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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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Intelligent MP Series

Up to 1500 Watts

Data Sheet

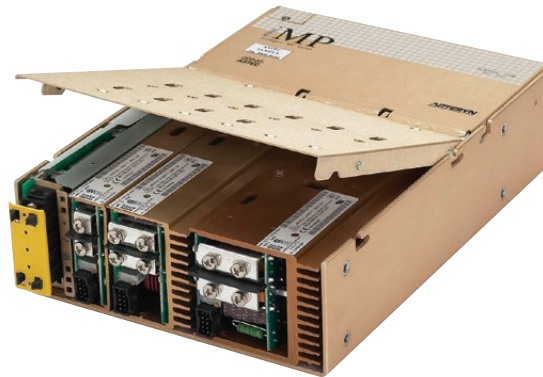
Total Power: Up to 1500 W
Input Voltage: 85 - 264 Vac
 120 - 300 Vdc
of Outputs: Up to 21

SPECIAL FEATURES

- Full medical EN60601 approval
- Intelligent I²C control
- Voltage adjustment on all outputs (manual or I²C)
- Configurable input and output OK signals and indicators
- Configurable inhibit/enable
- Configurable output UP/DOWN sequencing
- Configurable current limit (foldback or constant current)
- High power density (8.8 W/cu-in)
- Intelligent fan (speed control/fault status)
- Downloadable GUI from website
- Customer provided air option
- uP controlled PFC input with active inrush protection
- I²C monitor of voltage, current, and temp
- Programmable voltage, current limit, inhibit/enable through I²C
- Optional extended hold-up module (SEMI F47 compliance)
- Increased power density to 50% over standard MP
- External switching frequency sync input
- Optional conformal coating
- Industrial temp range (-40 °C to 70 °C)
- No preload required
- Industrial shock/vibration (> 50G's)

SAFETY

- UL UL60950/UL2601**
- CSA CSA22.2 No. 234 Level 5
- UV EN60950/EN60601-1**
- BABT Compliance to EN60950/EN60601 BS7002
- CB Certificate and report
- CE Mark to LVD



iMP™

PMBus®
 Power Management.
 Defined.

Electrical Specifications

Input	
Input range	85 - 264 Vac; 120 - 300 Vdc (limited to 300 Vdc in medical applications)
Frequency	47 - 440 Hz
Inrush current	40 A peak maximum (soft start)
Efficiency	Up to 85% @ full case load
Power Factor	0.99 typ. meets EN61000-3-2 (n/a @ 440 Hz)
Turn-on time	AC on 2.0 sec typ., inhibit/enable 150 ms typical Programmable delay; 50 ms internal turn-on delay (Dual Output only)
EMI filter	CISPR 22/EN55022 Level "B"***
Leakage current	300 µA max. @ 240 Vac; 47 - 63 Hz
Radiated EMI	CISPR 22/EN55022 Level "B"***
Holdover storage	20 ms minimum (independent of input Vac) additional 34 ms holdover storage with optional HUP module (SEMI F47 compatible). For iMP4 15 ms (low-line), 10 ms (high-line)
AC OK	> 5 ms early warning min. before outputs lose regulation Full cycle ride thru (50 Hz) (n/a on iMP4 > 750 W @ 90 Vac)
Harmonic distortion	Meets EN61000-3-2
Isolation	Meets EN60950 and EN60601 Input to output, input to ground: 2000 Vac; output to ground: 400 Vdc
Global inhibit / enable	TTL, Logic "1" and Logic "0"; configurable
Input fuse (internal)	iMP4: 16 A; iMP8: 20 A; iMP1: 25 A (both lines fused)
Warranty	2 years

Electrical Specifications

Output	
Adjustment range*	± 10% minimum all outputs (manual) (full module adjustment range using I ² C)
Factory set point accuracy	1%
I ² C output program accuracy	± 5%
Margining	± 4 - 6% nominal analog (single output module only)
Overall regulation	0.4% or 20 mV max. (1500 W modules 1% max.) (36 W modules 4% maximum)
Ripple	RMS: 0.1% or 10 mV, whichever is greater Pk-Pk: 1.0% or 50 mV, whichever is greater Bandwidth limited to 20 MHz
Dynamic response	< 2% or 100 mV, with 25% load step
Recovery time	To within 1% in < 300 µsec
Overcurrent protection**	Configurable through I ² C (calibration required). Single output module and main output of the dual output module 105 - 120% of rated output current. Aux output of dual output module 105 - 140% of rated output current
Short-circuit protection	Protected for continuous short-circuit. Recovery is automatic upon removal of short
Overvoltage protection*	Configurable through I ² C
	Single output module: 2 - 5.5 V 122 - 134%; 6 - 60 V 110 - 120%
	Dual output module: 2 - 6 V 122 - 134%; 8 - 28 V 110 - 120%
	Triple output module: 110 - 120% of highest voltage rating

Output (cont.)	
Reverse voltage protection	100% of rated output current
Thermal protection* (OTP and OTW)	Configurable through I ² C All outputs disabled when internal temp exceeds safe operating range. > 5 ms warning (AC OK signal) before shutdown
Remote sense	Up to 0.5 V total drop (not available on triple output module)
Single wire parallel	Current share to within 2% of total rated current
DC OK*	± 5% of nominal. Configurable through I ² C
Minimum load	Not required
Housekeeping bias voltage	5 Vdc @ 1.0 A max. present whenever AC input is applied (Optional 2.0 A available)
Module inhibit*	Configured and controlled through I ² C
Switching frequency	250k Hz accepts external sync signal
Output/Output isolation	> 1 Megohm, 500 V
External sync	TTL clock input signal used to adjust switching frequency. Frequency 500 kHz ± 20%; Duty cycle 40 - 55%

