



***Catalog CA.RC5.01
RC5 Regenerative Converter***

Date: 2/1/08

YASKAWA

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Other Documents and Manuals are available to support special use or installation of this product. These documents may be provided with the product or upon request. Contact Yaskawa Electric America, Inc. or visit www.yaskawa.com, as required. Documents may include the following:

TOE-S656-3D... RC5 Technical Manual included on CD-ROM with product

REVISIONS

Change	Page
Changed 7.5HP kit part number	4, 6
Changed revision date	All pages



The RC5 Converter is a high performance line regeneration unit for adjustable speed applications that include a high demand braking cycle. The RC5 is an excellent, competitive solution that takes excess regenerative energy from the driven motor and supplies it to the incoming AC power source. The RC5 is wired in parallel with the adjustable frequency drive and can be independently sized to suit the projected regenerative load. The RC5 is applicable to all Yaskawa drive families, including the F, G, P, and V series. Typical applications for the RC5 include:

- Decelerating and stopping high inertia loads such as centrifuges, presses, saws, large fans, and winders.
- Highly repetitive stopping of loads such as machine tool spindles, indexers, slides, feeders, etc.
- Driving eccentric loads such as punch and stamping presses, industrial washers and dryers, and vibratory equipment.
- Continuous braking of loads such as downhill conveyors, hoists, elevators, unwinders, and other web converting applications.
- Replacing DB resistors in harsh environments where contamination could cause fire or resistor failure - sawmills, foundries, etc.

In these types of applications, the RC5 is a cost-competitive alternative to DB resistors, especially when energy savings is considered. DB Resistors simply dissipate (waste) the regenerated energy. The RC5 returns the regenerated energy back to the power grid reducing the total energy consumption. Payback for high duty cycle applications is typically less than a year with the RC5.

The RC5 solution is perfect for dusty, wet or volatile environments. The RC5 mounts inside the panel with the drive, unlike braking resistors which must be mounted externally because of heavy heat generation and large footprints. The RC5 is pre-engineered for standard and heavy duty cycle ratings. Additional configurations are available. Consult the factory.

Standard Duty

Standard Duty applies for applications requiring frequent stopping and starting such as elevators or hoists. The standard duty rating is sized for applications requiring Continuous Energy Dissipation (less than 80% braking power), and Frequent Stopping (100% braking torque at a 25% duty cycle with 60 seconds maximum on-time).

Heavy Duty

This rating is designed for demanding "hold-back" type applications, such as unwinders, motor test stands, downhill conveyors. The heavy-duty rating is sized for applications requiring Continuous Energy Dissipation (100% regenerative torque).

Performance Features

- Ratings: 5 to 50HP, 230 VAC; 5 to 100HP, 460 VAC (standard duty)
- Overload capacity (standard duty): 80% continuous, 100% for 60 seconds at 25% duty cycle, 150% for 30 seconds, 200% peak
- Power Factor: 0.9 or greater
- Control Method: 120° current conduction

Protective Features

- DC bus charge indicator (LED)
- Optically-Isolated controls
- Overcurrent
- Overvoltage and Undervoltage
- Overtemperature
- Input phase loss
- Input frequency fluctuation

Design Features

- LCD keypad display: 2 lines x 16 characters, backlit
- Control logic: 24VDC (sinking or sourcing)

Service Conditions

- Enclosure: NEMA-1 or protected chassis
- Ambient service temperatures: -10 to 40°C (104°F) NEMA-1, -10 to 45°C (113°F) protected chassis
- Input frequency: 50/60Hz ± 3Hz
- Input voltage: 200-230VAC, 380-460VAC, 3 phase, +10% / -15% (2% or less phase imbalance)
- Humidity: Non-condensing, 90% maximum
- Altitude: Up to 3300 feet (1000 meters) w/o derate
- Vibration: 1G or less (0 to 20Hz), 0.2G or less (20 to 50Hz)

Inputs and Outputs

- Analog outputs: 1 programmable, ±10VDC, 9 bit plus sign
- Digital inputs: 4 (2 programmable), Sinking or sourcing
- Digital outputs: 1 form C fault contact, 2 programmable open collector

Standards & Reliability

- Approvals: UL, cUL & CE
- MBTF: Exceeds 28 years

Options

- JVOP-139 LED monitor keypad
- NEMA 12 enclosures



Heavy Duty Kits

Includes RC5 With All External Components

The Heavy Duty kit comprises the appropriate RC5 converter and all necessary external components. The kit components ship loose and must be integrated into an appropriate enclosure for the application. The kit is sized based on NEC horsepower so that any drive can be used in conjunction with this package. The drive and regenerative kit should be sized 1:1 based on horsepower. This kit is designed for demanding "hold-back" type applications, such as unwinders, elevators, hoists, or downhill conveyors. All regenerative energy is transferred to the incoming power line.

