



No. : WXXS-010-GGSY-11

APPROVAL SHEET
SPECIFICATIONS OF HERMETIC SCROLL COMPRESSOR

| | |
|-------|--------------|
| MODEL | C-SBR120H16A |
|-------|--------------|

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| NO. | DATE | PAGE | REVISION DETAILS | SANYO SIGNED | CLIENT SIGNED |

REVISION RECORD

USER:

MANUFACTURER:

DALIAN SANYO COMPRESSOR CO., LTD.

| | | | | | |
|--------|-----------------------|----------------------|----------|---------|-----------|
| LEADER | PURCHASING MANAGER | TECHNICAL MANAGER | APPROVED | CHECKED | SUBMITTED |
| | | | | | |

Section 1. General Specifications

| Content | | Unit | Specification |
|--------------------------|--|---|---------------------------------------|
| Compressor Model (Code) | | — | C-SBR120H16A |
| Type | | — | Hermetic Scroll Compressor |
| Application | | — | High Back Pressure |
| Evap. Temp. Range | | °C (°F) | -15~12 (5~54) |
| Compressor Cooling Type | | — | Natural Cooling |
| Power Source | Phase | — | 1 |
| | Rated Voltage | V | 208-230 |
| | Rated Frequency | Hz | 60 |
| Voltage Range | | V | 187-253 |
| Weight (Including Oil) | | kg (lb) | 38.5 (84.9) |
| Refrigerant | | — | R22 |
| Oil Type | | — | Mineral Oil (L-DRC/B56 or Equivalent) |
| Oil Charge | | ml (fl oz) | 1700 (57.5) |
| Displacement | | cm ³ (in ³) /rev | 55.7(3.40) |
| Motor | Motor Type | — | 1-PH Induction Motor (PSC) |
| | Number of Poles | — | 2 |
| | Electrical Insulation | Class | E |
| | Nominal Revolution | min ⁻¹ | — |
| | Locked Rotor Ampere | A | 136 |
| | Winding Resistance [at 25°C (77°F)] | Ω | C-S 1.298 C-R 0.360 |
| Connection Tube | Suction Line (O.D.) | mm (in) | 22.2 (0.875) |
| | Discharge Line (O.D.) | mm (in) | 12.7 (0.500) |
| Compressor Surface Paint | | — | Black Paint |

Notes

- 1 Voltage range is applied at standard rating conditions.
- 2 Motor specifications in the table are the average values for your reference.
- 3 (): All units with parentheses are reference values.

Expiration of Specification

Expiration of this specification shall be effected until issuing a notice with indication of the expiration date from the issued date . In case of improvement or elimination of this specification , it shall be handled by the revision record based on agreement between both sides.

Section 2. Performance Warranty

2.1 Performance

| | | | | |
|--------------------|----------|--------|--------|-----------|
| Power Source (1PH) | Hz | 60 | 60 | Remark |
| | V | 208 | 230 | |
| Capacity | W | 12,100 | 12,000 | ±7% |
| | (BTU/hr) | 41,285 | 40,944 | reference |
| Input Power | W | 3,750 | 3,850 | ±7% |
| Current | A | 18.40 | 17.80 | ±7% |

Standard Rating Conditions

| | | |
|-------------------|---------|------------|
| Condensing Temp. | °C (°F) | 54.4(130) |
| Evaporating Temp. | °C (°F) | 7.2(45) |
| Suction Gas Temp. | °C (°F) | 18.3(65) |
| Liquid Temp. | °C (°F) | 46.1(115) |
| Ambient Temp. | °C (°F) | 35(95) |

2.2 Sound Level

| | | |
|--|-------|--------|
| Power Source (1PH) | Hz | 60 |
| | V | 230 |
| Sound Level | dB(A) | 63Max. |
| Notes | | |
| 1 The operating conditions are the same as 2.1. | | |
| 2 MIC location is the distance of 1m (3.28feet) from the compressor. | | |
| 3 Sound Level is an average sound pressure level in four directions. | | |

2.3 Minimum Starting Voltage

| | | |
|--------------------------|----|-----|
| Power Source (1PH) | Hz | 60 |
| Minimum Starting Voltage | V | 187 |

Conditions

| | | |
|------------------|-------------|---------------|
| Compressor Temp. | °C (°F) | 10~60(50~140) |
| Ambient Temp. | °C (°F) | 10~40(50~105) |
| High Pressure | MPa(G)/psig | 1.3(188) |
| Low Pressure | MPa(G)/psig | 1.3(188) |

2.4 Others

| Content | Unit | Specification |
|---|----------|---------------------------|
| Design Pressure | L.P. S. | MPa(G)/psig 1.6(232) |
| | H. P. S. | MPa(G)/psig 3.0(435) |
| Insulation Resistance | MΩ | 100 (without refrigerant) |
| Dielectric Strength | V | 1800 (1 second) |
| Residual Moisture | mg | 300 |
| Note: | | |
| 1. The insulation resistance be measured with a DC500V megohm tester. | | |

