

3-Phase ARD Series Elevator Automatic Rescue Device User Manual

Rev.1.1

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Chapter 1 Product Overview

This chapter introduces the model, specifications, appearance and dimension of the elevator automatic rescue device (ARD for short).

1.1 Model Descriptions

Descriptions of ARD model is shown as Figure 1.1 (take 15kW for example).

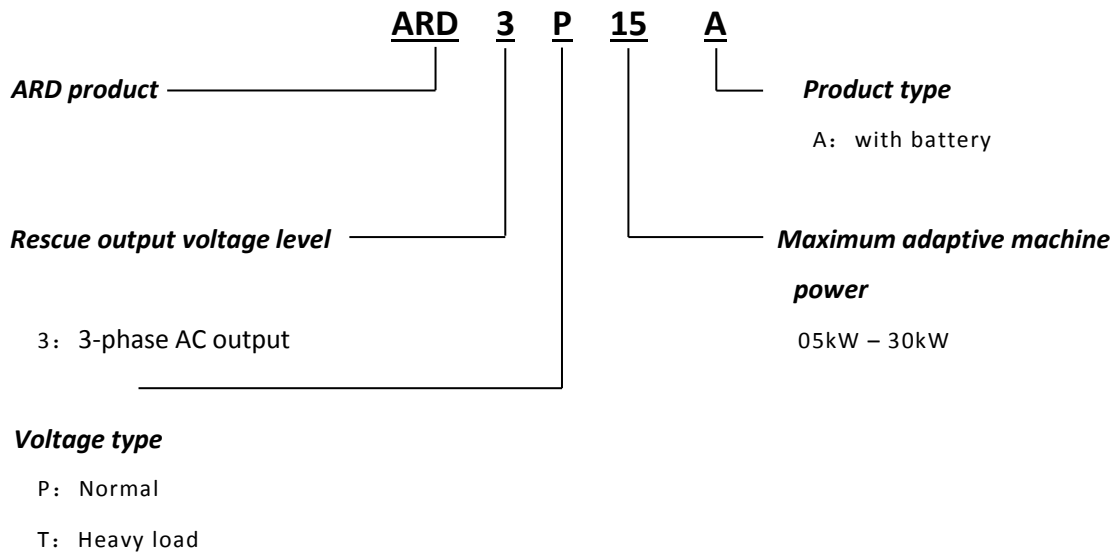


Figure 1.1 Model Descriptions of ARD

Note 1: Now 3P and 3T two types can be supplied. Input voltage and output voltage are both 3-phase 380V. And Neutral wire is also needed for input power.

Note 2: Normal type requires ARD function in control system. Elevator can rescue to direction of heavy load under ARD status. Heavy load type only requires leveling function in control system after power on.

1.2 Nameplate Descriptions

Nameplate of ARD is shown as Figure 1.2. Model, power, input, output, serial number (the manufacturing number), and barcode of ARD are noted on the nameplate, which is pasted on the right side of the ARD

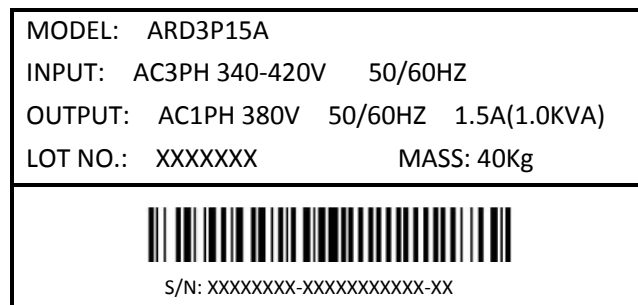


Figure 1.2 Nameplate of ARD

1.3 Technical Specifications

Table 1.1 Standard specification

Model	3P	Normal Type
	3T	Heavy load Type
Control Features	Recommended Elevator Rescue Speed	1/12 Elevator rated running speed
	Single Running Duration	5min
	Output Voltage Wave	Sine wave
	Efficiency	>80%
Ambience	Cooling Mode	Forced air-cooling
	Protection Class	IP20
	Ambient Temperature & Humidity	Ambient humidity below 90%RH (No dewing) -15~40°C, well ventilated
	Vibration Degree	>1G below 20Hz

