

SINGLE-STAGE STEAM CHILLER



Model	BDS	15	20	25	30	40	50	65	75	85	100	125	150	175	200	250	300
cooling capacity																	
kW	174	233	291	349	465	582	756	872	989	1163	1454	1745	2035	2326	2908	3489	
10 ⁴ kcal/h	15	20	25	30	40	50	65	75	85	100	125	150	175	200	250	300	
USRT	50	66	83	99	132	165	215	248	281	331	413	496	579	661	827	992	
chilled water 7°C /12°C high flow (A)																	
flowrate	m ³ /h	30	40	50	60	80	100	130	150	170	200	250	300	350	400	500	600
pressure drop	kPa	6	6	10	10	10	20	20	25	25	25	46	46	46	46	77	77
chilled water 7°C /14°C low flow (B)																	
flowrate	m ³ /h	21.4	28.6	35.7	42.9	57.1	71.4	92.9	107	121	143	179	214	250	286	357	429
pressure drop	kPa	3	3	5	5	5	11	11	14	14	14	25	25	25	25	42	42
cooling water 37°C /30°C																	
flowrate	m ³ /h	48.9	65.2	81.5	97.8	130	163	212	245	277	326	408	489	571	652	815	978
pressure drop	kPa	40	40	83	83	83	83	51	67	67	67	67	67	67	67	83	83
max.steam consumption kg/h																	
		349	465	581	698	930	1163	1511	1744	1976	2325	2906	3488	4069	4650	5813	6975
power kW																	
		1.8	1.8	2.2	2.2	2.2	2.2	4.8	4.8	5.0	5.0	6.9	6.9	8.4	8.4	8.7	8.7
solution weight t																	
		0.7	0.8	0.9	1.1	1.3	1.5	1.8	2.1	2.3	2.8	3.3	3.7	5.2	6.0	6.9	7.5
unit ship.weight t																	
		3.6	3.9	4.1	4.5	6.0	6.5	7.4	8.1	9.5	11.0	13.3	16.1	18.6	21.5	24.4	29
operation weight t																	
		3.8	4.2	4.4	4.9	6.6	7.1	8.2	9.4	10.8	12.5	15.8	18.7	21.8	25.0	28.6	33.2

Model	BDS	400	500	600	800	1000	1200	1600	2000
cooling capacity									
kW		4652	5815	6978	9304	11630	13956	18608	23260
10 ⁴ kcal/h		400	500	600	800	1000	1200	1600	2000
USRT		1323	1653	1984	2646	3307	3968	5291	6614
chilled water 7 /12°C high flow (A)									
flowrate	m ³ /h	800	1000	1200	1600	2000	2400	3200	4000
pressure drop	kPa	77	46	46	46	90	46	46	90
chilled water 7°C /14°C low flow (B)									
flowrate	m ³ /h	571	714	857	1143	1429	1714	2286	2857
pressure drop	kPa	42	25	25	25	49	25	25	49
cooling water 37 /30°C									
flowrate	m ³ /h	1304	1630	1956	2608	3260	3912	5216	6520
pressure drop	kPa	83	94	94	94	121	94	94	121
max.steam consumption kg/h									
		9300	11625	13951	18601	23251	27901	37201	46502
power kW									
		10.5	13.5	17.2	21.0	27.2	34.4	42.0	54.4
solution weight t									
		9.6	11.6	14.3	18.3	23.0	28.6	36.6	46.0
unit ship.weight t									
		29	37	44	52	62	44	52	62
operation weight t									
		44	55	64	78	95	129	157	191

General Conditions:

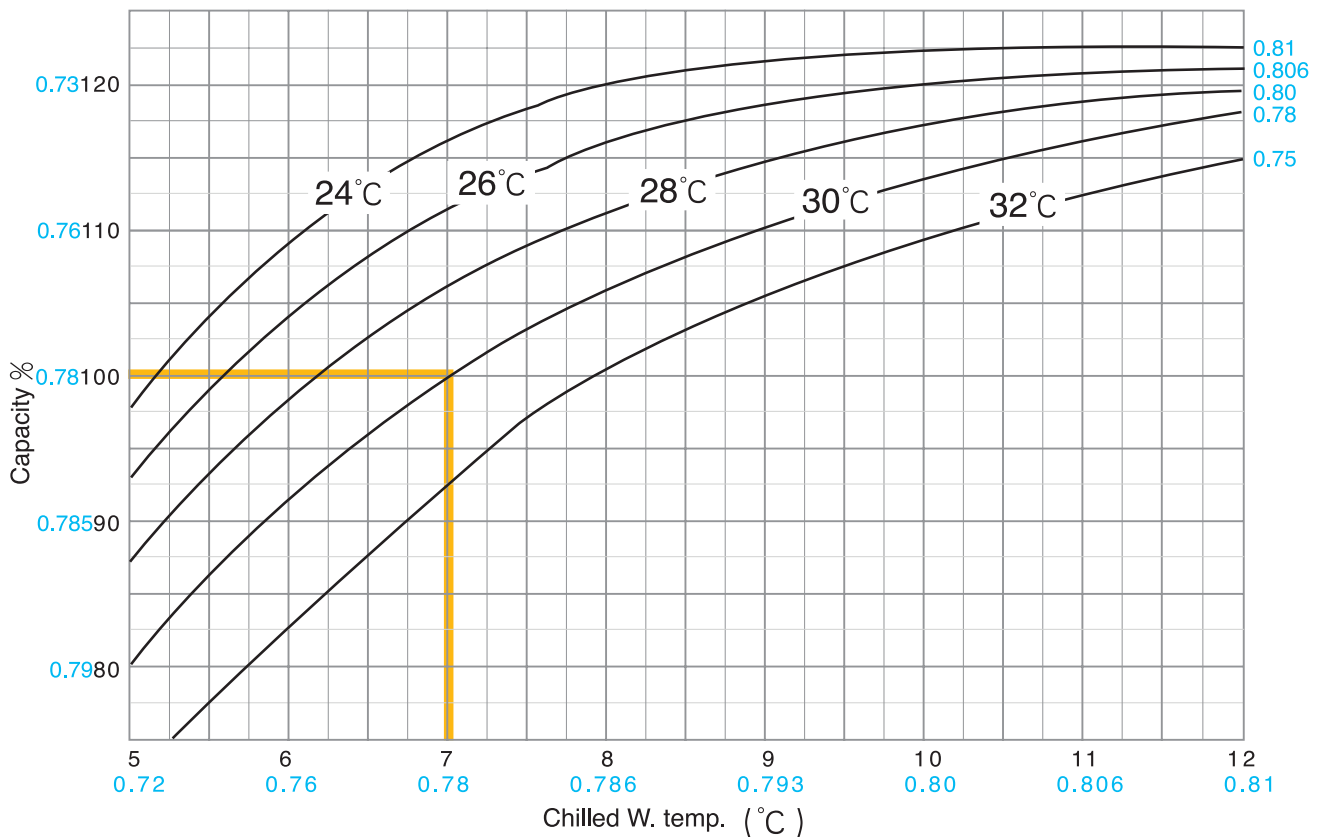
- Rated saturated steam pressure: 0.1MPa
Rated condensate temperature: 95°C
- Rated chilled W.outlet/inlet temp.: (A)7°C/12°C (B)7°C/14°C
- Rated cooling W.outlet/inlet temp.: 37°C/30°C
- Lowest permitted outlet temp.for chilled water: 5°C
(except special order)
- Lowest permitted inlet temp.for cooling water: 10°C
Lowest inlet temp.in operating: 18°C (no limit if 3-way valve is equipped)
- Pressure limit for chilled/cooling water:0.8MPa (800kPa)
(except special order)
- Fouling factor for chilled water:0.086m² · K/kW
- LiBr solution concentration:50%
- Machine room temperature: 5~43°C, humidity ≤ 85%
- Adjustable chilled water flowrate:50~120%
(according to flowrate A)
- Adjustable cooling water flowrate:30~140%
- Adjustable load:5~115%
- Rated COP:0.78

Note: ① (A)is for recommendation, (B)can be selected without affecting cooling capacity and COP.