Section 3. Standard Accessories

3.1 Accessories List

| Parts Name | Qty | Parts code | Revision No. | Note |
|--------------------|-----|------------|--------------|--------------------------|
| Terminal Box Cover | 1 | A-0101-DSB | 0 | Installed on Compressor |
| Terminal Box Clip | 1 | A-0201-DSB | 0 | Installed on Compressor |
| Insulating Grommet | 1 | A-0301-DSB | 0 | Installed on Compressor |
| Mounting Grommet | 4 | M-0101-DSB | 0 | Included with Compressor |
| Mounting Sleeve | 4 | M-0201-DSB | 0 | Included with Compressor |
| Screw Special | 1 | B-0101-DSB | 0 | Installed on Compressor |

3.2 The Drawing for Reference

| Parts Name | Parts Code | Revision No. |
|----------------------------|------------|--------------|
| Compressor Outline Drawing | D-0101-DSB | 0 |
| Mounting Parts Listing | M-5101-DSB | 0 |
| Packing Dimensions | D-0202-DSB | 0 |
| Wiring Diagram | E-0916-DSB | 0 |

3.3 Internal Motor Protector (in compressor)

| Parts Name | Specification | | |
|--------------------------|-------------------|--------|--------------|
| Internal Motor Protector | Trip Temperature | 130±5℃ | |
| | Reset Temperature | 70±9℃ | |
| | Trip Current | C-R | 110A / 3~10s |
| | | C-S | 50A / 3~9s |

3.4 Electrical Component Required but not Included with compressor

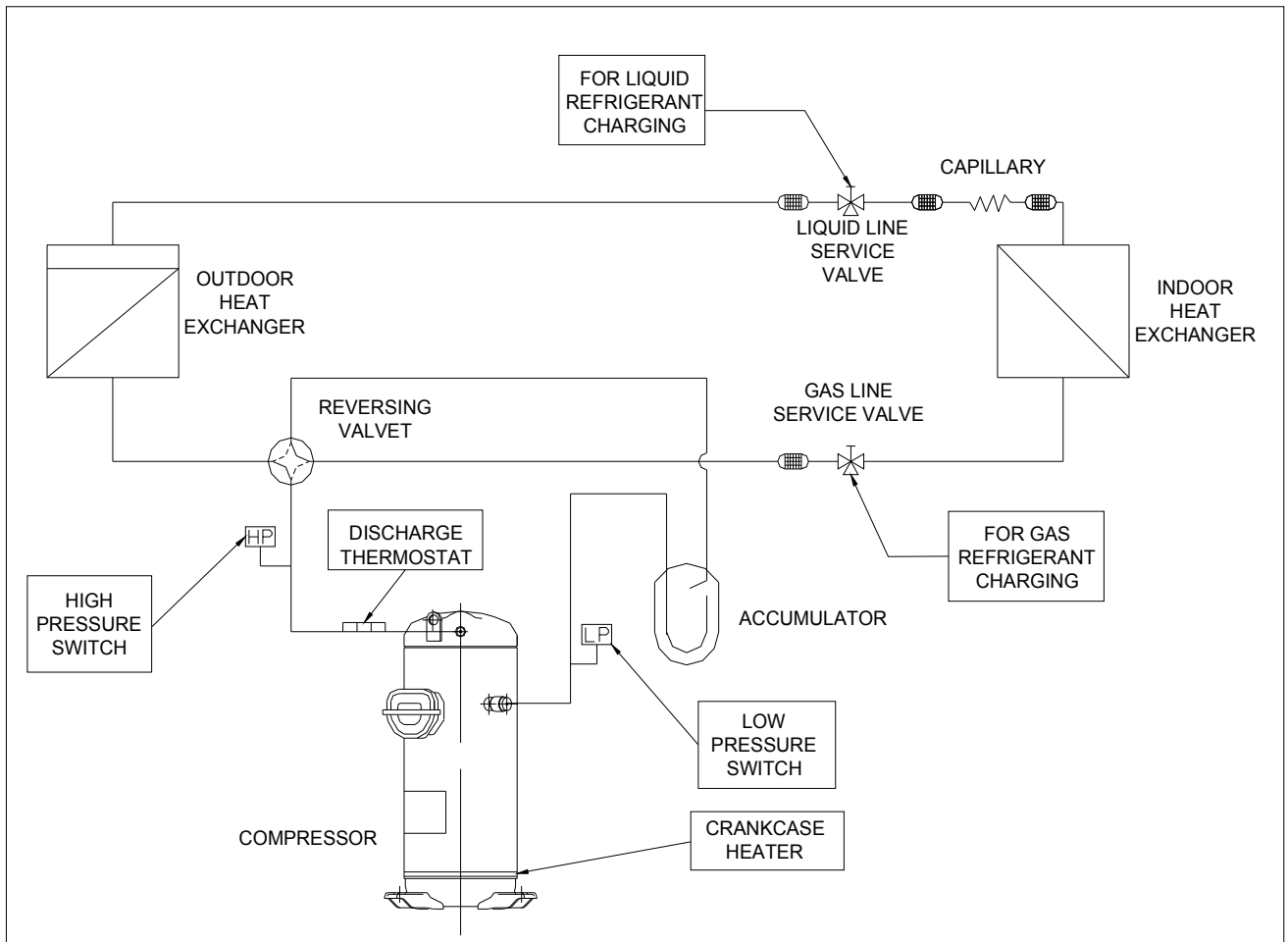
| Parts Name | Specification |
|-------------------|---------------|
| Running Capacitor | 50μF 440V |

