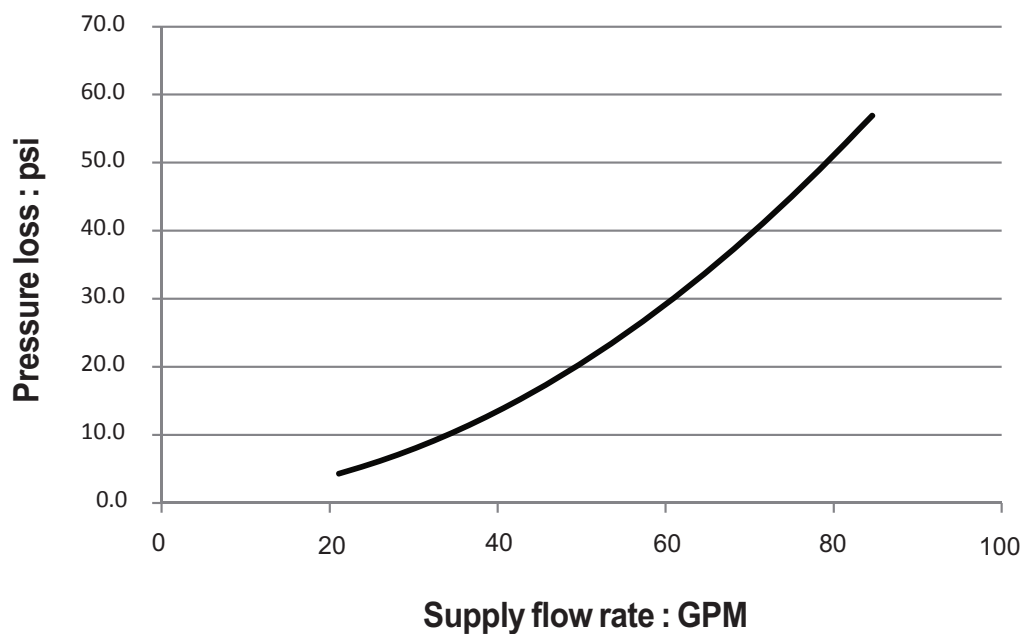


10 Hydraulic performance

1) AG010KSV***



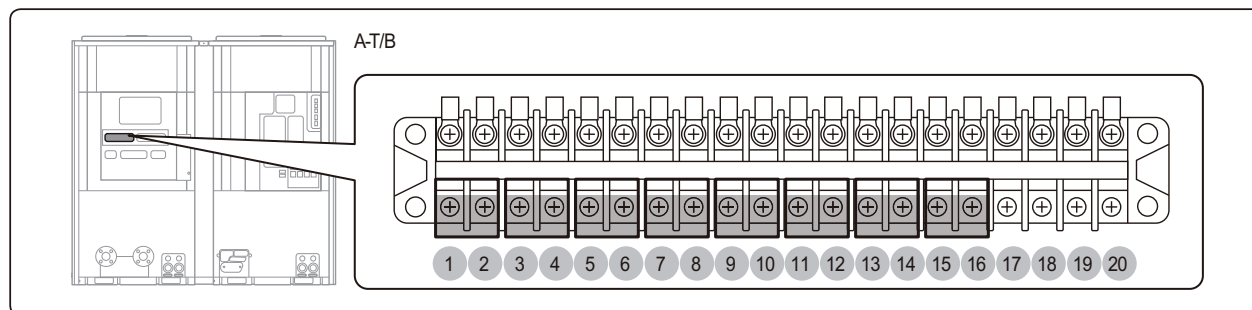
2) AG015KSV***



11 External contact

Wiring work

Output contact



No.	Name	Signal	Function	Contact Short	Contact Open
A-T/B	1-2	Zero voltage contact	Display when operates in heating mode	Heat	Cool
	3-4		Display when operates	Operate	Stop
	5-6		Display when error occurs	Error occurred	No error
	7-8		Display when defrosting	Defrost ON	Defrost OFF
	9-10		Display when pump operates	Pump ON	Pump OFF
	11-12		Display when compressor operates	Compressor ON	Compressor OFF
	13-14		Signal of pump operation	Pump signal ON	Pump signal OFF
	15-16		Display when freeze protection operates	Pump ON for freeze protection	Others
	17-18		Disuse	-	-
	19-20	-	-	-	-

- Output written above is information about individual unit.