The Heavy Duty kit is sized for applications requiring continuous energy dissipation (100% regenerative torque). The overload rating is 150% torque for 30 seconds, 200% torque peak.

Rated Input Voltage	Drive Nominal HP ⁽¹⁾	Regenerative Kit Part Number ⁽²⁾	Model Number of RC5 Used in Kit CIMR-R5U*	Standard Enclosure
230V	3	RC5-230-3HP-HD	23P71A	NEMA 1
	5	RC5-230-5HP-HD	25P51A	
	7.5	RC5-230-7P5HP-HD	27P51A	
	10	RC5-230-10HP-HD	20111A	
	15	RC5-230-15HP-HD	20151A	
	20	RC5-230-20HP-HD	20181A	
	25	RC5-230-25HP-HD	20221A	
	30	RC5-230-30HP-HD	20301A	
	40	RC5-230-40HP-HD	20370A	Protected Chassis
460V	3	RC5-460-3HP-HD	43P71A	NEMA 1
	5	RC5-460-5HP-HD	45P51A	
	7.5	RC5-460-7P5HP-HD	47P51A	
	10	RC5-460-10HP-HD	40111A	
	15	RC5-460-15HP-HD	40151A	
	20	RC5-460-20HP-HD	40181A	
	25	RC5-460-25HP-HD	40221A	
	30	RC5-460-30HP-HD	40301A	
	40	RC5-460-40HP-HD	40370A	Protected Chassis
	50	RC5-460-50HP-HD	40450A	
	60	RC5-460-60HP-HD	40550A	
	75	RC5-460-75HP-HD	40750A	

- (1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors
- (2) The kit includes the following loose components: RC5 Converter, MOVs, Input Fuses and Fuse Block(s), Drive Coordination Reactor and the RC5 Current Suppression Reactor. These components must be integrated along with the drive inside a suitable enclosure for the application.



This page contains the components that make up the RC5 Heavy Duty kits.

NEC		RC5 Unit			Reactor for VFD		Reactor for RC5	
HP	lac	CIMR-	lac	Idc	Yaskawa Model	MTE Model	Yaskawa Model	MTE Model
3	9.6	R5U23P71A	10	13	05P00620-0134	RL-01201	05P00620-0134	RL-01201
5	15.2	R5U25P51A	15	19	05P00620-0136	RL-01801	URX0000083	RL-02501
7.5	22	R5U27P51A	20	26	URX0000083	RL-02501	URX0000083	RL-02501
10	28	R5U20111A	30	37	05P00620-0044	RL-03501	05P00620-0044	RL-03501
15	42	R5U20151A	40	51	05P00620-0140	RL-04501	05P00620-0141	RL-05501
20	54	R5U20181A	50	64	05P00620-0141	RL-05501	05P00620-0143	RL-08001
25	68	R5U20221A	60	77	05P00620-0143	RL-08001	05P00620-0143	RL-08001
30	80	R5U20301A	80	102	05P00620-0143	RL-08001	URX0000085	RL-10001
40	104	R5U20370A	100	126	URX0000085	RL-10001	05P00620-0064	RL-13001
3	4.8	R5U43P71A	5	6	05P00620-0132	RL-00402	05P00620-0133	RL-00802
5	7.6	R5U45P51A	7.5	9	05P00620-0133	RL-00802	05P00620-0024	RL-00801
7.5	11	R5U47P51A	10	13	05P00620-0135	RL-01202	05P00620-0134	RL-01201
10	14	R5U40111A	15	19	05P00620-0137	RL-01802	05P00620-0136	RL-01801
15	21	R5U40151A	20	26	05P00620-0138	RL-02502	URX0000083	RL-02501
20	27	R5U40181A	25	32	05P00620-0139	RL-03502	05P00620-0044	RL-03501
25	34	R5U40221A	30	37	05P00620-0139	RL-03502	05P00620-0140	RL-04501
30	40	R5U40301A	40	51	05P00620-0049	RL-04502	05P00620-0141	RL-05501
40	52	R5U40370A	50	64	05P00620-0142	RL-05502	05P00620-0143	RL-08001
50	65	R5U40450A	60	77	05P00620-0144	RL-08002	05P00620-0143	RL-08001
60	77	R5U40550A	75	96	05P00620-0144	RL-08002	URX0000085	RL-10001
75	96	R5U40750A	100	128	05P00620-0145	RL-10002	05P00620-0064	RL-13001

