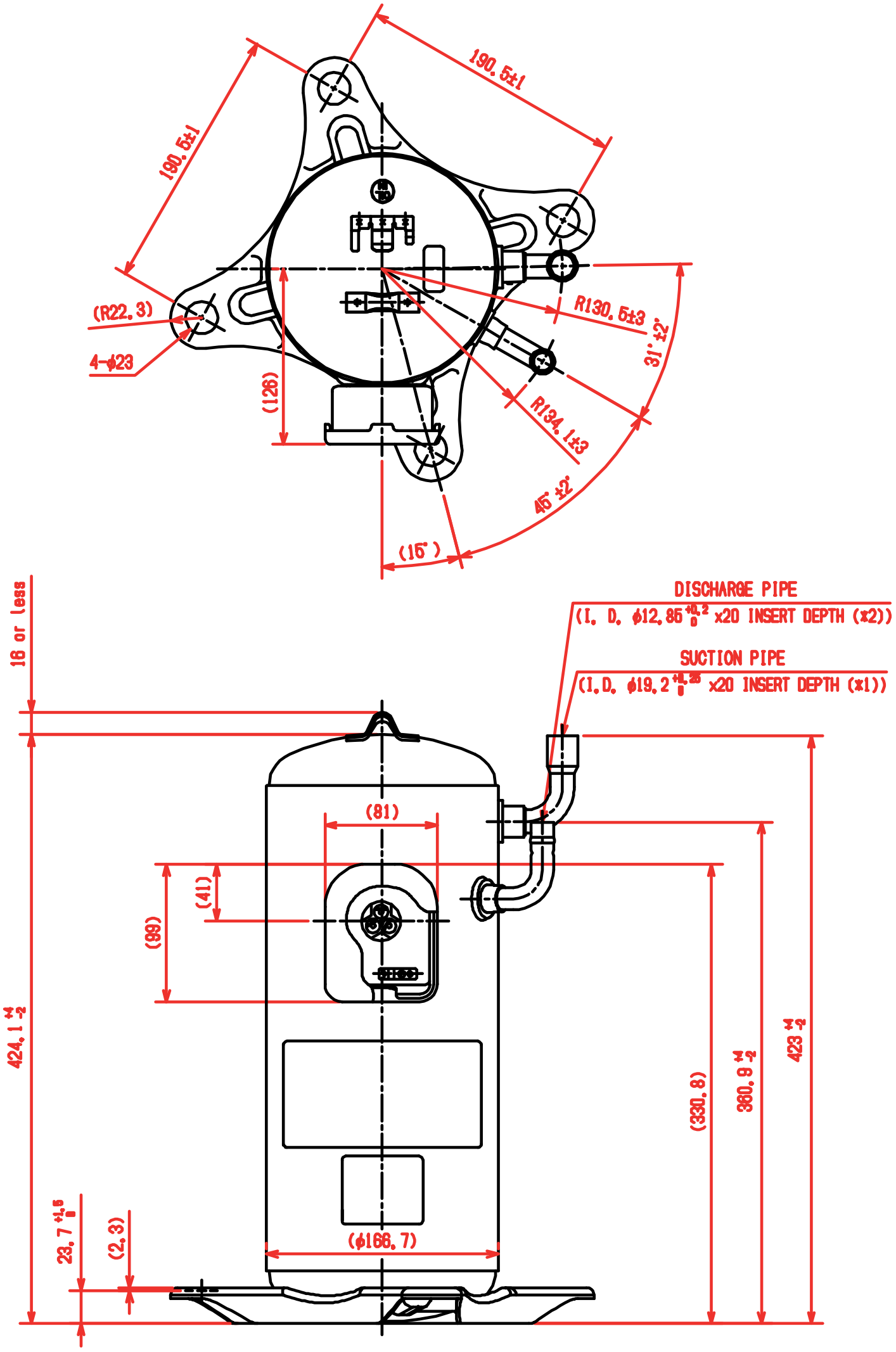
R-32 & R-290 Inverter Scroll for HVAC Application Specifications

