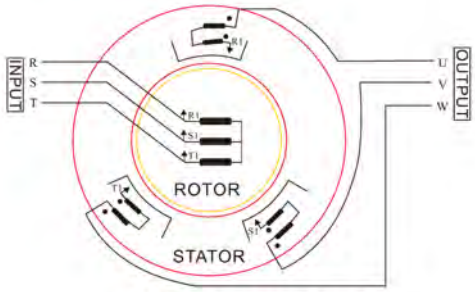
FARBER

# ARD Series

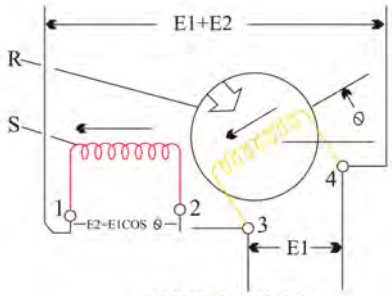
(200kVA~3,000kVA)

## 1. SCHEMATIC OF TRANSFORMER

The major parts are “R” (Rotor) and “S” (Stator). Winding “R” is the primary winding, which is connected to the mains power. Winding “S” is the secondary winding, which is connected to the load.




STRUCTURE OF COIL




SCHEMATIC

If a voltage "E1" is applied to the primary winding (between 3 and 4), there will be an induced voltage "E2" on the secondary winding (between 1 and 2). The value of "E2" will vary, along with variation of the crossing angle "θ" between the two windings.

$$E2=E1*\cos\theta$$

If connect 2 and 3, the output voltage "E1+E2" between 1 and 4 is equal to "E1*(1+cosθ)"

$$E1+E2=E1*(1+\cos\theta)$$

When the two windings are in the same direction (θ=0), the output voltage reaches the maximum. When the primary winding is vertically positioned to the secondary winding (θ=90), the induced voltage "E2" is "0", then the output voltage is equal to the input voltage. If the two windings are not in the same direction (θ>90), the output voltage will be less than the input voltage.


Position Switch
Handle for Manual Regulation
Precision HollowType Reduction Gears
High Efficiency Servo Motor

Terminal Block for Input
Terminal Block for Output

Thermostat Switch

TRANSFORMER

## 2. FEATURES

**Continuous Stepless Linear Voltage Regulation**
The contactless inductive transformer makes the linear voltage regulation. No tap from the transformer, there is no coupling noise and voltage drop is very low.

**No Arc Discharge (Sparkle)**
No contact point inside the transformer, there is no arc discharge.

**High Efficiency Transformer**
The winding is made of high purity oxygen-free copper wire, the core is made of high magnetic density silicon-steel plate. The copper loss and iron loss are small.

**Long Lifespan and Severe Environment Tolerance**
There is no any contact surfaces or components can be worn inside the transformer, others are the seriously selected industrial-strength components, it can work for more than 10 years. It also can tolerate the severe temperature, humidity, vibration and dust.

**Reliable Modular D esign**
Complete modular design, for easy after sales service and debugging. All the components are standardized, all the separate PCBAs (Regulation, Monitoring, Protection, Power Supply Board) are isolated from each other to ensure the reliability.

**Double Insurance Duplex Control**
Both regulation circuit and monitoring circuit have interlock function. Only when the two circuits detect the voltage change at the same time, the transformer starts regulation.

**Strong Overload Ability**
The transformer won't be damaged, if short circuit happened or it's overloaded in short time. 100% load for long time, 150% for 30 seconds, 200% for 10 seconds, 300% for 5 seconds.

**Rated Voltage, Output Precision are Adjustable.**
Rated voltage is adjustable (i.e. from 380V to 400V). The output precision is +/-2%~+/-15% adjustable, through the jumper on the regulation board.

**Full Protection Design**
When output voltage is out of range, or overload, overheat and open phase happens, or control circuit is abnormal, it will give buzzer beeping and LED is light (not cut off output). When short circuit happens, the air breaker will be activated to cut off the input power supply.

