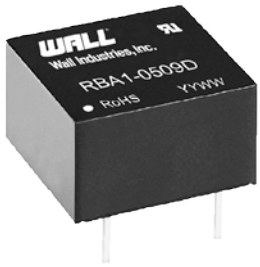
SIP Package "S" Suffix

Size: 0.5in x 0.24in x 0.40in

DIP Package "D" Suffix



Size: 0.5in x 0.40in x 0.303in

FEATURES

- Wide Input Voltage Range
- High Efficiency
- RoHS Compliant
- SIP or DIP Package
- Isolated & Unregulated Single Outputs
- Continuous Short Circuit Protection
- 3 Years Warranty
- International Standard Pinout
- Isolation Voltage of 1500VDC
- EN60950 & UL60950 Approval

DESCRIPTION

The RBA1 series of DC/DC converters offers up to 1 watt of output power in either a DIP or SIP package with international standard pin-out. This series consists of isolated and unregulated single output models with a wide, fixed input range and high efficiency. Features of this series include continuous short circuit protection, isolation voltage of 1500VDC, and RoHS compliance. This series has EN60950 and UL60950 safety approvals. Please contact factory for order details.

MODEL SELECTION TABLE

SIP Package

Model Number	Input Voltage Range	Output Voltage	Output Current		Efficiency		Certification	Load Regulation	Ripple & Noise	Output Power
			Min Load	Max Load	Min.	Typ.				
RBA1-303S	3.3VDC (2.97~3.63VDC)	3.3VDC	30mA	303mA	68%	72%	-	18%	60mVp-p	1W
RBA1-305S		5VDC	20mA	200mA	72%	76%	UL/CE	12%		
RBA1-312S		12VDC	9mA	84mA	76%	80%	UL/CE	7%		
RBA1-0503S	5VDC (4.5~5.5VDC)	3.3VDC	30mA	303mA	68%	72%	-	18%	60mVp-p	1W
RBA1-0505S		5VDC	20mA	200mA	76%	80%	UL/CE	12%		
RBA1-0509S		9VDC	12mA	111mA	76%	80%	UL/CE	8%		
RBA1-0512S		12VDC	9mA	84mA	76%	80%	UL/CE	7%		
RBA1-0515S		15VDC	7mA	67mA	76%	80%	UL/CE	6%		
RBA1-0524S		24VDC	4mA	42mA	76%	80%	UL/CE	5%		
RBA1-1203S	12VDC (10.8~13.2VDC)	3.3VDC	30mA	303mA	68%	72%	-	18%	60mVp-p	1W
RBA1-1205S		5VDC	20mA	200mA	76%	80%	UL/CE	12%		
RBA1-1209S		9VDC	12mA	111mA	76%	80%	UL/CE	8%		
RBA1-1212S		12VDC	9mA	84mA	76%	80%	UL/CE	7%		
RBA1-1215S		15VDC	7mA	67mA	76%	80%	UL/CE	6%		
RBA1-1224S		24VDC	4mA	42mA	76%	80%	UL/CE	5%		
RBA1-1505S	15VDC (13.5~16.5VDC)	5VDC	20mA	200mA	76%	80%	-	12%	60mVp-p	1W
RBA1-1512S		12VDC	9mA	84mA	76%	80%	-	7%		
RBA1-1515S		15VDC	7mA	67mA	76%	80%	-	6%		
RBA1-2403S	24VDC (21.6~26.4VDC)	3.3VDC	30mA	303mA	68%	72%	-	18%	60mVp-p	1W
RBA1-2405S		5VDC	20mA	200mA	76%	80%	UL/CE	12%		
RBA1-2409S		9VDC	12mA	111mA	76%	80%	UL/CE	8%		
RBA1-2412S		12VDC	9mA	84mA	76%	80%	UL/CE	7%		
RBA1-2415S		15VDC	7mA	67mA	76%	80%	UL/CE	6%		
RBA1-2424S		24VDC	4mA	42mA	76%	80%	UL/CE	5%		

