Compumotor AT6400

4-Axis Auxiliary Board

$895.00

In Stock

Qty Available: 10+

Used and in Excellent Condition

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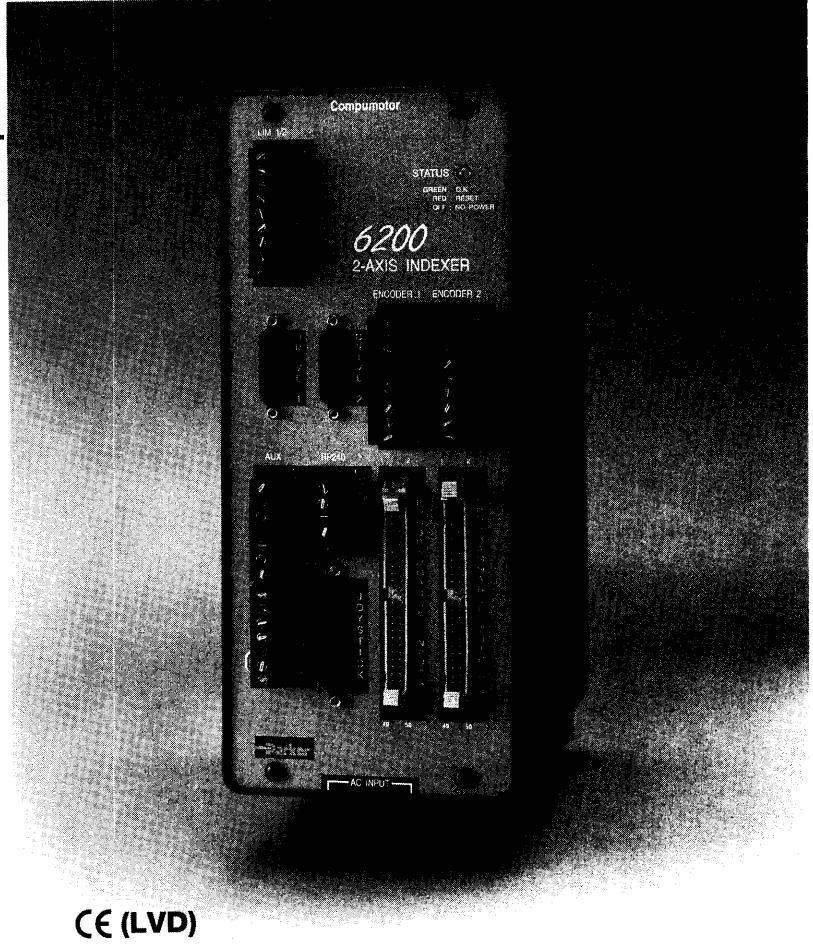
6200
2-Axis Indexer



CE (LVD)

Compumotor's 6200 motion controller is a stand-alone indexer for standard industrial step and direction motor drives. The 6200 can synchronize two axes of motion. Incremental encoder feedback on both axes enables the indexer to detect stalls, verify position, and correct for positioning errors generated by inaccurate mechanical transmissions.

Like all of Compumotor's 6000 Series controllers, the 6200 uses the 6000 Series command language—a powerful command language that is flexible enough to implement complex motion control applications, and simple enough for the novice programmer.

Included with every 6200 is Motion Architect, an intuitive Microsoft® Windows™-based programming tool that includes a Program Editor, a Terminal Emulator, and On-line Help utilities, plus three innovative application development aides:

- A System Configurator that automatically generates fully documented code for application-setup parameters
- A test panel to create custom operator test panels to run programs and check the activity of I/O, motion, system status, etc.
- An On-line Command Reference that provides interactive access to the contents of the 6000 Series Software Reference Guide.

The 6200 can interface with Compumotor's remote operator interface, the RP240 (detailed on page C119). The 6200 programming language allows the user to display text and numeric information on the RP240. Other RP240 features include programmable function keys, numeric data entry, user program selection, LED control, and jogging. A sophisticated operator interface can be easily programmed with just a few commands.

