

## Wall Industries, Inc.

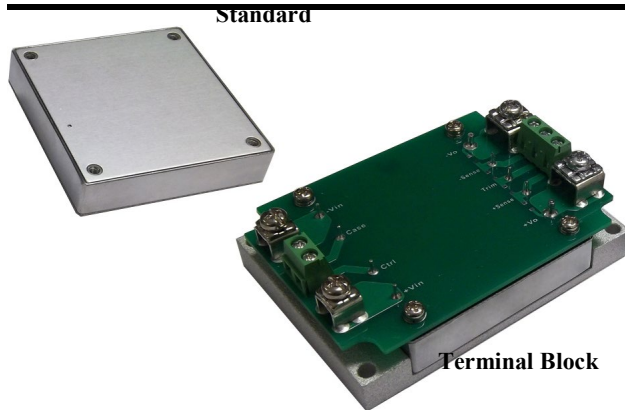
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# DC100 SERIES

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**2:1 Wide Input Voltage Ranges  
100 Watts, Single Outputs  
Industry Standard Half-Brick Footprint  
DC/DC Power Converters**

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### FEATURES

- Soft-Start
- RoHS Compliant
- 2:1 Wide Input Voltage Ranges
- Up to 100 Watts Output Power
- Single Outputs Ranging from 3.3VDC to 48VDC
- Output Current up to 25A
- Under Voltage Lockout
- Six-Sided Shielding
- High Efficiency up to 93%
- No Minimum Load Requirements
- Adjustable Output Voltage
- Industry Standard Half-Brick Footprint
- Remote On/Off Control
- Input to Output Basic Insulation: 2250VDC
- Threaded Inserts and Thru-Hole Inserts Available
- Input Reverse Protection
- Short Circuit, Over Voltage, Over Current, and Over Temperature Protection
- UL60950-1, EN60950-1, and IEC60950-1 Safety Approvals
- Several Mechanical Options Available

### APPLICATIONS

- Wireless Networks
- Telecom / Datacom
- Industry Control Systems
- Semiconductor Equipment
- Distributed Power Architectures
- Military Applications

### OPTIONS

- Pin Length
- Heatsinks
- Thru-Hole Inserts
- Negative Logic Remote On/Off
- Terminal Block
- Terminal Block with EMC Filter

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### DESCRIPTION

The DC100 series of DC/DC power converters provides up to 100 Watts of output power in an industry standard half-brick package and footprint. This series consists of single output models ranging from 3.3VDC to 48VDC with 2:1 wide input voltage ranges of 9~18VDC, 18~36VDC and 36~75VDC. Some features include high efficiency up to 93%, adjustable output voltage, positive remote on/off control, and six-sided shielding. These converters also have short circuit, over voltage, over current, over temperature, and input reverse protection. The DC100 series is RoHS compliant and has UL60950-1, EN60950-1, and IEC60950-1 safety approvals. Several different options are available for this series including negative remote on/off, terminal block, pin length, heatsinks, and thru-hole inserts. Please call factory for more details.

