



Air-Cooled Screw Chiller with Free Cooling



PRODUCT OVERVIEW

The TASF series free-cooling air-cooled screw chiller is designed and manufactured in compliance with industry standards, delivering high energy efficiency, exceptional reliability, and rapid response capabilities.

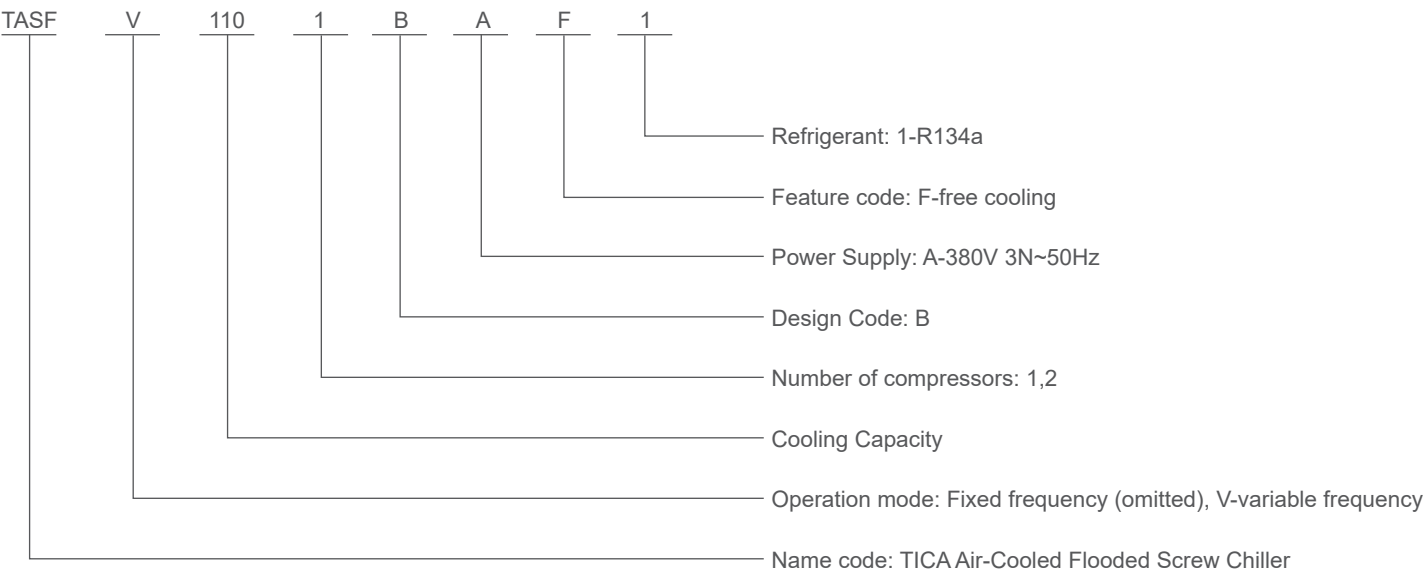
Depending on ambient temperature and detected water temperature, the unit operates in three different modes. When the ambient temperature falls below a set threshold—such as during transitional seasons or winter—it utilizes natural cooling from outdoor cold air to partially or fully meet the cooling load on the user side, significantly enhancing energy savings and reducing emissions.

The chiller can be installed directly on rooftops or open outdoor areas without the need for chiller plant rooms.

Ideal for a wide range of applications including pharmaceuticals, electronics, chemicals, metallurgy, and commercial use, this chiller offers substantial annual cooling cost savings.



NOMENCLATURE



OPERATING RANGE

TASF series unit operating range						
Serial Number	Model	Outlet water temperature	Ambient temperature	Storage temperature	Electrical system	Water Flow
1	TASF-BAF1	4~20°C	-35~45°C	-15~55°C	380V~3~50Hz	80%~130% Nominal Water Flow
2	TASFV-BAF1					

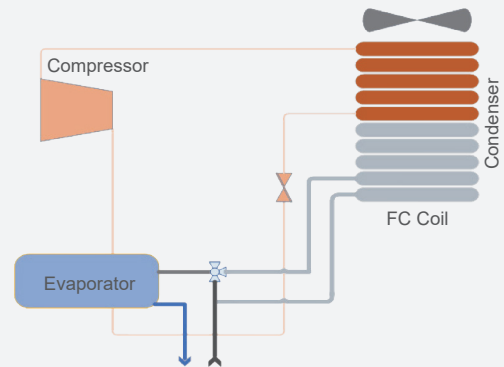
OPERATING MODE

Widely used in the pharma-biotech industry, the microelectronics industry, metallurgy and commercial construction, it can greatly save users' annual cooling costs.

