

§ Advanced Module Required

‡ STT® or Advanced Module Required

Δ Tandem Controller Required

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Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
All	All	GMAW CV	STD CV		5	Pinch	10 - 45 V
		GMAW Power	Power Mode®		40	Pinch	0.1 - 11 kW
Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
Steel	0.030	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	Argon Mix	95	UltimArc®	65 - 1200 ipm (1.65 - 30.48 m/min)
	0.035	GMAW CV	CV	CO <sub>2</sub>	10	Pinch	50 - 1200 ipm (1.27 - 30.48 m/min)
				Argon Mix	11		50 - 1010 ipm (1.27 - 25.65 m/min)
		GMAW Pulse	Pulse	Argon Mix	12	UltimArc®	60 - 1095 ipm (1.52 - 27.81 m/min)
			RapidArc®	Argon Mix	13		60 - 1200 ipm (1.52 - 30.48 m/min)
			Precision Pulse™	Argon Mix	411		100 - 600 ipm (2.54 - 15.24 m/min)
			Rapid X™(‡)	Argon Mix	272		75 - 1200 ipm (1.91 - 30.48 m/min)
	GMAW STT®	Synergic STT®(‡)	CO <sub>2</sub>	324	UltimArc®, Hot Start	100 - 225 ipm (2.54 - 5.72 m/min)	
			Argon Mix	325		100 - 225 ipm (2.54 - 5.72 m/min)	
		NonSynergic STT®(‡)	CO <sub>2</sub>	304	Peak, Background, Tailout, Hot Start	100 - 300 ipm (2.54 - 7.62 m/min)	
			Argon Mix	305		100 - 300 ipm (2.54 - 7.62 m/min)	
	0.040	GMAW CV	CV	CO <sub>2</sub>	138	Pinch	50 - 915 ipm (1.27 - 23.24 m/min)
				Argon Mix	139		50 - 880 ipm (1.27 - 22.35 m/min)
		GMAW Pulse	Pulse	Argon Mix	140	UltimArc®	60 - 835 ipm (1.52 - 21.21 m/min)
			RapidArc®	Argon Mix	141		60 - 1015 ipm (1.52 - 25.78 m/min)
			Precision Pulse™	Argon Mix	412		75 - 600 ipm (1.91 - 15.24 m/min)
			Rapid X™(‡)	Argon Mix	273		75 - 800 ipm (1.91 - 20.32 m/min)
		GMAW STT®	Synergic STT®(‡)	CO <sub>2</sub>	326	UltimArc®, Hot Start	90 - 225 ipm (2.29 - 5.72 m/min)
				Argon Mix	327		90 - 225 ipm (2.29 - 5.72 m/min)
		NonSynergic STT®(‡)	CO <sub>2</sub>	306	Peak, Background, Tailout, Hot Start	90 - 225 ipm (2.29 - 5.72 m/min)	
			Argon Mix	307		90 - 225 ipm (2.29 - 5.72 m/min)	
	0.045	GMAW CV	CV	CO <sub>2</sub>	20	Pinch	50 - 530 ipm (1.27 - 13.46 m/min)
				Argon Mix	21		50 - 490 ipm (1.27 - 12.45 m/min)
		GMAW Pulse	Pulse	Argon Mix	22	UltimArc®	50 - 585 ipm (1.27 - 14.86 m/min)
			RapidArc®	Argon Mix	18		75 - 680 ipm (1.91 - 17.27 m/min)
			Precision Pulse™	Argon Mix	413		75 - 600 ipm (1.91 - 15.24 m/min)
			Rapid X™(‡)	Argon Mix	274		100 - 680 ipm (2.54 - 17.27 m/min)
	GMAW STT®	Synergic STT®(‡)	CO <sub>2</sub>	328	UltimArc®, Hot Start	90 - 200 ipm (2.29 - 5.08 m/min)	
			Argon Mix	329		90 - 200 ipm (2.29 - 5.08 m/min)	
		NonSynergic STT®(‡)	CO <sub>2</sub>	308	Peak, Background, Tailout, Hot Start	90 - 225 ipm (2.29 - 5.72 m/min)	
			Argon Mix	309		90 - 225 ipm (2.29 - 5.72 m/min)	
	0.052	GMAW CV	CV	CO <sub>2</sub>	24	Pinch	50 - 435 ipm (1.27 - 11.05 m/min)
				Argon Mix	25		50 - 375 ipm (1.27 - 9.53 m/min)
		GMAW Pulse	Pulse	Argon Mix	26	UltimArc®	50 - 435 ipm (1.27 - 11.05 m/min)
RapidArc®			Argon Mix	27	60 - 455 ipm (1.52 - 11.56 m/min)		
Precision Pulse™			Argon Mix	414	75 - 410 ipm (1.91 - 10.41 m/min)		
		Rapid X™(‡)	Argon Mix	275		75 - 405 ipm (1.91 - 10.29 m/min)	
GMAW STT®	Synergic STT®(‡)	CO <sub>2</sub>	330	UltimArc®, Hot Start	75 - 175 ipm (1.91 - 4.45 m/min)		
		Argon Mix	331		75 - 175 ipm (1.91 - 4.45 m/min)		
	NonSynergic STT®(‡)	CO <sub>2</sub>	310	Peak, Background, Tailout, Hot Start	90 - 150 ipm (2.29 - 3.81 m/min)		
		Argon Mix	311		75 - 150 ipm (1.91 - 3.81 m/min)		
1/16	GMAW CV	CV	Argon Mix	107	Pinch	50 - 200 ipm (1.27 - 5.08 m/min)	
	GMAW Pulse	Pulse	Argon Mix	108	UltimArc®	50 - 235 ipm (1.27 - 5.97 m/min)	
Metal Core	0.035	GMAW AC Pulse	Rapid Z™(§)	Argon Mix	472	UltimArc®	75 - 900 ipm (1.91 - 22.86 m/min)
	0.040	GMAW AC Pulse	Rapid Z™(§)	Argon Mix	473	UltimArc®	70 - 700 ipm (1.78 - 17.78 m/min)
	0.045	GMAW CV	CV	Argon Mix	81	Pinch	100 - 700 ipm (2.54 - 17.78 m/min)
				Argon Mix	82		50 - 690 ipm (1.27 - 17.53 m/min)
		GMAW Pulse	Pulse	Argon Mix	87	UltimArc®	75 - 795 ipm (1.91 - 20.19 m/min)
		RapidArc®	Argon Mix	294	75 - 800 ipm (1.91 - 20.32 m/min)		
		Rapid X™(‡)	Argon Mix	294		75 - 800 ipm (1.91 - 20.32 m/min)	
	0.052	GMAW CV	CV	Argon Mix	83	Pinch	50 - 460 ipm (1.27 - 11.68 m/min)
				Argon Mix	84		50 - 445 ipm (1.27 - 11.3 m/min)
		GMAW Pulse	Pulse	Argon Mix	88	UltimArc®	60 - 440 ipm (1.52 - 11.18 m/min)
		RapidArc®	Argon Mix	295	60 - 495 ipm (1.52 - 12.57 m/min)		
		Rapid X™(‡)	Argon Mix	295		60 - 495 ipm (1.52 - 12.57 m/min)	
1/16	GMAW CV	CV	Argon Mix	85	Pinch	50 - 310 ipm (1.27 - 7.87 m/min)	
			Argon Mix	86		50 - 290 ipm (1.27 - 7.37 m/min)	
	GMAW Pulse	Pulse	Argon Mix	89	UltimArc®	60 - 310 ipm (1.52 - 7.87 m/min)	
	RapidArc®	Argon Mix	296	75 - 285 ipm (1.91 - 7.24 m/min)			
	Rapid X™(‡)	Argon Mix	296		75 - 285 ipm (1.91 - 7.24 m/min)		