**SPECIFICATIONS: DC100 SERIES**

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.  
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
<b>INPUT SPECIFICATIONS</b>					
Input Voltage Range	12VDC nominal input models	9	12	18	VDC
	24VDC nominal input models	18	24	36	
	48VDC nominal input models	36	48	75	
Start-up Voltage	12VDC nominal input models			9	VDC
	24VDC nominal input models			18	
	48VDC nominal input models			36	
Shutdown Voltage	12VDC nominal input models		7.5		VDC
	24VDC nominal input models		16		
	48VDC nominal input models		34		
Input Surge Voltage (100ms)	12VDC nominal input models			36	VDC
	24VDC nominal input models			50	
	48VDC nominal input models			100	
Input Current	No Load	See Table			
Input Filter <i>(See Note 11)</i>		Pi Type			
Input Reverse Protection <i>(See Note 14)</i>		Parallel diode			
<b>OUTPUT SPECIFICATIONS</b>					
Output Voltage		See Table			
Line Regulation	Low line to high line at full load	-0.1		+0.1	%
Load Regulation	No load to full load	-0.1		+0.1	%
Voltage Accuracy	Full load an nominal Vin	-1		+1	%
Voltage Adjustability <i>(See Note 7)</i>		-20		+10	%
Output Power		See Table			
Output Current		See Table			
Minimum Load		0			%
Ripple & Noise (peak to peak)	20MHz Bandwidth	See Table			
Transient Response Recovery Time	25% load step change		200		µs
Start-Up Time	Power Up	Nominal input and constant resistive load		25	ms
	Remote On/Off			25	ms
Remote Sense <i>(See Note 8)</i>			10		% Vo
Temperature Coefficient		-0.02		+0.02	%/°C
<b>PROTECTION</b>					
Over Voltage Protection Threshold	Hiccup	115		130	% Vo
Over Current Protection Threshold		110		140	% Io
Short Circuit Protection		Hiccup, automatic recovery			
Over Temperature Protection				+115	°C
<b>GENERAL SPECIFICATIONS</b>					
Efficiency	Nominal input voltage and full load	See Table			
Switching Frequency		255	300	330	KHz
Isolation Voltage	I/P to O/P (Basic Insulation)	For 1 minute	2250		VDC
	I/P to Case	For 1 minute	1600		VDC
	O/P to Case	For 1 minute	1600		VDC
Isolation Resistance		1			GΩ
Isolation Capacitance				2500	pF
Maximum Capacitive Load	Minimum input and constant resistive load	See Table			

SPECIFICATIONS: DC100 SERIES						
All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted. We reserve the right to change specifications based on technological advances.						
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
<b>REMOTE ON/OFF CONTROL (See Note 6)</b>						
Positive Logic (standard)	DC/DC ON				Open or 3V < Vr < 12V	
	DC/DC OFF				Short or 0V < Vr < 1.2V	
Negative Logic (optional)	DC/DC ON				Short or 0V < Vr < 1.2V	
	DC/DC OFF				Open or 3V < Vr < 12V	
Input Current of Remote Control Pin	Nominal Vin		-0.5		1	mA
Remote Off State Input Current	Nominal Vin			3		mA
<b>ENVIRONMENTAL SPECIFICATIONS</b>						
Operating Case Temperature Range	Standard		-40		+115	°C
	Terminal Block type		-40		+105	
Storage Temperature	Standard		-55		+125	°C
	Terminal Block type		-40		+105	
Relative Humidity			5		95	% RH
Thermal Shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
Thermal Impedance (See Note 9)	Standard			6.7		°C/Watt
	With 0.24" Heatsink			5.4		
	With 0.45" Heatsink			4.7		
MTBF (See Note 1)	BELLCORE TR-NWT-000332		1,010,000 hours			
	MIL-HDBK-217F		74,160 hours			
<b>PHYSICAL SPECIFICATIONS</b>						
Weight	Standard		3.42oz (97g)			
	"T" suffix models		7.05oz (200g)			
	"TF" suffix models		8.47oz (240g)			
	"TF1" suffix models		26.10oz (740g)			
Dimensions (L x W x H)	Standard		2.4x2.28x0.5 inches (61x57.9x12.7 mm)			
	"T" suffix models		3.35x2.4x1.1 inches (85x61x28 mm)			
	"TF" suffix models		3.35x2.4x1.27 inches (85x61x32.3 mm)			
	"TF1" suffix models		4x3.5x3.5 inches (101.6x88.9x88.9 mm)			
Case Material		Metal				
Base Material		FR4 PCB				
Potting Material		Silicon (UL94-V0)				
Shielding		Six-sided				
<b>SAFETY &amp; EMC CHARACTERISTICS</b>						
Safety Approvals	IEC60950-1, UL60950-1 (See Note 14), EN60950-1					
EMI (See Note 11)	Standard	EN55022				Class A
	TF or TF1 Option	EN55022				Class A
ESD	EN61000-4-2		Air ±8KV			Perf. Criteria A
			Contact ±6KV			
Radiated Immunity	EN61000-4-3		10 V/m			Perf. Criteria A
Fast Transient (See Note 11)	EN61000-4-4		±2KV			Perf. Criteria A
Surge (See Note 11)	EN61000-4-5	EN55024	±1KV			Perf. Criteria A
Conducted Immunity	EN61000-4-6		10 Vrms			Perf. Criteria A

