

Δ Tandem Controller Required

\* Range is limited by power source rating, module rating, or feeder configuration

Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
All	All	GMAW CV	STD CV		5	Pinch	10 — 55	V
		GMAW Power	Power Mode®		40	Pinch	0.1 — 40	kW
Steel	0.8 mm	GMAW CV	CV	CO <sub>2</sub>	93	Pinch	75 — 1200	ipm (1.91 — 30.48 m/min)
				Argon Mix	94		75 — 1200	ipm (1.91 — 30.48 m/min)
		GMAW Pulse	Pulse Precision Pulse™	Argon Mix	95	UltimArc®	65 — 1200	ipm (1.65 — 30.48 m/min)
				Argon Mix	410		100 — 600	ipm (2.54 — 15.24 m/min)
	0.9 mm	GMAW CV	CV	CO <sub>2</sub>	138	Pinch	50 — 1200	ipm (1.27 — 30.48 m/min)
				Argon Mix	139		50 — 1200	ipm (1.27 — 30.48 m/min)
		GMAW Pulse	Pulse RapidArc® Precision Pulse™	Argon Mix	140	UltimArc®	60 — 1200	ipm (1.52 — 30.48 m/min)
				Argon Mix	141		75 — 1200	ipm (1.91 — 30.48 m/min)
			Argon Mix	411		100 — 600	ipm (2.54 — 15.24 m/min)	
	1.0 mm	GMAW CV	CV	CO <sub>2</sub>	10	Pinch	50 — 1200	ipm (1.27 — 30.48 m/min)
				Argon Mix	11		50 — 1200	ipm (1.27 — 30.48 m/min)
		GMAW Pulse	Pulse RapidArc® Precision Pulse™	Argon Mix	12	UltimArc®	75 — 1200	ipm (1.91 — 30.48 m/min)
				Argon Mix	13		60 — 1200	ipm (1.52 — 30.48 m/min)
			Argon Mix	412		75 — 600	ipm (1.91 — 15.24 m/min)	
	1.2 mm	GMAW CV	CV	CO <sub>2</sub>	20	Pinch	50 — 800	ipm (1.27 — 20.32 m/min)
				Argon Mix	21		50 — 800	ipm (1.27 — 20.32 m/min)
		GMAW Pulse	Pulse RapidArc® Precision Pulse™	Argon Mix	22	UltimArc®	60 — 800	ipm (1.52 — 20.32 m/min)
				Argon Mix	18		60 — 800	ipm (1.52 — 20.32 m/min)
			Argon Mix	413		75 — 600	ipm (1.91 — 15.24 m/min)	
	1.32 mm	GMAW CV	CV	Argon Mix	540	Pinch	50 — 550	ipm (1.27 — 13.97 m/min)
Argon Mix				541	UltimArc®		60 — 1000	ipm (1.52 — 25.4 m/min)
1.4 mm	GMAW CV	CV	CO <sub>2</sub>	24	Pinch	50 — 650	ipm (1.27 — 16.51 m/min)	
			Argon Mix	25		50 — 550	ipm (1.27 — 13.97 m/min)	
	GMAW Pulse	Pulse RapidArc®	Argon Mix	26	UltimArc®	50 — 600	ipm (1.27 — 15.24 m/min)	
			Argon Mix	27		60 — 1000	ipm (1.52 — 25.4 m/min)	
1.6 mm	GMAW CV	CV	Argon Mix	107	Pinch	50 — 350	ipm (1.27 — 8.89 m/min)	
			Argon Mix	108		UltimArc®	50 — 400	ipm (1.27 — 10.16 m/min)
Stainless	0.8 mm	GMAW CV	CV	Argon Mix	61	Pinch	100 — 1200	ipm (2.54 — 30.48 m/min)
				Ar He CO <sub>2</sub>	63		100 — 1200	ipm (2.54 — 30.48 m/min)
		GMAW Pulse	Pulse	Ar He CO <sub>2</sub>	64	UltimArc®	100 — 1200	ipm (2.54 — 30.48 m/min)
				Argon Mix	66		100 — 1200	ipm (2.54 — 30.48 m/min)
	0.9 mm	GMAW CV	CV	Argon Mix	29	Pinch	75 — 1200	ipm (1.91 — 30.48 m/min)
				Argon Mix	30		60 — 1200	ipm (1.52 — 30.48 m/min)
		GMAW Pulse	Pulse Precision Pulse™	Argon Mix	421	UltimArc®	100 — 600	ipm (2.54 — 15.24 m/min)
				Argon Mix				
	1.0 mm	GMAW CV	CV	Argon Mix	31	Pinch	75 — 1200	ipm (1.91 — 30.48 m/min)
				Ar He CO <sub>2</sub>	33		75 — 1000	ipm (1.91 — 25.4 m/min)
		GMAW Pulse	Pulse Precision Pulse™	Ar He CO <sub>2</sub>	34	UltimArc®	60 — 1200	ipm (1.52 — 30.48 m/min)
				Argon Mix	36		60 — 1200	ipm (1.52 — 30.48 m/min)
			Argon Mix	422	UltimArc®	60 — 600	ipm (1.52 — 15.24 m/min)	
	1.2 mm	GMAW CV	CV	Argon Mix	41	Pinch	75 — 700	ipm (1.91 — 17.78 m/min)
				Ar He CO <sub>2</sub>	43		75 — 700	ipm (1.91 — 17.78 m/min)
		GMAW Pulse	Pulse Precision Pulse™	Ar He CO <sub>2</sub>	44	UltimArc®	50 — 700	ipm (1.27 — 17.78 m/min)
				Argon Mix	46		50 — 800	ipm (1.27 — 20.32 m/min)
			Argon Mix	423	UltimArc®	50 — 400	ipm (1.27 — 10.16 m/min)	
	1.6 mm	GMAW CV	CV	Argon Mix	51	Pinch	50 — 600	ipm (1.27 — 15.24 m/min)
				Argon Mix	56		UltimArc®	50 — 700
Metal Core	1.2 mm	GMAW CV	CV	Argon Mix	81	Pinch	50 — 700	ipm (1.27 — 17.78 m/min)
				Argon Mix	82		UltimArc®	50 — 700
	1.4 mm	GMAW CV	CV	Argon Mix	83	Pinch	50 — 1200	ipm (1.27 — 30.48 m/min)
				Argon Mix	84		UltimArc®	50 — 600
	1.6 mm	GMAW Pulse	Pulse RapidArc®	Argon Mix	88	UltimArc®	60 — 1000	ipm (1.52 — 25.4 m/min)
				Argon Mix	85		Pinch	50 — 450
		Argon Mix	86	UltimArc®	50 — 450	ipm (1.27 — 11.43 m/min)		

