

**THANKS FOR PURCHASING OUR PRODUCT**

# **MIG-MAG350I**

**Inverter MIG/MAG Semi-auto ARC Welding Machine**

## **Operation Manual**

(Read the manual carefully before installation ,operation and maintenance)

**New Advanced Product**

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# Prolegomenon

We do very appreciated for your selecting our products.

This kind of welding power Model MIG-MAG350I is taken new advanced technology to develop and manufacture the new generation inverter integrated controlling Semi-auto MIG/MAG ARC Welding machine.

It can be composed the MIG-MAG350I MIG/MAG ARC Welding system equipped with SB-10 wire feeder (350) and panasonic 350A welding gun .It has many characteristic such as easy Arc starting ,good Arc springiness ,adjustable arc thrusting ,low splash,good welding form ,easy welding operation,wide range and electricity save.

The MIG/MAG semi-auto Arc welding machine model MIG-MAG350I is advanced welding machine and it can be compared with foreign products.

This operation manual can help you for the machine installation, operation and maintenance correctly and safely.Pay attention to the points as following.

- . Installation of the power cord. Be grounded correctly.
- . Don't put sundries under the welder.Otherwise it will affect the heat released.
- . Installation for the positive and negative cable of the power output.
- . Welding voltage selection (the potentiometer on the wire feeder )
- . Welding current selection (speed of wire feeder)
- . Selection of Arc force (potentiometer on the front panel)
- . Arc drawing back selection (switch on the front panel )

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The amendment right and the explanation right of the manual belonging to my company.  
We have no special notice if the manual is amended.

## 1. Main characteristic and suitable range

This kind of welding power Model MIG-MAG350I is taken new advanced technology to develop and manufacture the new generation inverter integrated controlling Semi-auto MIG/MAG Arc welding machine. It makes use of the import key parts such as Siemens IGBT module of Germany, alloy magnetic core and the resume diode module of America. It has the perfect performance of high quality, good reliability, quick speed of welding current, steady welding process, low splash and good welding form. Anyway, it becomes the welding very easy.

### 1.1 Structure of the MIG-MAG350I CO<sub>2</sub>/MAG/MIG semi-auto Arc welding machine

#### a. The name of the model

MIG-MAG- 350 I



Model improvement

Rated max welding current

Semi-auto MIG/MAG Arc welding machine

#### b. Composing of the product

This product is composed by three parts as following

Power source(MIG-MAG350I)

Wire feeder SB-10 (350)

Panasonic welding gun

### 1.2 Suitable range of the MIG-MAG350I

Suitable material: low carbon steel, stainless steel, Al and its alloy

Thickness of the material: low carbon steel and stainless: more than 1mm Al and its alloy: more than 3mm

Suitable position: all positions

Suitable wire : 0.8, 1.0, 1.2, solid wire/flux cord wire, 1.2 AL wire.

### 1.3 Characteristic of MIG-MAG350I

Wide output current 60-350A: 0.8 -----60-150A

1.0-----60-250A

1.2-----80-350A

Steady welding process, low splash, easy control, good welding form.

High efficiency: 350A/31.5V the duty cycle is 60%

270A/27.5V the duty cycle is 100%

continuous wire feed, the max speed of wire feed is 15m/min

Low starting of wire feed

Function of Arc drawing back :Adjusting the voltage and current for Arc drawing back ,in order to improve the welding quality.

2/4steps changing:two steps is on the position of "OFF" for arc drawing back

four steps is on the position of "ON"for arc drawing back.

Pre-set the diameter of the wire to get the excellent arc steady and good welding form.

Pre-set the welding voltage :Preset the welding current to read the welding criterion easy.

Adjusting the arc thrusting: Control the splash and steady arc.

Strong resistance for the fluctuate of the electricity

Enlarge the output cable to 50m/50mm<sup>2</sup> to guarantee the welding current not less than 240A when using the 1.2 welding wire.

## **2.Main technical Data :**

Input Voltage	3~380/400V/415/430V $\pm$ 10% ;50/60Hz
Rated Input current	21A
Rated Input power	15KVA
No-load Voltage	65~75V
No-load first current	0.1~0.2A
No-load loss	100W
Voltage adjusting Range	14 $\pm$ 3V~40 $\pm$ 3V
Current output Range	60~350A
Suitable wire	0.8 , 1.0, 1.2(solid/flux)
Duty cycle	350A/31.5V X=60%(Rated condition); 270A/27.5V 2 X=100%
Efficiency	0.85
Power factor	=0.8
Insulation class	F
Protection class of shell	fan cooling
Weight	48KG

Note:(1) Adjust the no-load voltage according to the requirements. Normally it is 70V.