**Output Cutoff When Exception Happens (optional)**
When output voltage is out of range, or overload, overheat and open phase happen, or control circuit is abnormal, the output will be cut off. At the same time, it will give buzzer beeping and LED is light

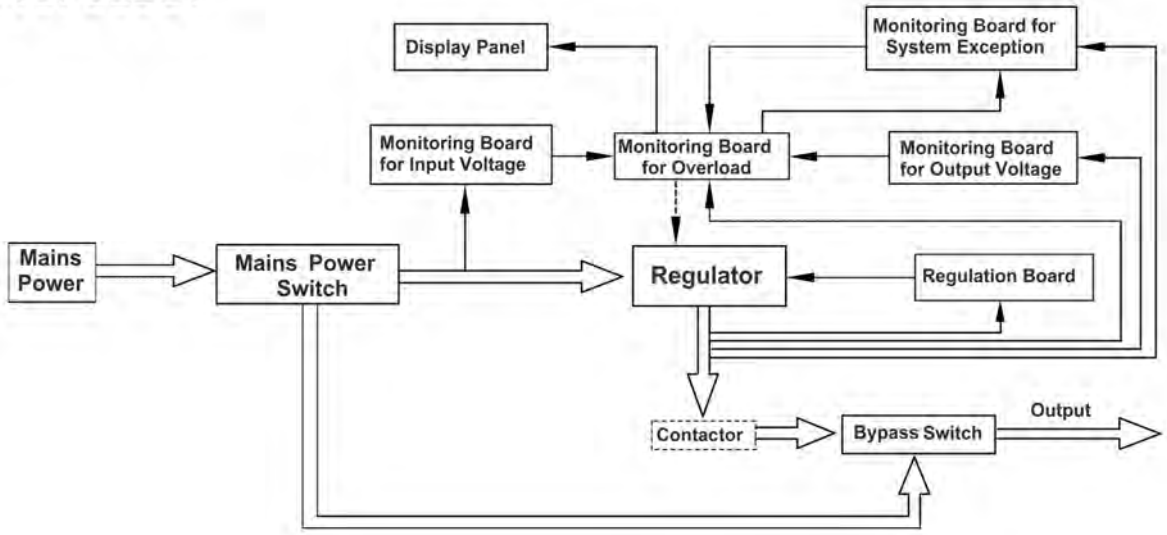
**Bypass Function**
Manual bypass switch is bundle. Automatic bypass function is customized

**Soft Startup Function (Only for Digital Display Type)**
With soft startup device, the rotor will stay in an appropriate position if mains power is failure, to prevent a high voltage is delivered out when mains power restores.

**Surge Protection Device (optional)**
Surge protection device can be added, to depress the surge and spike from mains power.

**RS232/RS485 Communication Port (optional)**
The monitoring and remote control can be realized through RS232/485 communication port.

## 3. TOPOLOGY




## 4. TECHNICAL SPECIFICATION

| | | |
|---|---|---|
| Input | Nominal Voltage | 3 Phase: 190V/200V/220V or 380V/400V/415V/440V |
| | Voltage Range | ±15%, ±30%, or customized |
| | Nominal Frequency | 50Hz or 60Hz |
| | Frequency Range | ±5Hz |
| | Power Factor | 0.97 |
| Output | Wave Form | Sine Wave |
| | Precision | Preset at ±2% (±2%~±10% adjustable) |
| | Harmonic Distortion | <3% |
| | Efficiency | >96% |
| | Power Factor | 0.8 |
| | Overload Ability | 150% for 30s, 200% for 10s, 300% for 5s |
| Display Panel & Indicator | Input Voltage | Analog or Digital Voltmeter |
| | Output Voltage | Analog or Digital Voltmeter |
| | Output Current | Analog or Digital Currentmeter |
| | Input Over Voltage | LED |
| | Input Under Voltage | LED |
| | Output Over Voltage | LED |
| | Output Under Voltage | LED |
| | Phase Connection | LED |
| | System Exception | LED |
| | Overload | LED |
| | Overheat | LED |
| | Soft Start Exception | LED |
| Protection & Alarm | Input Over Voltage | LED + Buzzer Beeping |
| | Input Under Voltage | LED + Buzzer Beeping |
| | Output Over Voltage | LED + Buzzer Beeping (Output Cutoff Optional) |
| | Output Under Voltage | LED + Buzzer Beeping (Output Cutoff Optional) |
| | Input Phase Failure | LED + Buzzer Beeping |
| | Output Phase Failure | LED + Buzzer Beeping (Output Cutoff Optional) |