* Can be controlled via I²C

** Controlled via I²C but requires load calibration

Internal Part Number Reference Table

Part #	Where X =	Description	Module Code
73-580-0001i	N/A	iMP8 Case	iMP8
73-690-0001i	N/A	iMP1 Case	iMP1

Environmental Specifications

Operating temperature	-40 ° to 70 °C ambient. Derate each output 2.5% per degree from 50 ° to 70 °C. (-20 °C start up)
Storage temperature	-40 °C to +85 °C
Electromagnetic susceptibility	Designed to meet EN61000-4; -2, -3, -4, -5, -6, -8, -11 Level 3
Humidity	Operating; non-condensing 10% to 95% RH
Vibratio	IEC68-2-6 to the levels of IEC721-3-2
MTBF demonstrated	> 550,000 hours at full load, 220 Vac and 25 °C ambient conditions

Output Module Line-up

Module Code	1	2	3	5	4	—
Module Type	Single	Single	Single	Single	Dual	Triple
Max output power	210 W	360 W	750 W	1500 W	144 W	36 W
Max output current	35 A	60 A	150 A	140 A	10 A	2 A
Output voltages available*	2 - 60 V	2 - 60 V	2 - 60 V	6 - 60 V	8 - 15*, 24 - 28; 8 - 15*, 8 - 15*; 8 - 15*, 2 - 6; 2 - 6, 2 - 6; 24 - 28, 24 - 28; 24 - 28, 2 - 6	8-15, 8-15, 2-6; 8-15, 8-15, 8-15; 8-15, 8-15, 18-28; 8-15, 18-28, 2-6
Standard voltage increments	25	25	25	18	16	18
Remote sense	Yes	Yes	Yes	Yes	Yes	No
Remote margin	Yes	Yes	Yes	Yes	No	No
V-Program - I ² C Control	Yes	Yes	Yes	Yes	Yes	No
Active Current Share	Yes	Yes	Yes	Yes	Yes	No
Module Inhibit - I ² C Control	Yes	Yes	Yes	Yes	Yes	Yes
Module Inhibit - Analog	Yes	Yes	Yes	Yes	Yes	No
Overvoltage/Overcurrent protection	Yes	Yes	Yes	Yes	Yes	Yes
Minimum load required	No	No	No	No	No	No
Slots occupied in any iVS case	1	2	3	4	1	1

* Note: Contact Factory for extended range down to 6V

Output Module Voltage/Current*

Voltage	Voltage Code	Single Output Module Code				Dual Output***		Triple Output			I ² C Adjustment Ranges****
		1	2	3	5	4	4	-	-	-	
2 V	A	35 A	60 A	150 A	300 A	10 A	10 A	-	-	2 A	1.8 - 2.2
2.2 V	B	35 A	60 A	150 A	300 A	10 A	10 A	-	-	2 A	2.0 - 2.4
3 V	C	35 A	60 A	150 A	300 A	10 A	10 A	-	-	2 A	2.7 - 3.3
3.3 V	D	35 A	60 A	150 A	300 A	10 A	10 A	-	-	2 A	3.0 - 3.6
5 V	E	35 A	60 A	150 A	300 A	10 A	10 A	-	-	2 A	4.5 - 5.5
5.2 V	F	35 A	60 A	144 A	288 A	10 A	10 A	-	-	2 A	4.7 - 5.7
5.5 V	G	34 A	58 A	136 A	273 A	10 A	10 A	-	-	2 A	5.0 - 6.1
6.0 V	H	23 A	42 A	97.5 A	250 A	10 A*	10 A*	-	-	2 A	5.4 - 6.6
8.0 V	I	20 A	36 A	84.4 A	187.5 A	10 A	4 A	1 A	1 A	1 A	7.2 - 8.8
10 V	J	18 A	32 A	75 A	140 A	10 A	4 A	1 A	1 A	1 A	9.0 - 11.0
11 V	K	17 A	31 A	68 A	136.3 A	10 A	4 A	1 A	1 A	1 A	9.9 - 12.1
12 V	L	17 A	30 A	62.5 A	125 A	10 A	4 A	1 A	1 A	1 A	10.8 - 13.2
14 V	M	14 A	21 A	53.5 A	107 A	9 A	4 A	1 A	1 A	1 A	12.6 - 15.4
15 V	N	14 A	20 A	50 A	100 A	8 A	4 A	1 A	1 A	1 A	13.5 - 16.5
18 V	O	11 A	19 A	41.6 A	83.3 A	-	-	-	0.5 A	0.5 A	16.2 - 19.8
20 V	P	10.5 A	18 A	37.5 A	75 A	-	-	-	0.5 A	0.5 A	18.0 - 22.0
24 V	Q	8.5 A	15 A	30 A	62.5 A	4 A	2 A	-	0.5 A	0.5 A	21.6 - 26.4
28 V	R	6.7 A	11 A	26.8 A	53.5 A	3 A	2 A	-	0.5 A	0.5 A	25.2 - 30.8
30 V	S	6.5 A	11 A	25 A	50 A	-	-	-	-	-	27.0 - 33.0
33 V	T	6.2 A	10.9 A	22.7 A	35.8 A	-	-	-	-	-	29.7 - 36.3
36 V	U	5.8 A	10 A	20.8 A	35.8 A	-	-	-	-	-	32.4 - 39.6
42 V	V	4.2 A	7.5 A	16 A	35.7 A	-	-	-	-	-	37.8 - 46.2
48 V	W	4.0 A	7.5 A	15.6 A	31.2 A	-	-	-	-	-	43.2 - 52.8
54 V	X	3.7 A	6.0 A	13.9 A	27.7 A	-	-	-	-	-	48.6 - 59.4
60 V	Y	3.5 A	6.0 A	12.5 A	25 A	-	-	-	-	-	54.0 - 66.0

