



Tecumseh

VS5614W-XG1A

VS5614W-XG1A

Product Family	VS Series Scroll Compressors
Application	AC, HBP
Voltage	380-420V 3PH 50Hz, 460V 3PH 60Hz
Refrigerant	R-22, R-407C
Product Technology	Scroll





1 Specification

1.1 Basic Specification

Model	VS5614W-XG1A (Including Extended Model)
Type	Low Side Shell Design Scroll Compressor
Application	Air conditioning
Refrigerant	R407C
Displacement(cc/rev)	189.1
Cooling Capacity(W) ^(a)	34080
Input Power(W) ^(a)	10240
RLA(A) ^(a)	17.8
Cooling COP(W/W) ^(a)	3.33
Power Supply	380-420V/3~/50Hz or 460V/3~/60Hz
Min. Operating Voltage(V)	342
Max. Operating Voltage(V)	462
LRA(A)	121
Max. Operating Current(A) ^(b)	25.3
Rated Speed(r/min) ^(a)	2900
Compressor Weight(With Oil)(kg)	54
Oil Type	POE
Oil Kinematic Viscosity(cSt, 40°C)	32
Oil Density(kg/L, 20°C)	0.977
Primary Charge(L)	3.0
Recharge(L)	2.85
Oil Circulation Rate ^(a)	≤1%
Rated Sound(Sound Power)(dBA) ^(c)	75
Max. Operating Sound in Running Envelope (Sound Power)(dBA)	80
Vibration Displacement Peak-Peak(mm) ^(d)	≤0.12
Moisture(mg)	≤1500
Impurity(mg)	≤180
LVS(V) ^(e)	323
MOV (V) ^(f)	342
Start Capacitor(μF/V)	/
Start Relay	/
Run Capacitor(μF/V)	/
IP Class of Terminal Box	IP54
Compressor Color	Black



1.2 Motor Parameters

Motor Type	Three-phase asynchronous motor
Motor Pole	2
Motor Insulation Class(°C)	130(B Class)
Line to Line Resistance UV(CS)(Ω, 25°C)	1.06(±10%)
Line to Line Resistance UW(CR)(Ω, 25°C)	1.06(±10%)
Line to Line Resistance VW(SR)(Ω, 25°C)	1.06(±10%)
Dielectric Strength	2000VAC / 1s / 50Hz, Leakage Current≤5mA
Insulation Resistance(MΩ)	≥20
Ground Resistance(Ω)	≤0.1

1.3 Safety Operating Limit

Tightness Test Pressure(MPa)	3.8-4.0
Max. Operating Pressure	
High Side(MPa)	H3.0/L2.0
Low Side(MPa)	
Compressor FreeSpace(Without Oil)	
High Side(L)	H0.9/L6.3
Low Side(L)	
Max. Refrigerant Charge(kg)	See Notes
Discharge Temperature Limit(°C)	≤125 (120mm to compressor discharge connection and well insulated)
Start-Stop Interval	See Notes

Performance Condition:

Condition	Condition Description
a	Rated Condition
b	Max. Load Condition, 90% Rated Voltage
c	Rated Condition, A Weighted Sound Power
d	Rated Condition, Max Operating Normal Displacement of Compressor Housing
e	Discharge Pressure and Suction Pressure: Saturated Refrigerant Pressure at 40°C
f	Max. Load Condition



2 Rated Condition, 48 Hours Break-in-Running before implementing Performance and Sound Testing

Item	Rated Condition	Max. Load Condition
E.T.(°C)/C.T.(°C)/S.H.(K)/ S.C.(K)/A.T.(°C)	7.2/54.4/11.1/8.3/35	11.9/65.5/11.9/8.3/46.1
Cooling Capacity Deviation	≥95.0%	-
Power Deviation	≤105.0%	-
COP Deviation	≥95.0%	-

