

Hitachi Highly
Rotary Specification
Verdichter Spezifikation Rollkolben
Modell
BSA586SDM-Y3FL

Edited by

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Directory

First: BSA586SDMY3FJ Specification	——— 1~3
1. Applications	
2. Compressor Specifications	
3. General Characteristics	
Second: The use of benchmarks DC inverter compressor	4-12
Third: Acceptance basis and rules	13
1. Basis for acceptance	
2. Acceptance rules	
Four: Drawings	14~18

	<p>SUBJECT</p> <p>Model BSA586SDMY3FJ SPECIFICATION</p>	PAGE: 1/18
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1. SCOPE

This specification is applied to rotary compressors produced by SHEC.

2. SPECIFICATION OF THE MODEL

Item	Spec
2.1 Model Type	BSA586SDMY3FJ
2.2 Power source input to inverter	<p>Rated voltage 220V</p> <p>Rated frequency 50 Hz 1</p> <p>Phase 1 phase</p>
2.3 Application	Dryer
2.4 Refrigerant	R134a
2.5 Displacement	5.86ml/rev
2.6 Allowable frequency range	2000~6000min ⁻¹
2.7 Oil	α 68HES-H or equivalent 153±5ml
2.8 Allowable amount of refrigerant charge	Below 400g
2.9 Compressor cooling	Forced air
2.10 Hermetic Terminal	Conventional
2.11 Space volume of inner case	570cm ³
2.12 Compressor weight	3.8kg incl. Oil
2.13 Motor Type Insulation class	Direct current brushless motor E class
2.14 Rated Capacity (see *) Cooling capacity (W)	744
2.15 Compressor Rated Input (see *)	223
2.16 COP	3.34

	<p>SUBJECT</p> <p>Model BSA586SDMY3FJ SPECIFICATION</p>	PAGE: 2/18
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Item	Spec
2.18 Current (A)	1.43 (compressor input)
2.19 Capacity measuring conditions	Rotational speed 3180min ⁻¹ Evaporating temp. 7.2℃ Condensing temp. 54.4℃ Liquid temp. 46.1℃ Ambient temp. 35.0℃ Return gas temp. 35.0℃ Wind speed 2m/s

*. Rated Capacity and input are measured with HITACHI inverter circuit by secondary Refrigerant calorimeter Methods of JIS B8606 by Shanghai Hitachi Electrical Appliances Co., Ltd. Allowable capacity should be more than 95% of the rated capacity and allowable input should be less than 107% of rated motor input.

3. THE PARAMETER OF MOTOR

Project	Parameter	Explanation
3.1 Number of rotor poles (pole)	4	4 Grade 12 slots distribution volume
3.2 Operating frequency range (Hz)	67~200	Radio frequency, depending on the drive VDCmax
3.3 demagnetize the magnet current (A) De-magnetic Current	20.00A	Peak current, 120 ℃ measured, power time of 2 seconds, less than 5% demagnetize
3.4 d-axis inductance (mH)	Table1	Inductance change with the current
3.5 q-axis inductance (mH)	Table1	Inductance change with the current
3.6 Stator coil resistance (Ω) (20℃)	3.57Ω	(line-to-line)
3.7 Induced voltage constant (Vrms/krpm)	30.60V/krpm	(line-to-line)
3.8 Motor torque constant (N·m/Arms)	0.47	Torque / current
3.9 Moment of inertia (Kg·m2)	0.000188	Quality * rotor diameter ^ 2/8
3.10 Magnetic flux FluxΦa (Wb)	0.1205	$\Phi (-peak) = \frac{\sqrt{2} \times E0}{2\pi f \sqrt{3}}$

	<p>SUBJECT</p> <p>Model BSA586CDMY3FJ SPECIFICATION</p>	PAGE: 3/18
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Notice: M—rotor weight Ro—rotor external radius Ri—rotor inside radius
Mp—centerless part weight Rp—centerless part radius ε —centerless

Table 1 Test Frequency 100Hz

Current (RMS)	0.5A	1A	1.5A	2A	2.5A	3A	3.5A	4A	5A	7A
Lq (mH)	16.48	16.08	15.49	14.88	14.30	13.77	13.28	12.85	12.09	10.82
Ld (mH)	9.04	9.13	9.12	9.05	8.96	8.85	8.73	8.60	8.35	7.88

Table 2

Running toque (Nm)	1.00	1.25	1.50
Running current RMS (A)	2.11	2.65	3.20

4. CHARACTERISTICS

4.1 Appearance

The surface of the compressor is painted to black, without obvious flaw ,impact scar, paint peel off, rust and so on.

4.2. Indication

Compressor model type, manufacturing data are clearly indicated on the surface of compressor.

4.3. Residual moisture 150mg MAX

(4.4. Residual impurities 100mg MAX

5. PARTS AND DRAWING LIST

PARTS NAME	QTY/SET	DRAWING NO.	REMARKS
OUTLINE DWG.	1	4CYCA0037	Dimensioned sketch
		Chart 1	Pressure guarantee Chart
Terminal parts accessories			
Terminal cover	1	SC01D775	
Clip	1	SC01D076	
Packing	1	SC01D075	