Section 4. Compressor Protection

4.1 Protection Required but not Included with compressor

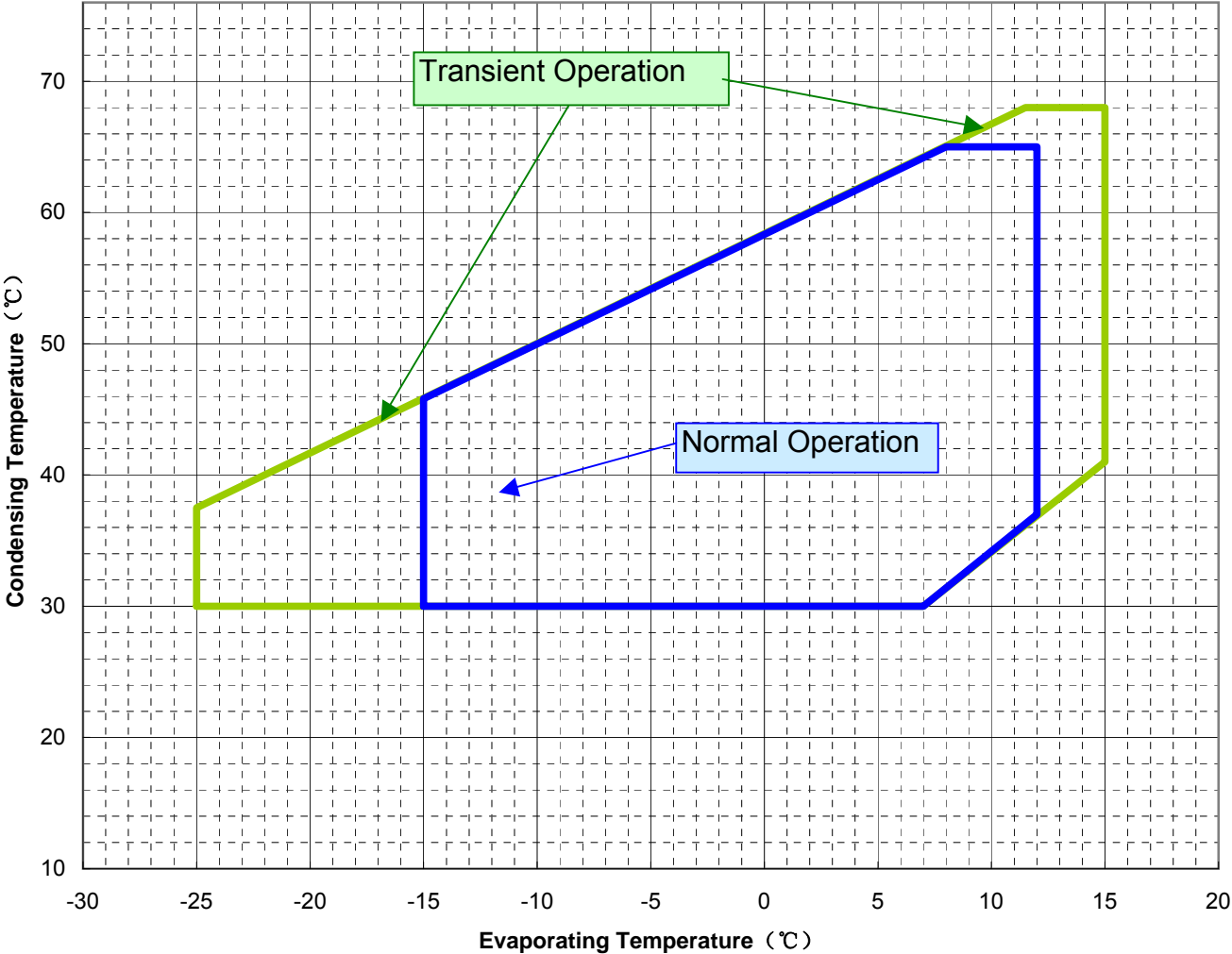
| Protection Device | Items | Specifications |
|------------------------|-------------------|--|
| Anti-short Cycle Timer | Characteristic | To prevent the reverse rotation caused by brief power interruption |
| | Setting | 3 minutes off / 7 minutes on |
| Crankcase Heater | Rated Power | 35 Watts |
| Discharge Thermostat | Mounting Position | Located within 100mm(4 in)from the compressor shell |
| | Trip Temperature | 130±5°C(266 ±10 °F) |
| | Reset Temperature | 95±11°C (205 ± 20 °F) |
| High Pressure Switch | Setting | Cut-out seting no higher than 3.0Mpa(G) |
| Low Pressure Switch | Setting | Cut-out seting no lower than 0.03Mpa(G) |

4.2 Position of the Protection and Refrigerant Charging



Section 5. Operating Envelope

Suction Gas Superheat: 11.1K
Refrigerant: R22



Section 6. Application Standard & Limit

The following requirements apply to vertical type hermetic scroll compressors:

Standard: Applicable to ordinary conditions in Japan JIS B8616 or standards relative to JIS B8616, such as standard rating conditions, maximum operating conditions, low temperature conditions, etc.

