

USER MANUAL

Please use properly after having fully familiarized with this user manual.



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01 Introduction

Thank you for the purchase of Comp Korea Compressor.

Founded in 1996, Comp Korea has been providing the highest standard of quality and prompt services based on advanced technology and accumulated experience. We ensure that the compressor you have purchased was constructed and tested with a high level of precision to satisfy your needs.

This operational manual is intended to help you operate and maintain your new compressor properly. Please read instructions carefully before use.



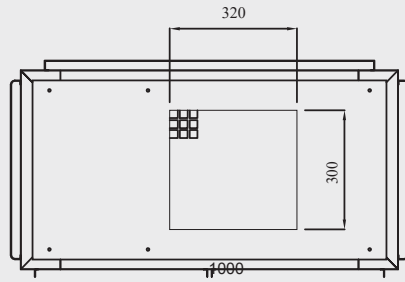
02 Safety Instructions and Warnings



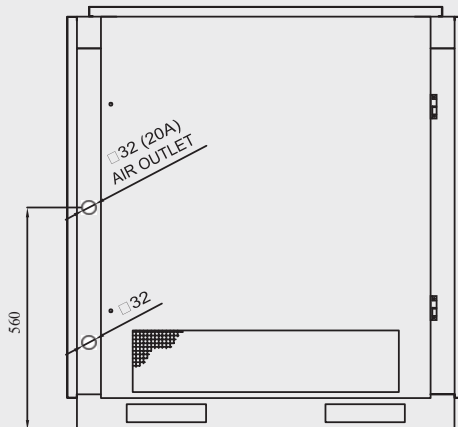
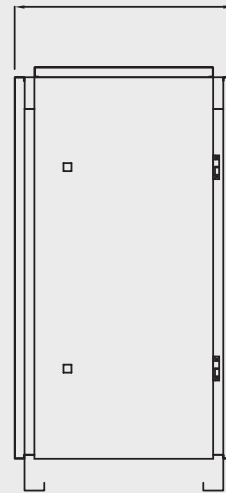
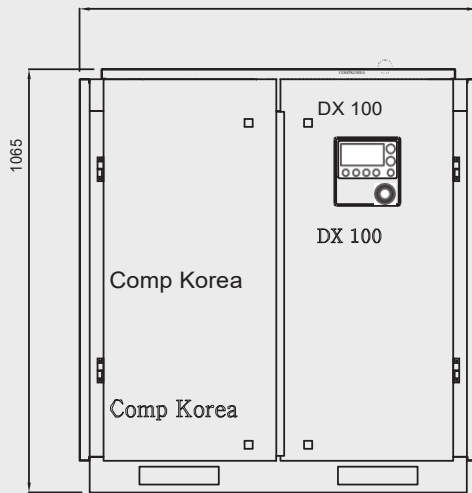
The following safety instructions should be followed to prevent safety risks. Failure to follow warnings and instructions may result in personal injury or damage to property including the compressor.

- Serious personal injury can occur if the air produced by the compressor is inhaled or used for food process.
- This compressor is designed to draw air from the normal atmosphere. Any other gas or vapor should not be used for the compressor.
- Switch off all power supply even remote controllers before attempting any maintenance.
- Remove all pressure internal to the compressor before attempting any maintenance. Do not use check valves to hold system pressure.
- You are responsible for maintaining the compressor in good conditions and replace any damaged or worn parts to ensure safe operation.
- Only experienced personnel should install, operate and maintain the compressor and check the operating conditions (pressure, temperature and time setting) on a regular basis.
- Do not use any inflammable or toxic solvent to wash the air filter and parts.
- Do not attempt any maintenance or repair while the compressor is operating.
- Pressure must not exceed the maximum recommended rating.
- Do not modify the compressor except with a permit from Comp Korea. Only authorized personnel of Comp Korea can modify internal structure of the compressor.

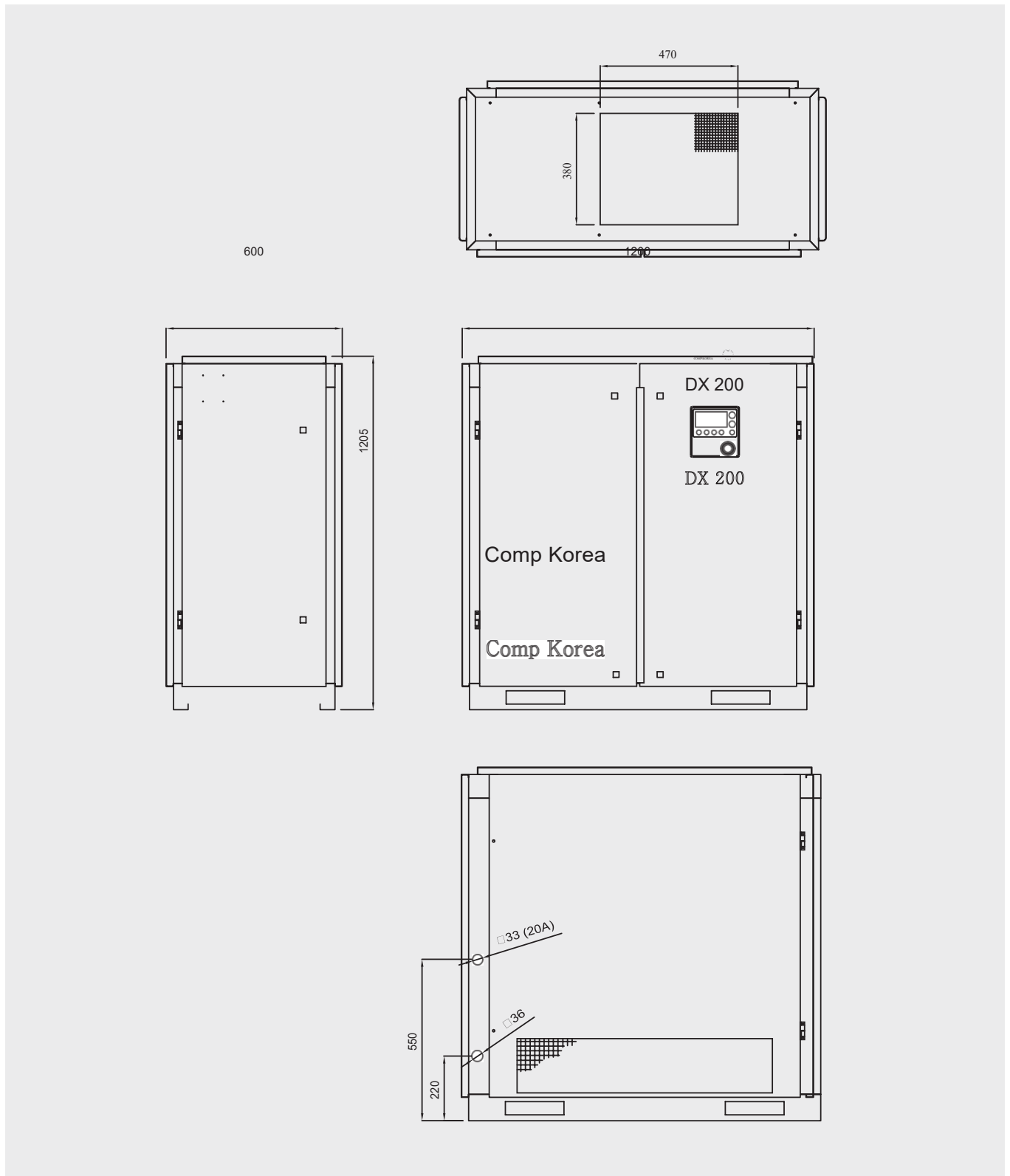
03 Compressor Features DX100



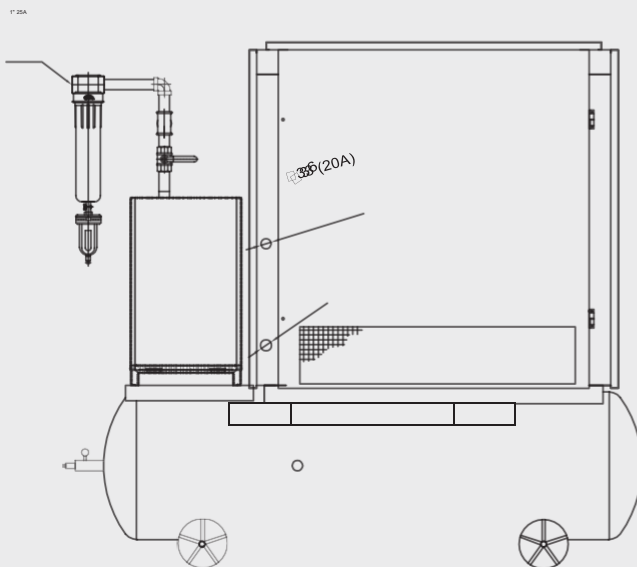
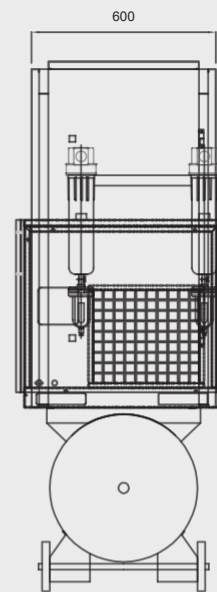
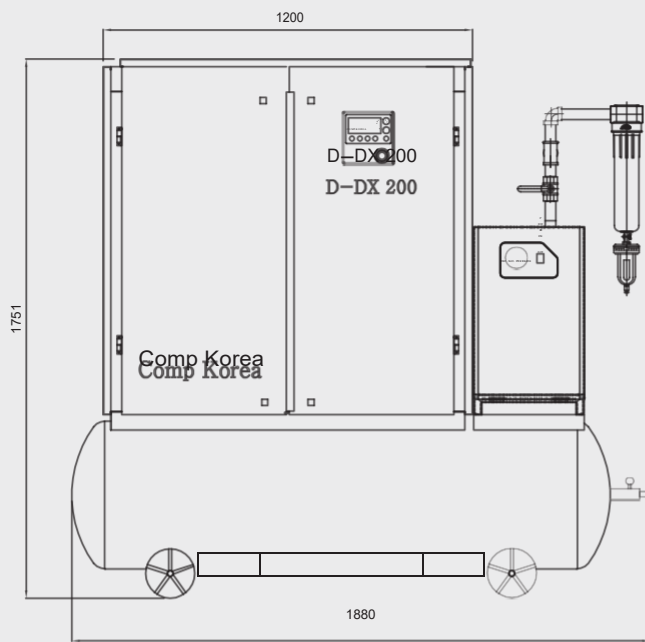
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03 Compressor Features DX150, DX200, DX300



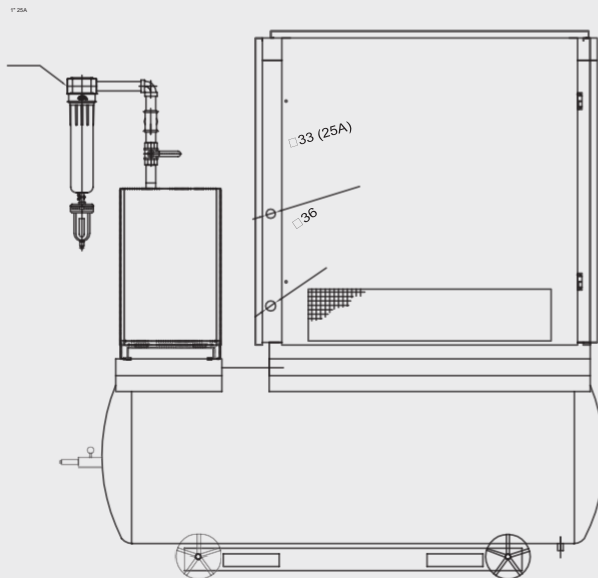
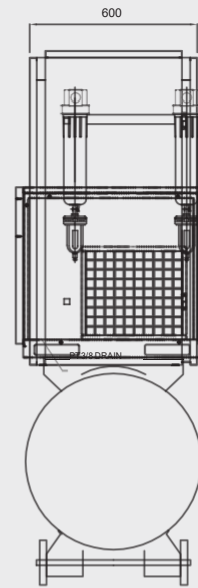
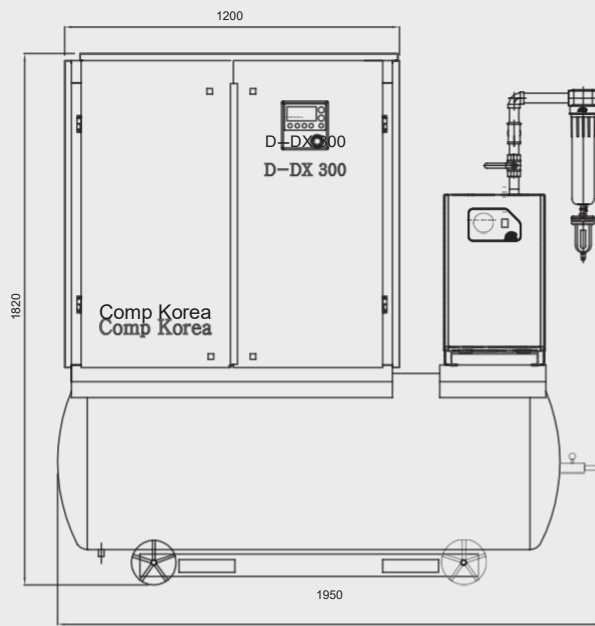
03 Compressor Features D-DX100, D-DX150, D-DX200



