



Size:
2.28 x 1.45 x 0.50 inches
(57.9 x 36.8 x 12.7 mm)

Applications:

- Railway Systems
- Wireless Networks
- Telecom/Datacom
- Industry Control Systems
- Semiconductor Equipment

FEATURES

- Soft Start
- Single Outputs
- Input Under Voltage Protection
- High Efficiency up to 90%
- Remote ON/OFF Control
- 4:1 Ultra Wide Input Voltage Ranges
- No Minimum Load Required
- Low Stand-by Power Consumption
- Industry Standard Quarter-brick Package
- Up to 132 Watts Maximum Output Power
- 2250VDC I/O Basic Insulation
- Short Circuit, Over Voltage, Over Load, & Over Temp. Protection
- UL60950-1, EN60950-1, IEC60950-1, & EN50155 Safety Approvals
- CE Mark Meets 2006/95/EC, 2011/95/EC, and 2004/108/EC
- Compliant to RoHS EU Directive 2011/65/EU
- Optional Heatsinks Available (Suffix "HS")
- Threaded (Standard) or Thru-Hole (Optional) Inserts Available
- Railway Applications

DESCRIPTION

The DCQAW150 series of DC/DC power converters provides up to 132 Watts of output power in a 2.28" x 1.45" x 0.5" industry standard quarter-brick package. This series has single output models with 4:1 wide input voltage ranges of 8.5-36VDC, 16.5-75VDC, and 40-160VDC. Some features include high efficiency up to 90%, 2250VDC I/O basic insulation, and remote ON/OFF control. These converters are also protected against input under voltage, short circuit, over voltage, over load, and over temperature conditions. All models are RoHS compliant and have UL60950-1, EN60950-1, IEC60950-1, and EN50155 safety approvals. Several different options are available for this series including negative logic remote ON/OFF, heatsinks, and thru-hole inserts.

MODEL SELECTION TABLE

Model Number	Input Voltage	Output Voltage	Output Current		Output Ripple & Noise	No Load Input Current	Output Power	Efficiency	Maximum Capacitive Load
			Min Load	Max Load					
DCQAW150-24S33	24 VDC (8.5 - 36 VDC)	3.3 VDC	0mA	30A	75mVp-p	25mA	99W	88%	91,000µF
DCQAW150-24S05		5 VDC	0mA	24A	75mVp-p	25mA	120W	89%	48,000µF
DCQAW150-24S12		12 VDC	0mA	10A	100mVp-p	25mA	120W	88%	8300µF
DCQAW150-24S15		15 VDC	0mA	8A	100mVp-p	25mA	120W	89%	5300µF
DCQAW150-24S24		24 VDC	0mA	5A	200mVp-p	25mA	120W	88%	2100µF
DCQAW150-24S30		30 VDC	0mA	4A	200mVp-p	25mA	120W	89%	1300µF
DCQAW150-24S48		48 VDC	0mA	2.5A	300mVp-p	25mA	120W	88%	520µF
DCQAW150-48S33		48 VDC (16.5 - 75 VDC)	3.3 VDC	0mA	30A	75mVp-p	15mA	99W	88%
DCQAW150-48S05	5 VDC		0mA	24A	75mVp-p	15mA	120W	89%	48,000µF
DCQAW150-48S12	12 VDC		0mA	10A	100mVp-p	15mA	120W	89%	8300µF
DCQAW150-48S15	15 VDC		0mA	8A	100mVp-p	15mA	120W	90%	5300µF
DCQAW150-48S24	24 VDC		0mA	5A	200mVp-p	15mA	120W	90%	2100µF
DCQAW150-48S30	30 VDC		0mA	4A	200mVp-p	15mA	120W	90%	1300µF
DCQAW150-48S48	48 VDC		0mA	2.5A	300mVp-p	15mA	120W	90%	520µF
DCQAW150-110S33	110 VDC (40 - 160 VDC)		3.3 VDC	0mA	30A	75mVp-p	8mA	99W	88%
DCQAW150-110S05		5 VDC	0mA	24A	75mVp-p	8mA	120W	89%	48,000µF
DCQAW150-110S12		12 VDC	0mA	11A	100mVp-p	8mA	132W	88%	9170µF
DCQAW150-110S15		15 VDC	0mA	8.6A	100mVp-p	8mA	129W	89%	5730µF
DCQAW150-110S24		24 VDC	0mA	5.5A	200mVp-p	8mA	132W	89%	2290µF
DCQAW150-110S30		30 VDC	0mA	4.4A	200mVp-p	8mA	132W	89%	1470µF
DCQAW150-110S48		48 VDC	0mA	2.7A	300mVp-p	8mA	129.6W	89%	560µF