NEC		Input Fuse			Input Fuse Holder			MOV
HP	lac	Yaskawa Model	Ferraz Model	Qty	Yaskawa Model	Ferraz Model	Qty	Yaskawa Model
3	9.6	UFU000151	A30QS20-1	3	UFU000157	70318	1	XX-000221
5	15.2	UFU000152	A30QS30-1	3	UFU000157	70318	1	XX-000221
7.5	22	UFU000152	A30QS30-1	3	UFU000157	70318	1	XX-000221
10	28	UFU000153	A30QS50-4	3	FU-002082	P243G	3	XX-000221
15	42	UFU000154	A30QS80-4	3	FU-002083	P243	3	XX-000221
20	54	UFU000154	A30QS80-4	3	FU-002083	P243	3	XX-000221
25	68	UFU000155	A30QS100-4	3	FU-002083	P243	3	XX-000221
30	80	UFU000156	A30QS150-4	3	FU-002083	P243	3	XX-000221
40	104	UFU000156	A30QS150-4	3	FU-002083	P243	3	XX-000221
3	4.8	FU-002029	A60Q10-2	3	FU-002055	30323	1	XX-000222
5	7.6	FU-002030	A60Q15-2	3	FU-002055	30323	1	XX-000222
7.5	11	FU-002030	A60Q15-2	3	FU-002055	30323	1	XX-000222
10	14	FU-002032	A60Q30-2	3	FU-002055	30323	1	XX-000222
15	21	FU-002032	A60Q30-2	3	FU-002055	30323	1	XX-000222
20	27	FU-000783	A50P50-4	3	FU-002082	P243G	3	XX-000222
25	34	FU-000783	A50P50-4	3	FU-002082	P243G	3	XX-000222
30	40	FU-000806	A50P80-4	3	FU-002084	P243E	3	XX-000222
40	52	FU-000806	A50P80-4	3	FU-002084	P243E	3	XX-000222
50	65	FU-000807	A50P100-4	3	FU-002084	P243E	3	XX-000222
60	77	FU-000809	A50P150-4	3	FU-002084	P243E	3	XX-000222
75	96	FU-000809	A50P150-4	3	FU-002084	P243E	3	XX-000222



Standard Duty Kits

Includes RC5 With All External Components

The Standard Duty kit comprises the appropriate RC5 converter and all necessary external components. The kit components ship loose and must be integrated into an appropriate enclosure for the application. The kit is sized based on NEC horsepower so that any drive can be used in conjunction with this package. The drive and regenerative kit should be sized 1:1 based on horsepower. This kit is designed to assist the drive to decelerate loads without overvoltage trips or for “hold-back” type applications, such as unwinders, elevators, hoists or downhill conveyors that require 80% or less of the drives rating. All regenerative energy is transferred to the incoming power line.

The Standard Duty kit is sized for applications requiring either continuous energy dissipation (80% or less braking torque) or 100% braking torque for 60 seconds at a 25% duty cycle (60 seconds maximum on-time of every 240 seconds). The overload rating is 150% braking torque for 30 seconds, 200% braking torque peak.

Rated Input Voltage	Drive Nominal HP ⁽¹⁾	Regenerative Kit Part Number ⁽²⁾	Model Number of RC5 Used in Kit CIMR-R5U*	Standard Enclosure	
230V	5	RC5-230-5HP-SD	23P71A	NEMA 1	
	7.5	RC5-230-7P5HP-SD	25P51A		
	10	RC5-230-10HP-SD	27P51A		
	15	RC5-230-15HP-SD	20111A		
	20	RC5-230-20HP-SD	20151A		
	25	RC5-230-25HP-SD	20181A		
	30	RC5-230-30HP-SD	20221A		
	40	RC5-230-40HP-SD	20301A		
	50	RC5-230-50HP-SD	20370A	Protected Chassis	
460V	5	RC5-460-5HP-SD	43P71A	NEMA 1	
	7.5	RC5-460-7P5HP-SD	45P51A		
	10	RC5-460-10HP-SD	47P51A		
	15	RC5-460-15HP-SD	40111A		
	20	RC5-460-20HP-SD	40151A		
	25	RC5-460-25HP-SD	40181A		
	30	RC5-460-30HP-SD	40221A		
	40	RC5-460-40HP-SD	40301A		
		50	RC5-460-50HP-SD	40370A	Protected Chassis
		60	RC5-460-60HP-SD	40450A	
		75	RC5-460-75HP-SD	40550A	
		100	RC5-460-100HP-SD	40750A	

(1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table.

(2) The kit includes the following loose components: RC5 Converter, MOVs, Input Fuses and Fuse Block(s), Drive Coordination Reactor and the RC5 Current Suppression Reactor. These components must be integrated along with the drive inside a suitable enclosure for the application.

This page contains the components that make up the RC5 Standard Duty kits.