1.4 Model Selection

Table 1.2 3P series (External grid power type: 3-PH AC380V, supply 3-phase AC380V while rescue)

ARD MODEL	Voltage class during rescue	Maximum Adaptable Machine Power	A Type Maximum Adaptable Elevator Load(kg)	Output Capacity	Dimension
ARD3P07A	3-PH AC380V	7.5KW	1150 KG	0.7 KW	E1
ARD3P11A	3-PH AC380V	11KW	1150 KG	1.0 KW	E1
ARD3P15A	3-PH AC380V	15KW	1150 KG	1.0 KW	E1
ARD3P18A	3-PH AC380V	18.5KW	1150 KG	1.0 KW	E1
ARD3P22A	3-PH AC380V	22KW	1350 KG	1.2 KW	E2
ARD3P30A	3-PH AC380V	30KW	1350 KG	1.2 KW	E2

Table 1.3 3Tseries (External grid power type: 3-PH AC380V, supply 3-phase AC380Vwhile rescue)

ARD 型号	Voltage class during rescue	Maximum Adaptable Machine Power	A Type Maximum Adaptable Elevator Load(kg)	Output Capacity	Dimension
ARD3T05A	3-PH AC380V	5.5KW	800 KG	1.0 KW	E1
ARD3T07A	3-PH AC380V	7.5KW	1150 KG	1.2 KW	E1
ARD3T11A	3-PH AC380V	11KW	1150 KG	1.2 KW	E2
ARD3T15A	3-PH AC380V	15KW	1150 KG	1.4 KW	E2
ARD3T18A	3-PH AC380V	18.5KW	1150 KG	1.4 KW	E2
ARD3T22A	3-PH AC380V	22KW	1150 KG	1.8 KW	E2
ARD3T30A	3-PH AC380V	30KW	1150 KG	1.8 KW	E2

Note:

1. Output capacity list in Table 1.2~1.3 is rated output capacity. It can supply 2 or 3 times overload output in short time.
2. Rated load list inTable 1.2~1.3 is suitable for geared machine or 2:1 gearless machine.
3. For elevator with 4:1 gearless machine, rated load can be rised to 1.8 times of nominal value. For example, in above table, rated load of ARD3P15A for 2:1 machine is 1150KG, then rated load for 4:1 machine is about 2000KG.
4. For elevator with 1:1 gearless machine, it should select the rated load of one higher level.
5. For elevator with winch machine (positive drive), please consult our technical department.

1.5 Outline Dimension

Two types of installation are provided: floor type and wall hanging type.