NOTES

- Input Source Impedance: The power modules will operate to specifications without external components, assuming that the source voltage has very low impedance and reasonable input voltage regulation. Highly inductive source impedances can affect the stability of the power module. Since real-world voltage sources have finite impedance, performance is improved by adding an external filter capacitor.
 - For 24VDC & 48VDC input models we recommend using Nippon Chemi-con KY series, 100µF/100V.
 - For 110VDC input models we recommend using Ruby-con BXF series, 39µF/200V.
- 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.
- The DCQAW150 series can only meet EMI 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.
 - For 24VDC & 48VDC input models we recommend connecting two aluminum electrolytic capacitors (Nippon chemi-con KY series, 220µF/100V) in parallel.
 - For 110VDC input models we recommend connecting three aluminum electrolytic capacitors (Ruby-con BXF series, 100µF/250V) in parallel.
- Both positive logic and negative logic remote ON/OFF control is available. Positive logic remote ON/OFF comes standard; for negative logic remote ON/OFF add the suffix "R" to the model number (Ex: DCQAW150-48S24R).
- Optional heatsinks available. See page 5 for ordering details.
- M3 x 0.5 threaded-thru inserts come standard. For Ø.126 thru-hole inserts add the suffix "TH" to the model number (Ex: DCQAW150-48S24TH). Models with thru-hole inserts cannot be equipped with a heatsink.
- BASE-PLATE GROUNDING: EMI can be reduced when you connect the case pin and the four screw bolts to the shield plane.

CAUTION: This power module is not internally fused. An input line fuse must always be used.

SPECIFICATIONS: DCQAW150 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.