Contact Factory											
Special*	Z	35 A	60 A	150 A	300 A	-	10 A				2.3 - 2.6
Special*	Z	35 A	60 A	150 A	300 A	-	10 A				3.7 - 4.4
Special*	Z	20 A	36 A	80 A	140 A	-	8 A				6.7 - 7.1

* Note: Contact Factory for extended range down to 6 V.
 ** Increments of current not shown can be achieved by paralleling modules (add currents of each module selected).
 *** Total output power on dual model must not exceed 144 W.
 **** For single output modules only.
 Green reference lines indicate physical module groupings

Ordering Notes:

- The cases and modules of both MP and iMP series can be interchanged to allow more flexibility. If intelligent modules are used with non-intelligent cases, a numeric code "4" is placed at the end of the module code (ex. 4LL0 becomes 4LL4).
- USB to I²C module order code 73-769-001

Parallel Codes

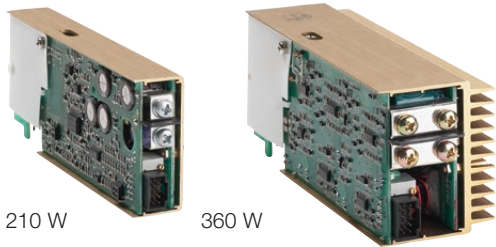
0 = no parallel
 1 = 1 & 2
 2 = 2 & 3
 3 = 3 & 4
 4 = 4 & 5
 5 = 3 & 4 & 5
 6 = 5 & 6
 7 = 4 & 5 & 6
 8 = 6 & 7
 9 = 3 & 4, 6 & 7
 A = 1 & 2, 3 & 4, 5 & 6
 C = 2 & 3, 4 & 5
 E = 3 & 4, 5 & 6
 F = 2 & 3, 4 & 5, 6 & 7

Ordering Information

Case Size	Module/Voltage/Option Codes	Case Option Codes	Software Code	Hardware Code
iMP1*	3L0 - 2E2 - 1Q1 - 4LL0	00	A	###
<p>Case Size (mm) 4 = 2.5" x 5" x 10"; 750 W - 1158 W, 5 Slots (63.5 x 127 x 254 mm) 8 = 2.5" x 7" x 10"; 1000 W - 1200 W, 6 Slots (63.5 x 177.8 x 254 mm) 1 = 2.5" x 8" x 11"; 1200 W - 1500 W, 7 Slots (63.5 x 203.2 x 279.4 mm)</p>	<p>Module Codes Module/voltage/option codes Module codes: (None) = 36 W triple O/P (1 slot) 1 = 210 W single O/P (1 slot) 2 = 360 W single O/P (2 slot) 3 = 750 W single O/P (3 slot) 4 = 144 W dual O/P (1 slot) 5 = 1500 W single O/P (4 slot) 6 - 9 = future Voltage Codes: See Output Module Voltage/Current table above Option Codes: 0 = Standard 1 = Module enable 2 = Constant current 3 = 1 & 2 combined 4 = Set for use in standard (non-intelligent case) 5 = Shutdown mode for 1500 W 6 = 1 & 5 combined 7 - 9 = future</p>	<p>Case Option Codes First digit 0 - 9, A - Z parallel code (See Parallel Codes table above) Second digit 0 = No options 1 = Reverse air 3 = Global enable 4 = Fan idle with inhibit 5 = Opt 1 + Opt 3 6 = Opt 1 + Opt 4 7 = Opt 3 + Opt 4 8 = Opt 1 + 3 + 4 9 = RS485 73-544-002 A = RS485 73-544-002 + Reverse air C = Opt 3 + Opt 9 D = CAN BUS 73-544-003 E = Opt 3 + Opt D</p>	<p>Software code used for configuration change. "A" is standard</p>	<p>Factory assembled for hardware of firmware mods.</p>

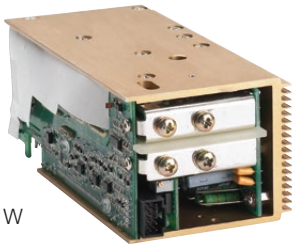
* Note: Add "E" after iMP4 to denote IEC input option. e.g. iMP4E (Not available on iMP8 or iMP1)