Features

Motion
- 1 or 2 axes of step and direction control with encoder feedback
- 1.6 MHz step output frequency

I/O
- Home limit, positive and negative end-of-travel limits for both axes
- 24 programmable inputs, 24 programmable outputs
- 2 interrupt-driven inputs for encoder capture and registration
- 2 auxiliary screw terminal outputs
- 3 analog inputs that can be used for joystick or feed-rate override control
- Encoder channels can be configured as hardware up/down counters

Language
- Linear interpolation standard
- Circular interpolation optional
- Position-based following
- Variable storage, conditional branching, and math capability
- Scaling of distance, velocity and acceleration parameters
- Capability to interrupt program on error conditions
- Program debug tools—trace mode, break points, and simulation of I/O
- Programmable timer
- 150,000 bytes of nonvolatile memory for program and path storage

Software Provided
- Motion Architect, Microsoft Windows-based application development software
- DOS®-based program editor and terminal emulator software
- Dynamic Link Library (DLL) provided for use with Microsoft Windows and Microsoft Windows NT software development kits

Optional Software
- CompuCAM™, computer-aided motion software, imports geometry from CAD programs, plotter files, or NC programs and generates 6000 Series code
- Motion Toolbox library of LabVIEW® virtual instruments (VIs) for icon-based programming of Compumotor's 6000 Series controllers
- Dynamic Data Exchange (DDE) server available allowing data exchange between different Windows software applications
- Motion Builder provides a visual-development environment for graphical icon-based programing of the 6000 Series product

Interface Capability
- Operates stand-alone or interfaces to PCs & PLCs
- Two RS-232C communications ports
- Compatible with RP240 operator interface panel

Physical
- Stand-alone package
- 120-240VAC operation
- Two 10-foot indexer-to-drive cables included
- Power cable included

Software information is available on page C90.

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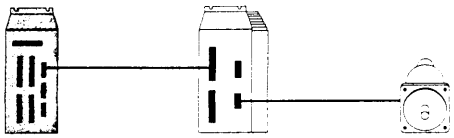
Indexer

Command Language (partial command list)

The 6200 is easily programmed with the 6000 Series language. Each command is an ASCII character mneumonic with numeric parameters for both axes following the command.

The following command example sets acceleration for axes 1 and 2: A10,15

Conditionals

Command	Description
IF( )	If statement
REPEAT	Repeat statement
WAIT( )	Wait for a specific condition
WHILE( )	While a condition is true

Display [RP240]

Command	Description
DCLEAR	Clear display
DLED	Display LEDs
DREAD	Read display entry
DVAR	Display variable
DWRITE" "	Write string to display

Encoder

Command	Description
ENC	Encoder/motor step mode
EPM	Position maintenance mode enable
EPMDB	Position maintenance deadband
ERES	Encoder resolution
ESDB	Encoder backlash stall deadband
ESTALL	Stall detect enable

Homing

Command	Description
HOM	Go home
HOMA	Home acceleration
HOMAD	Home deceleration
HOMBAC	Home backup enable
HOMDF	Home direction final
HOMEDG	Home reference edge
HOMLVL	Home active level
HOMV	Home velocity
HOMVF	Home velocity final
HOMZ	Home to Z-channel enable

Following

Command	Description
FOLEN	Enable following
FOLMAS	Define master axes
FOLMD	Define master move distance
FOLRN	Set maximum following ratio numerator
FOLRD	Set maximum following ratio denominator
FSHFD	Initiate preset phase shift
FSHFC	Initiate continuous shift

Joystick

Command	Description
JOY	Joystick mode enable
JOYA	Joystick acceleration
JOYAD	Joystick deceleration
JOYCDB	Joystick center deadband
JOYVH	Joystick velocity high
JOYVL	Joystick velocity low

Limits

Command	Description
LH	Hard limit enable
LHAD	Hard limit deceleration
LHLVL	Hard limit active level
LS	Soft limit enable
LSAD	Soft limit decelration
LSNEG	Soft limit NEG range
LSPOS	Soft limit POS range

Mathmatical

Command	Description
+	Addition
-	Subtration
*	Multiplication
/	Division
&	Boolean and
I	Boolean or
SIN	Sine
COS	Cosine
TAN	Tangent
ATAN	Arc tangent
SQRT	Square root

Miscellaneous

Command	Description
;	Comment
DRIVE	Drive enable
ERRORP	Error program
L	Loop
MA	Absolute incremental mode enable
MC	Preset continuous mode enable
PSET	Define position counter
READ	Read a value from terminal
TIMST	Reset and start timer
STEP	Single step mode enable
WRITE" "	Transmit a string to terminal