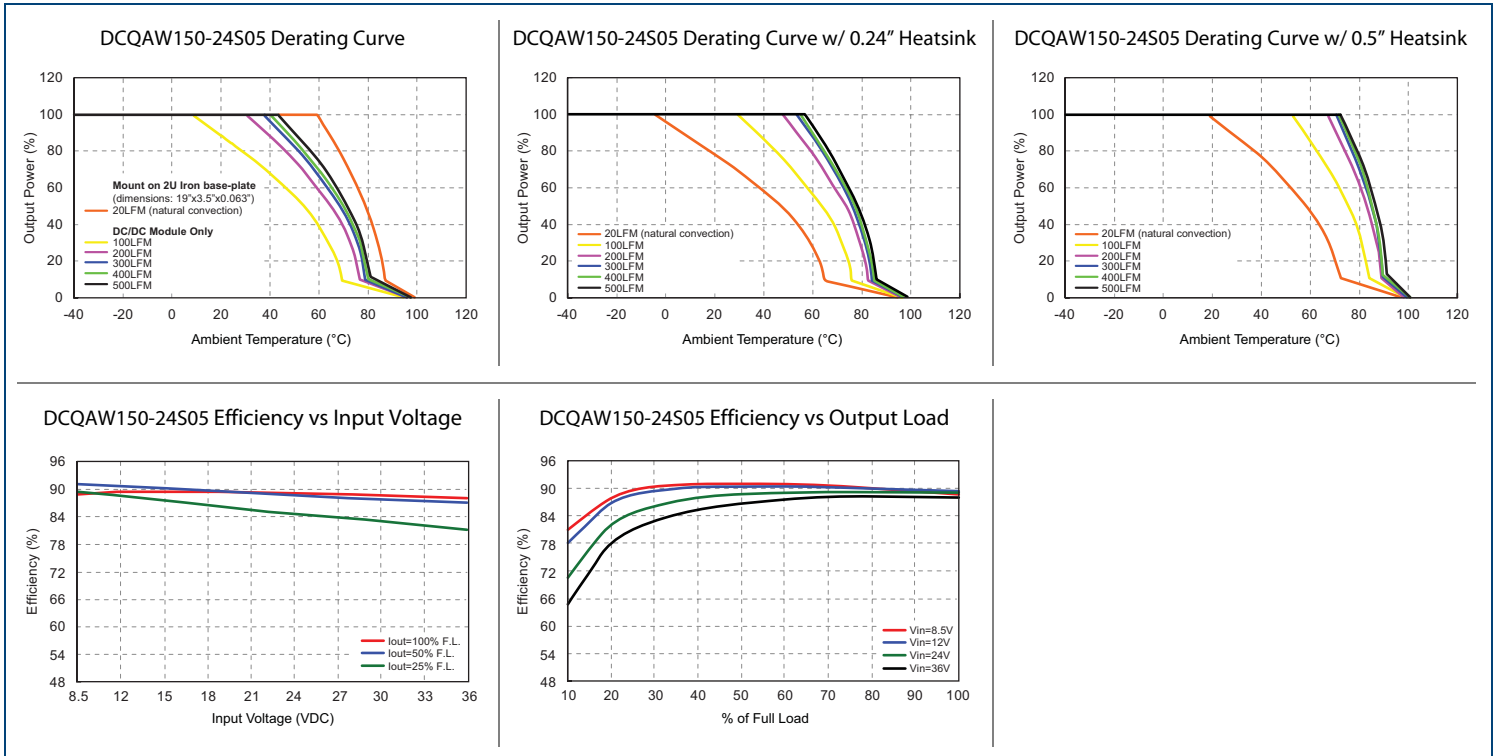
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	24VDC nominal input models		8.5	24	36	VDC
	48VDC nominal input models		16.5	48	75	
	110VDC nominal input models		40	110	160	
Start-Up Voltage	24VDC nominal input models				9	VDC
	48VDC nominal input models				18	
	110VDC nominal input models				43	
Shutdown Voltage	24VDC nominal input models		7.3		8.1	VDC
	48VDC nominal input models		15.5		16.3	
	110VDC nominal input models		33.0		36.0	
Input Surge Voltage (1sec, max.)	24VDC nominal input models				50	VDC
	48VDC nominal input models				100	
	110VDC nominal input models				185	
Input Current	No Load		See Table			
Input Filter (See Note 1)			Pi type			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy			-1.0		+1.0	%
Line Regulation	Low line to high line at full load		-0.1		+0.1	%
Load Regulation	No load to full load	3.3V & 5V Output Models	-0.2		+0.2	%
		Others	-0.1		+0.1	
Voltage Adjustability	Maximum output deviation is inclusive of remote sense		-20		+10	%
Remote Sense (See Note 2)	% of Vo (nom)				10	%
Output Power			See Table			
Output Current			See Table			
Minimum Load			0			%
Maximum Capacitive Load	Minimum input and constant resistive load		See Table			
Ripple & Noise (20MHz BW)	Measured with a 22µF/25V X7R MLCC	3.3V & 5V Output Models		75		mVp-p
	Measured with a 22µF/25V X7R MLCC	12V & 15V Output Models		100		
	Measured with a 4.7µF/50V X7R MLCC	24V & 30V Output Models		200		
	Measured with a 2.2µF/100V X7R MLCC	48V Output Models		300		
Transient Response Recovery Time	25% load step change			250		µs
Start-Up Time	Constant resistive load	Power Up		75	100	ms
		Remote On/Off		75	100	
Temperature Coefficient			-0.02		+0.02	%/°C
PROTECTION						
Short Circuit Protection			Continuous, automatic recovery			
Over Load Protection	% of rated Iout; hiccup mode		110		140	%
Over Voltage Protection	% of Vo (nom); hiccup mode		115		130	%
Over Temperature Protection				+110		°C
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load		See Table			
Switching Frequency			270	300	330	kHz
Isolation Voltage	1 minute (basic insulation)	Input to Output	2250			VDC
		Input/Output to Base-plate	2250			VDC
Isolation Resistance	500VDC		1			GΩ
Isolation Capacitance					1500	pF
REMOTE ON/OFF (See Note 5)						
Positive Logic (standard)	Referenced to -Input pin	DC/DC ON	Open or 3~12 VDC			
		DC/DC OFF	Short or 0~1.2VDC			
Negative Logic (optional)	Referenced to -Input pin	DC/DC ON	Short or 0~1.2 VDC			
		DC/DC OFF	Open or 3~12VDC			
Input Current of Remote Control Pin	Nominal Vin		-0.5		1	mA
Remote OFF State Input Current	Nominal Vin			3		mA

