1.3 Servo amplifier standard specifications

(1) 200 V class

Model: MR-J4(-RJ)		10A	20A	40A	60A	70A	100A	200A	350A	500A	700A	11KA	15KA	22KA
	Rated voltage							3-ph	ase 170	V AC					
Output	Rated current	[A]	1.1	1.5	2.8	3.2	5.8	6.0	11.0	17.0	28.0	37.0	68.0	87.0	126.0
	Voltage/ Frequency At DC		3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					3-phase phase AC to AC, 50 Hz (No	se or 1- 200 V 240 V Hz/60 pte 14)	3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					
		input (Note 17)						283 V	DC to 34	10 V DC		1			
Main circuit	Rated current (Note 11)	[A]	0.9	1.5	2.6	3.2 (Note 5)	3.8	5.0	10.5	16.0	21.7	28.9	46.0	64.0	95.0
power supply input	Permissible voltage	At AC input		3-phase or 1-phase 170 V AC to 264 V AC				3-phas phase AC to AC (No	se or 1- 170 V 264 V ote 14)		3-phas	se 170 V	AC to 26	4 V AC	
	fluctuation	At DC input (Note 17)						241 V	DC to 37	4 V DC					
	Permissible freque		Within ±5%												
	Power supply capacity	[kVA]						Refer	to sectio	n 10.2.					
	[A]						Refer	to sectio	n 10.5.						
	Voltago/	At AC input	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz												
	Frequency	At DC input (Note 17)	283 V DC to 340 V DC												
	Rated current	[A]	0.2 0.3												
Control circuit power supply	Permissible	At AC input		1-phase 170 V AC to 264 V AC											
input	voltage fluctuation	At DC input (Note 17)						241 V	DC to 37	4 V DC					
	Permissible freque	Jency	Within ±5%												
	Power consumpt	ion [W]				3	0						45		
	Inrush current	[A]						Refer	to sectio	n 10.5.					
Interface power	Voltage							24	V DC ±	10%					
supply	Current capacity	[A]				0.5	(includin	g the CN	18 conne	ctor sig	nals) (No	ote 1)			
Control method						Sir	ie-wave	PWM co	ontrol, cu	rrent co	ntrol met	thod			
Dynamic brake							Bui	lt-in					Ext (N	ernal opti lote 8, 12	ion !)
Fully closed loop	control							Comp	atible (N	lote 9)					
Load-side encod	er interface (Note	10)				Mitsu	bishi Ele	ctric high	n-speed	serial co	mmunic	ation			
Communication f	unction			U	SB: Con		a perso	nal com	puter or	others (I	MR Cont	figurator:	2-compat	ible)	
Encodor output r	NUISOS				R	0-422/KC	-400: 1: Co	mostible				(INDLE /	, 13)		
Analog monitor	741353							Tv	vo chanr	iels	130)				

