



## BENEFITS OF USING LINE/LOAD REACTORS

**G**uard-AC line/load reactors help keep your equipment running longer by absorbing many of the power line disturbances which otherwise damage or shut down your inverters, variable speed controllers, or other sensitive equipment. They are the modern technology solution to inverter and drive application problems. Guard-AC reactors are harmonic compensated to assure optimum performance in the presence of harmonics. They are very effective at reducing harmonics produced by inverters and drives, and in most cases will help you to meet IEEE 519. Use our harmonic compensated reactors on either the input or output of an adjustable speed drive/inverter. There is no need to de-rate our "harmonic compensated" reactors for harmonics.

Guard-AC reactors are manufactured to the exacting standards of MIL-I-45208, VDE-0550, are UL recognized and CSA certified.

- **UL File #E53094 (1 amp through 250 amps)**
- **CSA File #LR29753-13 (250 amps or less)**

All higher current reactors offer UL recognized insulation systems and construction.

## IMPEDANCE RATINGS

**3% IMPEDANCE** reactors are typically sufficient to absorb power line spikes and motor current surges. They will prevent nuisance tripping of drives or circuit breakers in most applications.

**5% IMPEDANCE** reactors are best for reducing harmonic currents and frequencies. Use them when you must comply with IEEE 519, to reduce motor operating temperature, or to reduce motor noise.

- VIRTUALLY ELIMINATE NUISANCE TRIPPING
- EXTEND SEMICONDUCTOR LIFE
- REDUCE HARMONIC DISTORTION
- REDUCE SURGE CURRENTS
- REDUCE MOTOR TEMPERATURE
- REDUCE MOTOR AUDIBLE NOISE
- IMPROVE POWER FACTOR
- LIMIT SHORT CIRCUIT CURRENT
- HELPS MEET IEEE 519



## REACTOR MASTER SOFTWARE

This easy-to-use software computes reactor specifications for virtually any adjustable speed drive application. It is capable of making computations for any operating frequency, for both input and output applications, and for any desired impedance.

Reactor Master Software is compatible with any DOS system and is a color program but runs on monochrome monitors as well. It is available on either 3 1/2 inch or 5 1/4 inch floppy disks.

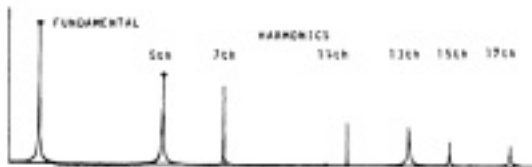
DESCRIPTION	CATALOG NO.
3 1/2" Floppy Disk	RMS-3
5 1/4" Floppy Disk	RMS-5



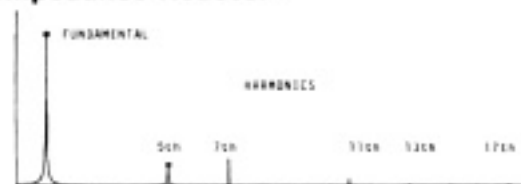
**HARMONIC REDUCTION**

Because all standard Guard-AC reactors are compensated for harmonics (current and frequency), they are extremely effective at reducing the amount of harmonics which are produced by a drive/inverter. Use 5% impedance, harmonic compensated reactors for best reduction of harmonic distortion.

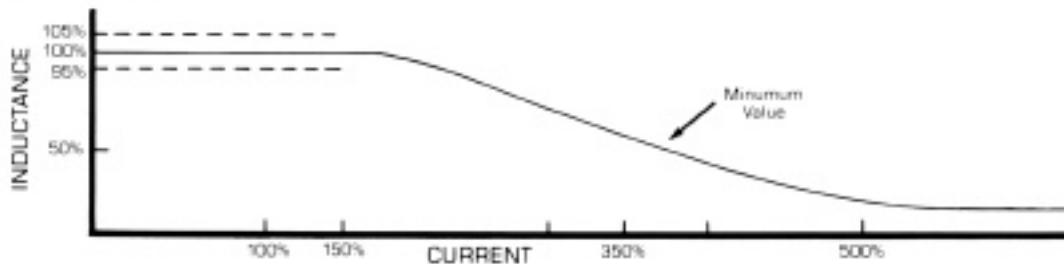
**Typical Harmonic Distortion of PWM Inverter without Reactor**



**Typical Harmonic Distortion with 5% Impedance Reactor**



**Reactor Linearity Curve**



This curve illustrates the extreme linearity of Guard-AC reactors. Even at 150 percent of their current rating, these reactors still have 100% of their nominal inductance. This assures maximum filtering of distortion even in the presence of severe harmonics and best absorption of surges. The tolerance on rated inductance is plus-or-minus 5 percent.