② Technical specification is based upon Japanese Industry Standard JIS B 8622 " Absorption Chiller"

PERFORMANCE CURVES OF SINGLE-STAGE STEAM CHILLER

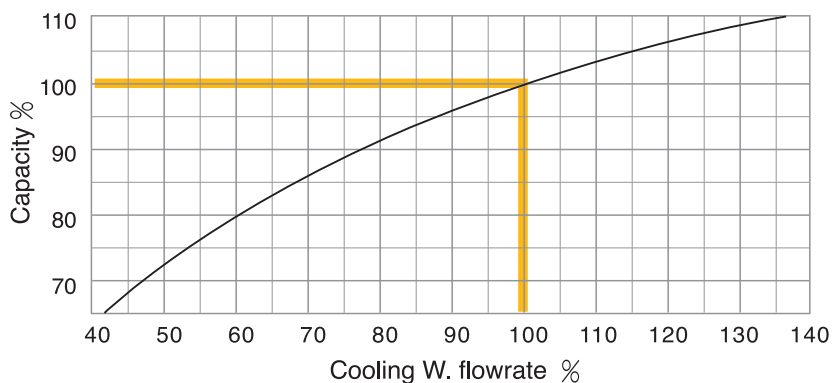
● Chilled W./cooling W./Capacity/COP (model selection)



Note: The figure in blue is COP. In calculation, 3 of them will be added and then divided by 3. Example:

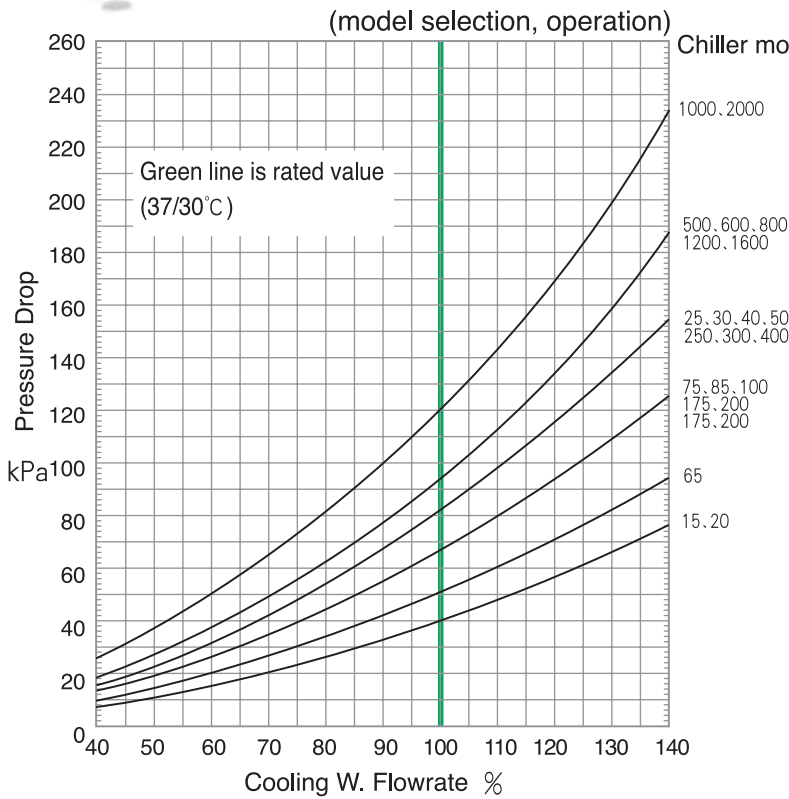
- ① Known: cooling capacity is 100%, cooling W. temp. 28°C;
check out chilled W. temp. is 6.2°C, COP is 0.782, i.e. $(0.78+0.8+0.765)/3=0.782$
- ② Known: chilled W. temp. 10°C, cooling W. temp. 30°C;
check out cooling capacity is 113%, COP=0.777
- ③ Known: cooling capacity is 110%, chilled water 7°C;
check out cooling water temperature is 26.8°C, COP =0.781

● Cooling W. flowrate vs. Capacity
(model selection, operation)