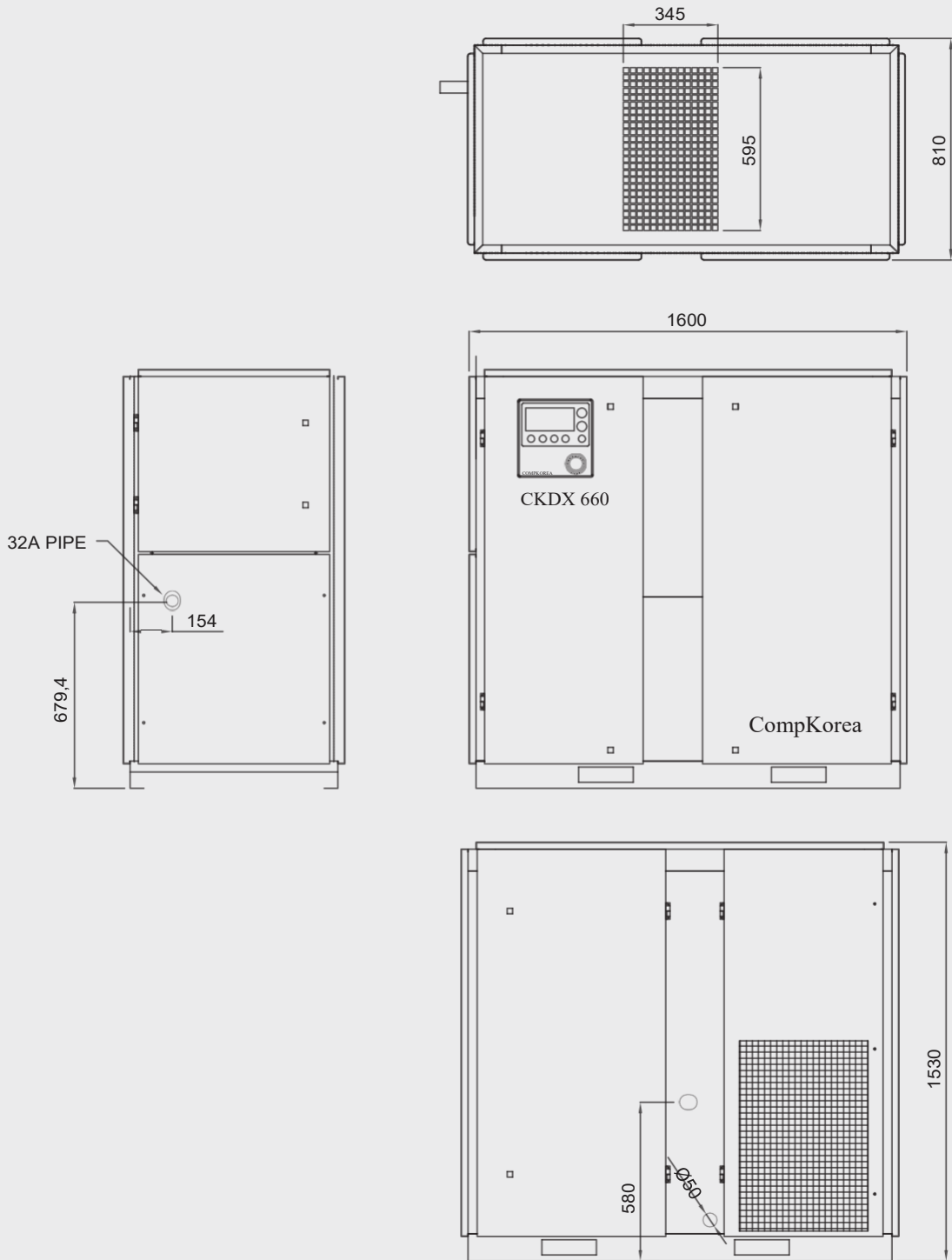
D-DX 100 Dimension
1880 X 660 X 1580 mm



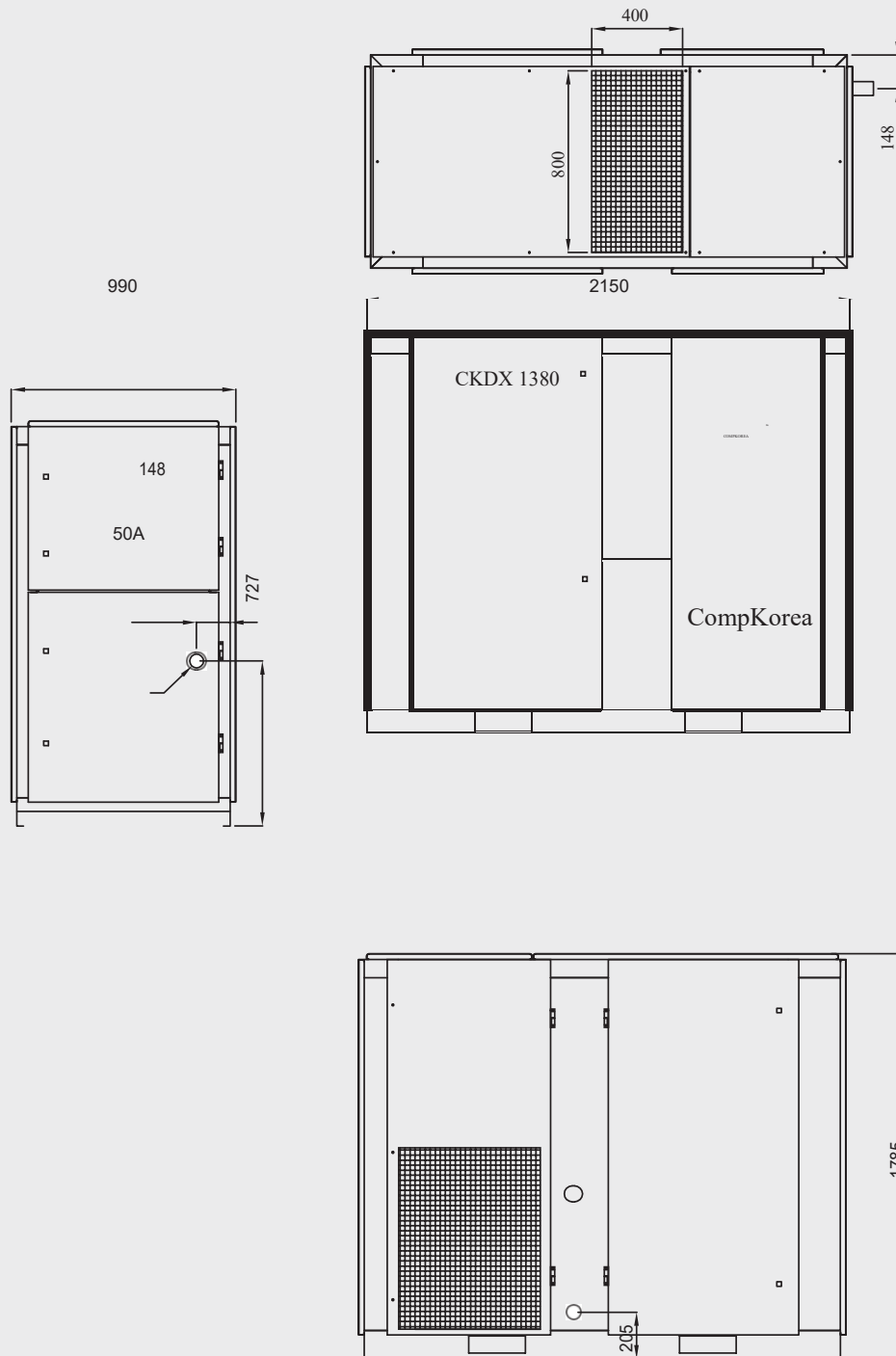
03 Compressor Features D-DX300



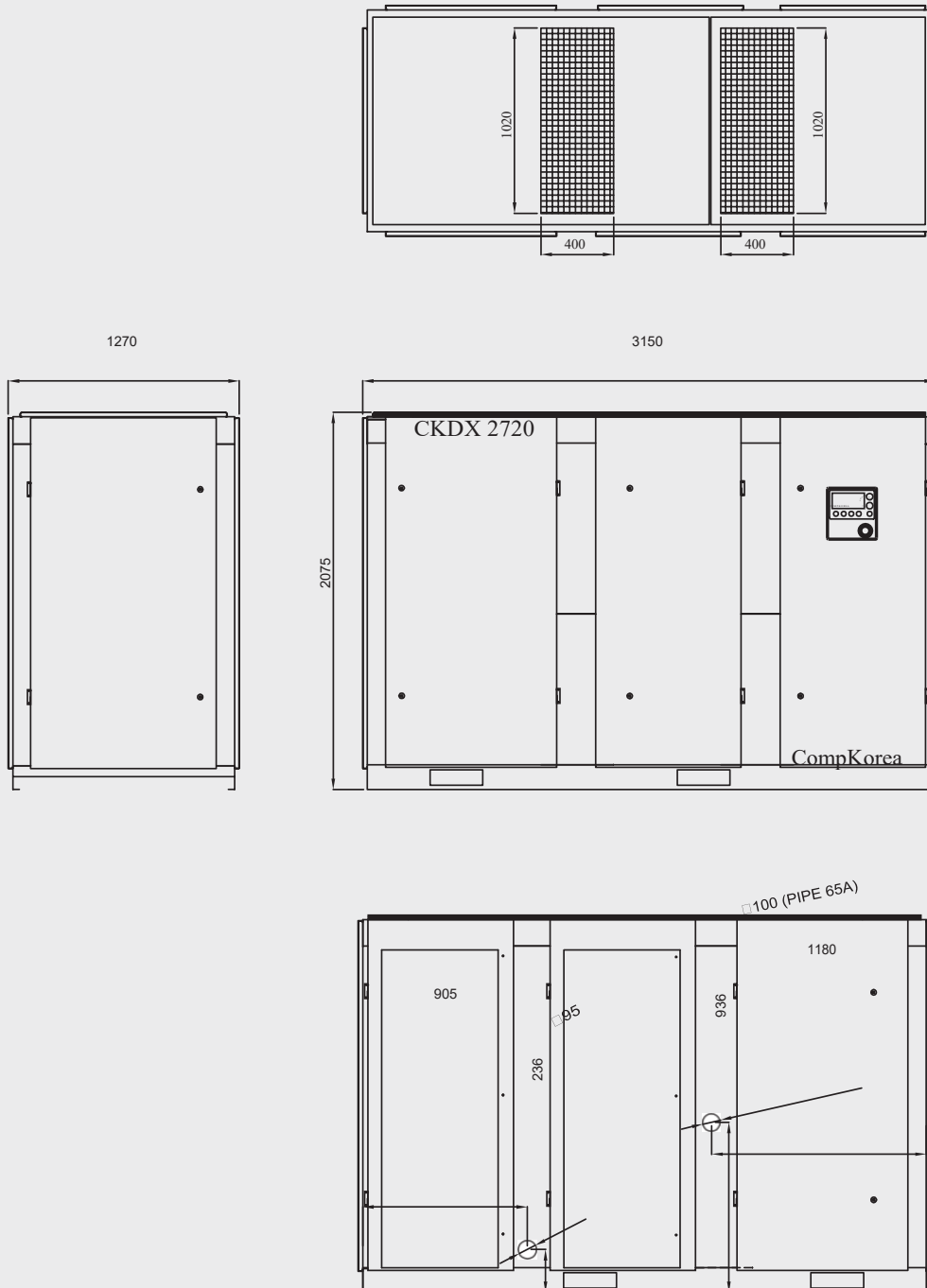
03 Compressor Features CKDX660, CKDX660 PLUS



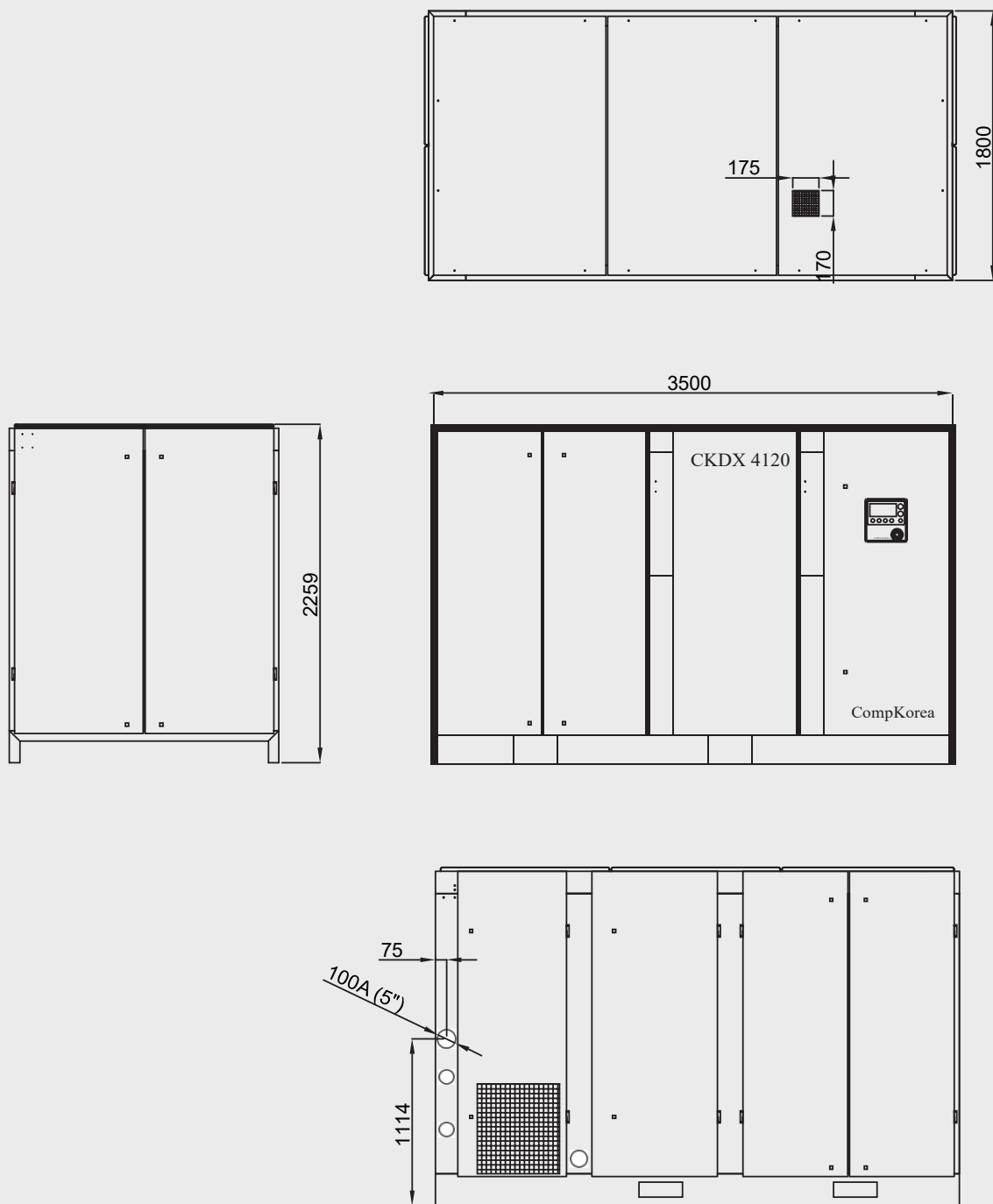
03 Compressor Features CKDX1020, CKDX1380, CKDX1380 PLUS