APB Inverter Scroll Compressor for R-290

Models	Capacity Range (min ~ max)						Performance at 60 rps						Weight (kgs.)	Oil (cc.)	Drawing Number
							Capacity		Input		COP.	EER.			
	Watt		Kcal/hr		BTU/hr		W	BTU/hr	Watt	Amps	(w/w)	(Btu/hr*w)			
a) DC Inverter 200 Volt															
Horizontal Suction	Min	Max	Min	Max	Min	Max									
APB33FABMT(15-120 RPS)	1,500	10,500	1,290	9,028	5,118	35,826	5,100	17,401	1,650	5.90	3.09	10.55	30.4	900	14
APB42FABMT(15-120 RPS)	2,000	14,100	1,720	12,123	6,824	48,109	6,200	21,154	2,200	8.70	2.82	9.62	30.3	900	14
APB52FABMT(15-120 RPS)	2,500	17,500	2,150	15,047	8,530	59,710	8,300	28,320	2,620	9.20	3.17	10.81	30.5	900	14
b) DC Inverter 400 Volt															
Horizontal Suction	Min	Max	Min	Max	Min	Max									
APB33FAAMT(15-120 RPS)	1,500	10,500	1,290	9,028	5,118	35,826	5,100	17,401	1,720	4.00	2.97	10.12	31.0	900	14
APB42FAAMT(15-120 RPS)	2,000	14,100	1,720	12,123	6,824	48,109	6,200	21,154	2,200	4.70	2.82	9.62	30.7	900	14
APB52FAAMT(15-120 RPS)	2,500	17,500	2,150	15,047	8,530	59,710	7,800	26,614	2,620	5.60	2.98	10.16	31.0	900	14

Heat pump Condition


190.5±1
190.5±1
(R22.3)
4-φ23
(126)
R130.5±3
31°±2°
R134.1±3
45°±2°
(15°)
16 or less
DISCHARGE PIPE
(I. D. φ12.85 +0.2 0 x20 INSERT DEPTH (x2))
SUCTION PIPE
(I.D. φ19.2 +0.25 0 x20 INSERT DEPTH (x1))
(81)
(41)
(99)
424.1 +4 -2
(330.8)
380.9 +4 -2
423 +4 -2
23.7 +1.5 0
(2.3)
(φ166.7)

SIAM COMPRESSOR INDUSTRY

Classification : Specification for Compressor	Written By	Wanmongkol Marathong	
	Approved By	Korakot Intraratat	
Subject : APB33FAAMT	Issued Date	2020-04-29	Revised
	Document No.	SPC18O2010.02	D

1.Compressor data

Type		Scroll
Displacement	$cm^3/rev.$	33.0
	$in^3/rev.$	2.0

2.Motor data

Motor type		BLDCM
Motor protection		External
Nominal output	W	2500
Number of pole		6
Nominal revolution	rpm	3600 (at 60rps)
Insulation class		E
Motor resistance (20 °C)	Ohm	1.21

3.Refrigerant

Type		R-290

4.Oil

Type		PZ46M
Charge amount	L (in^3)	1.40 (85.4)

5.Mass (include.oil)	kg (lbs)	31.1 (68.6)

6.Compressor power source

Rated voltage	V	103-415
Rated frequency	Hz	180 (60rps)
Running frequency	Hz	45-360 (15-120rps)
Phase	Ø	3

7.Performance

Refrigerating capacity (±5%)	W	6200	5100
	BTU/hr	21154	17401
Motor input (±5%)	W	1820	1720
COP	W/W	3.41	2.97
EER	BTU/hr.W	11.62	10.12
Current	A	3.9	4.0
Note: Conditions	°C (°F)	ARI	Heat Pump
Evaporating temp.	°C (°F)	7.2 (45.0)	-7.0 (19.4)
Condensing temp.	°C (°F)	54.4 (129.9)	50.0 (122.0)
Return gas temp.	°C (°F)	18.3 (64.9)	-2.0 (28.4)
Ambient temp.	°C (°F)	35.0 (95.0)	0.0 (32.0)
Liquid temp.	°C (°F)	46.1 (115.0)	46.0 (114.8)
Power source	rps/Hz	60/180	60/180
Cooling performance curve		SCI-CPDA145	
Cooling performance injection curve		-	
Heating performance curve		SCI-HPDA078	
Heating performance injection curve		-	

-Performance data are base on SCI's calculation at oil 900 cc.

