



DL350II

CO₂/MAG Automatic Welding Machine

NEW

D Digital Inverter
Welding Machine
SERIES

Further evolution of our high quality welding performance low spatter and low heat input CO₂/MAG welder

- The new Controlled Bridge Transfer method has achieved further progress in reducing spatter.
- The new AC short Arc welding Method has dramatically improved the quality of thin sheet welding.
- The new CP Start Control has achieved constant stable arc initiation.
- The DL350II combines with the Almega AX series for the best welding quality.





A welder essential for high quality CO₂ Advancing the Progress of Low Spatter P



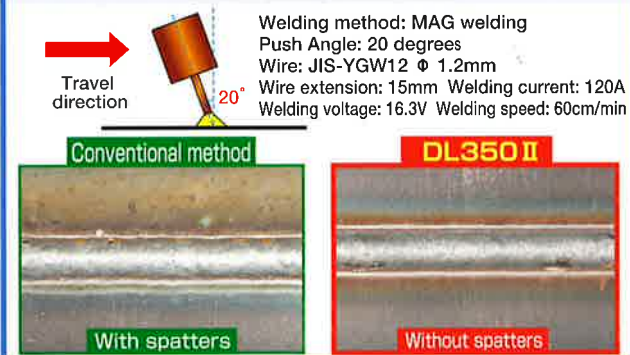
DAIHEN's exclusive new Controlled Bridge Transfer Advanced Low Spatter Performance!

Always delivers stable low spatter performance even in tough welding positions!

The newly developed "CBT method" achieves the ideal waveform-control in tough positions where spatters are easily generated, and always gives the best performance in a variety of welding environments. (Previously, this was difficult to achieve by conventional technology.)

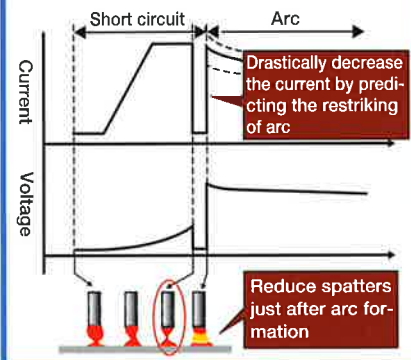
※ Controlled Bridge Transfer

Incredible low spatter performance, even in non-optimal positions to avoid fixture interference.



● What is the CBT welding method...

CBT reduces spatter generation by controlling the current waveform accurately just before arc formation.

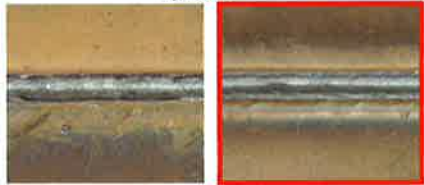


Brilliantly achieved "spatter reduction" that has been a perpetual challenge for high quality welding!

Reduced Spatter Removal Processes!

Smaller spatters adhere to the work, which effectively reduces the amount of time spent on spatter removal processes.

■ Comparison of spatters adhered on the work



Existing inverters

DL350 II

- Shielding gas : CO₂
- Welding current : 250A
- Welding voltage : 25.5V
- Welding speed : 80cm/min
- Sheet thickness : 4.5mm

Reduced Nozzle Cleaning Frequency!

Spatter adhesion on the nozzle can be reduced up to 1/4 of the existing quantity, which effectively reduces the nozzle cleaning frequency and contributes to improved operating rate of the automation line.

■ Comparison of spatters adhered on the nozzle



Existing inverters

DL350 II

Improved efficiency in the automation line!

- Shielding gas : CO₂
- Welding current : 250A
- Welding time : 1 min

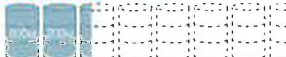
Reduced Industrial Waste!

Reduce industrial waste and contribute to environmental sustainability by reducing spatters.