3 Internal Protector

Protection Method	Config	Parameter		
		Vendor	Vendor1	Vendor2
Internal Overload Protector	With	Model	35HM568-XX	UP28KY05B-XX
		Open Temp.(°C)	130±5	120±5
		Close Temp. (°C)	61±9	60±10
		Short Time Trip	87A	90A
			2-10s	3-10s
Internal Pressure Relieve Valve	With	2.76-3.10MPa		

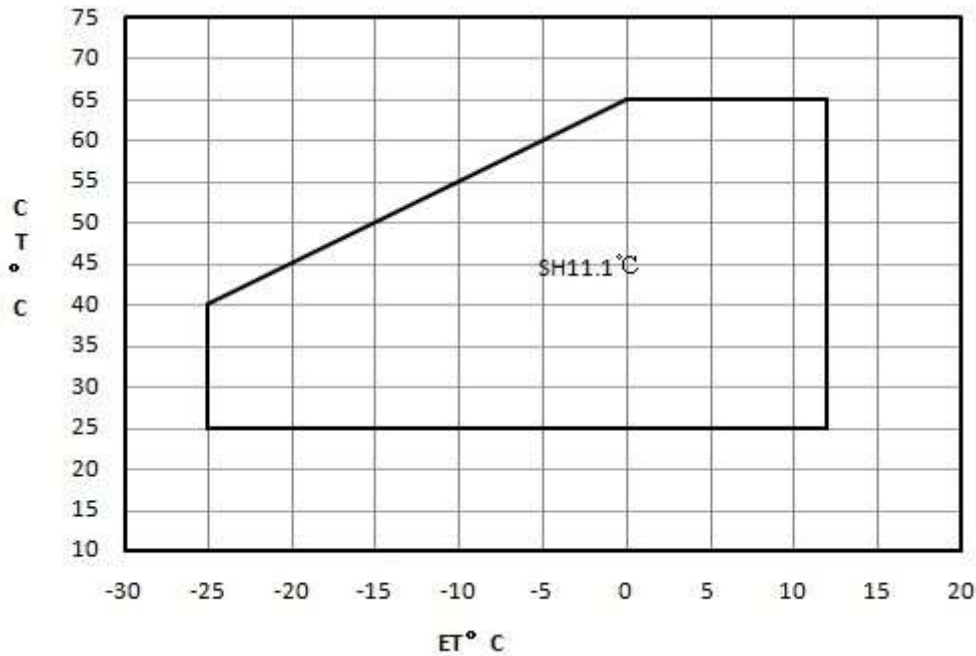
4 Accessory

VS5614W-XG1A			
Item	Name	P.N.	PCS
1	Grommet	070-0003-00	4
2	Sleeve	010-0014-00	4
3			
4			
5			



5 Compressor Operating Envelope

5.1 Compressor Operating Envelope



5.2 EVI control logic(only for EVI module)

- Recommend system subcooling 5K
- $DLT \leq 95^{\circ}\text{C}$, control superheat of injection line=5K
- $DLT > 95^{\circ}\text{C}$, control $DLT=95^{\circ}\text{C}$
- Max injection pressure $\leq 2.0\text{MPa}$

6 Compressor Performance Sheet

- Performance Based on Superheat is within the Operating Envelope, Subcooling after Condenser is 8.3K;
- Performance Calculated by Coefficients of Polynomial is Only Suitable for the Condition within Operating Envelope
- Capacity, Power can be Calculated by Coefficients of Polynomial



6.1 Performance Table

Item	E.T.(°C)	-20	-10	0	10
	C.T.(°C)				
Heating Cap.(W) (Cooling Cap.)	50				
	40				
	30				
Cooling Cap. (W)	50	11723	18639	27745	39550
	40	13319	20843	30688	43362
	30	14871	22890	33361	46792
Power(W)	50	9049	9244	9327	9439
	40	7209	7462	7597	7757
	30	5779	6067	6233	6419