## **3.Function**

### 3.1 Adjusting function for the welding voltage and welding current

MIG-MAG350I supply the adjusting range as following,

Welding voltage :  $14V \pm 3V \sim 40V \pm 3V$  use the voltage adjusting knob on the wire feeder

Welding current : 60A~350A use the current adjusting knob on the wire feeder

### 3.2 Adjusting function of the Arc thrusting(arc force)

It has the important function to select the proper Arc thrusting for improvement of the welding line ,control the welding splash and the steady Arc. Normally,.

If the thrusting is low ,the arc is soft and splash .

If the thrusting is high,the arc is strong and high splash.

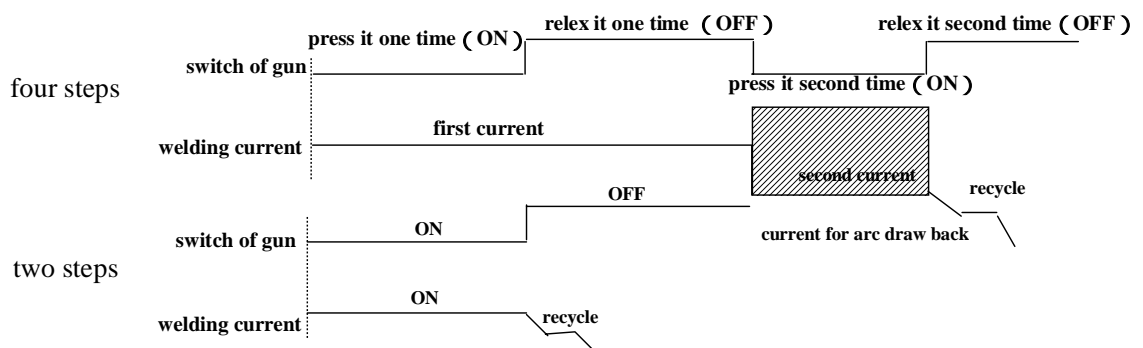
Use the arc thrusting continuously by the control knob on the front panel of MIG-MAG350I.

### 3.4 Function of arc drawing back

Reduce the welding criterion at the end of welding line in order to fill the short coming of welding end.

Change the knob on the welding gun ,you may get two kinds of welding criterions to fit for different position and different thickness.Turn on the switch of : "Arc drawing back".the power now has the function of Arc drawing back.The voltage adjusting is used by the current knob on the front panel.

### 3.5 2/4 steps change(crater mode)



### 3.6 Function for low Arc starting

We design the function for low arc starting in order to improve the efficiency of arc starting.

### 3.7 36V-3A/110W power function

When you use the CO<sub>2</sub> MIG/MAG welding machine, you may generally equip with gas heating source. So we design the power function to meet the heating for 36V-3A /110W

heater .The out connection is down of the front panel of MIG-MAG350I.

### 3.8 Recycle function

We design the function to settle two problems.

- 1) Control the diameter of the wire ball at the end of wire .
- 2) Prevent the wire into the pool after the Arc stop.

### 3.9 Over current function of the wire feed motor

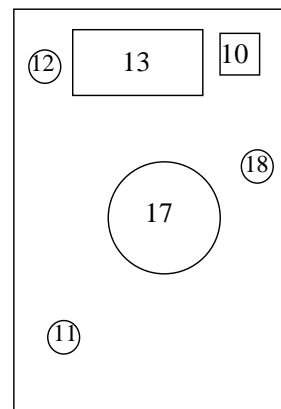
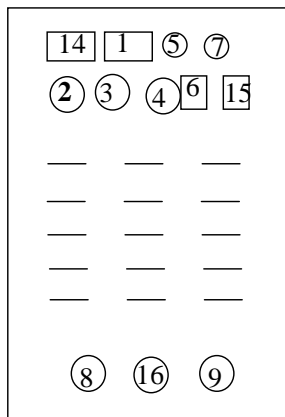
In order to protect the motor, the wire feed motor may stop rolling automatically if the current reaches 10A .When it is lower than 10A ,the motor begins rolling automatically.