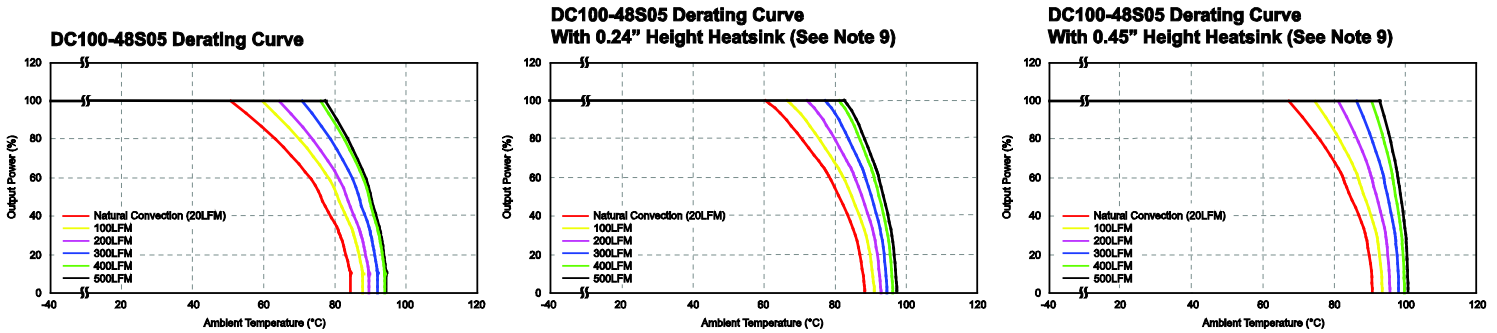
**MODEL SELECTION TABLE**

Model Number	Input Voltage	Output Voltage	Output Current		No Load <sup>(2)</sup> Input Current	Ripple & Noise <sup>(3)(4)</sup>	Output Power	Maximum Capacitive Load <sup>(5)</sup>	Efficiency <sup>(3)</sup>
			Min. load	Full load					
DC100-12S3.3	12 VDC (9 – 18 VDC)	3.3VDC	0mA	25A	155mA	75mVp-p	82.5W	75700µF	90%
DC100-12S05		5 VDC	0mA	20A	150mA	75mVp-p	100W	40000µF	91%
DC100-12S12		12 VDC	0mA	8.4A	180mA	100mVp-p	100W	7000µF	91%
DC100-12S15		15 VDC	0mA	6.7A	180mA	100mVp-p	100W	4460µF	91%
DC100-12S24		24 VDC	0mA	4.2A	90mA	200mVp-p	100W	1750µF	90%
DC100-12S28		28 VDC	0mA	3.6A	100mA	200mVp-p	100W	1280µF	90%
DC100-12S48		48 VDC	0mA	2.1A	100mA	300mVp-p	100W	430µF	90%
DC100-24S3.3	24 VDC (18 – 36 VDC)	3.3VDC	0mA	25A	90mA	75mVp-p	82.5W	75700µF	91%
DC100-24S05		5 VDC	0mA	20A	150mA	75mVp-p	100W	40000µF	93%
DC100-24S12		12 VDC	0mA	8.4A	185mA	100mVp-p	100W	7000µF	93%
DC100-24S15		15 VDC	0mA	6.7A	185mA	100mVp-p	100W	4460µF	93%
DC100-24S24		24 VDC	0mA	4.2A	85mA	200mVp-p	100W	1750µF	92%
DC100-24S28		28 VDC	0mA	3.6A	85mA	200mVp-p	100W	1280µF	92%
DC100-24S48		48 VDC	0mA	2.1A	85mA	300mVp-p	100W	430µF	92%
DC100-48S3.3	48 VDC (36 – 75 VDC)	3.3VDC	0mA	25A	80mA	75mVp-p	82.5W	75700µF	91%
DC100-48S05		5 VDC	0mA	20A	90mA	75mVp-p	100W	40000µF	93%
DC100-48S12		12 VDC	0mA	8.4A	90mA	100mVp-p	100W	7000µF	93%
DC100-48S15		15 VDC	0mA	6.7A	90mA	100mVp-p	100W	4460µF	93%
DC100-48S24		24 VDC	0mA	4.2A	40mA	200mVp-p	100W	1750µF	92%
DC100-48S28		28 VDC	0mA	3.6A	40mA	200mVp-p	100W	1280µF	92%
DC100-48S48		48 VDC	0mA	2.1A	40mA	300mVp-p	100W	430µF	92%