03 Compressor Features CKDX2120, CKDX2720



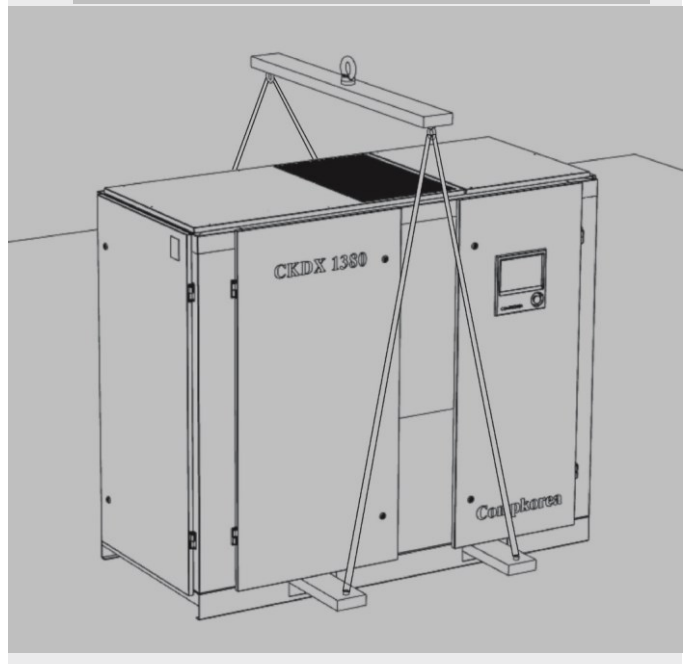
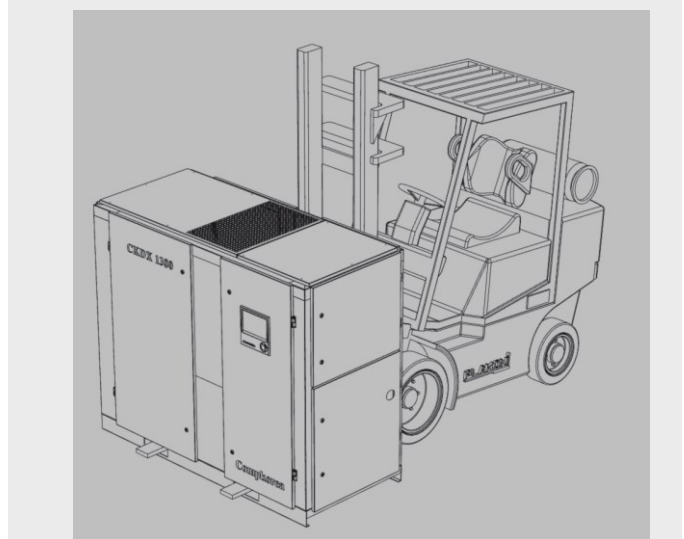
03 Compressor Features CKDX4120



04 Compressor Transfer and Installation

■ Delivering the compressor

- A forklift is recommended to deliver the compressor to the receiver in order to prevent any risk of damage.
- Use enough buffers to protect the compressor against any damage during delivery and ensure that forks are fully under the compressor before raising it.
- If a crane is used, a professional operator should operate the crane to deliver the compressor.
- Use supporting materials such as logs and buffers to prevent any damage of the compressor during delivery.

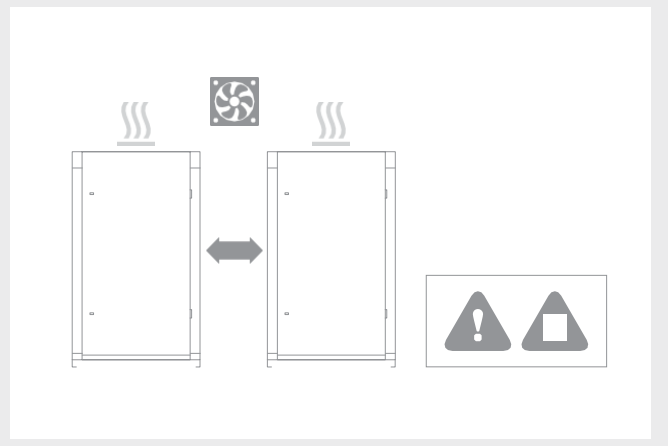


- Make sure the compressor is slowly moved in a horizontal position to transfer it with a crane. Falling off the compressor can cause serious injury.
- Ensure that no one stays around the compressor while it is being lifted into the air because it is dangerous.

04 Compressor Transfer and Installation

■ Location Selection

- To install more than two compressors, ensure that ample circulation of heated air is provided to avoid the heated air produced from one compressor from affecting the other.
- Operating temperature of the compressor ranges from 0°C to 40°C, and a ventilation system should be installed to keep the temperature within the range.



- Keep the location free of any inflammable materials, chlorine gas, emulsifying hydrogen gas, sulfurous acid gas, high-density ozone and other hazardous gas because they can cause fire, oxidation of lubricating oil or corrosion of parts.

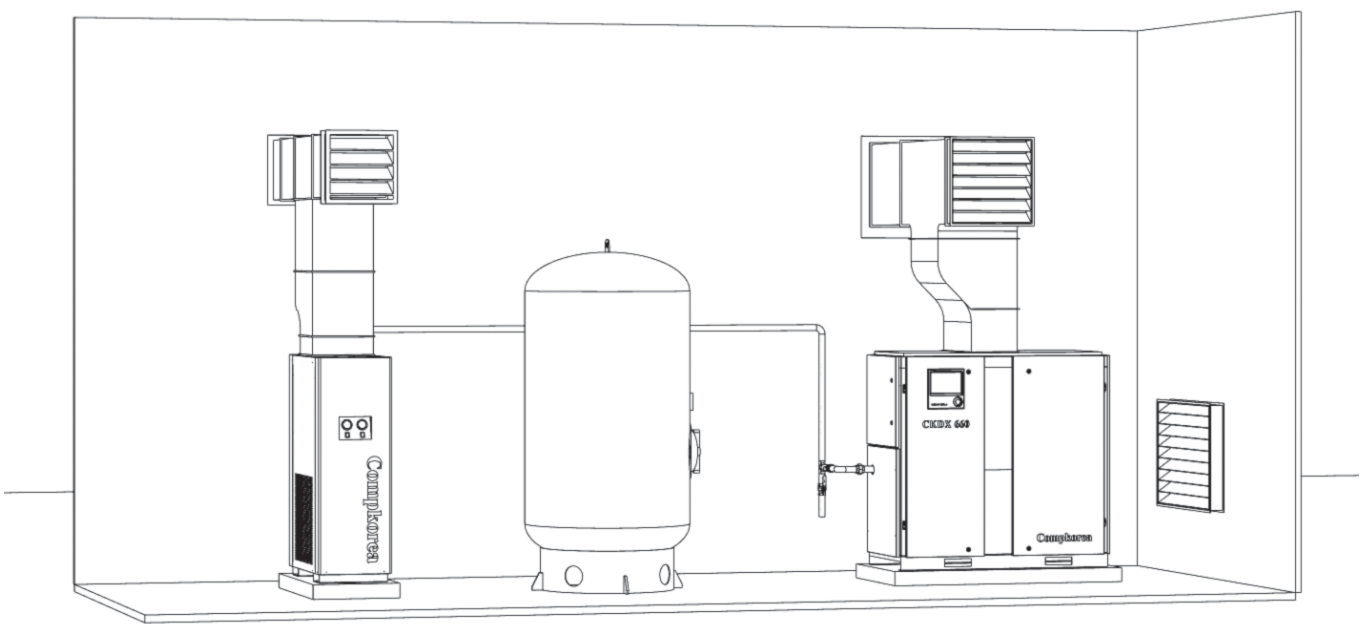


- If the compressor is installed in an area exposed to rain or basement area exposed to high temperature, the risks of electric shock, drain and surface corrosion increase.
- Continued exposure to vibration can result in poor contact and damage to air-ends and pipes.



04 Compressor Transfer and Installation

■ Ventilation Requirements



- Locate the compressor in a clean, well ventilated area with an air intake opening being installed as low as possible. The size of the intake opening should be at least 1 m².
- If the temperature inside is lifted as much 10°C or above that outside, ventilation fans are required. Continuous operating at 40°C or higher can cause the compressor to malfunction.
- Ventilation duct sections should be connected to the exhaust pipes of the compressor.
- Maintenance of the compressor with exhaust ducts. The exhaust ducts should be removable for inspection and cleaning.

05 Electrical wiring instructions

Wire Connections



- Electrical wiring should be conducted by a qualified electrician. Improper electrical work can result in electric shock or fire.
- Do not replace or modify any parts within the compressor electrical box without consulting with the head office.
- Ensure that all the cables connected to the compressor terminals without being crushed, and seal the holes where wires pass through using rubber to protect the wires from any damage that might be caused by vibration.

Breaking capacity of circuit breaker

| Model | Horsepower (HP) | Supply voltage (V) | Capacity of circuit breaker |
|----------|-----------------|--------------------|-----------------------------|
| DX5/DX75 | 5 / 7.5 | 220 | 50 |
| | | 380 / 440 | 50 |
| DX100 | 10 | 220 | 75 |
| | | 380 / 440 | 50 |
| DX150 | 15 | 220 | 100 |
| | | 380 / 440 | 75 |
| DX200 | 20 | 220 | 100 |
| | | 380 / 440 | 75 |
| DX300 | 30 | 220 | 150 |
| | | 380 / 440 | 100 |

| Model | Horsepower (HP) | Supply voltage (V) | Capacity of circuit breaker |
|---------------------|-----------------|--------------------|-----------------------------|
| CKDX660 | 50 | 220 | 225 |
| | | 380 / 440 | 150 |
| CKDX1020 / CKDX1380 | 75/100 | 220 | 300 |
| | | 380 / 440 | 225 |
| CKDX2120 / CKDX2720 | 150/200 | 220 | 500 |
| | | 380 / 440 | 400 |
| CKDX4120 | 300 | 220 | 600 |
| | | 380 / 440 | 500 |
| CKDX5320 | 400 | 220 | 800 |
| | | 380 / 440 | 600 |

Protection devices



- Any attempt to modify or remove the protection devices can cause an accident.
- The setting values of protection devices should not be changed or altered.

Grounding



- If the compressor is not connected to non-grounded plug or cord, electric shock and compressor malfunction can occur.
- Connect the ground wire to the terminal within the electrical box..
- Ground the grounding terminal in compliance with 400V class type or above 400V class type, depending on the voltage.

06 Generation Facilities

■ Wire gauge

• If your electricity capacity and wire gauges are not consistent with preferences, the compressor may not operate due to voltage drop. The acceleration fault of main motor and voltage drop of the control circuit also can cause compressor failure. Voltage drop is defined as the voltage is less than 5% of the nominal supply voltage.

▶ The following wire gauges are recommended for the two models:

| Model/Motor size (Kw) | | DX50/75(3.7/5.5Kw) | DX100 (7.5Kw) | DX150 (11Kw) | DX200 (15Kw) | DX300 (22Kw) | CKDX660 (37Kw) |
|-------------------------------|--------|--------------------|---------------|--------------|--------------|--------------|----------------|
| Wire gauge (mm ²) | AC 220 | 10 | 10 | 10 | 16 | 16 | 50 |
| | AC 440 | 10 | 10 | 10 | 10 | 10 | 35 |

| Model / Motor size (Kw) | | CKDX1020 (55Kw) | CKDX1380 (75Kw) | CKDX2120 (110Kw) | CKDX2720 (150Kw) | CKDX4120 (225Kw) | CKDX5320 (300Kw) |
|-------------------------------|--------|-----------------|-----------------|------------------|------------------|------------------|------------------|
| Wire gauge (mm ²) | AC 220 | 95 | 120 | 185 | 240 | | |
| | AC 440 | 50 | 50 | 150 | 185 | | |

* The above wire gauges are recommended when the length of wires between the compressor and a distribution transformer is less than 100m. If the wire length exceeds 100m, wire gauge is not mattered.

| Voltage | Standard type | Grounding resistance | Nominal current value | Wire gauge (mm ²) | Nominal current value | Wire gauge (mm ²) |
|---------|-------------------------|----------------------|-----------------------|-------------------------------|-----------------------|-------------------------------|
| AC 220 | 400V class type | 100Ω | Less than 20A | 1.5(2.0) or higher | Less than 150A | 6(8.0) or higher |
| | | | Less than 30A | 1.5(2.0) or higher | Less than 200A | 10(14) or higher |
| AC 440 | Special 400V class type | Less than 100Q | Less than 50A | 2.5(3.0) or higher | Less than 400A | 16(22) or higher |
| | | | Less than 100A | 4(5.5) or higher | Less than 600A | 35(38) or higher |

■ Electrical Connection warnings

- Main electrical connections and the installation of protection devices should be conducted by a qualified electrician.
- If the power capacity falls short of the requirement, voltage drop can occur during operation. Measure generation capacity before installing the compressor to prevent voltage drop.
- Because steep supply voltage variations adversely affect the compressor, maintain voltage variations in supply and between phases within the range of $\pm 5\% \pm 2\%$.
- Use 600V CV wire for main power cable.
- Perform ground connections using GV cables and a ground rod.
- Install a circuit breaker in the short-circuit protection device because the fuse and attached blades may cause open phase, which will harm the motor.
- Ensure that all screws are properly tightened because loose screws can lead to cable degradation and even fire.

087 Inspection and Fitting Installation

1 Ensure that the discharging pipe lines are connected with a french or iron union to facilitate maintenance, inspection and disassembly of the compressor.