**YOU BENEFIT FROM THESE UNIQUE FEATURES**

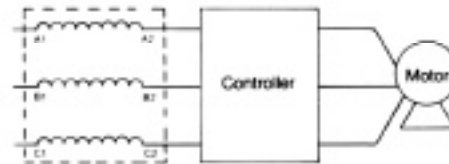
- **HARMONIC COMPENSATION** makes Guard-AC reactors suitable for use on either the drive input or drive output. They are designed to carry full rated fundamental current plus handle current and frequencies associated with harmonics—up to 50 percent more.
- **TERMINALS** are provided as standard to save installation cost and minimize panel space. Finger proof terminals are provided through 80 amps, solid copper box lugs above that to 600 amps.
- **EPOXY IMPREGNATION** minimizes audible noise in the reactor and enhances its structural integrity.
- **SHORT CIRCUIT PROTECTION** is increased because coils are wound with a high number of turns to maximize the air core inductance of the reactor.
- **LOW TEMPERATURE RISE** and low watts loss are achieved through our unique design. This means that heat dissipation requirements are reduced and system efficiency is improved.
- **HIGH SATURATION CURRENT RATING** of Guard-AC reactors maximizes their surge current protection capability. Guard-AC reactors absorb many of the power line disturbances which cause nuisance trips on drives or circuit breakers.



## APPLYING LINE/LOAD REACTORS

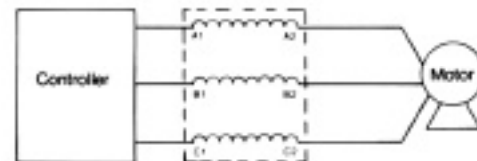
### INPUT TO INVERTER/DRIVE:

On the input of an electronic controller, line reactors protect sensitive electronic equipment from electrical noise created by the drive or inverter (notching, pulsed distortion, harmonics). They also protect the controller from surges or spikes on the incoming power lines, as well as reduce harmonic distortion. They help to meet the requirements of IEEE 519.



### OUTPUT OF INVERTER/DRIVE:

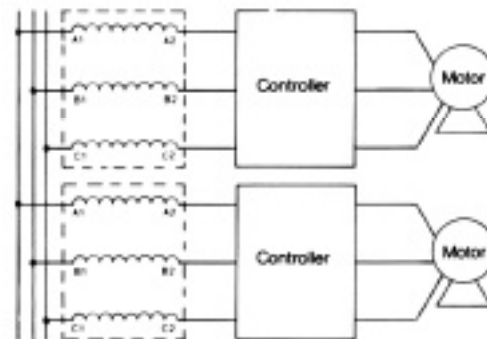
The use of reactors between a controller and a motor (or other load) protects the controller from either a short circuit in the load, or a surge in output current. It accomplishes this by limiting the short circuit current and slowing down and limiting surges.



Our reactors also reduce operating temperature and audible noise in motor loads. Harmonic compensation of all Guard-AC reactors allows standard units to be used here with confidence. They improve the waveform integrity, thus enhancing motor performance and system efficiency.

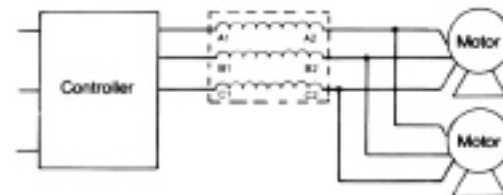
### MULTIPLE CONTROLLERS:

Multiple drives or inverters on a common power line require one reactor per controller. Individual reactors provide filtering between each controller (reduce crosstalk) and also provide optimum surge protection for each unit. A single reactor serving several controllers does not provide adequate protection or filtering when the system is partially loaded.



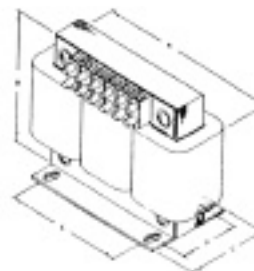
### MULTIPLE MOTORS:

When more than one motor is controlled by a single drive, a single reactor can typically be used between the controller and the motors, as illustrated. The reactor should be sized based on the total motor/load horsepower.