Limit: Applicable to transitional brief period of time, such as start-up and beginning of defrost mode.

| No. | Item | Standard | Limit | Note |
|-----|--------------------------------|---|---|---|
| 1 | Refrigerant | R22(Meet the standard of Japan JIS K1517) | | |
| 2 | Evaporating Temp. | -15~12°C(5~54 ° F) 0.20~0.62MPa(G)(29~90psig) | -25~15°C(-13~59 ° F) 0.10~0.69MPa(G)(14.5~100psig) | Comp. Suction Pressure |
| 3 | Condensing Temp. | 30~65°C(86~149 ° F) 1.09~2.60MPa(G)(158~377psig) | 68°C(155 ° F) 2.78MPa(G)(403psig) | Comp.Design Pressure(High) 3.0MPa(G) (435psig) |
| 4 | Compression Ratio | 2 ~ 6 | 10 | |
| 5 | Winding Temp. | 115°C(240 °F) Max. | 125°C(257 °F) | |
| 6 | Shell Bottom Temp. | 90°C(194 °F) Max. | | |
| | | Evaporating Temp.+12°C(21 °F) Min. | | Operating |
| | | Ambient Temp.+11°C(20 °F) Min. | | Not Operating |
| 7 | Discharge Gas Temp. | 115°C(240 °F) Max. | C-SB:130°C(266°F) Max. | Temp. within 100mm(4in) of the discharge fitting. |
| | | | C-SC:135°C(275°F) Max. | Temp. inside of the well pipe on the top of compressor |
| 8 | Suction Gas Temp. | Superheat: 5K(10 °F)Min. | No excessive noise | It should meet the requirement of item 5, 6, 7 and 14 within 30cm of the suction fitting. |
| 9 | Running Voltage | Within ±10% of the rated voltage | | Voltage at compressor terminals. |
| 10 | Starting Voltage | Three Phase Models: 85% of the rated voltage min. | | Voltage at compressor terminals. |
| | | Single Phase Models: 90% of the rated voltage min. | | |
| 11 | On/Off Cycling | On Period: Until the oil level returns to the center of the lower bearing Off Period: Until balance of high and low pressure is obtained | | For at least 7 minutes - on/3 minutes-off is recommendable. |
| 12 | Refrigerant Charge | oil/refrigerant(wt.)≥0.35 | | Specific gravity of the Oil:0.91 |
| 13 | Life Time | 200,000 cycle | | |
| 14 | Minimum Oil Level | C-SB: Center of the lower bearing | C-SB:Bottom of the lower bearing | |
| | | C-SC:No less than 70% of the initial oil charge | | |
| 15 | Abnormal Pressure Rise/Drop | Pressure Rise: 3.0MPa(G) (435psig) Max. | | By high pressure switch |
| | | Pressure Drop: 0.03MPa(G) (4.35psig) Min. | | By low pressure switch |
| 16 | System Moisture Level | 200ppm Max. | | |
| 17 | System Uncondensable Gas Level | 1 Vol.% Max. Residual Oxygen 0.1 Vol.% Max. | | 24 hrs. after vacuuming: 1.01kPa Max. |
| 18 | Tilt | 5° Deg.Max. | | |

Operation beyond the above limits must be approved by Dalian SANYO Compressor Co., Ltd.

(G): Gauge Pressure

Notes

- 1 Installation should be completed within 15 minutes after removing the rubber plugs.
- 2 Do not use the compressor to compress air.
- 3 Do not energize the compressor under vacuumed condition.
- 4 Evacuation and Refrigerant charge : Evacuate internal section in the refrigeration system from high and low pressure sides and charge liquid refrigerant from condenser outlet side. Additional charge shall be done with gas condition from low side.
- 5 Do not tilt over the compressor while carrying it.
- 6 Do not remove the paint.
- 7 Crankcase heater is required when the oil sump temperature is too low to meet the requirement of item 6 on page 7.
- 8 Voltage fluctuation between compressor terminals, during operation, shall be within 2% of the rated voltage.
- 9 Do not operate compressor in reverse rotational direction.
- 10 Suction strainers are recommended for all applications.
- 11 Copper Piping Stress

| | |
|----------------|------------------------------|
| Start/Shutdown | 34.32 N/mm ² Max. |
| Run | 12.26 N/mm ² Max. |