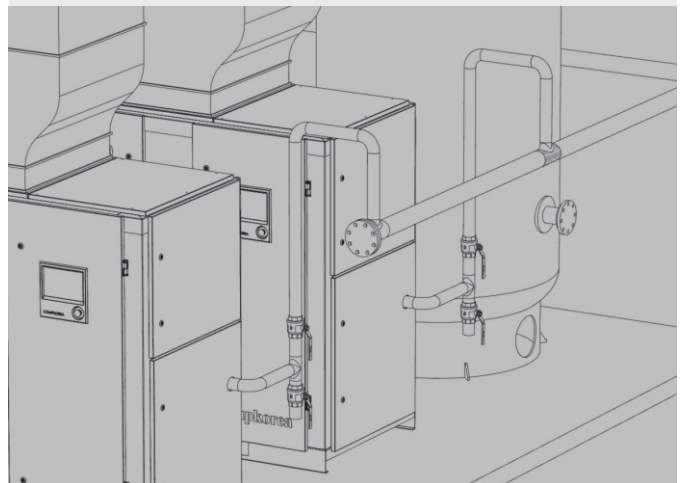
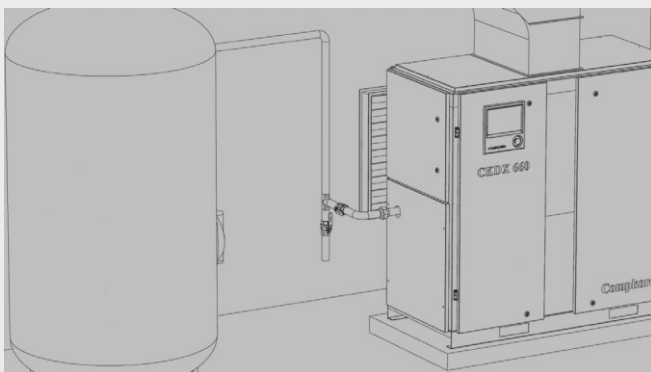
2 Install a functional valve such as a ball valve in the compressor discharge line to prevent backflow while the compressor is not used for a long time.

3 Ensure that any concave-faced pipe or pipe with a hole facing upwards is connected to a drain valve at the bottom.

4 After the compressor shuts off, discharge condensation water by opening the drain valve.

5 Ensure that one pipe connected to another at a right angle has a distance of about 600mm from the compressor door to facilitate maintenance.

6 While connecting compressor pipes with main pipes, make the seal of pipes face upwards to prevent backflow.



Oil change instructions

- 1 After operating the compressor for 5 minutes, shut it off and put a container to the hose attached to the drain valve at the bottom of the separation tank.

- 2 When the tank pressure reaches 2Bar, open the drain valve to allow separated oil to drain into the container. If the oil is severely contaminated, clean the tank and inside the cooler and replenish fresh oil.
 - Warnings
 - Use caution to protect yourself from splash oil or the risk of fire at the time of the discharge.
 - During oil change, prevent oil from leaking onto the floor, and dispose contaminated oil in compliance with environmental law.

- 3 Once oil is drained, close the drain valve and replace the separator and oil filter.

- 4 Once the parts are replaced, open the plug in the middle of the separation tank, and add fresh oil to the level indicated in green.

- 5 Once again that the drain valve and plug are properly tightened.

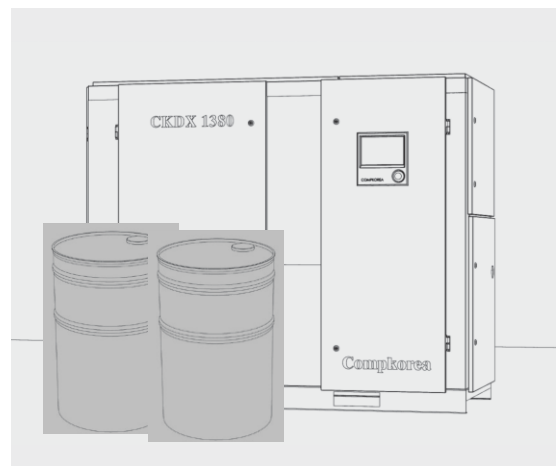
- 6 Conduct a trial on the compressor and maintain a proper level of oil (the middle of the level gauge).
 - Warnings
 - Use only genuine manufacturer-approved oil.
 - Comp Korea uses only COMPPART32 oil for its compressors.

Oil maintenance

- Use only genuine (COMPPART32) oil and make sure that it is not mixed with other types of oil.

- Conduct oil change at frequencies described herein in this manual. It is recommended that oil and the separator are replaced at least every 3,000 hours and 1 year, respectively.

- Maintain a proper level of oil because insufficient oil can accelerate oil degradation and temperature rise.



088 Inspection and Maintenance

■ Inspection



• Daily inspection

It is important to inspect and maintain the compressor on a daily basis by keeping a maintenance log to operate the compressor efficiently. In addition, inspect and maintain the compressor at least once every six months to prevent malfunction.



• Use of Genuine parts

Use genuine manufacturer-approved parts that need to be replaced on a regular basis. The use of non-genuine parts can cause early degradation of the compressor.

※We will not be responsible for any problems arising from use of non-genuine parts.

▶Parts to be replaced on a regular basis: Oil separator, oil filter, air filter

• Controller setting for parts replacement

Menu → Enter Password (default 119) → Maintenance data → Duration of oil filter {Press "Confirm" button twice} → Initialization
Duration of the separator
Duration of the air filter
Duration of inspection, maintenance and disassembly

1 Pressure control

▶ Upper limit control

Menu → Enter Password (default 119) → pneumatic system control - Load pressure (Default = 7Bar) → No-load pressure (8Bar) → Adjust the arrow key (up and down) and press Enter.

2 Idle operation time setting

Menu → Enter Password (default 119) → pneumatic system control - Automatic shut-off time (Default = 150 seconds) → Adjust the arrow key (up and down) and press Enter.

3 Maintenance data resetting

Menu → 119 → Maintenance data - Aspiration filter replacement (press Reset for 3 seconds) → Oil, oil filter, separator, disassembly/inspection (press Reset for 3 seconds each time)

■ Control panel

Control panel **DX500**



Control panel **CKDX1000**





Control panel **CKDX2000 Inverter**



008 Inspection and Maintenance

■ Indicators of Operating States

| Control buttons | |
|---|---|
| Function key | Description |
|  | [Main screen] Option keys for sub-items [Selection screen], [Setting screen] Select a menu [Setting screen] Adjust setting values |
|  | [Main screen] Main screen, indicator of malfunction state Option key for maintenance items [Setting screen] Change the number of digits |
|  | [Main screen] A brief press goes to User's menu, and a press for 3 seconds or longer goes to the Selection Screen showing sub-menus [Selection screen] Switch to the main menu [Setting screen] Switch to the Selection screen [Setting screen] Cancel the value changed |
|  | [Selection screen] Select a menu [Setting screen] Set values for the selected menu [Setting screen] Save changed values |
|  | Start Manually: Start on the compressor Reservation Operation: Apply reservation operation |
|  | Stop manually: Shut off the compressor Preset operation: Undo preset operation after shut off Control the input load on the compressor |
|  | User controls the equipment's load input If you push the buttons whilst operating then load input will be auto-cancel-auto-cancel...changes |
|  | If you push the equipment stop, then it will convert to reservation operating mode. Reservation operating mode whilst pushing the button to setting-cancel-setting-cancel....changes |
|  | Stop beeping sound and dismounting in the event of malfunction. Lamp testing function included. |

■ Indicators of Operating States

| LED Display | | |
|---------------------|--------|--|
| Category | Color | Functions |
| Maintenance | Red | Light is on during maintenance. |
| Automatic shut-off | Yellow | Light is on during automatic shutoff. |
| Continued operation | Yellow | Operation continues until the preset shutoff time, and light is on. |
| Remote control | Yellow | Light is on when monitoring and controlling takes place using MODBUS communication methods. |
| Warning | Red | Light turns on in the event of malfunction. |
| Preset operation | Yellow | Indicating the preset operation mode. |
| No-load | Green | Light is on when loaded and off when unloaded. Blinking light when manually unloaded. |
| Starting | Yellow | Light is on during operation and off when the compressor shuts off. Blinking light when the operation is pending in preset mode. |
| Stopping | Red | Light is on when the compressor shuts off and off when the compressor is started. Blinking light during air ventilation after stopping. |

■ Terminal Block

| RS485 Communication Terminal | | | |
|------------------------------|----------|---------------|--|
| No. | Terminal | Signal | Description |
| 13 | (+) | Communication | Connected with RS485 communication Compatible with MODBUS communication. Connected with an external monitoring device or a parallel controller. |
| 14 | (-) | | |
| 15 | - | | |

| VSD(RS485) Communication Terminal | | | |
|-----------------------------------|----------|---------------|---|
| No. | Terminal | Signal | Description |
| 41 | (+) | Communication | Connected with RS485 communication for VSD. Connected with RS485 communication terminal in the inverter. |
| 42 | (-) | | |
| 43 | - | | |

08 Inspection and Maintenance

■ Starting and stopping

- 1 Use the [Start] button and [Stop] buttons on the control panel to operate the compressor.
- 2 Use RS485 communication to start and stop
- 3 Contact switch D4 [Remote switch on/switch off] Starting and stopping using contact. Contact input starts the compressor. Output contact will stop the compressor. After the compressor is started with contact input, the operation can be interrupted by pressing button, communication method or malfunction. In that case, to reactivate the compressor with contact, the output of the previous contact should be followed by contact input.
- 4 Starting and stopping can be controlled using a combination of buttons, contact and communication.
- 5 In automation mode, [Start] means an immediate operation of the compressor [Stop] means an immediate shut off.
- 6 In preset mode, [Start] means that preset operation is applied and [Stop] means discontinuing of preset operation. However, when the compressor is operated in preset mode, it should be stopped first to discontinue the mode.

■ Star-Delta (Y- Δ) Starting

- 1 After a time delay, the switch over from star to delta (Star \rightarrow delta) takes place to start the compressor. But the star delta switch over may take 0 second in a direct-start design by activating the Start MC.
- 2 Once the motor is started, the electrical frequency remains stable.
- 3 A time delay is required to change star to delta connection and to protect the compressor. If the two requirements are met, start load performance.
[Load time delay] Time is delayed during the preset time after start-up.
[Load temperature delay] Temperature is delayed until the preset temperature is reached.
- 4 [Protective control] To protect the compressor, loading continues for 3 seconds and unloading for 7 seconds (depending on the preset number of protective controls) repeatedly to warm up the machine before loading. This protective control is activated for the first starting that is customized by the user and not applied when the compressor is restarted.
- 5 If the discharge pressure measured during operation falls below the cut-in pressure, the solenoid becomes operative. If the discharge pressure exceeds the cut-out pressure, the solenoid becomes inoperative.
- 6 If no-load operation continues during the preset [automatic shut-off time], the compressor will eventually stop. During this automatic shut-off, the discharge pressure falls below the cut-in pressure, the compressor will be immediately restarted.
- 7 It is normal for the compressor to shut off completely if the no-loading operation exceeds the [Safe Shut-off Time]. If the compressor automatically shuts off due to a malfunction, the [Safe Shut-off Time] is not applied. When the compressor is shut-off, the [Air Ventilation Time] is activated to prevent the machine from starting during the time. If a pressure sensor is used, it works to protect the compressor, and the [Air Ventilation Time] is automatically set for 5 seconds.
- 8 After being started, the compressor is designed to keep working for the preset {Minimum Operation Hours}.

■ VSD Operating

- 1 The inverter compressor adjusts the motor rotation speed according to discharge pressure, making it effective for reducing power consumption.

- 2 Dispatch frequency of the inverter to be used is set with RS-485, and starting/stopping is activated through contact. Setting menus vary among inverters, so please read the manual of your inverter carefully.

- 3 After connecting RS485 communication between the inverter and the controller, [VSD inverter model],[VSD Communication Station No.] and [VSD Communication BAUDRATE] should be set. When all communication is done, the controller will display the inverter data.

- 4 Once the compressor is started, the VSD Mode Relay is out during the [Start Time Delay].

- 5 After the time delay, the inverter is started and working to allow the main motor to reach to the preset [VSD minimum frequency] for the [Inverter Stability Time], while the compressor remains in no-load operation.

- 6 During operation, the discharge pressure is controlled to meet the preset [VSD dispatch pressure while the inverter adjusts the motor rotation speed Based on RS-485, motor rotation will increase in response to low pressure and vice versa. At the same time, the controller will display the frequency of the inverter, voltage and Current. The motor rotation speed is controlled in the range of [VSD minimum frequency]~[VSD maximum frequency].

- 7 The speed and sensitivity can be also changed in the [VSD Gain] and [VSD Integration Frequency]

- 8 If the discharge pressure exceeds the cut-out pressure, close the solenoid valve and maintain the rotational speed at the [VSD Minimum Frequency] (No-load Operation).

- 9 During the no-load operation, if the discharge pressure falls below the cut-in pressure, open the solenoid valve and control the rotational speed.

- Ⓜ If the no-load operation continues during the [Automatic Shut-off Time], the compressor will automatically shut off. During this automatic shut-off, the discharge pressure falls below the [VSD cut-in pressure], the compressor will be immediately restarted.

- It is normal for the compressor to shut off completely if the no-load operation exceeds the [Safe Shut-off Time]. If the compressor automatically shuts off due to a malfunction, the [Safe Shut-off Time] is not applied. When the compressor is shut-off, the [Air Ventilation Time] is activated to prevent the machine from starting during the time. However, if a pressure sensor is used, it works to protect the compressor, and the [Air Ventilation Time] is automatically set for 5 seconds

008 Inspection and Maintenance

■ Operation Combining Star Delta and VSD

- 1 Panel composition: The Relay 5 and Relay 6 in the controller is set for star-delta mode and VSD mode, respectively, and these Relays forms a combined panel to enable the main power to connect to either the motor or the inverter, depending on the mode.
- 2 [Mode switch in the event of VSD failure] It can be set in the menu.
- 3 The [Contact Failure] produced by the inverter is connected to the contact of the CUBE310, and the corresponding port is set as the [Inverter Failure].
- 4 In the event of inverter failure during VSD operation, the compressor will automatically shut off, and then the mode will switch to the star-delta operation. If the machine is shut off again, the mode will switch back to VSD.

■ Automatic operation

- 1 User can start and stop the compressor at his convenience using buttons, communication and contact.
- 2 Once the compressor is started, it will operate according to the preset-mode.