Model: MR-J4(-RJ)		10A	20A	40A	60A	70A	100A	200A	350A	500A	700A	11KA	15KA	22KA	
	Max. input pu frequency	ılse		4	Mpulse	es/s (for d	ifferentia	l receive	er) (Note	6), 200 I	kpulses/	s (for op	en collect	or)	·
	Positioning fe	edback			E	ncoder re	solution	(resoluti	on per s	ervo mot	or revolu	ution): 22	2 bits		
Position control mode	Command pu multiplying fa	ılse ctor			Ele	ctronic ge	ear A:1 to	167772	215, B:1 1	to 16777	215, 1/1	0 < A/B	< 4000		
	In-position ra	nge setting				0	pulse to :	±65535	pulses (c	ommano	d pulse ι	unit)			
	Error excessi	ve						±3	3 revoluti	ons					
	Torque limit			Set by	/ param	eter settir	ng or exte	ernal an	alog inpu	t (0 V D	C to +10	V DC/m	aximum	torque)	
	Speed contro	ol range		Analog speed command 1: 2000, Internal speed command 1: 5000											
Speed control	Analog speed input	d command			0 to ±10) V DC/ra	ted spee	d (The s	peed at	10 V is c	hangeat	ole with [Pr. PC12].)	
mode	Speed fluctua	ation ratio		±0.29	±0.01% % or less	6 or less (s (ambier	load fluc it temper	tuation: ature: 2	0% to 10 5 °C ± 10	0%), 0%) °C) whe	o (power en using	fluctuati analog	on: ±10% speed co) mmand	
	Torque limit			Set by parameter setting or external analog input (0 V DC to +10 V DC/maximum torque)											
Torque control	Analog torque	e command		0 V DC to ±8 V DC/maximum torque (input impedance 10 k Ω to 12 k Ω)											
mode	Speed limit			Se	et by par	rameter s	etting or	externa	analog i	nput (0 \	V DC to	10 V DC	/rated sp	eed)	
Positioning mode	9		Т	Refer t he posit	o "MR-J ioning n	I4AR	J Servo A sed by M	Amplifier R-J4- A	Instructi	on Manu ∿o ampl	ial (Posii ifier with	tioning N software	lode)" se e version	ction 1.1. B3 or late	er.
Protective functions			erro	Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, regenerative error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection, magnetic pole detection protection, and linear servo control fault protection											
Functional safety	,							STO (IE	EC/EN 61	800-5-2)				
Standards certified by CB (Note 15)				EN ISC	0 13849-	-1 Catego	ory 3 PL e	e, IEC 6	1508 SIL	3, EN 6	, 2061 SII	L CL3, a	nd EN 61	800-5-2	
	Response pe	rformance				8	ms or le	ss (STO	input off	\rightarrow ener	gy shut o	off)			
	Test pulse in	put (STO)					Tes	t pulse i	nterval: ²	1 Hz to 2	25 Hz				
	(Note 3)						Te	est pulse	off time	Up to 1	ms				
Safety performance	Mean time to dangerous failure (MTTFd)		MTTFd ≥ 100 [years] (314a)												
	Diagnostic co (DC)	overage	DC = Medium, 97.6 [%]												
	Average prob dangerous fa hour (PFH)	bability of ilures per						PFH :	= 6.4 × 1	0 ⁻⁹ [1/h]					
								LVD	EN 618	00-5-1					
Compliance with	CE marking							EMO	C: EN 61	800-3					
global standards						М	D: EN IS	O 13849	9-1, EN 6	1800-5-	2, EN 62	2061			
	UL standard						-		UL 5080	<u> </u>	_				
Structure (IP ratir	ng) Dankara manu		Natur	al coolir	ıg, open	(IP20)	Force	e cooling	g, open (IP20)	Forc	e cooling	g, open (I	P20) (No	te 4)
Close mounting	input	er supply				Pos	sible						Impossibl	e	
(Note 2)	1-phase powe	er supply			Possibl	e		Impo	ssible						
	Ambient	Operation					() °C to 5	5 °C (no	n-freezin	a)				
	temperature	Storage					-2	0 °C to	65 °C (no	on-freezi	ng)				
	Ambient	Operation					5 %R	H to 90	%RH (no	on-conde	ensina)				
Environment	humidity	Storage						ndoors	(no direc	t sunligh	t),				
	Ambience					free from	corrosiv	e gas, fl	ammable	e gas, oil	mist, du	ust, and	dirt		
	Altitude						2000 m	or less	above se	ea level (Note 16)			
	Vibration resi	stance				5.9 m/s	², at 10 ⊦	Iz to 55	Hz (direc	tions of	X, Y and	Z axes)		
Mass		[kg]	0	.8		1.0	1	.4	2.1	2.3	4.0	6.2	13	3.4	18.2

- Note 1. 0.5 A is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points.
 - 2. When closely mounting the servo amplifiers, operate them at the ambient temperature of 0 °C to 45 °C or at 75% or smaller effective load ratio.
 - 3. Test pulse is a signal which instantaneously turns off a signal to the servo amplifier at a constant period for external circuit to self-diagnose.
 - 4. Except for the terminal block.
 - 5. The rated current is 2.9 A when the servo amplifier is used with a UL or CSA compliant servo motor.
 - 1 Mpulse/s or lower commands are supported in the initial setting. When inputting commands over 1 Mpulse/s and 4 Mpulses/s or lower, change the setting in [Pr. PA13].
 - 7. RS-422 communication is supported by servo amplifier with software version A3.
 - 8. Use an external dynamic brake for this servo amplifier. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at emergency stop. Ensure the safety in the entire equipment.
 - 9. For the compatible version for the fully closed loop system, refer to table 1.1. Check the software version of the servo amplifier with MR Configurator2.
 - The MR-J4-_A servo amplifier is compatible only with the two-wire type. The MR-J4-_A-RJ servo amplifier is compatible with the two-wire type, four-wire type, and A/B/Z-phase differential output method. Refer to table 1.1 for details.
 - 11. This value is applicable when a 3-phase power supply is used.
 - 12. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB (Dynamic brake interlock) in [Pr. PD23] to [Pr. PD26], [Pr. PD28], and [Pr. PD47]. Failure to do so will cause the servo amplifier to become servo-off when an instantaneous power failure occurs.
 - 13. RS-485 communication is available with servo amplifiers manufactured in November 2014 or later.
 - 14. When using 1-phase 200 V AC to 240 V AC power supply, operate the servo amplifier at 75% or smaller effective load ratio.
 - 15. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether STO input diagnosis by TOFB output is performed or not. For details, refer to the Function column of [Pr. PF18] in section 5.2.6.
 - 16. Follow the restrictions in section 2.6 when using this product at altitude exceeding 1000 m and up to 2000 m above sea level.
 - 17. The DC power supply input is available only with MR-J4-_A-RJ servo amplifiers. For the connection example of the power circuit when a DC input is used, refer to app. 13.