The Operating Mode of Unit is as follows:

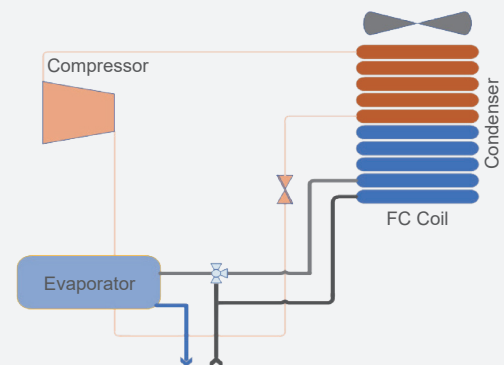
■ Summer: Mechanical Mode

When the ambient temperature is high, the unit operates solely in compressor-driven cooling mode with the free-cooling function deactivated. This avoids unnecessary water pump power consumption and prevents a loss of cooling capacity. As ambient conditions change, the system primarily relies on compressor and fan modulation to achieve an optimal energy-efficient operation mode. This cooling mode is typically used during the summer.



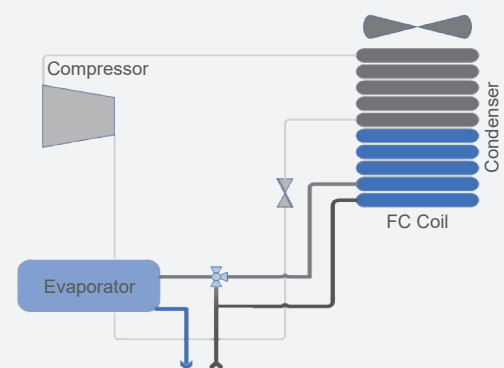
■ Transition Seasons: Hybrid Mode

As the ambient temperature drops below a certain threshold relative to the returning chilled water temperature, the system activates hybrid cooling mode. In this mode, the returning chilled water is first pre-cooled by passing through the free-cooling coil, which handles a portion of the cooling load using the natural cold source. The remaining load is then managed by the compressor. This hybrid mode strikes an optimal balance between compressor and fan power consumption, thereby minimizing the total power draw of the unit.

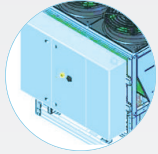


■ Winter: Full Free-Cooling Mode

At sufficiently low ambient temperatures, the entire cooling load is handled by the free-cooling coil. In this mode, the compressor is completely shut down, and cooling capacity is regulated solely by adjusting the fan speed. This operating mode is typically employed during the winter.



PROFESSIONAL DESIGN

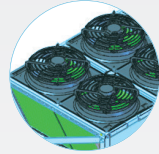


Control cabinet



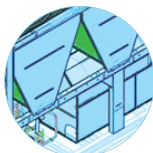
"V" type heat exchanger

- DX/FC coils
- Cu/Al



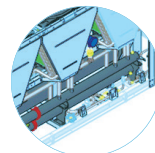
Low noise fan

- EC fan/ AC fan with VFD



Compressor(Bitzer)

- Semi-hermetic screw type
- With soundproof box



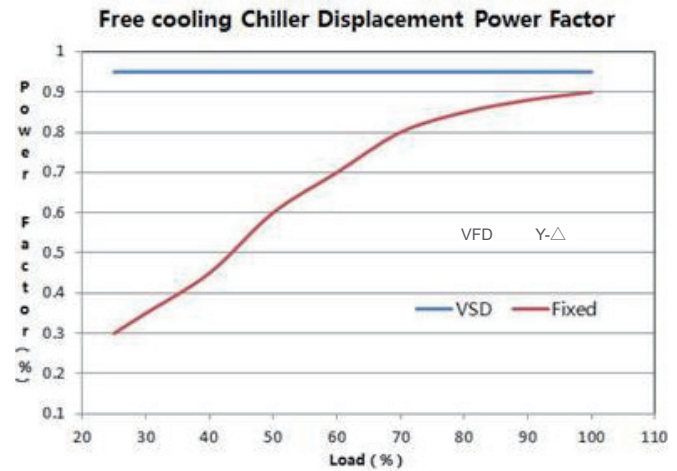
Oil separator

PRODUCT FEATURES

ENERGY SAVING AND HIGH EFFICIENCY

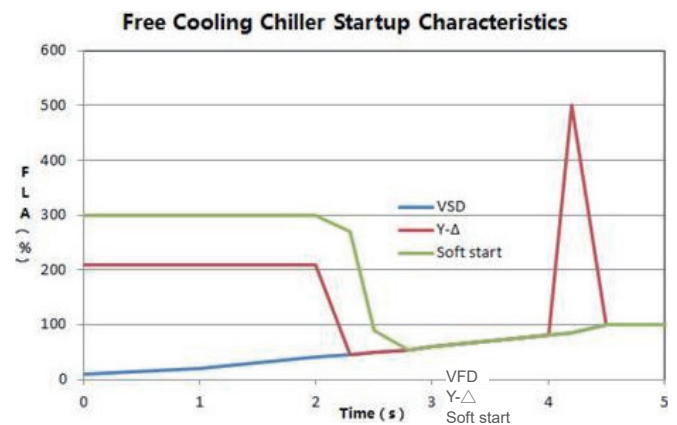
■ High Power Factor

For conventional air-cooled screw units, the power factor decreases with the decrease of unit load. The TASFV series unit has a power factor of up to 0.95, which reduces the requirement for transformer capacity. Moreover, the power factor does not decrease with a reduction in load.



