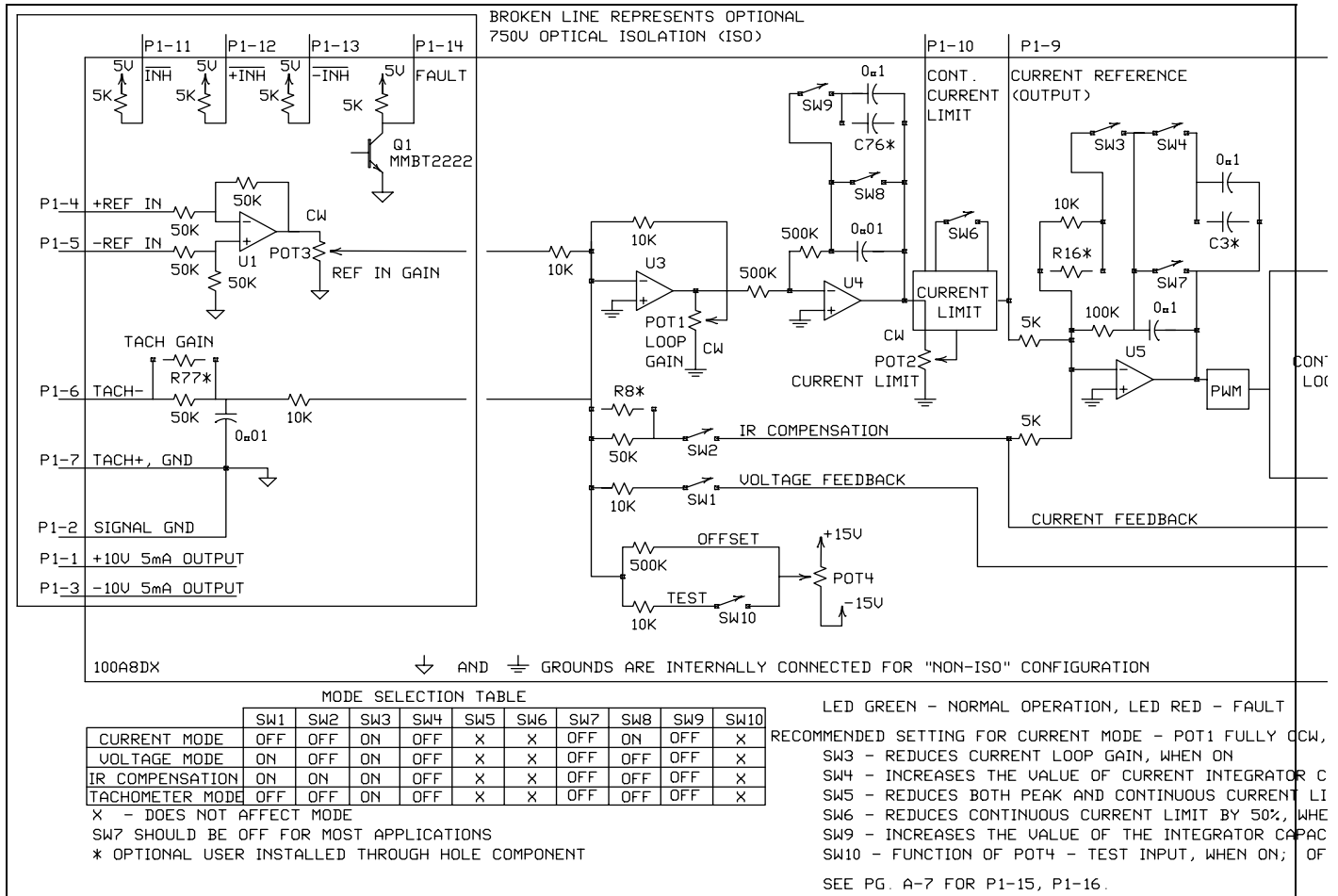


SERIES 120A SERVO AMPLIFIERS MODELS: 100A8, 100A6, 120A5

FEATURES:

- * Surface-mount technology
- * Small size, low cost, ease of use
- * Optional input signal isolation for off-the-rectified 120 VAC line operation
- * DIP switch selectable: current, voltage, velocity, IR compensation, position loop control
- * Four quadrant regenerative operation

DESCRIPTION: 120A Series PWM servo amplifiers are designed to drive brush type DC motors at a high switching frequency. Operating efficiency is 97%. Single red/green LED indicates operating status. All models are fully protected against over-voltage, over-current, over-heating and short-circuits across motor, ground and power leads. All models interface with digital controllers or can be used as a stand-alone drive. They require only a single unregulated DC power supply. Loop gain, current limit, input gain and offset can be adjusted using 14-turn potentiometers. The offset adjusting potentiometer can also be used as an on-board input signal for testing purposes when SW10 (DIP switch) is "On".