(2) 400 V class

Model: MR-J4(60A4	100A4	200A4	350A4	500A4	700A4	11KA4	15KA4	22KA4			
	Rated voltage				3-p	phase 323 V	AC	•				
Output	Rated current [A]	1.5	2.8	5.4	8.6	14.0	17.0	32.0	41.0	63.0		
	Voltage/Frequency			3-ph	ase 380 V A	AC to 480 V	AC, 50 Hz/6	60 Hz				
	Rated current [A]	1.4	2.5	5.1	7.9	10.8	14.4	23.1	31.8	47.6		
Main circuit	Permissible voltage fluctuation		3-phase 323 V AC to 528 V AC									
power supply input	Permissible frequency fluctuation		Within ±5%									
	Power supply capacity [kVA]				Refe	er to section	10.2.					
	Inrush current [A]				Refe	er to section	10.5.					
	Voltage/Frequency			1-ph	ase 380 V A	AC to 480 V	AC, 50 Hz/6	60 Hz				
	Rated current [A]		0.1				C).2				
Control circuit	Permissible voltage fluctuation	1-phase 323 V AC to 528 V AC										
input	Permissible frequency fluctuation		Within ±5%									
	Power consumption [W]		30				4	45				
	Inrush current [A]				Refe	er to section	10.5.					
Interface power	Voltage				2	24 V DC ± 10)%					
supply	Current capacity [A]			0.5 (i	ncluding CN	N8 connecto	r signals) (N	ote 1)				
Control method			Sine-wave PWM control, current control method									
Dynamic brake			Bu	ilt-in			Externa	al option (No	ote 6, 7)			
Fully closed loop					Compatible)						
Load-side encod			Mitsubis	shi Electric h	nigh-speed s	erial commu	unication					
Communication f		USB: conn	ection to a	personal cor	mputer or ot	hers (MR Co	onfigurator2-	compatible)				
			RS-422/RS-	485: 1: n co	mmunication	n (up to 32 a	ixes) (Note 8	3)				
Encoder output p	oulses				Compatib	ble (A/B/Z-pr	ase pulse)					
Analog monitor				/ /6 1:55		I wo channe	IS	1 15				
	Max. Input pulse frequency	4 Mpulses/s (tor differential receiver) (Note 4), 200 kpulses/s (for open collector)										
	Command pulse multiplying	Encoder resolution (resolution per servo motor revolution): 22 bits										
Position control mode	factor		Elec	tronic gear /	A:1 to 16777	7215, B:1 to	16777215,	1/10 < A/B <	4000			
	In-position range setting			0 puls	se to ±65538	5 pulses (co	mmand puls	e unit)				
						±3 revolution		40.1/ 0.0/				
		56	et by parame	eter setting c	r external a	nalog input	U V DC to +	10 V DC/ma	aximum torq	ue)		
	Speed control range		An	alog speed	command 1	: 2000, Inter	nai speed co	ommand 1: t	5000			
Speed control	input	/ - /	0 to ±10	V DC/rated	speed (The	speed at 10	V is change	eable with [F	Pr. PC12].)			
mode	Speed fluctuation ratio	±0.01%	or less (load t	l fluctuation emperature	0 % to 100% 25 ± 10 °C)	%), 0% (pow) when using	er fluctuation analog spe	n ±10%), ±0 ed comman	.2% or less d	(ambient		
	Torque limit	Se	et by parame	eter setting o	r external a	nalog input	0 V DC to +	10 V DC/ma	aximum torq	ue)		
Torque control	Analog torque command input		0 V D	OC to ±8 V D	C/maximum	n torque (inp	ut impedanc	ce 10 kΩ to ²	12 kΩ)			
mode	Speed limit		Set by parameter setting or external analog input (0 V DC to 10 V DC/rated speed)									
Positioning mode	2	Ret The p	fer to "MR-J4 ositioning m	4ARJ Se ode is used	ervo Amplifie by MR-J4	er Instructior _ARJ serve	n Manual (Po o amplifier w	ositioning Mo vith software	ode)" sectior version B3	n 1.1. or later.		
		Ove	ercurrent shu	it-off, regene	erative overv	voltage shut	-off, overloa	d shut-off (e	lectronic the	rmal),		
Protective function	s	s	ervo motor o	overheat pro	tection, enc	oder error p	rotection, re	generative e	error protecti	on,		
			undervoltage	e protection,	instantaneo	ous power fa	ilure protect	tion, overspe	ed protectio	on,		
		error ex	cessive prote	ection, magr	netic pole de	etection prot	ection, and I	inear servo	control fault	protection		
Functional safety	1				STO ([IEC/EN 618	00-5-2)					