Single



210 W

360 W



750 W



1500 W (2.0 - 8.0 V)



1500 W (10 - 60 V)

1500 W with Bus Bar Adapter Option (used with the 10 - 60 V module)



Dual



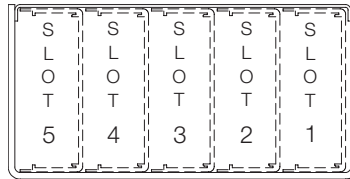
144 W

Triple



36 W

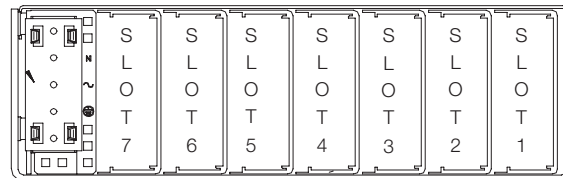
iMP4 (AC input on opposite side)



iMP4 = 2.5" x 5" x 10" 5 available slots (63.5 x 127 x 254 mm)

Input
 90 - 264 Vac 750 W max.
 180 - 264 Vac 1158 W max.

iMP8 and iMP1



iMP1 only

iMP8 = 2.5" x 7" x 10" 6 available slots (63.5 x 177.8 x 254 mm)

Input
 85 - 264 Vac 1000 W max.
 180 - 264 Vac 1200 W max.

iMP1 = 2.5" x 8" x 11" 7 available slots (63.5 x 203.2 x 279.4 mm)

1200 W max. 1500 W max.

Pin Connectors

Figure 1. AC Input

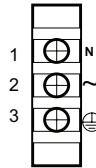
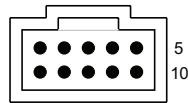


Figure 2. Connector J1



Mates with
 Molex 90142-0010 Housing
 90119-2110 Pin

Connector Kit Part No.:
 70-841-004

Figure 3. Connector J2



Mates with
 Landwin 2050S1000 Housing
 2053T011V Pin

or
 JST PHDR-10VS Housing
 JST SPHD-002T-P0.5 (28-24)
 JST SPHD-001T-P0.5 (26-22)

Connector Kit Part No.:
 70-841-023

AC Input	
Pin No.	Function
1	AC neutral
2	AC line (hot)
3	Chassis (earth) ground
PFC Input Connector (control and signals)	
Pin No.	Function
1	Input AC OK - "emitter"
2	Input AC OK - "collector"
3	Global DC OK - "emitter"
4	Global DC OK - "collector"
5	External Sync
6	Global inhibit/optional enable logic "0"
7	Global inhibit/optional enable logic "1"
8	Global inhibit/optional enable return
9	+5 VSB housekeeping
10	+5 VSB housekeeping return
I ² C Bus Output Connector	
Pin No.	Function
1	No connection
2	No connection
3	No connection
4	Serial clock signal (SCL)
5	Serial data signal (SDA)
6	Address bit 0 (A0)
7	Address bit 1 (A1)
8	Address bit 2 (A2)
9	Secondary return (GND)
10	5 Vcc external bus (5 VCC. Bus)

Mechanical Drawings

iMP Modules

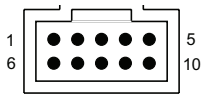
DC-DC Converter Output Modules

Control Signal Information, J1 Control Connector

Pin No.	Function	
1	+ Remote Sense	single or dual o/p main
2	Remote Margin / V. Program	single o/p
3	Margin High	single o/p
4	- Remote Sense / Margin Low	single or dual o/p main
5	Spare	
6	Module, Isolated Inhibit	single or dual o/p
7	Module Inhibit Return	single or dual o/p
8	Current Share (SWP)	single or dual o/p main
9	+ Remote Sense V2	dual o/p, single is spare
10	- Remote Sense V2	dual o/p, single is spare

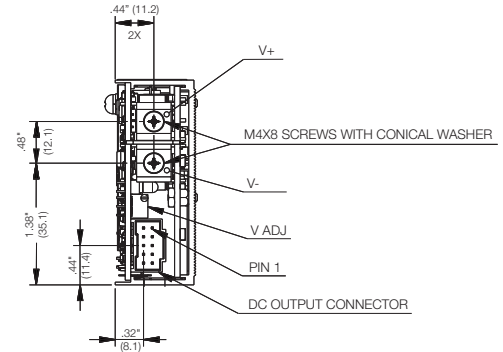
* Note: All iMP modules have a green DCOK LED. (except for 36 W module)