### 3.10 Quick wire feed function

The spot wire feed speed can be adjusted by the welding current knob on the wire feed panel, so that it is convenient for the customers to get the quick wire feed speed.

## 4. Indicating and warning on the MIG-MAG350I control panel

### 4.1 Indicating and adjusting



1.indication of welding current 2.crater voltage regulator 3.crater current regulator 4.arc force regulator 5. indicating light of power 6.crater mode switch 7.warning indicating light 8.output"+" 9、 output "-" 10.、 power switch 11.safety earthing column 12.power supply 13.、 nameplate 14.indication of welding voltage 15、 pre-check switch 16、 control plug 17、 fan 18、 heating plug

#### 4.1.1 Voltage indicating

The voltage meter on the front panel can indicate the actual welding voltage or preset voltage.The indicating number has the precision of 0.1V .The meter indicates the preset during no welding.

#### 4.1.2 Current indicating

The current indicating meter on the front panel indicates the actual welding current during

the welding. The adjusting range is  $0 \pm 3 \sim 100 \pm 3$ .

#### 4.1.3 Power indicating

If the indicating light is on the control circuit connects the power already.

#### 4.1.4 Switch for gas inspection

Before welding, if switch is "ON", you can adjust the gas flow.

During welding, switch is "OFF", otherwise the flow directly.

#### 4.2 Warning

In order to remind the operator, we design the warnings as following.

excess temp

In the condition of more than 40 temperature, large current is used continuously ( $I_2 > 200A$ ), efficiency radiator temperature is more than  $80 \pm 5$ , overheat circuit begins working. The indicating light is on, the power stop the welding automatically. The fan running continuously. If the temperature is lower, the indicating is off, the power can work and weld can be continued automatically. Remind: Don't turn off the machine while the indicating overheat light is ON.

warning

If the circuit is over current, the light is ON. The control circuit stop the power automatically.

### 5. Safe and installation caution

Read the safe caution before installation and operation. It comes down to the high voltage electricity, electric Arc and high temperature splash. So keep the safe regulation, operate the machine properly, avoid the danger of electricity and high temperature arc.

Check if any damage or out looking of the welder.

Confirm the capacity: more than 35A.

Power source is grounded, diagram 6

Prohibit the combustible goods in the welding locale.

There is fire proof measure in the welding locale with favorable ventilated condition.

There is smoke discharge system if the welding is operated inside the house in order to keep the safety of workers.

The welding operator must be professional workers.

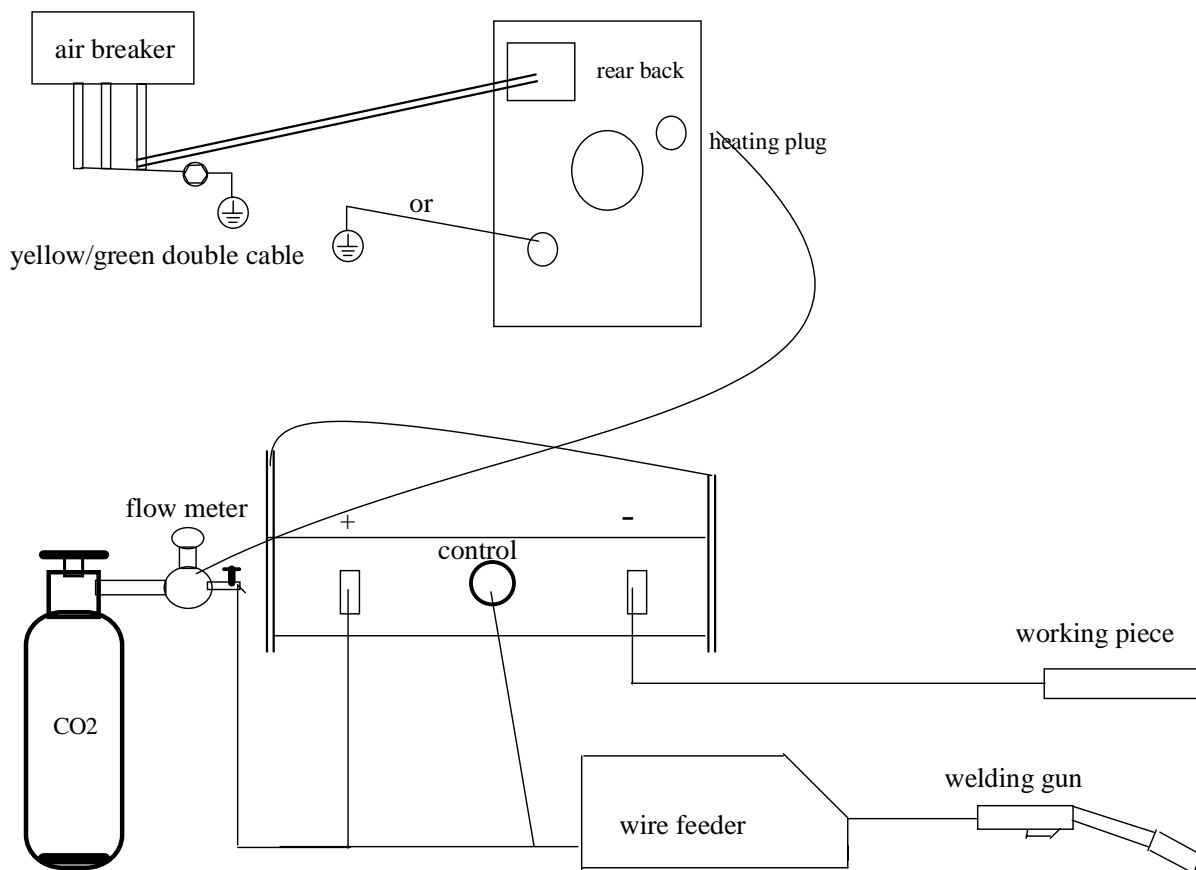
The operator must be fitted with safe accessories. Such as safe shoes, gloves, cover, welding mask and welding dress etc.