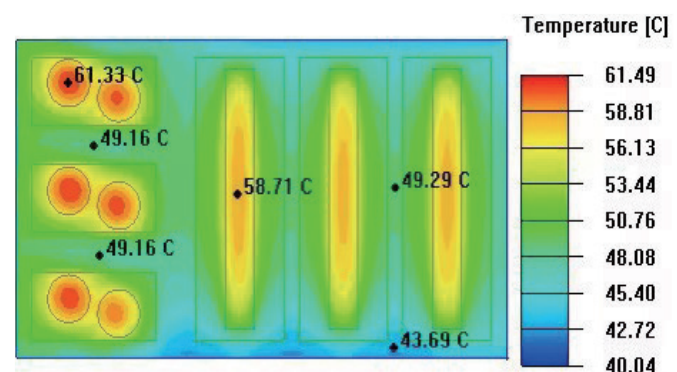
■ No Inrush Current

The VFD chiller utilizes variable frequency starting mode, which has no inrush current. This eliminates any impact on the electrical grid, ensuring its safe and reliable operation. The maximum starting current does not exceed the full-load rated current, significantly reducing the demand on the customer's grid infrastructure and lowering the required transformer capacity.



■ Refrigerant-Cooled VFD

The system utilizes a refrigerant-cooled, unit-mounted VFD, which offers superior heat dissipation and a compact design. This significantly improves the module utilization rate and allows the unit to operate at extremely high ambient temperatures without any capacity degradation. The VFD's cold plate effectively removes over 90% of the heat generated by the drive, reducing the temperature rise within the VFD cabinet and extending the service life of the electrical components.

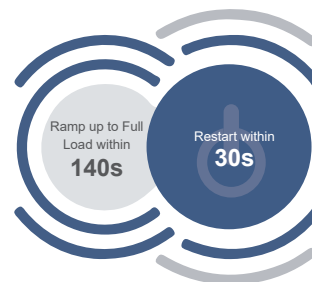


PRODUCT FEATURES

RELIABLE OPERATION

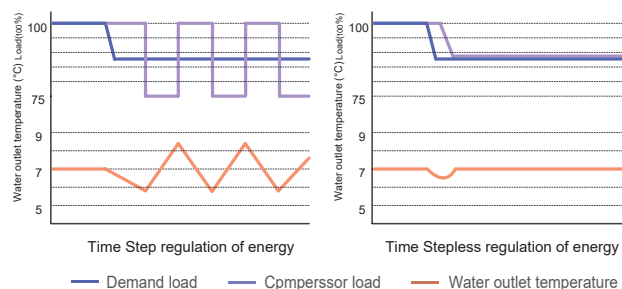
■ Rapid Restart

When equipped with an optional ATS and UPS, the unit is capable of rapid restart and rapid load recovery after a power outage. Within 30 minutes of a power failure, the compressor can restart within 30 seconds and ramp up to full load within 140 seconds, effectively ensuring water temperature stability.



■ High-Precision evaporator LWT Control

Through high-precision stepless regulation of the compressor's slide valve, the system achieves a highly accurate match between the compressor's actual load and target load, ensuring perfect alignment between the unit's output capacity and the building system's demand load. The evaporator leaving water temperature control accuracy is within $\pm 0.3^{\circ}\text{C}$.



■ Long-Term Experimental Validation

TICA has a 600RT AHRI certified performance laboratory. The chiller has undergone extensive long-term simulated performance testing under a wide range of conditions, including variable and extreme operational scenarios, as well as real-world simulated vibration tests equivalent to third-class highway transportation. These rigorous trials have validated and further optimized the unit's performance, reliability, and structural integrity, ensuring its high quality and dependable operation.



■ Multiple Protections

The unit incorporates multiple safety protection features that provide comprehensive monitoring of both the unit and the system. These protective functions promptly safeguard the equipment from potential damage in the event of abnormal operating conditions or system irregularities. Additionally, the unit is equipped with a three-level password protection mechanism to prevent unauthorized operation by non-professional personnel, ensuring secure and reliable system performance.

