EXCELLENCE Axidyne® IN MOTION®

AXIOM PV CONTROLLER/DRIVE & SW44 ACTUATOR

PV30

SW44

Integrated PLC performs real-time scans on a separate thread and communicates through software rather than physical wiring. Windows®-based software utilizes a point and click sequential program and PLC ladder logic editor, allowing programming without learning code.

Designed for the most exacting applications, the SW44 is a field-proven electric cylinder that is built to last. Properly applied, the SW44 will deliver millions of maintenance-free cycles.

Air-Oil Systems, Inc. www.airoil.com

3604-4156_00

ELECTRIC LINEAR MOTION PRODUCTS FROM TOL-O-MATIC

SW44 Actuator

OVERVIEW

FEATURES, ADVANTAGES, BENEFITS

FEATURE	ADVANTAGE	BENEFIT
Millions of cycles	Long Life	Lower Operating Cost
Zero Maintenance	No System Down Time	Higher Productivity
Actuator/Motor/Feedback Integrated in One Unit	Compact Envelope	Application Flexibility
8 Pole Hollow Core Motor	Short Body Length	Application Flexibility
High Force & High Speed	with Controlled Motion	Hydraulic Replacement
Controlled Motion Profile	Fast Move to Position with Reduced Impact Speed	Fast Cycle Time with Less Parts Stress
Ball Screw or Roller Screw	Lower Cost Higher Force	Application Flexibility
Manual Override	In 2 Locations	Use in Power Loss

SPECIFICATIONS

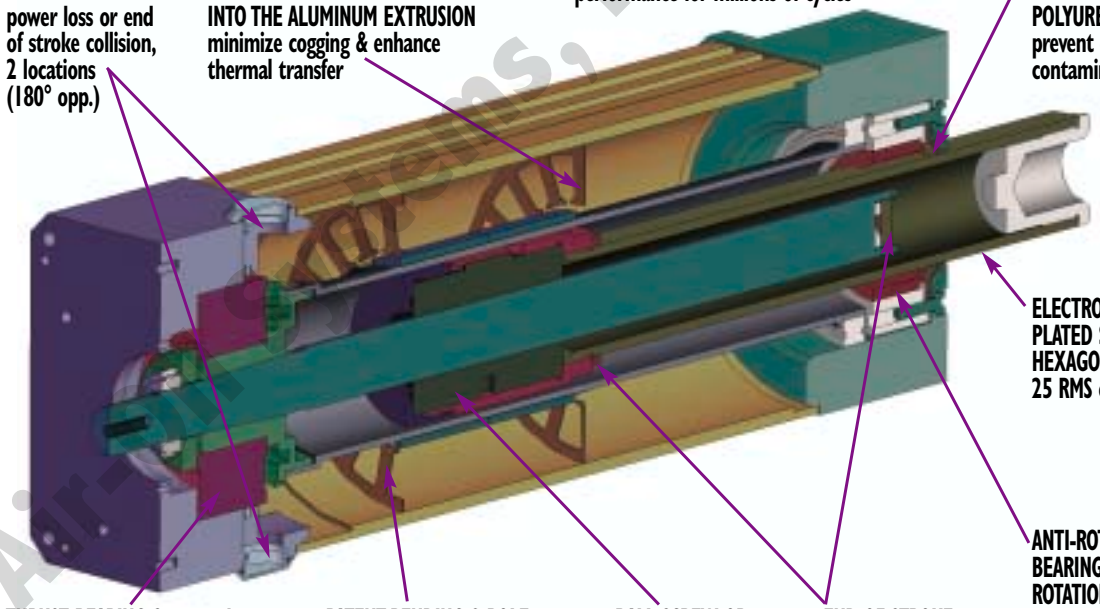
FEATURES	SW SERIES	
Operating Force	**ROLLER SCREW** Up to 2500 lbf [11.1 kN]	**BALL SCREW** Up to 1000 lbf [4.4 kN]
Peak Force*	4400 lbf [19.6 kN]	
Continuous Force**	1850 lbf [8.2 kN]	
Peak Speed (at 2000 lbf)	13 in/sec [330.2mm/sec]	
Feedback Device	Quantum Quadrature Encoder - *Others Available on Reqest, Contact Factory*	
Weight (with 6" stroke)	31 lbs [14.1 kg]	