DC INVERTER COMPRESSOR CRITERIA		PAGE: 4/18	
PARTS NAME	QTY/SET	DRAWING NO.	REMARKS
◆ Anti-vibration parts Mounting accessories Rubber mount	3	4CYC01030	
<p>COMPRESSOR CRITERIA</p> <p>1 Strictly observe the specification</p> <p>The compressor should be used in specifications written in this “compressor specification” and not be used in specifications outside it. The main circuit must link up with fuse or breaker.</p> <p>2 Source voltage</p> <p>Specified inverter is linked up with compressor terminals . Applied voltage of this inverter should be voltage specified in this “compressor specification”. Alternating voltage should never be applied on terminals (for example : commercial alternating voltage of 1φ100V, 200V, 3φ200V). This is because that if applied alternating current the direct current motor will demagnetize.</p> <p>3 Operating voltage range</p> <p>The compressor should be operated in the range of rated voltage $\pm 10\%$, under standard condition and overload condition of rated frequency (applied voltage to inverter). It must be satisfied with item 5 , 6, 7.</p> <p>4 Operating temperatures and pressures</p> <p>The operating temperatures and pressures of a compressor should be within the range shown in the table 3 for a reliable compressor operation over lifetime, according to lifetime test SHEC protocols.</p>			

Table 3

Item	Standard load condition	Overload Condition	Blocked fan Condition
Discharge pressure MPa {kgf/cm ² G}	in the range mentioned in chart 1.		4.5 (44.9)
Suction pressure MPa {kgf/cm ² G}	0.201~0.887MPa It can also be 0.201~0.887MPa when in transition , but should not be used when it is less than 0.201MPa Transition at 0.201 ~ 0.887MPa conditions should not be dissatisfied 0.201MPa Use		
Compressor case bottom temp Housing bottom temperature	99℃ or below and 6 degrees higher than condensing temperature 99 ℃ or lower than the condensation temperature and Higher 6℃		
Motor winding temp. Motor coil temperature	Rated voltage: 105℃ MAX	R. Voltage±10%: 120℃ MAX	
	R. Voltage±10%: 120℃ MAX		
Accumulator temp	Higher than outlet pipe of evaporator		
Ambient temp.	Meet for the condition of above mentioned motor winding temp.		

Notes: Overload condition should not be continuous.

5 Current limitation

Current peak among motor terminals (include instantaneous current peak) should be below 20A in order to prevent magnet in motor from demagnetization.

6 Pressure difference between suction and discharge

In all allowable rotational speed range, the difference of pressure should be more than 0.39MPa{4kgf/cm²}. But if there is no problem of noise when assembled in air conditioner, it can also below this value.

7 Discharge pipe temperature

Discharge pipe temperature is measured at a distance 300mm from the surface of compressor and should be less than 110°C. The tip of the thermocouple is fixed by soldering when measuring discharge pipe temperature .Furthermore, soldering point is covered with urethane foam to prevent the effect of wind.

8 Dust of compressor hermetic terminals

Compressor hermetic terminals should be mounted with specified cover in right way to prevent dust entering, and should be used in direction which dust is hard to enter in.

9 Lead wire of compressor hermetic terminals

Measuring the temperature of hermetic terminals , lead wire should be resist to the temperature and be clamped so as not in touch with the surface of compressor and pipe.

10 Start-stop frequency

The frequency should be less than 6 times per hour. Operating time from start to stop should be more than 3 minutes. Stopping time should be more than 3 minutes.

11 Rate of rotational speed change

The rate of compressor rotational speed (acceleration) should be less than 133min⁻¹/s, But if The variable range is below 120min⁻¹, rate can also be less than 600min⁻¹ when rotational speed is reduced to avoid temporary over- current.

12 Air and moisture in refrigerating system

The degree of vacuum in refrigerating system should be less than 133Pa (998×10^{-3} mmHg) at room temperature just before charging refrigerant. The quantity of water should be less than 0.2ml.

13 Impurities in refrigerating system

- (1) The weight of residue on the inside surface of the heat exchanger and tube should be less than 0.01g/m^2 . But metallic dust should not be permitted in the system. This value means the weight of foreign residue collected by filter paper after washing inside surface of the heat exchanger tubes with R-11.
- (2) Prevent the impurities from entering into the enclosed unit system used R134a. When the impurities entered into the enclosed system, it will damage the moving mechanism parts and result in the capillary depositing.
- (3) Eliminate all system contaminants such as trichlorethylene, alkalies, soaps, oil, acids & washing fluid used at machining heat exchanger and tubes.

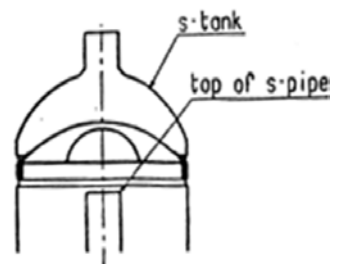
14 Compressor vacuum operation

Compressor should never be operated while under vacuum. Otherwise, internal arcing can cause damaging parts.

- 15 The compressor should be operated for more than 20 seconds within 15 minutes after charging refrigerant into the system so proper lubrication results.

16 Liquid refrigerant return limitations

- (1) Liquid refrigerant level in s-tank should be lower than the top of s-pipe in s-tank. (see chart at right)



- (2) There should not exist noise of the liquid refrigerant compression, current and vibrancy increase. System can append the assistant tank or reduce the amount of refrigerant to prevent from liquid refrigerant compression. Refrigerant system forbid liquid refrigerant from flowing back compressor in any case. In normal condition the overheat gas refrigerant

should flow back compressor.

- 17 Purge parts with dry nitrogen or dry air to remove remains in parts (dust, detergent, etc.) before assembly of system. Time for purging: over one second for pipe; over three seconds for heat exchanger. Purging pressure: 0.9 ± 0.1 MpaG. Dew point of dry air: Below -20°C .

The motor winding temperature should be less than 149°C and hermetic terminal body temperature should be less than 177°C in process of manufacturing.

- 18 Apply for vehicle

The compressor should not be used on moving equipment such as automobiles, trains, ships, etc.