NEC		RC5 Unit			Reactor for VFD		Reactor for RC5	
HP	lac	CIMR-	lac	Idc	Yaskawa Model	MTE Model	Yaskawa Model	MTE Model
5	15.2	R5U23P71A	10	13	05P00620-0136	RL-01801	05P00620-0134	RL-01201
7.5	22	R5U25P51A	15	19	URX000083	RL-02501	URX000083	RL-02501
10	28	R5U27P51A	20	26	05P00620-0044	RL-03501	URX000083	RL-02501
15	42	R5U20111A	30	37	05P00620-0140	RL-04501	05P00620-0044	RL-03501
20	54	R5U20151A	40	51	05P00620-0141	RL-05501	05P00620-0141	RL-05501
25	68	R5U20181A	50	64	05P00620-0143	RL-08001	05P00620-0143	RL-08001
30	80	R5U20221A	60	77	05P00620-0143	RL-08001	05P00620-0143	RL-08001
40	104	R5U20301A	80	102	URX000085	RL-10001	URX000085	RL-10001
50	130	R5U20370A	100	126	05P00620-0064	RL-13001	05P00620-0064	RL-13001
5	7.6	R5U43P71A	5	6	05P00620-0133	RL-00802	05P00620-0025	RL-00803
7.5	11	R5U45P51A	7.5	9	05P00620-0135	RL-01202	05P00620-0133	RL-00802
10	14	R5U47P51A	10	13	05P00620-0137	RL-01802	05P00620-0135	RL-01202
15	21	R5U40111A	15	19	05P00620-0138	RL-02502	05P00620-0137	RL-01802
20	27	R5U40151A	20	26	05P00620-0139	RL-03502	URX000083	RL-02501
25	34	R5U40181A	25	32	05P00620-0139	RL-03502	05P00620-0044	RL-03501
30	40	R5U40221A	30	37	05P00620-0049	RL-04502	05P00620-0049	RL-04502
40	52	R5U40301A	40	51	05P00620-0142	RL-05502	05P00620-0142	RL-05502
50	65	R5U40370A	50	64	05P00620-0144	RL-08002	05P00620-0144	RL-08002
60	77	R5U40450A	60	77	05P00620-0144	RL-08002	05P00620-0143	RL-08001
75	96	R5U40550A	75	96	05P00620-0145	RL-10002	URX000085	RL-10001
100	124	R5U40750A	100	128	05P00620-0013	RL-13002	05P00620-0064	RL-13001

NEC		Input Fuse			Input Fuse Holder			MOV
HP	lac	Yaskawa Model	Ferraz Model	Qty	Yaskawa Model	Ferraz Model	Qty	Yaskawa Model
5	15.2	UFU000151	A30QS20-1	3	UFU000157	70318	1	XX-000221
7.5	22	UFU000152	A30QS30-1	3	UFU000157	70318	1	XX-000221
10	28	UFU000152	A30QS30-1	3	UFU000157	70318	1	XX-000221
15	42	UFU000153	A30QS50-4	3	FU-002082	P243G	3	XX-000221
20	54	UFU000154	A30QS80-4	3	FU-002083	P243	3	XX-000221
25	68	UFU000154	A30QS80-4	3	FU-002083	P243	3	XX-000221
30	80	UFU000155	A30QS100-4	3	FU-002083	P243	3	XX-000221
40	104	UFU000156	A30QS150-4	3	FU-002083	P243	3	XX-000221
50	130	UFU000156	A30QS150-4	3	FU-002083	P243	3	XX-000221
5	7.6	FU-002029	A60Q10-2	3	FU-002055	30323	1	XX-000222
7.5	11	FU-002030	A60Q15-2	3	FU-002055	30323	1	XX-000222
10	14	FU-002030	A60Q15-2	3	FU-002055	30323	1	XX-000222
15	21	FU-002032	A60Q30-2	3	FU-002055	30323	1	XX-000222
20	27	FU-002032	A60Q30-2	3	FU-002055	30323	1	XX-000222
25	34	FU-000783	A50P50-4	3	FU-002082	P243G	3	XX-000222
30	40	FU-000783	A50P50-4	3	FU-002082	P243G	3	XX-000222
40	52	FU-000806	A50P80-4	3	FU-002084	P243E	3	XX-000222
50	65	FU-000806	A50P80-4	3	FU-002084	P243E	3	XX-000222
60	77	FU-000807	A50P100-4	3	FU-002084	P243E	3	XX-000222
75	96	FU-000809	A50P150-4	3	FU-002084	P243E	3	XX-000222
100	124	FU-000809	A50P150-4	3	FU-002084	P243E	3	XX-000222

