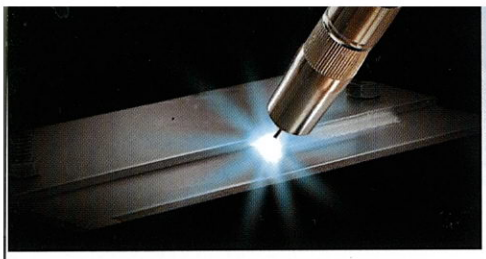
OTC

Welding & Handling Robot **Friendly** series

Gas Metal Arc

Synchro-feed GMA Welding Robot Package

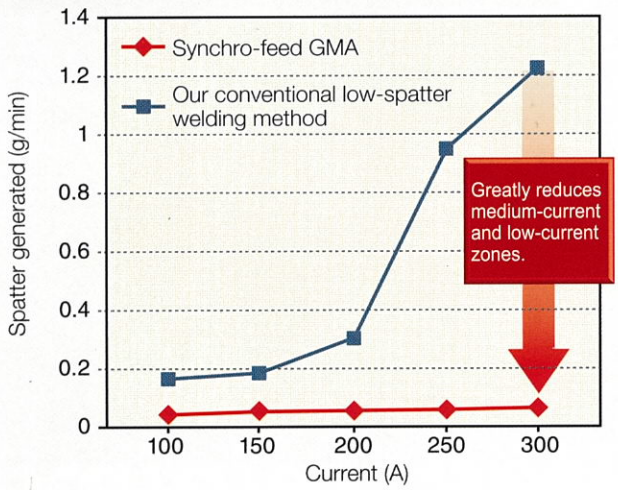
With minimum spatter!

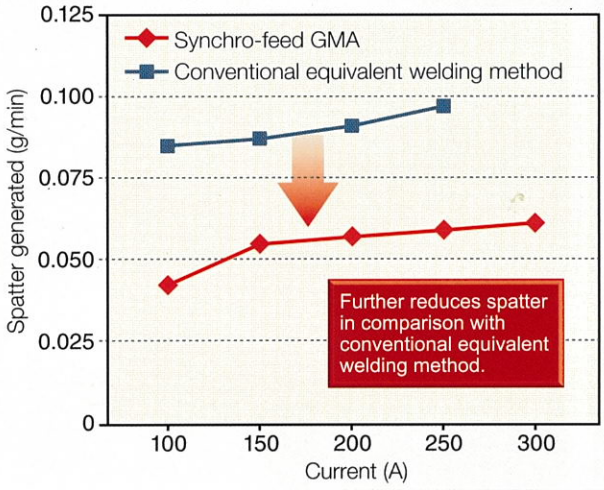


OTC's new welding process
Synchro-feed GMA Welding

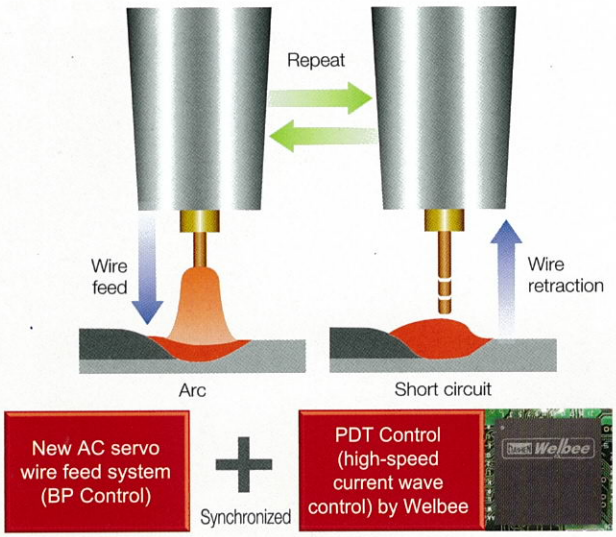
Ultra-low-spatter welding across a wide current zone (50 A–300 A)