MODEL SELECTION TABLE

DIP Package

Model Number	Input Voltage Range	Output Voltage	Output Current		Efficiency		Certification	Load Regulation	Ripple & Noise	Output Power
			Min Load	Max Load	Min.	Typ.				
RBA1-303D	3.3VDC (2.97~3.63VDC)	3.3VDC	30mA	303mA	68%	72%	-	18%	60mVp-p	1W
RBA1-305D		5VDC	20mA	200mA	72%	76%	-	12%		
RBA1-0503D	5VDC (4.5~5.5VDC)	3.3VDC	30mA	303mA	68%	72%	-	18%	60mVp-p	1W
RBA1-0505D		5VDC	20mA	200mA	76%	80%	UL/CE	12%		
RBA1-0509D		9VDC	12mA	111mA	76%	80%	UL/CE	8%		
RBA1-0512D		12VDC	9mA	84mA	76%	80%	UL/CE	7%		
RBA1-0515D		15VDC	7mA	67mA	76%	80%	UL/CE	6%		
RBA1-0524D		24VDC	4mA	42mA	76%	80%	UL/CE	5%		
RBA1-1203D	12VDC (10.8~13.2VDC)	3.3VDC	30mA	303mA	68%	72%	-	18%	60mVp-p	1W
RBA1-1205D		5VDC	20mA	200mA	76%	80%	UL/CE	12%		
RBA1-1209D		9VDC	12mA	111mA	76%	80%	UL/CE	8%		
RBA1-1212D		12VDC	9mA	84mA	76%	80%	UL/CE	7%		
RBA1-1215D		15VDC	7mA	67mA	76%	80%	UL/CE	6%		

MODEL SELECTION TABLE

DIP Package (Cont.)

Model Number	Input Voltage Range	Output Voltage	Output Current		Efficiency		Certification	Load Regulation	Ripple & Noise	Output Power
			Min Load	Max Load	Min.	Typ.				
RBA1-1505D	15VDC (13.5~16.5VDC)	5VDC	20mA	200mA	76%	80%	-	12%	60mVp-p	1W
RBA1-1509D		9VDC	12mA	111mA	76%	80%	-	8%		
RBA1-1515D		15VDC	7mA	67mA	76%	80%	-	6%		
RBA1-2403D	24VDC (21.6~26.4VDC)	3.3VDC	30mA	303mA	68%	72%	-	18%	60mVp-p	1W
RBA1-2405D		5VDC	20mA	200mA	76%	80%	UL/CE	12%		
RBA1-2409D		9VDC	12mA	111mA	76%	80%	UL/CE	8%		
RBA1-2412D		12VDC	9mA	84mA	76%	80%	UL/CE	7%		
RBA1-2415D		15VDC	7mA	67mA	76%	80%	UL/CE	6%		
RBA1-2424D		24VDC	4mA	42mA	76%	80%	UL/CE	5%		

SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%, Nominal Input Voltage, and Rated Output Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	3.3VDC Nominal Input		2.97	3.3	3.63	VDC
	5VDC Nominal Input		4.5	5	5.5	
	12VDC Nominal Input		10.8	12	13.2	
	15VDC Nominal Input		13.5	15	16.5	
	24VDC Nominal Input		21.6	24	26.4	
Input Current	Full Load	3.3VDC Nominal Input		404		mA
		5VDC Nominal Input		277		
		12VDC Nominal Input		115		
		15VDC Nominal Input		83		
		24VDC Nominal Input		57		
	No Load	3.3VDC Nominal Input		30	70	mA
		5VDC Nominal Input		20	60	
		12VDC Nominal Input		15	50	
		15VDC Nominal Input		10	35	
		24VDC Nominal Input		17	30	
Surge Voltage (1 sec. max.)	3.3VDC Nominal Input		-0.7		5	VDC
	5VDC Nominal Input		-0.7		9	
	12VDC Nominal Input		-0.7		18	
	15VDC Nominal Input		-0.7		21	
	24VDC Nominal Input		-0.7		30	
Reflected Ripple Current				15		mA
Input Filter			Filter Capacitor			
Hot Plug			Unavailable			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Output Accuracy			See Tolerance Curves			
Line Regulation	Input Voltage Change: ±1%	3.3VDC			±1.5	-
		Other Models			±1.2	
Load Regulation	10-100% Load		See Table			
Output Power			See Table			
Output Current			See Table			
Maximum Capacitive Load	@Nominal Input Voltage and Full Load				220	µF
Ripple & Noise [1]	20MHz Bandwidth			60	150	mVp-p
Temperature Coefficient	Full Load				±0.03	%/ºC
PROTECTION						
Short Circuit Protection	24VDC Nominal Inputs, RBA1-0524S & RBA1-0524D [2]				1	s
	Other Models		Continuous, Self-Recovery			
ENVIRONMENTAL SPECIFICATIONS						
Operating Temperature	Derating when operating temperature up to 85ºC		-40		105	ºC
Storage Temperature			-55		125	ºC
Case Temperature Rise	Ta=25ºC, Nominal Input, Full Load Output			25		ºC
Storage Humidity	Non-Condensing				95	%RH
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds				300	ºC
MTBF	MIL-HDFK-217F@25ºC		3500			K Hours

SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%, Nominal Input Voltage, and Rated Output Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

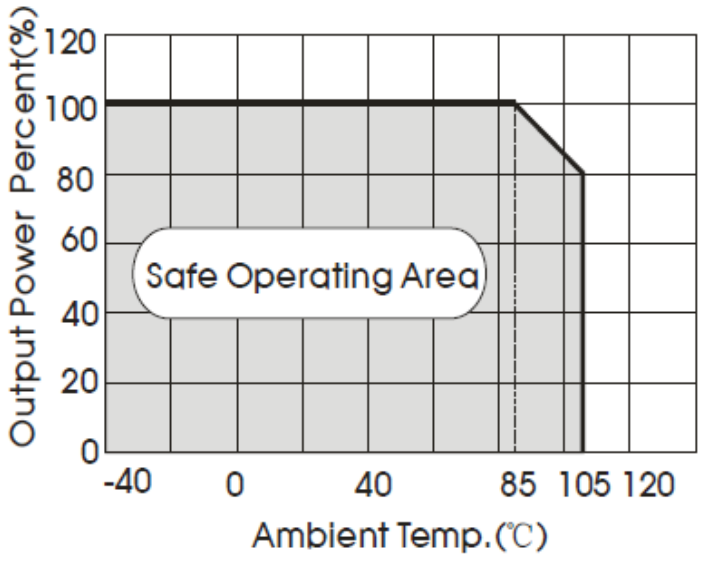
SPECIFICATION	TEST CONDITIONS			Min	Typ	Max	Unit
GENERAL SPECIFICATIONS							
Efficiency	@Full Load				See Table		
Switching Frequency	Full Load, Nominal Input Voltage				100		KHz
Isolation Voltage	Input-Output, test time of 1 minute, leak current less than 1mA			1500			VDC
Isolation Resistance	Input-Output, Isolation Voltage 500VDC			100			MΩ
Isolation Capacitance	Input-Output, 100KHz/0.1V				20		pF
PHYSICAL SPECIFICATIONS							
Weight	SIP Package				0.046oz (1.3g)		
	DIP Package				0.063oz (1.8g)		
Dimensions (L x W x H)	SIP Package				0.46in x 0.24in x 0.4in (11.60mm x 6mm x 10.16mm)		
	DIP Package				0.5in x 0.4in x 0.32in (12.70mm x 10.16mm x 8.20mm)		
Case Material					Black Flame-Retardant Heat-Proof Epoxy Resin (UL94-V0)		
Cooling					Free Air Convection		
SAFETY CHARACTERISTICS							
Safety Approvals			EN60950, UL60950				
EMI	CE		CISPR22/EN55022[3]				Class B
	RE		CISPR22/EN55022[3]				Class B
EMS	ESD	IEC/EN61000-4-2	Contact ±8kV				Perf. Criteria B