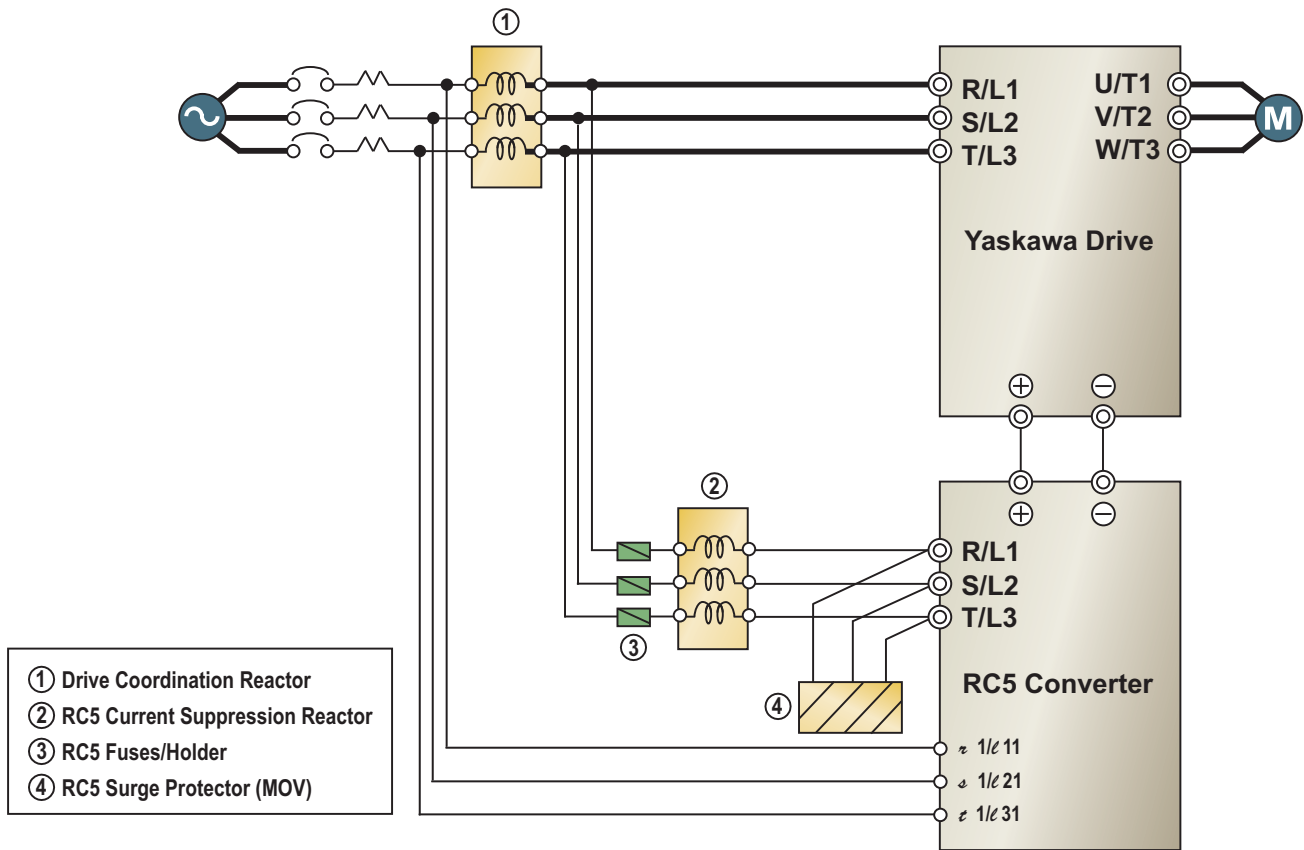
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Dimensions and Data

Rated Input Voltage	Basic Drive Model Number CIMR R5U	Physical Dimensions (in.)			Weight (lbs) ⁽¹⁾	Standard Enclosure	Drawing Number ⁽¹⁾	Heat Loss (watts)		
		H	W	D				Heatsink	Internal	Total
230V	23P71	11.02	5.51	7.09	9.9	NEMA 1	EZZ00619	70	60	130
	25P51	11.02	5.51	7.09	9.9		EZZ00619	70	60	130
	27P51	11.02	5.51	7.09	9.9		EZZ00619	90	80	170
	20111	11.81	7.87	8.07	12.1		EZZ00620	160	110	270
	20151	11.81	7.87	8.07	13.2		EZZ00620	200	130	330
	20181	14.96	9.84	8.86	22.0		EZZ00621	250	150	400
	20221	14.96	9.84	8.86	22.0		EZZ00621	320	180	500
	20300	15.75	9.84	8.86	24.3		EZZ00622	410	220	630
	20370	17.72	12.80	11.22	50.7	OC	EZZ00623	540	290	830
460V	43P71	11.02	5.51	7.09	7.7	NEMA 1	EZZ00619	30	50	80
	45P51	11.02	5.51	7.09	8.8		EZZ00619	40	60	100
	47P51	11.02	5.51	7.09	8.8		EZZ00619	60	60	120
	40111	11.81	7.87	8.07	13.2		EZZ00625	80	70	150
	40151	11.81	7.87	8.07	13.2		EZZ00625	110	90	200
	40181	14.96	9.84	8.86	23.1		EZZ00626	120	100	220
	40221	14.96	9.84	8.86	23.1		EZZ00626	140	110	250
	40301	14.96	9.84	8.86	23.1		EZZ00626	210	140	350
	40371	17.72	12.80	11.22	55.1	OC	EZZ00627	290	160	450
	40451	17.72	12.80	11.22	58.4		EZZ00628	360	190	550
	40550	24.61	12.80	11.22	75.0		EZZ00629	470	260	730
	40750	24.61	12.80	11.22	79.4		EZZ00629	550	310	860