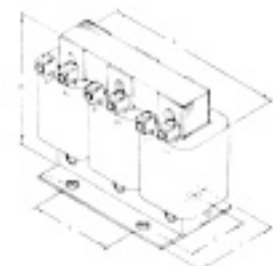


### OUTLINE DIMENSIONS:

All Guard-AC reactors are supplied with field wiring terminals, as illustrated. Units rated 80 amperes or below are supplied with the international terminal block as shown. Reactors rated above 80 amperes are supplied with solid copper box lugs.



(80 amperes and below)



(above 80 amperes)



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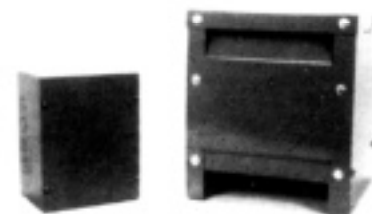
# TRANSFORMERS & REACTORS

## SELECTION TABLE - 600 Volts, 50/60 Hertz (Open Type)

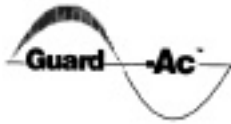
Select Guard-AC line/load reactors based upon motor horsepower, [or kilowatts] and voltage. Verify that the drive and motor continuous current rating is within the fundamental current rating of the reactor.

RATINGS	HP/kw	1/75	15/1.1	2/15	3/22	5/3.7	7.5/55	10/7.5	15/11	20/15	25/18.5	30/22	40/30
208 VOLTS 50/60 HZ	3% Impedance	RL-00401	RL-00801	RL-00801	RL-01201	RL-01801	RL-02501	RL-03501	RL-04501	RL-05501	RL-08001	RL-10001	RL-13001
	5% Impedance	RL-00402	RL-00802	RL-00802	RL-01202	RL-01802	RL-02502	RL-03502	RL-04502	RL-05502	RL-08002	RL-10002	RL-13002
	Amperes (Fundamental)	4	8	8	12	18	25	35	45	55	80	100	130
240 VOLTS 50/60 HZ	3% Impedance	RL-00401	RL-00801	RL-00801	RL-01201	RL-01801	RL-02501	RL-03501	RL-04501	RL-05501	RL-08001	RL-08001	RL-10001
	5% Impedance	RL-00402	RL-00802	RL-00802	RL-01202	RL-01802	RL-02502	RL-03502	RL-04502	RL-05502	RL-08002	RL-08002	RL-10002
	Amperes (Fundamental)	4	8	8	12	18	25	35	45	55	80	80	100
380 VOLTS 50/60 HZ	4% Impedance	RL-00201	RL-00403	RL-00403	RL-00803	RL-01203	RL-01803	RL-01802	RL-02502	RL-03503	RL-04502	RL-04502	RL-08002
415 VOLTS	4% Impedance	RL-00202	RL-00404	RL-00403	RL-00804	RL-00802	RL-01202	RL-01803	RL-02502	RL-03503	RL-03502	RL-04502	RL-05502
480 VOLTS 50/60 HZ	3% Impedance	RL-00201	RL-00201	RL-00402	RL-00402	RL-00802	RL-01202	RL-01802	RL-02502	RL-03502	RL-03502	RL-04502	RL-05502
	5% Impedance	RL-00202	RL-00202	RL-00403	RL-00403	RL-00803	RL-01203	RL-01803	RL-02503	RL-03503	RL-03503	RL-04503	RL-05503
	Amperes (Fundamental)	2	2	4	4	8	12	18	25	35	35	45	55
600 VOLTS 50/60 HZ	3% Impedance	RL-00202	RL-00202	RL-00403	RL-00403	RL-00803	RL-00802	RL-01202	RL-01802	RL-02502	RL-02502	RL-03502	RL-04502
	5% Impedance	RL-00203	RL-00203	RL-00404	RL-00404	RL-00804	RL-00803	RL-01203	RL-01803	RL-02503	RL-02503	RL-03503	RL-04503
	Amperes (Fundamental)	2	2	4	4	8	8	12	18	25	25	35	45

- For higher or lower current ratings, consult distributor.
- For other voltages or frequencies, consult distributor.
- Single phase reactors are also available, consult distributor for proper selection.
- Custom or modified reactors are available to meet specific requirements for special applications such as harmonic filters. Consult distributor for assistance.



