

Selection Guide



Servo Drives
Stepper Drives
Control Software
Linear Motors
Linear Actuators

Copley Cont

About Copley

Copley Controls delivers high performance motion solutions to a wide range of industries including semiconductor, life sciences, automated assembly, test and measurement and packaging. An ISO 9001:2000 company, Copley produces products of the highest quality in state-of-the-art manufacturing facilities in both the US and UK.

With over 25 years of experience in OEM partnerships, Copley's application team combines with R&D to deliver world-class, highly responsive support. Our global commitment is backed with sales offices and local technical support in the US, Europe and Asia.



Drives & Controls

From networked servo and stepper drives to traditional torque amplifiers, Copley has the solution for your system. Flexible packaging options are provided in the 100W - 6kW power range. Both AC and DC powered drives are available. Advanced tuning and commutation algorithms maximize motor performance.

Copley drive configuration software is highly intuitive and incorporates powerful diagnostics tools. An easy-to-use Indexer is built in. Network software tools make distributed control system commissioning fast and simple.



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Linear Motors & Actuators

Copley Controls is the inventor of the tubular linear motor, setting new standards for performance and ease of mechanical integration. Patented magnetics and internal feedback deliver 12 micron repeatability without the need for a linear encoder. Moving-rod linear actuators with integral bearings are available as well as moving-forcer linear motors. Peak force capability is up to 1860 N.

For wash-down applications and hygienic environments in the food & beverage and pharmaceutical industries, Copley offers a IP69K rated stainless steel actuator. The hygienic actuator has no fins and is water-cooled for optimal continuous force rating.



Custom OEM Solutions

Copley provides competitive advantage to the OEM by tailoring designs to precisely fit the application. Drive customization can be as simple as special I/O functions or as complex as a complete, cost-optimized multi-axis system. Custom indexer functions bring fill-in-the-blanks simplicity to more complex single-axis applications.

Linear motors can be incorporated into ready-to-use modules with long-life bearing rail, limit switches and drag-chain. Optional laser welded bellows and hard-anodizing are also available.

Connectivity

Seamless System Integration

Copley drives incorporate comprehensive control and motor feedback interfaces for seamless integration into any control system. EtherCAT and CANopen networks are supported by powerful software tools for rapid commissioning.

Incremental Encoders

Digital incremental encoder and Halls are the standard interface on all drives with position mode capability. Xenus and Accelnet have an analog encoder option and feature a wake-and-wiggle algorithm for commutation without Halls.

Resolvers

Resolvers are the feedback of choice for rugged environments. Available as an option on Xenus and Accelnet, Copley's proprietary interface delivers 14-bit resolution up to 10,000 rpm.

Absolute Encoders

Select Copley drives are available with a range of open standard absolute encoder interfaces including EnDat, BiSS, Hiperface and SSI.



FEEDBACK

PC, Motion Card, PLC

A flexible range of operating modes and command interfaces enables seamless integration into both centralized and distributed control architectures. Operating modes, including advanced camming and trajectory tracking, are built in as standard.

Copley CANopen drives have also been integrated into third party software tools including LabVIEW and CoDeSys SoftMotion for complete PC-Based multi-axis motion control solutions.

CONTROL

Y

CANopen

CANopen is a highly cost-effective implementation of distributed control. In PVT mode, the drive accepts tightly synchronized position/velocity/time points. In profile mode, the drive executes a move based on pretransmitted parameters. CANopen also accommodates velocity and torque modes.

Copley provides comprehensive hardware and software tools for CANopen. CAN-PCI-02 is a fully isolated dual-channel PCI card with an on-board micro controller. CAN-IPM-01 I/O Processor Module enables OEMs to design optimal system interfaces and integrate them seamlessly into a CANopen network.



CAN-PCI-02



CAN-IPM-01



NETWORKS

EtherCAT

EtherCAT is an open, real-time Ethernet network. Fast and deterministic, EtherCAT supports a variety of network topologies including line, tree and star. EtherCAT leverages standard CANopen device profiles facilitating migration to an Ethernet based system. Both centralized and distributed control architectures can be implemented with EtherCAT.

MACRO

Designed for Delta Tau controllers, MACRO is Ethernet based and available in both fiber and copper physical layers. Fast and synchronized, MACRO is typically used in a centralized control architecture with position and velocity loops closed in the motion card.

DeviceNet

DeviceNet is a distributed control solution typically used in PLC based systems. Drives operate as Indexers or execute moves based on pretransmitted parameters. There is no drive synchronization and DeviceNet finds its best application in point-to-point motion.

