INVOTECH
CENTRO DE DISTRIBUCIÓN MÉXICO
INNOVATION HVAC/R SOLUTION

SCROLL COMPRESSOR
TECHNICAL DATASHEET: YF13E3G-Q100

ISO 9001:2015

Basic Specification	
Model	YF13E3G-Q100
Type	Low Side Shell Design Scroll Compressor
Application	Refrigeration
Power	2 HP
Capacity (BTU/Hr)	5386
Refrigerant	R448A/R449A
Displacement(cc/rev)	33.3
Cooling Capacity(W)[a]	1578
Input Power(W)[a]	1453
RLA(A)[a]	6.7
Cooling COP(W/W)[a]	1.09
Power Supply	208-230V/1~/60Hz
Min. Operating Voltage(V)	187
Max. Operating Voltage(V)	253
LRA(A)	76
Max. Operating Current(A)[b]	13.0
Rated Speed(r/min)[a]	3500
Compressor Weight (With Oil)(kg)	31
Oil Type	POE
Oil Kinematic Viscosity(cSt, 40°C)	32
Oil Density(kg/L, 20°C)	0.977
Primary Charge(L) Recharge(L)	1.4 1.25
Oil Circulation Rate[a]	≤1%
Rated Sound(Sound Power)(dBA)[c]	73
Max. Operating Sound in Running Envelope (Sound Power)(dBA)	78
Vibration Displacement Peak-Peak(mm)[d]	≤0.09
Moisture(mg)	≤500
Impurity(mg)	≤80
LVS(V)[e]	177
MOV (V)[f]	187
Start Capacitor(μF/V)	160
Start Relay	HLR3800-4AI3D
Run Capacitor(μF/V)	40/450
IP Class of Terminal Box	IP21
Compressor Color	Black

Motor Parameters	
Motor Type	Single-phase asynchronous motor
Motor Pole	2
Motor Insulation Class(°C)	130(B Class)
Line to Line Resistance UV(CS)(Ω, 25°C)	1.519(±10%)
Line to Line Resistance UW(CR)(Ω, 25°C)	0.67(±10%)
Line to Line Resistance VW(SR)(Ω, 25°C)	2.189(±10%)
Dielectric Strength	2000VAC / 1s / 60Hz, Leakage Current≤5mA
Insulation Resistance(MΩ)	≥20
Ground Resistance(Ω)	≤0.1

Safety Operating Limit	
Tightness Test Pressure (MPa)	3.8-4.0
Max. Operating Pressure	
High Side(MPa) Low Side(MPa)	H3.2/L2.0
Compressor FreeSpace(Without Oil)	
High Side(L) Low Side(L)	H1.0/L3.6
Max. Refrigerant Charge(kg)	See Notes
Discharge Temperature Limit(°C)	≤120 (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)	-31.6/40.6/36/0/35	10/65/11.9/0/46.1
Cooling Capacity Deviation	≥90.0%	-
Power Deviation	≤110.0%	-
COP Deviation	≥90.0%	-

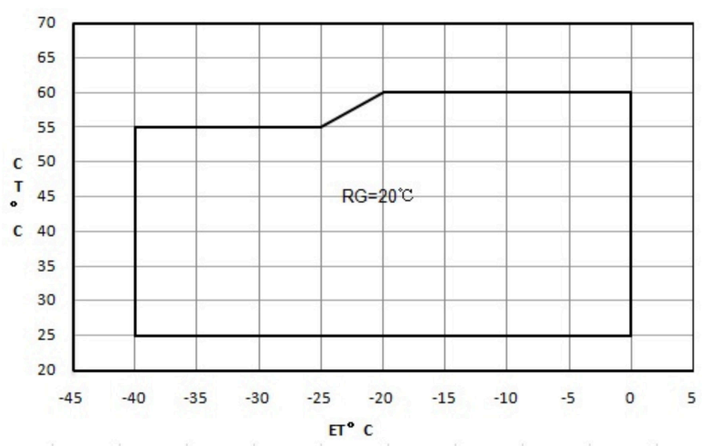
3. Internal Protector

Protection Method	Config	Parameter		
Internal Overload Protector	With	Vendor	Vendor 1	Vendor 2
		Model	15HM2495-XX	
		Open Temp.(°C)	105±5	
		Close Temp. (°C)	61±9	
		Short Time Trip	65A 2-10s	A S
Internal Pressure Relieve Valve	Without	-MPa		

4. Accessory

Item	Name	P.N.	PCS
1	Grommet	070-0003-00	4
2	Sleeve	010-0014-00	4
3	StartBox	110-0076-02	1
4	TREV	100-0002-01	1