SPECIFICATIONS: DCQAW150 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
ENVIRONMENTAL SPECIFICATIONS					
Operating Base-Plate Temperature		-40		+100	°C
Storage Temperature Range		-55		+125	°C
Thermal Impedance (See Note 6)	Vertical direction by natural convection (20LFM)	Without Heatsink	9		°C/W
		With 0.24" Height Heatsink	7.1		
		With 0.5" Height Heatsink	5.5		
		Mounted on 2U iron base-plate	2.8		
Relative Humidity		5		95	% RH
Thermal Shock		EN61373, MIL-STD-810F			
Vibration		EN61373, MIL-STD-810F			
MTBF	BELLCORE TR-NWT-000332 Case 1: 50% Stress, Ta=40°C	974,200 hours			
	MIL-HDBK-217F Ta=25°C, full load (G/B, controlled environment)	85,730 hours			
PHYSICAL SPECIFICATIONS					
Weight		2.26oz (64g)			
Dimensions (L x W x H)		2.28x1.45x0.50 inch (57.9x36.8x12.7 mm)			
Case Material		Aluminum base-plate with plastic case			
Potting Material		Silicon (UL94-V0)			
SAFETY & EMC CHARACTERISTICS					
Safety Approvals		IEC60950-1, UL60950-1, EN60950-1, EN50155			
EMI (See Note 3)	EN55011, EN55022	Class B			
ESD	EN61000-4-2	Air ±8kV Contact ±6kV	Perf. Criteria A		
Radiated Immunity	EN61000-4-3	20 V/m	Perf. Criteria A		
Fast Transient (See Note 4)	EN61000-4-4	±2kV	Perf. Criteria A		
Surge (See Note 4)	EN61000-4-5	EN55024: ±2kV EN50155: ±2kV	Perf. Criteria A		
Conducted Immunity	EN61000-4-6	10 Vrms	Perf. Criteria A		

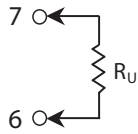
CHARACTERISTIC CURVES



OUTPUT VOLTAGE ADJUSTMENT

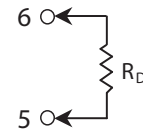
Output is adjustable for 10% trim up or -20% trim down of nominal output voltage by connecting an external resistor between the TRIM pin and either the +SENSE or -SENSE pins. With an external resistor between the TRIM and -SENSE pin, the output voltage set decreases. With an external resistor between 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.

TRIM UP



$$R_U = \left(\frac{5.1V_{OUT}(100 + \Delta\%)}{1.225\Delta\%} - \frac{(511 + 10.22\Delta\%)}{\Delta\%} \right) K\Omega$$