Our existing device (Approx. 1,500kg/yr)



DL350 II (Approx. 430kg/yr)



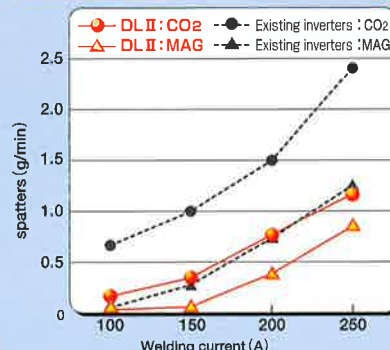
Reduce spatters by 1 ton/yr

- Shielding gas : CO₂
- Welding current : 150A
- Usage rate : 50%
- Daily working hours : 8 hrs
- Number of operating welders : 20

Improved Quality of Stainless-Steel Welding!

Reduce problematic spatter adhesion when using stainless-steel solid wire, such as automobile parts, and leaves a beautiful bead appearance.

The CBT Method can reduce spatters in CO₂ welding to levels comparable to that of normal MAG welding!



Low Spatter and Low Heat Input
CO₂/MAG Automatic Welding Machine

DL350II

CO₂/MAG welding

Performance and Thin Sheet Welding Performance!



DAIHEN's exclusive new AC short Arc Welding Method

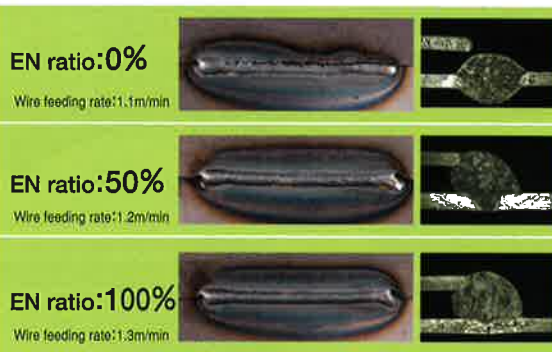
Advanced Thin Sheet Welding Performance!

Dramatically improves the welding quality of thin sheet materials with gaps!

The new AC Short Arc Welding Method is an upgrade to the "Thin Sheet Electrode Negative Mode", which helps control burn through and heat distortion of thin sheet welding.

This method makes it possible to freely change the depth of penetration and the metal deposition during welding, which dramatically improves the welding range for thin sheet welding.

Dramatically improved the welding ranges for thin sheet materials with gaps!

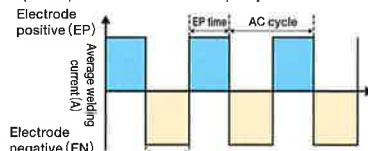


Welding method: MAG welding, Welding current: 40A, Welding voltage: 14.7V, Welding speed: 30cm/min, Wire diameter: Φ1.2mm, Base material: SPCC 0.8mmt, Gap: 1.5mm

$$\text{EN ratio} = \frac{\text{EN time}}{\text{AC cycle}} \times 100 (\%)$$

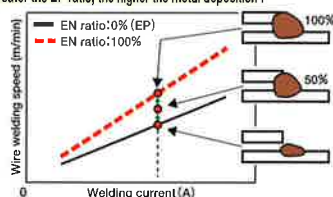
What is the AC Short Arc Welding?

AC Short Arc welding is used to generate polarity power by alternating electrode positive (EP) and electrode negative (EN). The polarity ratio (En ratio) between EP and EN is completely variable.



AC Short Arc Welding Method Diagram

The greater the EP ratio, the higher the metal deposition!

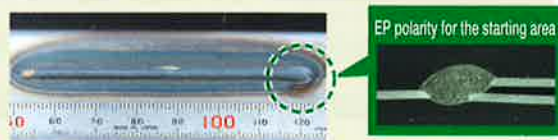


Effectiveness of the AC Short Arc Welding Method

Dramatically improves thin sheet welding quality, a key factor for determining high quality welding!

Improved Arc Start Penetration Control

This method ensures sufficient penetration of the arc starting area by starting the arc in electrode positive mode (EP polarity), and automatically shifting to the thin sheet AC mode after a certain period of time.