NOTES

1. Ripple & noise are measured by “parallel cable” method.
2. Supply voltage must be discontinued at the end of short circuit duration for all these models.
3. See Design Reference for recommended circuit.
4. If product is not operated within required load range, product performance cannot be guaranteed to comply with all parameters in datasheet.
5. Performance parameters of the product models listed in this data sheet are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Contact factory for more information.
6. Product customization available

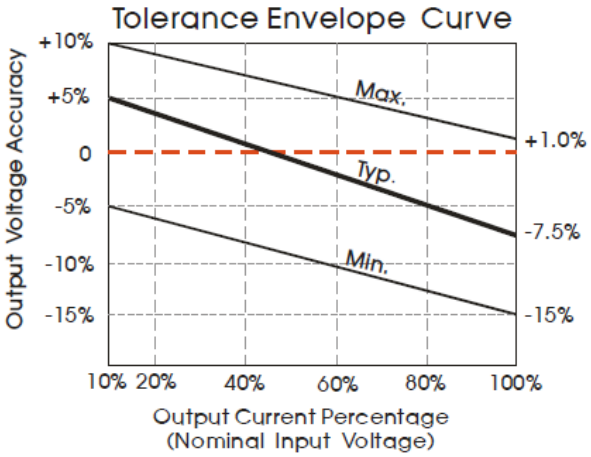
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVE

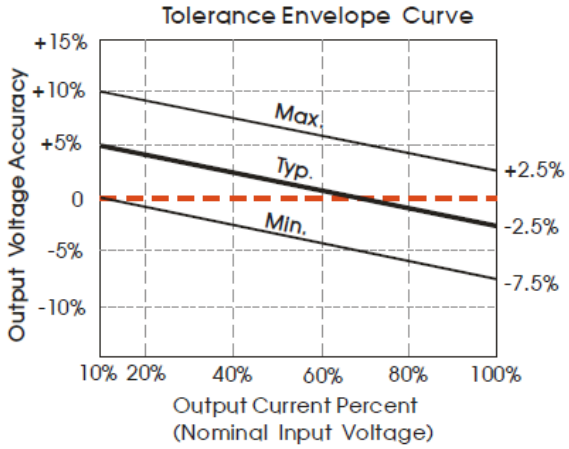


TOLERANCE CURVES

3.3VDC Output

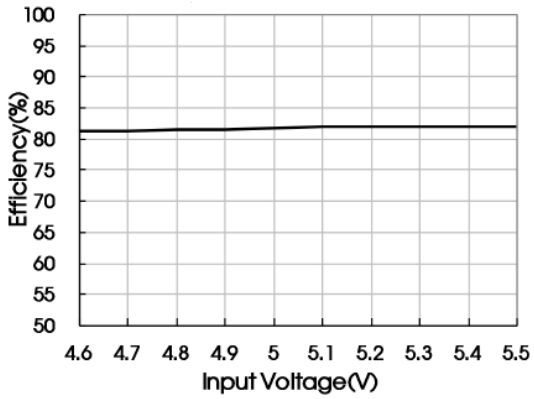


Other Outputs

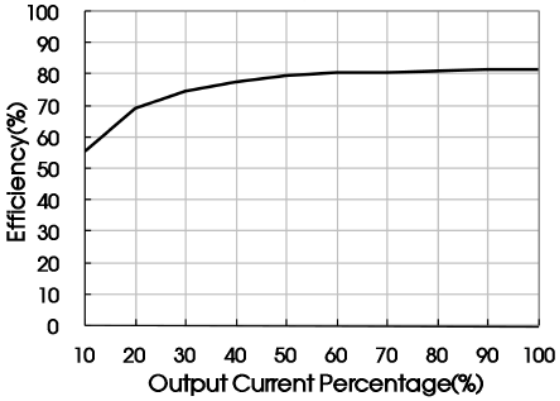


EFFICIENCY CURVES

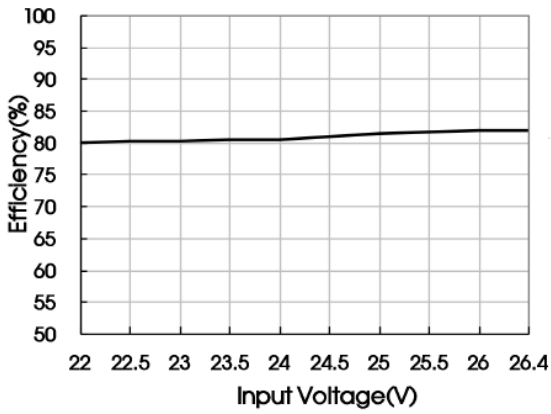
Efficiency vs. Input Voltage (Full Load) RBA1-505S