Comparison of spatter quantity with CO_2 shielding gas

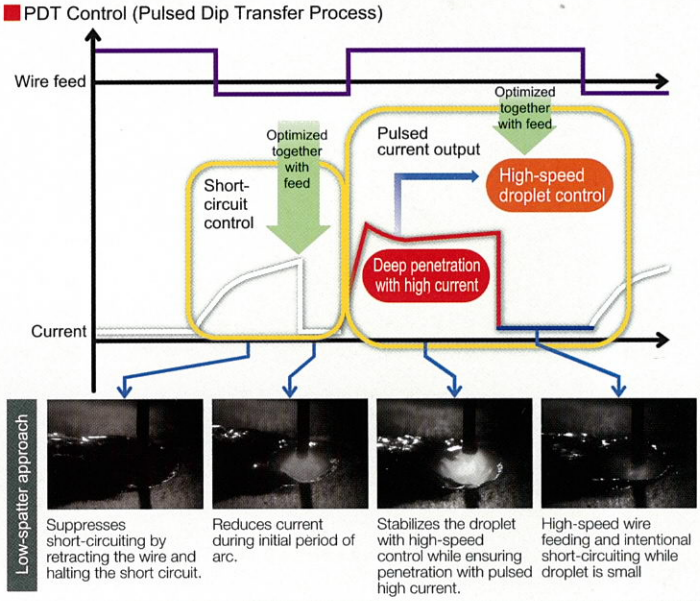




Features of the Synchro-feed GMA Welding System



■ PDT Control (Pulsed Dip Transfer Process)



Suppresses short-circuiting by retracting the wire and halting the short circuit.

Reduces current during initial period of arc.

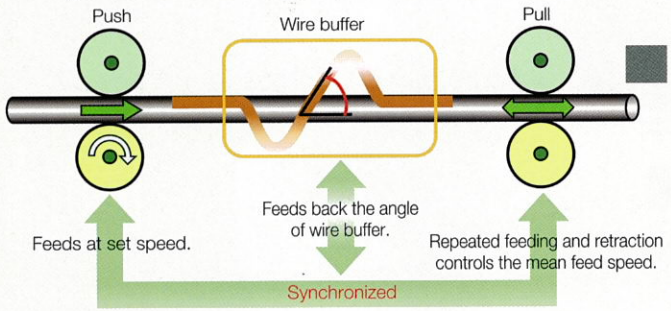
Stabilizes the droplet with high-speed control while ensuring penetration with pulsed high current.

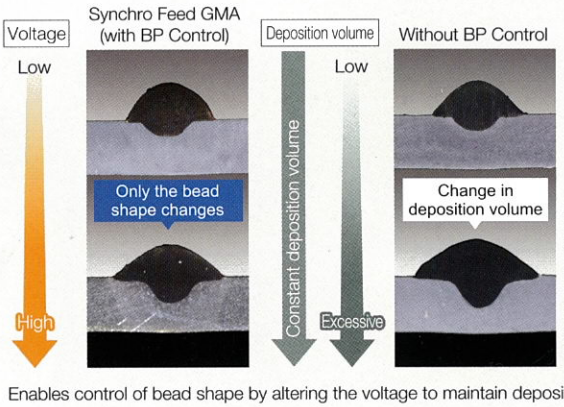
High-speed wire feeding and intentional short-circuiting while droplet is small

Synchro-feed GMA Wire Feed Control

■ BP Control (Buffer Position Control)

The mean feed speed is controlled with repeated feeding and retraction according to the settings of the new AC servo wire feed system.





Shielding gas: 80% Ar + 20% CO_2
Current: 150 A
Voltage: 16–20 V
Welding speed: 50 cm/min
Sheet thickness: 3.2 mmt
Welding wire: YGW-12 1.2-mm dia.

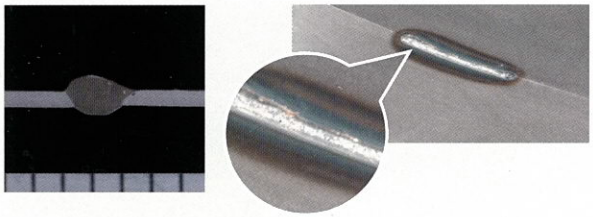
Enables control of bead shape by altering the voltage to maintain deposition volume.

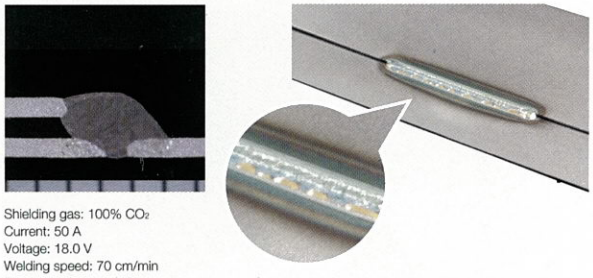
achieves the lowest possible spatter.
Robot Package

Ensures low heat input into super-thin sheet.

Sheet thickness **0.6 mmt**

Achieves low-spatter welding of super-thin sheet with 1.2-mm dia. wire for low running cost. Low heat input prevents burn-through.





Shielding gas: 100% CO_2
Current: 50 A
Voltage: 18.0 V
Welding speed: 70 cm/min
Feed speed: 1.2 m/min
Sheet thickness: 0.6 mmt
Welding wire: YGW-12 1.2-mm dia.