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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	<b>GMAW</b>	<b>Stainless</b>	0.030	GMAW CV	CV	Argon Mix	61	Pinch
He Ar CO <sub>2</sub>						63	100 - 1200 ipm (2.54 - 30.48 m/min)	
GMAW Pulse				Pulse	He Ar CO <sub>2</sub>	64	UltimArc®	90 - 1200 ipm (2.29 - 30.48 m/min)
					Argon Mix	66		80 - 1200 ipm (2.03 - 30.48 m/min)
				Precision Pulse™	Argon Mix	420	UltimArc®	100 - 800 ipm (2.54 - 20.32 m/min)
					He Ar CO <sub>2</sub>	430		100 - 800 ipm (2.54 - 20.32 m/min)
0.035			GMAW CV	CV	Argon Mix	31	Pinch	75 - 1200 ipm (1.91 - 30.48 m/min)
					He Ar CO <sub>2</sub>	33		75 - 1200 ipm (1.91 - 30.48 m/min)
				Pulse	He Ar CO <sub>2</sub>	34	UltimArc®	75 - 1200 ipm (1.91 - 30.48 m/min)
					Argon Mix	36		60 - 1200 ipm (1.52 - 30.48 m/min)
			GMAW Pulse	Precision Pulse™	Argon Mix	421	UltimArc®	100 - 600 ipm (2.54 - 15.24 m/min)
					He Ar CO <sub>2</sub>	431		100 - 700 ipm (2.54 - 17.78 m/min)
		Rapid X™(‡)		Argon Mix	282	UltimArc®	100 - 800 ipm (2.54 - 20.32 m/min)	
				Argon Mix	364		UltimArc®, Hot Start	100 - 300 ipm (2.54 - 7.62 m/min)
GMAW STT®		Synergic STT®(‡)	He Ar CO <sub>2</sub>	365	100 - 250 ipm (2.54 - 6.35 m/min)			
		NonSynergic STT®(‡)	Argon Mix	344	Peak, Background, Tailout, Hot Start	100 - 300 ipm (2.54 - 7.62 m/min)		
He Ar CO <sub>2</sub>			345	100 - 300 ipm (2.54 - 7.62 m/min)				
0.040		GMAW STT®	Synergic STT®(‡)	Argon Mix	366	UltimArc®, Hot Start	100 - 300 ipm (2.54 - 7.62 m/min)	
				He Ar CO <sub>2</sub>	367		100 - 250 ipm (2.54 - 6.35 m/min)	
			NonSynergic STT®(‡)	Argon Mix	346	Peak, Background, Tailout, Hot Start	100 - 300 ipm (2.54 - 7.62 m/min)	
				He Ar CO <sub>2</sub>	347		100 - 300 ipm (2.54 - 7.62 m/min)	
0.045		GMAW CV	CV	Argon Mix	41	Pinch	75 - 515 ipm (1.91 - 13.08 m/min)	
				He Ar CO <sub>2</sub>	43		75 - 555 ipm (1.91 - 14.1 m/min)	
			Pulse	He Ar CO <sub>2</sub>	44	UltimArc®	75 - 610 ipm (1.91 - 15.49 m/min)	
				Argon Mix	46		50 - 515 ipm (1.27 - 13.08 m/min)	
				Argon Mix	423		UltimArc®	50 - 400 ipm (1.27 - 10.16 m/min)
		He Ar CO <sub>2</sub>	433	60 - 400 ipm (1.52 - 10.16 m/min)				
		GMAW Pulse	Rapid X™(‡)	Argon Mix	284	UltimArc®	100 - 725 ipm (2.54 - 18.42 m/min)	
	Argon Mix			368	UltimArc®, Hot Start		90 - 200 ipm (2.29 - 5.08 m/min)	
	Synergic STT®(‡)		He Ar CO <sub>2</sub>	369		90 - 200 ipm (2.29 - 5.08 m/min)		
			NonSynergic STT®(‡)	Argon Mix	348	Peak, Background, Tailout, Hot Start	90 - 225 ipm (2.29 - 5.72 m/min)	
He Ar CO <sub>2</sub>				349	90 - 225 ipm (2.29 - 5.72 m/min)			
1/16	GMAW CV	CV	Argon Mix	51	Pinch	50 - 230 ipm (1.27 - 5.84 m/min)		
		Pulse	Argon Mix	56		UltimArc®	50 - 270 ipm (1.27 - 6.86 m/min)	
<b>Stainless Metal Core EC4XX</b>		0.045	GMAW Pulse	Rapid X™(‡)	Argon Mix	290	UltimArc®	75 - 665 ipm (1.91 - 16.89 m/min)
<b>SiBr</b>	0.035	GMAW Pulse	Pulse	Argon	192	UltimArc®	80 - 1110 ipm (2.03 - 28.19 m/min)	
	0.045	GMAW Pulse	Pulse	Argon	191	UltimArc®	50 - 555 ipm (1.27 - 14.1 m/min)	
<b>Cu</b>	0.035	GMAW Pulse	Pulse	Argon Helium	198	UltimArc®	100 - 700 ipm (2.54 - 17.78 m/min)	
	0.045	GMAW Pulse	Pulse	Argon Helium	196	UltimArc®	75 - 500 ipm (1.91 - 12.7 m/min)	
<b>NiCr</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	501	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	503	UltimArc®	75 - 600 ipm (1.91 - 15.24 m/min)	
<b>NiCu</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	507	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	509	UltimArc®	75 - 575 ipm (1.91 - 14.61 m/min)	
<b>NiFe-CI</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	513	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	515	UltimArc®	75 - 600 ipm (1.91 - 15.24 m/min)	
<b>Ni-1</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	519	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	521	UltimArc®	75 - 555 ipm (1.91 - 14.1 m/min)	
<b>Ni-CI</b>	0.035	GMAW Pulse	Pulse	Ar/ Ar He	525	UltimArc®	75 - 800 ipm (1.91 - 20.32 m/min)	
	0.045	GMAW Pulse	Pulse	Ar/ Ar He	527	UltimArc®	75 - 400 ipm (1.91 - 10.16 m/min)	