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Power Supply Protections

- Power overvoltage and undervoltage protection;
- Power supply phase loss, reverse phase, and phase imbalance protection

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Compressor Protections

- Compressor oil level protection
- Compressor motor overheat protection
- Compressor motor overload protection
- Compressor frequency converter fault protection
- Compressor startup failure protection
- Compressor rotation error protection;
- Communication fault protection

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System Protections

- Protection against high exhaust pressure
- Low suction pressure protection
- Differential pressure protection for suction and discharge
- Anti freeze protection
- Interruption protection
- Protection against high exhaust temperature

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Other Protections

- Fan overload protection
- Sensor fault protection
- Freezing point protection
- Protection against excessive water temperature difference

TECHNICAL SPECIFICATIONS

TASFV-BAF1				100.1	130.1	170.1	205.1	230.1
Cooling Mode Data	Design Condition 1	Cooling Capacity	kW	341	447	587	721	798
		Power Input	kW	117	156.1	197.2	255.3	265.9
		COP	kW/kW	2.91	2.86	2.98	2.82	3.00
		Rated Current	A	194	258	326	420	438
		Full Freecooling Ambient Temperature	°C	-5.5	-8.0	-7.9	-7.7	-6.8
		FC Coils Pressure Drop	kPa	105	178	173	168	146
	Design Condition 2	Cooling Capacity	kW	350	458	602	740	819
		Power Input	kW	118.1	157.7	199.3	258.1	268.5
		COP	kW/kW	2.96	2.90	3.02	2.87	3.05
		Rated Current	A	196	261	329	425	442
		Full Freecooling Ambient Temperature	°C	-4.5	-7.1	-6.9	-6.7	-5.8
		FC Coils Pressure Drop	kPa	104	176	171	166	144
Electrical Data	Maximum Operating Current		A	258	315	398	516	540
	Maximum Starting Current		A	20	20	20	20	20
	Power Supply			380V / 50Hz				
Refrigerant	Type			R134a				
	Refrigerant Circuit Number			1				
Compressor	Type			Semi-hermetic Screw Compressor				
	Regulation Range			25%~100%				
	Starting Mode			Y- △				
Fan	Air Flow Rate		m ³ /h	135000	135000	180000	225000	270000
	Quantity		/	6	6	8	10	12
	Power Input		kW	19.2	19.2	25.6	32	38.4
Evaporator	Type			Flooded Shell-and-Tube				
	Water Pipe Diameter		DN	125	125	150	150	150
	Design Pressure		MPa	1.0				
	Design Condition 1	Water Flow Rate	m ³ /h	64.3	84.3	110.7	135.9	150.3
		Water Pressure Drop	kPa	129	123	124	123	123
	Design Condition 2	Water Flow Rate	m ³ /h	69.0	90.2	118.7	145.9	161.5
		Water Pressure Drop	kPa	130	124	125	124	124
Dimensions	Length		mm	4220	4220	5455	6690	7925
	Width		mm	2250				
	High		mm	2560				

Notes:

- Design condition 1 is based on: Evaporator LWT at 7°C, EWT at 12°C, and ambient dry bulb temperature at 35°C, with 40% propylene glycol as secondary refrigerant;
- Design condition 2 is based on: Evaporator LWT at 7°C, EWT at 12°C, and ambient dry bulb temperature at 35°C, with 40% ethylene glycol as secondary refrigerant;
- Voltage fluctuation within ±10% is allowed.

TECHNICAL SPECIFICATIONS

TASFV-BAF1				215.2	250.2	280.2	325.2	370.2	400.2
Cooling Mode Data	Design Condition 1	Cooling Capacity	kW	751	867	989	1137	1294	1395
		Power Input	kW	275.3	308.9	346.6	390	436	504.8
		COP	kW/kW	2.73	2.81	2.85	2.92	2.97	2.76
		Rated Current	A	448	512	572	645	717	831
		Full Freecooling Ambient Temperature	°C	-8.1	-7.7	-7.5	-7.5	-7.7	-7.4
		FC Coils Pressure Drop	kPa	181	169	162	164	167	159
	Design Condition 2	Cooling Capacity	kW	778	897	1023	1177	1340	1446
		Power Input	kW	278.6	312.1	350.3	394.3	440.7	510.7
		COP	kW/kW	2.79	2.87	2.92	2.99	3.04	2.83
		Rated Current	A	453	517	578	652	725	841
		Full Freecooling Ambient Temperature	°C	-7.2	-6.8	-6.6	-6.6	-6.8	-6.5
		FC Coils Pressure Drop	kPa	181	169	163	165	168	160
Electrical Data	Maximum Operating Current		A	545	629	705	795	881	1031
	Maximum Starting Current		A	20	20	20	20	20	20
	Power Supply			380V / 50Hz					
Refrigerant	Type			R134a					
	Refrigerant Circuit Number			2					
Compressor	Type			Semi-hermetic Screw Compressor					
	Regulation Range			12.5%~100%					
	Starting Mode			Y- △					
Fan	Air Flow Rate		m ³ /h	225000	270000	315000	360000	405000	450000
	Quantity		/	10	12	14	16	18	20
	Power Input		kW	32	38.4	44.8	51.2	57.6	64
Evaporator	Type			Flooded Shell-and-Tube					
	Water Pipe Diameter		DN	150	150	200	200	200	200
	Design Pressure		MPa	1.0					
	Design Condition 1	Water Flow Rate	m ³ /h	141.6	163.4	186.4	214.3	244.0	263.0
		Water Pressure Drop	kPa	98	97	99	98	95	96
	Design Condition 2	Water Flow Rate	m ³ /h	153.3	176.9	201.8	232.1	264.1	285.1
		Water Pressure Drop	kPa	100	99	101	100	97	98
Dimensions	Length		mm	6690	7925	9160	10395	11630	12865
	Width		mm	2250					
	High		mm	2560					