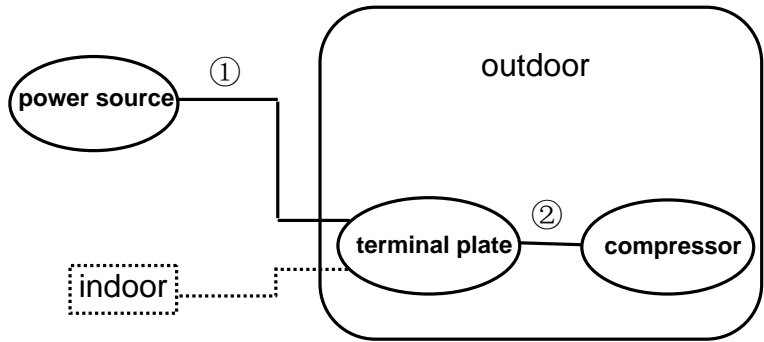
Section 7. Selection of Electrical Wire

Voltage drop may occur due to the large current draw during compressor starting.

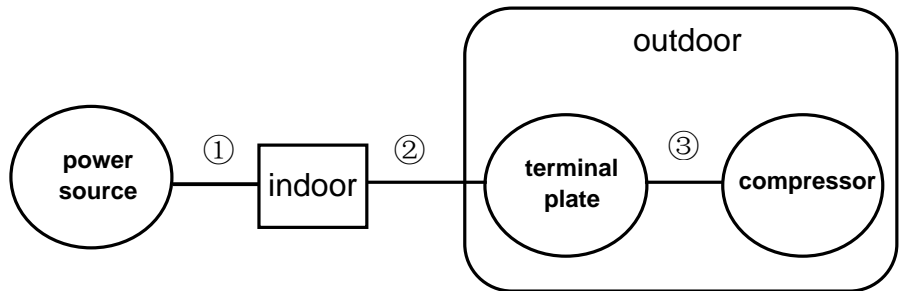
We recommend selecting the wire size from the table below.

7.1 Type of Unit

7.1.1 Window & Commercial Type Unit



7.1.2 Split Type(Separate Type)



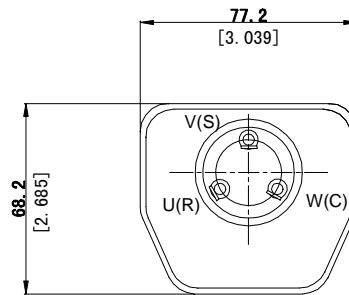
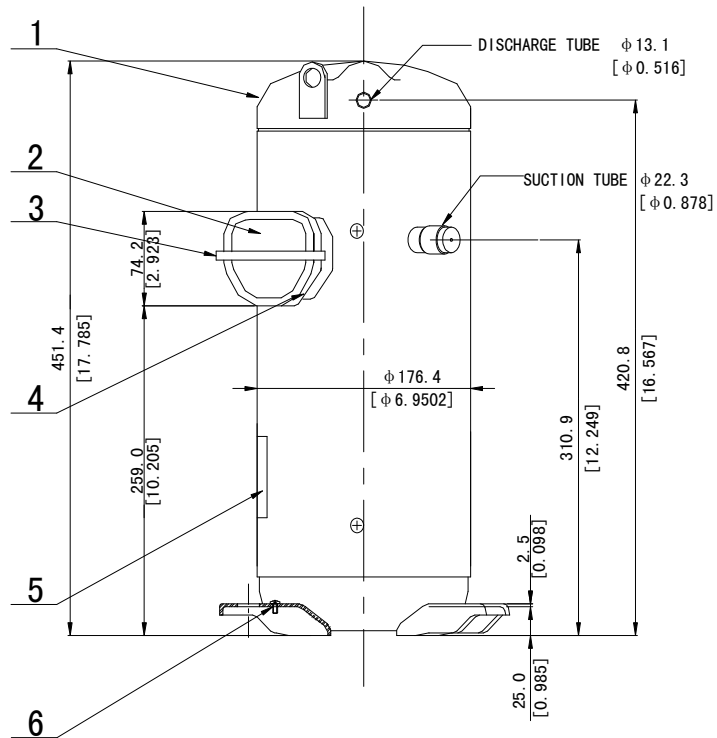
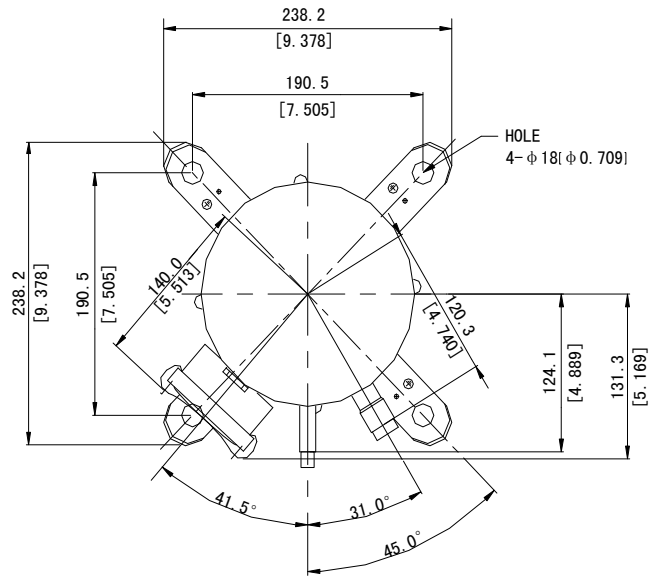
7.2 Size Table of Electrical Wire