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Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)		
							ipm	(m/min)	
GMAW	Aluminum (AISI)	1.0 mm	GMAW CV	CV	Argon	148	Pinch	125 – 800	ipm (3.18 – 20.32 m/min)
			GMAW Pulse	Pulse	Argon	149	UltimArc®	125 – 800	ipm (3.18 – 20.32 m/min)
				CC Pulse	Argon	150		125 – 800	ipm (3.18 – 20.32 m/min)
		GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	98	Frequency	100 – 500	ipm (2.54 – 12.7 m/min)	
		1.2 mm	GMAW CV	CV	Argon	71	Pinch	125 – 700	ipm (3.18 – 17.78 m/min)
			GMAW Pulse	Pulse	Argon	72	UltimArc®	85 – 600	ipm (2.16 – 15.24 m/min)
	CC Pulse			Argon	69	85 – 600		ipm (2.16 – 15.24 m/min)	
	GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	99	Frequency	85 – 500	ipm (2.16 – 12.7 m/min)		
	1.6 mm	GMAW CV	CV	Argon	73	Pinch	75 – 375	ipm (1.91 – 9.53 m/min)	
		GMAW Pulse	Pulse	Argon	74	UltimArc®	75 – 350	ipm (1.91 – 8.89 m/min)	
			CC Pulse	Argon	79		75 – 350	ipm (1.91 – 8.89 m/min)	
		GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	100	Frequency	80 – 400	ipm (2.03 – 10.16 m/min)	
Aluminum (AlMg)	1.0 mm	GMAW CV	CV	Argon	151	Pinch	175 – 750	ipm (4.45 – 19.05 m/min)	
		GMAW Pulse	Pulse	Argon	152	UltimArc®	125 – 700	ipm (3.18 – 17.78 m/min)	
			CC Pulse	Argon	153		125 – 700	ipm (3.18 – 17.78 m/min)	
		GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	101	Frequency	140 – 800	ipm (3.56 – 20.32 m/min)	
	1.2 mm	GMAW CV	CV	Argon	75	Pinch	125 – 750	ipm (3.18 – 19.05 m/min)	
		GMAW Pulse	Pulse	Argon	76	UltimArc®	85 – 700	ipm (2.16 – 17.78 m/min)	
			CC Pulse	Argon	70		85 – 700	ipm (2.16 – 17.78 m/min)	
		GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	102	Frequency	100 – 600	ipm (2.54 – 15.24 m/min)	
	1.6 mm	GMAW CV	CV	Argon	77	Pinch	125 – 500	ipm (3.18 – 12.7 m/min)	
		GMAW Pulse	Pulse	Argon	78	UltimArc®	100 – 500	ipm (2.54 – 12.7 m/min)	
			CC Pulse	Argon	80		100 – 450	ipm (2.54 – 11.43 m/min)	
		GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	103	Frequency	75 – 350	ipm (1.91 – 8.89 m/min)	
SiBr	1.0mm	GMAW Pulse	Pulse	Argon	192	UltimArc®	80 – 1000	ipm (2.03 – 25.4 m/min)	
	1.2mm	GMAW Pulse	Pulse	Argon	191	UltimArc®	50 – 600	ipm (1.27 – 15.24 m/min)	
Cu	1.0mm	GMAW Pulse	Pulse	Argon Helium	198	UltimArc®	75 – 500	ipm (1.91 – 12.7 m/min)	
	1.2mm	GMAW Pulse	Pulse	Argon Helium	196	UltimArc®	75 – 500	ipm (1.91 – 12.7 m/min)	
NiCr	1.0mm	GMAW Pulse	Pulse	Ar/ Ar He	502	UltimArc®	75 – 800	ipm (1.91 – 20.32 m/min)	
	1.2mm	GMAW Pulse	Pulse	Ar/ Ar He	504	UltimArc®	75 – 600	ipm (1.91 – 15.24 m/min)	

Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)		
FCAW	Flux Core	All	FCAW-S	Self Shield CV	NA	6	Pinch	10 – 45	V
			FCAW-G	Gas Shield CV		7	Pinch	10 – 45	V
	Cored Wire	1.2 mm	FCAW-G	CV	CO <sub>2</sub>	90	Pinch	175 – 600	ipm (4.45 – 15.24 m/min)
					Argon Mix	91		175 – 600	ipm (4.45 – 15.24 m/min)
		1.4 mm	FCAW-G	CV	CO <sub>2</sub>	187	Pinch	150 – 500	ipm (3.81 – 12.7 m/min)
					Argon Mix	188		150 – 500	ipm (3.81 – 12.7 m/min)
		1.6 mm	FCAW-G	CV	CO <sub>2</sub>	189	Pinch	125 – 400	ipm (3.18 – 10.16 m/min)
					Argon Mix	190		125 – 400	ipm (3.18 – 10.16 m/min)

Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
SMAW	NA	DCEP SMAW	SMAW Soft	NA	1	Arc Force, Hot Start	15 – 900	A
			SMAW Crisp	NA	2	Arc Force, Hot Start	15 – 900	A
			SMAW Pipe	NA	4	Arc Force	50 – 250	A

Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
GTAW	NA	DCEN GTAW	Touch Start TIG	Ar / He	3	Hot Start	5 – 900	A
			Touch Start TIG Pulse	Ar / He	8	Frequency, Background, Hot Start	5 – 800	A

Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
CAG	NA	CAG	Arc Gouge	Compressed Air	9		60 – 900	A

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GMAW-Tandem	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
	Steel	1.0 mm	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	402	UltimArc®, Phase Angle	150 – 800	ipm
Sync Pulse Trail				Argon Mix	403	UltimArc®	150 – 800	ipm	(3.81 – 20.32 m/min)
HotWire Pulse Trail				Argon Mix	461		80 – 800	ipm	(2.03 – 20.32 m/min)
1.2 mm		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	404	UltimArc®, Phase Angle	100 – 700	ipm	(2.54 – 17.78 m/min)
			Sync Pulse Trail	Argon Mix	405	UltimArc®	100 – 700	ipm	(2.54 – 17.78 m/min)
			HotWire Pulse Trail	Argon Mix	462		75 – 800	ipm	(1.91 – 20.32 m/min)
1.4 mm		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	406	UltimArc®, Phase Angle	100 – 600	ipm	(2.54 – 15.24 m/min)
			Sync Pulse Trail	Argon Mix	407	UltimArc®	100 – 600	ipm	(2.54 – 15.24 m/min)
			HotWire Pulse Trail	Argon Mix	463		50 – 800	ipm	(1.27 – 20.32 m/min)
1.6 mm		GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	408	UltimArc®, Phase Angle	100 – 500	ipm	(2.54 – 12.7 m/min)
			Sync Pulse Trail	Argon Mix	409	UltimArc®	100 – 500	ipm	(2.54 – 12.7 m/min)
			HotWire Pulse Trail	Argon Mix	464		50 – 500	ipm	(1.27 – 12.7 m/min)

GMAW-HyperFill	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
	Steel	GMAW	0.9mm	HyperFill	Argon Mix	601		100 – 800	ipm
1.0mm			HyperFill	Argon Mix	602		100 – 700	ipm	(2.54 – 17.78 m/min)
1.2mm			HyperFill	Argon Mix	603		100 – 465	ipm	(2.54 – 11.81 m/min)