6.2 Ten Coefficients of Polynomial

Expression	$z = p_0 + p_1*x + p_2*y + p_3*x^2 + p_4*x*y + p_5*y^2 + p_6*x^3 + p_7*x^2*y + p_8*x*y^2 + p_9*y^3$		
Description	z: Cooling Capacity(W) or Power (W) Specially: Heating Capacity(W)=Cooling Capacity(W)+Power (W) x: E.T. °C y: C.T. °C p0~p9: Coefficients of Polynomial		
Cooling Cap. Factor	Value	Power Factor	Value
p0	39828.20544	p0	2645.710254
p1	1326.6208	p1	10.174297
p2	-178.1248	p2	140.84464
p3	16.76736	p3	0.02811
p4	-2.97632	p4	0.502113
p5	-1.21542	p5	-1.555742
p6	0.084734	p6	0.023793
p7	-0.065508	p7	0.00241
p8	-0.056301	p8	-0.011177
p9	-0.001106	p9	0.028225

Notes: Coefficients of polynomial are based on the fitting results of some sample data, which can be used as a reference of compressor selection, but cannot completely eliminate customer's test.



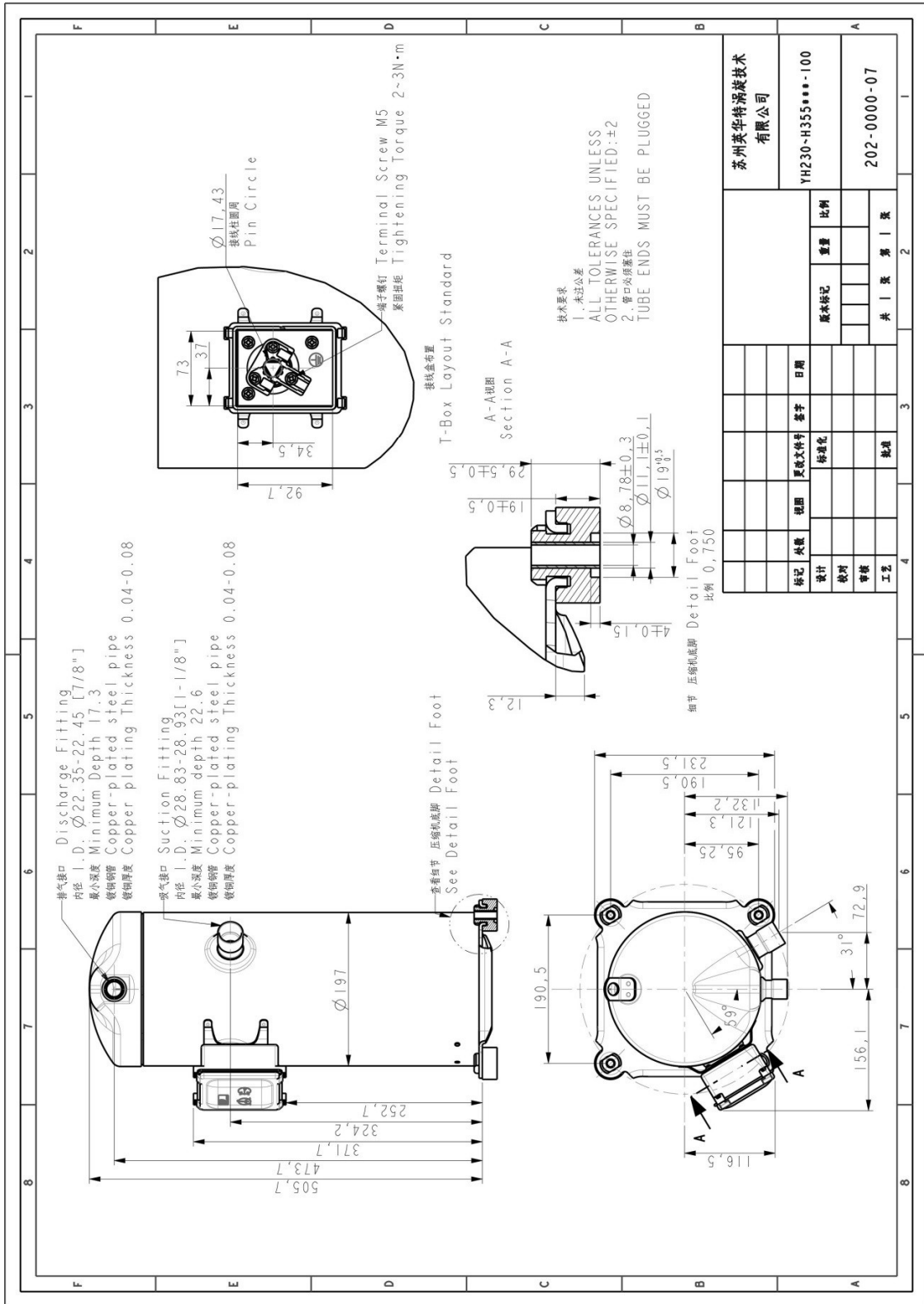
7 Notes

- 7.1 It is not allowed to perform vacuum in the system by using the refrigeration compressor. The compressor can start only after the refrigerant is charged. In some cases, such as on the field site, if it is limited by the situation that can't charge the required volume of refrigerant, 50% of the required refrigerant is charged necessary before the compressor starts. Double check the system and make sure everything is under safe status, then power on the compressor and charge the remained refrigerant when the compressor is running.
- 7.2 It is not allowed to charge the refrigerant from the suction or discharge line closer to the compressor. The charge port should be arranged on the connection pipe of suction line accumulator or receiver, which is on the side far away from the compressor, to avoid the liquid refrigerant flood back.
- 7.3 Refrigerant charge limitation: the ratio between the weight of oil and refrigerant should be ≥ 0.4 .
- 7.4 It is not allowed to vacuum by compressor, not allowed to run the compressor without refrigerant, and not allowed to run the compressor in the reversed direction for long duration.