■ Preset operation

- 1 The compressor will automatically start and stop according to the preset times, which offer up to three time schedules for weekly operation.
- 2 The same date can be entered for the [Starting Time} and {Stopping Time} to deactivate one of three time schedules.
- 3 Once the operation time is set, press the [Preset Operation] button to start the machine, then the light is on the [Preset Operation] button.
- 4 The [Preset Operation] can be used when the compressor is started by buttons, communication and contact. With the preset operation function being activated, the [Start] button light is blinking when the compressor is shut off, and LED light stays on the [Start] button.
- 5 Since then the operation will depend on the preset mode.
- 6 Once the compressor is started, it will operate according to the preset-mode.
- 7 To deactivate the preset operation, press the [Preset Operation] button when the compressor is stopped. During the preset operation, stop the compressor using buttons, communication or contact and press the [Preset Operation] button. Once the preset operation is deactivated, light is off from the [Preset Operation] button.

| Category | Description | Contact type | Delay time | Degree of protection |
|--|--|---------------------|---------------------|----------------------|
| Discharge overpressure | The pressure exceeds the preset value | - | 0.1[seconds] | Shut off |
| Differential pressure of oil skimmer | The pressure difference between compressor and discharge exceeds the preset value | - | Setting is possible | Setting is possible |
| High oil temperature | Oil temperature exceeds the preset value | - | Setting is possible | Setting is possible |
| High discharge temperature | Discharge temperature exceeds the preset value | - | Setting is possible | Setting is possible |
| Overcurrent | Motor's current exceeds the preset value | - | Setting is possible | Setting is possible |
| Overvoltage | The voltage supplied from the national grid exceeds the preset value | - | Setting is possible | Setting is possible |
| Undervoltage | The voltage supplied from the national grid falls below the preset value | - | Setting is possible | Setting is possible |
| Phase Reversal | The voltage phase rotation from the national grid is reversed from the preset direction | - | 1[seconds] | Shut off |
| Failure of the discharge pressure sensor | Failure of the discharge pressure sensor or the sensor malfunctions or disconnection | - | 3[seconds] | Shut off |
| Failure of the compressor pressure sensor | Failure of the compressor pressure sensor or the sensor malfunctions or disconnection | - | 3[seconds] | Warning |
| Failure of the temperature sensor | Failure of the temperature sensor or the sensor malfunctions or disconnection | - | 3[seconds] | Warning |
| Failure of the discharge temperature sensor | Failure of the discharge temperature sensor or the sensor malfunctions or disconnection | - | 3[seconds] | Warning |
| Emergency shutoff | DI1 [Emergency Shutoff] contact input occurs | Setting is possible | Immediately | Shut off |
| Fan motor overload | DI2 [Fan Motor Overload] contact input occurs | Setting is possible | Immediately | Setting is possible |
| Oil filter differential pressure | DI3 Oil filter differential pressure | Setting is possible | Immediately | Setting is possible |
| Separator differential pressure | DI5 [External failure 1] DI6 [External failure 2] DI7 [External failure 3] Contact input occurs | Setting is possible | Immediately | Setting is possible |
| Cooling water differential pressure | | | | |
| Main motor overload relay | | | | |
| Reverse, Phase reversal and open phase relay | | | | |
| Overvoltage relay | | | | |
| Undervoltage relay | | | | |
| Inverter failure | | | | |
| Inverter communication failure | The communication with the inverter fails | - | 10 times | Warning |

088 Inspection and Maintenance

Maintenance

| Category | Function | Range | Restoring the Factory Settings |
|---------------------------------|---|------------|--------------------------------|
| >Password | Password is required to access to the Maintenance Menu | 0000~9999 | 0000 |
| >Duration of oil filter | Duration of the oil filter used. Press [ENTER] to initialize | - | - |
| >Oil filter replacement time | Set the hours after which the filter is to be replaced | 0~9999 | 1500[hour] |
| >Duration of oil separator | Durationoftheoilseparatorused.Press[ENTER]toinitialize | - | - |
| >Oil separator replacement time | Set the hours after which the separator is to be replaced | 0~9999 | 3000[hour] |
| >Duration of air filter | Duration of the air filter used. Press [ENTER] to initialize | - | - |
| >Air filter replacement time | Set the hours after which the filter is to be replaced | 0~9999 | 1500[hour] |
| >Duration of SOL valve | ThefrequencyoftheSOLvalveused.Press[ENTER]toinitialize | - | - |
| >SOL valve replacement time | Set the hours after which the valve is to be replaced | 0~999[000] | 100[000] |
| >Operation duration | Duration of compressor operation after disassembly and inspection Press [ENTER] to initialize | | |
| >Disassemblyandinspectiontime | Set the hours after which disassembly and inspection of the compressor will take place | 24000 | 24000[hour] |
| >Operation frequency | The number of times the compressor is started. Press [ENTER] to initialize | - | - |
| >Change password | to change the password | 0000~9999 | 0000 |

Preset Operation

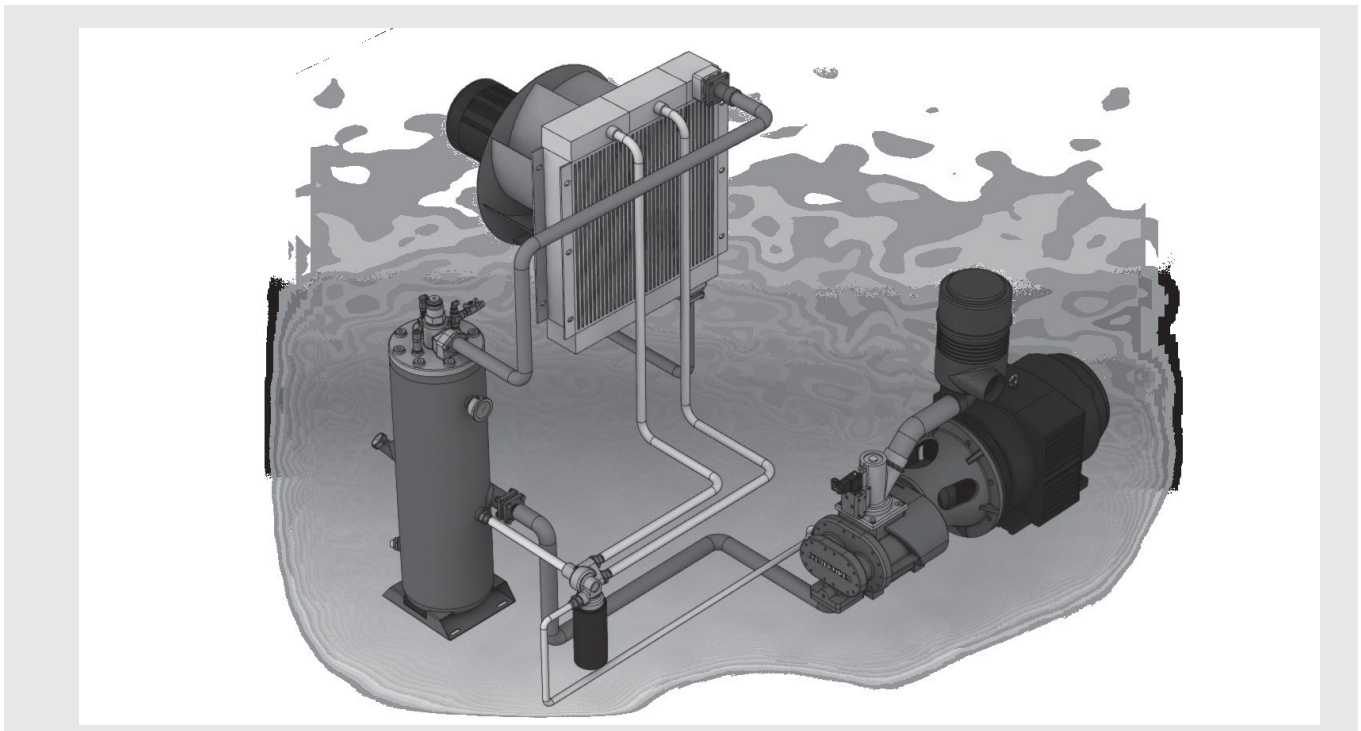
| Category | Function | Range | Restoring the Factory Settings |
|---------------------------------------|---|-------------|--------------------------------|
| Monday: Operation 1 >Op 2 >Op 3 | Operation schedule preset for Monday. Up to three different schedules can be preset. To deactivate any schedule out of three schedules, make the starting and stopping hours identical | 00:00~23:59 | 00:00~00:00 |
| Tuesday: Operation 1 >Op 2 >Op 3 | Operation schedule preset for Tuesday. Up to three different schedules can be preset. To deactivate any schedule out of three schedules, make the starting and stopping hours identical | 00:00~23:59 | 00:00~00:00 |
| Wednesday: Operation 1 >Op 2 >Op 3 | Operation schedule preset for Wednesday. Up to three different schedules can be preset. To deactivate any schedule out of three schedules, make the starting and stopping hours identical | 00:00~23:59 | 00:00~00:00 |
| Thursday: Operation 1 >Op 2 >Op 3 | OperationschedulepresetforThursday.Up to three different schedules can be preset. To deactivate any schedule out of three schedules, make the starting and stopping hours identical | 00:00~23:59 | 00:00~00:00 |
| Friday : Operation 1 >Op 2 >Op 3 | OperationschedulepresetforFridayUp to three different schedules can be preset. To deactivate any schedule out of three schedules, make the starting and stopping hours identical | 00:00~23:59 | 00:00~00:00 |
| Saturday: Operation 1 >Op 2 >Op 3 | Operation schedule preset for Saturday Up to three different schedules can be preset. To deactivate any schedule out of three schedules, make the starting and stopping hours identical | 00:00~23:59 | 00:00~00:00 |
| Sunday: Operation 1 >Op 2 >Op 3 | Operation schedule preset for Sunday Up to three different schedules can be preset. To deactivate any schedule out of three schedules, make the starting and stopping hours identical | 00:00~23:59 | 00:00~00:00 |

09 Production of compressed air

■ Compressed air and oil circulation system

▫ Compressed air and oil circulation system

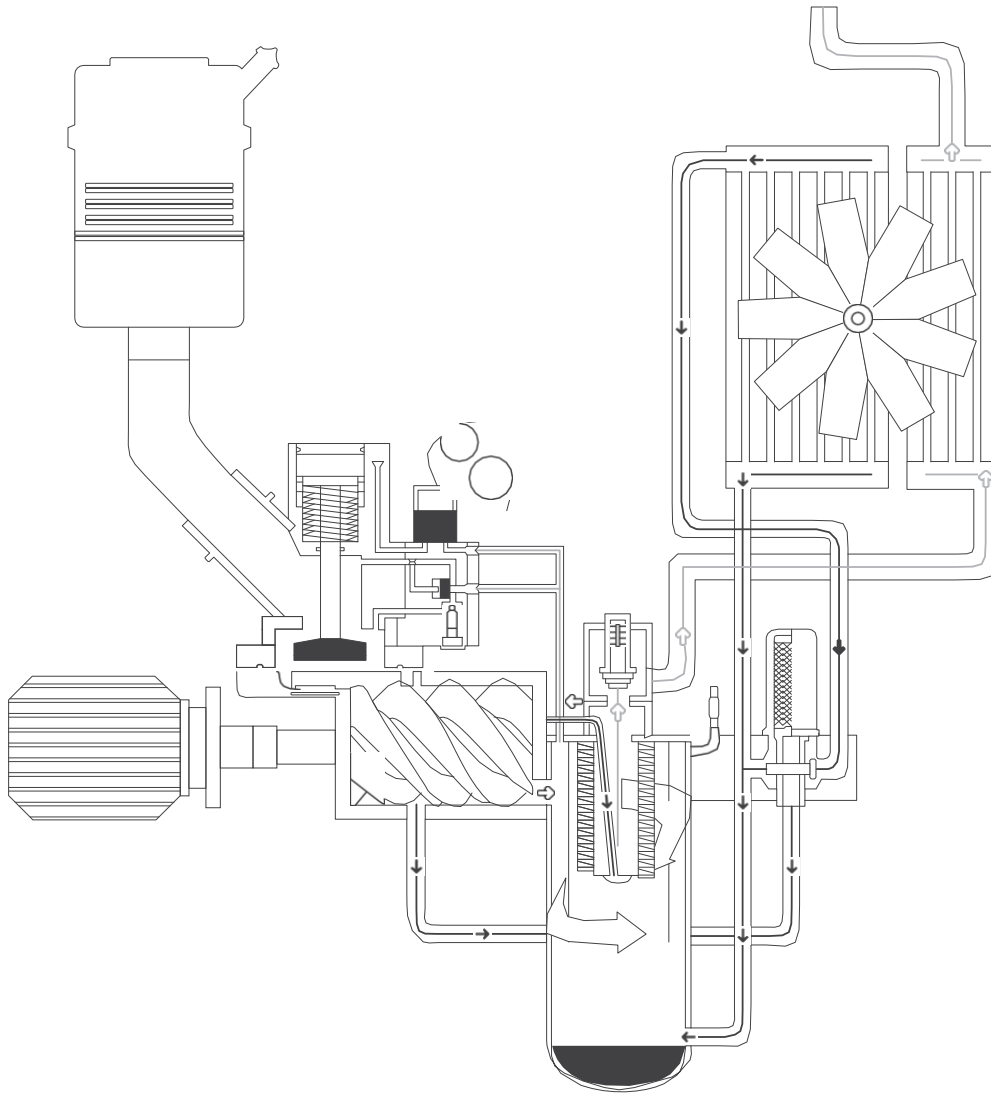
Compressed air and oil circulation system of a direct driven compressor is as follows.



- 1 If a motor rotates, air end rotates by the direct drive, and air is absorbed through the suction filter for compression.
- 2 Oil filtered through the oil filter is sprayed through a nozzle for effective compression and cooling.
- 3 Compressed air mixed with oil is released from the air end to the oil separator tank.
- 4 Oil is separated from compressed air mixed with oil in the oil separator tank by collision and cyclone phenomena, and fine oil existing in the compressed air is completely separated through a separator.
- 5 Oil gathered at the bottom of the oil separator tank is again cooled through the oil cooler, and sprayed to the air end through the oil filter.
- 6 Oil separated pure compressed air is cooled in the after-cooler through the pressure control valve installed in the oil separator tank, released through the discharge pipe, and supplied to the receiver tank and others.