NEMA 1 CABINETS



For **Input** or **Output** of adjustable speed drive/inverter systems

This table is suitable for selection of both input and output reactors because their harmonic compensation allows them to be used in either application. Specific current and inductance ratings are indicated. Consult distributor for any special applications (higher current, motor rating different than controller rating, etc.)

50/37.5	60/45	75/55	100/75	125/93	150/112	200/150	250/187	300/225	350/262	400/300	500/375	600/450	750/550					
RL-16001	RL-20001	RL-25001	RL-32001	RL-40001	RL-50001	RL-60001	RL-75001	CONSULT DISTRIBUTOR										
RL-16002	RL-20002	RL-25002	RL-32002	RL-40002	RL-50002	RL-60002	RL-75002											
160	200	250	320	400	500	600	750											
RL-13001	RL-16001	RL-20001	RL-25001	RL-32001	RL-40001	RL-50001	RL-60001							RL-75001				
RL-13002	RL-16002	RL-20002	RL-25002	RL-32002	RL-40002	RL-50002	RL-60002							RL-75002				
130	160	200	250	320	400	500	600							750				
RL-08002	RL-10002	RL-13003	RL-16003	RL-20003	RL-25003	RL-32003	RL-40003							RL-50003	RL-60003	RL-75003		
RL-08002	RL-08002	RL-10002	RL-13002	RL-16002	RL-20003	RL-25002	RL-40003							RL-40002	RL-50002	RL-60003	RL-75003	
RL-08002	RL-08002	RL-10002	RL-13002	RL-16002	RL-20002	RL-25002	RL-32002							RL-40002	RL-50002	RL-50002	RL-60002	RL-75002
RL-08003	RL-08003	RL-10003	RL-13003	RL-16003	RL-20003	RL-25003	RL-32003							RL-40003	RL-50003	RL-50003	RL-60003	RL-75003
80	80	100	130	160	200	250	320	400	500	500	600	750						
RL-05502	RL-08002	RL-08002	RL-10002	RL-13002	RL-16002	RL-20002	RL-25002	RL-32002	RL-40002	RL-40002	RL-50002	RL-60002	RL-75002					
RL-05503	RL-08003	RL-08003	RL-10003	RL-13003	RL-16003	RL-20003	RL-25003	RL-32003	RL-40003	RL-40003	RL-50003	RL-60003	RL-75003					
55	80	80	100	130	160	200	250	320	400	400	500	600	750					

**NEMA 1 CABINETS**

All Guard-AC reactors are available as either open type or in a Nema Type 1 general purpose enclosure. To order a reactor mounted in a cabinet simply change the second last digit of the part number from "0" to "1". Example RL-00802 becomes RL-00812.

REACTOR PART NUMBER	TYPE	W	H	D	WGT.	CABINET
RL-002XX, RL-004XX, RL-008XX RL-012XX, RL-01801, RL-01802	Wall Mount	8	8	6	7#	CAB-8
RL-01803, RL-025XX, RL-035XX, RL-045XX, RL-055XX, RL-080XX, RL-100XX, RL-130XX, RL-160XX, RL-200XX, RL-25001	Floor	13	15	13	31#	CAB-13
RL-25002, RL-25003, RL-320XX, RL-400XX, RL-500XX, RL-600XX	Floor	17	22	17	45#	CAB-17
RL-750XX	Floor	24	30	24	83#	CAB-24