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	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	<b>GMAW</b>	Aluminum 4XXX	0.035	GMAW CV	CV	Argon	148	Pinch
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	125 - 800 ipm (3.18 - 20.32 m/min)
GMAW AC Pulse			AC Pulse (§)	Argon	391	UltimArc®	125 - 700 ipm (3.18 - 17.78 m/min)	
3/64			GMAW CV	CV	Argon	71	Pinch	125 - 590 ipm (3.18 - 14.99 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)
GMAW AC Pulse			AC Pulse (§)	Argon	393	UltimArc®	100 - 500 ipm (2.54 - 12.7 m/min)	
1/16			GMAW CV	CV	Argon	73	Pinch	75 - 340 ipm (1.91 - 8.64 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)	
GMAW AC Pulse		AC Pulse (§)	Argon	394	UltimArc®	100 - 400 ipm (2.54 - 10.16 m/min)		
Aluminum 5XXX		0.035	GMAW CV	CV	Argon	151	Pinch	175 - 750 ipm (4.45 - 19.05 m/min)
			GMAW Pulse	Pulse	Argon	152	UltimArc®	150 - 800 ipm (3.81 - 20.32 m/min)
				CC Pulse	Argon	153		150 - 800 ipm (3.81 - 20.32 m/min)
			GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	101	Frequency	140 - 800 ipm (3.56 - 20.32 m/min)
		GMAW AC Pulse	AC Pulse (§)	Argon	396	UltimArc®	125 - 800 ipm (3.18 - 20.32 m/min)	
	3/64	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)	
	GMAW AC Pulse	AC Pulse (§)	Argon	398	UltimArc®	85 - 600 ipm (2.16 - 15.24 m/min)		
	1/16	GMAW CV	CV	Argon	77	Pinch	125 - 470 ipm (3.18 - 11.94 m/min)	
		GMAW Pulse	Pulse	Argon	78	UltimArc®	100 - 460 ipm (2.54 - 11.68 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)		
GMAW AC Pulse	AC Pulse (§)	Argon	399	UltimArc®	100 - 400 ipm (2.54 - 10.16 m/min)			
<b>FCAW</b>	Flux Core	All	FCAW-S	Self Shield CV	NA	6	Pinch	10 - 45 V
			FCAW-G	Gas Shield CV	NA	7	Pinch	10 - 45 V
	Cored Wire	0.045	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)			
		0.052	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)		
	1/16	FCAW-G	CV	CO <sub>2</sub>	189	Pinch	125 - 400 ipm (3.18 - 10.16 m/min)	
Argon Mix				190	125 - 375 ipm (3.18 - 9.53 m/min)			
<b>SMAW</b>	NA	NA	DCEP SMAW	SMAW Soft	NA	1	Arc Force, Hot Start	15 - 350 A
				SMAW Crisp	NA	2	Arc Force, Hot Start	15 - 350 A
				SMAW Pipe	NA	4	Arc Force	50 - 250 A
			DCEN SMAW	SMAW DC- (§)	NA	379	Arc Force, Hot Start	15 - 350 A
			AC SMAW	AC SMAW (§)	NA	374	Arc Force, Hot Start, Frequency	15 - 350 A
<b>GTAW</b>	NA	NA	DCEN GTAW	Touch Start TIG	Ar / He	3	Hot Start	5 - 350 A
				Touch Start TIG Pulse	Ar / He	8	Frequency, Background, Hot Start	5 - 350 A
				HF TIG (§)	Ar / He	375	Hot Start	5 - 350 A
				HF TIG Pulse (§)	Ar / He	376	Frequency, Background, Hot Start	5 - 350 A
			AC GTAW	Touch Start AC TIG (§)	Ar / He	377	AC Frequency, AC Balance, DC Offset, Hot Start	10 - 350 A
				HF Start AC TIG (§)	Ar / He	378	AC Frequency, AC Balance, DC Offset, Hot Start	10 - 350 A