- 19 Installation

The rotational axis of compressor should be kept vertical during operation. But in actual application the axis incline must be within 5° at all directions during operation.

- 20 Pipe vibration

The displacement of the pipes, which connect from the compressor to other parts of the refrigeration systems, should be less than 0.8mm ($1/32''$) when the compressor is operating at allowable rotational speed range and voltage range of rated $\pm 10\%$.

Displacement in excess of 0.8mm ($1/32''$) will require changing tube length and/or routing.

- 21 Connecting tube design

In designing and routing tubing that connect from the compressor to the other parts of the air conditioner, following should be considered.

Moving tubes to the moving parts; minimum clearance 12.7mm ($1/2''$)

Moving tubes to non-moving parts; minimum clearance 9.5mm((3/8"))

Moving tubes never touch to lead wire.

22 Miscellany

(1) The compressor should be carried carefully to avoid drop, drag, impact and should not apply partial force on projection parts such as pipe, hermetic terminals, foot during carrying and processing.

(2) The compressor should not be operated to form a vacuum and to absorb air. The compressor only can run in one direction which according to lead routing wiring diagram. Never reversion otherwise the compressor will be in trouble.

(3) The compressor should not be left opened in the atmosphere for more than 5 minutes.

When the air entered into the unit system with refrigerant R134a, it will expedite the deterioration of the oil and result in the capillary depositing and the reducing of insulation resistance.

(4) Electric pulse should not be applied to compressor when it is in vacuum.

(5) The compressor should be kept in the place with low-dust, low-moisture.

(6) The compressor can't be used in the place with corrosive atmosphere such as hot spring and chemical warehouse. It should not be the structure often splash water on the surface of the compressor forcibly.

(7) The trouble of cross valve, electromagnetic valve, defroster, refrigerant controller,

fan motor used in refrigerating system may cause compressor accident. So their reliability should be ensured completely. Moreover, the way of design, manufacture, application of refrigeration cycle with less-leak should be adopted.

(8) The main electric circuit should be equipped with fuse or breaker.

(9) Refrigerant should be charged from the end of condenser of refrigerating systems. Never Charge refrigerant to the compressor directly.

The refrigerant should always be charged in liquid state. When the refrigerant is charged in gas state, The percent component will possibly be changed. Do not recharge with the remaining refrigerant in the system when leakage happened. Because the percent component of the refrigerant in the unit system had possibly been changed.

(10) Temperatures within systems during stable compressor operation should not be less than -35°C to prevent wax precipitation from the oil.

(11) The units of refrigerating system should be connected to earth.

(12) Compressor mounting

Rubber grommets are designed soft to provide the noise isolation and to lessen vibration Energy transmission. Stud bolt should be designed to provide sufficient clearance for noise and vibration isolation and to prevent compressor from coming off its mount.

(13) There should be 0.5~3mm clearance between the under—surface of Push-Nut and the upper surface of rubber grommets.

(14) SHEC will not take any responsibility against accident that is caused by the accessories equipped by yourselves.

(15) The hermetic terminals of compressor should not be inserted slantingly and not be applied twisting force after inserting so as to avoid reducing of terminal fixed force.

(16) The pipe and hermetic pens attached to the compressor should not be bent.

(17) The dropped compressor can't be used anymore.

(18) Compressor can be used when ambient temperature is higher than -10°C . Confirm the start-up of compressor if the temperature of compressor surface is below -10°C . Heat up compressor to reach the temperature higher than -10°C with heater if the ambient temperature is below -10°C .

(19) Set a thermistor on the case cover of compressor to prevent from accident of leakage of refrigerant.

The thermistor can stop the operation of compressor when compressor in abnormal temperature.

The lead wires of thermostat is enveloped with tube, as same as that of the terminals, to avoid direct contact with the compressor and pipe.

(20) The compressor should not be splashed with water intentionally. Prevent moisture from entering into the enclosed unit system. When the moisture entered into the unit of the refrigerant R407C, the refrigerant oil and the organic compound material presented in the hermetic motor will possibly decompose on the affecting of water. It will result in the capillary depositing and the reducing of insulation resistance.

It is necessary to install a dryer to dehumidify the residual moisture mixed in the refrigerant in the cycling system. The specially defined molecular-sieve dryer is advised.

(21) Use the refrigerant of specified brand. When the refrigerant not specified used, it will possibly cause trouble of the performance and reliability of the compressor by the impurities in the refrigerant.

(22) The lead wires should be connected to hermetic terminals without being touched on the surface of the compressor.

(23) Be careful of avoiding oxide scale while soldering during assembly of refrigerating system.

(for example: flow or fulfill dry nitrogen)

(24) The quantity and kind of contamination (the process materials) in the cycle should be grasped and managed. Carry on reliability test that input contamination a lot than anticipated contamination quantity.

(25) To avoid water and impurity into the refrigeration system and make sure no leakage of refrigerant during the operating course. It's required to direct the erector and maintenance man of air-conditioner.

(26) The start-up current and torsion of compressor
Adjust the start-up current of the compressor to get enough torsion by inverter. Confirm and measure the start-up current if change the parts and design.

(27) The thickness of the refrigerating system using tube the tube thickness as followed

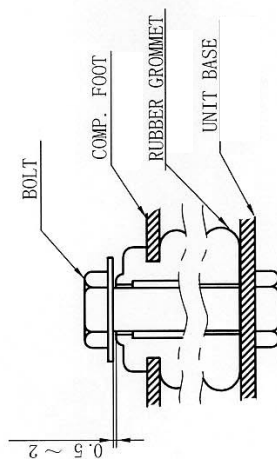
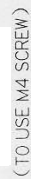
external diameter(mm)	6.35	6.35~11.0	11.0~13.0	13.0~15.0	15.0~19.0
Thickness (mm)	0.5	0.5	0.6	0.6	0.8

1. Basis for Checking upon Delivery

The Performance test will be carried out in accordance with this “compressor Specification”.
The Safety Performance in accordance with GB4706.1 Safety of household and similar electrical appliances General requirements and GB 4706.17 Safety of household and similar electrical appliances Particular requirements for motor-compressor.