(1) This data represents the RC5 unit weight only, not shipping weight.

(2) Outline drawings are not included in this price book. Please refer to our website at www.drives.com for outline drawings.



Terms and Conditions

YASKAWA ELECTRIC AMERICA, INC. - STANDARD TERMS AND CONDITIONS OF SALE

1. GENERAL:

- (a) Any sale of products or services by Yaskawa Electric America, Inc. ("YEA") is governed exclusively by these Standard Terms and Conditions of Sale ("Standard Terms") and shall supersede any inconsistent or additional terms on Buyer's purchase order or any other document. These Standard Terms constitute the final, complete and exclusive agreement between YEA and the Buyer as to the subject matter hereof. YEA hereby objects to any inconsistent or additional terms. This Agreement may be amended only in writing signed by an authorized representative of YEA.
- (b) Any order placed with YEA must be in the form of a written purchase order or letter from Buyer ("Order") and shall set forth all information necessary for YEA to fill the Order, if accepted. All proposals, quotations or similar communications from YEA will be considered invitations to Buyer to submit an Order. A binding sales contract will result only when YEA accepts Buyer's Order, at YEA's office in Waukegan, Illinois or such other place as designated by YEA. YEA reserves the right to bill any Order at a minimum of \$100, plus any additional charges provided for herein.
- (c) All products shall be packaged for domestic shipment in accordance with YEA's standard specifications. If special packaging is required, it must be clearly requested on Buyer's Order. The price for any special packaging shall be billed to Buyer.

2. WARRANTY:

- (a) YEA warrants that each new and unused product sold by YEA shall be free of defects in material workmanship for a period of one (1) year from the date the product is first used by Buyer, or 18 months from the date of shipment, whichever occurs first. YEA warrants that its services shall be free of defects in workmanship for a period of ninety (90) days from the date they are first provided. Within the applicable warranty period, YEA will, at its sole discretion, either repair, replace or return the purchase price paid to YEA for any product, part or service found by YEA to be defective; provided that the subject product is used under normal conditions for which it was designed and installed, operated and maintained in accordance with YEA's instructions and (subject always to such instructions) in accordance with generally accepted industrial practices.
- (b) YEA's warranty obligation shall be conditioned upon receipt by YEA of written notice of any alleged defects within sixty (60) days after discovery. YEA will not be responsible or accept invoices for unauthorized repairs to any products, even if defective. YEA shall not be responsible for any products which have been altered, abused, misused, or improperly installed or repaired, or for any loss, damage, defect, claim or non-performance resulting from or attributable to Buyer's specifications.
- (c) Where Buyer requests that YEA supply non-stock products or component parts manufactured by a third-party, YEA will, to the extent permitted, pass through to Buyer any warranty of the manufacturer. As to such items, Buyer's sole remedy for breach of warranty shall be the remedy offered by and available from the manufacturer. YEA shall have no liability, whether in contract, tort or otherwise, for such products.
- (d) YEA does not guarantee production rates or the quality of goods made using YEA's products or services, nor shall any longer warranty periods apply, except as agreed in writing signed by an authorized YEA representative.
- (e) YEA's WARRANTY HEREIN IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES OF YEA AND ALL PARENT OR AFFILIATED COMPANIES OF YEA. ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE OR USE, ARE HEREBY EXCLUDED.
- (f) UNDER NO CIRCUMSTANCES SHALL YEA, OR ANY PARENT OR AFFILIATED COMPANY OF YEA, BE LIABLE TO