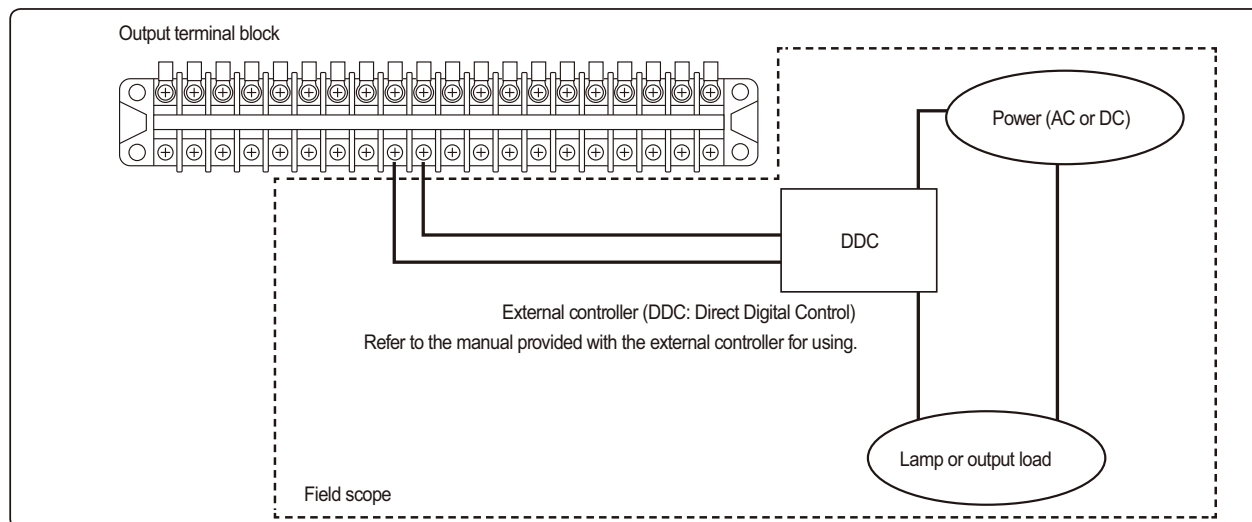
⚠ CAUTION

- You must turn off the power before working on external contact wiring.
- Output contact can be connected neutral contact and Open/Short only.
- Be sure to install a buzzer (alarm) on terminals 15 and 16 in order that the operator can check the system when the freeze protection function starts.

Unit : N·m (lb·in)

Terminal block	Tightening torque	
20P T/B	M3	0.5~0.75 (4.4~6.6)

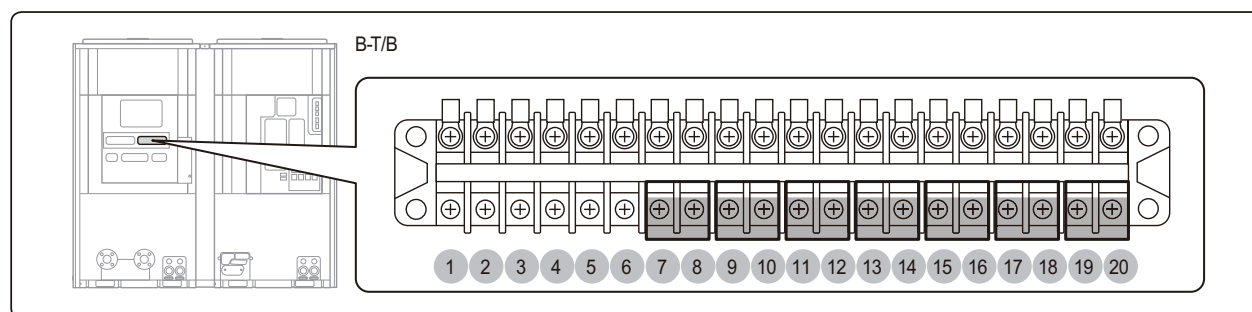
[Example of output contact installation]