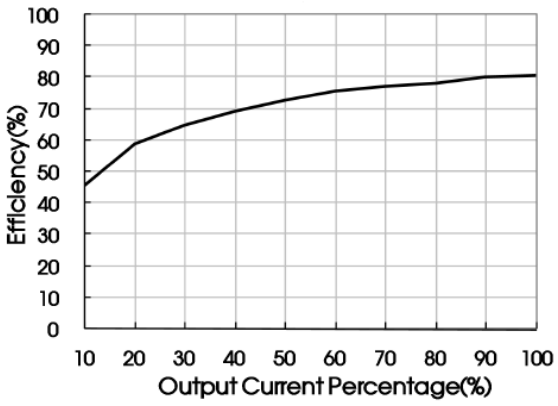
Efficiency vs. Output Load (Vin=5V) RBA1-505S



Efficiency vs. Input Voltage (Full Load) RBA1-2415S

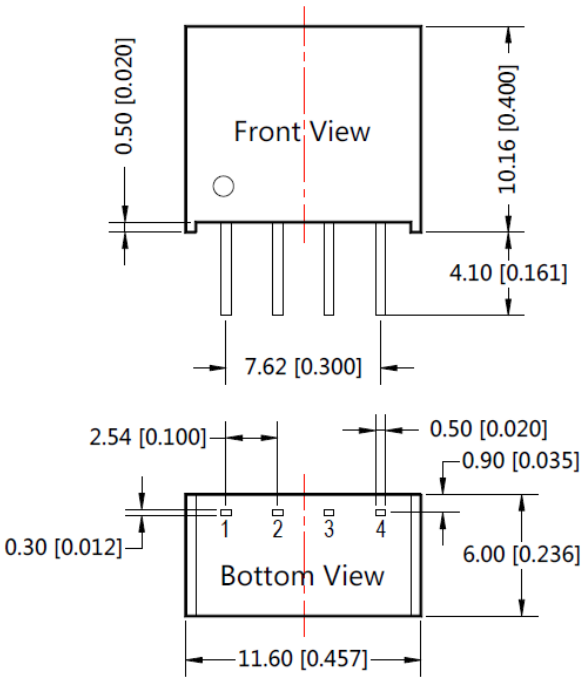


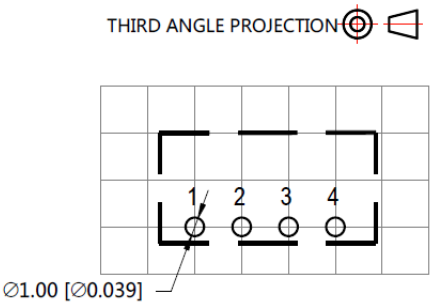
Efficiency vs. Output Load (Vin=24V) RBA1-2415S