### 6. Explanation of installation

Check the products according to the packing list when open the package.

Grounded protection.Attached the diagram 6

The power source is 380/400/415/430Vac/(50~60)HZ with three phases and 4 lines.The yellow/green double cable is grounding cable.Be sure to connect the yellow/green double cable into the grounding connection in the welding locale .Another way is selecting the M8 bolt on the back on the machine and connect the grounding as the diagram as following.



confirm the positive and negative marks and install the cable as diagram.

Insert the connectors inside the positive "+" and negative "-" position and roll it in 90.

Do it oppositely when unloading the connectors.Keep the surface clean

Install the welding gun on the wire feeder and roll the welding gun in 90,then lock the bolt.

If use the CO<sub>2</sub> heater,connect the heating power with 36V/3A power source.

Connect the gas pipe with the gas bottle according to the locale conditions. Check the air proof conditions to ensure the good airproof.



Connect the control cable of the wire feeder with the relative connectorS of the power MIG-MAG350I.

## **7. Operatings**

"ON" and "OFF" indicating switch on the front panel.

Preset the welding voltage ,welding current(voltage adjusting knob,current adjusting knob on the wire feeder) and Arc force .

Preset arc drawing back switch (selection switch of second current)

If you need the second current welding ,please turn the second current knob and second voltage knob to the suitable position.

preset arc drawing back current(or second current)

preset arc drawing back voltage(or second voltage)

Confirm the specification of the wire feed hose

Confirm the specification of nib base .It affects the extended length of the wire .

Confirm the specification of nib. It affects the electric resistance.

Confirm the wire slot of the roller is suitable for the diameter of the wire. Different diameter of wire select different wire slot. Otherwise it affects the wire feed result.

Confirm the pressure of the roller to avoid slipping.

If the pressure is not enough ,the wire feed is slow speed.

If the pressure is too much ,the wire will be anamorphic.

The wire feeder can not work properly.

Confirm the flow of the gas and air proof.

We suggest the gas flow to be "L" more than 10D(D-diameter of wire ).If the selection is not proper,it also affects the welding quality.When using the CO<sub>2</sub> gas,please confirm if the heating power works properly or not .

Straight the hose of welding gun as much as possible .The bending radius can not be less than 400mm.Otherwise it affects the wire feeder.

### **7.1 2 steps/4 steps working process**

4 steps : Put the switch of the panel on the position "Arc crater switch ON",press the switch of the gun for the first time,the normal welding begins.Relax the switch for the first time, the welding process keeps unchanged.Press the switch for the second time,the welding becomes Arc drawing back welding.Relax the switch for the second time,the arc stops.