Motion

Command	Description
A	Acceleration
AD	Deceleration
D	Distance
GO	Initiate motion
GOL	Initiate linear interpolated motion
S	Stop
V	Velocity

Path Contouring (optional)

Command	Description
PARCP	Radius specified CW arc
PARCOP	Origin specified CW arc
PLIN	Move in a line
PRUN	Execute path

Registration

Command	Description
RE	Registration enable
REG	Registration distance

Scaling

Command	Description
SCALE	Enabling scaling
SCLA	Accel/decel scale factor
SCLD	Distance scale factor
SCLV	Velocity scale factor

Subroutines

Command	Description
DEF	Define a subroutine
GOSUB	Execute a subroutine with return
GOTO	Execute a subroutine without return

Transfer Information

Command	Description
TAS	Transfer axis status
TANV	Transfer analog input value
TCMDER	Transfer command that caused an error
TCNT	Transfer counter
TIN	Transfer input status
TLIM	Transfer limit status
TOUT	Transfer output state
TPE	Transfer position of encoder
TPM	Transfer position of motor

Software information is available on page C90.

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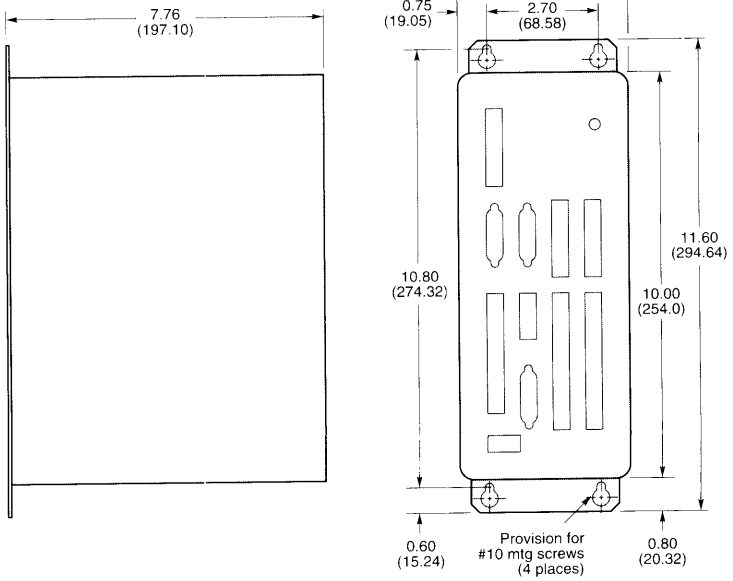
Specifications

Parameter	Value
Power	
Input	110-240VAC (±10%), 50-60 Hz, 0.6A @ 120VAC
Performance	
Position range	+2,147,483,648 steps
Velocity range	1 to 1,600,000 steps/sec
Acceleration range	1 to 24,999,975 steps/sec^2
Stepping Accuracy	±0 steps from preset total
Velocity Accuracy	±0.02% of maximum rate
Velocity Repeatability	±0.02% of set rate
Motion Algorithm Update Rate	2 ms
Inputs	
Encoder	Differential comparator accepts two-phase quadrature incremental encoders with differential (recommended) or single-ended outputs (+5VDC TTL compatible). Max frequency = 1.6 MHz, post-quadrature. Minimum time between transitions = 625 ns.
24 Programmable	TTL-compatible*; internal 6.8 KΩ pull-up sourcing current (or you can change jumer JU2 to sink current). Voltage range = 0V–24V. 50-pin plug is compatible with OPTO-22™ signal conditioning equipment. Controllable with the 6000 Series programming language.
2 triggers	TTL-compatible* with internal 6.8 KΩ pull-up to +5VDC. Controllable with the 6000 Series programming language.
Analog (joystick)	Voltage range 0-2.5VDC, 8-bit A/D converter.
Home Enable; Positive (CW) and Negative (CCW) Limits; Pulse Cutoff; Joystick Trigger, Release, Select, & Velocity	TTL-compatible*; internal 6.8 KΩ pull-ups to 5V; voltage range is 0–24V.
Drive Fault	TTL-compatible*; internal 1.0 KΩ pull-up to 5V; voltage range is 0–5V.
Outputs	
26 Programmable (includes OUT-A and OUT-B on AUX connector)	TTL-compatible*, open collector output. Can be pulled up by connecting OUT-P to +5V on AUX connector, or to user-supplied voltage of up to 24V. Max voltage in OFF state (not sinking current) = 24V, max current in ON state (sinking) = 30mA. 50-pin plug is compatible with OPTO-22™ signal conditioning equipment. Controllable with the 6000 Series programming language.
Step, Direction, Shutdown	Differential line driver output. Signal high > 3.5VDC @ +30 mA, signal low < 1.0VDC @ -30 mA. +output for each differential driver is active high; -output for each driver is active low. Step pulse width is 0.3µs to 20 µs (depending on the state of the PULSE command—default is 0.3 µs.)