- 7.5 The compressor can only work with approved refrigerant.
- 7.6 The compressor is not allowed to work outside its envelope, the system should guarantee the suction line superheat and avoid the liquid refrigerant flood back.
- 7.7 When the suction and discharge plugs are removed, the assembly and brazing should be done in 15 minutes.
- 7.8 The frequently start/stop should be avoided. The suggested minimum continuous running time is 10 minutes to guarantee the safe oil level ($\geq 50\%$ initial charge volume), the suggested minimum interval duration between start and stop is 3 minutes.
- 7.9 The deviation of supplied voltage should be less than $\pm 10\%$ of rated voltage.
- 7.10 A 90W crankcase heater is recommended to avoid the refrigerant migration during the off cycle and flood start. The crankcase heater should be powered on 12 hours earlier than the first start or restart after long duration off.
- 7.11 The system should be equipped with necessary protection devices, such as pressure, temperature, oil return, overcurrent and phase fault, etc.
- 7.12 The compressor is not allowed to lay down or place upside down during transportation, stock and installation. The maximum inclination is 15° when the compressor is running.



8 Drawings

8.1 Outline Drawing





8.2 Sleeve Drawing

6	5	4	3	2	1
<p>技术要求：</p> <p>1. 未注单位：mm</p> <p>2. 材料：镀锌钢管；镀锌层厚度：0.0025-0.0070mm 板厚：1.1-1.3mm；</p> <p>3. 未注公差IT12；</p>					
D	C	B	A		
<p>苏州英华特涡旋技术有限公司 有限公司</p>			<p>镀锌钢管</p>		
<p>导套</p>			<p>010-0014-00</p>		
<p>设计</p>			<p>版本标记</p>		
<p>校对</p>			<p>重量</p>		
<p>审核</p>			<p>比例</p>		
<p>工艺</p>			<p>3:1</p>		
<p>批准</p>			<p>共 1 张 第 1 张</p>		
<p>标准</p>			<p>2</p>		
<p>日期</p>			<p>3</p>		
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<p>视图</p>			<p>6</p>		
<p>外数</p>			<p>7</p>		
<p>标记</p>			<p>8</p>		



8.3 Grommet Drawing