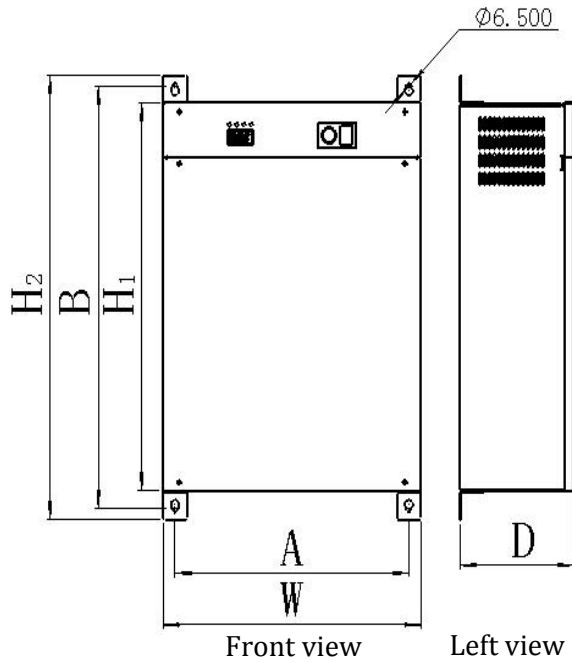


Figure 1.3 Hanging-type

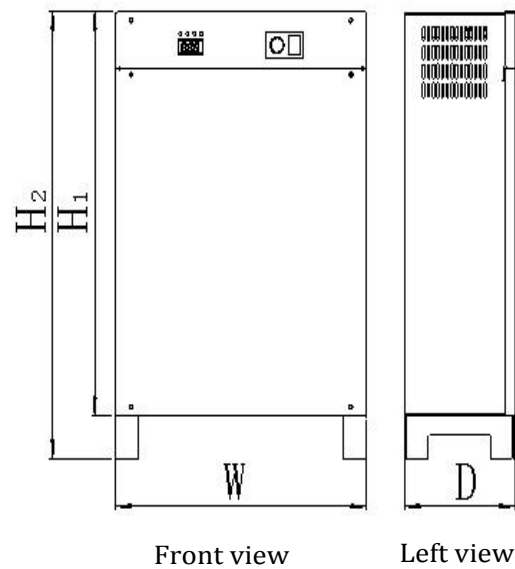


Figure 1.4 Floor type

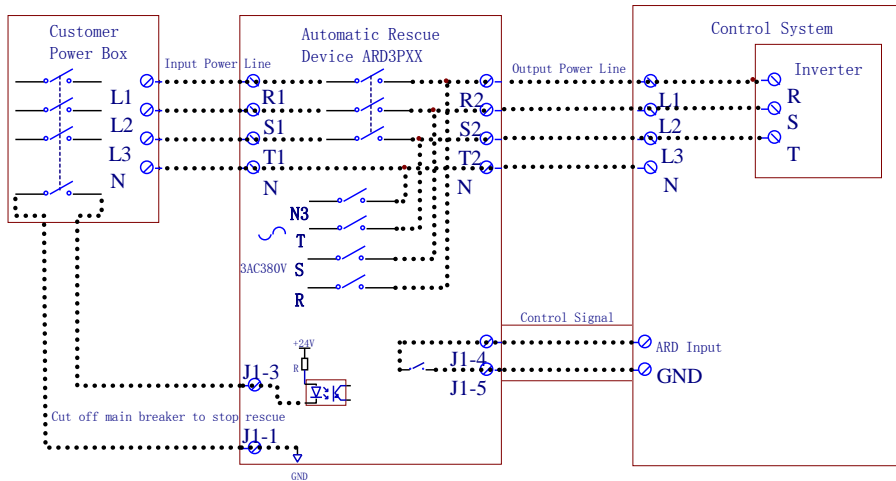
Table 1.4 Product size list (unit: mm)

Lable	W	D	H	W1	A	B	Installation
E1	360	169	505	420/360	390	330	Hanging/Floor
E2	405	169	530	465/405	435	355	

Chapter 2 Wiring

2.1 ARD3PXX wiring

ARD3PXX is fit for control system with automatical rescue function.