| | | |
|---|---|---|
| Protection & Alarm | System Exception | LED + Buzzer Beeping (Output Cutoff Optional) |
| | Overheat | LED + Buzzer Beeping (Output Cutoff Optional) |
| | Soft Start Exception | LED + Buzzer Beeping (Output Cutoff Optional) |
| | Overload | 200kVA~600kVA: Input Cutoff +LED +Buzzer Beeping |
| | Short Circuit | 800kVA~3,000kVA: LED +Buzzer Beeping |
| | Manual Bypass | Yes |
| | Automatic Bypass | Optional |
| | Surge / Spike | Optioanl, Replaceable Module |
| | Delay Output | Preset at 6s (0~6s adjustable) |
| Safety | Insulation Voltage | 2,000V 60s (Coil to Grounding) |
| | Insulation Resistance | >5M Ω |
| | Creepage Distance | >8mm |
| | Grounding Resistance | <0.1M Ω |
| | Vibration Resistant | 0.3G |
| | Temp. Rating of Coil | Class F, 155°C |
| | Cooling Mode | Forced Air Cooling (Cooling Fan) |
| | IP Class | IP20 |
| | Protection Class | I |
| Environment | Audible Noise | <56dB at 1m distance with full load |
| | Operation Humidity | 0%~95%, Non-condensing |
| | Operation Temperature | -10°C ~ 40°C |
| | Operation Altitude | <1,000m |
| | Storage Temperature | -20°C ~ 40°C |

## 5. CAPACITY, RATED CURRENT, MACHINE SIZE AND WEIGHT

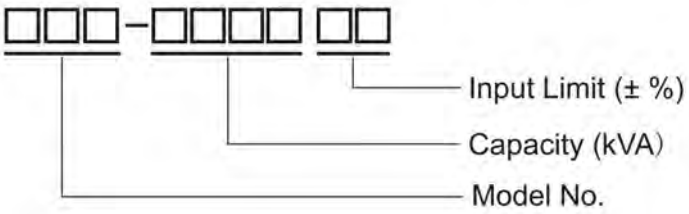
ARD Series (Three Phase Dependent Regulation, Input Voltage Range ±15% )

| Model No. | Capacity (kVA / kW) | Rated Current | | Machine Size (W x D x H cm) | N.W. (kgs) |
|---|---|---|---|---|---|
| | | 220V | 380V | | |
| ARD-20015 | 200/ 160 | 525 | 303 | 55 x 80 x 170 | 380 |
| ARD-25015 | 250 / 200 | 656 | 379 | 55 x 80 x 170 | 430 |
| ARD-30015 | 300 / 240 | 787 | 455 | 55 x 80 x 170 | 480 |
| ARD-40015 | 400 / 320 | 1050 | 606 | 80 x 80 x 200 | 870 |
| ARD-50015 | 500 / 400 | 1312 | 758 | 80 x 80 x 200 | 980 |
| ARD-60015 | 600 / 480 | / | 909 | 80 x 80 x 200 | 1100 |
| ARD-80015 | 800 / 640 | / | 1212 | 140 x 100 x 200 | 1350 |
| ARD-100015 | 1000 / 800 | / | 1515 | 140 x 100 x 200 | 1620 |
| ARD-120015 | 1200 / 960 | / | 1818 | 140 x 100 x 200 | 1850 |
| ARD-150015 | 1500 / 1200 | / | 2273 | 140 x 100 x 200 | 2200 |
| ARD-200015 | 2000 / 1600 | / | 3030 | 160 x 120 x 200 | 3200 |
| ARD-250015 | 2500 / 2000 | / | 3788 | 160 x 120 x 200 | 3750 |
| ARD-300015 | 3000 / 2400 | / | 4545 | 160 x 120 x 200 | 4350 |