Figure 4. Connector J1

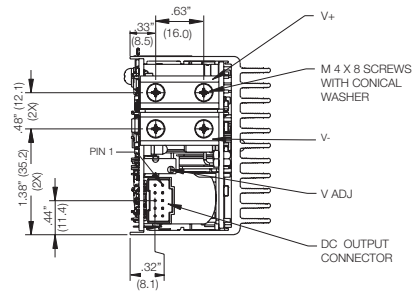


Mates with
Molex 90142-0010 Housing
90119-2110 Pin

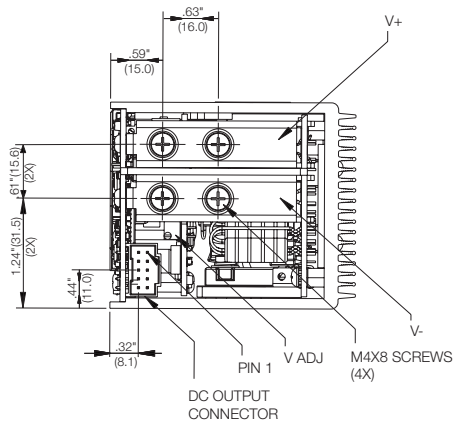
Single 210 Watt



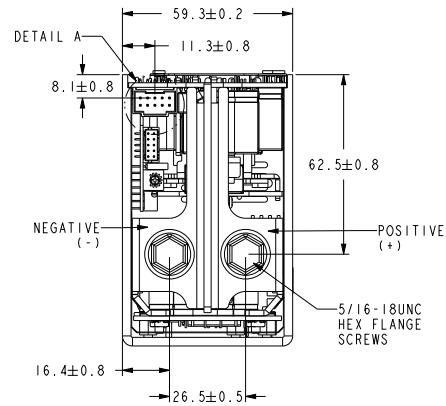
Single 360 Watt



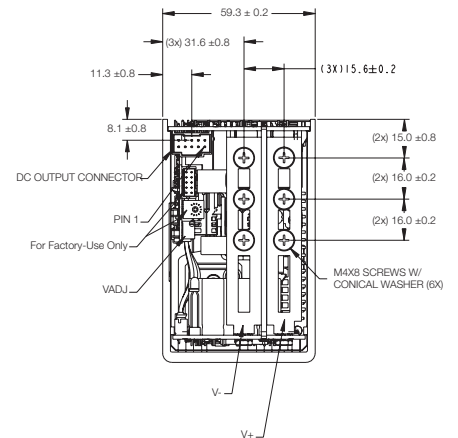
Single 750 Watt



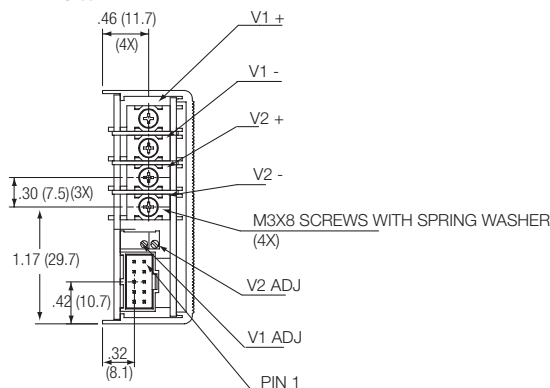
Single 1500 Watt 2-8 V



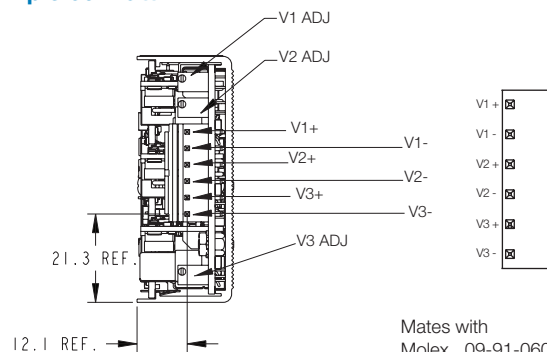
Single 1500 Watt 10-60 V



Dual 144 Watt



Triple 36 Watt



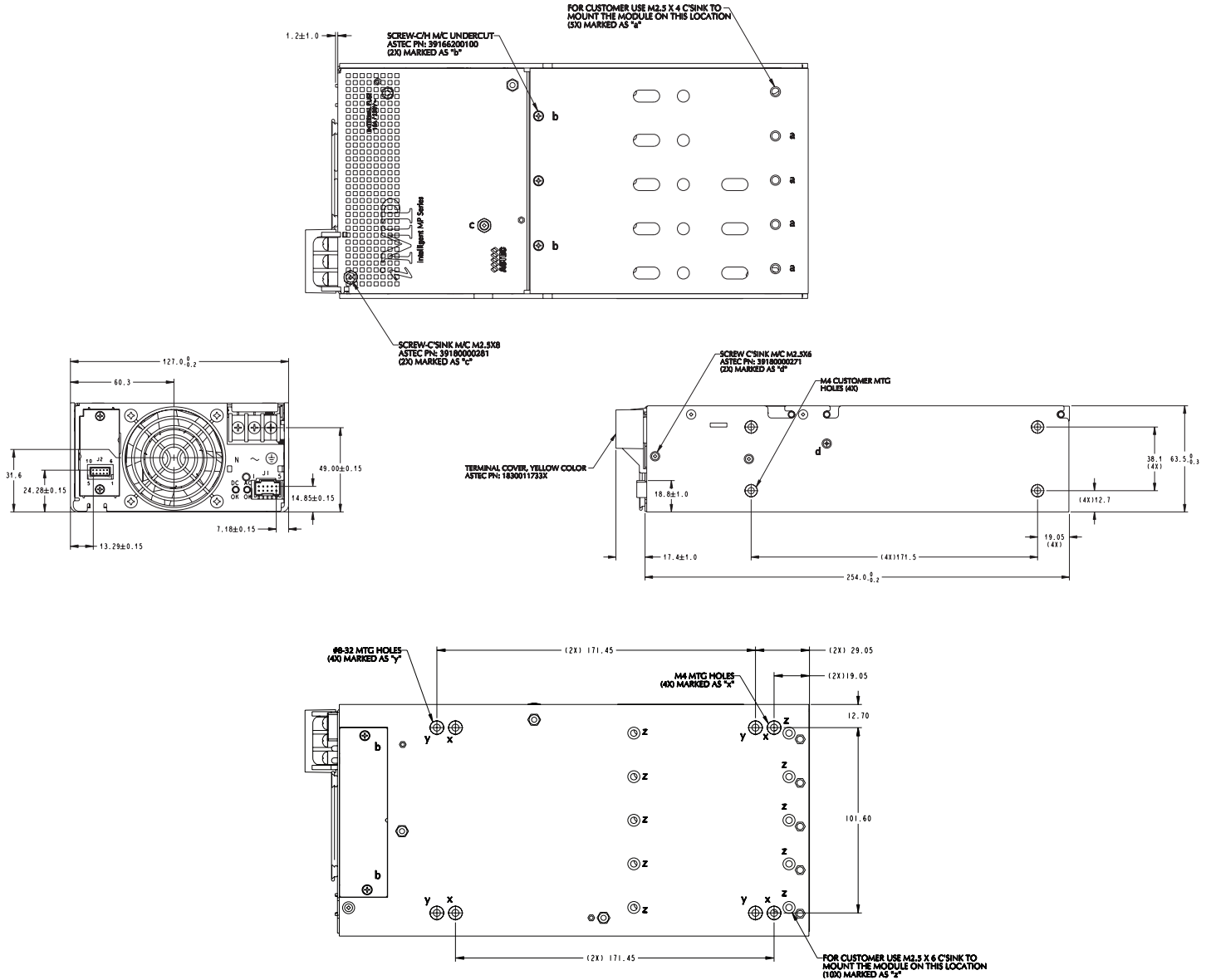
Mates with
Molex 09-91-0600 Housing
26-60-5060 Pin