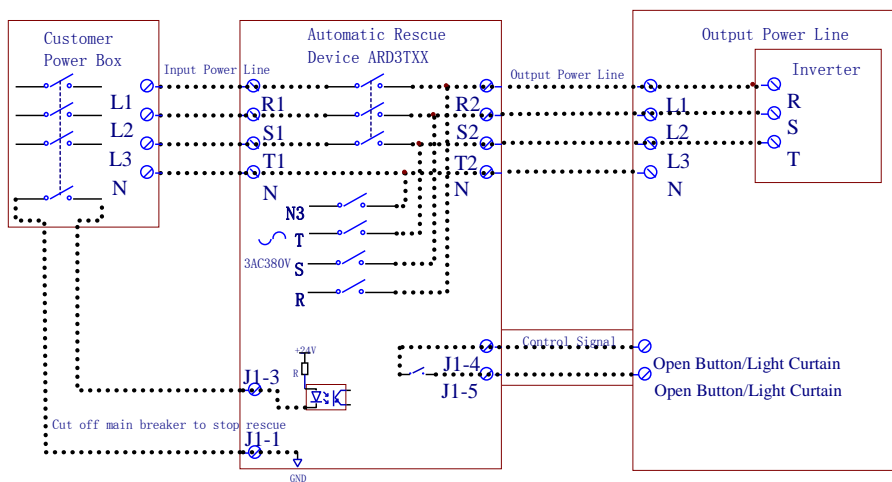


Disconnect the main air switch stop rescue signal: Connect the auxiliary contact of the main air switch, the auxiliary contact is disconnected, and ard stops rescue.

Figure 2.1 ARD3PXX application wirings diagram

2.2 ARD3TXX wiring

ARD3TXX is fit for control system that has no automatical rescue function but can level to nearest floor after power on.



Disconnect the main air switch stop rescue signal: Connect the auxiliary contact of the main air switch, the auxiliary contact is disconnected, and ard stops rescue.

Figure 2.2 ARD3TXX application wirings diagram

Chapter 3 Usage and Maintenance

3.1 Working principle

When the power supply of the external network is normal, the main contactor in the emergency device is sucked in and power supply is provided to the elevator system through the external network. Meanwhile, the device will automatically charge the battery.

When the 3-phase power supply of the external network is cut off, the main contactor in the emergency device is disconnected, and the elevator system is disconnected from the external network. Emergency device will produce single AC220V or AC380V power for elevator system using, meanwhile, emergency running signal will be produced at the output port making the elevator run in self-rescue mode and complete the levelling process at self-rescue speed.

When the emergency power supply is put into use, it can run for up to 5 minutes at a time, and the power will be cut off automatically after 5 minutes.

3.2 Operation Panel

The operation panel consists of four LED indicator lamps and a 4-bit digital block and two operation switches. The appearance is shown in Figure 3.1.



Figure 3.1 Appearance diagram of operation panel

3.2.1 The definition of LED Indicator Lamps

The definitions and functions of the four LED indicator lamps on the operation panel are as shown in **Table 3.1**.

Table 3.1 The definition and functions of the LED indicator lamps

Name	Function
D1	ARD fault indicator lamp. When fault of ARD occurs, this indicator lamp will be lit up, and extinguished when the fault is restored.
D2	The outer net status indicator lamp. When the power supply voltage of outer net is connected, the indicator is lit up, and when the power supply voltage of outer net is cut off, the indicator lamp is off.
D3	ARD charging indicator. When the ARD starts charging, the indicator is lit up, and when the ARD quits from charging state, the indicator is off.
D4	ARD running indicator. After power on, the ARD runs normally and the indicator lights flicker.

3.2.2 Operation button and switch

The definitions and functions of the button and switch on operation panel are as shown in Table 3.2.

Table 3.2 The definition and functions of the button and switch on operation panel

Name	Function
Circular vertical start button	In power off state, press this button to start the ARD until the digital display is normal, release the button and finish the start process.
Rocker Enable Switch	The rocker switch is inner enable switch. If the normal output state of ARD is required, the rocker switch should be allocated to the "ON". If the external enable switch is effective at the same time and there is no voltage on the net side, the system will delay for about 13 seconds and start working and output the corresponding voltage level.

3.2.3 Display Panel

Display Panel consists of 4-bit digital blocks, the first bit indicates work status, and the latter three bits indicate corresponding value.