### **7.2 Gas inspection**

Press the switch of the gun before the wire roller is firmed,pre-set the gas flow through the

meter to check if it is gasproof. Otherwise, it affects the welding result.

### 7.3 Rip into the wire

Select the specification of the wire, materials according to the craft requirements. Firm the bolt and press the bottom on the front panel. The speed of ripping wire can be controlled by the welding current knob. Unload the nib if necessary and load it again after the wire is out.

## 8. Suggested welding criterion

Select good quality welding wire to get the perfect welding result and smooth welding process. Low quality wire can affect the welding quality by resistance welding process and blocking etc.

### 8.1 Selection switch for wire diameter

Please refer to the function on 1.3

### 8.2 Selection for Arc force

Please refer to the function on 2.2

### 8.3 Selection for welding voltage and current Diagram 8

d(mm)	0.8	1.0	1.2
suitable welding criterion	18~20V/80~120A*	17~18V/50~80A*	17~19V/50~100A*
		18~19V/80~100A*	19~22V/100~150A*
	17~18V/50~80A*	19~22V/100~160A*	22~24V/150~200A*
		22~24V/150~200A*	22~27V/200~250A*
	19~22V/100~150A	24~27V/200~250A	27~32V/250~350A

## 9. working elements

Diagram for the MIG-MAG350I working elements. Diagram 9

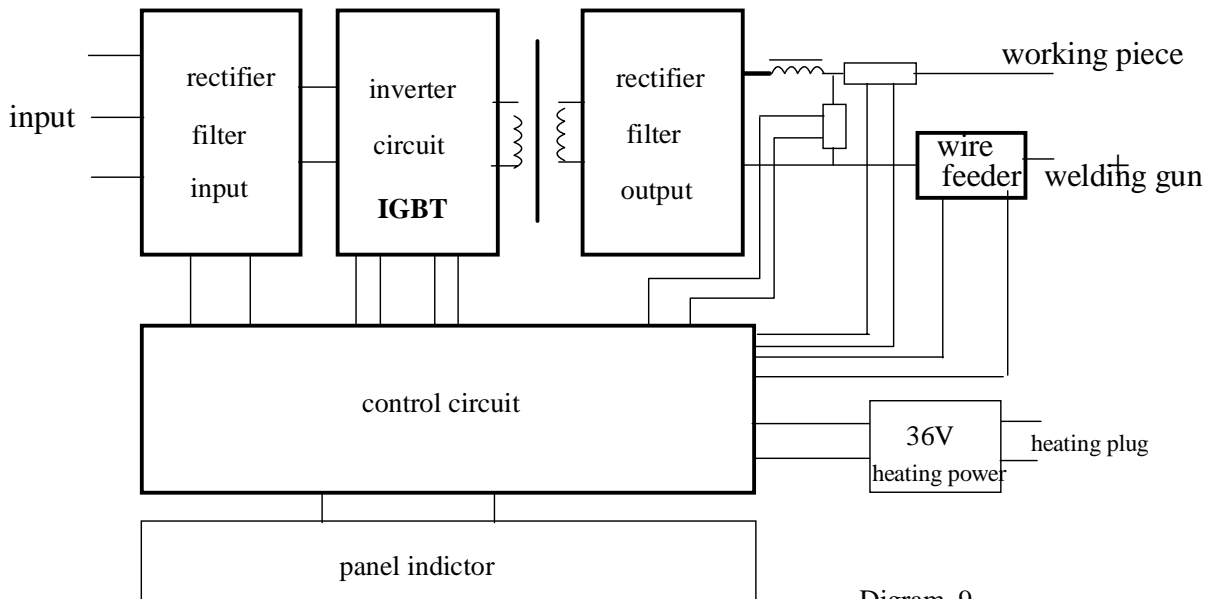


Diagram 9

Input AC 380/400/415/430V, rectifier and filter it into 540VDC.

Control the IGBT by PWM+FM, inverter the 540VDC to 20KHZ AC.

High frequency transformer pass the power by insulation and voltage reducing with high efficiency.

Output the second rectifier and the second filter. Output the required welding current and voltage.

## 10. Maintenance

Check the safety measure be efficiency.

Get rid of the dust for the power source (for example, dry compressed air)

Before operating,, Check the "+" "-" connectors of the power panel if they are relaxed

. Check the connection between the grounding cable and plug if they are relaxed, (If relaxed, the serious heating will damage the quick connectors)

. Check the fan if it works regularly. charge it if it is trouble.