BUYER OR ANY ENTITY FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER ARISING FROM BREACH OF CONTRACT, TORT, NEGLIGENCE, MISREPRESENTATION, STRICT LIABILITY OR OTHERWISE, INCLUDING FOR LOST PROFITS, IMPAIRMENT OF GOODS, WORK STOPPAGE OR OTHERWISE, IN ANY WAY ARISING OUT OF OR RELATED TO GOODS OR SERVICES SUPPLIED BY YEA OR ANY TRANSACTION TO WHICH THESE STANDARD TERMS APPLY. THE MAXIMUM LIABILITY OF YEA, INCLUDING, BUT NOT LIMITED TO, WITH RESPECT TO THE DESIGN, MANUFACTURE, SALE, DELIVERY, RESALE, INSPECTION, ASSEMBLY, INSTALLATION, TESTING, REPAIR, REPLACEMENT, MAINTENANCE OR USE OF ANY PRODUCT OR THE PERFORMANCE OF ANY SERVICE, SHALL NOT EXCEED THE PURCHASE PRICE PAID TO YEA FOR THE DEFECTIVE PRODUCT OR SERVICE.

3. DRAWINGS/MEASUREMENTS:

All drawings, tables, graphs and the like submitted by YEA or contained in YEA's publications shall be regarded as approximations only. Weights, measurements, capacities and all other particulars of products or services offered by YEA are approximations only. YEA is not responsible for such approximations, including, in particular, based on data supplied by Buyer.

4. INFRINGEMENT:

YEA's liability for infringement (and the liability of any parent or affiliated company of YEA) is limited to YEA's defense of any suit or proceeding brought against Buyer based on a claim that products sold hereunder, when employed in the manner intended by YEA, constitutes an infringement of any patent of the United States. If Buyer's use of the products in the manner intended by YEA is finally enjoined in such action, YEA shall, at its option, procure for Buyer the right to continue using the products, replace the same with non-infringing products, modify the products so that they become non-infringing equivalent products, or refund the purchase price (less allowance for use, damage or obsolescence). YEA makes no warranty against patent infringement resulting from portions of the products made to Buyer's specifications or the use of products in combination with any other products or in the practice of any process, and if a claim, suit or action is brought against YEA or any parent or affiliate of YEA, Buyer shall defend, indemnify and save YEA (and its parent/affiliates) harmless from and against any and all claims, losses or damages arising therefrom.

5. SHIPMENT, FORCE MAJEURE, PRICES AND ERROR:

- (a) Shipment/delivery dates are approximations only. YEA shall not be liable to pay any penalty or damages, including consequential damages, for any delay in shipment.
- (b) In no event shall YEA be liable for any damages, including consequential damages, caused by delays or non-performance resulting from or related to force majeure or other causes beyond YEA's reasonable control, including, but not limited to, war, blockade, civil disturbances, strikes and lockouts, labor shortages, fire and other casualties, acts of nature, accidents and governmental acts (including regulations concerning export and import licensing and currency exchange). In case of non-delivery, YEA's obligation shall be limited to the refund of any advance payment received from Buyer.
- (c) All claims for loss of or damage to products, whether concealed or obvious, must be made, in writing, to the carrier and to YEA by Buyer as soon as possible after receipt of shipment, and in no case beyond 30 days of shipment, or such claims shall be deemed waived. YEA will render reasonable assistance in providing information necessary for Buyer to process such damage claims with the carrier or any insurance company.

Terms and Conditions

(d) YEA's quoted prices are firm for thirty (30) days from the date of YEA's written proposal. Thereafter, the applicable prices are those in effect at the time Buyer's Order is placed with YEA. YEA will notify Buyer of any price changes for incorporation into a revised Order prior to acceptance by YEA. Pricing based on volume discounts is subject to adjustment by YEA if actual shipping volumes do not meet minimum volume requirements of agreement. Clerical errors in any element of a proposal, purchase order, invoice or contract are subject to correction by YEA.

(e) (1) Buyer agrees to accept delivery within fifteen (15) days following the anticipated date of delivery. If Buyer refuses to take delivery within the fifteen (15) day period, YEA reserves the right to charge Buyer for storage charges plus interest.

(f) (2) All shipments are F.O.B. YEA's (or its suppliers') manufacturing plant or warehouse. YEA will, at Buyer's expense, arrange for the transportation of the products from the manufacturing plant or warehouse designated by YEA. Buyer is responsible to timely procure all necessary export and import licenses and all permits required for the consummation of the transaction.

6. TERMS OF PAYMENT:

(a) All payments are due within thirty (30) days of YEA's invoice. YEA reserves the right to require payment in advance, or satisfactory security, for any shipment or sale. YEA may cancel any shipment or Order for any Buyer which has failed to make payment or comply with any other provision of these Standard Terms. YEA reserves the right to seek any other remedy available at law or equity. Payment shall be made at the agreed time, to the place specified, and in the currency indicated on YEA's invoice. Buyer's failure to pay at the agreed time and place constitutes a waiver of Buyer's right to demand YEA's performance under the contract.