Please follow to the general specification for APB (TDRD20M039)

Classification : Specification for Compressor	Issued Date	2020-04-29
Subject : APB33FAAMT	Document No.	SPC18O2010.02

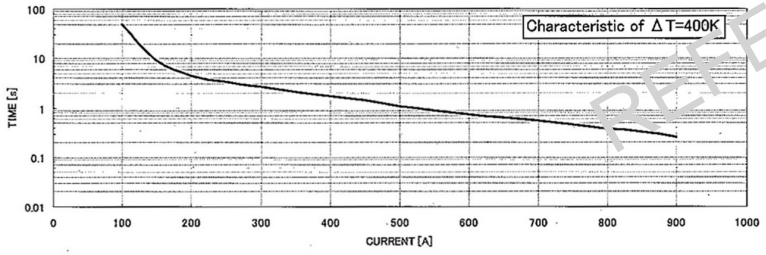
Compressor data	SC01F970	
Wiring diagram	CS01D584	
Terminal parts accessories		
Terminal parts assy	CS01F449	
Terminal cover	SC25C057H01	1 pce.
Mounting accessories		
Mounting parts	SC01D525	
Rubber mount	SC31D009H01	4 pce.
Spacer (Optional)	SC10D377H01	4 pcs.

Classification : Specification for Compressor	Issued Date	2020-04-29
Subject : APB33FAAMT	Document No.	SPC18O2010.02

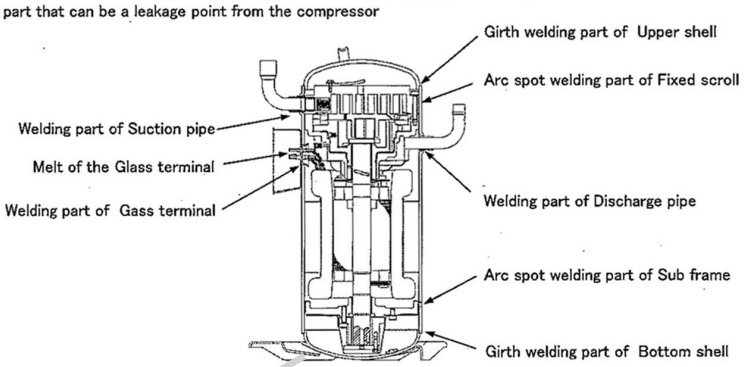
THE DATA ON COMPRESSOR SAFETY

◆ Specifications of compressor protector (for fixed speed)	
Ultimate trip current chracteristic	
Amb temp	130℃
Current	22.4～30.6A
Operating temp	
Open	170±5℃
Close	90±10℃
◆ Abnormally over current and input of compressor (at 198V)	
Current	19.4A
Input	3690W
◆ Destructive pressure of compressor shell (Hydrostatic pressure)	13.7MPa

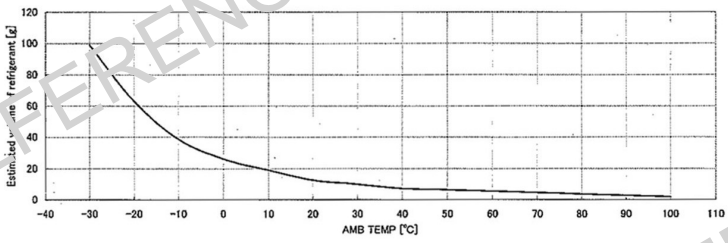
◆ Glass melting temperature curve for the glass terminal



◆ The part that can be a leakage point from the compressor



◆ Estimated volume of refrigerant remaining in oil when you expose compressor to the air



VM-CZC21

Classification : Specification for Compressor	Issued Date	2020-04-29
Subject : APB33FAAMT	Document No.	SPC18O2010.02