Model: MR-J4((-RJ)		60A4	100A4	200A4	350A4	500A4	700A4	11KA4	15KA4	22KA4		
	Standards certit (Note 9)	fied by CB	EN	EN ISO 13849-1 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL3, and EN 61800-5-2									
	Response perfo	ormance			8 ms	or less (ST) input off –	→ energy sh	ut off)				
Test puls (Note 2)	Test pulse input	t (STO)		Test pulse interval: 1 Hz to 25 Hz									
	(Note 2)	iole Z)		Test pulse off time: Up to 1 ms									
performance	Mean time to da failure (MTTFd)	angerous		MTTFd ≥ 100 [years] (314a)									
	Diagnostic cove	erage (DC)				DC =	Medium, 97	7.6 [%]					
	Average probat dangerous failu (PFH)	bility of res per hour				PFH = 6.4 × 10 ^{.9} [1/h] LVD: EN 61800-5-1 EMC: EN 61800-3 EN ISO 13849-1, EN 61800-5-2, EN 62061 UL 508C							
				LVD: EN 61800-5-1									
Compliance	CE marking		EMC: EN 61800-3										
with standards					MD: E	EN ISO 1384	9-1, EN 618	800-5-2, EN	N 62061				
	UL standard						UL 508C			32061 g, open (IP20) (Note 3)			
Structure (IP rati	ng)		Natural co (IP	oling, open 20)	Force coc (IP	ling, open 20)		Force coolir	ng, open (IP	20) (Note 3)			
Close mounting		_					Impossible						
	Ambient	Operation				0 °C to	55 °C (non-	freezing)					
	temperature	Storage				-20 °C to	65 °C (non	-freezing)					
	Ambient	Operation						aandanaina	•)				
Environment	humidity	Storage				5 %RH 10 91		-condensing	<i>1)</i>				
Environment	Ambionoo					Indoors	(no direct s	sunlight),					
	Ambience	Ampience		t	free from co	rrosive gas,	flammable o	gas, oil mist,	dust, and d	irt			
	Altitude				20	00 m or less	s above sea	level (Note	10)				
	Vibration resista	ance			5.9 m/s², a	10 Hz to 55	5 Hz (directi	ons of X, Y a	and Z axes)				
Mass		[kg]	1	.7	2.1	3.6	4.3	6.5	13	3.4	18.2		

Note 1. 0.5 A is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points.

- 2. Test pulse is a signal which instantaneously turns off a signal to the servo amplifier at a constant period for external circuit to self-diagnose.
- 3. Except for the terminal block.
- 4. 1 Mpulse/s or lower commands are supported in the initial setting. When inputting commands over 1 Mpulse/s and 4 Mpulses/s or lower, change the setting in [Pr. PA13].
- 5. MR-J4-_A4 servo amplifier is compatible only with two-wire type. MR-J4-_A4-RJ servo amplifier is compatible with two-wire type, four-wire type, and A/B/Z-phase differential output method. Refer to table 1.1 for details.
- 6. Use an external dynamic brake for this servo amplifier. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at emergency stop. Ensure the safety in the entire equipment.
- 7. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB (Dynamic brake interlock) in [Pr. PD23] to [Pr. PD26], [Pr. PD28], and [Pr. PD47]. Failure to do so will cause the servo amplifier to become servo-off when an instantaneous power failure occurs.
- 8. RS-485 communication is available with servo amplifiers manufactured in November 2014 or later.
- 9. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether STO input diagnosis by TOFB output is performed or not. For details, refer to the Function column of [Pr. PF18] in section 5.2.6.
- 10. Follow the restrictions in section 2.6 when using this product at altitude exceeding 1000 m and up to 2000 m above sea level.