* TTL-compatible voltage levels: low ≤ 0.4V; high ≥ 2.4V

Dimensions

(—) denotes millimeters



C Step Motor Systems

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Model 6200 Connections Pin-Out Lists

Drive 1-2
15-Pin "D"

Pin No	Signal
1	Step +
2	Direction +
3	Reserved
4	In Position/Stall
5	Drive Fault
6	Reserved
7	+5VDC (out)
8	Shield
9	Step -
10	Direction -
11	Shutdown +
12	Shutdown -
13-14	Ground
15	Reserved

Encoder 1-2
9-Pin Screw Terminal

Pin No	Signal
1	Shield
2	Ground
3	Z-
4	Z+
5	B-
6	B+
7	A-
8	A+
9	+5VDC (out)

Joystick
25-Pin "D"

Pin No	Signal
1	Analog Ch. 1
2	Analog Ch. 2
3	Analog Ch. 3
8	Shield
14	Ground
15	Axes Select
16	Velocity Select
17	JoystickRelease
18	Joystick Trigger
19	Joystick Auxiliary
23	+5VDC (out)

Limits 1/2
9-Pin Screw Terminal

Pin No	Signal
1	Shield
2	Ground
3	Home 2
4	Neg 2
5	Pos 2
6	Ground
7	Home 1
8	Neg 1
9	Pos 1

Auxiliary
14-Pin Screw Terminal

Pin No	Signal
1	Rx (RS-232C)
2	Tx (RS-232C)
3	Ground
4	Shield
5	+5VDC (out)
6	Output Pull-up
7	Trigger A
8	Trigger B
9	Ground
10	Output A
11	Output B
12	Ground
13	Shield
14	Pulse Cutoff

RP240
5-Pin Screw Terminal

Pin No	Signal
1	+5VDC (out)
2	Ground
3	Rx
4	Tx
5	Shield

Power Input
4-Pin Screw Terminal

Pin No	Signal
1	Earth
2	Neutral
3	N/A
4	Line

Programmable Inputs
50-Pin Header

Pin No	Signal
1	Input #24 (MSB)
...	...
47	Input #1 (LSB)
49	+5VDC (out)
Even #'s	Ground

Programmable Outputs
50-Pin Header

Pin No	Signal
1	Output #24 (MSB)
...	...
47	Output #1 (LSB)
49	+5VDC (out)
Even #'s	Ground

Ordering Information

Part No.	Description CE (LVD)
6200	6200 indexer with two indexer-to-drive cables, user guides and software support disks.

Accessories

Part No.	Description
VM24	Family of extended I/O modules. See page C117 for details.
VM50	50-Pin header to screw terminal breakout board for connecting I/O. See page C118 for details.
RP240	Operator interface. See page C119 for details.
RP240-NEMA 4	NEMA 4 rated operator interface. Flat panel mounted. See page C119 for details.
JS6000	2-axis joystick. See page C120 for details.