ADVANCED MOTION CONTROLS

3805 Calle Tecate, Camarillo, CA 93012 Tel: (805) 389-1935, Fax: (805) 389-1165

	MODELS		
POWER STAGE SPECIFICATIONS	100A8	100A6	120A5
DC SUPPLY VOLTAGE	20-80V	20-60V	18-50V
PEAK CURRENT (2 sec. max., internally limited)	± 100	± 100	± 120
MAX. CONT. CURRENT (internally limited)	$\pm 50A$	$\pm 50A$	$\pm 60A$
MINIMUM LOAD INDUCTANCE*	200uH		
SWITCHING FREQUENCY	22KHZ $\pm 15\%$		
HEATSINK (BASE) TEMPERATURE RANGE	0° to +65°C; disables if >65°C		
OVER-VOLTAGE SHUT-DOWN (self-reset)	86V	62 V	52V
BANDWIDTH	2.5KHz		

MECHANICAL SPECIFICATIONS	
POWER CONNECTOR	Screw terminals
SIGNAL CONNECTOR	Molex connector
SIZE (inches)	10.00 x 5.06 x 1.70
WEIGHT	2.5 lb.

* Low inductance motors ("pancake" and "basket-wound") require external inductors.

PIN FUNCTIONS

CONNECTOR	PIN	NAME	DESCRIPTION / NOTES	I/O
P1	1	+10V	Provides regulated voltages of +/-10V @ 5mA for customer use. Short circuit protected	O
	2	SIGNAL GND		
	3	-10V		
	4	+REF IN	Differential analog input, maximum ±15V, 50K input resistance	I
	5	-REF IN		
	6	-TACH IN	Maximum ±60V analog, 60K input resistance	I
	7	+TACH (GND)		
	8	CURRENT MONITOR	This signal is proportional to the actual current in the motor leads. Scaling is 1V=16A when SW5=On (full current), 1V=8A when SW5=Off	O
	9	CURRENT REF	Command signal to the internal current-loop. The maximum peak current rating of the amplifier equals 7.5V at this pin	O
	10	CONTINUOUS CURRENT LIMIT	Can be used to reduce the factory-preset maximum continuous current limit	I
	11	INHIBIT	Inhibit. TTL, turns off all four mosfets of the "H" bridge drive when pulled to ground. For inverted inhibit inputs, see section "G".	I
	12	+INHIBIT	Inhibits the motor for "+" direction only. This function can be useful to drive the motor off from a "limit switch"	I
	13	-INHIBIT	Inhibits the motor for "-" direction only. This function can be useful to drive the motor off from a "limit switch"	I
	14	FAULT (red LED)	TTL compatible output. It becomes high during output short-circuit, over-voltage, over-heating, inhibit, and during "power-on reset". Fault condition indicated by red LED	O
	15	SYNCH IN	Used for synchronizing the switching frequency of several amplifier modules. Consult factory for this option. Not applicable for "ISO" option. In the "ISO" option pin 16 is connected to power ground and can be used as ground with P1- 8,9	N/A
	16	SYNCH OUT		

