

PROFESSIONAL IN WELDING

PROMIG 250SYN DPulse



Quick guide | English

A. Preparation.

Check the package contents.



You will also need.



Argon regulator



300mm wire spool



CO₂ regulator



Helmet



V groove roller for M.S/S.S (0.8/1.0mm)



Liner for M.S/S.S

Connect to the main supply and switch on.

Voltage of power source: 1-PH 230 V ±10% ; 3-PH 380 V ±10% Frequency: 50/60 Hz





Connect to the shielding gas.





Gas Check.

Gas Check And Flow Adjust Typical flow rate for shielding gas is 20 to 30 CFH (cubic feet per hour).



B. Machine description - quick overview.

Machine control - operating elements.



Item	Symbol	Description		Symbol	Description
1	A ● 8 ● ‡+ ●	Welding amperage Wire feeding speed Metal thickness (M.S. only)	6	JOB- LIST	Job-list: Job-list number selection
2	● ∨ ● [□]	Welding voltage: -5 V to 5 V Arc length: -5 V to 5 V	\bigcirc	Wire S	Inch feeding
3	• m	Induction: Softer arc or harder arc (0 to 10, 5 in the middle)	8	Test	Check the gas
4	PROG	Program setting: Select all the programs to set	9	SYN MIG • MIG • MMA •	SYN MIG: Synergy MIG welding MIG: Not able to select MMA: MMA/STICK welding
(5)	• DPMIG	DPulse: Double pulse function (optional)	10	• 社 • 莊 • 內	2T: Non-latched mode (S2T:Non-latched mode) 4T: Latched mode S4T:Latched mode

Front view.



ltem	Symbol	Description
1		Machine control See Machine control – operating elements chapter on page 05
2		Connection socket Connect to MIG torch
3	+	 Connection socket, "+" welding current MMA welding: workpiece connection MIG/MAG welding: welding current connection for the welding torch Flux-cored welding: workpiece connection
4		Connection socket(10 Pins) Push Pull torch connection
5	—	 Connection socket, "-" welding current MMA welding: electrode holder connection MIG/MAG welding: workpiece connection Flux-cored welding: welding current connection for the welding torch

Rear view.



Item	Symbol	Description
1		Power switch Machine on or off
2		Main power cable
3		Ground/Earth connector
4		Gas connector
5		Bracket for shielding gas cylinder

C. Method of the operation.

MIG welding.

Connect the filler wire.

1.Load and secure spool, adjust the break force



3.Push wire through guides into gun; continue to hold wire.



5.Connect the MIG torch and the earth clamp.

2.Check and adjust filler wire drive roll. V-groove roller for M.S./S.S.; U-groove roller for AL.



4.Close and tighten pressure assembly, and let go of wire.



6.Feeding the wire by inch-feeding button.



10.Connect the earth clamp

10.1 Solid wires welding with a positive wire electrode.



10.2 Flux-cored wires welding with a negative wire electrode



Start welding.



3 steps to achieve weld perfection

ltem	Symbol	Description
1		Select SYN MIG
2	JOB- LIST	Regarding the JOBs-list, set the job list number
3	\bigcirc	Set the welding output parameters (set either one in enough) See machine description on page 05

You may also need to check the following knobs for some optional functions

ltem	Symbol	Description
4	m	Check the arc dynamic (soft arc/ medium arc / hard arc)
5	DPMIG	To check if you need Double Pulse (lights on:Double Pulse on / lights off:Double Pulse off)
6		Select 2T(S2T)/4T/S4T mode
7	PROG	Check the program if it's suitable for present jobs

JOBs-list						
	()((O Material			Ø Wire		
			Gas ·	0.8	1.0	1.2
					JOBs No.	
	MS Flux Cored MS		100%CO2	101	102	/
No Pulse			82%Ar 18%CO2	201	202	/
			Self-shiled	101	102	/
			82%Ar 18%CO2	1	402	/
	SS	308	98%Ar 2%CO2	1	/	/
Dulas		316		/	/	/
Fuise		4043		1	702	703
	AL	5356	100%Ar	1	802	803

Dynamic control







Arc setting: hard

The program

Program is used to set all the settings during the complete welding phase.