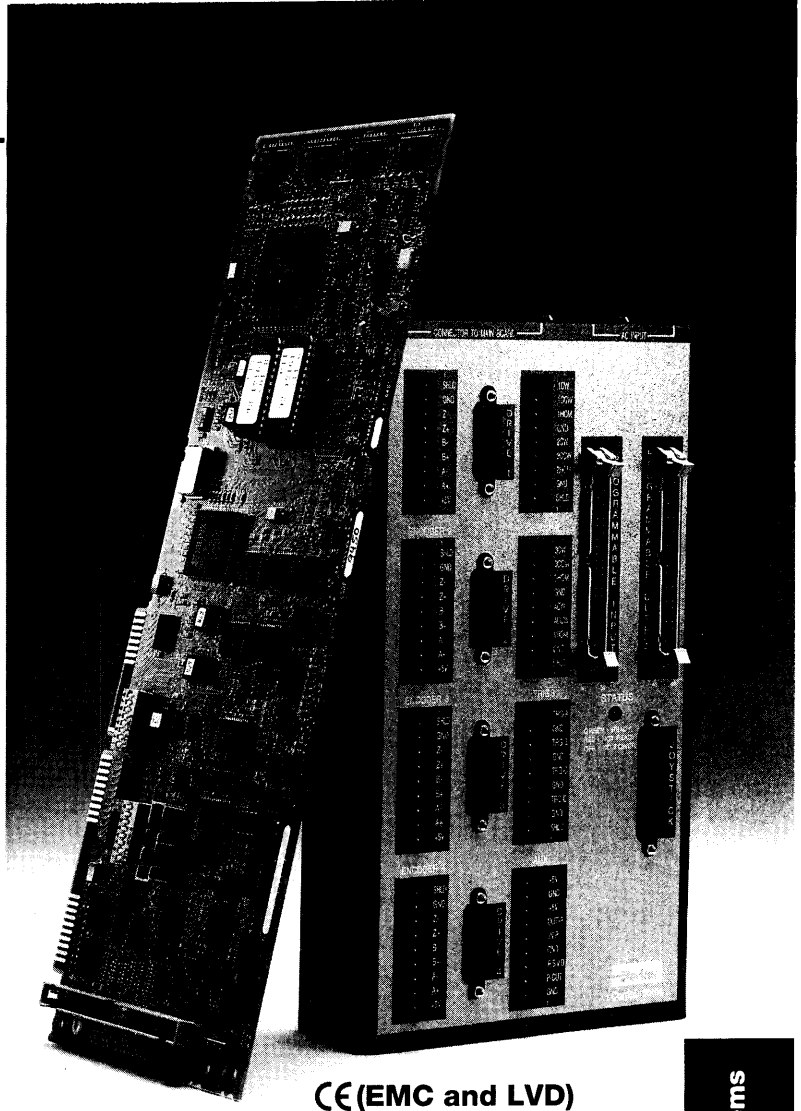
Software Accessories

Part No.	Description
DDE6000	DDE server for 6000 Series. Includes software disk with instructions.
CompuCAM	CompuCAM is available in three versions: DXF, HPGL and G-Code
Motion Toolbox	Library of LabVIEW VIs for Motion Control.
Motion Builder	Graphical icon-based software.

Software information is available on page C90.

AT6200/AT6400

Indexers



CE (EMC and LVD)

Compumotor's AT6200 (two axes of control) and AT6400 (four axes of control) are PC bus-based (ISA) indexers designed for industry-standard step and direction motor drives. These indexers can synchronize 2, 3, or 4 axes of motion. Incremental encoder feedback on all four axes provides the ability to detect stalls, verify position, and correct for positioning errors generated by inaccurate mechanical transmissions. Like all Compumotor 6000 Series controllers, the AT6200 and AT6400 use the 6000 Series command language, a powerful command language that is flexible enough to implement complex motion control applications and simple enough to not overwhelm the novice programmer.

The AT6200 and AT6400 come standard with Motion Architect, support software for Microsoft Windows operating environment.

In addition to Motion Architect, DOS-based support disk program editor and terminal emulator program examples in C, Pascal, BASIC, and Assembly are included. These examples illustrate controlling and communicating with the AT6200 and AT6400.

These indexers have a separate auxiliary board to simplify motor drives, encoders, programmable I/O and joystick connections. There are three auxiliary board versions available: a 120VAC input, a 240VAC input, or a +5VDC input, open-framed version.

Features

Motion

- 1–2 axes of step and direction control with encoder feedback (AT6200)
- 1–4 axes of step and direction control with encoder feedback (AT6400)
- 1.6MHz step output frequency

I/O

- Home limit, positive and negative end-of-travel limits provided for all axes
- 24 programmable inputs, 24 programmable outputs
- 4 analog inputs that can be used for joystick or feed-rate override control
- Up to 4 interrupt-driven inputs for encoder capture and registration inputs
- Encoder channels can be configured as hardware up/down counters

Language

- Example routines written for Microsoft Visual Basic™ and Visual C++
- Velocity and acceleration changes on-the-fly
- Scaling of distance, velocity and acceleration parameters
- Position-based following
- 2-axis circular or linear interpolation (4-axis linear interpolation for AT6400)
- Variable storage, conditional branching, and math
- Direct access to motor and encoder position information, I/O and system status (Fast Status area)
- Program debug tools—trace mode, break points, and simulation of I/O
- Programmable timer
- Programmable PC interrupt conditions
- Capability to interrupt program on error conditions
- 1.5 Mbytes of RAM for program and path storage

Software information is available on page C90.