2. Rule for Checking upon Delivery

If come across any quality problem, please notify the company in written form within 30 days after the arrival of the cargo, the company shall exchange exactly the number of the products, otherwise they shall be regarded as being up to standard.

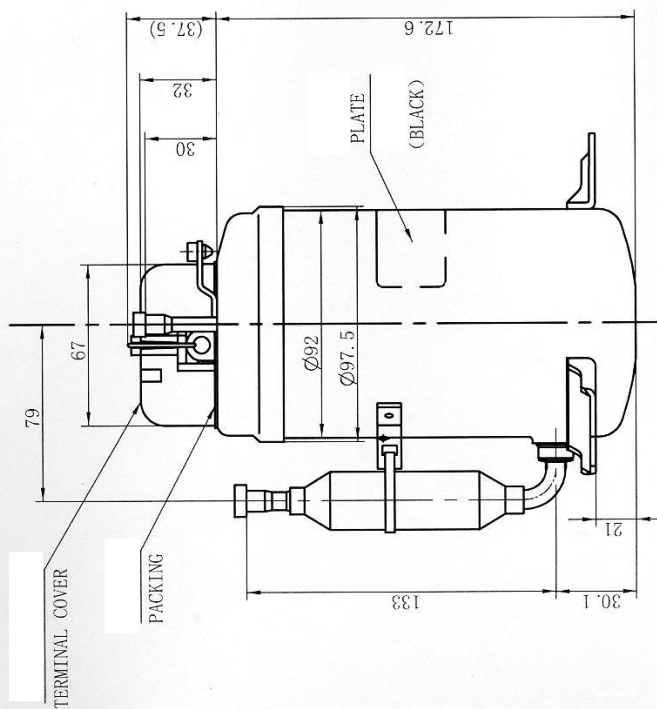



RUBBER GROMMET STRUCTURE

THE CONCRETE APPEARANCE IS
SUBJECT TO MATERIAL OBJECT

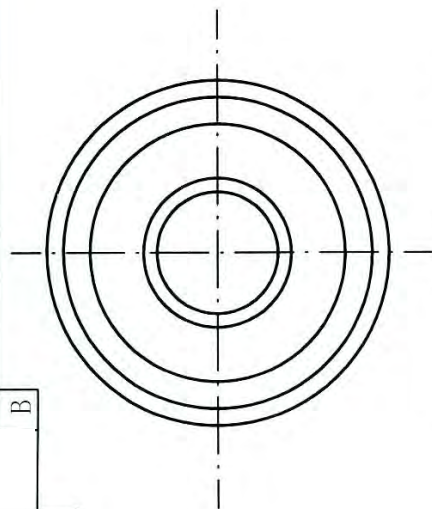
DIMENSION: mm

BSA586SDMY3FJ			

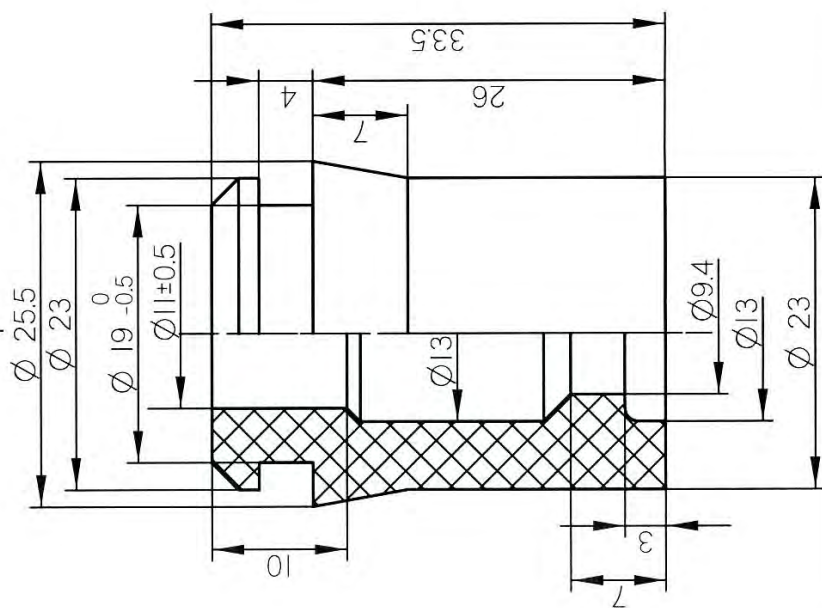




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		APPD.	2012. 10. 25				
					4CYCA0037		