(b) When an account becomes past due according to its payment terms, Buyer shall pay interest on the balance due, at the greater of 1.50% per month (18% per annum) or the maximum permitted by law, until paid in full.

(c) If delivery and/or payment in installments are accepted by YEA, Buyer's failure to pay any installment when due shall give YEA the right to suspend work or delivery until such payment is made. In the event that any such default by Buyer continues for more than fifteen (15) days, YEA may then cancel the contract by written notice to Buyer. Upon cancellation of an installment contract, all items already delivered to and paid for in full by Buyer will be transferred to Buyer "AS IS, WHERE IS," without any warranty.

(d) All duties, tariffs, fees, costs and other charges connected with shipment, insurance, exportation and importation of the products are the responsibility of Buyer, and, if paid by YEA, such expenses may be recovered by YEA from Buyer, and Buyer shall indemnify YEA against claims for the same. Buyer is responsible for all taxes applicable or related to this transaction, including all sales, use and excise taxes.

7. RISK OF LOSS:

Risk of loss and/or damage to the products shall pass to Buyer upon delivery thereof to Buyer or its representative, or to a carrier for shipment to Buyer or its designated customer, as the case may be, at the manufacturing plant or warehouse of YEA or its supplier. Buyer is responsible to obtain insurance coverage on all shipments of products supplied by YEA.

8. RETURNS/CANCELLATION CHARGES:

Buyer shall not return any product to YEA without the written consent of, and upon terms agreed to, by YEA. If Buyer refuses to accept delivery, or improperly revokes acceptance of product, Buyer shall be responsible for YEA's cancellation charges and expenses.

Before returning products, a Return Merchandise Authorization ("R.M.A.") number must be obtained from YEA. Products returned without an R.M.A. number clearly marked on the outside of the shipping carton will be refused. Except for approved warranty returns, YEA will only accept for return and credit new, unused, current stock items, in the original packaging and undamaged. Buyer shall be responsible for all freight charges, import/export charges, duties, tariffs, taxes, insurance and risk of loss/damage regarding return shipment to YEA.

9. SECURITY INTEREST:

To secure any indebtedness due and owing from Buyer from time to time, Buyer hereby grants to YEA, and YEA hereby reserves, a continuing purchase money security interest in all Yaskawa-brand and other products heretofore or hereafter sold and delivered to Buyer by YEA, and all related parts, components and accessories therefor, and all proceeds arising from the sale or other disposition of the foregoing, including, but not limited to, cash, accounts, contract rights, accounts receivable, instruments and chattel paper. Buyer shall at no time grant any security interest that conflicts with that granted to YEA herein. Buyer shall cooperate with YEA, and hereby appoints YEA as its attorney-in-fact, to execute and file, on Buyer's behalf, any documents necessary to evidence and perfect YEA's security interest.

10. GOVERNING LAW, FORUM AND JURY WAIVER:

These Standard Terms and the relationship of the parties hereto shall be governed by the internal laws of the State of Illinois, U.S.A., without regard to its choice of law rules. For all claims or disputes arising out of or relating to the sale of products or services by YEA and/or the relationship of Buyer and YEA, Buyer shall file any and all lawsuits or claims exclusively in the state or federal courts located in Cook County, Illinois. Buyer hereby submits to the personal jurisdiction of said courts and waives any claim of improper or inconvenient venue. To the fullest extent permitted by law, Buyer hereby agrees to waive the right to trial by jury for all claims or disputes arising out of or relating to the sale of products or services by YEA and/or the relationship of Buyer and YEA. The parties agree that U.N. Convention of Contracts for the International Sale of Goods shall not apply to their relationship or the sale of products by YEA.

11. MISCELLANEOUS:

(a) Failure on the part of YEA to enforce any of its rights derived from this contract shall never be construed as a waiver of any of YEA's rights.

(b) The invalidity of one or more of the clauses herein shall not affect the validity of the other clauses, which for this purpose are considered severable.

(c) Any use by Buyer of any YEA trademark must be approved by YEA in writing.

(d) Buyer may not delegate its performance or assign its rights under this Agreement except upon the express written consent of YEA. In any case, these Standard Terms shall be binding upon the successors and legal representatives of Buyer.

(e) Buyer shall comply with all applicable laws and regulations regarding the use, import and export of the products sold hereunder. The products and services to be sold hereunder are not intended for use in any nuclear, chemical or weapons production or environmental damage. If Buyer uses the products or services for such or other impermissible purposes, it shall indemnify, hold harmless and defend YEA, all parent and affiliated companies of YEA, from and against all related claims and damages.

(f) All rights and remedies available to YEA under the Uniform Commercial Code and other applicable law are reserved to YEA as remedies in the event of Buyer's default.

RC5 Regenerative Converter Catalog

Data Subject to change without notice.



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