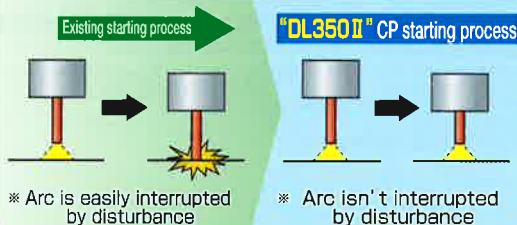
New CP Start Control Arc Start System

Advanced Arc Start Performance.

Achieved stable arc initiation!

Fluctuations in the arc length just after arc initiation are evened out, resulting in immediately smooth and stable arc starts.

The combination with the digital turbo start improves the arc starting performance.



*Disturbance comes from fluctuations in wire extension length, wire tip shape, base material temperature and worn tips.

Comparison of the instant starting ratio



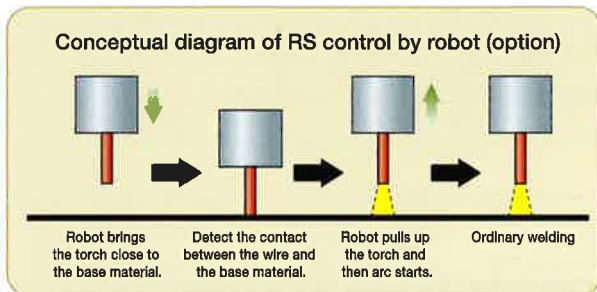
MAG (80%Ar+20%CO₂) 15L/min SPCC 4.5mmt
JIS-YGW12 1.2mm EXT. 15mm 125A 15.0V 50cm/min

Quality

DAIHEN provides the best welding quality package with the Almega AX Series !

- The DL350II can become a dedicated power source to DAIHEN's AX series robot by adding a special interface board.
- The DAIHEN special RS control (option) with the standard 4-roll feeder and robot control ensures proper arc starts and spatter reduction at the start of the arc.

Simple RS Control via Robot Operation!



- Directly set and change parameters necessary for welding through the teach pendant. Easily set optimal welding conditions and ensure higher quality welding, even with complicated work!

■ Example of welding parameters which can be set through the teach pendant.

Welding parameters	
Start of welding	Welding current and voltage
End of welding	Arc characteristic
Condition setting	Pre-flow time
	Slowdown speed
	Crater time and post-flow time
	Anti-sticking adjustment
Welding mode setting	
Welding mode switching at any welding point	
Arc monitoring (Welding current and arc voltage)	
Setting the abnormality monitoring system for welding current and arc voltage	
Monitoring motor load of the wire feeder	
Setting the abnormality monitoring system for motor load of the wire feeder	
Arc interruption detecting	
Adhesion detecting	



- Equipped with an arc monitoring function to monitor welding conditions, used for preventing poor welds and recording error messages.

Convenience

Easily set convenient functions with the touch panel

1 EN ratio NEW

Achieve high quality welding for thin sheet materials or pieces with gaps controlling the heat input to the base material.

2 Spatter adjusting function

Reduce spatters that may be increased by various changes in the environment.

For example...

- long cable
- complicated welding position

3 Welding control NEW

- Manage your welding results
- Welding Points
 - Wire consumption
 - Welding time
 - Welding current fluctuation

4 Welding condition memory function

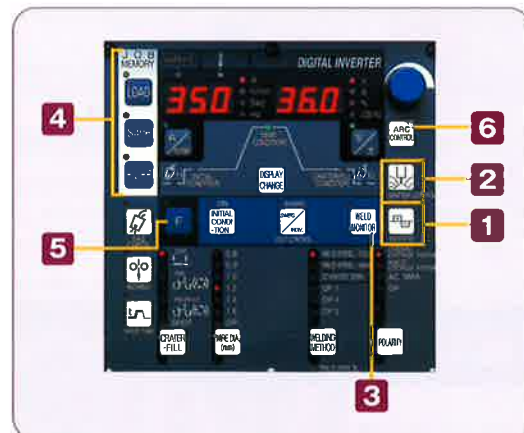
Record and play back welding conditions according to the work with one-touch operation. Improves the reproducibility and workability of welding conditions.

5 Function key

Used to set functions on the front panel that were previously set via switches inside the welding power source. This allows operators to easily set special functions meeting their individual preferences.