**Peak Force is a result of the limit of the drive*
***Continuous Force is achieved with actuator surface temp. less than 155° F (69° C)*

DRIVE CONSIDERATIONS

All servo actuators are tested with the Tol-O-Matic AxiomPlus™ drive/controller before leaving the factory and are validated to meet performance specifications. Actual performance may be affected by the choice of the motor drive.

SW FEATURES



Patent pending

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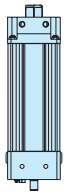
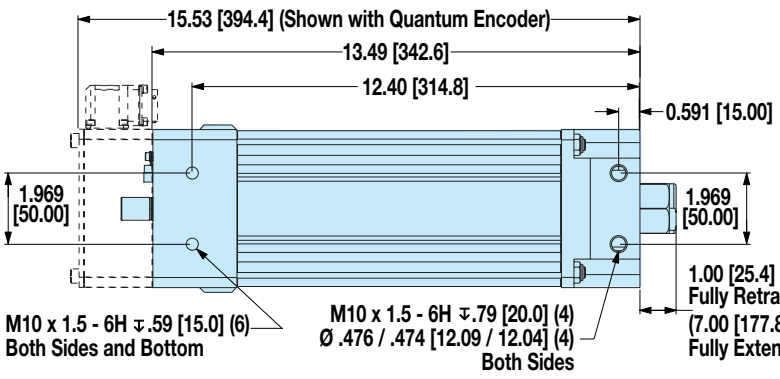


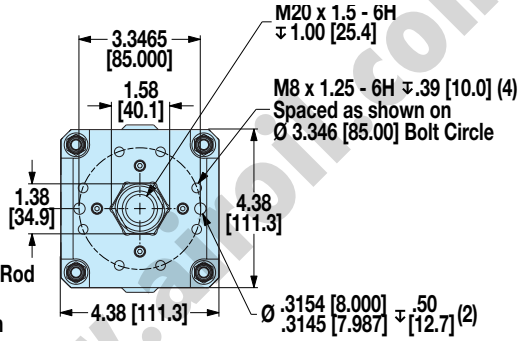
DIMENSIONS (SHOWN WITH FEEDBACK DEVICE)

3D SOLID MODELS AVAILABLE – CONTACT TOL-O-MATIC

NOTE: Base actuator shown with feedback device. Dimensions are for reference only. Contact Tol-O-Matic for solid models

Dimensions in inches
[Dimensions in millimeters]





ORDERING

I M	S W 4 4	R N 2 0 0 5	S K 0 6	F B	T Q M	L V 3	M N T S A	P V 3 0	C R 0 6

ACTUATOR TYPE
IM Integral Motor

MODEL & SIZE
SW44 4.4" Face Width

NUT/SCREW
RN2005 Roller Nut/Screw, 20mm Dia./5mm lead
BN2505 Ball Nut/Screw, 25mm Dia./5mm lead

STROKE LENGTH
SK06 6" Stroke Length *(only stroke available)*

FEEDBACK DEVICE
FB Feedback Device, then enter desired feedback device:
TQM Quantum, Tol-O-Matic Standard
Call factory for additional feedback devices.