MECHANICAL DRAWINGS

SIP Package “S” Suffix





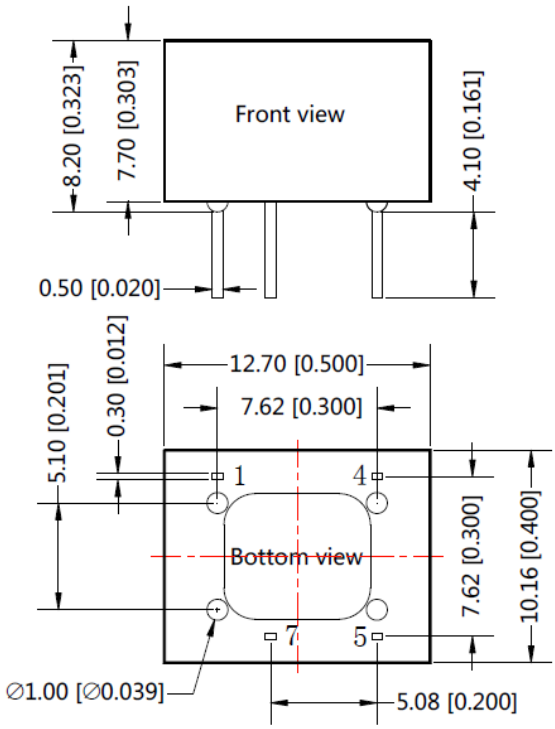
Note: Grid 2.54*2.54mm

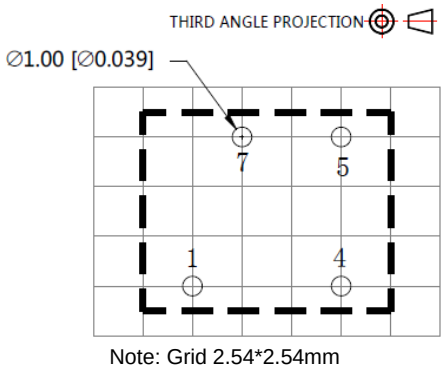
Pin-Out

Pin	Function
1	GND
2	Vin
3	0V
4	+Vo

Notes:
Unit: mm [inch]
Pin section tolerances: ±0.10 [±0.004]
General tolerances: ±0.25 [±0.010]

DIP Package “D” Suffix





Note: Grid 2.54*2.54mm

Pin-Out

Pin	Function
1	GND
4	Vin
5	+Vo
7	0V

Notes:
Unit: mm[inch]
Pin section tolerances: ±0.10 [±0.004]
General Tolerances: ±0.25 [±0.010]

DESIGN REFERENCE

1. Typical Application Circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals. Moreover, choosing a suitable filter capacitor is very important, start-up problems may arise if capacitance is too large. Under the condition of safe and reliable operation, recommended capacitive load values are shown in table below.

Fig 1

Recommended Capacitive Load Value Table

Vin (VDC)	Cin (µF)	Vo (VDC)	Cout (µF)
3.3/5	4.7	3.3/5	10
12	2.2	9	4.7
15	2.2	12	2.2
24	1	15	1
-	-	24	0.47

2. EMC Solution-Recommended Circuit

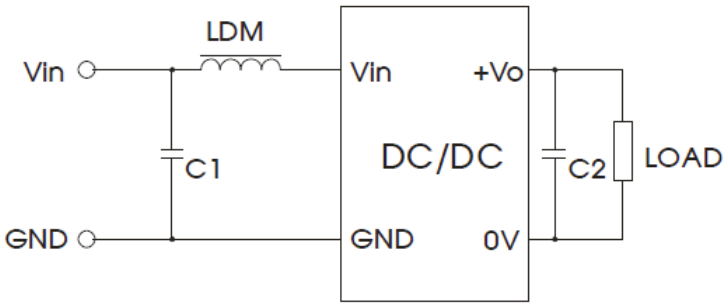


Fig 2

Input Voltage (VDC)		3.3/5/12/15/24
EMI	C1	4.7µF/50V
	C2	Refer to the Cout Fig 1
	LDM	6.8µH

3.Output Load Requirements

In order to ensure the converter works reliably with high efficiency, the minimum load should not be less than 10% rated load when it is used. If the needed power is small, please parallel a resistor on the output side (the sum of the efficient power and resistor consumption power is not less than 10%)

MODEL NUMBER SETUP

RBA	1	-	05	05	S
Series Name	Output Power		Input Voltage	Ouptut Voltage	Package Type
			03: 3.3VDC **05:** 5VDC **12:** 12VDC **15:** 15VDC **24:** 24VDC	**03:** 3.3VDC **05:** 5VDC **09:** 9VDC **12:** 12VDC **15:** 15VDC **24:** 24VDC	**S:** SIP Package **D:** DIP Package

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001-2008 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833