Pressure	
Condensing	3.15 MPaG [457 psiG] or less
Evaporating	0.07 ~ 0.69 MPaG [10.2~100.1 psiG]
Compression ratio	Follow pressure operating envelop
Abnormal rise in pressure	-
High pressure switch recommendation	-
Temperature	
Condensing temperature	Under 82 °C
Evaporating temperature	-30 ~ 18 °C
Discharge gas (max)	-30 ~ 18 °C
Suction gas superheat	Must be more than 0 °C - No liquid-back
Discharge gas superheat	10 °C or more
Outdoor ambient temp.	-
Electrical	
Reverse phase (rotation)	Not possible
ON / OFF	
ON/OFF frequency	Less than 250,000 cycles
ON/OFF cycle	-The ON/OFF cycle shall be a maximum of 10 times/hour. -OFF time shall be the time until the high side and low side pressure reach to balance pressure (more than 3 minutes)
Piping stress	34.3 N/mm² or less at start and stop condition (17.7 N/mm² during operation)
Refrigerant circuit	
Maximum refrigerant charge	Amount of refrigerant [g] < or = Amount of oil [g] x 4 (the relative density of oil : 1[g/cm^3]). Regarding operation which exceeds the above limit, consult with us.
Piping vibration	Maximum 0.8 mm.
Inclination of compressor	Within 5°
Piping	Suction & Discharge pipes are sealed with rubber plugs.
Discharge gas temp. measurement	Discharge gas temperature sensor at 340mm distance from the shell is acceptable by the test result.
Discharge gas temp. measurement	Discharge gas temperature sensor at 340mm distance from the shell is acceptable by the test result.
Accumulator installation	In case of 1.1kg refrigerant amount usage, it is not necessary to install accumulator in the circuit by the soaking start test result of sightglass compressor.

SIAM COMPRESSOR INDUSTRY

Classification : Specification for Compressor	Written By	Wanmongkol Marathong	
	Approved By	Korakot Intraratat	
Subject : APB42FAAMT	Issued Date	2021-05-07	Revised
	Document No.	SPC19O2061.02	C

1.Compressor data

Type		Scroll
Displacement	cm³/rev.	42.0
	in³/rev.	2.6

2.Motor data

Motor type		BLDCM
Motor protection		External
Nominal output	W	2500
Number of pole		6
Nominal revolution	rpm	3600 (at 60rps)
Insulation class		E
Motor resistance (20 °C)	Ohm	1.21

3.Refrigerant

Type		R-290

4.Oil

Type		PZ46M
Charge amount	L (in³)	0.90 (54.9)

5.Mass (include.oil)	kg (lbs)	30.3 (66.8)

6.Compressor power source

Rated voltage	V	103-415	
Rated frequency	Hz	180 (60rps)	
Running frequency	Hz	45-360 (15-120rps)	
Phase	Ø	3	

7.Performance

Refrigerating capacity (±5%)	W	7900	6200
	BTU/hr	26955	21154
Motor input (±5%)	W	2260	2200
COP	W/W	3.50	2.82
EER	BTU/hr.W	11.93	9.62
Current	A	4.6	4.7
Note: Conditions	°C (°F)	ARI	Heat Pump
Evaporating temp.	°C (°F)	7.2 (45.0)	-7.0 (19.4)
Condensing temp.	°C (°F)	54.4 (129.9)	50.0 (122.0)
Return gas temp.	°C (°F)	18.3 (64.9)	-2.0 (28.4)
Ambient temp.	°C (°F)	35.0 (95.0)	0.0 (32.0)
Liquid temp.	°C (°F)	46.1 (115.0)	46.0 (114.8)
Power source	rps/Hz	60/180	60/180

Cooling performance curve	SCI-CPDA154
Cooling performance injection curve	-
Heating performance curve	SCI-HPDA079
Heating performance injection curve	-

-Performance data are base on SCI's calculation at oil 900 cc.

Please follow to the general specification for APB (TDRD13F039)

Classification : Specification for Compressor	Issued Date	2021-05-07
Subject : APB42FAAMT	Document No.	SPC19O2061.02

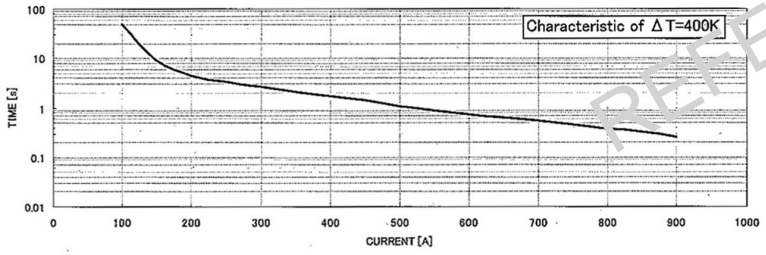
Compressor data	SC01F135	
Wiring diagram	CS01D584	
Terminal parts accessories		
Terminal parts assy	CS01F449	
Terminal cover	SC25C057H01	1 pce.
Mounting accessories		
Mounting parts	SC01D525	
Rubber mount	SC31D009H01	4 pce.
Spacer (Optional)	SC10D377H01	4 pcs.