11 External contact

Wiring work

Input contact



No.	Name	Signal	Function	Contact Short	Contact Open	Signal recognition	Setting unit
B-T/B	1-2	Disuse	-	-	-	-	-
	3-4	Disuse	-	-	-	-	-
	5-6	Disuse	-	-	-	-	-
	7-8	Pump interlock	Signal about pump operation • Pump interlock error (E918) occurs if ON is not input when operating pump	Pump ON	Pump OFF	Usual input	Each unit
	9-10	Operation ON/OFF	Controlling operation ON/OFF ^{Note1)}	^{Note3)}		Usual/instant input	Main unit of group ^{Note4)}
	11-12						
	13-14	Operation mode	Selecting cool/heat mode ^{Note2)}	Heat	Cool	Usual input	Main unit of group ^{Note4)}
	15-16	Hot water (Cool storage) mode	Entering hot water (cool storage) mode by external control • Cool + ON: Cool storage • Heat + ON: Hot water	Cool storage/Hot water	Cool/Heat	Usual input	Main unit of group ^{Note4)}
	17-18	Hot water (Cool storage) control standard	Control depending on set temperature when ON Control depending on external hot water (cool storage) thermostat when OFF	Control by set temperature	Control by thermostat	Usual input	Main unit of group ^{Note4)}
	19-20	Hot water (Cool storage) thermostat signal	When thermostat is set as standard for hot water (cool storage) mode • Thermo ON when ON (Not over range of water outlet temperature) • Thermo OFF when OFF	Thermo ON	Thermo OFF	Usual input	Main unit of group ^{Note4)}

• To use hot water (cool storage) mode, the function should be activated by Module Controller.

• Usual input: Operate by current status of contact

Instant input: Operate when contact signal changes from OFF to ON / from ON to OFF.

Note1) Operates when input method of Operation On/Off is set as external contact

Note2) Operates when input method of operation mode is set as external contact

Note3) Operation depending on external contact operation ON/OFF input method

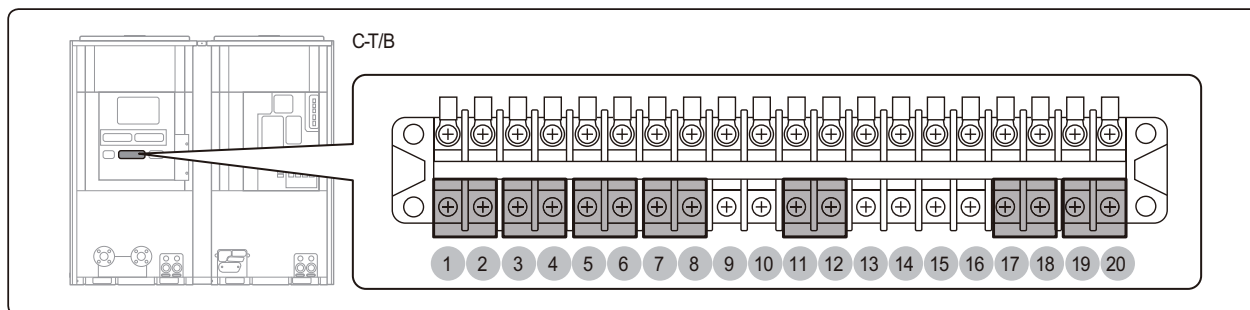
- When set as usual input (0): Operation ON when 9-10 is ON; OFF when 9-10 is OFF

- When set as instant input (1): Operation ON when 9-10 is ON more than 0.1 second; OFF when 11-12 is ON more than 0.1 second

Note4) Main unit of module when group is not available

11 External contact

Wiring work



No.	Name	Signal	Function	Contact Short	Contact Open	Signal recognition	Setting unit
C-T/B	1-2	Quiet function	Operate quiet function in level set by main option or module control ^{Note4)}	Quiet function	-	Usual input	Main unit of group ^{Note8)}
	3-4	Demand function	Operate demand function (current limit control) in level set by main option or module control ^{Note5)}	Demand function	-	Usual input	Main unit of group ^{Note8)}
	5-6	Forced fan function	Operate forced fan function ^{Note6)}	Forced fan function	-	Usual input	Main unit of group ^{Note8)}
	7-8	Unusual condition reset	Reset on error occurred status • Operates only when remote error reset input function is set to use	Reset error	-	Instant input	Main unit of module
	9-10	Disuse	-	No use (N/A)	-	-	-
	11-12	Water law	Zero voltage contact Operate water law ^{Note7)}	Water law control	Water outlet set temperature control	Usual input	Main unit of group ^{Note8)}
	13-14	Disuse	-	No use (N/A)	-	-	-
	15-16	Disuse	-	No use (N/A)	-	-	-
	17-18	Set temperature/room temperature sensor	Analog current Recognize water outlet set temperature by external input (4 ~ 20 mA) ^{Note1)} Recognize value of room temperature sensor (4 ~ 20 mA) when standard for water law is room temperature ^{Note2)}	-	-	Current input	Main unit of group ^{Note8)}
	19-20	External water outlet temperature	Analog current Recognize external water outlet temperature by external temperature sensor (4 ~ 20 mA) ^{Note3)}	-	-	Current input	Main unit of group ^{Note8)}