Notes:

1. Design condition 1 is based on: Evaporator LWT at 7°C, EWT at 12°C, and ambient dry bulb temperature at 35°C, with 40% propylene glycol as secondary refrigerant;
2. Design condition 2 is based on: Evaporator LWT at 7°C, EWT at 12°C, and ambient dry bulb temperature at 35°C, with 40% ethylene glycol as secondary refrigerant;
3. Voltage fluctuation within ±10% is allowed.

TECHNICAL SPECIFICATIONS

TASF-BAF1				100.1	130.1	170.1	205.1	230.1	
Cooling Mode Data	Design Condition 1	Cooling Capacity	kW	341	447	587	721	798	
		Power Input	kW	114.2	152.3	192.4	249	259.4	
		COP	kW/kW	2.99	2.93	3.05	2.90	3.08	
		Rated Current	A	203	272	342	438	456	
		Full Freecooling Ambient Temperature	℃	-5.5	-8.0	-7.9	-7.7	-6.8	
		FC Coils Pressure Drop	kPa	105	178	173	168	146	
	Design Condition 2	Cooling Capacity	kW	350	458	602	740	819	
		Power Input	kW	115.3	153.9	194.5	251.7	261.6	
		COP	kW/kW	3.04	2.98	3.10	2.94	3.13	
		Rated Current	A	205	275	346	443	460	
		Full Freecooling Ambient Temperature	℃	-4.5	-7.1	-6.9	-6.7	-5.8	
		FC Coils Pressure Drop	kPa	104	176	171	166	144	
Electrical Data	Maximum Operating Current		A	258	315	398	516	540	
	Maximum Starting Current		A	390	615	845	965	965	
	Power Supply			380V / 50Hz					
Refrigerant	Type		R134a						
	Refrigerant Circuit Number		1						
Compressor	Type		Semi-hermetic Screw Compressor						
	Regulation Range		25%~100%						
	Starting Mode		Y- △						
Fan	Air Flow Rate		m³/h	135000	135000	180000	225000	270000	
	Quantity		/	6	6	8	10	12	
	Power Input		kW	19.2	19.2	25.6	32	38.4	
Evaporator	Type		Flooded Shell-and-Tube						
	Water Pipe Diameter		DN	125	125	150	150	150	
	Design Pressure		MPa	1.0					
	Design Condition 1	Water Flow Rate	m³/h	64.2	84.2	110.7	135.9	150.3	
		Water Pressure Drop	kPa	129	123	124	123	123	
	Design Condition 2	Water Flow Rate	m³/h	69.0	90.2	118.7	145.9	161.5	
		Water Pressure Drop	kPa	130	124	125	124	124	
Dimensions	Length		mm	4220	4220	5455	6690	7925	
	Width		mm	2250					
	High		mm	2560					

Notes:

- Design condition 1 is based on: Evaporator LWT at 7°C, EWT at 12°C, and ambient dry bulb temperature at 35°C, with 40% propylene glycol as secondary refrigerant;
- Design condition 2 is based on: Evaporator LWT at 7°C, EWT at 12°C, and ambient dry bulb temperature at 35°C, with 40% ethylene glycol as secondary refrigerant;
- Voltage fluctuation within ±10% is allowed.