6 Arc characteristic

Freely set favorable arc and optimal arc conditions according to the environment.



Variety

With our rich welding mode choices (27 modes in total), the DL350II responds to a variety of welding environments to achieve the best welding quality!



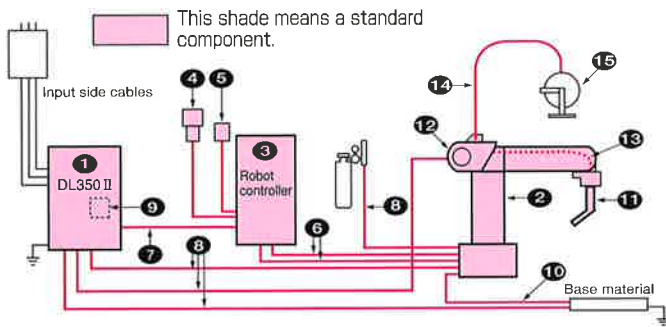
- Equipped with stainless steel mode, broadly respond to diversified welding materials with 27 modes. The wire with $\phi 0.8\text{mm}$ diameter is also available as an option.

Wire	Gas	Polarity	Wire diameter mm
Soft steel solid	CO ₂	Standard / high speed electrode positive	※ ($\phi 0.8$), $\phi 0.9$, $\phi 1.0$, $\phi 1.2$
		Thin sheet AC	※ ($\phi 0.8$), $\phi 0.9$, $\phi 1.0$, $\phi 1.2$
	MAG [80%Ar, 20%CO ₂]	Standard / high speed electrode positive	※ ($\phi 0.8$), $\phi 0.9$, $\phi 1.0$, $\phi 1.2$
		Thin sheet AC	※ ($\phi 0.8$), $\phi 0.9$, $\phi 1.0$, $\phi 1.2$
Stainless steel solid	MIG [98%Ar, 2%O ₂]	Standard / high speed electrode positive	※ ($\phi 0.8$), $\phi 0.9$, $\phi 1.0$, $\phi 1.2$
		Thin sheet AC	※ ($\phi 0.8$), $\phi 0.9$, $\phi 1.0$, $\phi 1.2$

※ The $\phi 0.8$ mode in parentheses requires optional software.

Connection Diagrams, Typical Combination Examples and their Required Equipment

AX-V4 AP Robot :



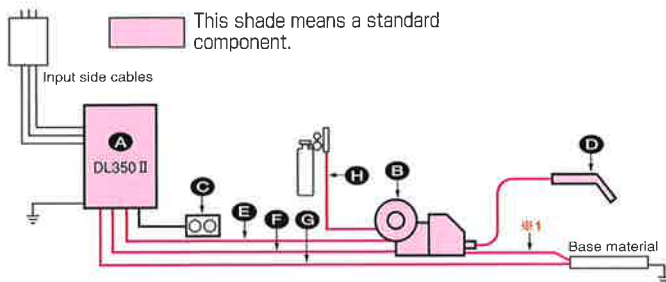
This diagram shows only major components based on the standard configuration of the CO₂/MAG system.
For further information, please contact dealers or our sales division.

Example of combination with AX-V4 AP

Item Name	Type
1 Welding power source	DL-350 (S-2)
2 Manipulator	AX-MV4 AP (Type : AXMV4 AP1)
3 Controller	AX-C (Type : AXCAN1)
4 Teach pendant	AXTPDS0N-JC08
5 Switch box	AXOP-0005
6 Control cables 1 & 2 (Wire harness)	AXRB-1005
7 Control cable 5	AXRB-5105
8 Control cable 4 and cable hoses	※1 AXRB-4605
9 Built-in CAN interface board	L9123C
10 Voltage detection line (Base material)	L9509B
11 CO ₂ /MAG welding torch	MTXC-3531
12 Wire feeder	AF-4001 (for D series)
13 Single-mode power cable	L-10140 (for DL)
14 Conduit	Z318D41
15 Wire reel stand	L318H

※1. Cable hoses include welding cables of the gas hose torch side.