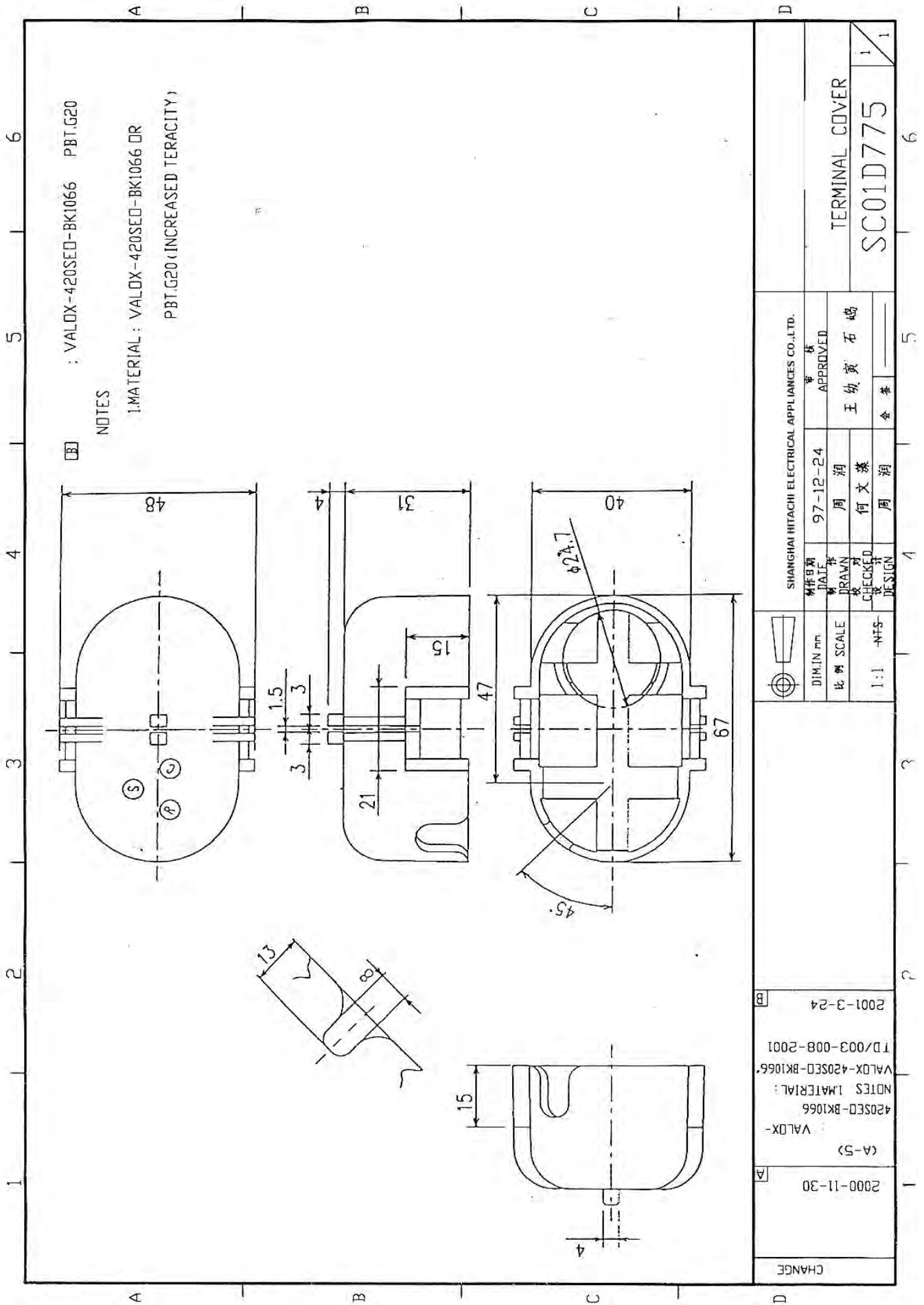
4CYC01030



2..HARDNESS: Hs40

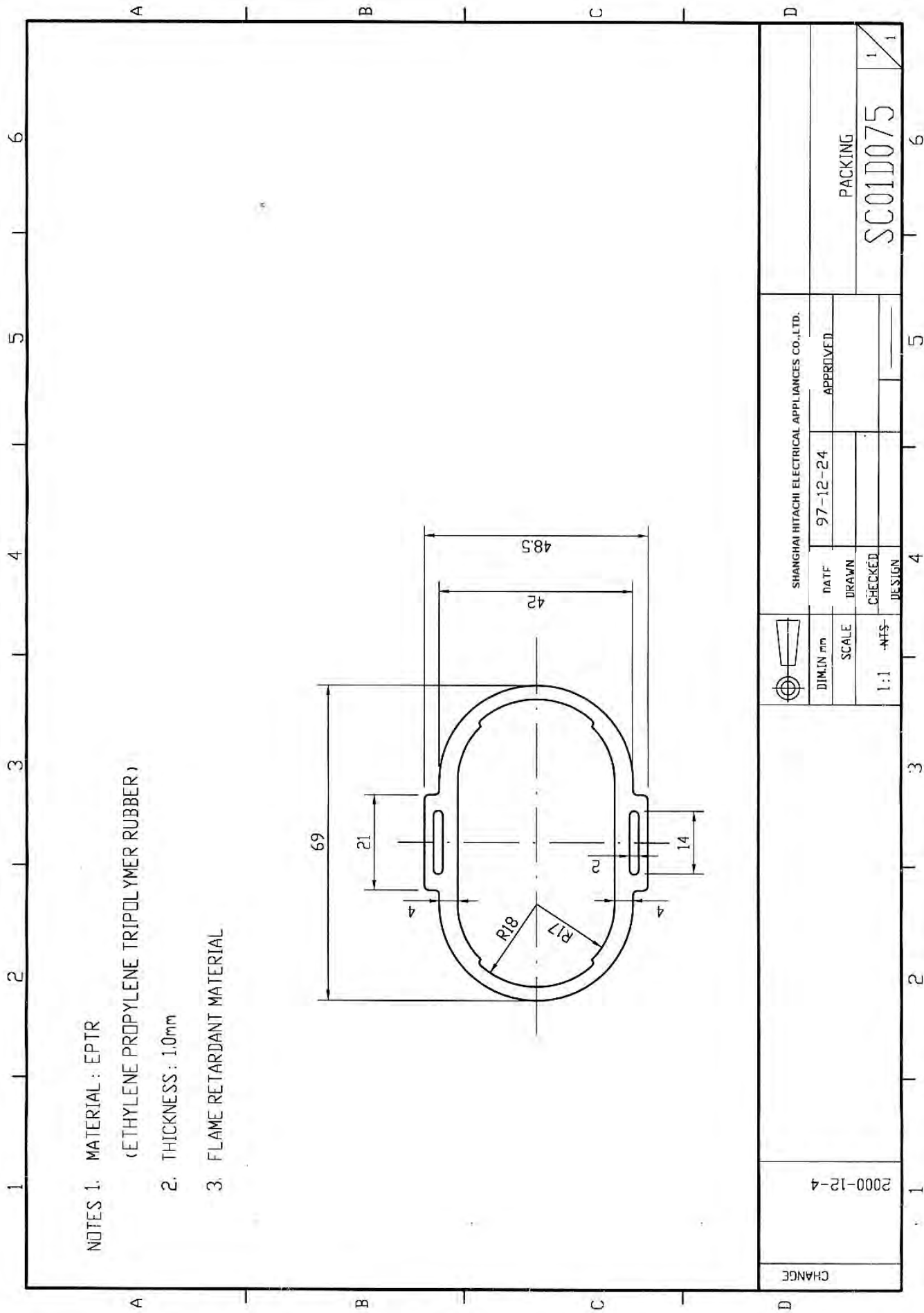


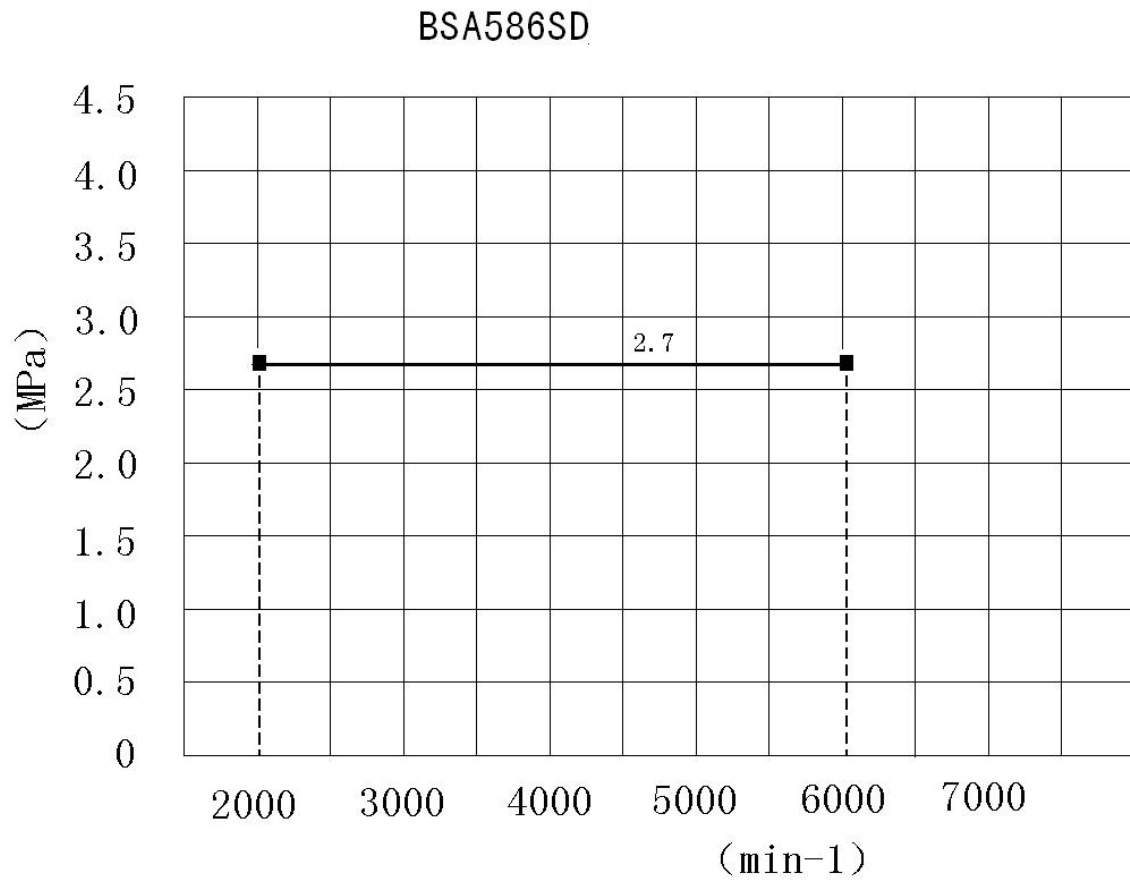
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	CHKD.	200-11-12				
	APPD.	200-11-12				
				shanghai		
				Hitechi Ltd.		