SWITCH FUNCTIONS

SWITCH	FUNCTION DESCRIPTION	SETTING	
		ON	OFF
1	Internal voltage feedback	On	Off
2	Internal current feedback for IR compensation	On	Off
3	Current loop gain	Decrease	Increase
4	Current loop integration	Increase	Decrease
5	Current scaling. When "Off", increases sensitivity of current sense thus reducing both peak and continuous current limit by 50% (see section "G")	Full-current	Half-current
6	Can be used to reduce factory-preset maximum continuous current limit (see section "G")	Cont./Peak Ratio 25%	Cont./Peak Ratio 50%
7	It is recommended to leave SW7 in "Off" position	Shorts out the current loop integrator capacitor	Current loop integrator operating
8	This capacitor normally ensures "error-free" operation by reducing the error-signal (output of summing amplifier) to zero	Shorts out the outer velocity / voltage loop integrator capacitor	Velocity/ Voltage integrator operating
9	Increases the value of the integrator capacitor. It is recommended to leave SW9 in "Off" position for most applications	Increase	Decrease
10	Offset / test. Sensitivity of the "offset" pot. Used as an on-board reference signal in test mode	Increase	Decrease

POTENTIOMETER FUNCTIONS

POTENTIOMETER	DESCRIPTION	TURNING CW
Pot 1	Loop gain adjustment in voltage & velocity modes. Voltage to current scaling factor adjustment in current mode	Increases loop gain
Pot 2	Current limit. It adjusts both continuous and peak current limit by maintaining their ratio	Increases current limit
Pot 3	Reference gain. It adjusts the ratio between input signal and output variables (voltage, current, velocity)	Increases reference input gain
Pot 4	Offset / test. Used to adjust any imbalance in the input signal or in the amplifier. When SW10 (DIP switch) is "On", the sensitivity of this pot is greatly increased thus it can be used as an on-board signal source for testing purposes	N/A

TEST POINTS FOR POTENTIOMETERS

See section "G"

PLUG-IN-AND-USE TEST MODE

Advanced Motion Controls' 100A Series amplifiers can operate in a DIP switch selectable "Test Mode" to facilitate evaluation and installation (SW 1, 3, 10 = On; SW 2, 4, 7, 8, 9 = Off). This is "voltage amplifier mode" with on-board potentiometer adjustable reference. See section "G" for powering-up in test mode.

OPTIONAL INPUT SIGNAL ISOLATION

These amplifiers can be ordered with an internally installed analog isolation amplifier which optically isolates the inputs and inhibit lines from the remainder of the amplifier circuitry ("ISO" option). See block diagram on data sheet (page A-5). This optional input isolation facilitates off-the-rectified-line operation. Isolation is necessary in transformerless applications to isolate controller signal ground (often the same as earth ground) from DC power ground. The isolation option may also reduce system noise. This option is generally not required with isolated power supplies.

OPERATING MODE SELECTION

These modes can be selected by the DIP switches according to the chart in the functional block diagram:

- * Current Mode
- * Voltage Mode
- * IR Compensation Mode
- * Tachometer Mode

See section "G" for more information.

CURRENT LIMIT ADJUSTMENTS

These amplifiers feature separate peak and continuous current limit adjustments.

The current limit adjusting Pot 2 adjusts both peak and continuous current limit at the same time. It has 12 active turns plus 1 inactive turn at each end and is approximately linear. Thus, to adjust the current limit, turn the potentiometer counter-clockwise to zero (using ohmmeter), then turn clockwise to the appropriate value. Pin P1- 9 is the input to the internal current amplifier stage. Since the output current is proportional to P1- 9, the adjusted current limit can easily be observed at this pin. The maximum peak current value equals 7.5V at this pin. The actual current can be monitored at pin P1- 8. If the desired limit is, for example, 50 amperes, and the servo amplifier peak current is 100 amperes, turn the potentiometer 7 turns clockwise from zero.

The continuous current limit can be reduced without affecting the peak current limit by connecting an external current limiting resistor R-lmt between P1-10 and P1- 2. See table below.

CURRENT LIMITING RESISTOR	40K	20K	3K	1K	0 K
CONTINUOUS CURRENT LIMIT	90%	80%	50%	30%	10%

SW6 (DIP switch) will reduce the continuous current limit to 50% of the maximum value, when switched "On". SW5 (DIP switch) will reduce the current feedback (monitor) scaling by 50%, thereby reducing both the peak and the continuous current limit by 50%, when switched "Off".

See section "G" for more information

TYPICAL SYSTEM WIRING: See section "G"

ORDERING INFORMATION

Models: 120A5X, 100A6X, 100A8X

With isolation: 120A5IX, 100A6IX, 100A8IX

X indicates the current revision number.

MOUNTING DIMENSIONS: See below.