Software Provided

- Motion Architect, Microsoft Windows-based application development software
- DOS-based program editor and terminal emulator software
- Dynamic Link Library (DLL) provided for use with Microsoft Windows and Microsoft Windows-NT™ software development kits

Optional Software

- Motion OCX Toolkit provides three custom controls for communication, terminal emulation and fast status polling
- CompuCAM, computer-aided motion software, imports geometry from CAD programs, plotter files, or NC programs and generates 6000 Series code
- Motion Toolbox library of LabVIEW virtual instruments (VIs) for icon-based programming of Compumotor's 6000 Series controllers
- Motion Builder provides a visual-development environment for graphical icon-based programming of the 6000 Series product

Physical

- Separate adaptor board to simplify connections for all inputs and outputs
- Auxiliary board available in three versions: 120VAC input, 240VAC input and +5VDC input, open-frame
- All connections from PC card to auxiliary board through a single 5-foot high density cable

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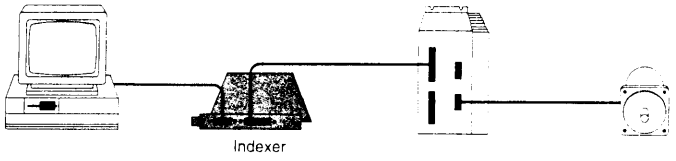

Specifications – AT6200/6400

Parameter	Value
Performance	
Position range	±2,147,483,648 steps
Velocity range	1 to 1,600,000 steps/sec
Acceleration range	1 to 24,999,975 steps/sec²
Stepping Accuracy	±0 steps from preset total
Velocity Accuracy	±0.02% of maximum rate
Velocity Repeatability	±0.02% of set rate
Motion Algorithm Update Rate	2 ms
Input Power	
AT6n00 PC Card	5VDC @ 1.8A max from the PC bus
120V Auxiliary Board (AC or DC input)	90-132VAC, 50/60Hz, 1.5A @ 120VAC, single-phase; or power from an external power source of 5VDC, ±10%
240V Auxiliary Board (AC or DC input)	90-264VAC, 50/60Hz, 0.75A @ 240VAC, single-phase; or power from an external power source of 5VDC, ±10%
DC Auxiliary Board	+5VDC @ 1.6A
Inputs (see also I/O pinouts & circuit drawing)	
Encoder	Differential comparator accepts two phase quadrature incremental encoders with differential (recommended) or single ended outputs (+5VDC TTL compatible*). Maximum frequency = 1.6 MHz, post-quadrature. Minimum time between transitions = 625 ns.
24 Programmable	HCMOS* compatible with internal 6.8 KΩ pull-up (connect IN-P to +5–24V to source current or connect IN-P to GND to sink current). Voltage range = 0–24V. 50-pin plug is compatible with OPTO-22™ signal conditioning equipment. Controllable with the 6000 Series programming language.
Trigger Inputs	AT6200 has two and AT6400 has four high-speed inputs for encoder capture and registration. HCMOS* compatible with internal 6.8 KΩ pull-up to AUX-P (wired to +5V at factory). Voltage range=0V-24V.
Analog (joystick)	Voltage range 0-2.5VDC, 8-bit A/D converter.
Home, Pos/Neg Limits Pulse Cut off	HCMOS* compatible; internally 6.8 K pull-ups to AUX-P (wired to +5V at factory). Voltage Range = 0V-24V.
Joystick Inputs (Axes and Velocity Select, Release, Trigger and Auxiliary)	HCMOS and TTL compatible; internal 6.8 KΩ pull-up to +5V; voltage range is 0-24V.
Drive Fault, In Position	HCMOS* compatible; internal 1.0 KΩ pull-up to 5V; voltage range = 0V–5V.
Outputs	
24 Programmable	HCMOS* compatible, open collector output. Can be pulled up by connecting OUT-P to +5V on the auxiliary board, or to user-supplied voltage of up to 24V. Max voltage in OFF state (not sinking current) = 24V, max current in ON state (sinking) = 30mA. 50-pin plug is compatible with OPTO-22™ signal conditioning. Controllable with the 6000 Series programming language.
Step, Direction, Shutdown	Differential line driver output. Signal high > 3.5VDC @ +30 mA, signal low < 1.0VDC @ -30 mA. +output for each differential drive is active high; output for each driver is active low. Step pulse width is 0.3µs to 20 µs (depending on the state of the PULSE command—default is 0.3 µs.)
Board Monitor Alarm (BMA)	Detects unrecoverable faults in hardware and software. When BMA detects fault, status light on AT6400 card turns off and status light on auxiliary board turns red. BMA can be reset by cycling power to the PC, or by redownloading the AT6400 operating system.
Environmental	
Operating temperature	32° to 122°F (0° to 50°C)
Storage temperature	-22° to 185°F (-30° to 85°C)
Humidity	0% to 95% noncondensing