09 Production of compressed air

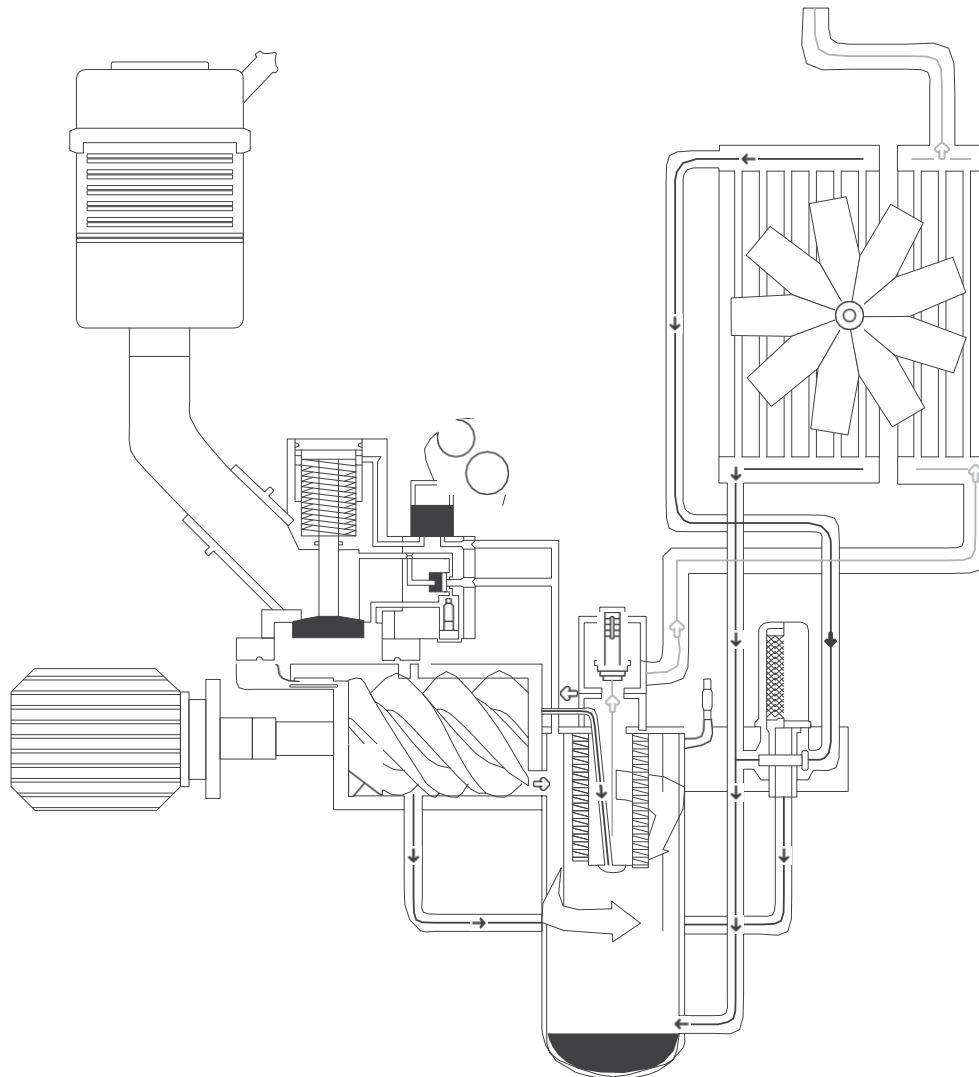
■ Load operation



- 1 If a motor starts, as a small amount of air is absorbed through the check orifice, the pressure in the oil separator tank increases. If P1 pressure reaches $1.5 \sim 2 \text{ kg/cm}^2$ (4 ~ 5 sec), suction valve is completely opened and a lot of air is absorbed to start the compression.
- 2 If the pressure in the oil separator tank reaches 4 kg/cm^2 after the start of compression, pressure holding valve installed in the outlet pipe of the tank is opened and compressed air is transported to the cooler. Compressed air having been cooled through the cooler is transported through the discharge pipe, to the receiver tank, and supplied to the site.

09 Production of compressed air

■ Unload operation



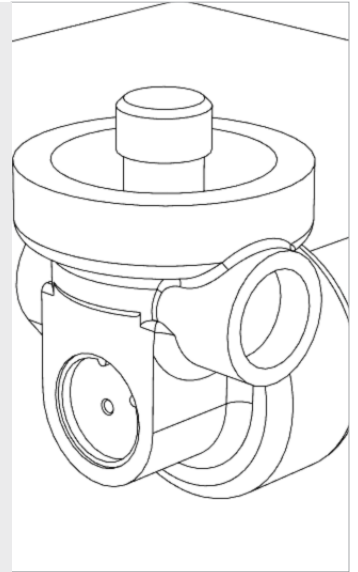
- 1 If the pressure in the receiver tank rises and reaches the upper setting pressure of the pressure switch, the power for the solenoid valve is disconnected and the suction valve is closed. Then, P1 pressure is released through the purge valve for the complete unloaded state.
- 2 If compressed air is not used and unloaded operating state continues for a certain time, compressor stops to operate. If compressed air is used and compression switch reaches the lower setting pressure, compressor automatically restarts.

10 Functions and management of major parts

■ Automatic temperature control valve (BYPASS VALVE)

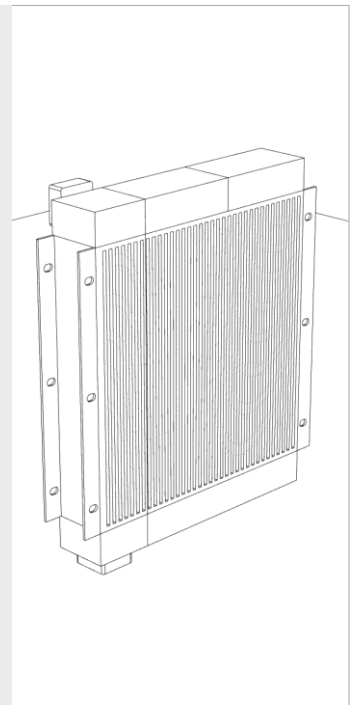
- It helps maintain the proper oil temperature
- It inhibits water occurrence in the oil tank.
- If oil temperature rises, it sends oil to the oil cooler to lower oil temperature and to maintain the proper oil temperature.

- Notice
- For an oil separator, be sure to use genuine parts supplied by COMPKOREA.
 - Under dusty environment, more frequent replacement is recommended.



■ Oil / After-cooler

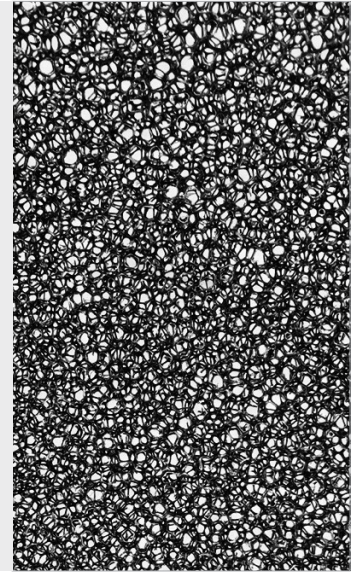
- It is designed for cooling oil and compressed air up to 15 Bar.
- As accumulation of dust may cause temperature rise, clean it periodically.



10 Functions and management of major parts

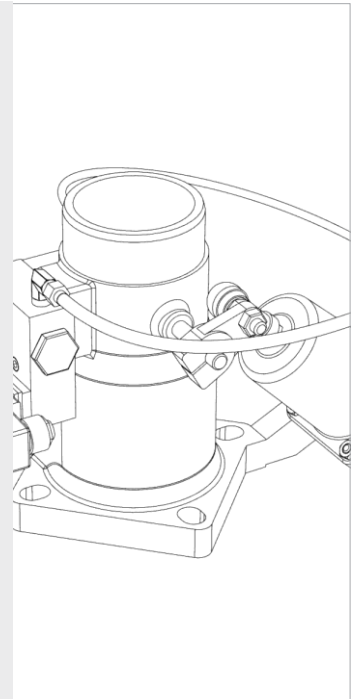
■ Cleaning a dust filter

- Big foreign materials and dust should be filtered before air in the atmosphere is absorbed into the compressor.



■ Suction valve

- Suction valve is a device to relieve the load on the compression upon starting, to control 0~100% load of the compressor with increase/decrease of air consumption, and to control load/unload operation of the compressor with the signal of the input sensor. Its adhesion and diagram damage may cause failures like pressure rise of the released air.
- Input switch signal acts to control load/unload operation of the compressor.
- It helps maintain the proper oil temperature to inhibit water occurrence in the oil tank.

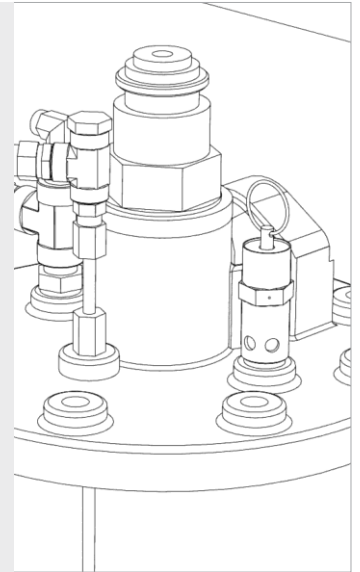


10 Functions and management of major parts

■ MPV

- MVP valve maintains the pressure within the oil separator tank at the level above the minimum pressure and prevents the refluxing of the compressed air. In addition, the oil retrieval device installed retrieves the oil within the separator to AIR END and sprays it.
- At the time of cleaning through dismantling, replace the O-ring and make sure that the pressure within the oil tank is maintained at more than 4kgf/cm^2 because the operation at pressure below 4kgf/cm^2 may induce breakdown in the equipment due to the formation of condensed water.

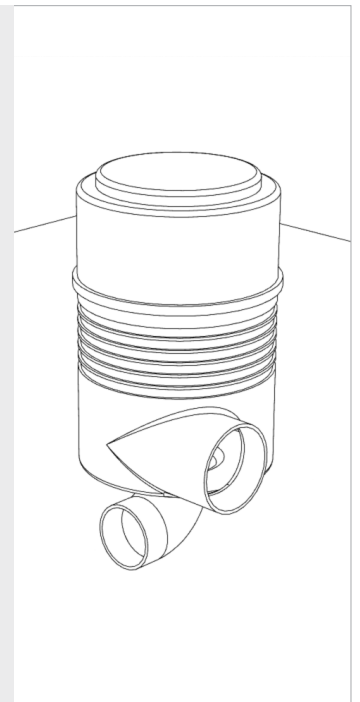
▶ Notice If the pressure in the oil separator is lower, oil content in the air released is more.



■ Management and replacement of the air filter

- Inspect the air filter frequently. If contaminated seriously, used for over one year, or air filter gasket is damaged, be sure to replace it. As filter should not be cleaned by water, clean it by blowing the compressed air toward the opposite direction of the suction air flow (from inside to outside of the element).
- ▶ Must be replaced:
 - 1 In case of serious choking or contamination
 - 2 If used more than one time of cleaning
 - 3 If used for over 6 months
 - 4 If gasket is damaged

▶ Notice For an air filter, be sure to use genuine parts supplied by COMPKOREA.

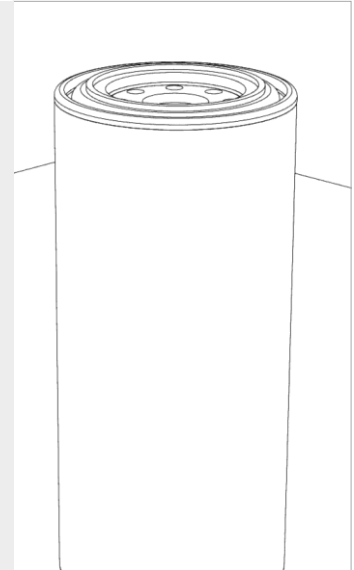


10 Functions and management of major parts

■ Management/replacement of oil filters

- If foreign materials in the oil flow into the air end, it may cause rotor damage and directly affect damage and life of the equipment. Check tightening is well done. Replace it every 3,000 hours. Frequent replacement under special service conditions will be helpful for life extension of the equipment. It is preferred to replace it together with lubricating oil.

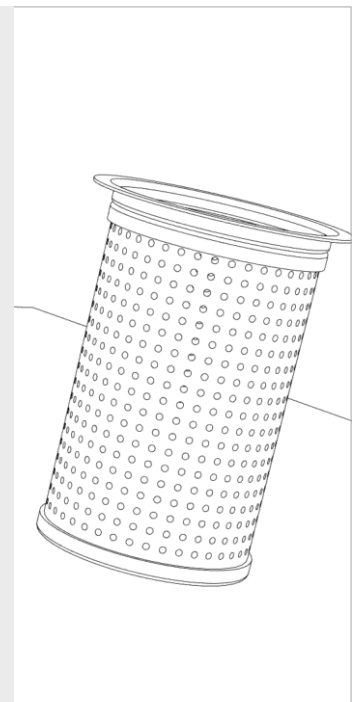
▶ Notice For an air filter, be sure to use genuine parts supplied by COMPKOREA.



■ Replacement of an oil separator

- Oil separator is embedded in the oil separator tank. As it is made of fine special resin fiber, periodical replacement is necessary for continuous effect to separate oil and compressed air. Replacement every 3,000 hours is preferred. Frequent replacement under special service conditions will be helpful.

▶ Notice • For an air filter, be sure to use genuine parts supplied by COMPKOREA.
• Under dusty environment, more frequent replacement is recommended.



11 Checking points during operation

■ Pressure sensor

- Internal pressure and release pressure are measured by the pressure sensor
- P1 pressure gauge: It indicates internal pressure of the compressor. Analog gauge is mounted on the oil separator tank.
- P2 pressure gauge: It measures release pressure of the compressed air, which is indicated in the PCB monitor.

▶ Notice

- Operation under the pressure out of the compressor specification is prohibited.
- If pressure adjustment out of the equipment specification is necessary, please call our sales office.

- Check that load/unload operation is normally converted according to the setting pressure of the compressor. If necessary, please adjust the pressure switch.

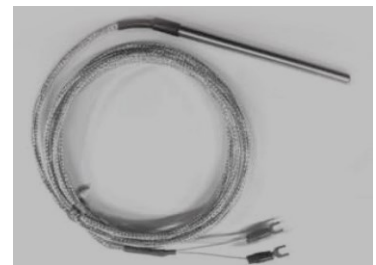


Pressure sensor DP5 30,0~16bar

■ Temperature sensor

- Released air temperature is measured by the temperature sensor and indicated in the PCB monitor.
- For safety, allowable operation temperature is set to within 110°C when being shipped.
- Upon starting, check that average temperature is maintained at 80°C ± 10°C.
- If compressor is operated over allowable operation temperature, check oil amount in operation, an oil cooler, ambient temperature, air end, etc. (Alarm sounds at 105°C, and it automatically stops at over 110°C)

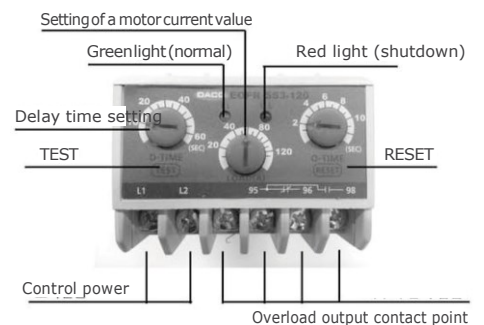
▶ Notice Be careful not to operate the compressor out of allowable operation temperature. If operated out of setting temperature, it automatically stops.