| Starting current (A) | Size of electrical wire (mm ²) | | | | | | |
|----------------------|--|----------|----------|----------|----------|----------|--|
| | Remark ① or Remark ①+② (heat-resistance Temperature: 60°C(140°F) min.) | | | | | | Remark③ (heat-resistance Temperature: 120°C(248°F) min.) |
| | 5m max. | 10m max. | 15m max. | 20m max. | 30m max. | 50m max. | 1m max. |
| 20max. | 2.0 | 2.0 | 2.0 | 3.5 | 5.5 | 8.0 | 2.0 |
| 30max. | ↑ | ↑ | 3.5 | 5.5 | ↑ | 14.0 | ↑ |
| 40max. | ↑ | 3.5 | 5.5 | ↑ | 8.0 | ↑ | ↑ |
| 50max. | ↑ | ↑ | ↑ | 8.0 | 14.0 | 22.0 | ↑ |
| 60max. | ↑ | 5.5 | ↑ | ↑ | ↑ | ↑ | ↑ |
| 70max. | 3.5 | ↑ | 8.0 | 14.0 | ↑ | ↑ | 3.5 |
| 80max. | ↑ | ↑ | ↑ | ↑ | 22.0 | 30.0 | ↑ |
| 90max. | ↑ | ↑ | 14.0 | ↑ | ↑ | ↑ | ↑ |
| 100max. | ↑ | 8.0 | ↑ | ↑ | ↑ | 38.0 | ↑ |
| 110max. | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| 120max. | 5.5 | ↑ | ↑ | 22.0 | 30.0 | ↑ | ↑ |
| 140max. | ↑ | 14.0 | ↑ | ↑ | ↑ | 50.0 | 5.5 |
| 160max. | ↑ | ↑ | 22.0 | ↑ | ↑ | ↑ | ↑ |
| 180max. | ↑ | ↑ | ↑ | ↑ | 38.0 | 60.0 | 8.0 |
| 200max. | 8.0 | ↑ | ↑ | 30.0 | ↑ | ↑ | ↑ |
| 220max. | ↑ | ↑ | ↑ | ↑ | 50.0 | 80.0 | ↑ |
| 240max. | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | 14.0 |

7.3 Caution of Ground

The internal motor protector does not protect the compressor against all possible conditions.

Please be sure that the system utilizes the ground connection when installed in the field.



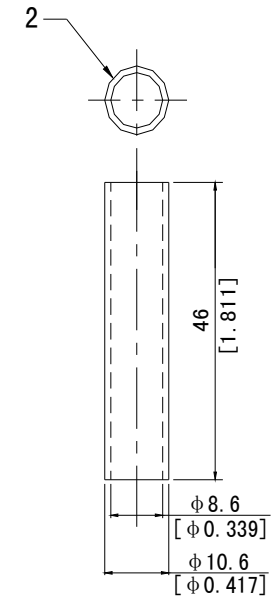
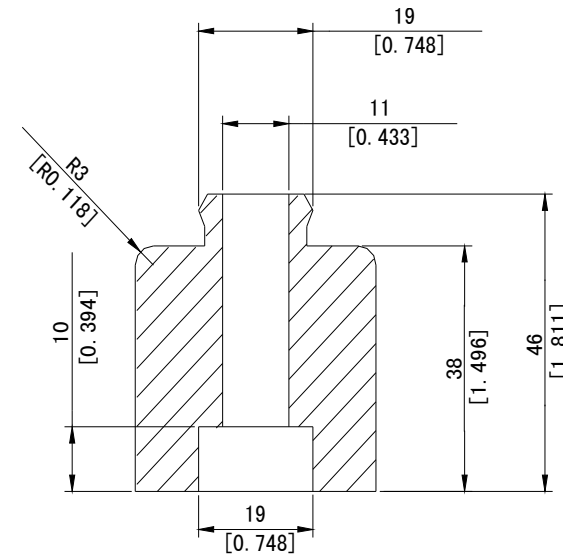
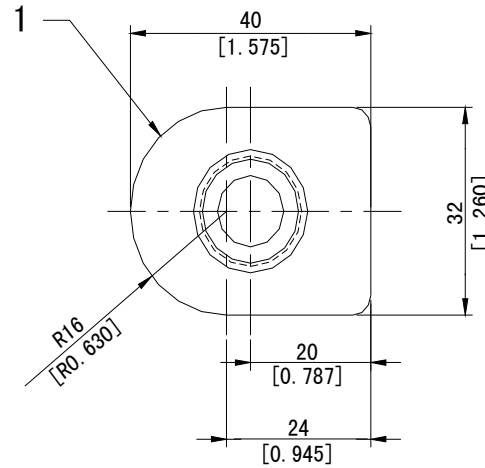
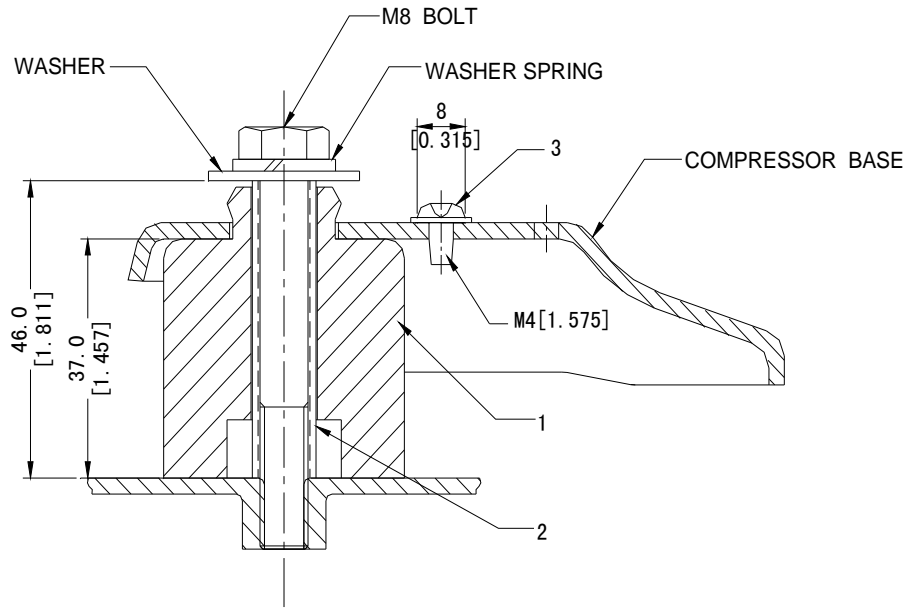
TERMINAL