Improved starts

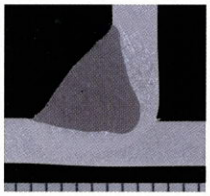
Current waveform control and dedicated wire feed start control contribute to a beautifully wide bead and greatly reduced spatter during starts.

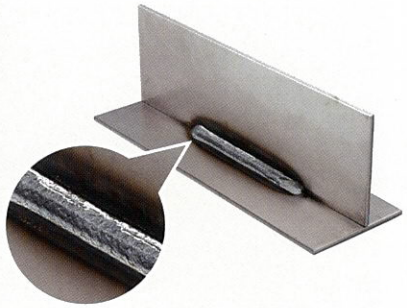
Shielding gas: 100% CO_2
Current: 250 A
Voltage: 23.0 V
Welding speed: 50 cm/min
Feed speed: 10 m/min
Sheet thickness: 3.2 mmt
Welding wire: YGW-12 1.2-mm dia.

Achieves ultra-low-spatter welding that ensures deep penetration.

Sheet thickness **3.2 mmt**

The combination of PDT Control (pulsed high-current control) and BP Control (high-speed wire feed control) overcomes the limitations of CO_2 shielding gas to achieve sufficiently deep penetration and a flat bead shape.





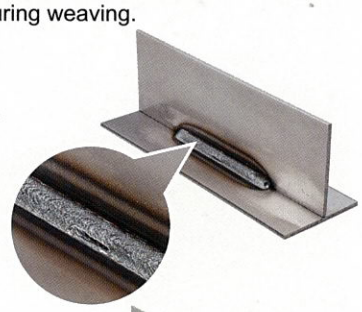
Shielding gas: 100% CO_2
Current: 250 A
Voltage: 23.0 V
Welding speed: 50 cm/min
Feed speed: 10 m/min
Sheet thickness: 3.2 mmt
Welding wire: YGW-12 1.2-mm dia.

Optimized for weaving

Good beads are guaranteed because rapid wire-feed control has an excellent tracking capability with the wire extension, ensuring low spatter even during weaving.

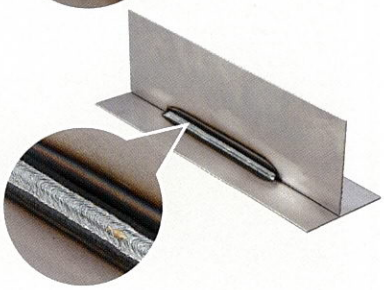
Sheet thickness **3.2 mmt**

Shielding gas: 100% CO_2
Current: 130 A
Voltage: 17.0 V
Welding speed: 45 cm/min
Feed speed: 3.2 m/min
Weaving frequency: 4 Hz
Sheet thickness 3.2 mmt
Welding wire:
YGW-12 1.2-mm dia.



Sheet thickness **1.0 mmt**

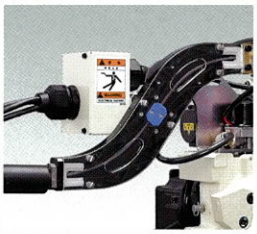
Shielding gas: 100% CO_2
Current: 80 A
Voltage: 17.0 V
Welding speed: 45 cm/min
Feed speed: 1.7 m/min
Weaving frequency: 5 Hz
Sheet thickness 1.0 mmt
Welding wire:
YGW-12 1.2-mm dia.



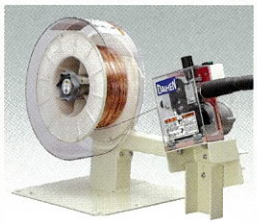
Main Components

Pull Feed Unit
AFPSB-2501
(for FD-B4(S))

Pull Feed Unit
AFPSB-2501
(for FD-V6(S))