Classification : Specification for Compressor	Issued Date	2021-05-07
Subject : APB42FAAMT	Document No.	SPC19O2061.02

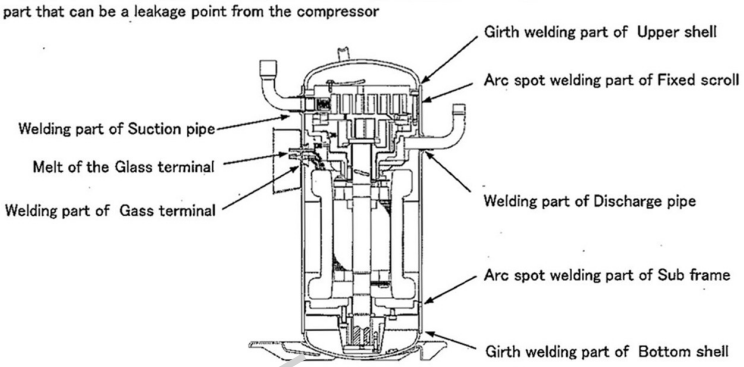
THE DATA ON COMPRESSOR SAFETY

◆ Specifications of compressor protector (for fixed speed)	
Ultimate trip current chracteristic	
Amb temp	130℃
Current	22.4～30.6A
Operating temp	
Open	170±5℃
Close	90±10℃
◆ Abnormally over current and input of compressor (at 198V)	
Current	19.4A
Input	3690W
◆ Destructive pressure of compressor shell (Hydrostatic pressure)	13.7MPa

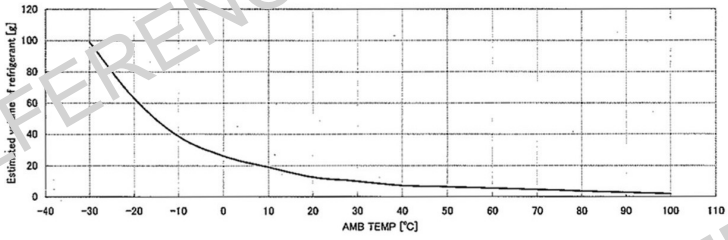
◆ Glass melting temperature curve for the glass terminal



◆ The part that can be a leakage point from the compressor



◆ Estimated volume of refrigerant remaining in oil when you expose compressor to the air



VM-CZC21

Classification : Specification for Compressor	Issued Date	2021-05-07
Subject : APB42FAAMT	Document No.	SPC19O2061.02

Pressure	
Condensing	3.15 MPaG [457 psiG] or less
Evaporating	0.07 ~ 0.69 MPaG [10.2~100.1 psiG]
Compression ratio	Follow pressure operating envelop
Abnormal rise in pressure	-
Temperature	
Condensing temperature	Under 82 °C
Evaporating temperature	-30 ~ 18 °C
Discharge gas (max)	-30 ~ 18 °C
Suction gas superheat	Must be more than 0 °C - No liquid-back
Discharge gas superheat	10 °C or more
Outdoor ambient temp.	-
Electrical	
Reverse phase (rotation)	Not possible
ON / OFF	
ON/OFF frequency	Less than 250,000 cycles
ON/OFF cycle	-The ON/OFF cycle shall be a maximum of 10 times/hour. -OFF time shall be the time until the high side and low side pressure reach to balance pressure (more than 3 minutes)
Piping stress	34.3 N/mm² or less at start and stop condition (17.7 N/mm² during operation)
Refrigerant circuit	
Maximum refrigerant charge	Amount of refrigerant [g] < or = Amount of oil [g] x 4 (the relative density of oil : 1[g/cm^3]). Regarding operation which exceeds the above limit, consult with us.
Piping vibration	Maximum 0.8 mm.
Inclination of compressor	Within 5°
Piping	Suction & Discharge pipes are sealed with rubber plugs.
Discharge gas temp. measurement	Discharge gas temperature sensor at 340mm distance from the shell is acceptable by the test result.
Discharge gas temp. measurement	Discharge gas temperature sensor at 340mm distance from the shell is acceptable by the test result.
Accumulator installation	In case of 1.1kg refrigerant amount usage, it is not necessary to install accumulator in the circuit by the soaking start test result of sightglass compressor.