**SPECIFICATIONS**

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**TRANSFORMERS & REACTORS**

PART NUMBER	AMPS	INDUCTANCE	WATTS LOSS	CABINET	A	B	C	D	E	WGT. (KGLBS)
RL-00201	2	12.0mh	9	CAB-8	112/4.4	102/4.0	74/2.9	50/2.0	36/1.44	1.8/4
RL-00202	2	20.0 mh	11	CAB-8	112/4.4	102/4.0	74/2.9	50/2.0	36/1.44	1.8/4
RL-00203	2	32.0 mh	31	CAB-8	112/4.4	102/4.0	74/2.9	50/2.0	36/1.44	1.8/4
RL-00204	2	8.0 mh	10	CAB-8	112/4.4	102/4.0	69/2.7	44/1.73	36/1.44	1.4/3
RL-00401	4	3.0 mh	8	CAB-8	112/4.4	102/4.0	74/2.9	50/2.0	36/1.44	1.8/4
RL-00402	4	6.5 mh	14	CAB-8	112/4.4	102/4.0	74/2.9	50/2.0	36/1.44	2.3/4
RL-00403	4	9.0 mh	34	CAB-8	112/4.4	102/4.0	79/3.1	54/2.1	36/1.44	1.8/5
RL-00404	4	12.0 mh	29	CAB-8	112/4.4	102/4.0	91/3.6	66/2.6	36/1.44	2.7/6
RL-00801	8	1.5 mh	18	CAB-8	152/6.0	122/4.8	79/3.1	54/2.1	50/2.0	3.1/7
RL-00802	8	3.0 mh	30	CAB-8	152/6.0	122/4.8	79/3.1	54/2.1	50/2.0	3.2/8
RL-00803	8	5.0 mh	36	CAB-8	152/6.0	122/4.8	86/3.4	63/2.5	50/2.0	5.0/11
RL-00804	8	7.5 mh	38	CAB-8	152/6.0	122/4.8	86/3.4	63/2.5	50/2.0	5.9/13
RL-01201	12	1.25 mh	22	CAB-8	152/6.0	122/4.8	79/3.1	54/2.1	50/2.0	4.0/9
RL-01202	12	2.5 mh	40	CAB-8	152/6.0	122/4.8	79/3.1	54/2.1	50/2.0	4.5/10
RL-01203	12	4.2 mh	46	CAB-8	152/6.0	122/4.8	94/3.7	70/2.75	50/2.0	6.1/18
RL-01801	18	0.8 mh	31	CAB-8	152/6.0	122/4.8	79/3.1	54/2.1	50/2.0	4.0/9
RL-01802	18	1.5 mh	52	CAB-8	152/6.0	122/4.8	86/3.4	63/2.5	50/2.0	5.4/12
RL-01803	18	2.5 mh	87	CAB-13	183/7.2	145/5.7	97/3.8	68/2.6	76/3.0	7.3/16
RL-02501	25	0.5 mh	35	CAB-13	183/7.2	142/5.6	86/3.4	60/2.3	76/3.0	5.0/11
RL-02502	25	1.2 mh	82	CAB-13	183/7.2	142/5.6	86/3.4	60/2.3	76/3.0	6.3/14
RL-02503	25	2.0 mh	102	CAB-13	183/7.2	145/5.7	97/3.8	66/2.6	76/3.0	8.1/18
RL-03501	35	0.4 mh	55	CAB-13	183/7.2	142/5.6	97/3.8	66/2.6	76/3.0	6.3/14
RL-03502	35	0.8 mh	104	CAB-13	183/7.2	145/5.7	97/3.8	66/2.6	76/3.0	7.3/16
RL-03503	35	1.2 mh	99	CAB-13	229/9.0	178/7.0	122/4.8	80/3.2	76/3.0	14/30
RL-04501	45	0.3 mh	63	CAB-13	229/9.0	178/7.0	122/4.8	80/3.2	76/3.0	10/23
RL-04502	45	0.7 mh	98	CAB-13	229/9.0	178/7.0	122/4.8	80/3.2	76/3.0	13/28
RL-04503	45	1.2 mh	137	CAB-13	229/9.0	178/7.0	135/5.3	93/3.6	76/3.0	18/39
RL-05501	55	0.25 mh	104	CAB-13	229/9.0	178/7.0	122/4.8	80/3.2	76/3.0	11/24
RL-05502	55	0.50 mh	121	CAB-13	229/9.0	178/7.0	122/4.8	80/3.2	76/3.0	12/27
RL-05503	55	0.85 mh	127	CAB-13	229/9.0	178/7.0	142/5.6	99/3.9	76/3.0	18/41
RL-08001	80	0.20 mh	86	CAB-13	274/10.8	208/8.2	142/5.6	88/3.5	92/3.6	19/43
RL-08002	80	0.40 mh	138	CAB-13	274/10.8	211/8.3	142/5.6	88/3.5	92/3.6	23/51