- Usual input: Operate by current status of contact
- Instant input: Operate when contact signal changes from OFF to ON / from ON to OFF

11 External contact

Wiring work

Note1) Value of water outlet set temperature (°C) = $5.625 \times \text{Current} - 32.5$

Heat (Hot water) mode recognizes minimum 25°C(77°F) and maximum 55°C(131°F)

Cool (Cool storage) mode recognizes minimum 5°C(41°F) and maximum 25°C(77°F) (Minimum -10°C(14°F) when using low temperature function)

Current (mA)	4	6	8	10	12	14	16	18	20
Temperature (°C)	-10.00	1.25	12.50	23.75	35.00	46.25	57.50	68.75	80.00
Temperature (°F)	14.00	34.25	54.50	74.75	95.00	115.25	135.50	155.75	176.00

Note2) Room temperature (°C) = $6.25 \times \text{Current} - 75$

Current (mA)	4	6	8	10	12	14	16	18	20
Temperature (°C)	-50.00	-37.50	-25.00	-12.50	0.00	12.50	25.00	37.50	50.00
Temperature (°F)	-58.00	-35.50	-13.00	9.50	32.00	54.50	77.00	99.50	122.00

Note3) If operation pattern is not standard control, control standard temperature depends on external water outlet temperature sensor. External water outlet temperature sensor should be installed where can represent the temperature of water pipe system.

Water outlet temperature (°C) = $6.25 \times \text{Current} - 55$

Current (mA)	4	6	8	10	12	14	16	18	20
Temperature (°C)	-30.00	-17.50	-5.00	7.50	20.00	32.50	45.00	57.50	70.00
Temperature (°F)	-22.00	0.50	23.00	45.50	68.00	90.50	113.00	135.50	158.00

Note4) Operates when input method for quiet function is set as external contact

- If the contact is short, quiet function operates in Cool/Heat mode.
- Quiet function by Module Controller operates in Cool mode and night time.

Note5) Operates when input method for demand function is set as external contact

Note6) Operates when input method for forced fan function is set as external contact

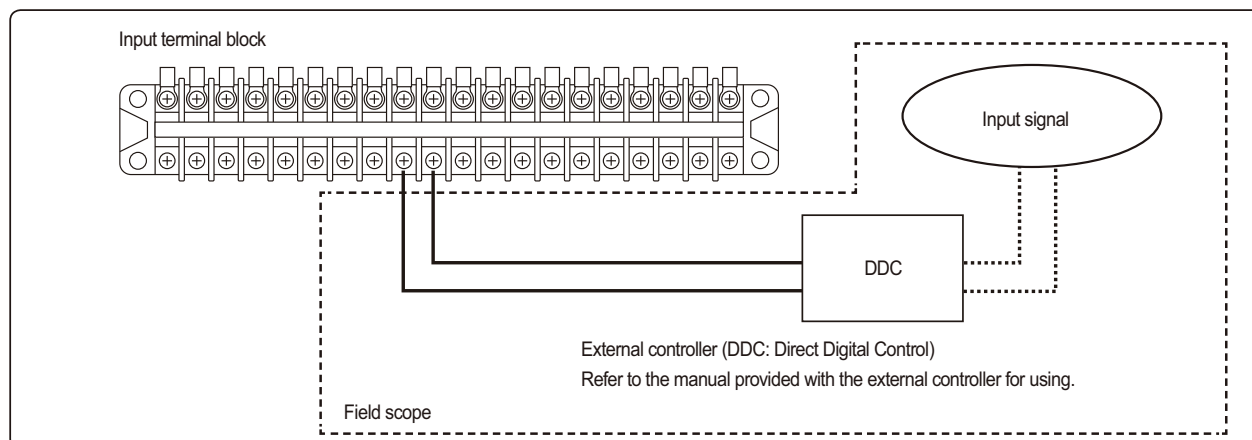
Note7) Operates when input method for water law function is set as external contact

Note8) Main unit of module when group is not available

NOTE

- Room temperature sensor and external water outlet temperature sensor is not supplied. Purchase and install the appropriate sensor according to the usage.
 - Room temperature sensor : 4mA : -50°C(-58°F), 20mA : 50°C(122°F)
 - External water outlet temperature sensor : 4~20mA (4mA : -30°C(22°F), 20mA : 70°C(158°F))

[Example of input contact installation]



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