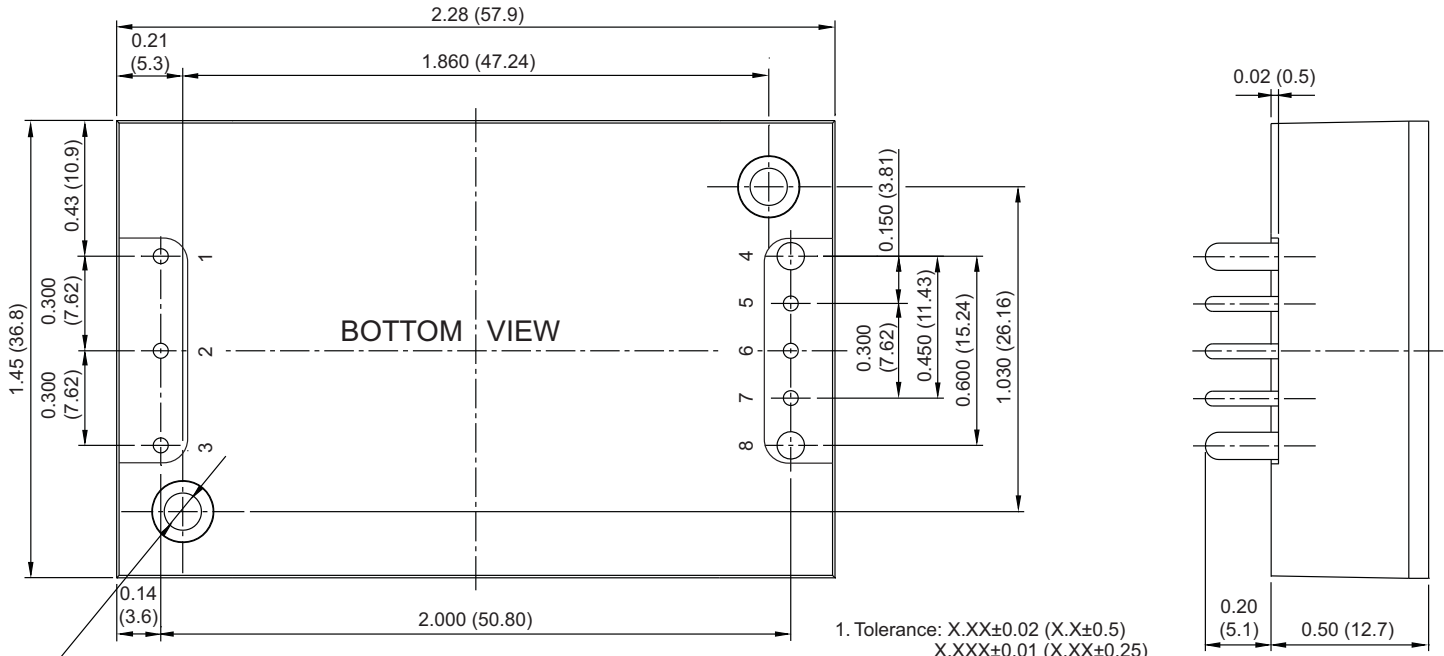
TRIM DOWN



$$R_D = \left(\frac{511}{\Delta\%} - 10.22 \right) K\Omega$$

MECHANICAL DRAWING

Unit: inches (mm)