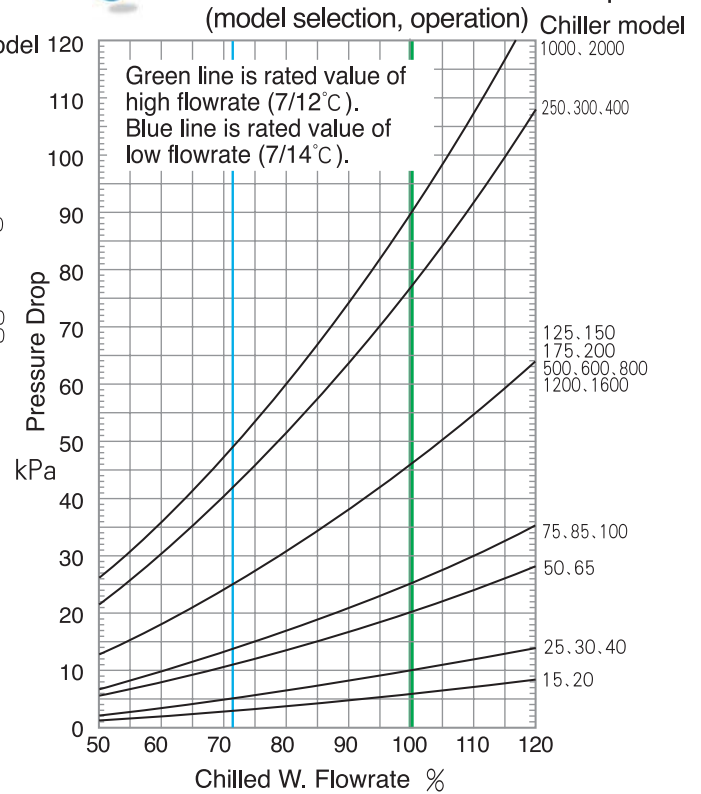


(orange line is the rated value)