| No. | Part Code | Qty | Name |
|-----|--------------|-----|--------------------|
| 1 | C-SBR120H16A | 1 | Compressor |
| 2 | A-0101-DSB | 1 | Terminal Box Cover |
| 3 | A-0201-DSB | 1 | Terminal Box Clip |
| 4 | A-0301-DSB | 1 | Insulating Grommet |
| 5 | | 1 | Nameplate |
| 6 | B-0101-DSB | 1 | Screw Special |

Part Code
D-0101-DSB

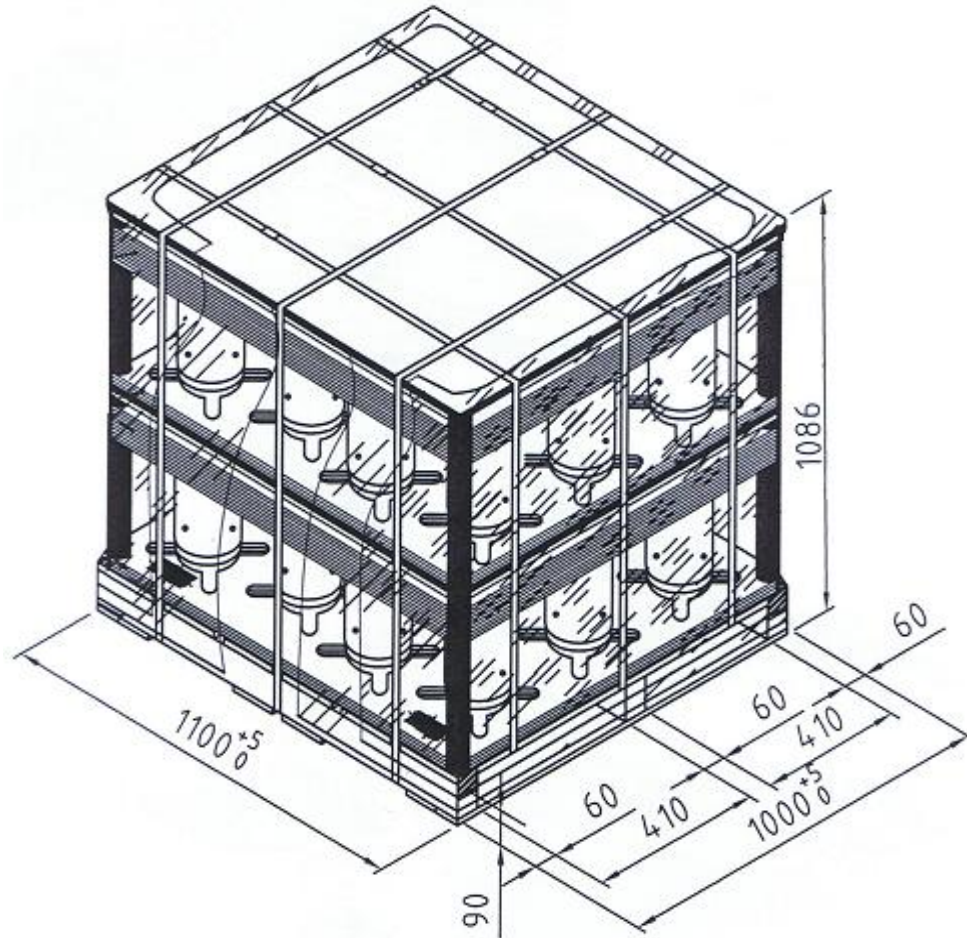
Name
Compressor Outline Drawing