1.MATERIAL: SUS 304 WPb ϕ 1.2

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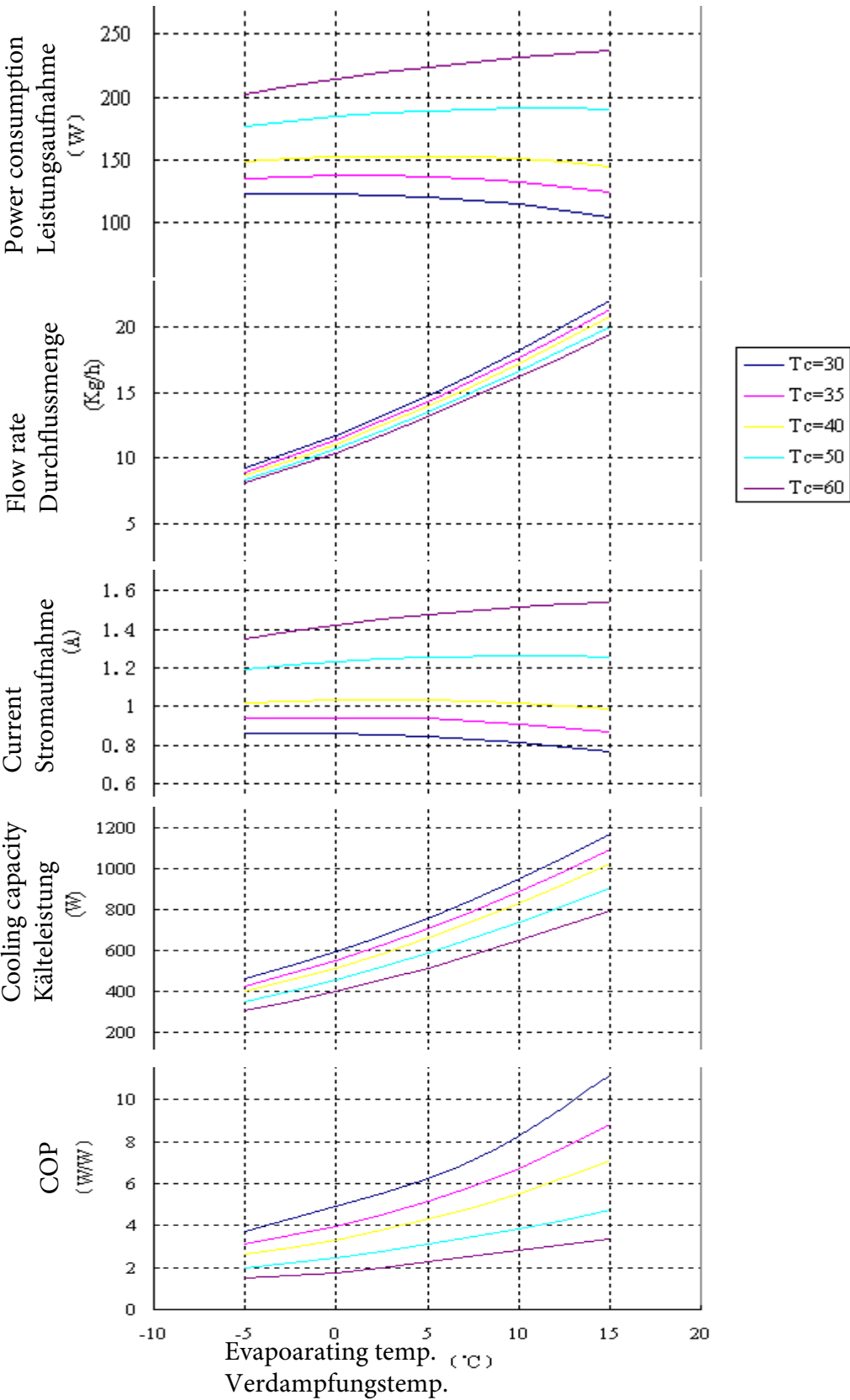


Compressor running speed range: Min 2000min⁻¹~Max 6000min⁻¹
: Min 2000 min⁻¹~Max 6000min⁻¹

Rotational speed	Pd limit
2000	2.7
6000	2.7

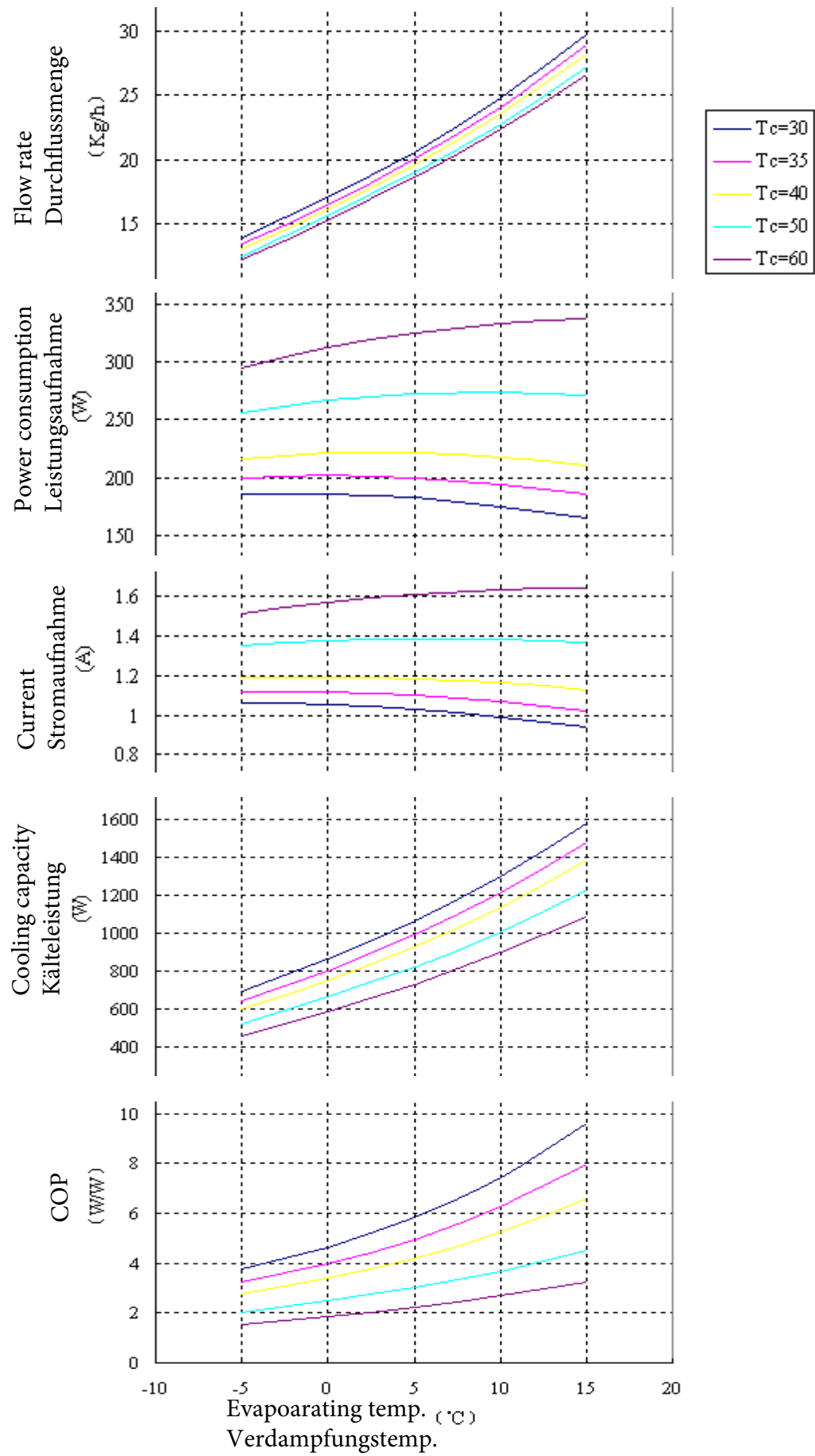
Leistungsdiagramm BSD586SD
Capacity diagram