* HCMOS-compatible voltage levels: low ≤ 1.67V, high ≥ 3.3V
TTL-compatible voltage levels: low ≤ 0.4V; high ≥ 2.4V

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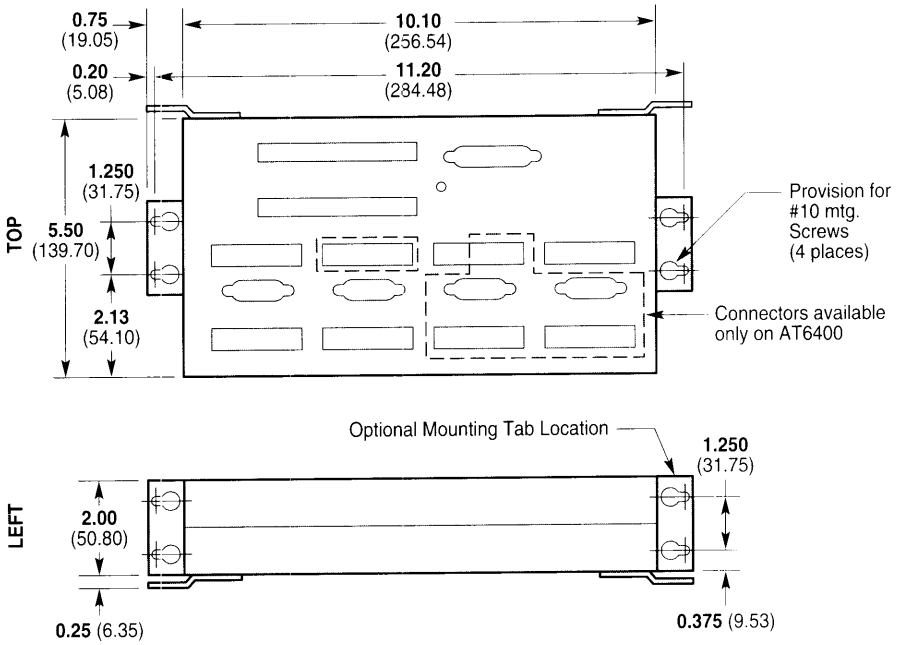
System Summary

	AT6200 (1–2 axes)	AT6400 (1–4 axes)
Shutdown output	1 per axis	1 per axis
Drive Fault input	1 per axis	1 per axis
Incremental encoder input	1 per axis	1 per axis
POS & NEG end-of-travel limit inputs	1 each per axis	1 each per axis
Home limit input	1 per axis	1 per axis
8-bit analog input channels for joystick control and variable input	4	4
General purpose programmable inputs (Opto-22™ compatible)	24	24
General purpose programmable outputs (Opto-22™ compatible)	24	24
Trigger inputs	2	4