iMP Series

iMP4 (750/1158 Watts Max)

5-Inch Case Size: iMP4: 2.5" x 5" x 10" (63.5 mm x 127 mm x 254 mm)

Weight: iMP4 Case: 3 lbs. • 360 W Single 1.0 lb. • 750 W Single: 1.6 lbs. 144 W Dual: 0.6 lb.



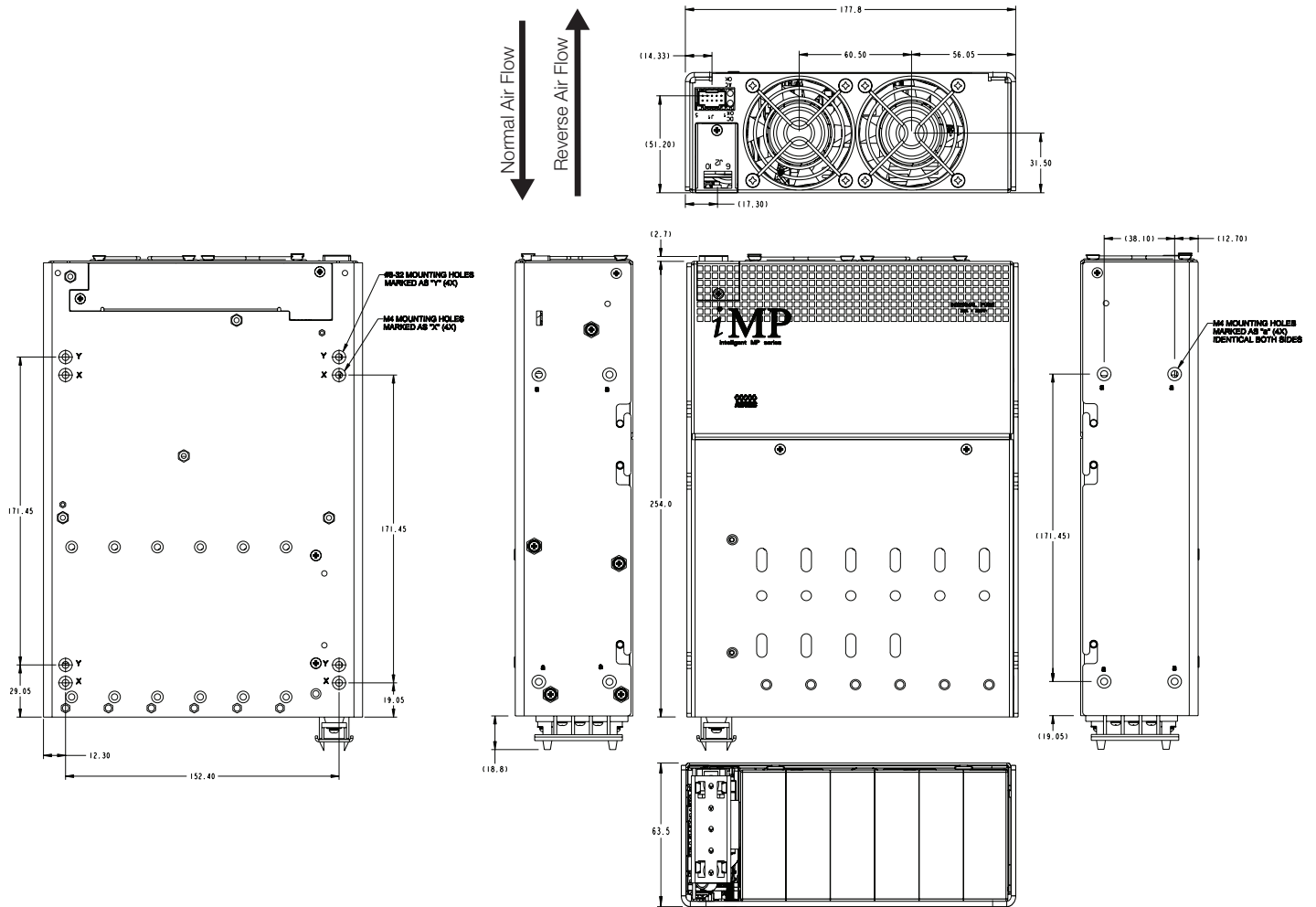
Notes:

1. Input: Barrier type. Three No. 6-32 B.H. screws (0.375" centers). Max torque: 6 in-lbs. (0.67 N-m). (Optional IEC input connector)
2. Control connectors: (J1) 10 position housing, gold plated contacts. Mates with Molex 90142-0010 housing with 90119-2110 crimp contacts (Molex C - Grid III Series). Connector kit includes mating connector and 10 pins, Astec part #70-841-004. (J2) 10 position housing (Landwin 2051P1000T). Mates with housing 2050S1000 (Landwin) with 2053T011P (Landwin) pins or JST PHDR-IOVS Housing and JST SPHD-002T-PO.5 pins.
3. Chassis material: aluminum with chemical film coating (conductive).
4. All dimensions are in millimeters and inches, and are typical.
5. Customer mounting -3 sides M4, bottom also includes 8-32 mounting holes. Max. penetration is 0.150" (3.8 mm). Max. torque: 5 in-lbs. (0.57 N-m).
6. Output module connections: All single O/P modules are M4 x 8 mm screws. Max. torque: 10 in-lbs. (1.13 N-m). Dual O/P module is M3 x 8 mm screws. Max. torque: 5 in-lbs. (0.57 N-m).

iMP Series

iMP8 (1000/1200 Watts Max)

7-Inch Case Size: iMP8: 2.5" x 7" x 10" (63.5 mm x 177.8 mm x 254 mm)
 Weight: iMP8 Case: 4.1 lbs. • 210 W Single: 0.6 lb. • 360 W Single: 1.0 lb.
 • 750 W Single: 1.6 lbs. 144 W Dual: 0.6 lb.



Notes:

1. Input: Barrier type. Three No. 6-32 B.H. screws (0.375" centers). Max torque: 6 in-lbs. (0.67 N-m).
2. Control connectors: (J1) 10 position housing, gold plated contacts. Mates with Molex 90142-0010 housing with 90119-2110 crimp contacts (Molex C - Grid III Series) Connector kit includes mating connector and 10 pins, Astec part #70-841-004. (J2) 10 position housing (Landwin 2051P1000T). Mates with housing 2050S1000 (Landwin) with 2053T011P (Landwin) pins or JST PHDR-IOVS Housing and JST SPHD-002T-PO.5 pins.
3. Chassis material: aluminum with chemical film coating (conductive).
4. All dimensions are in millimeters and inches, and are typical.
5. Customer mounting -3 sides M4, bottom also includes 8-32 mounting holes. Max. penetration is 0.150" (3.8 mm). Max. torque: 5 in-lbs. (0.57 N-m).
6. Output module connections: All single O/P modules are M4 x 8 mm screws. Max. torque: 10 in-lbs. (1.13 N-m). Dual O/P module is M3 x 8 mm screws. Max. torque: 5 in-lbs. (0.57 N-m).