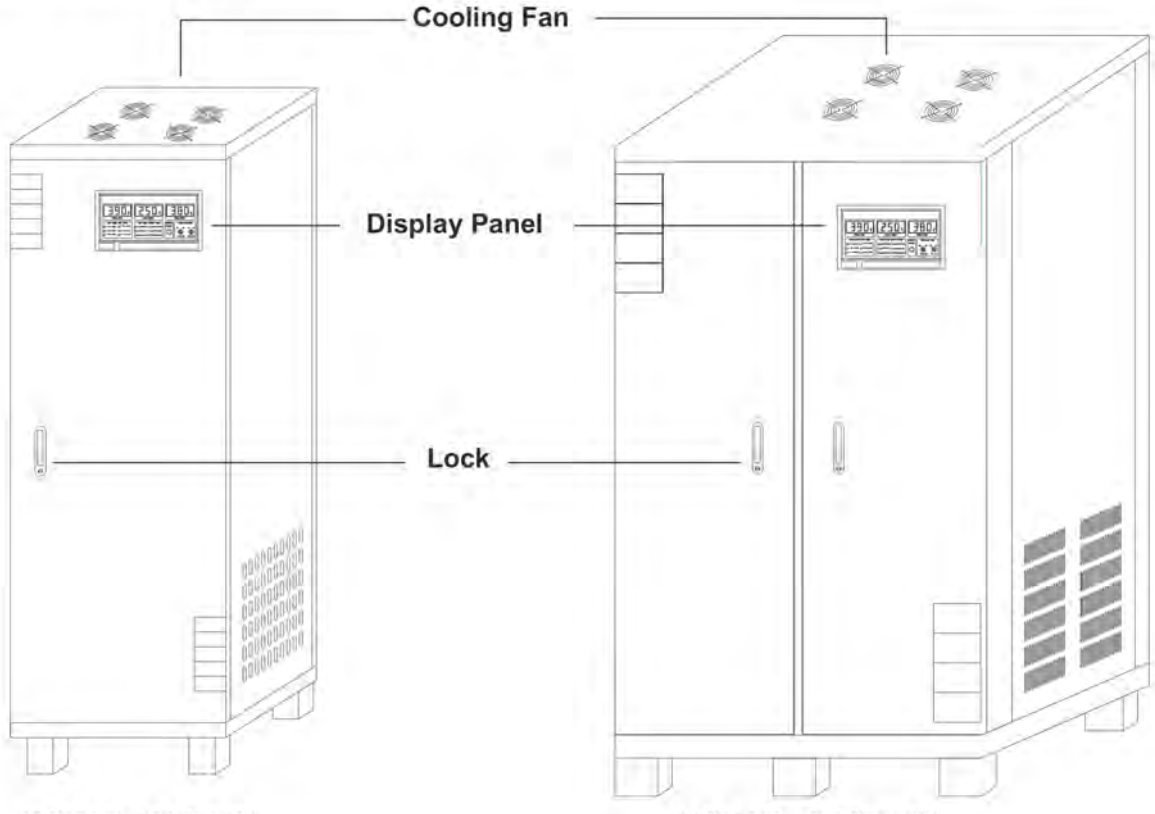
ARD Series (Three Phase Dependent Regulation, Input Voltage Range ±30% )

| Model No. | Capacity (kVA / kW) | Rated Current | | Machine Size (W x D x H cm) | N.W. (kgs) |
|---|---|---|---|---|---|
| | | 220V | 380V | | |
| ARD-20030 | 200/ 160 | 525 | 303 | 140 x 100 x 200 | 1120 |
| ARD-25030 | 250 / 200 | 656 | 379 | 140 x 100 x 200 | 1280 |
| ARD-30030 | 300 / 240 | 787 | 455 | 140 x 100 x 200 | 1450 |
| ARD-40030 | 400 / 320 | 1050 | 606 | 140 x 100 x 200 | 1750 |
| ARD-50030 | 500 / 400 | 1312 | 758 | 140 x 100 x 200 | 2100 |
| ARD-60030 | 600 / 480 | / | 909 | 140 x 100 x 200 | 2400 |
| ARD-80030 | 800 / 640 | / | 1212 | 140 x 100 x 200 | 2800 |
| ARD-100030 | 1000 / 800 | / | 1515 | 180 x 120 x 200 | 3900 |
| ARD-120030 | 1200 / 960 | / | 1818 | 180 x 120 x 200 | 4600 |
| ARD-150030 | 1500 / 1200 | / | 2273 | 180 x 120 x 200 | 5300 |