| No. | Part | QTY | Name |
|-----|------------|-----|------------------|
| 1 | M-0101-DSB | 4 | Mounting Grommet |
| 2 | M-0201-DSB | 4 | Mounting Sleeve |
| 3 | B-0101-DSB | 1 | Screw Special |

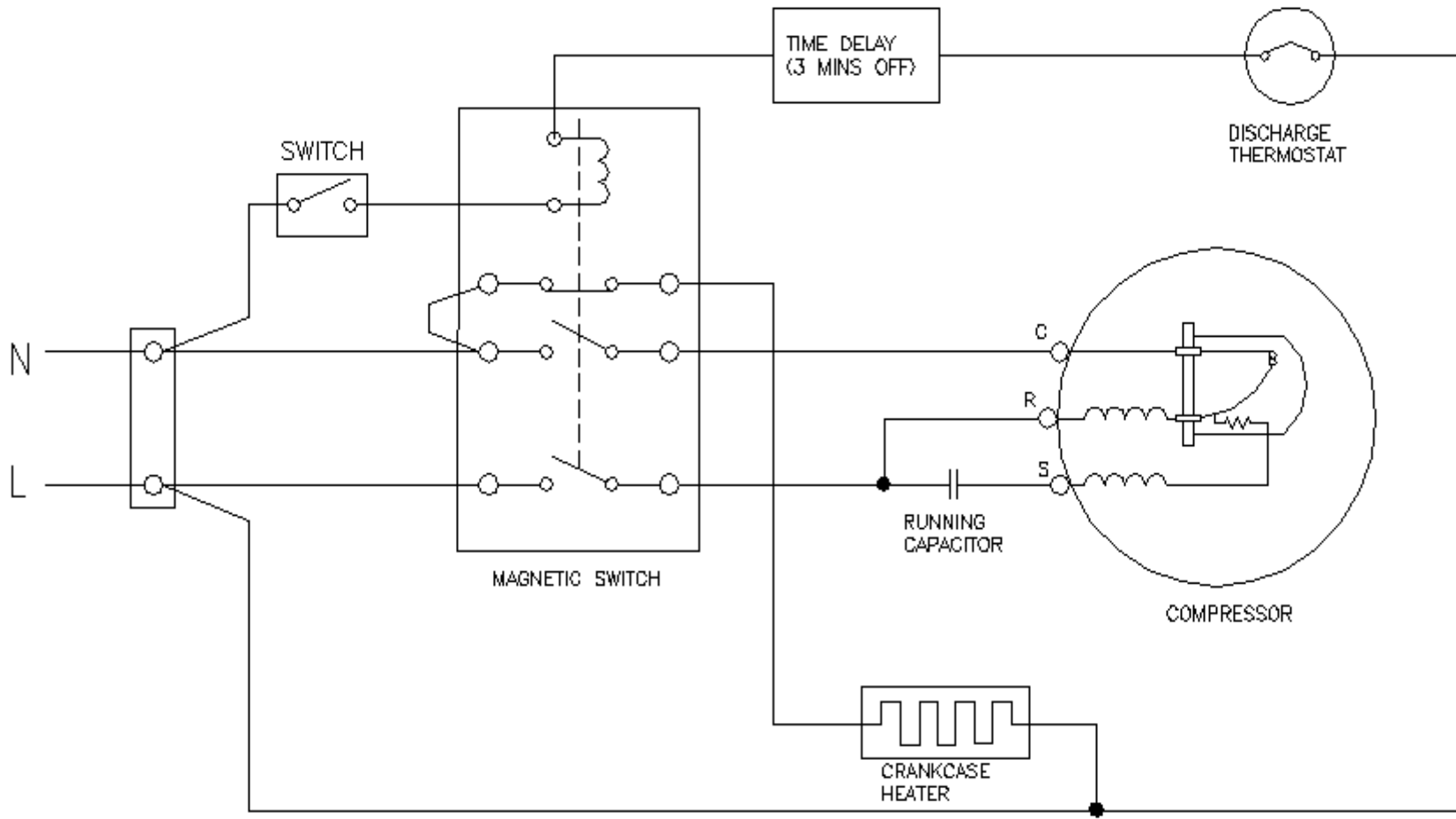


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Part Code
M-5101-DSB
Name
Mounting Parts Listing



Part Code
D-0202-DSB
Name
Packing Dimensions



Part Code
E-0916-DSB
Name
Wiring Diagram