Check the insulation and breakage of the input power cord

. Change it in time to ensure the safety.

check if there is any noisy for the wire feed motor.

Check the abrasion of the wire feed hose. Get rid of the dust inside of the hose. (1~2 times / 40kg wire)

. Get rid of the splash inside the nib regularly to ensure the guaranteed result by the gas

blow.

Check the abrasion of the nib.Change it in time.(suggest 1~2pieces nibs/40kg wire).

## 11.Troubles and Remedy

Troubles and remedy are as the form 10 as following,,

**form 10**

Troubles	Cause	Remedy
1.Fan not works properly	1.phase absent of the power 2.the fan line lose 3.Fan breakage	1.Check the power 2.Connect the line 3.Change the fan
2.No indicating on the front panel	1.phase absent of the power 2.the fuse broken 3.Indicating light broken	1.Check the power 2.Change the fuse 1A/250V( in machine ) 3.Change it( 8)
3.Over heating light on	1.aeration is not good 2.The temperature is too high 3.over-load use 4.Thermostat broken 5.Control plate broken	1.get rid of the bar 0.5m around 2.Reduce the temperature 3.Reduce the use loading 4.Change the thermostat(JUC-OF) 5.Check and change the control plate
4.Over-current light ON	1.IGBT broken 2.output diode broken 3.Drive plate broken 4.Control plate broken	Contact the manufacturer
5.Wire feeder not work	1.the fuse broken 2.the Cables are not 3.the wire blocked 4.the drive circuit broken 5.other reasons	1.Change the fuse 1A/250V (in machine) 2.the Cables are not connected properly 3.Check the gun 4.Change the control panel 5.Contact with the namufacturer
6.Welding Voltage and welding current not adjustable	1.Potentiometer line fall down 2.Potentiometer broken 3.the cables not connectecl properly 4.he drive circuit broken	1.Connect the lines 2.Change it (4.7K) 3.Check it 4.Change the control panel

## 12.Enlarge the length of the welding cable

The length of the welding cable includes the total length of the welding circuit including the cables between the positive "+" of the power source. The cables longer, the section area thinner, It caused large voltage reducing and large voltage loss, More over, it affect the quality of the arc and the slag. So arrange the position of the welding machine properly to get the shortest cable.

The cable between the welding power and wire feeder is the shorter, the better. Otherwise it affects the maximum speed of wire feeder and the maximum welding current.

form 12 The relationship between cable length, section area and maximum output current

The maximum output is 36V	6V 30m	9.6V 60m	14V 100m
50mm <sup>2</sup>	350A/31.5-36V	280A/28-35V	240A/26-36V
70mm <sup>2</sup>	350A/31.5-36V	350A/31.5-36V	315A/30-36V

on the condition of low speed (lower than 12m/min), we can enlarge the cable to 50m when use 0.8~1.2

Straight the enlarged cable, otherwise it affects the arc stability.

## 13.Transportation, storage and environment conditions

The package (Wooden cases or cartons) of the manufacturer is suitable for air, sea, railway and highway (three class more) transportation..

Pay attention to the indication on the package during the transportation.

the environment conditions

A Temperature range	operating 0 ~ 40
	transportation -25 ~ +55
B The air humidity	40 50%RH
	20 90%RH

C The dust, acid and caustic gas in the environment must be lower than the normal level (The welding process produced not included)

D Rain proof when it is used outside.

## 14.Quality Guaranteed

If you have any problem of the quality, please contact us in time. We generally have one year quality guarantee on condition that you operate or transport the machine properly according to the operation manual.

## 15.ACCESSORIES:SEE PACKING LIST,PLEASE

### PACKING LIST

MIG-MAG350I Welding machine	1	
Wire feeder FCS201	1	8M
Earth cable	1	35mm <sup>2</sup> 8m
welding torch	1	MB36KD 4M
Operation instructions	1	
Certificate of quality	1	

No.

### Certificate of quality

**Name of product:** CO<sub>2</sub>/MIG/MAG Semi-auto ARC Welding Machine

**Type of product:** MIG-MAG350I

**Packing No:** \_\_\_\_\_

**Test results of this welder fulfils**\_\_\_\_\_

\_\_\_\_\_technical requirements and its release  
from the works is granted.

**Inspector**\_\_\_\_\_ **Date**\_\_\_\_\_