## 6. DEFINITION OF MODEL NO.



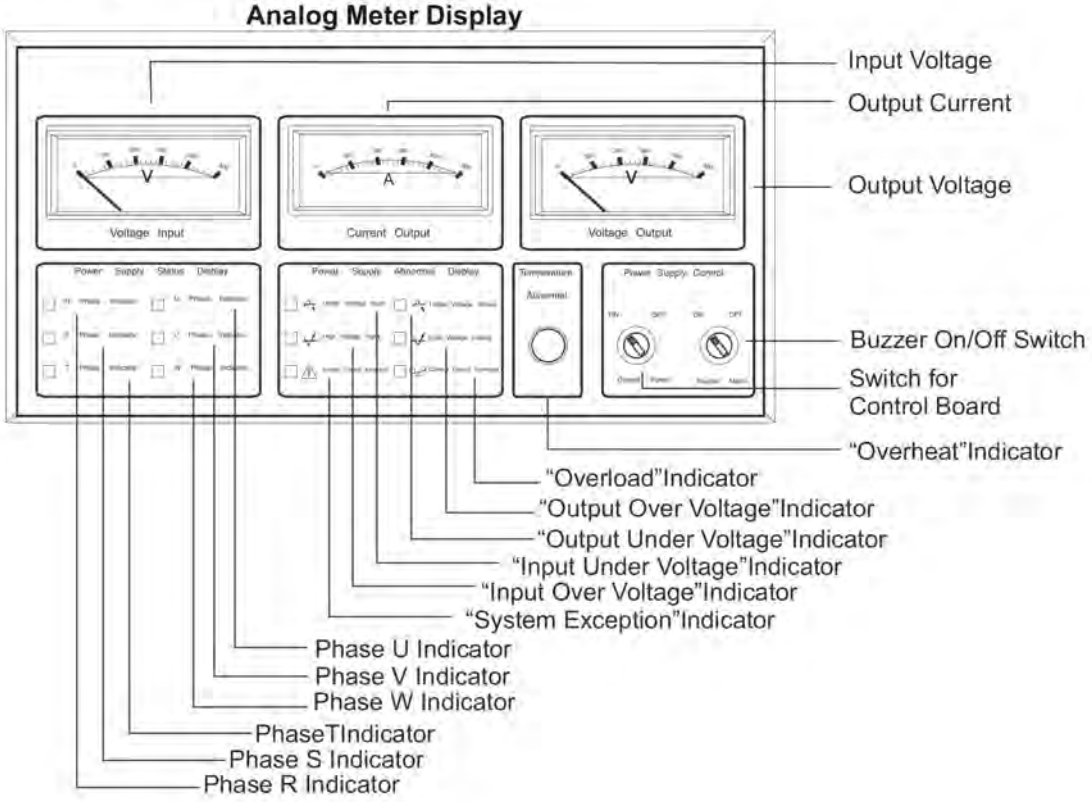

## 7. EXTERIOR VIEW



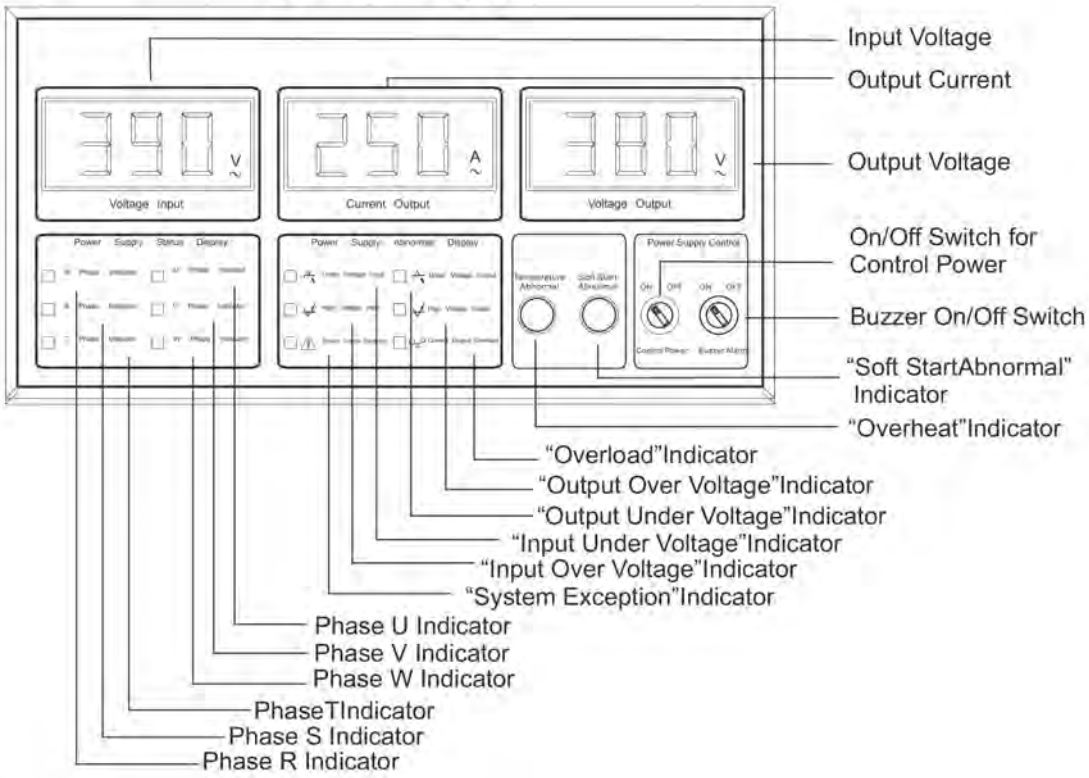

(200kVA~300kVA) (400kVA~3,000kVA)