SIAM COMPRESSOR INDUSTRY

Classification : Specification for Compressor	Written By	Wanmongkol Marathong	
	Approved By	Korakot Intraratat	
Subject : APB52FAAMT	Issued Date	2021-07-25	Revised
	Document No.	SPC18O2050.02	E

1.Compressor data				
Type		Scroll		
Displacement	cm³/rev.	52.0		
	in³/rev.	3.2		
2.Motor data				
Motor type		BLDCM		
Motor protection		External		
Nominal output	W	2500		
Number of pole		6		
Nominal revolution	rpm	3600 (at 60rps)		
Insulation class		E		
Motor resistance (20 °C)	Ohm	1.21		
3.Refrigerant				
Type		R-290		
4.Oil				
Type		PZ46M		
Charge amount	L (in³)	1.40 (85.4)		
5.Mass (include.oil)	kg (lbs)	30.9 (68.1)		
6.Compressor power source				
Rated voltage	V	103-415		
Rated frequency	Hz	180 (60rps)		
Running frequency	Hz	45-360 (15-120rps)		
Phase	Ø	3		
7.Performance				
Refrigerating capacity (±5%)	W	9800	7800	
	BTU/hr	33438	26614	
Motor input (±5%)	W	2800	2620	
COP	W/W	3.50	2.98	
EER	BTU/hr.W	11.94	10.16	
Current	A	5.4	5.6	
Note: Conditions	°C (°F)	ARI	Heat Pump	
Evaporating temp.	°C (°F)	7.2 (45.0)	-7.0 (19.4)	
Condensing temp.	°C (°F)	54.4 (129.9)	50.0 (122.0)	
Return gas temp.	°C (°F)	18.3 (64.9)	-2.0 (28.4)	
Ambient temp.	°C (°F)	35.0 (95.0)	0.0 (32.0)	
Liquid temp.	°C (°F)	46.1 (115.0)	46.0 (114.8)	
Power source	rps/Hz	60/180	60/180	
Modulation		PWM(Sine wave), carrier frequency 4kHz		
Cooling performance curve		SCI-CPDA159		
Cooling performance injection curve		-		
Heating performance curve		SCI-HPDA080		
Heating performance injection curve		-		

-Performance data are base on SCI's calculation at oil 900 cc.

Please follow to the general specification for APB (TDRD13F039)

Classification : Specification for Compressor	Issued Date	2021-07-25
Subject : APB52FAAMT	Document No.	SPC18O2050.02

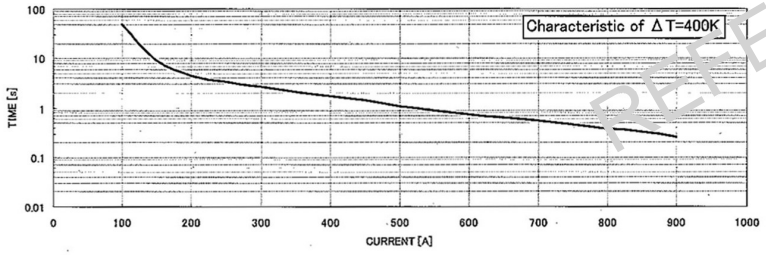
Compressor data	SC01F135	
Wiring diagram	CS01D584	
Crank case heater		38 W or more
Terminal parts accessories		
Terminal parts assy	CS01F449	
Terminal cover	SC25C057H01	1 pce.
Mounting accessories		
Mounting parts	SC01D525	
Rubber mount	SC31D009H01	4 pce.
Spacer (Optional)	SC10D377H01	4 pcs.