	PROGRAM		ADJUSTMENT RANGE	DEFAULTS
P00	Pre-gas Time		0.0-10.0s	0.1
P01	Slow-feeding A	djustment	1.0 - 10.0 m/min	1.5
P02		Hot-start Amp	100-200%	100%
P03		Hot-start Arc Voltage	-5.0 to 5.0 V	0
P04	Hot Start	Hot-start Continue Time	0.0 - 10.0 s	0
P05		Up/Down-slope Time from Hot-start	0.0 - 10.0 s	0.1
P06		Arc Ignition Amps	10-200%	100%
P07	Start Arc	Arc Ignition Voltage	-5.0 to 5.0 V	0
P08		Arc Ignition Time	0.0 - 10.0 s	0
P09		Up-slope Time	0.0 - 10.0 s	0.1
P10		Base-pulse Amp	10-100%	50%
P11		Base-pulse Votage	-5.0 to 5.0 V	0
P12	Double Pulse	Pulse Frequency	0.1 - 10.0 Hz	1.0Hz
P13		Peak-pulse Ratio	10-90%	50%
P14		High/Low Pulse Wave Correction	0.0 - 10.0 s	0.1
P15		Down-slope Time	0.0 - 10.0 s	0.1
P16		Crater Arc Amp	10-100%	50%
P17	End Arc	Crater Arc Voltage	-5.0 to 5.0 V	0
P18		Crater Arc Time	0.0 - 10.0 s	1.0s
P19		Burn-back Time	0.1 - 2.0 s	0.5s
P20	Post-gas Time		0.0 - 10.0 s	0.1

Welding phases



Pre-gas Time(P00)

GPr:Gas pre-flow

Hot Start (P02-P05)

I-H:Hot start current phase:In cold conditions, the wire is heated firstly, so it becomes the normal temperature state at the moment of welding to reduce defects.

t-H:Hot start current time

H:Hot start arc length correction

SL3:Slope 3:the hot start current is steadily raised until it reaches the welding current

Start Arc(P06-P09)

I-S:Starting-current phase: the base material is heated up rapidly, despite the high thermal dissipation that occurs at the start of welding
t-S:Starting current time
▲ S:Start arc length correction
SL1: Slope 1: the starting current is steadily raised until it reaches the welding current *Hot Start explanation:
①Hot start is not necessary, if you don't need it, set t-H to 0.
②Hot Start prior to Start Arc.
③Hot Start and Start Arc both belong to the Start Phase.
I:Welding-current phase: uniform thermal input into the base material, whose temperature is raised by the advancing heat

End Arc(P15-P19)

I-E:Final current phase: to prevent any local overheating of the base material due to heat build-up towards the end of welding. This eliminates any risk of weld seam drop-through. **t-E:**Final current time

E:End arc length correction

SL2:Slope 2: the welding current is steadily lowered until it reaches the final current

Post-gas Time(P20)

GPo:Gas post-flow

Welding Mode

Symbol



2T mode



- "2T mode" is suitable for
- Tacking work
- Short weld seams
- Automated and robot welding





*Hot Start prior to Start Arc(P02-P05)

"S2T mode" is ideal for welding in the higher power range. In S2T mode, the arc starts at a lower power, which makes it easier to stabilize. Arc start phase(including hot start) and end arc phase's crater arc time is 0(P18) equal to STD 2T.

4T mode



"4T mode" is suitable for longer weld seams.

S4T mode



*Hot Start prior to Start Arc(P02-P05)

"S4T mode" is particularly suitable for welding aluminium materials. The special slope of the welding current curve takes account of the high thermal conductivity of aluminium.

Setting Double Pulse



- 1.Peak:A/V(adjust the Peak current and voltage)
- 2.Base:A/V(set P10-P11 in program)
- 3.Peak Pulse Ration(set P13 in program)
- 4.Double Pulse Frequency(set P12 in program)
- 5.High/Low Pulse Wave Correction(set P14 in program)

MMA welding.