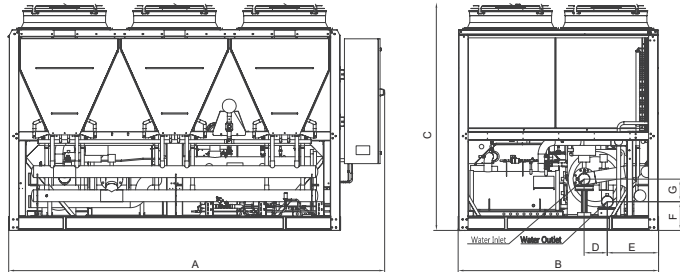
TECHNICAL SPECIFICATIONS

TASF-BAF1				215.2	250.2	280.2	325.2	370.2	400.2
Cooling Mode Data	Design Condition 1	Cooling Capacity	kW	751	867	989	1137	1294	1395
		Power Input	kW	268.5	301.4	338.1	380.5	425.4	492.4
		COP	kW/kW	2.80	2.88	2.93	2.99	3.04	2.83
		Rated Current	A	463	539	600	677	748	867
		Full Freecooling Ambient Temperature	°C	-8.1	-7.7	-7.5	-7.5	-7.7	-7.4
		FC Coils Pressure Drop	kPa	181	169	162	164	167	159
	Design Condition 2	Cooling Capacity	kW	778	897	1023	1177	1340	1446
		Power Input	kW	271.7	304.6	341.7	384.7	430	498.1
		COP	kW/kW	2.86	2.94	2.99	3.06	3.12	2.90
		Rated Current	A	469	545	606	684	756	877
		Full Freecooling Ambient Temperature	°C	-7.2	-6.8	-6.6	-6.6	-6.8	-6.5
		FC Coils Pressure Drop	kPa	181	169	163	165	168	160
Electrical Data	Maximum Operating Current		A	545	629	705	795	881	1031
	Maximum Starting Current		A	760	930	1036	1243	1285	1481
	Power Supply			380V / 50Hz					
Refrigerant	Type			R134a					
	Refrigerant Circuit Number			2					
Compressor	Type			Semi-hermetic Screw Compressor					
	Regulation Range			12.5%~100%					
	Starting Mode			Y- △					
Fan	Air Flow Rate		m³/h	225000	270000	315000	360000	405000	450000
	Quantity		/	10	12	14	16	18	20
	Power Input		kW	32	38.4	44.8	51.2	57.6	64
Evaporator	Type			Flooded Shell-and-Tube					
	Water Pipe Diameter		DN	150	150	200	200	200	200
	Design Pressure		MPa	1.0					
	Design Condition 1	Water Flow Rate	m³/h	141.6	163.4	186.4	214.3	244.0	263.0
		Water Pressure Drop	kPa	98	97	99	98	95	96
	Design Condition 2	Water Flow Rate	m³/h	153.3	176.9	201.8	232.1	264.1	285.1
		Water Pressure Drop	kPa	100	99	101	100	97	98
Dimensions	Length		mm	6690	7925	9160	10395	11630	12865
	Width		mm	2250					
	High		mm	2560					

Notes:

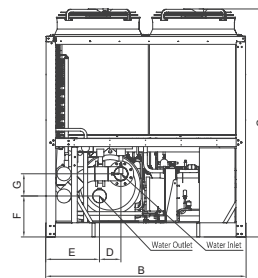
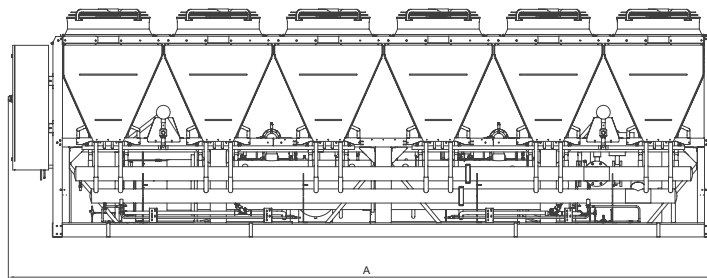
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2. Design condition 2 is based on: Evaporator LWT at 7°C, EWT at 12°C, and ambient dry bulb temperature at 35°C, with 40% ethylene glycol as secondary refrigerant;
3. Voltage fluctuation within ±10% is allowed.