# 8. DISPLAY PANEL

**Analog Meter Display**

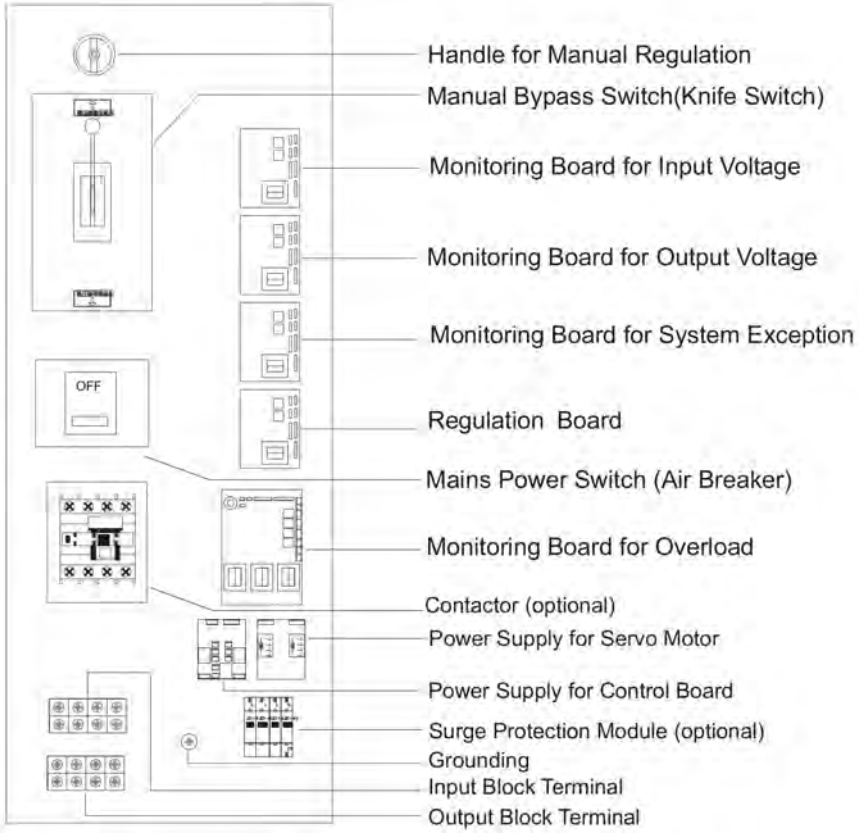



**Digital Meter Display**



## ■ 9. INTERNAL VIEW/CONTROL BOARD

200kVA~600kVA




800kVA~3,000kVA