(3) 100 V class

Model: MR-14- ((-R I)	1041	2041	1041						
	Deted voltage		2 mbass 170 V AC							
Output			3-phase 170 V AC							
	Rated current [A]	1.1	1.5	2.8						
	Voltage/Frequency	1-ph;	ase 100 V AC to 120 V AC, 50 Hz/6	0 Hz						
	Rated current [A]	3.0	5.0	9.0						
Main circuit	Permissible voltage fluctuation		1-phase 85 V AC to 132 V AC							
power supply input	Permissible frequency fluctuation		Within ±5%							
	Power supply [kVA]	Refer to section 10.2.								
	Inrush current [A]		Refer to section 10.5.							
	Voltage/Frequency	1-ph	ase 100 V AC to 120 V AC 50 Hz/6	0 Hz						
	Rated current [A]		0.4							
	Permissible voltage									
Control circuit power supply	fluctuation		1-phase 85 V AC to 132 V AC							
input	Permissible frequency fluctuation		Within ±5%							
	Power consumption [W]		30							
	Inrush current [A]		Refer to section 10.5.							
	Voltage		24 V DC ± 10%							
Interface power	Current consoit ([A]		0.5							
supply	Current capacity [A]	(inclu	ding the CN8 connector signals) (No	ote 1)						
Control method		Sine-w	ave PWM control, current control m	ethod						
Dynamic brake		Built-in								
Fully closed loop	control		Compatible (Note 5)							
Load-side encod	er interface (Note 6)	Mitsubis	ni Electric high-speed serial commu	nication						
		USB: Connection to a p	ersonal computer or others (MR Co	onfigurator2-compatible)						
Communication	runction	RS-422/RS-4	85: 1: n communication (up to 32 a	kes) (Note 7)						
Encoder output p	oulses		Compatible (A/B/Z-phase pulse)							
Analog monitor			Two channels							
	Max. input pulse frequency	4 Mpulses/s (for different	ential receiver) (Note 4), 200 kpulse	s/s (for open collector)						
	Positioning feedback	Encoder resolu	tion (resolution per servo motor rev	olution): 22 bits						
Position control mode	Command pulse	Electronic gear A:1 to 16777215, B:1 to 16777215, 1/10 < A/B < 4000								
	In-position range setting	0 pulse	e to ±65535 pulses (command pulse	e unit)						
	Error excessive	•	±3 revolutions	,						
	Torque limit	Set by parameter setting or	external analog input (0 V DC to +	10 V DC/maximum torque)						
	Speed control range	Analog speed c	ommand 1: 2000. Internal speed co	mmand 1: 5000						
Speed control	Analog speed command input	0 to ±10 V DC/rated s	peed (The speed at 10 V is change	able with [Pr. PC12].)						
mode	Speed fluctuation ratio	±0.01% or less (load	fluctuation: 0% to 100%), 0% (pow	er fluctuation: ±10%)						
	Torque limit	Set by parameter setting or	external analog input (0 V DC to \pm	10 V DC/maximum torque)						
		Set by parameter setting of								
Torque control mode	input	0 V DC to ±8 V D0	C/maximum torque (input impedance	e 10 kΩ to 12 kΩ)						
	Speed limit	Set by parameter settin	g or external analog input (0 V DC t	o 10 V DC/rated speed)						
Positioning mode	e	Refer to "MR-J4ARJ Se	vo Amplifier Instruction Manual (Po	sitioning Mode)" section 1.1.						
		The positioning mode is used l	oy MR-J4ARJ servo amplifier wi	th software version B3 or later.						
		Overcurrent shut-off, regenerative	overvoltage shut-off, overload shut-	off (electronic thermal), servo motor						
Drata ative from 1			overheat protection,	materian instant						
Protective function	אווכ	encoder error protection, regene	lure protection, overspeed protection	e protection, instantaneous power n,						
		error excessive protection, magn	etic pole detection protection, and li	near servo control fault protection						
Functional safety	/		STO (IEC/EN 61800-5-2)							