● Cooling W. Flowrate vs. Pressure Drop



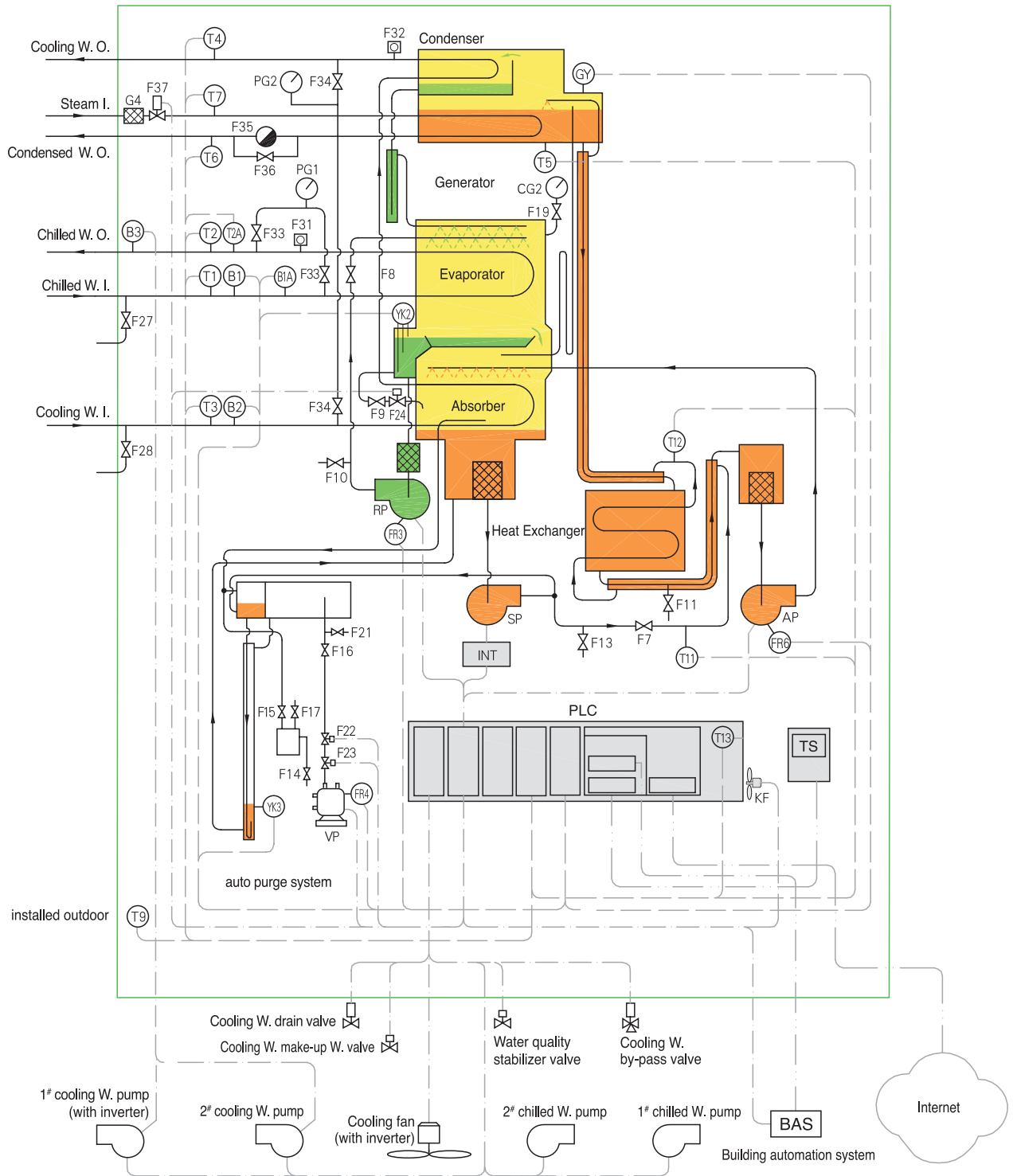
● Chilled W. Flowrate vs. Pressure Drop



SUPPLY LIST SINGLE-STAGE STEAM CHILLER

Category	Item	Remark
Unit	main shell body	includes low temp. generator, condenser, evaporator, absorber, water box, heat/cold insulation, etc..
	low temp. heat exchanger	plate heat exchanger, includes heat insulation.
	canned pumps	includes generator pump, refrigerant pump and solution pump.
	automatic purge system	includes inline falling head purge system, solenoid valve and vacuum pump.
	steam motor valve	used for steam flowrate regulation to realize automatic regulation of cool capacity, including steam filter.
Control system	control cabinet	includes PLC, solution pump inverter, refrigerant pump inverter(≥ 200 model), low voltage parts and control software
	touch screen	for office control of IFA, includes metal enclosure, DC power and typical 30m cable (with an optional length up to 5km). Delivered in separate package.
	back-up switch	for commissioning or maintenance use, installed on the main shell body
	network converter	for remote control through internet, mounted in the control cabinet.
	terminals for exterior system	mounted in the control cabinet for control of chilled water pump, cooling water pump, cooling tower fan, cooling water by-pass valve and water quality stabilizer charge device, etc.
Accessories	sensors to be field installed	only one ambient temp. sensor. Others are factory-mounted.
	spare parts	include sealing elements and a complete set of easily worn-out parts (meet 4-year maintenance requirement)
	special tools	include tools for water box cover assembling/dismantling, descaling tools and maintenance tools.
	documents	include packing list, quality certificate, users' manual, and auxiliary devices' manuals
	toolbox	spare parts, special tools and documents are locked in this stainless steel box before shipment.

P & I DIAGRAM OF SINGLE-STAGE STEAM CHILLER



Code :

T1	chilled W. inlet temp. sensor	B3	chilled W. flow switch	CG2	compound gauge	F19	main shell pressure valve
T2	chilled W. outlet temp. sensor	GY	pressure control	PG1	pressure gauge	F21	nitrogen charging valve
T2A	chilled W. calibrating temp. sensor	YK2	refrigerant level probe	PG2	pressure gauge	F22	purge solenoid valve
T3	cooling W. inlet temp. sensor	YK3	non-condensable probe	G4	steam filter	F23	purge solenoid valve
T4	cooling W. outlet temp. sensor	FR3	refrigerant pump thermal relay	F7	concentration regulating valve	F24	refrigerant solenoid valve
T5	generator temp. sensor	FR4	vacuum pump thermal relay	F8	refrigerant regulating valve	F27	chilled W. drain valve
T6	condensed W. outlet temp. sensor	FR6	absorber pump thermal relay	F9	refrigerant by-pass valve	F28	cooling W. drain valve
T7	steam inlet temp. sensor	INT	solution pump inverter	F10	refrigerant sampling valve	F31	chilled W. vent valve
T9	ambient temp. sensor	PLC	programmable logic controller	F11	concentrated solution sampling valve	F32	cooling W. vent valve
T11	exchanger diluted solution inlet temp. sensor	KF	control casing draft fan	F13	diluted solution sampling valve	F33	chilled W. pressure valve
T12	generator crystallization sensor	RP	refrigerant pump	F14	main purge valve	F34	cooling W. pressure valve
B1	chilled W. flow switch	VP	vacuum pump	F15	direct purge valve	F35	steam trap
B1A	chilled W. flow switch	AP	absorber pump	F16	air cannister valve	F36	condensed w. by-pass valve
B2	cooling W. flow switch			F17	sampling purge valve	F37	steam motor valve

Notes: 1. BROAD supply scope

2. All the components are installed and commissioned in the factory before shipment except T9.

3. Wire type: actuator signal output

sensor signal input

communication signal