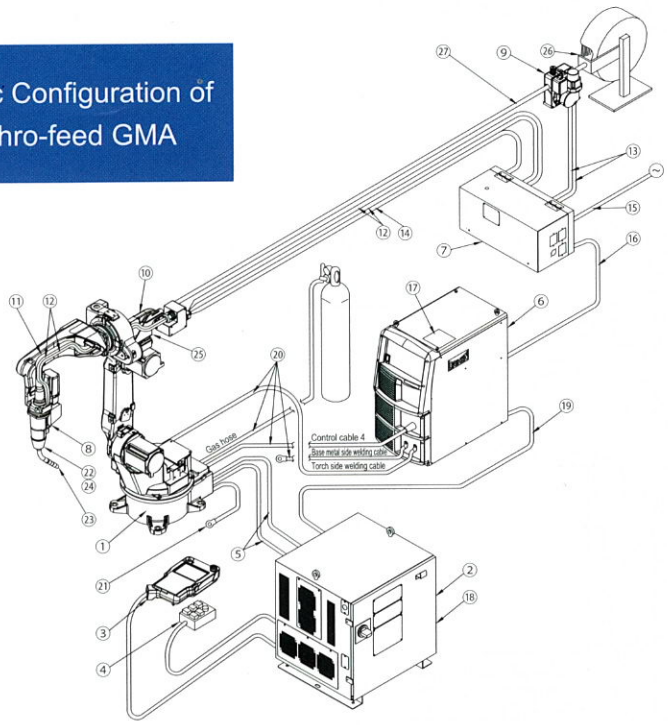
Wire Buffer
L-11610



Push Feeder
AFS-2301

Wire Feed Controller
AFCA-S1W04

Basic Configuration of Synchro-feed GMA



Application Range of Snychro-feed GMA Welding System

Item	Specification
Shielding gas	CO_2/MAG
Applicable wire diameter/material	YGW-12 1.2-mm dia. mild steel solid wire
Wire stock method	Wire reel/pack wire
Applicable tips	Welding current 50–200 A: E tip 50–300 A: CW tip
Mean wire feed speed	1.2–18.0 m/min.
Welding current	CO_2: 300 A 30% MAG: 250 A 30%
Rated use	CO_2: 50–300 A MAG: 50–250 A
Applicable sheet thickness	0.6–4.5 mm (Varies with welding speed.)
Max. cable length in conduit	5 m

Basic Configuration of Friendly Series

Diagram Reference & Part Name		Model	Specification
①	Manipulator	NB42—□□□□	NB4
		NB4S1—□□□□	NB4S
		NV62—□□□□	NV6
		NV6S1—□□□□	NV6S
②	Control Unit	FD11—J□□□□□□	FD11 Control Unit
③	Teach Pendant	FDTPDSJN—4L□□	Standard: 8 m
	WiTP Wireless Teach Pendant (optional)	FDWTPDSJN—4	Wireless
④	Operation Box	FDOP—00□□	Standard: 5 m
⑤	Control Cable 1, 2 (Wire harness)	FDRB—10□□	Standard: 5 m

Basic Configuration of Synchro-feed GMA Welding System

Diagram Reference & Part Name		Model	Specification
⑥	Welding Power Supply	WB-P500L	
⑦	Wire Feed Control Unit	AFCA-S1W04	
⑧	Pull Feed Unit (Note 1)	AFPSB-2501	Use for NB42/NB4S1
		AFPS-2501	Use for NV62/NV6S1
⑨	Push Feeder	AFS-2301	
⑩	Wire Buffer	L-11610	Use for NV62/NV6S1
			Use for NB42/NB4S1
⑪	Single-Wire Power Cable	L-11621	Use for NB42/NB4S1
		L-11622	Use for NV62/NV6S1
⑫	Pull Feeder Control Cable	AFRB-PL10□□	□□: 08 8 m (Standard) : 13 13 m : 18 18 m
⑬	Push Feeder Control Cable	AFRB-PS10□□	□□: 05 5 m (Standard) : 10 10 m : 15 15 m
⑭	Wire Buffer Control Cable	AFRB-BF10□□	□□: 08 8 m (Standard) : 13 13 m : 15 15 m
⑮	Power Supply Cable	AFRB-AC10□□	□□: 05 5 m (Standard) : 10 10 m : 15 15m
⑯	CAN cable	AFRB-CN10□□	□□: 05 5 m (Standard) : 10 10m : 15 15m
⑰	CAN Interface Assembly	L22789C	
⑱	Software Options	L22153F	
⑲	Control Cable 5	FDRB-51□□	□□: 05 5 m (Standard) : 10 10 m : 15 15 m
⑳	Cable Hose (Note 2)	A2RB-4D□□	□□: 05 5 m (Standard) : 10 10 m : 15 15 m
㉑	Voltage Detection Line (negative side)	L9509□	□ : B 5 m (Standard) : C 10 m : D 15 m
㉒	CO_2/MAG Welding Torch	RT3500H	Air-cooled 350 A 45° curved torch (350-A rated output welder: Standard)
㉓	Tip Gauge Assembly	L317X	350-A rated output welder (For RT3500* torch, 15-mm wire protrusion)
㉔	Robot Gauge (optional)	L11608H	Use for NB42/NB4S1
		—	Use for NB42/NB4S1
㉕	Bracket for Wire Buffer	L11610C	Use for NB42/NB4S1
		L11610D	Use for NV62/NV6S1
㉖	Bracket for Push Feeder	L11623A	For wire reel
		L11624A	For back wire
㉗	Conduit	L10597D	3 m

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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