Semi-Automatic Welding :

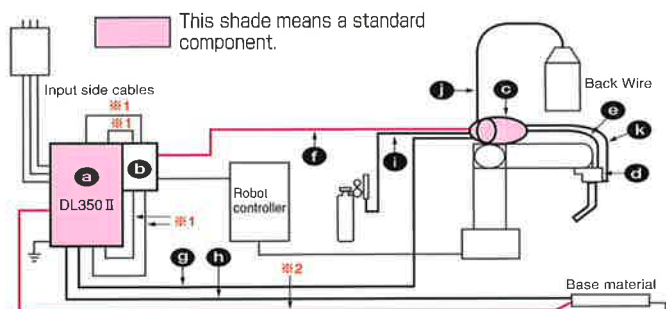


Example of semi-automatic welding (10m extension code set)

Generic Name	DL350 II
A Welding power source	DL-350 (S-2)
B Wire feeder	※2 CMV-7401
C Remote control	K5416F00 (treated as a part)
D CO ₂ /MAG welding torch	※3 WT3500-SD / WT3510-SD
E Feeder side control cable (10 cores)	※4 BKCPJ-1010
F Feeder side power cable	※4 BKPDT-6012
G Base material side power cable	※4 BKPDT-6012
H Gas hose	※4 BKGG-0610

※1. Use the attached cable K5416N00 to the welding power source.
 ※2. Wire feeder exclusive to DL.
 ※3. In case of semi-automatic welding, only Blue Torch II is applicable.
 ※4. Choose appropriate length of cables and gas hoses from among 5m, 10m, 15m and 20m.

Other companies' robots :



This diagram shows only major components of the CO₂/MAG system.
When connecting to other companies' robots and automated equipment, check the detailed specifications.

Example of combination with other robots (10m extension code set)

Item Name	Type
a Welding power source	DL-350 (S-2)
b Interface box	IFR-101D (Mounting hook: E2451P00)
c Wire feeder	CMRE-741
d Welding torch	K2331 type curved torch K2525 type straight torch
e Single-mode power cable	K5369 (1.1m) , K5370 (1.2m)
f Feeder side control cable (10 cores)	※3 BKCPJ-1010
g Feeder side power cable	※3 BKPDT-6012
h Base material side power cable	※3 BKPDT-6012
i Gas hose	※3 BKGG-0610
j Conduit	※4 Z318P50 (The guide adaptor mount is 9/16-18UNF.)
k Input side cable (Torch)	※5 K5416P (3m)

※1. The attached cable to the interface box. For connecting instructions, refer to the instruction manual for IFR-101D.
 ※2. Use the attached cable K5416N00 to the welding power source.
 ※3. Choose appropriate length of cables and gas hoses from among 5m, 10m, 15m and 20m.
 ※4. When using 7/16-20UNF conduit, the guide adaptor L7810D04 is separately required.
 ※5. This wiring is to detect the voltage at the tip of the torch. Cut the cable at necessary length to use.

● Capacity of Power Supply Facility and Connecting Cables

Item	Model	DL-350 (S-2)
Power Source Voltage	V	200/220±10%
Phase	—	3 phases
Input Power Capacity	kVA	19 or more
Fuse/Breaker Capacity	Fuse	A 70
	Breaker	A 75
Input Side Cable	mm ²	14 or more
Base Metal / Feeder Power Cable	mm ²	60
Earth Cable	mm ²	14 or more