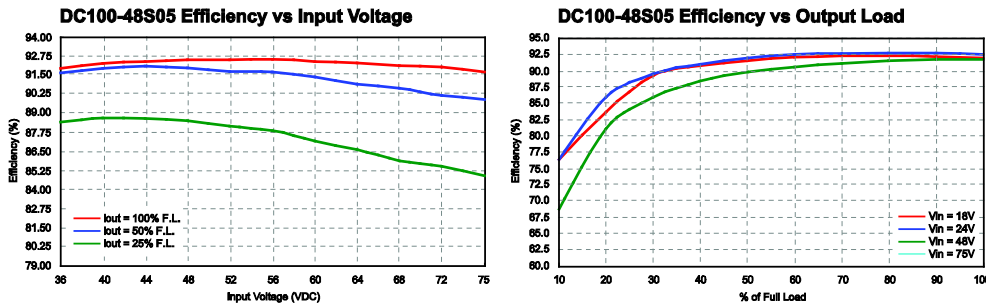
**NOTES**

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.  
MIL-HDBK-217F Notice2 @Ta=25°C, Full load (Ground, Benign, controlled environment).
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- The ripple and noise of 48VDC output voltage models is measured with a 2.2µF/100V X7R 1812 MLCC;  
The ripple and noise of all other output voltages is measured with a 4.7µF/50V X7R 1812 MLCC.
- Test by minimum input and constant resistive load.
- The CTRL pin voltage is referenced to –INPUT. To order negative logic remote on/off control add the suffix “R” to the model number.
- Output voltage is adjustable for 10% trim up or -20% trim down of nominal output voltage by connecting a single resistor between TRIM and +SENSE pins for trim up or between TRIM and -SENSE pins for trim down. To calculate the value of the resistor R<sub>U</sub> and R<sub>D</sub> for a particular output voltage see page 5.
- Maximum output deviation is +10% inclusive of remote sense and trim. If remote sense is not being used the +SENSE should be connected to its corresponding +OUTPUT and likewise the -SENSE should be connected to its corresponding -OUTPUT.
- (1) Thermal test conditions for vertical direction are by natural convection (20LFM).  
(2) Heat sink is optional. See the “Product Options” table on page 6 for suffix options.
- The DC100 series can only meet EN55022 Class A or Class B with external components added. Please contact factory for more information.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. We recommend connecting one aluminum electrolytic capacitor (Nippon chemi-con KY series, 220µF /100V, ESR 48mΩ) in parallel.
- CASE GROUNDING: EMI can be reduced when you connect the four screw bolts to the shield plane.
- This series comes with several different options: negative remote on/off control, heatsinks, pin length, thru-hole inserts, and terminal blocks. See the “Product Options” table on page 6 for more ordering information.
- This product is Listed to applicable standards and requirements by UL.
- CAUTION:** This power converter is not internally fused. An input line fuse must always be used.  
*Due to advances in technology, specifications are subject to change without notice.*