RL-08003	80	0.70 mh	164	CAB-13	274/10.8	213/8.4	160/6.3	117/4.6	92/3.6	25/55
RL-10001	100	0.15 mh	82	CAB-13	274/10.8	211/8.3	142/5.6	88/3.5	92/3.6	21/47
RL-10002	100	0.30 mh	146	CAB-13	274/10.8	208/8.2	147/5.8	93/3.6	92/3.6	23/51
RL-10003	100	0.45 mh	192	CAB-13	274/10.8	213/8.4	160/6.3	106/4.2	92/3.6	33/74
RL-13001	130	0.10 mh	109	CAB-13	229/9.0	178/7.0	122/4.8	80/3.2	76/3.0	14/30
RL-13002	130	0.20 mh	168	CAB-13	274/10.8	213/8.4	147/5.8	93/3.6	92/3.6	26/58
RL-13003	130	0.30 mh	210	CAB-13	274/10.8	213/8.4	160/6.3	106/4.2	92/3.6	32/72
RL-16001	160	0.075 mh	136	CAB-13	274/10.8	213/8.4	135/5.3	80/3.2	92/3.6	24/53
RL-16002	160	0.150 mh	194	CAB-13	274/10.8	213/8.4	142/5.6	88/3.5	92/3.6	25/55
RL-16003	160	0.230 mh	210	CAB-13	274/10.8	213/8.4	160/6.3	106/4.2	92/3.6	30/65
RL-20001	200	0.055 mh	136	CAB-13	274/10.8	213/8.4	160/6.3	106/4.2	92/3.6	32/70
RL-20002	200	0.110 mh	194	CAB-13	274/10.8	213/8.4	160/6.3	106/4.2	92/3.6	34/75
RL-20003	200	0.185 mh	250	CAB-13	274/10.8	216/8.5	204/8.1	150/5.9	92/3.6	53/117
RL-25001	250	0.045 mh	142	CAB-13	274/10.8	213/8.4	160/6.3	106/4.2	92/3.6	34/76
RL-25002	250	0.090 mh	205	CAB-17	366/14.4	284/11.2	170/6.7	128/5.1	117/4.6	57/125
RL-25003	250	0.150 mh	218	CAB-17	366/14.4	284/11.2	173/6.8	131/5.2	117/4.6	64/141
RL-32001	320	0.040 mh	142	CAB-17	366/14.4	284/11.2	185/7.3	144/5.7	117/4.6	53/118
RL-32002	320	0.075 mh	209	CAB-17	366/14.4	284/11.2	185/7.3	144/5.7	117/4.6	63/140
RL-32003	320	0.125 mh	237	CAB-17	366/14.4	284/11.2	198/7.8	156/6.2	117/4.6	66/190
RL-40001	400	0.030 mh	174	CAB-17	366/14.4	284/11.2	170/6.7	128/5.1	117/4.6	51/114
RL-40002	400	0.060 mh	244	CAB-17	366/14.4	284/11.2	170/6.7	128/5.1	117/4.6	54/120
RL-40003	400	0.105 mh	256	CAB-17	366/14.4	287/11.3	198/7.8	156/6.2	117/4.6	61/180
RL-50001	500	0.025 mh	303	CAB-17	366/14.4	287/11.3	198/7.8	156/6.2	117/4.6	72/160
RL-50002	500	0.050 mh	303	CAB-17	366/14.4	287/11.3	198/7.8	156/6.2	117/4.6	85/189
RL-50003	500	0.085 mh	387	CAB-17	366/14.4	287/11.3	244/9.6	208/8.2	117/4.6	120/264
RL-60001	600	0.020 mh	291	CAB-17	366/14.4	287/11.3	210/8.3	169/6.7	117/4.6	100/220
RL-60002	600	0.040 mh	333	CAB-17	366/14.4	287/11.3	210/8.3	169/6.7	117/4.6	100/220
RL-60003	600	0.065 mh	377	CAB-17	366/14.4	287/11.3	244/9.6	208/8.2	117/4.6	122/270
RL-75001	750	0.015 mh	352	CAB-24	559/22.0	419/16.5	208/8.2	157/6.2	183/7.2	110/241
RL-75002	750	0.029 mh	455	CAB-24	559/22.0	419/16.5	218/8.6	166/6.5	183/7.2	128/283
RL-75003	750	0.048 mh	603	CAB-24	559/22.0	419/16.5	233/9.2	183/7.2	183/7.2	163/360