Model: MR-J4((-RJ)		10A1	20A1	40A1				
	Standards cer CB (Note 8)	tified by	EN ISO 13849-1 Category	3 PL e, IEC 61508 SIL 3, EN 62061 \$	SIL CL3, and EN 61800-5-2				
	Response per	formance	8 ms	s or less (STO input off $ ightarrow$ energy shu	it off)				
	Test pulse inp	ut (STO)	Test pulse interval: 1 Hz to 25 Hz						
	(Note 3)		Test pulse off time: Up to 1 ms						
Safety performance	Mean time to failure (MTTFo	dangerous d)	MTTFd ≥ 100 [years] (314a)						
	Diagnostic cov (DC)	/erage		DC = Medium, 97.6 [%]					
	Average proba dangerous fail hour (PFH)	ability of ures per		PFH = 6.4 × 10 ⁻⁹ [1/h]					
Compliance				LVD: EN 61800-5-1					
	CE marking			EMC: EN 61800-3					
standards			MD: EN ISO 13849-1, EN 61800-5-2, EN 62061						
otandardo	UL standard			UL 508C	UL 508C				
Structure (IP rati	ng)		Natural cooling, open (IP20)						
Close mounting	(Note 2)			Possible					
	Ambient	Operation		0 °C to 55 °C (non-freezing)					
	temperature	Storage		-20 °C to 65 °C (non-freezing)					
	Ambient	Operation		5 % Dil to 00 % Dil (non condensing	N				
Environment	humidity	Storage		5 %RH to 90 %RH (non-condensing)				
Environment	Ambienee			Indoors (no direct sunlight),					
	Ambience		free from co	rrosive gas, flammable gas, oil mist,	dust, and dirt				
	Altitude		2	000 m or less above sea level (Note	9)				
	Vibration resis	tance	5.9 m/s ² , at 10 Hz to 55 Hz (directions of X, Y and Z axes)						
Mass		[kg]	0	.8	1.0				

Note 1. 0.5 A is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points.

- 2. When closely mounting the servo amplifiers, operate them at the ambient temperature of 0 °C to 45 °C or at 75% or smaller effective load ratio.
- 3. Test pulse is a signal which instantaneously turns off a signal to the servo amplifier at a constant period for external circuit to self-diagnose.
- 4. 1 Mpulse/s or lower commands are supported in the initial setting. When inputting commands over 1 Mpulse/s and 4 Mpulses/s or lower, change the setting in [Pr. PA13].
- 5. For the compatible version for the fully closed loop system, refer to table 1.1. Check the software version of the servo amplifier with MR Configurator2.
- The MR-J4-_A servo amplifier is compatible only with the two-wire type. The MR-J4-_A-RJ servo amplifier is compatible with the two-wire type, four-wire type, and A/B/Z-phase differential output method. Refer to table 1.1 for details.
- 7. RS-485 communication is available with servo amplifiers manufactured in November 2014 or later.
- 8. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether STO input diagnosis by TOFB output is performed or not. For details, refer to the Function column of [Pr. PF18] in section 5.2.6.
- 9. Follow the restrictions in section 2.6 when using this product at altitude exceeding 1000 m and up to 2000 m above sea level.

1.4 Combinations of servo amplifiers and servo motors



- •When a 1-phase 200 V AC input is used, the maximum torque of 400% cannot be achieved with HG-JR series servo motor.
- ●When you use the MR-J4-100A or MR-J4-200A with the 1-phase 200 V AC input, contact your local sales office for the torque characteristics of the HG-UR series, HG-RR series, and HG-JR series servo motors.