**DERATING CURVES**



**EFFICIENCY GRAPHS**

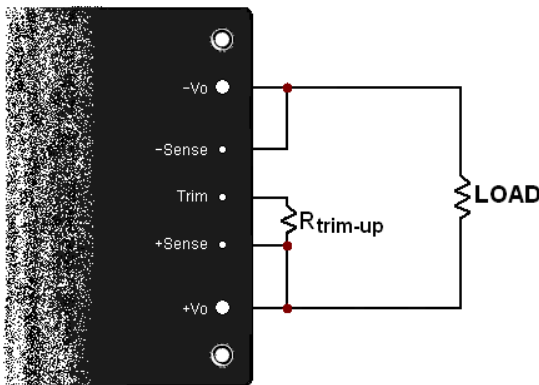


**OUTPUT VOLTAGE ADJUSTMENT**

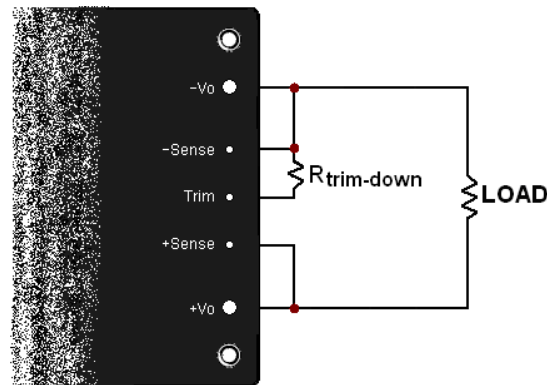
Output is adjustable for 10% trim up or -20% trim down of nominal output voltage by connecting an external resistor between the TRIM pin and either the +SENSE or -SENSE pins. With an external resistor between the TRIM and -SENSE pin, the output voltage set decreases. With an external between the TRIM and +SENSE pin, the output voltage set point increases. Maximum output deviation is +10% inclusive of remote sense. The value of the external resistor can be obtained by the equations below. The external TRIM resistor needs to be at least 1/8W resistor.

$$R_U = \left( \frac{V_{OUT}(100 + \Delta\%)}{1.225\Delta\%} - \frac{(100 + 2\Delta\%)}{\Delta\%} \right) K\Omega$$

$$R_D = \left( \frac{100}{\Delta\%} - 2 \right) K\Omega$$



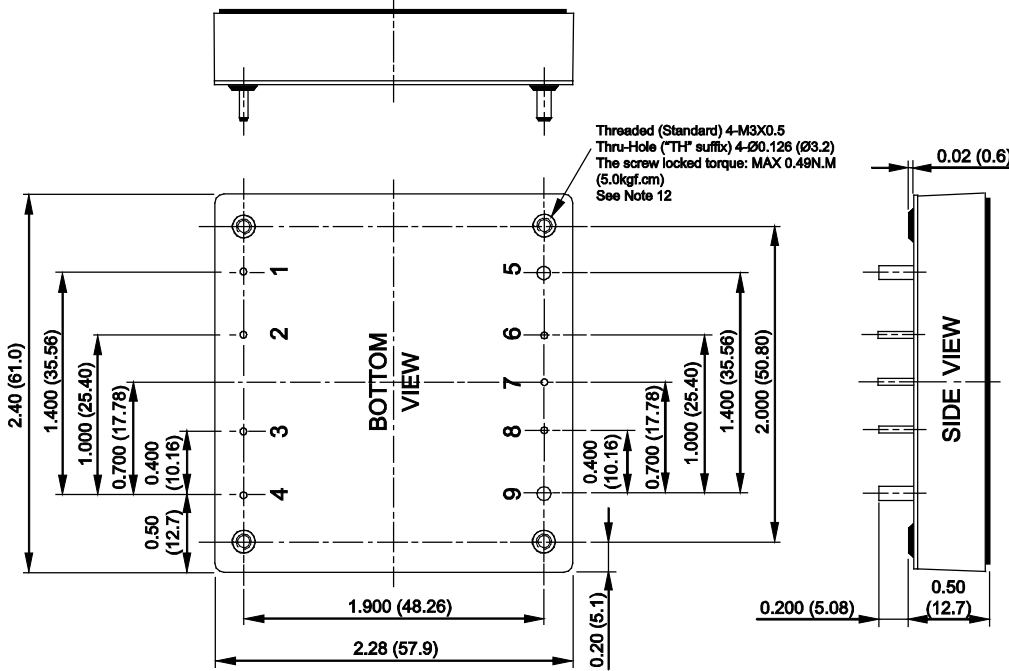
TRIM UP



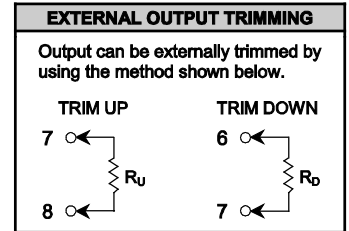
TRIM DOWN

**MECHANICAL DRAWING**

Unit: inches (mm)



PIN CONNECTIONS		
PIN	DEFINE	DIAMETER
1	- INPUT	0.04 in.
2	CASE	0.04 in.
3	CTRL	0.04 in.
4	+ INPUT	0.04 in.
5	- OUTPUT	0.08 in.
6	- SENSE	0.04 in.
7	TRIM	0.04 in.
8	+ SENSE	0.04 in.
9	+ OUTPUT	0.08 in.