UNIT DIMENSIONS



Single Compressor Models

TASF(V)100.1BAF1
TASF(V)130.1BAF1
TASF(V)170.1BAF1
TASF(V)205.1BAF1
TASF(V)230.1BAF1

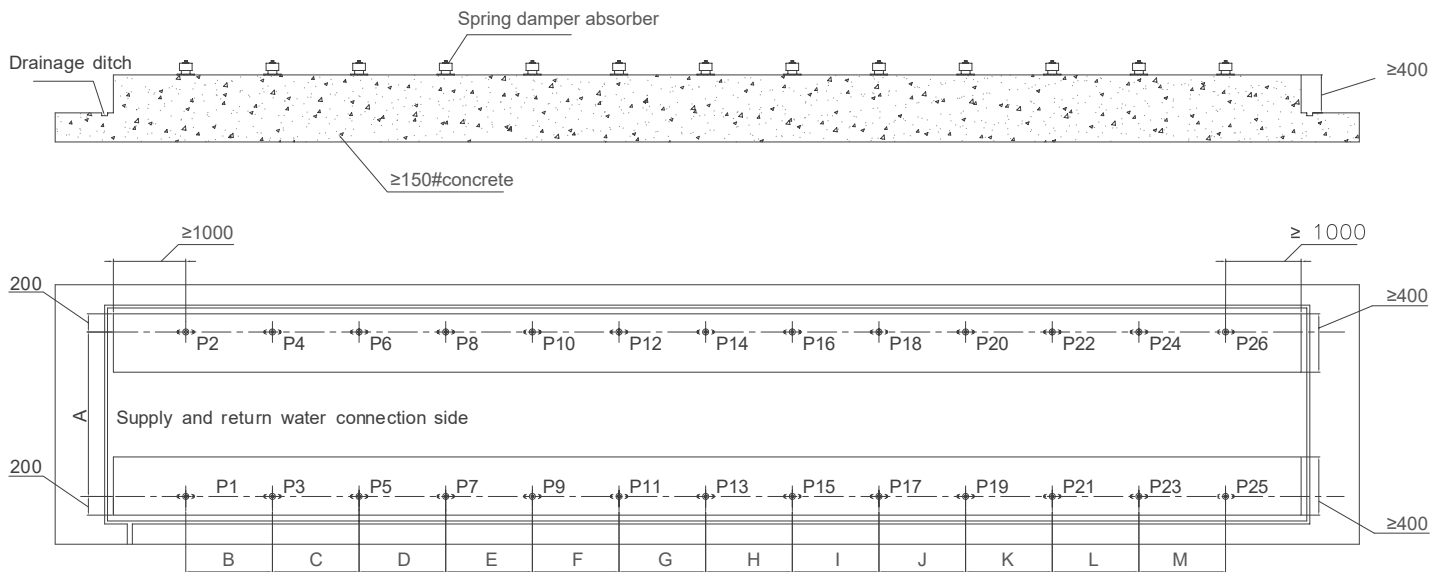


Dual Compressors Models

TASF(V)215.2BAF1
TASF(V)250.2BAF1
TASF(V)280.2BAF1
TASF(V)325.2BAF1
TASF(V)370.2BAF1
TASF(V)400.2BAF1

Model	L	W	H
	mm	mm	mm
TASF(V)100/130.1BAF1	4220	2250	2560
TASF(V)170.1BAF1	5450		
TASF(V)205.1BAF1	6690		
TASF(V)230.1BAF1	7920		
TASF(V)215.2BAF1	6690		
TASF(V)250.2BAF1	7920		
TASF(V)280.2BAF1	9160		
TASF(V)325.2BAF1	10400		
TASF(V)370.2BAF1	11640		
TASF(V)400.2BAF1	12880		