VOLTAGE
LV3 230 VAC / 325 VDC **HV3** 460 VAC / 680 VDC

MOUNTING
MNTSA Mounting Standard

CONTROLLER/DRIVE
PV30 Axiom®Plus Controller/Drive

CABLE
CR06 6-meter encoder cable, power cable
CR15 15-meter encoder cable, power cable
CC RS232 communication cable

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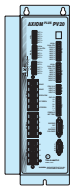

Axiom PV30

FEATURES

AXIOM PV30
FEATURES
SPECIFI-CATIONS
DIMENSIONS
PLC / SEQUENTIAL PROGRAM EDITORS
ORDERING

PV30

PLC:

- Real-time scan supervisory function continuous from power-up
- Typical scan time of 2-4 milliseconds
- Ladder logic allows 175 rungs, 4 lines deep, 5 input operations, and an output coil
- Operations include: normally-open, normally-closed, logical invert, one-shot, output coil, latch, unlatch, timers and counters
- 64 character rung descriptor downloaded and uploaded with program
- Internal bit-flags for information transfer between controller and PLC

MOTION CONTROLLER:

- 1.5 axis (gearing to auxiliary axis)
- Commands include: absolute, incremental and velocity moves, branch to labels, subroutine calls, repeat loops, time delays, wait on conditions/inputs, output/flag control and parameter value changes including torque limit, following error, position band, follower gear ratio, maximum velocity, analog position and analog velocity
- Event triggering based on intermediate positions
- Motion pause and resume
- Comment lines and labels down-loaded and uploaded with program

DRIVE:

- PV series drives use space vector commutation providing better bus voltage utilization than traditional sine drives for improved speed/torque curves
- Flux vector current control provides accurate high bandwidth control of torque producing current for better efficiency and more torque over the full speed range than with traditional sine drives
- Drives Tol-O-Matic SW44 and MRV series brushless servo motors or can be configured for customer supplied brushless servo motors
- Autophasing eliminates the need for Hall sensors in motors

GENERAL:

- Modbus RTU and ASCII interface
- Pluggable screw terminal connectors eliminate the need for special connectors and secondary breakout terminal strips
- Short circuit, over current and over voltage protection prevents drive damage
- 25W or 50W internal regeneration
- 14 bit analog input
- External regeneration connections
- CW/CCW travel limit inputs
- Fault, enabled, and in-position outputs
- 3A brake relay
- 3 second peak ratings

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Axiom PV30

SPECIFICATIONS

SPECIFICATIONS		Axiom® PV30 Drive
	Weight	12.5 lbs (5.66 kg)
Power	Peak Output Current:	30 Amps
	Continuous Output Current:	15 Amps
	Continuous Output Power:	4.2 kW
	Input Voltage:	95 Vac -250 Vac 1Ø; 95 Vac - 250 Vac 3Ø (voltage range is switch selectable)
	Input Frequency:	47Hz - 63Hz
User Programming		
Language/Programming Environment:		Tol-O-Motion™ windows-based software with point and click sequential program and PLC ladder logic editors
	Firmware Field Upgradeable:	YES
	User Program Storage Capacity:	500 lines of graphic-based, high-level sequential motion and control instructions with unlimited subroutine calls.
PLC	Connection/Capabilities:	Internal PLC with typical real-time scan of 2-4 msec, 10-12 msec for programs of maximum capacity; 15 inputs
Interface	Interfaces supported:	Modbus RTU ASCII

SPECIFICATIONS	Axiom® PV30 Drive
Inputs/Outputs	
General-Purpose Digital Inputs:	15 optically isolated 5-25 Vdc
Inputs/Outputs:	Sinking/sourcing selectable
Analog Input:	1 14 bit ±10V Differential
General-Purpose Digital Outputs:	8 optically isolated, 5-25 Vdc, 20 mA max.
Communications:	Serial: RS-232, 19,200 baud rate
Motor Feedback	
Input Modes:	Incremental with index
Maximum Input Frequency:	4 MHz (post-quadrature)
Commutation Startup:	Auto-phase - no Hall sensors required
Connectors	
Auxiliary Feedback, I/O, Analog I/O:	Wire trap screw terminals
Motor Feedback:	Wire trap screw terminals
Serial Port:	9-pin D-sub
Main AC, Motor Power and DC Bus:	Screw terminal block
Approvals:	UL, CUL, CE
Environmental	
Storage Temperature:	-40˚C to 70˚C (-40˚F to 158˚F)
Operating Temperature:	0˚C to 50˚C (32˚F to 126˚F)
Humidity:	5% to 95% noncondensing