Temperature sensor DPR-TH02-P6D100L

■ Motor overload trip

- If alarm "Main motor trip" appears on the PCB monitor, it means motor overload. In this case, please check supply voltage and current.



12 Failure causes and measures

| Problems | Causes estimated | Actions and measures |
|--------------------------------|---|--|
| Compressor starting impossible | Motor overload | <ul style="list-style-type: none"> Manually reset the main motor and fan motor EOCR. If failure repeats, replace the motor bearing and motor coil. Check the voltage, and in case of low voltage (over 10%) ask the power supply company. Check differential pressure between P1 and P2. If necessary, take proper actions. |
| | No fuse breaker working | <ul style="list-style-type: none"> Check fuse capacity and replace Check short state. |
| | Stop by the temperature sensor (Be sure to check overheat causes and to take actions) | <ul style="list-style-type: none"> Insufficient cooling air: ventilation, cooler, air suction inlet choking, etc. filling different mixed oils, or oil surplus and shortage Ambient temperature over 40°C Choking of the oil separation element Failure of the temperature controller Failure of the temperature sensor or temperature gauge |
| | Failure of an electric circuit | <ul style="list-style-type: none"> Check the magnet contact point and coil, and take actions. |
| | Circuit breaker working | <ul style="list-style-type: none"> Reset If circuit breaker continues to work, check the reason and take actions. |
| Shortage of compressed air | Choking of an air suction filter | <ul style="list-style-type: none"> Check visually contamination of the air filter. |
| | Choking of an oil separation element | <ul style="list-style-type: none"> Check differential pressure between P1 and P2. → Replace oil, the oil filter, and oil separation element. |
| | Functional failure of a suction valve | <ul style="list-style-type: none"> Closely check operating state of the suction valve. If necessary, replace it. Check control line and take actions. |
| | Failure of a solenoid valve | <ul style="list-style-type: none"> Check operating state of the solenoid valve, and take actions. |
| | Failure of pressure production | <ul style="list-style-type: none"> Replace the purge valve. |
| | Failure of pressure production | <ul style="list-style-type: none"> Check air leakage of the pipe line and take actions |
| | Check a coupling and pulley | <ul style="list-style-type: none"> Replace the belt and coupling |
| | Exhaust defect of a compressor room | <ul style="list-style-type: none"> Supplement for sufficient cooling air flow |

12 Failure causes and measures

| Problems | Causes estimated | Actions and measures |
|---|---|---|
| Compressor overheat | Oil surplus and shortage | • Check the oil level and take actions |
| | Choking or bursting of an oil separating element | • Check differential pressure between P1 and P2, and take actions. |
| | Choking of a scavenge orifice/ screen | • Disassemble and check the scavenge line. If necessary, clean it in accordance with the manual. |
| | Operation under low pressures | • Disassemble and check the scavenge line. If necessary, clean it in accordance with the manual. |
| | Failure of a temperature sensor | • Check the temperature sensor and replace it. |
| | Operating defect of a temperature controller | • Check and replace it. |
| | Air leakage in the cooling system, cooler contamination | • Check the cooling line and take actions. • Clean the cooler. |
| Excessive oil content in the released air | Choking of an oil recovery line and scavenge line | • Orifice/screen cleaning |
| | Damage of an oil separation element | • Check differential pressure between P1 and P2, and replace the element. |
| | Wrong oil selection and aging | • Oil change |
| | High air supply temperature | • Measure the temperature of the released air or check the state of after-cooler. |
| | Excessive oil injection | • Check oil level and discharge the oil. |
| | Low operation pressure | • Adjust to the specified pressure. |
| Failure of operating pressure | Failure of a pressure sensor | • Check operating state of the pressure sensor and replace it. |
| | Damage of a solenoid valve | • Check contamination of the solenoid valve and clean it. |
| | Functional failure of a suction valve | • Check operating state of the suction valve and replace it. |
| | Oil leakage of an air end | • Check oil leakage area of the air end and take actions. |
| | Air leakage in the control system | • Check air leakage and take actions. |
| | Ambient temperature below 0°C | • Freezing of the pressure control valve line → Wrap the compressor or control line with sponge or else. |

12 Failure causes and measures

| Problems | Causes estimated | Actions and measures |
|---------------------------------|---|---|
| Excessive noise | Damages of parts (bearing, gear, air end, etc.) | • Ask our sales office. |
| | Defective door closing | • Check the closing of a door and compressor cover and take actions. |
| | Loose tightening of a part | • Check assembled parts and take actions. |
| Excessive vibration | Loose parts assembly | • Check parts assembly and tighten again. |
| | Damage of a motor or air end bearing | • Ask our sales office. |
| | External causes | • Check the equipment installed in the surroundings and take actions. |
| Open relief valve | Failure of compressor operation pressure | • Adjust to the specified pressure • Replace the pressure switch. |
| | Valve damage | • Replace the relief valve. |
| | Choking of a separator element | • Check the separator element and replace it |
| | Air leakage in the fitting | • Check the fitting and take actions (Replacement/tightening) |
| | Choking or functional failure of a minimum pressure holding valve | • Check and correct the minimum pressure valve. |
| Excessive water in the air line | After-cooler contamination | • Check and clean it. |
| | Cooler and dryer not installed in the air line | • Install the dryer. |
| | Functional defects of a water separator and drain | • Check and clean them. |
| | Choking of a drain pipe and trap | • Check and clean them. |
| | Defective installation of a drain line | • Check and correct a pipe line structure. |

13 Maintenance checklist

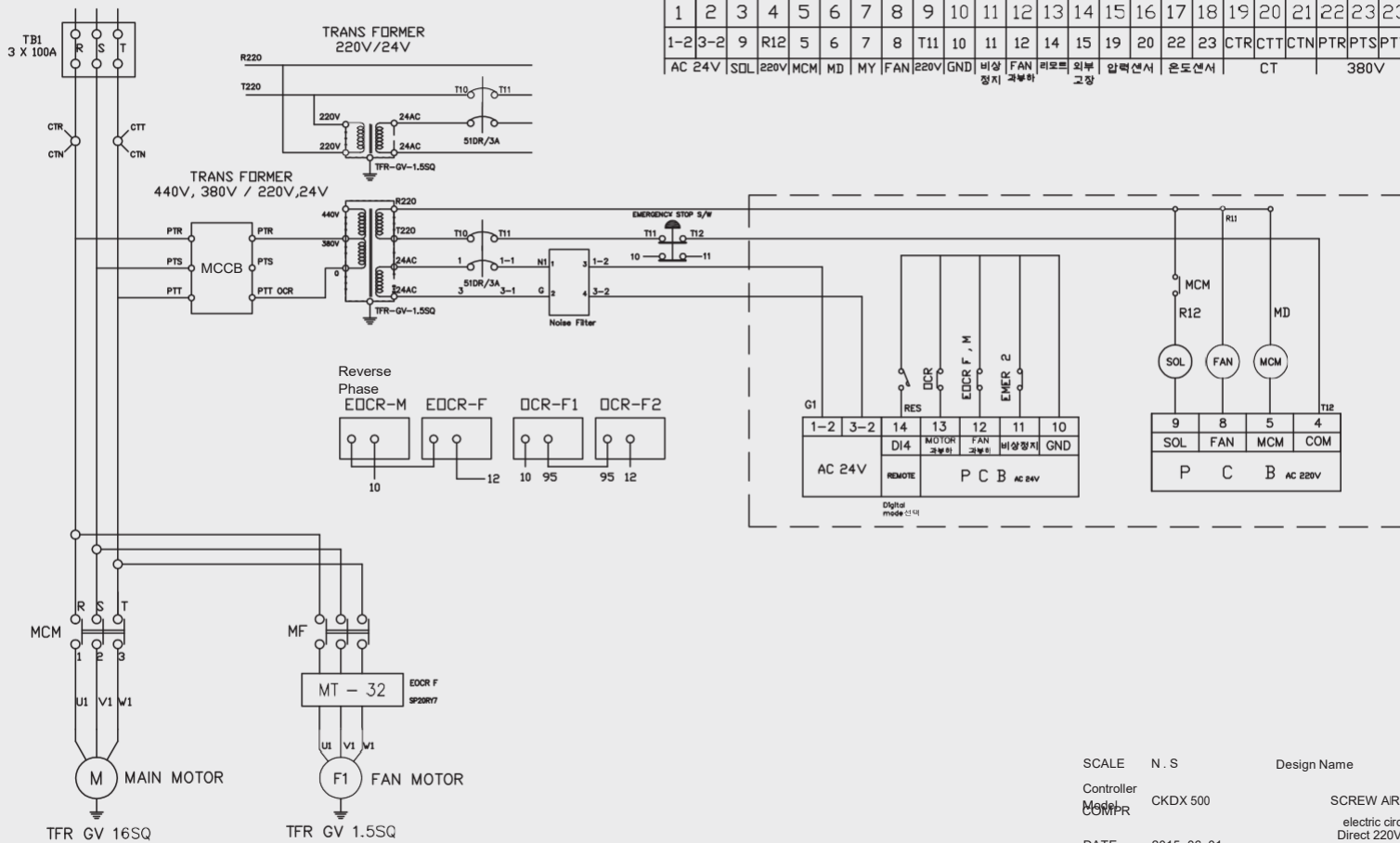
| Item | Checking points | Daily | 500Hrs | 3000Hrs | 6000Hrs | 12000Hrs | 24000Hrs | Remarks | |
|-------------------------|------------------------|---------------|---------|---------|---------|----------|----------|--|--|
| | | | 1months | 6months | 1years | 2years | 4years | | |
| Motor | Coil | Insulation | | v | | | | In case of below 10Ω, hot air drying or repair required | |
| | Bearing | Replacement | | | | | v | | |
| | Grease | Supplement | | | | | | Not charging type | |
| Air end | Bearing | Replacement | | | | | v | | |
| | Oil seal | Oil leakage | | | v | | | | |
| | Oil, gasket | Replacement | | | | | v | | |
| Monitor | | Lamp | v | | | | v | | |
| Air cleaner, element | | Suitability | | v | | | | | |
| Oil separation tank | Oil level | Suitability | v | | | | | Oil change - At first, replace it after 500 hours. - Supplement oil in shortage. | |
| | Oil drain | Drain | | v | | | | | |
| | Oil | Sampling | | | v | | | | |
| Replacement | | | | v | | | | | |
| Capacity control device | Intake suction valve | Cleaning | | | | | v | | |
| | | O-ring change | | | v | | | | |
| | Safety valve | Checking | | v | | | | | |
| | Solenoid valve | checking | | v | | | | | |
| | Minimum pressure valve | Checking | | | v | | | | |
| | | O-ring change | | | | v | | | |
| Vibration absorber | Replacement | | | | | v | | | |



Control Circuit Diagram

C O M P K O R E A

DX500 (DX100 ~ DX200)



TEMINAL BLOCK

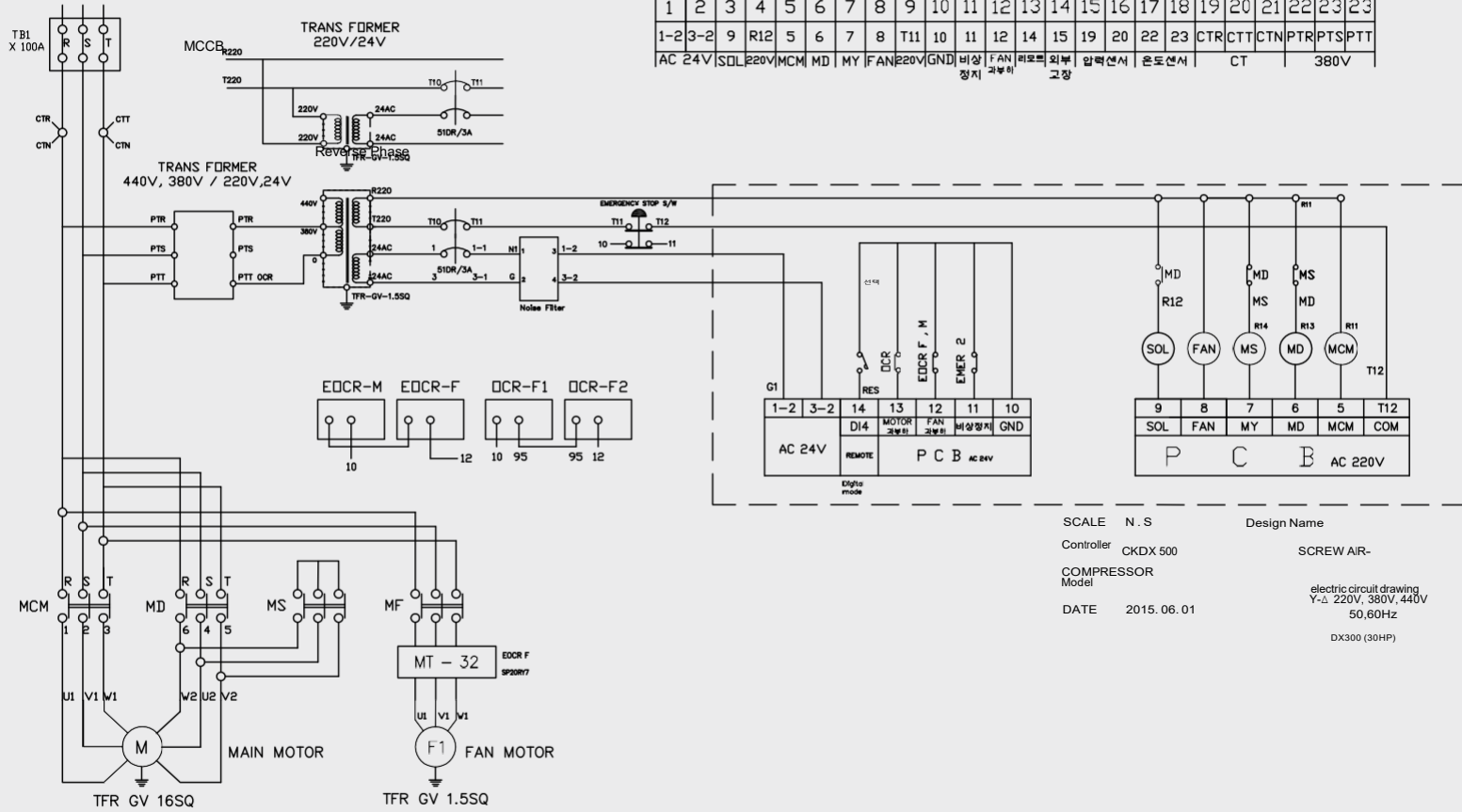
| | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-----|------|-----|----|----|-----|------|-----|----------|------------|------------------|----------|------|------|----|----|----|-----|-----|-----|-----|-----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 23 |
| 1-2 | 3-2 | 9 | R12 | 5 | 6 | 7 | 8 | T11 | 10 | 11 | 12 | 14 | 15 | 19 | 20 | 22 | 23 | CTR | CTT | CTN | PTR | PTS | PTT |
| AC 24V | SOL | 220V | MCM | MD | MY | FAN | 220V | GND | 비상 정지 | FAN 과부하 | FAN 리모트 고장 | 외부 고장 | 압력센서 | 온도센서 | | | | | CT | | | | 380V |

| | | | | | | |
|--------|-----|--------------|------------|------|--------|----|
| 1-2 | 3-2 | 14 | 13 | 12 | 11 | 10 |
| AC 24V | DI4 | MOTOR 과부하 | FAN 과부하 | 비상정지 | GND | |
| REMOTE | | P | C | B | AC 24V | |