Classification : Specification for Compressor	Issued Date	2021-07-25
Subject : APB52FAAMT	Document No.	SPC18O2050.02

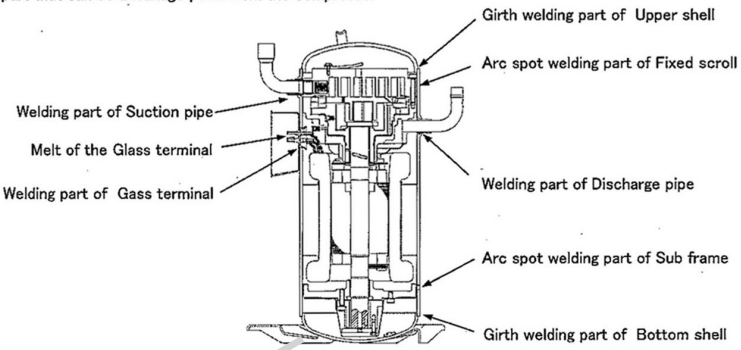
THE DATA ON COMPRESSOR SAFETY

◆ Specifications of compressor protector (for fixed speed)	
Ultimate trip current chracteristic	
Amb temp	130℃
Current	22.4～30.6A
Operating temp	
Open	170±5℃
Close	90±10℃
◆ Abnormally over current and input of compressor (at 198V)	
Current	19.4A
Input	3690W
◆ Destructive pressure of compressor shell (Hydrostatic pressure)	13.7MPa

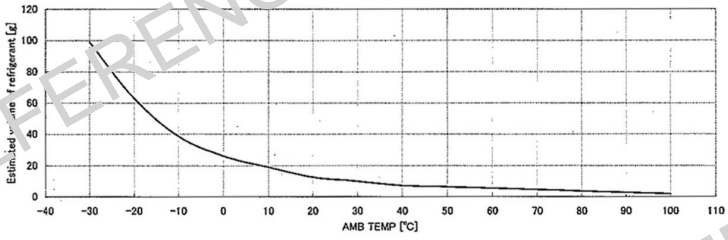
◆ Glass melting temperature curve for the glass terminal



◆ The part that can be a leakage point from the compressor



◆ Estimated volume of refrigerant remaining in oil when you expose compressor to the air



VM-CZC21

Classification : Specification for Compressor	Issued Date	2021-07-25
Subject : APB52FAAMT	Document No.	SPC18O2050.02

Pressure	
Condensing	3.15 MPaG [457 psiG] or less
Evaporating	0.07 ~ 0.69 MPaG [10.2~100.1 psiG]
Compression ratio	Follow pressure operating envelop
Abnormal rise in pressure	-
Temperature	
Condensing temperature	Under 82 °C
Evaporating temperature	-30 ~ 18 °C
Discharge gas (max)	-30 ~ 18 °C
Suction gas superheat	Must be more than 0 °C - No liquid-back
Discharge gas superheat	10 °C or more
Outdoor ambient temp.	-
Electrical	
Reverse phase (rotation)	Not possible
ON / OFF	
ON/OFF frequency	Less than 250,000 cycles
ON/OFF cycle	-The ON/OFF cycle shall be a maximum of 10 times/hour. -OFF time shall be the time until the high side and low side pressure reach to balance pressure (more than 3 minutes)
Piping stress	34.3 N/mm² or less at start and stop condition (17.7 N/mm² during operation)
Refrigerant circuit	
Maximum refrigerant charge	Amount of refrigerant [g] < or = Amount of oil [g] x 4 (the relative density of oil : 1[g/cm^3]). Regarding operation which exceeds the above limit, consult with us.
Piping vibration	Maximum 0.8 mm.
Inclination of compressor	Within 5°
Piping	Suction & Discharge pipes are sealed with rubber plugs.
Discharge gas temp. measurement	Discharge gas temperature sensor at 340mm distance from the shell is acceptable by the test result.
Discharge gas temp. measurement	Discharge gas temperature sensor at 340mm distance from the shell is acceptable by the test result.
Accumulator installation	In case of 1.1kg refrigerant amount usage, it is not necessary to install accumulator in the circuit by the soaking start test result of sightglass compressor.