- NOTES**
1. Tolerance:  $x.xx \pm 0.02$  ( $x.x \pm 0.5$ )  
 $x.xxx \pm 0.01$  ( $x.xx \pm 0.25$ )
  2. Pin Pitch Tolerance:  $\pm 0.01$  ( $\pm 0.25$ )
  3. Pin Dimension Tolerance:  $\pm 0.004$  ( $\pm 0.1$ )

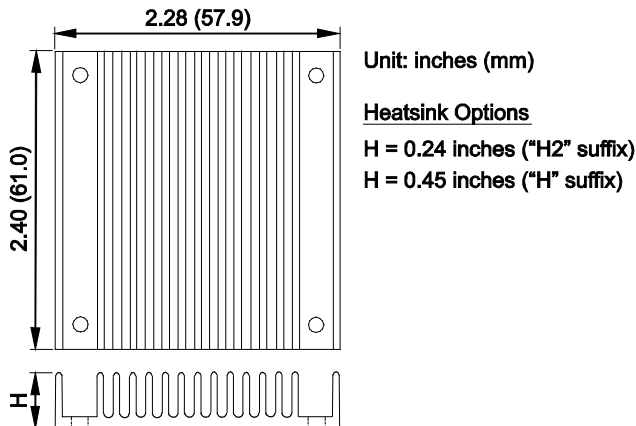
Product Options		Suffix	Product Options		Suffix
Negative Remote ON/OFF Logic	0.200" pin length	R	Heatsink <sup>(1)</sup>	H = 0.45" Vertical	H
	0.145" pin length	RL		H = 0.24" Horizontal	H1
Positive Remote ON/OFF Logic	0.200" pin length	None		H = 0.24" Vertical	H2
	0.145" pin length	S		H = 0.45" Horizontal	H3
Thru-Hole Inserts (No Thread) <sup>(1)</sup>	Ø0.126 thru-hole (no thread) Inserts	TH	Terminal Block <sup>(2)(3)</sup>	Wall Mounted	T
				Wall Mounted with EMC Filter <sup>(2)</sup>	TF
				Wall Mounted with Fin Type Heatsink and EMC Filter <sup>(2)(3)</sup>	TF1

**NOTES**

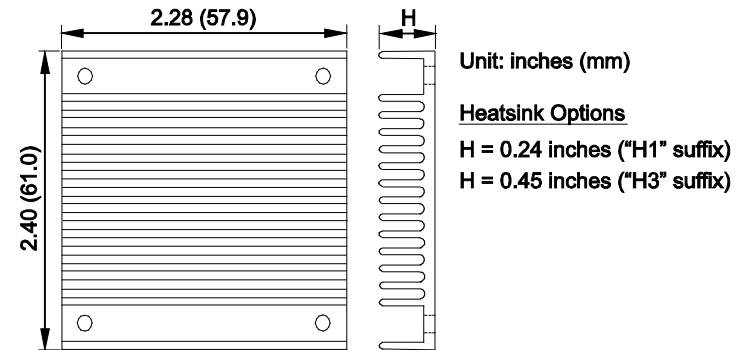
1. Models with thru-hole inserts cannot be equipped with a heatsink.
2. Models with EMC filter (suffix "TF" and "TF1") meet EN55011, EN55022 Class A.
3. "TF1" models have an ambient operating temperature of -40°C to +85°C (without derating).