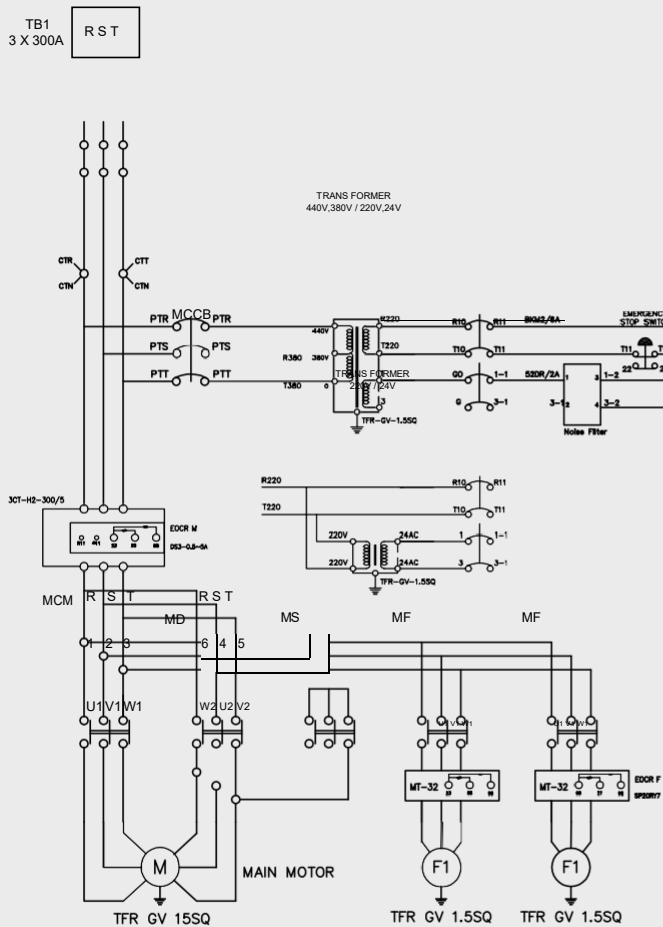
| | | | |
|-----|-----|-----|---------|
| 9 | 8 | 5 | 4 |
| SOL | FAN | MCM | COM |
| P | C | B | AC 220V |

SCALE N . S
 Controller CKDX 500
 Motor MCM PR
 DATE 2015. 06. 01
 Design Name SCREW AIR-
 electric circuit dia
 Direct 220V, 380V,
 50, 60Hz
 DX 100 ~ 200 (1)

DX500 (DX300)

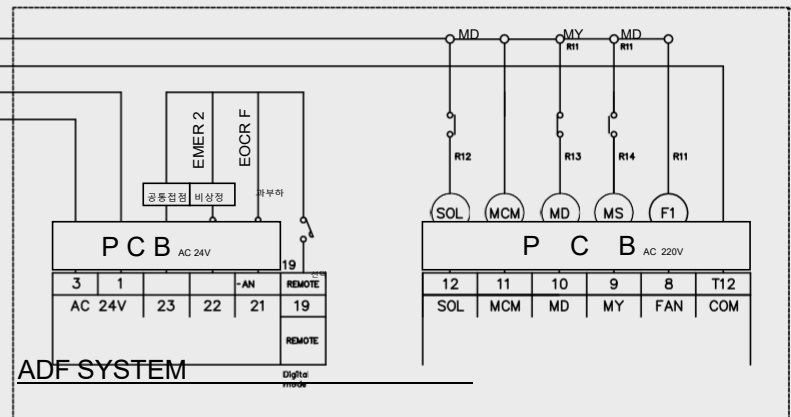


CKDX1000 (CKDX660 ~ CKDX2720)



TERMINAL BLOCK

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-----|------|-----|----|----|-----|------|------|------|-----|------|----|------|------|------|-----|-----|-----|-----|-----|-----|------|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1-2 | 3-2 | 12 | R12 | 11 | 10 | 9 | 8 | T11 | 23 | 22 | 21 | 20 | 19 | 18 | 32 | 33 | 36 | 37 | 28 | 30 | 31 | 24 | 25 | 26 | 34 | 35 |
| AC 24V | SOL | 220V | MCM | MD | MY | FAN | 220V | 공통정점 | 비상정점 | FAN | 공통정점 | 리드 | 외부고장 | 압력센서 | 온도센서 | CTR | CTT | CTN | PTT | PTS | PTR | 압력센서 | | | | |

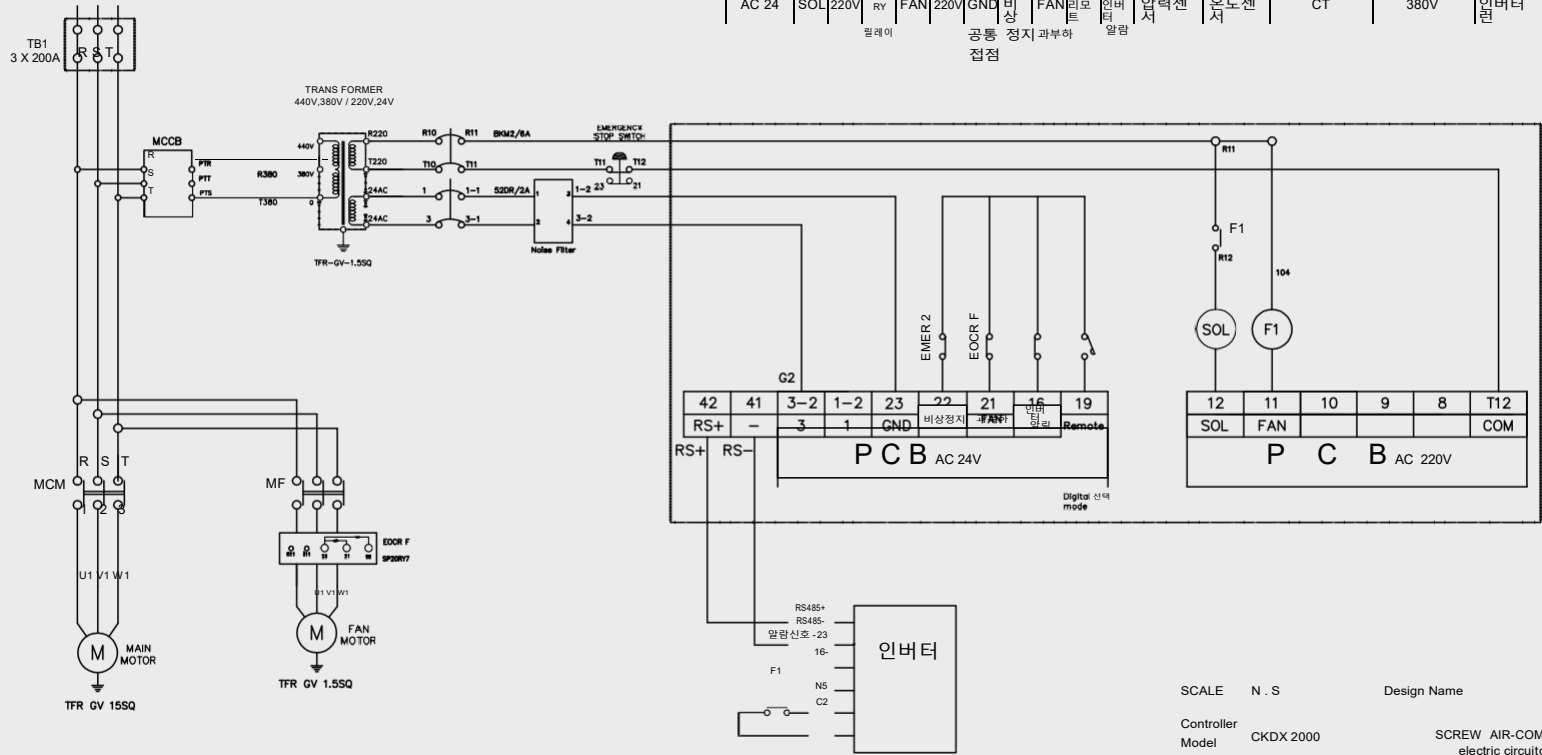


SCALE N. S Design

Controller Model CKDX 1000

DATE 2015. 06. 01

CKDX2000 (DX300 ~ CKDX2720) VSD



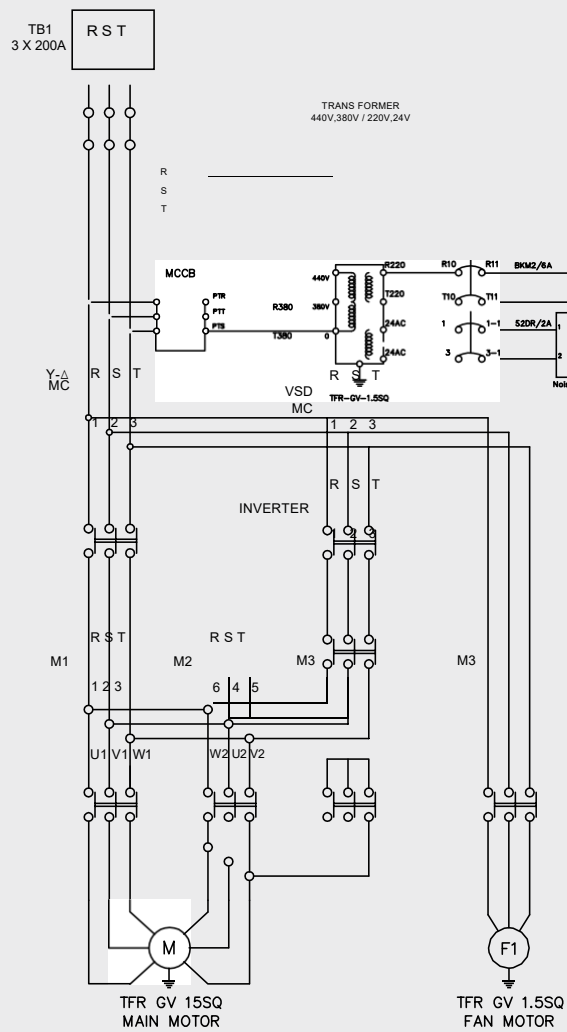
TERMINAL BLOCK

| | | | | | | | | | | | | | | | | | | | | | | | |
|-------|-----|------|----------------|-----|------|-----|-------|---------|-----|-----|----|----|----|----|----|-----|-----|-----|-----|------|-----|-----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 1-2 | 3-2 | 12 | R12 | 11 | 8 | T11 | 23 | 22 | 21 | 19 | 16 | 32 | 33 | 36 | 37 | CTR | CTT | CTN | PTT | PT3 | PTR | N5 | C2 |
| AC 24 | SOL | 220V | R _Y | FAN | 220V | GND | 비상 정지 | FAN 리모트 | 인버터 | 인버터 | 알람 | 알람 | 센서 | 온도 | 센서 | | CT | | | 380V | | 인버터 | 원 |

필레이
공통 접점
정지 과부하
접점

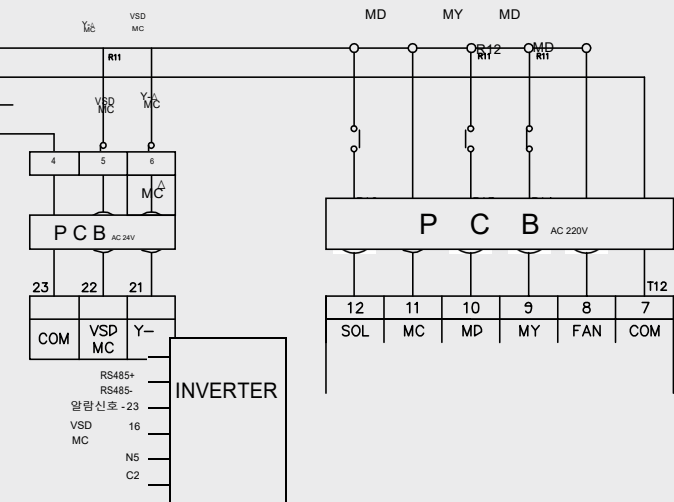
SCALE N . S
 Controller CKDX 2000
 Model Model
 DATE 2015. 06. 01
 Design Name SCREW AIR-COMPRESS
 electric circuitdrawing
 VSD 220V, 380V, 440V
 50,60Hz
 Comp. Model DX 200 VSD - CKDX 27
 (20 - 200HP VSD)

CKDX2000 (CKDX660 ~ CKDX2720) VSD and Y-Delta enable



TERMINAL BLOCK

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|-----|------|-----|-----|------|-----|----|-----|-----|-----|----|----|----|----|----|-----|-----|-----|-----|------|-----|-----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 1-2 | 3-2 | 12 | R12 | 11 | 8 | T11 | 23 | 22 | 21 | 19 | 16 | 32 | 33 | 36 | 37 | CTR | CTT | CTN | PTT | PT3 | PTR | N5 | C2 | 4 | 5 | 6 |
| AC 24 | SOL | 220V | RY | FAN | 220V | GND | 비상 | FAN | 리모트 | 인버터 | 알림 | 알림 | 센서 | 온도 | 센서 | | CT | | | 380V | | 인버터 | | | | |
| | | | 릴레이 | | | 공통 | 정지 | 과부하 | | | 접점 | | | | | | | | | | | | | | | |





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