(1) 200 V class

Servo amplifier			Rotar	y servo n	notor		Linear servo motor (primary side) (Note 1)	Direct drive motor (Note 1)
	HG-KR	HG-MR	HG-SR	HG-UR	HG-RR	HG-JR	(p	
MR-J4-10A(-RJ)	053	053						
	13	13	$ $ \setminus					
MR-J4-20A(-RJ)				N			LM-U2PAB-05M-0SS0	TM-RFM002C20
			$ \rangle$	$ \rangle$	$ \rangle$		LM-U2PBB-07M-1SS0	TM-RG2M002C30 (Note 2)
	23	23	$ \rangle$		$ \rangle$			TM-RU2M002C30 (Note 2)
								TM-RG2M004E30 (Note 2)
								TM-RU2M004E30 (Note 2)
MR-J4-40A(-RJ)			\land	Ν	\land	\searrow	LM-H3P2A-07P-BSS0	TM-RFM004C20
	40	40	$ \rangle$	$ \rangle$	$ \rangle$		LM-H3P3A-12P-CSS0	TM-RG2M004E30 (Note 2, 4)
	43	43	$ \rangle$	$ \rangle$	$ \rangle$		LM-K2P1A-01M-2SS1	TM-RU2M004E30 (Note 2, 4)
			$ \rangle$	$ \rangle$			LM-U2PAD-10M-0550	TM-RG2M009G30 (Note 2)
		\leftarrow					LM-U2PAF-15M-USSU	TM-R02M009G30 (Note 2)
MR-J4-60A(-RJ)	$\left \right\rangle$		51			53	LM-02PBD-15M-1880	
			52		$ \rightarrow $			
WIR-J4-70A(-RJ)					$\left \right\rangle$		LM-H3P3D-24P-C350	
	73	73	$ \rangle$	72	$ \rangle$	73	LM-H3P76-30F-0330	TM-RFM012G20
	10	10		12	$ \rangle$	10	LM-K2P2A-02M-1SS1	
			$ \setminus$		$ \setminus$		LM-U2PBF-22M-1SS0	
MR-,14-100A(-R,1)		\leftarrow	81		\vdash	53 (Note 3)		TM-REM018E20
			102			103		
MR-J4-200A(-RJ)			-				LM-H3P3D-48P-CSS0	\smallsetminus
()		$ \rangle$	121			73 (Note 3)	LM-H3P7B-48P-ASS0	
	$ \rangle$	$ \rangle$	201	450	103	103 (Note 3)	LM-H3P7C-72P-ASS0	
	$ \rangle$		152	152	153	153	LM-FP2B-06M-1SS0	
	$ \rangle$		202			203	LM-K2P1C-03M-2SS1	
							LM-U2P2B-40M-2SS0	
MR-J4-350A(-RJ)	N	Ν				153 (Note 3)	LM-H3P7D-96P-ASS0	TM-RFM048G20
	$ \rangle$	$ \rangle$	301	202	203	203 (Note 3)	LM-K2P2C-07M-1SS1	TM-RFM072G20
			352			353	LM-K2P3C-14M-1SS1	TM-RFM120J10
							LM-U2P2C-60M-2SS0	
MR-J4-500A(-RJ)		Ν					LM-FP2D-12M-1SS0	TM-RFM240J10
		$ \rangle$	421	352	353	353 (Note 3)	LM-FP4B-12M-1SS0	
	$ \rangle$		502	502	503	503	LM-K2P2E-12M-1SS1	
	$ \rangle$	$ \rangle$					LIVI-NZP3E-24IVI-1551	
		$ \longrightarrow $				503 (Noto 3)	LM-02F2D-00M-2330	<hr/>
WIX-34-700A(-IX3)				$\left \right\rangle$		505 (Note 5) 601	LM-FP4D-24M-1990	
		$ \rangle$	702	$ \rangle$	$ \rangle$	701M	LW-11 4D-24W-1000	
	$ \setminus$	$ \setminus$		$ \setminus$	$ \setminus$	703		
MR-J4-11KA(-RJ)	()	\vdash				801	LM-FP4F-36M-1SS0	
	$ \rangle $			$ \rangle$	$ \rangle$	12K1		
		$ \rangle$	$ \rangle$	$ \rangle$	$ \rangle$	11K1M		
	$ \rangle$	$ \setminus$	$ \setminus$	$ \setminus$	$ \setminus$	903		
MR-J4-15KA(-RJ)	\square	(\square	\square	\square	15K1	LM-FP4F-48M-1SS0	
						15K1M		
MR-J4-22KA(-RJ)	Ν	\mathbb{N}	\mathbb{N}	N	N	20K1		
	$ \setminus $				$ \setminus $	25K1		
	$ \rangle$	$ \rangle$	$ \rangle$	$ \rangle$	$ \rangle$	22K1M		

Note 1. This is available with servo amplifiers with software version A5 or later.

- 2. This is available with servo amplifiers with software version C8 or later.
- 3. The combination increases the maximum torque of the servo motor to 400%.
- 4. The combination increases the rated torque and the maximum torque.

(2) 400 V class

O amaga ana difi an	Rotary se	ervo motor	Linear servo motor
Servo ampliner	HG-SR	HG-JR	(primary side) (Note 1)
MR-J4-60A4(-RJ)	524	534	\
MR-J4-100A4(-RJ)		534 (Note 2)	7\
	1024	734	
		1034	
MR-J4-200A4(-RJ)		734 (Note 2)	\neg \land
	1524	1034 (Note 2)	
	2024	1534	
		2034	
MR-J4-350A4(-RJ)		1534 (Note 2)	7 \
	3524	2034 (Note 2)	
		3534	
MR-J4-500A4(-RJ)	5024	3534 (Note 2)	
	5024	5034	
MR-J4-700A4(-RJ)		5034 (Note 2)	
	7024	6014	
	7024	701M4	
		7034	
MR-J4-11KA4(-RJ)		8014	
		12K14	
		11K1M4	
		9034	
MR-J4-15KA4(-RJ)		15K14	
		15K1M4	
MR-J4-22KA4(-RJ)	1 \	20K14	LM-FP5H-60M-1SS0
		25K14	
		22K1M4	

Note 1. This is available with servo amplifiers with software version A5 or later.