● Standard Specifications

Generic Name		DL350 II	
● Welding power source			
Rated Input Voltage	Type	DL-350 (S-2)	
	V	200/220 (For both 50/60Hz)	
Phase		3 phases	
Rated Input	kVA	18.2 (16.6kW)	
Rated Duty Cycle	%	60	
Rated Output Current	A	350	
Rated Load Voltage	V	36	
Range of Output Current	A	30~350	
Range of Output Voltage	V	12~36	
Max. no-load Voltage	V	84	
Dimensions (W x D x H)	mm	300×705×595 (excluding handle)	
Weight	kg	55	
● Wire Feeder Power Cable			
	Type	BKPDT-6002	
Cable Size	mm ²	60	
● Base Metal Power Cable			
	Type	BKPDT-6002	
Cable Size	mm ²	60	
● Wire Feeder			
	Type	CMV-7401 (semi-automatic)	CMRE-741 (other robots)
※ Applicable Wire Size	mm	(0.8), 0.9, 1.0, 1.2, (1.4, 1.6)	
Wires type		Solid Wire, Flux-cored Wire	
Wire Feeding Speed	m/分	22	
Dimensions (W×D×H)	mm	215×543×350	195×275×248 (excluding cables)
Weight	kg	13	7
● CO ₂ /MAG Welding Torch			
	Type	WT3500-SD	WT3510-SD
Rated Current	A	350	350
※ Applicable Wire Size	mm	(0.9, 1.0), 1.2	(0.9, 1.0), 1.2, (1.4)
Duty Cycle	%	30	60
Cooling Method		Air cooling	Air cooling
Cable Length	m	3, (4.5, 6)	3, (4.5, 6)

※ When using the wire size in parentheses, some of options are required separately

● Standard Accessories

Welding Power Source		DL-350 (S-2)	
Dustproof Filter		2	
Voltage Detection Cable (For feeder, 10m)		1	
Voltage Detection Cable (for Automated Equipment, 30m)		1	
● Wire Feeder			
		CMV-7401	CMRE-741
Gas Hose (3m)		1	—
Voltage Detection Adapter Kit ※1		1	—
● Welding Torch			
		WT3500-SD	WT3510-SD
Hexagon Wrench (for M5)		1	1

※1 To detect the voltage at the tip of the torch, use this kit after connecting to the torch.
For detailed instructions, refer to the instruction manual.

● Options

■ Extension Cable

	5m	10m	15m	20m
※ Power cable (for both base material side and feeder side) (60mm ²)	BKPDT-6007	BKPDT-6012	BKPDT-6017	BKPDT-6022
Gas hose	BKGG-0605	BKGG-0610	BKGG-0615	BKGG-0620
Feeder side control cable (10 cores)	BKCPJ-1005	BKCPJ-1010	BKCPJ-1015	BKCPJ-1020
Control cable for analog remote controller (6 cores)	BKCPJ-0605	BKCPJ-0610	BKCPJ-0615	BKCPJ-0620
Control cable for digital remote controller (4 cores)	—	BKCAN-0410	—	BKCAN-0420

※ When using the extension cable, the standard power cable (2m) is not required.
※ When using the extension cable around at the rated current and for the water cooling system, and using the over 15m-long cable, the 80mm² cable is recommended.

■ Remote Controller

● Analog remote controller

Item Name	Part No.
Analog remote controller (3m)	K5416S00

● Digital remote controller

(A set of the following 3 items is required.)

Item Name	Type
Digital remote controller (Body)	E-2442
Control cable	BKCAN-0410 (10m) BKCAN-0420 (20m)
CAN communication board (treated as a part)	K5422B00



Analog remote controller



Digital remote controller

■ Interface / Feeder for Other Companies' Robots

Item Name	Type
Interface	IFR-101D
Wire feeder	CMRE-741
Connection hook	E2451P00
※ Control cable	E2451M00

※ For details about connecting to other companies' robots, please contact us.

■ Welding Torch

● Stainless steel MIG welding torch

It's for welding stainless steel with the MIG welding technique.

WTS300-SD	
Applicable wires and wire diameters	Stainless steel (φ1.0mm), φ1.2mm
	Soft steels (φ0.9mm), (φ1.0mm), φ1.2mm
Maximum working current	300A
Utilization	50%
Cable length	3m

● CO₂/MAG welding torch

It's for optional soft steels with 0.8mm diameter.

WT1800-SD	
Applicable wire diameters	(φ0.6mm), φ0.8mm
Maximum working current	180A (CO ₂) / 130 (MAG)
Utilization	40A (CO ₂) / 30 (MAG)
Cable length	3m

In accordance with DAIHEN's policy to make continuing improvements, design and/or specifications are subject to change without notice and without any obligation on the part of manufacturer.

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