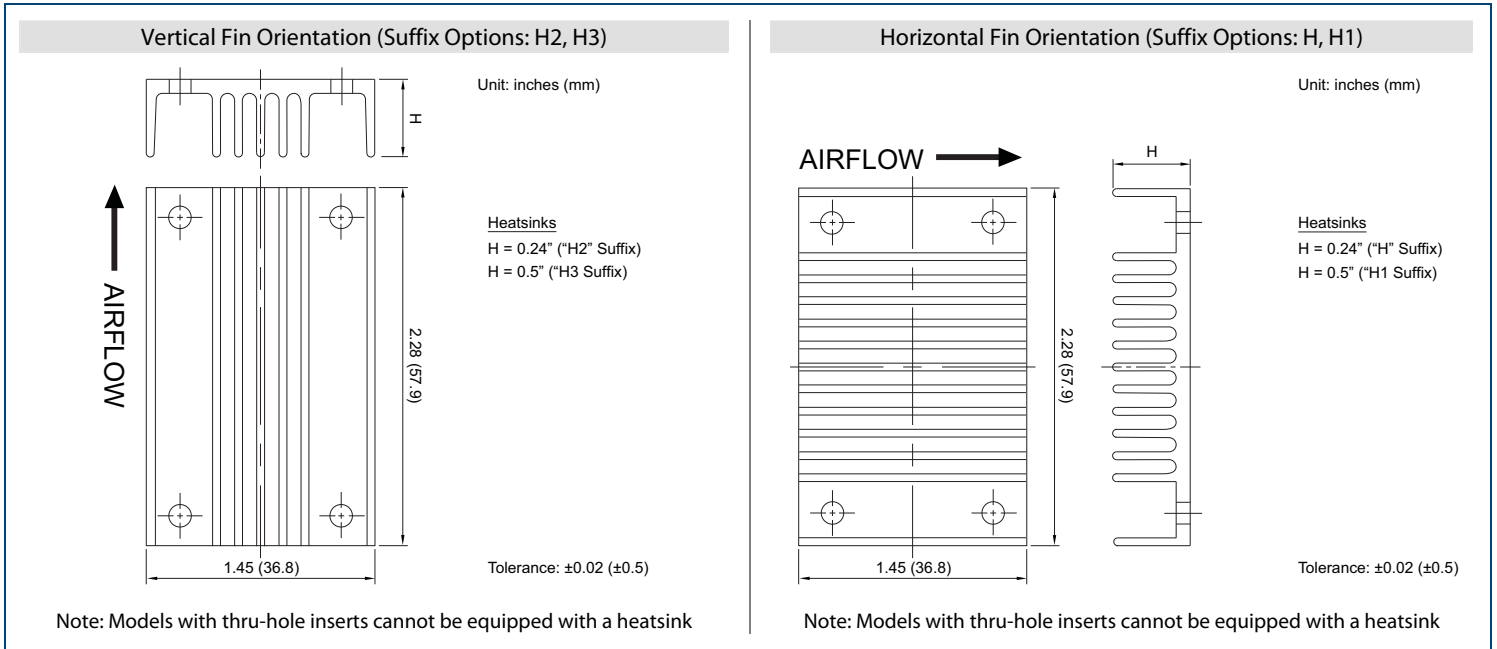
Threaded (Standard) 2-M3X0.5
Thru-Hole (Optional) 2-Ø0.126 (Ø3.2)

- 1. Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
- 2. Pin Pitch Tolerance: ±0.01 (±0.25)
- 3. Pin Dimension Tolerance: ±0.004 (±0.1)

PRODUCT OPTIONS		SUFFIX
Positive Logic Remote ON/OFF Control (Standard)		None
Negative Logic Remote ON/OFF Control		R
Threaded-Thru Inserts (Standard)	M3x0.5	None
Thru-Hole Inserts (No Thread) ⁽¹⁾	Ø0.126 thru-hole (no thread) inserts	TH
Heatsink ⁽¹⁾	H = 0.24" Horizontal	H
	H = 0.5" Horizontal	H1
	H = 0.24" Vertical	H2
	H = 0.5" Vertical	H3
NOTES		
1. Models with thru-hole inserts cannot be equipped with a heatsink.		

PIN CONNECTIONS		
PIN	FUNCTION	PIN Ø
1	-INPUT	Ø.04 (1.02)
2	CTRL	Ø.04 (1.02)
3	+INPUT	Ø.04 (1.02)
4	-OUTPUT	Ø.06 (1.52)
5	-SENSE	Ø.04 (1.02)
6	TRIM	Ø.04 (1.02)
7	+SENSE	Ø.04 (1.02)
8	+OUTPUT	Ø.06 (1.52)

HEATSINK OPTIONS



MODEL NUMBER SETUP

DCQAW	150	-	48	S	05	R	H ⁽¹⁾
Series Name	Output Power		Input Voltage	Output Quantity	Output Voltage	Remote ON/OFF	Hole Thread & Heatsink Options
	150: 150 Watts		24: 8.5~36 VDC 48: 16.5~75 VDC 110: 40~160 VDC	S: Single Output	33: 3.3 VDC 05: 5 VDC 12: 12 VDC 15: 15 VDC 24: 24 VDC 30: 30 VDC 48: 48 VDC	None: Positive Logic R: Negative Logic	None: M3x0.5 Threaded-thru Inserts TH: Ø.126 Thru-hole Inserts ⁽¹⁾ H: 0.24" Horizontal Heatsink H1: 0.5" Horizontal Heatsink H2: 0.24" Vertical Heatsink H3: 0.5" Vertical Heatsink

(1) Models with thru-hole inserts cannot be equipped with a heatsink.

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.

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