FOUNDATION DIAGRAMS

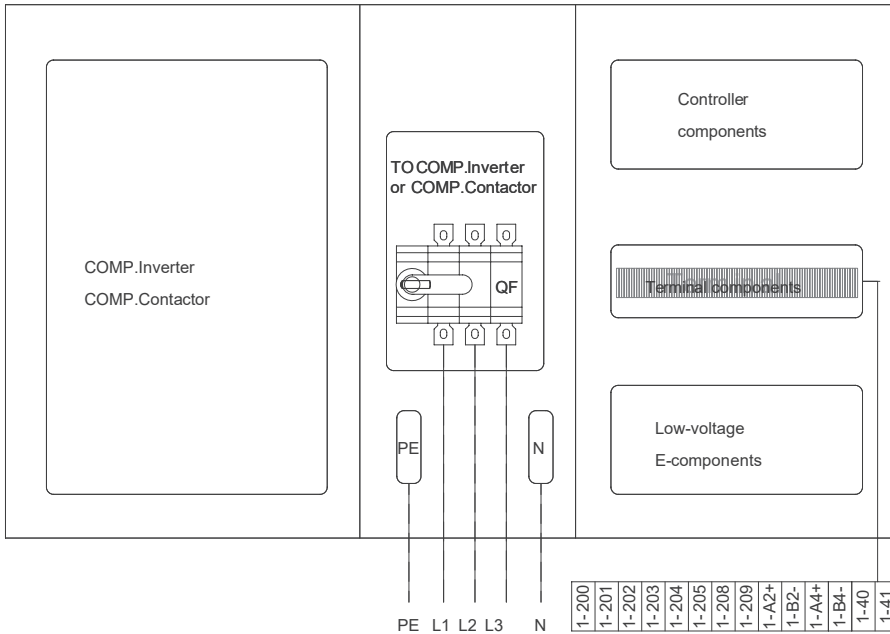


Model	Code(mm)											Quantity
	A	B	C	D	E	F	G	H	I	J	K	
TASF(V)100.1BAF1	2170	1150	1150	1150	—	—	—	—	—	—	—	8
TASF(V)130.1BAF1	2170	1150	1150	1150	—	—	—	—	—	—	—	8
TASF(V)170.1BAF1	2170	1375	1375	1375	—	—	—	—	—	—	—	8
TASF(V)205.1BAF1	2170	1340	1340	1340	1340	—	—	—	—	—	—	10
TASF(V)230.1BAF1	2170	1320	1320	1320	1320	1320	—	—	—	—	—	12
TASF(V)215.2BAF1	2170	1340	1340	1340	1340	—	—	—	—	—	—	10
TASF(V)250.2BAF1	2170	1000	1000	1000	1000	1000	1000	—	—	—	—	14
TASF(V)280.2BAF1	2170	1000	1000	1000	1000	1000	1000	1000	—	—	—	16
TASF(V)325.2BAF1	2170	1200	1000	1000	1000	1000	1000	1000	1200	—	—	18
TASF(V)370.2BAF1	2170	1000	1000	1000	800	1600	800	1000	1000	1000	—	20
ASF(V)400.2BAF1	2170	1300	1000	1000	1000	1000	1000	1000	1000	1000	1300	22

Notes:

1. Foundation levelness ≤ 0.1%;
2. The bearing capacity of foundation ≥ 1.5 times of the operating weight of unit;
3. Drainage ditches must be provided around the foundation to prevent accumulation of water;
4. Shock absorbers must be installed between the unit and the foundation (the shock absorber itself has anti-slip and anti-roll functions and does not need to be fixed on the foundation).

ON-SITE WIRING DIAGRAM



Single Compressor

Input

1-40 | 1-41: Remote Startup & Shutdown

Output

1-200 | 1-201 : Operation Signal

1-202 | 1-203 : Alarm Signal

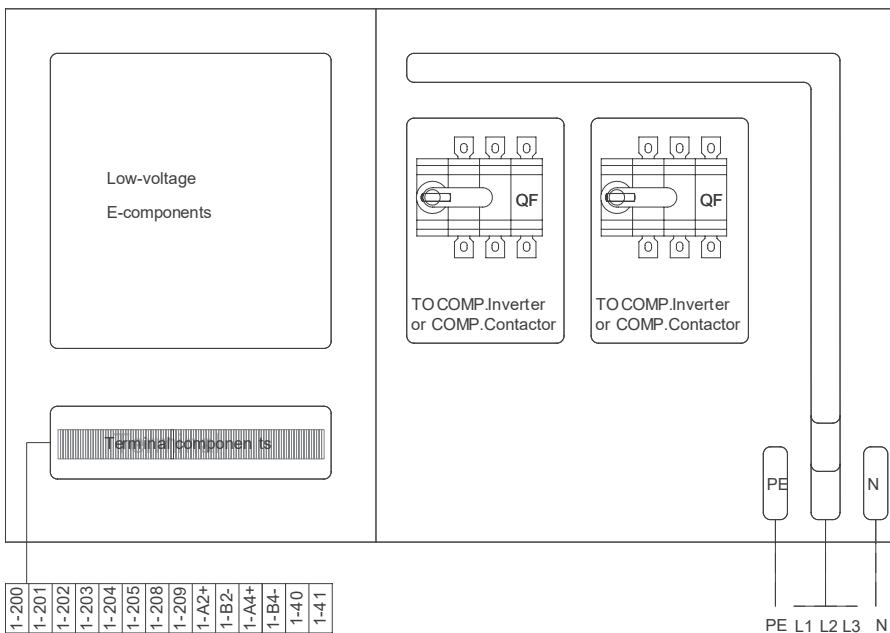
1-204 | 1-205 : Chilled Water Pump

1-208 | 1-209 : Evaporator Electric Valve

Communication

1-A2⁺ | 1-B2- : MultiControl Communication

1-A4⁺ | 1-B4- : Remote Communication



Dual Compressors

Input

1-40 | 1-41: Remote Startup & Shutdown

Output

1-200 | 1-201 : Operation Signal

1-202 | 1-203 : Alarm Signal

1-204 | 1-205 : Chilled Water Pump

1-208 | 1-209 : Evaporator Electric Valve

Communication

1-A2⁺ | 1-B2- : MultiControl Communication

1-A4⁺ | 1-B4- : Remote Communication

Fostering a better life

Limiting the temperature increase to 1.5°C



Website: www.global.tica.com

Note: Due to constant improvement and innovation of TICA product, the specifications and parameters contained in this document are subject to change without prior notice.