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

  

GMAW-Tandem	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
	Steel	0.035	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	400	UltimArc®, Phase Angle	100 - 1000 ipm	(2.54 - 25.4 m/min)
				Sync Pulse Trail	Argon Mix	401	UltimArc®	100 - 800 ipm	(2.54 - 20.32 m/min)
				HotWire Pulse Trail	Argon Mix	460		80 - 900 ipm	(2.03 - 22.86 m/min)
		0.040	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	402	UltimArc®, Phase Angle	150 - 800 ipm	(3.81 - 20.32 m/min)
				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)
		0.045	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	404	UltimArc®, Phase Angle	100 - 655 ipm	(2.54 - 16.64 m/min)
				Sync Pulse Trail	Argon Mix	405	UltimArc®	100 - 655 ipm	(2.54 - 16.64 m/min)
				HotWire Pulse Trail	Argon Mix	462		75 - 610 ipm	(1.91 - 15.49 m/min)
	0.052	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	406	UltimArc®, Phase Angle	100 - 435 ipm	(2.54 - 11.05 m/min)	
			Sync Pulse Trail	Argon Mix	407	UltimArc®	100 - 435 ipm	(2.54 - 11.05 m/min)	
			HotWire Pulse Trail	Argon Mix	463		50 - 445 ipm	(1.27 - 11.3 m/min)	