Item	Symbol	Description
1		Select MMA
2	\bigcirc	Set the amperage

D. Gmaw Welding (mig) Guidelines.

Typical GMAW (MIG) Process Connections



Typical GMAW (MIG) Process Control Settings



Wire Size	Amperage Range	Recommended Wire Feed Speed	Wire Feed Speed*
0.023 in. (0.58 mm)	30–90 A	3.5 in. (89 mm) per amp	3.5 x 62.5 A = 219 ipm (5.56 mpm)
0.030 in. (0.76 mm)	40–145 A	2 in. (51 mm) per amp	2 x 62.5 A = 125 ipm (3.19 mpm)
0.035 in. (0.89 mm)	50–180 A	1.6 in. (41 mm) per amp	1.6 x 62.5 A = 100 ipm (2.56 mpm)
*62.5 A based on 1/16 in. (1.6 mm) m	aterial thickness.	ipm = inches per minute; mpm = n	neters per minute

Holding And Positioning Welding Gun



Conditions That Affect Weld Bead Shape



Gun Movement During Welding





Good Weld Bead Characteristics



Troubleshooting – Excessive Spatter



Excessive Spatter – scattering of molten metal particles that cool to solid form near weld bead.

	S-0636
Possible Causes	Corrective Actions
Wire feed speed too high.	Select lower wire feed speed.
Voltage too high.	Select lower voltage range.
Electrode extension (stickout) too long.	Use shorter electrode extension (stickout).
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, undercoating, and dirt from work surface before welding.
Insufficient shielding gas at welding arc.	Increase flow of shielding gas at regulator/flowmeter and/or prevent drafts near welding arc.
Dirty welding wire.	Use clean, dry welding wire.
	Eliminate pickup of oil or lubricant on welding wire from feeder or liner.
Incorrect polarity.	Check polarity required by welding wire, and change to correct polarity at welding power source.

Troubleshooting – Porosity

	Porosity – small cavities or holes resulting from gas pockets in weld metal.
	S-0635
Possible Causes	Corrective Actions
Insufficient shielding gas at welding arc.	Increase flow of shielding gas at regulator/flowmeter and/or prevent drafts near welding arc.
	Remove spatter from gun nozzle.
	Check gas hoses for leaks.
	Place nozzle 1/4 to 1/2 in. (6-13 mm) from workpiece.
	Hold gun near bead at end of weld until molten metal solidifies.
Wrong gas.	Use welding grade shielding gas; change to different gas.
Dirty welding wire.	Use clean, dry welding wire.
	Eliminate pick up of oil or lubricant on welding wire from feeder or liner.
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, and dirt from work surface before welding.
	Use a more highly deoxidizing welding wire (contact supplier).
Welding wire extends too far out of nozzle.	Be sure welding wire extends not more than 1/2 in. (13 mm) beyond nozzle.

Troubleshooting – Excessive Penetration

Evenesive Reportation Good Report	Excessive Penetration – weld metal melting through base metal and hanging underneath weld.
	S-0639
Possible Causes	Corrective Actions
Excessive heat input.	Select lower voltage range and reduce wire feed speed.
	Increase travel speed.

Troubleshooting – Lack Of Penetration



Lack Of Penetration – shallow fusion between weld metal and base metal.

Lack of Penetration Good Penetration S-0638		
Possible Causes	Corrective Actions	
Improper joint preparation.	Material too thick. Joint preparation and design must provide access to bottom of groove while maintaining proper welding wire extension and arc characteristics.	
Improper weld technique.	Maintain normal gun angle of 0 to 15 degrees to achieve maximum penetration.	
	Keep arc on leading edge of weld puddle.	
	Be sure welding wire extends not more than 1/2 in. (13 mm) beyond nozzle.	
Insufficient heat input.	Select higher wire feed speed and/or select higher voltage range.	
	Reduce travel speed.	
Incorrect polarity.	Check polarity required by welding wire, and change to correct polarity at welding power source.	