**HEATSINK OPTIONS**

Vertical Fin Orientation (Suffixes "H", "H2")

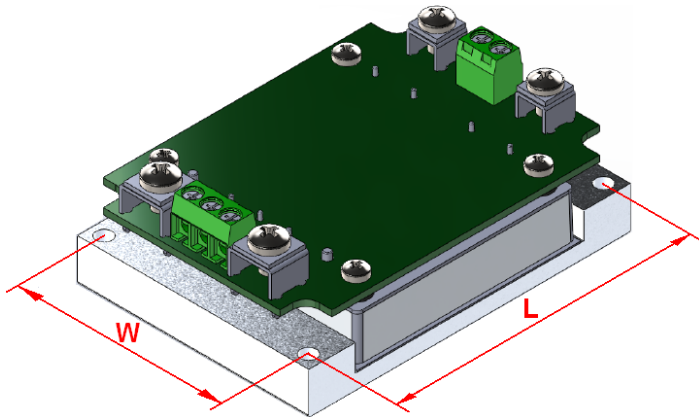


Horizontal Fin Orientation (Suffixes "H1", "H3")

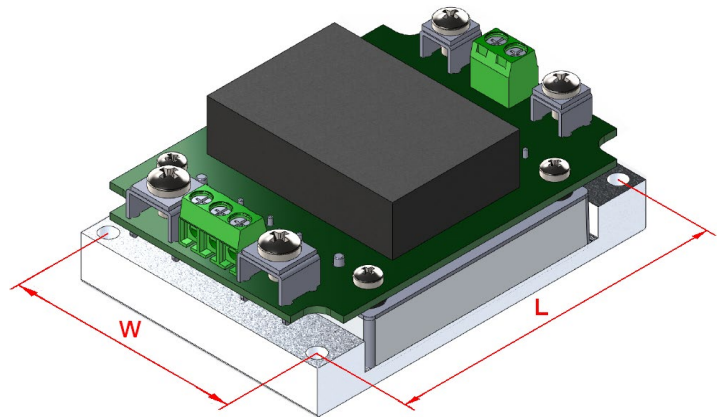


## TERMINAL BLOCK OPTIONS

Wall Mounted without EMC Filter (Suffix “T”)



Wall Mounted with EMC Filter (Suffix “TF”)



Terminal Block Type	T	TF <sup>(2)</sup>	TF1 <sup>(2)(3)</sup>
Weight	7.05oz (200g)	8.47oz (240g)	26.10oz (740g)
Dimensions	3.35 x 2.4 x 1.1 inches (85 x 61 x 28 mm)	3.35 x 2.4 x 1.27 inches (85 x 61 x 32.3 mm)	4.0 x 3.5 x 3.5 inches (101.6 x 88.9 x 88.9 mm)
Thru-Hole Inserts (WxL)	2.126 x 3.071 inches (54.00 x 78.00 mm)	2.126 x 3.071 inches (54.00 x 78.00 mm)	2.126 x 3.071 inches (54.00 x 78.00 mm)

## MODEL NUMBER SETUP

DC	100	-	24	S	12
Series Name	Output Power		Input Voltage	Single Output	Output Voltage
	100: 100 Watts		12: 9~18 VDC 24: 18~36 VDC 48: 36~75 VDC	S: single	3.3: 3.3 VDC 05: 5 VDC 12: 12 VDC 15: 15 VDC 24: 24 VDC 28: 28 VDC 48: 48 VDC

R	TH	H	TF
Remote On/Off & Pin Length	Thru-Hole Inserts <sup>(1)</sup>	Heatsink <sup>(1)</sup>	Terminal Block <sup>(2)(3)</sup>
None: positive Logic, 0.200" pin length S: positive Logic, 0.145" pin length R: negative Logic, 0.200" pin length RL: negative Logic, 0.145" pin length	None: threaded inserts TH: Ø0.126 thru-hole inserts <sup>(1)</sup>	None: no heatsink H: 0.45" vertical H1: 0.24" horizontal H2: 0.24" vertical H3: 0.45" horizontal	None: no terminal block T: wall mounted TF: wall mounted with EMC filter <sup>(2)</sup> TF1: wall mounted with fin type heatsink and EMC filter <sup>(2)(3)</sup>

### NOTES

1. Models with thru-hole inserts cannot be equipped with a heatsink.
2. Models with EMC filter (suffix “TF” and “TF1”) meet EN55011, EN55022 Class A.
3. “TF1” models have an ambient operating temperature of -40°C to +85°C (without derating).



## 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 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](mailto:sales@wallindustries.com)  
Web: [www.wallindustries.com](http://www.wallindustries.com)  
Address: 37 Industrial Drive  
Exeter, NH 03833

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