5. Compressor Operating Envelope



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

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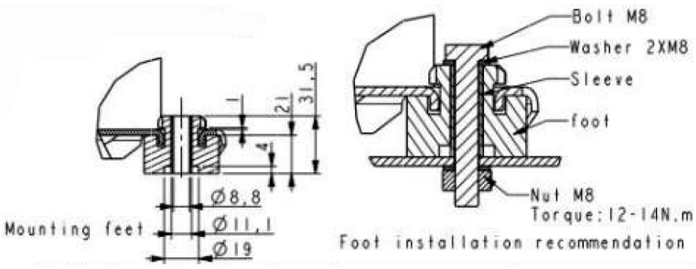
Performance Table										
Item	E.T.(°C) / C.T.(°C)	-40	-35	-30	-25	-20	-15	-10	-5	0
Cooling Cap. (W)	60					2259	2767	3364	4066	4886
	55	940	1247	1592	1990	2455	3003	3648	4405	5288
	50	1036	1353	1715	2138	2636	3223	3915	4726	5671
	45	1121	1447	1826	2273	2802	3428	4167	5031	6038
	40	1196	1531	1926	2396	2956	3620	4404	5322	6389
	35	1264	1607	2017	2509	3099	3801	4630	5600	6726
	30	1327	1676	2100	2615	3234	3973	4846	5867	7052
	25	1385	1741	2179	2714	3362	4137	5053	6125	7369
Power (W)	60					2574	2572	2580	2601	2637
	55	2214	2217	2222	2229	2241	2260	2288	2326	2377
	50	1864	1892	1919	1947	1977	2011	2052	2101	2160
	45	1595	1642	1685	1726	1768	1811	1859	1912	1974
	40	1393	1451	1504	1553	1600	1646	1694	1746	1803
	35	1243	1307	1364	1414	1459	1502	1544	1588	1635
	30	1132	1196	1250	1294	1332	1366	1396	1425	1455
	25	1047	1104	1148	1182	1206	1223	1234	1243	1250

Ten Coefficients of Polynomial			
Expression	z = p0 + p1*x + p2*y + p3*x^2 + p4*x*y + p5*y^2 + p6*x^3 + p7*x^2*y + p8*x*y^2 + p9*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	8867.270034	p0	-637.7599622
p1	326.4727198	p1	-41.88508586
p2	-58.9976043	p2	117.9737965
p3	4.455411373	p3	-0.222429708
p4	-2.31587065	p4	2.363128069
p5	0.022518232	p5	-2.157745674
p6	0.019602695	p6	0.002546807
p7	-0.02968702	p7	0.009278266
p8	-0.00292411	p8	-0.025313717
p9	-0.00241818	p9	0.01835073

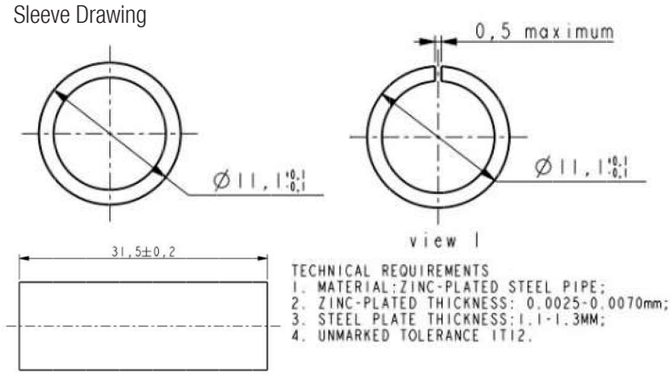
Notes: Coefficients of polynomial are based on the fitting results of some sample data, which can be used as a reference of compressor selection, but cannot completely eliminate customer's test.