Troubleshooting – Incomplete Fusion

Incomplete Fusion – failure of weld metal to fuse completely with base metal or a preceeding weld bead.		
Possible Causes	Corrective Actions	
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, undercoating, and dirt from work surface before welding.	
Insufficient heat input.	Select higher voltage range and/or adjust wire feed speed.	
Improper welding technique.	Place stringer bead in proper location(s) at joint during welding.	
	Adjust work angle or widen groove to access bottom during welding.	
	Momentarily hold arc on groove side walls when using weaving technique.	
	Keep arc on leading edge of weld puddle.	
	Use correct gun angle of 0 to 15 degrees.	

Troubleshooting – Burn-Through

	Burn-Through – weld metal melting completely through base metal resulting in holes where no metal remains.	
		S-0640
Possible Causes	Corrective Actions	
Excessive heat input.	Select lower voltage range and reduce wire feed speed.	
	Increase and/or maintain steady travel speed.	

Troubleshooting – Waviness Of Bead



Waviness Of Bead – weld metal that is not parallel and does not cover joint formed by base metal.

		S-0641
Possible Causes	Possible Causes Corrective Actions	
Welding wire extends too far out of nozzle.	Be sure welding wire extends not more than 1/2 in. (13 mm) beyond nozzle.	
Unsteady hand.	Support hand on solid surface or use two hands.	

Troubleshooting – Distortion

Base m in the d the w	Distortion – contraction of weld metal during welding that forces base metal to move. etal moves irection of eld bead. S-0642	
Possible Causes	Corrective Actions	
Excessive heat input.	Use restraint (clamp) to hold base metal in position.	
	Make tack welds along joint before starting welding operation.	
	Select lower voltage range and/or reduce wire feed speed.	
	Increase travel speed.	
	Weld in small segments and allow cooling between welds.	

Troubleshooting Guide For Semiautomatic Welding Equipment

Problem	Probable Cause	Remedy
Wire feed motor operates, but wire does not feed.	Too little pressure on wire feed rolls.	Increase pressure setting on wire feed rolls.
	Incorrect wire feed rolls.	Check size stamped on wire feed rolls, replace to match wire size and type if necessary.
	Wire spool brake pressure too high.	Decrease brake pressure on wire spool.
	Restriction in the gun and/or assembly.	Check and replace cable, gun, and contact tip if damaged. Check size of contact tip and cable liner, replace if necessary.
Wire curling up in front of the wire feed rolls (bird nesting).	Too much pressure on wire feed rolls.	Decrease pressure setting on wire feed rolls.
	Incorrect cable liner or gun contact tip size.	Check size of contact tip and check cable liner length and diameter, replace if necessary.
	Gun end not inserted into drive housing properly.	Loosen gun securing bolt in drive housing and push gun end into housing just enough so it does not touch wire feed rolls.
	Dirty or damaged (kinked) liner.	Replace liner.
Wire feeds, but no gas flows.	Gas cylinder empty.	Replace empty gas cylinder.
	Gas nozzle plugged.	Clean or replace gas nozzle.
	Gas cylinder valve not open or flowmeter not adjusted.	Open gas valve at cylinder and adjust flow rate.
	Restriction in gas line.	Check gas hose between flowmeter and wire feeder, and gas hose in gun and cable assembly.
	Loose or broken wires to gas solenoid.	Have Factory Authorized Service Agent repair wiring.
	Gas solenoid valve not operating.	Have Factory Authorized Service Agent replace gas solenoid valve.
	Incorrect primary voltage connected to welding power source.	Check primary voltage and relink welding power source for correct voltage.
Welding arc not stable.	Wire slipping in drive rolls.	Adjust pressure setting on wire feed rolls. Replace worn drive rolls if necessary.
	Wrong size gun liner or contact tip.	Match liner and contact tip to wire size and type.
	Incorrect voltage setting for selected wire feed speed on welding power source.	Readjust welding parameters.
	Loose connections at the gun weld cable or work cable.	Check and tighten all connections.
	Gun in poor shape or loose connection inside gun.	Repair or replace gun as necessary.

E. Electrical schematics.



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PROFESSIONAL IN WELDING

Web & Mail

www.cn-topwell.com sales@topwellwelders.com Phone

(+86)571-88231791 (+86)571-88231792