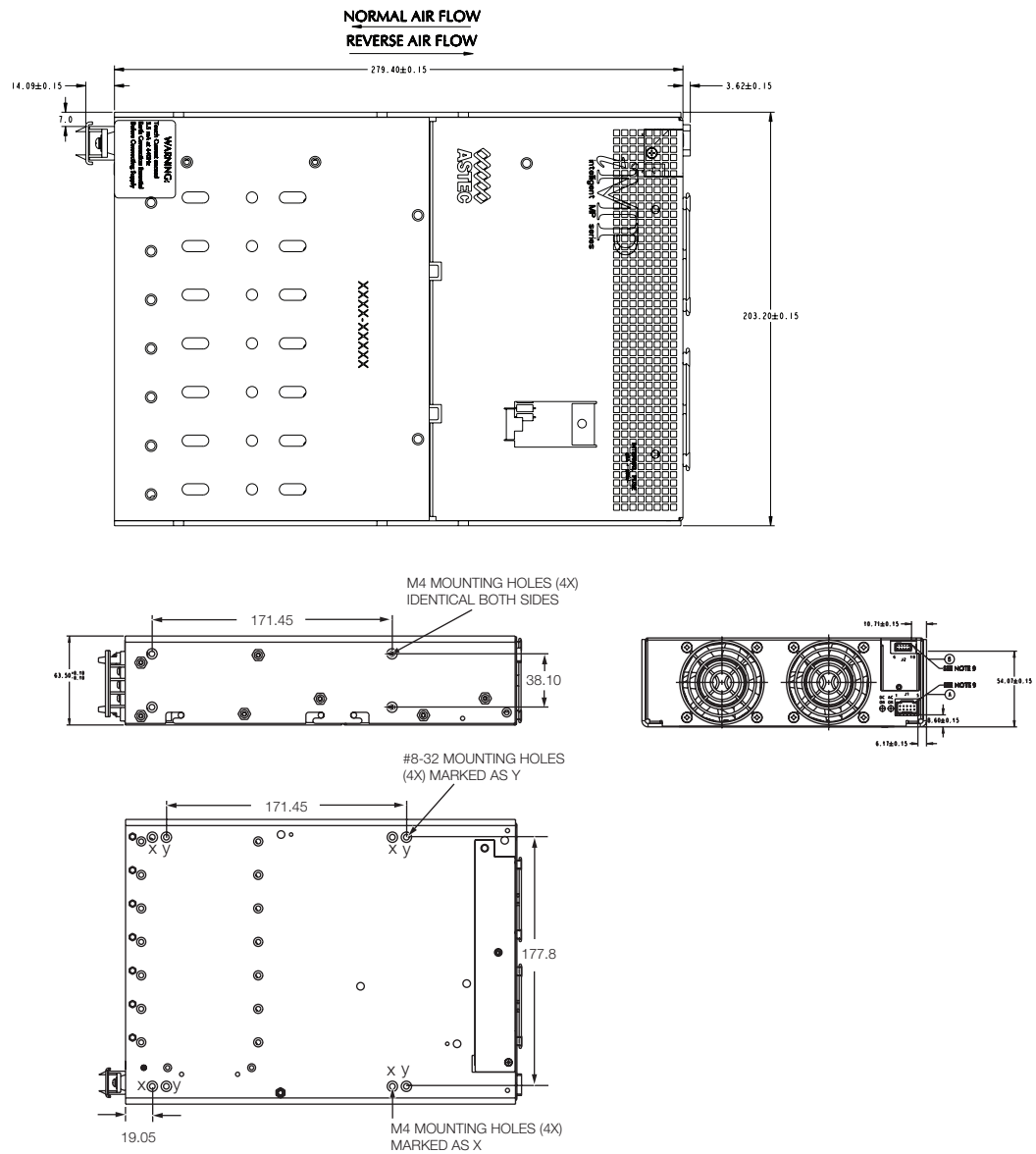
iMP Series

iMP1 (1200/1500 Watts Max)

8-Inch Case Size: iMP1: 2.5" x 8" x 11" (63.5 mm x 203.2 mm x 279.4 mm)

Weight: iMP1 Case: 5.0 lb. • 210 W Single: 0.6 lb. • 360 W Single: 1.0 lb.

• 750 W Single: 1.6 lb. • 144 W Dual: 0.6 lb.



Notes:

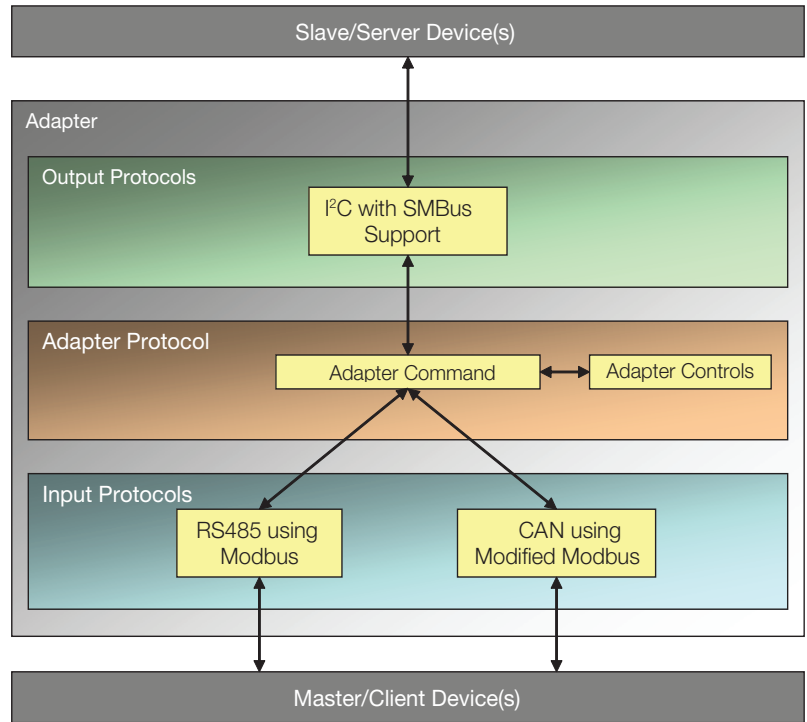
1. Input: Barrier type. Three No. 6-32 B.H. screws (0.375" centers). Max torque: 6 in-lbs (0.67 N-m).
2. Control connectors: (J1) 10 position housing, gold plated contacts. Mates with Molex 90142-0010 housing with 90119-2110 crimp contacts (Molex C - Grid III Series). Connector kit includes mating connector and 10 pins, Astec part #70-841-004. (J2) 10 position housing (Landwin 2051P1000T). Mates with housing 2050S1000 (Landwin) with 2053T011P (Landwin) pins or JST PHDR-IOVS Housing and JST SPHD-002T-PO.5 pins.
3. Chassis material: aluminum with chemical film coating (conductive).
4. All dimensions are in millimeters and inches, and are typical.
5. Customer mounting -3 sides M4, bottom also includes 8-32 mounting holes. Max. penetration is 0.150" (3.8 mm). Max. torque: 5 in-lbs. (0.57 N-m).
6. Output module connections: All single O/P modules are M4 x 8 mm screws. Max. torque: 10 in-lbs. (1.13 N-m). Dual O/P module is M3 x 8 mm screws. Max. torque: 5 in-lbs. (0.57 N-m).

Optional CANBUS or RS485 Interface

The RS485/CAN-to-I²C uses 2 Input Protocols and 1 Output Protocol.

The Input Protocols used are RS485 using Modbus (Command Index: 0x01), and CAN using modified Modbus (Command Index: 0x02).

The Output Protocol use is: I²C with SMBus support (Command Index: 0x80).



iMP CAN RS485

RS485/CAN - to - I²C

For detailed info, download the Software Requirements Specification (SRS) from <http://www.artesyn.com/power/power-supplies/cat/101/Configurable-Power-Supplies-iMP-Series>

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