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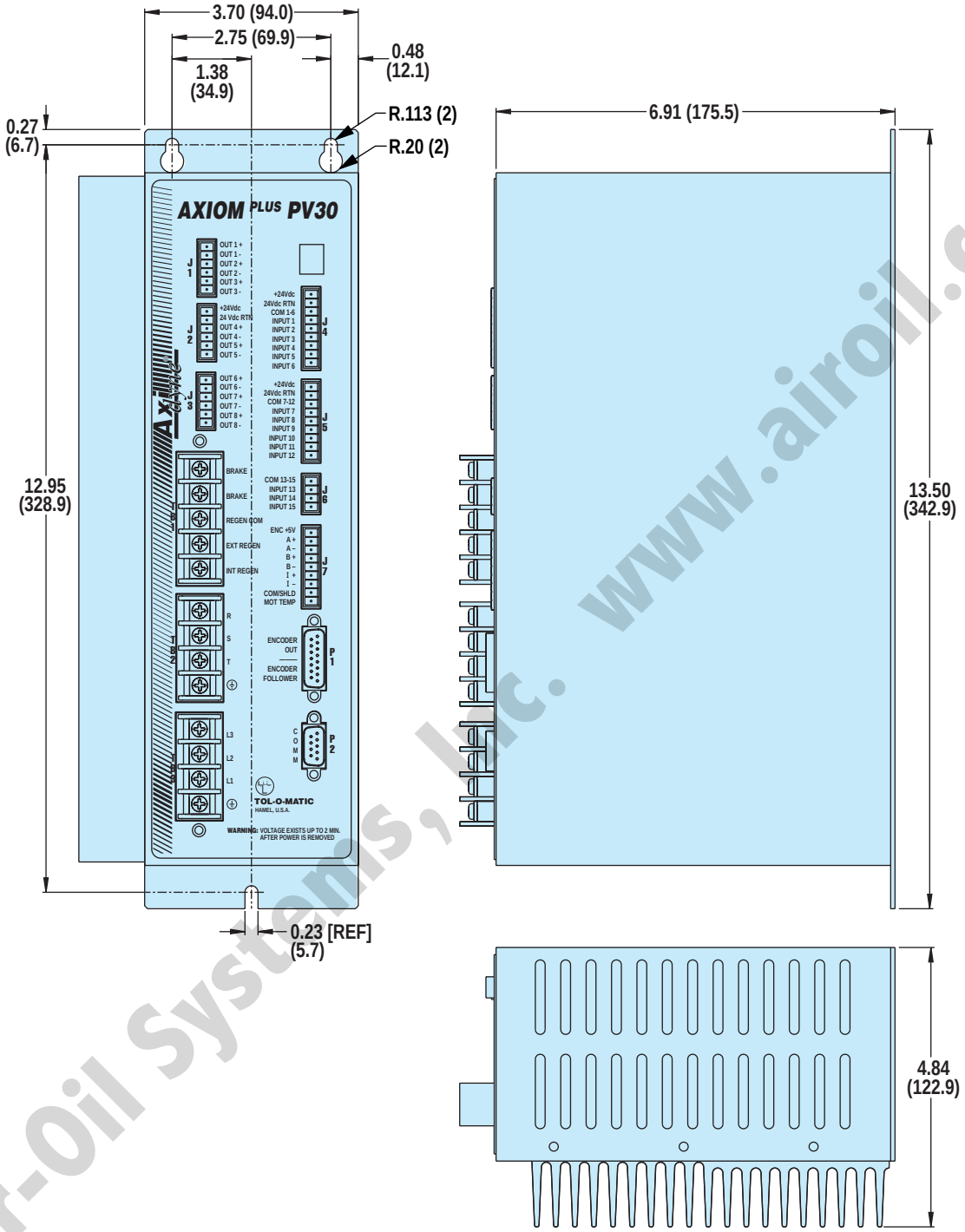
APPLICATIONS FOR SW44 AND PV30

The combination of the SW44 linear actuator and PV30 motor drive/controller/PLC creates a high performance package for many demanding applications. The zero maintenance and durability of the SW44 combined with the ease of use of the PV30 makes an excellent automation package.