2. The combination is for increasing the maximum torque of the servo motor to 400%.

(3) 100 V class

O amage and stiffing	Rotary se	ervo motor	Linear servo motor	Direct drive motor (Note 1)	
Servo amplifier	HG-KR	HG-MR	(primary side) (Note 1)		
MR-J4-10A1(-RJ)	053	053			
	13	13			
MR-J4-20A1(-RJ)			LM-U2PAB-05M-0SS0	TM-RFM002C20	
			LM-U2PBB-07M-1SS0	TM-RG2M002C30 (Note 2)	
	23	23		TM-RU2M002C30 (Note 2)	
				TM-RG2M004E30 (Note 2)	
				TM-RU2M004E30 (Note 2)	
MR-J4-40A1(-RJ)			LM-H3P2A-07P-BSS0	TM-RFM004C20	
			LM-H3P3A-12P-CSS0	TM-RG2M004E30 (Note 2, 3)	
	43	43	LM-K2P1A-01M-2SS1	TM-RU2M004E30 (Note 2, 3)	
			LM-U2PAD-10M-0SS0	TM-RG2M009G30 (Note 2)	
			LM-U2PAF-15M-0SS0	TM-RU2M009G30 (Note 2)	

Note 1. This is available with servo amplifiers with software version A5 or later.

2. This is available with servo amplifiers with software version C8 or later.

3. The combination increases the rated torque and the maximum torque.

1.5 Function list

The following table lists the functions of this servo. For details of the functions, refer to each section indicated in the detailed explanation field.

Function	Description	Detailed explanation
Model adaptive control	This realizes a high response and stable control following the ideal model. The two- degrees-of-freedom-model model adaptive control enables you to set a response to the command and response to the disturbance separately. Additionally, this function can be disabled. Refer to section 7.5 for disabling this function. This is used with servo amplifiers with software version B4 or later. Check the software version of the servo amplifier with MR Configurator2.	
Position control mode	This servo amplifier is used as a position control servo.	Section 3.2.1 Section 3.6.1 Section 4.2
Speed control mode	This servo amplifier is used as a speed control servo.	Section 3.2.2 Section 3.6.2 Section 4.3
Torque control mode	This servo amplifier is used as a torque control servo.	Section 3.2.3 Section 3.6.3 Section 4.4
Positioning mode	Used when you use an MR-J4ARJ servo amplifier in the positioning mode under the point table/program/indexer method. The positioning mode is used by MR-J4ARJ servo amplifier with software version B3 or later.	MR-J4A RJ Servo Amplifier Instruction Manual (Positioning Mode)
Position/speed control change mode	Using an input device, control can be switched between position control and speed control.	Section 3.6.4
Speed/torque control change mode	Using an input device, control can be switched between speed control and torque control.	Section 3.6.5
Torque/position control change mode	Using an input device, control can be switched between torque control and position control.	Section 3.6.6
High-resolution encoder	High-resolution encoder of 4194304 pulses/rev is used as the encoder of the rotary servo motor compatible with the MELSERVO-J4 series.	
Absolute position detection system	Merely setting a home position once makes home position return unnecessary at every power-on.	Chapter 12
Gain switching function	You can switch gains during rotation and during stop, and can use an input device to switch gains during operation.	Section 7.2
Advanced vibration suppression control II	This function suppresses vibration at the arm end or residual vibration.	Section 7.1.5
Machine resonance suppression filter	This is a filter function (notch filter) which decreases the gain of the specific frequency to suppress the resonance of the mechanical system.	Section 7.1.1
Shaft resonance suppression filter	When a load is mounted to the servo motor shaft, resonance by shaft torsion during driving may generate a mechanical vibration at high frequency. The shaft resonance suppression filter suppresses the vibration.	Section 7.1.3
Adaptive filter II	Servo amplifier detects mechanical resonance and sets filter characteristics automatically to suppress mechanical vibration.	Section 7.1.2
Low-pass filter	Suppresses high-frequency resonance which occurs as servo system response is increased.	Section 7.1.4
Machine analyzer function	Analyzes the frequency characteristic of the mechanical system by simply connecting an MR Configurator2 installed personal computer and servo amplifier. MR Configurator2 is necessary for this function.	
Robust filter	This function provides better disturbance response in case low response level that load to motor inertia ratio is high for such as roll send axis.	[Pr. PE41]
Slight vibration suppression control	Suppresses vibration of ±1 pulse produced at a servo motor stop.	[Pr. PB24]
Electronic gear	Input pulses can be multiplied by 1/10 to 4000.	[Pr. PA06] [Pr. PA07]
S-pattern acceleration/ deceleration time constant	Speed can be increased and decreased smoothly.	[Pr. PC03]