Notes

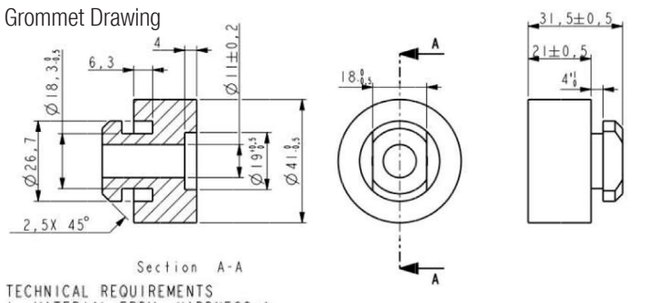
- » It is not allowed to perform vacuum in the system by using the refrigeration compressor.The compressor can start only after the refrigerant charged. In some cases, such as on the field site, if it is limited by the situation that can't charge the required volume of refrigerant, 50% of the required 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.
- » It is not allowed to charge the refrigerant from the suction or discharge line closes 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 to the compressor, to avoid the liquid refrigerant flood back.
- » Refrigerant charge limitation: the ratio between the weight of oil and refrigerant should be >=0.4.
- » It is not allowed to vacuum by compressor, not allowed to run the compressor without refrigerant, and not allowed to run the compressor on the reversed direction for long duration.
- » The compressor can only work with approved refrigerant.
- » 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.
- » When the suction and discharge plugs are removed, the assembly and brazing should be done in 15 minutes.
- » The frequently start/stop should be avoided. The suggested minimum continuous running time is 10 minutes to guarantee the safe oil level (>=50% initial charge volume), the suggested minimum interval duration between start and stop is 3 minutes.
- » The deviation of supplied voltage should be less than +/-10% of rated voltage.
- » A 70W crankcase heater is recommended to avoid the refrigerant migration during the off circle and flood start. The crankcase heater should be power on 12 hours earlier than the first start or restart after long duration off.
- » The system should be equipped with necessary protection devices, such as pressure, temperature, oil return, overcurrent and phase fault, etc.
- » 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.



Sleeve Drawing

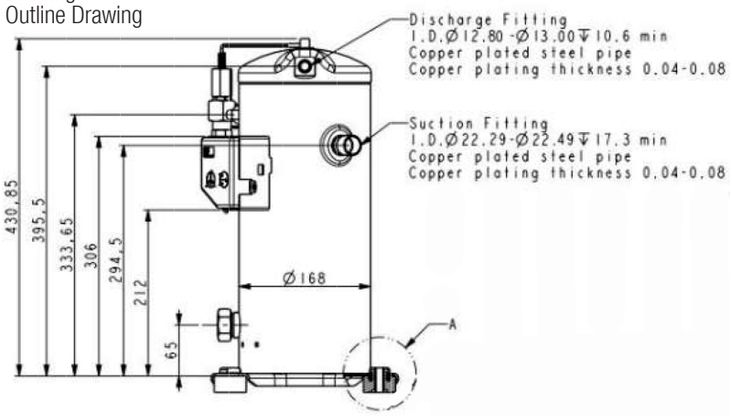


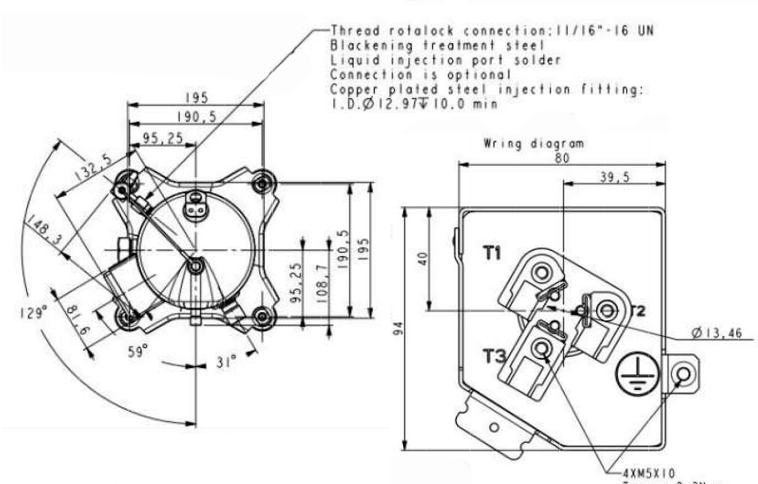
Grommet Drawing



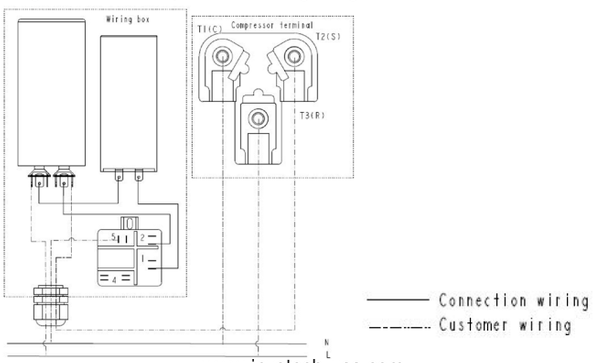
Drawings

Outline Drawing





Single Phase Compressor Wiring Diagram



Application

- » See Details in the YF serial LBP refrigerant scroll compressor application manual