Typical applications:

- Hydraulic cylinder replacement
- Stamping / pressing / embossing
- Precision valve control
- Volumetric pumps / filling
- Part clamping
- Packaging machinery
- Medical equipment
- Automation and assembly

DIMENSIONS



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AXIOM PV PLC SEQUENTIAL EDITOR

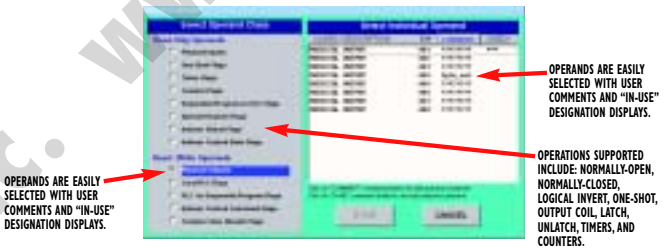
A configuration option for motor selection and related parameters is included, along with a tuning and diagnostic mode. Help menus and control loop description information can be accessed from the main menu.

The Axiom PV also includes a point and click sequential program and PLC ladder logic editor. Instructions include incremental and absolute motion commands, branching (conditional and unconditional), subroutine calls, repeat loops, I/O control, time delays, etc. Use the PLC editor to enter and edit PLC programs, which run using an independent scan. The PLC program accesses all 15 inputs and 8 outputs of the Axiom PV, including general purpose and dedicated internal flags.

Both of these editors utilize easy icon/text driven selections, making the creation of motion profiles a snap (no code memorization required).

AXIOM PV PLC EDITOR

The PLC Editor main menu allows user access to all editing functions along with a 175 rung ladder display. Rungs can be inserted at any point in the program and are easily edited by simply double-clicking with the mouse and selecting the desired functions from subsequent menus. The PLC program's real-time scan is continuous upon power-up and ranges from 2-4 milliseconds for a typical application, with 10-12 milliseconds for a maximum-length program.



AXIOM PV PLC SEQUENTIAL EDITOR

The Sequential Editor main menu provides easy access to all essential program and display functions. Using a series of menus, the program guides the user through instruction selection. The Incremental Position Move window allows two separate trigger moves to be defined based on incremental position reached, physical input transition or flag from the PLC. Two actions can be commanded for each trigger event including torque limit or velocity change, output control or flag passing to PLC. This functionality allows an almost limitless combination of functions associated with a single move, while the PLC facilitates real-time control.

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Axiom PV30

ORDERING

*AXIOM PV CONTROLLER / DRIVE		
Config. Code	Includes	Part #
PV30	Controller/Drive (order cables below)	3604-0010

*Includes user manual and software CD-ROM

Cables

SW44 TO AXIOM PV DRIVE/CONTROLLER

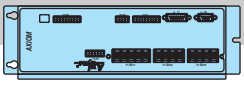
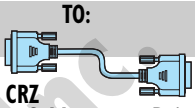
SW44 TO: AXIOM PV30



CR6 OR CR15


Config Code	Replacement Part Number	Included with Drive	Type	Description	Cable Length	Motor Size	CONNECTORS AT Motor	Axiom DV/PV Axiom DV/PV 10	Size
CR6	3604-1192	Optional	Power		6m	SW44	MS	Screw terminal	30
CR15	3604-1193	Optional	Power		15m	SW44	MS	Screw terminal	30
CR6	3604-1196	Optional	Encoder		6m	All	MS	Screw terminal	All
CR15	3604-1197	Optional	Encoder		15m	All	MS	Screw terminal	All

CONTROLLER TO IBM COMPATIBLE PC

AXIOM PV30  TO:  CRZ PC 

Config Code	Replacement Part Number	Included with SSC	Type	Description	Cable Length	Drive	CONNECTORS AT Axiom PV	PC	PC Size
CRZ	3600-1172	Optional	Comm		2m	AxiomPV	DB9	DB9	All

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