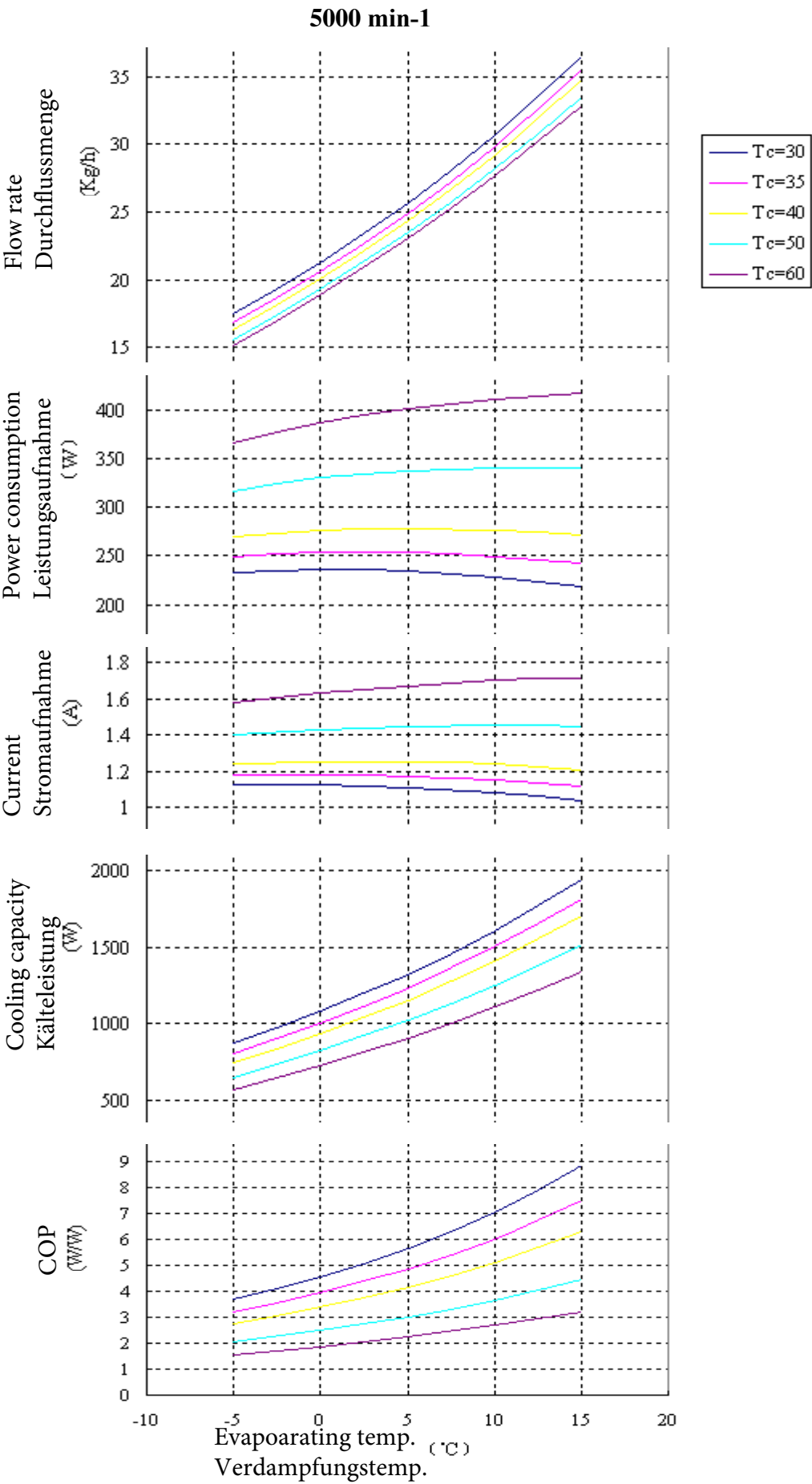
3000 min-1



Leistungsdiagramm BSD586SD
Capacity diagram

4200 min-1





6000 min⁻¹