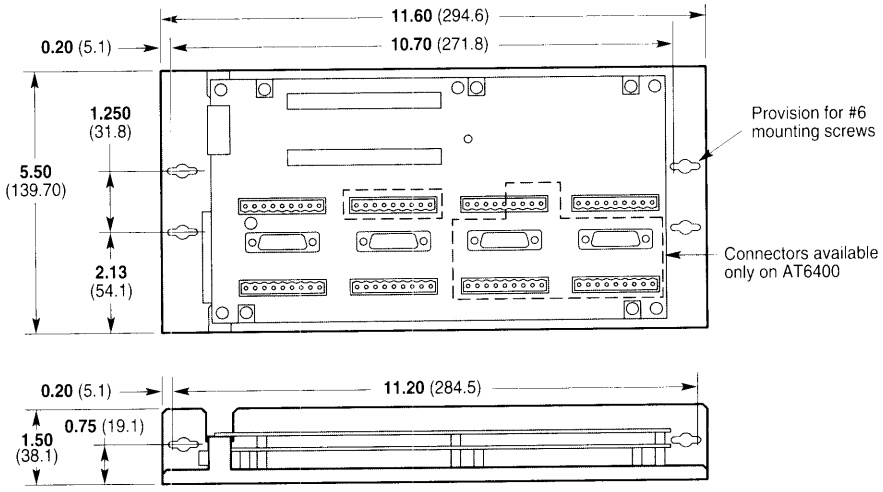
120VAC and 240VAC Input AUX Boards

(—) denotes millimeters



DC Input Open Frame AUX Board

(—) denotes millimeters



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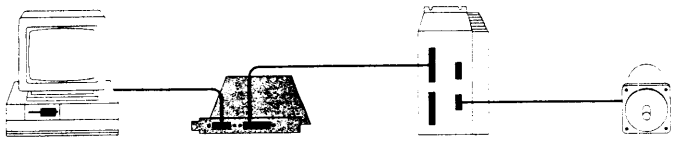

AT6200/AT6400 Connections

Drive 2 or 4
15-Pin "D"

Pin No.	Signal
1	Step+
2	Direction +
3	Reserved
4	In Position/Stall
5	Drive fault
6	Reserved
7	+5VDC (out)
8	Shield
9	Step –
10	Direction –
11	Shutdown +
12	Shutdown –
13-14	Ground
15	Reserved

Programmable Inputs
50-Pin Header

Pin No.	Signal
1	Input #24 (MSB)
...	...
47	Input #1 (LSB)
49	+5VDC (out)
Even #s	Ground

Programmable Outputs
50-Pin Header

Pin No.	Signal
1	Output #24 (MSB)
...	...
47	Output #1 (LSB)
49	+5VDC (out)
Even #s	Ground

Encoder 2 or 4
9-Pin Screw Terminal

Pin No.	Signal
1	Shield
2	Ground
3	Z –
4	Z +
5	B –
6	B +
7	A –
8	A +
9	+5VDC (out)

Triggers
9-Pin Screw Terminal

Pin No.	Signal	
1	Shield	
2	Ground	
3	Input 4	AT6400 only
4	Ground	
5	Input 3	
6	Ground	
7	Input 2	
8	Ground	
9	Input 1	

Limit 2 or 4
9-Pin Screw Terminal

Pin No.	Signal
1	Shield
2	Ground
3	Home
4	NEG
5	POS
6	Ground
7	Home
8	NEG
9	POS

Joystick
25-Pin "D"

Pin No.	Signal
1	Analog Ch. 1
2	Analog Ch. 2
3	Analog Ch. 3
4	Analog Ch. 4
8	Shield
14	Ground
15	Axes select
16	Velocity select
17	Joystick release
18	Joystick trigger
19	Joystick auxiliary
23	+5VDC (out)

Auxiliary
9-Pin Screw Terminal

Pin No.	Signal
1	Ground
2	Pulse cutoff
3	Auxiliary pull-up
4	Ground
5	Input pull-up
6	Output pull-up
7	+5VDC
8	Ground
9	+5VDC

Ordering Information

Part No.	Description CE (EMC and LVD)
AT6200-120/240	AT6200 with 90–264VAC input power
AT6400-AUX1-120V	AT6400 with 120VAC input power
AT6400-AUX1-240V	AT6400 with 240VAC input power

DC Versions

Part No.	Description
AT6200-AUX1-DC	AT6200 with +5VDC input power, open-framed version
AT6400-AUX1-DC	AT6400 with +5VDC input power, open-framed version

Software information is available on page C90.

Accessories

Part No.	Description
VM24	Family of external I/O modules. See page C117.
VM50	50-pin header to screw terminal breakout board. See page C118.
71-012832-15	15-foot cable to connect the AT6N00 to the auxiliary board. The standard cable is 5 feet in length.
JS6000	Two-axis joystick. See page C120 for details.

Software Accessories

Part No.	Description
Motion OCX Toolkit	Three custom controls for communication, terminal emulation and fast status polling
CompuCAM	CompuCAM is available in three versions: DXF, HPGL and G-Code
Motion Toolbox	Library of LabVIEW VIs for Motion Control.
Motion Builder	Graphical icon-based software.

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