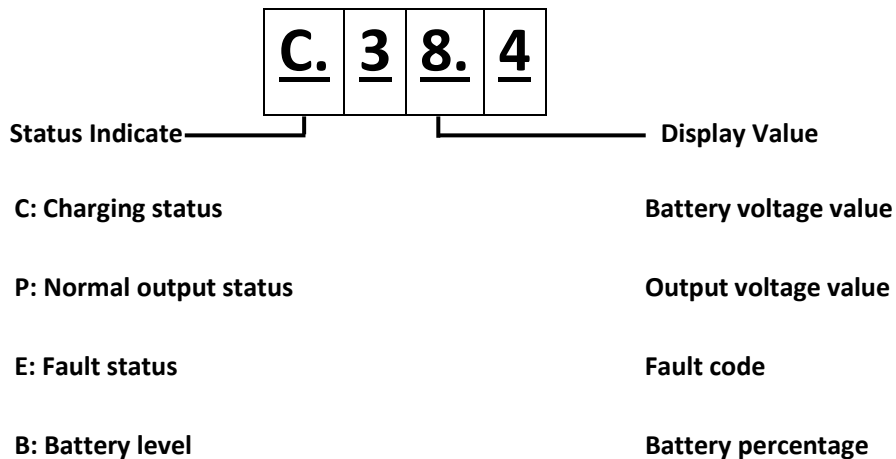


Figure 3.2 Schematic diagram of display panel

Example:

As the digital blocks show **C.38.4**, the first bit shows "C.", which means current status is charging; the latter 3-bit blocks mean the battery voltage value, and the current battery voltage is 38.4V.

As the digital blocks show **P.220**, the first bit shows "P.", which means normal output status; the latter 3-bit blocks mean output voltage value, and the current output voltage is 220V.

As the digital blocks show **E.01**, the first bit shows "E.", which means current status is fault; the latter 3-bit blocks mean Fault 01. The fault can be resolved according to the ARD Fault list.

As the digital blocks show **B.80**, the first bit shows "B.", which means current battery remaining capacity; the latter 3-bit blocks mean the percentage of battery remaining capacity, and the current remaining battery capacity is 80%.

Table 3.3 ARD fault list

Fault Code	Descriptions	Reasons and Solutions
E.01	Undervoltage battery	Battery charging time is not enough; battery life has reached the limit; charging circuit is abnormal.
E.02	Overtoltage battery	Abnormal battery charging circuit or abnormal battery voltage.
E.03	Overheat	Overheat status has been detected or cooling fan works abnormally.
E.04	IF error	Output current is detected up to limit; the rescue speed should be reduced.
E.05	Output overcurrent	Instantaneous value of output current is detected too large; the rescue speed should be reduced.
E.06	Abnormal charging power supply	Charging circuits work error, please contact the factory.
E.07	Abnormal zero point of AC voltage or AC current	While working, the zero-point bias of AC voltage or AC current is too large.
E.08	Output overload	The output has been detected arrived at the limit and last for a long time, system should be power down, and rescue speed should be reduced.
E.09	Net-side contactor error: the feedback does not match to the net-side contactor act command	Check the net-side contactor and its output and feedback circuit.
E.10	Inner flash storage error	Internal resident parameters store abnormally, please contact the manufacturer.
E.11	Abnormal voltage sensor	Internal hardware error, please contact the manufacturer.
E.12	Error produced immediately as ARD was put into operation, and the number of retry times is up to 5.	Necessary to determine and dispose according to the error code before E.12
E.13	Undefined error	Inner error, please contact the manufacturer.

3.3 Battery Replacement Guidance

Take ARD3P15A as an example, introduce battery replacement and installation, and ARD3P15A contains 6 batteries.

Step 1: Loose 4 screws and remove the “L” faceplate.

Step 2: Remove the wirings of batteries. Then remove the batteries.

Step 3: When changing batteries or installing batteries, be sure to pay attention to connecting line numbers. Connect the red outgoing line of the main control board (labelled DC+) with the red terminal of battery (labelled 1); connect the black outgoing line (labelled DC-) with the black terminal of battery. Failure to connect in accordance with specified line sequence will cause damage to devices on the control board, and ARD will not work properly.