RS-232 ASCII

RS-232 is used for point-to-point motion in both PLC and PC based systems. Drives operate as Indexers or execute moves based on pretransmitted parameters. Multiple axes can be addressed via a transparent CANopen connection between drives.

Software To

Control Software

Copley distributed control software makes system commissioning fast and simple. The development of low-level code to control a CANopen or EtherCAT network is eliminated. All network management is accomplished with a few simple commands linked into your application program.

Copley supports two development environments. Copley Motion Libraries (CML) link into a C++ application program. Copley Motion Objects (CMO) are COM objects that can be used by Visual Basic®, .NET®, LabVIEW® or any COM compliant software.

Network Management

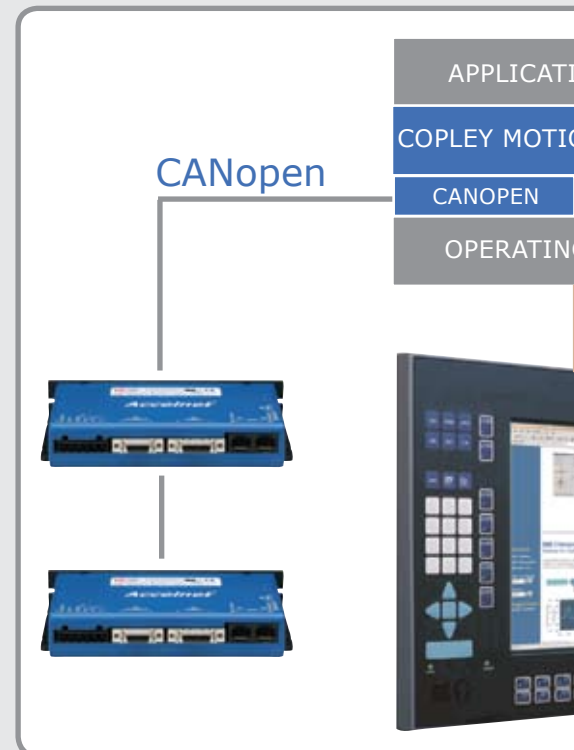
- Configuration and startup
- Synchronization
- Node guarding
- Message generation
- Heartbeat
- Error management

Motion Control

- Path planning
- PVT generation
- Profile execution
- PVT buffer management

General

- Parameter set/get
- Setup file download
- Drive fault handling
- I/O interfacing



Configuration

Java based CME 2 configuration software is powerful and intuitive. Comprehensive diagnostics, auto-tuning and advanced oscilloscope tools simplify system commissioning.

Auto-phasing eliminates the time consuming rewire-and-try procedure for encoder/Halls/motor connections. CME 2 automatically compensates for crossed wires - the most common cause of startup headaches.

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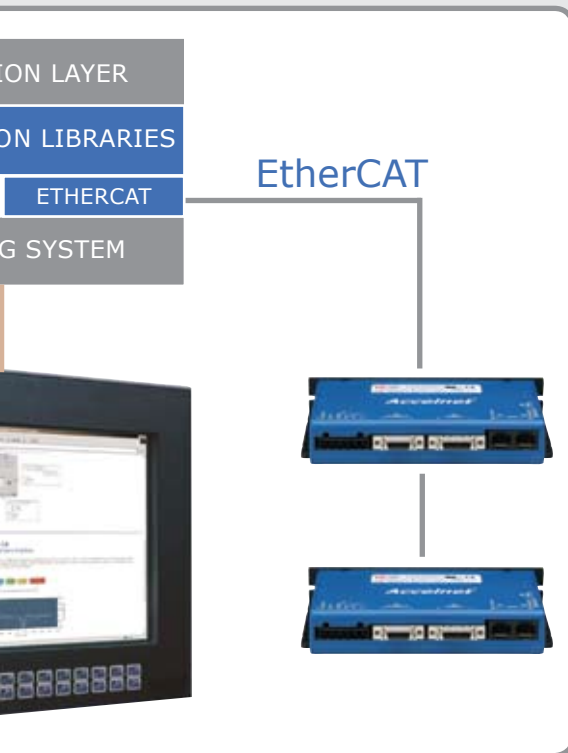
Built-In Indexing

Point-and-click to define up to 32 indexes or index sequences. Index sequences can include parameter changes, dwell times and I/O control. Simply select the index/sequence and command GO.

Any parameter (e.g. move distance) can be assigned to a register for efficient adjustment by a PLC.

For more complex applications, Copley can provide custom functions. Just install and fill in the blanks.

Copley also provides a flexible OEM programming environment. Copley Virtual Machine assembler and powerful debugger facilitate the development of fast, compact control programs.



- | | |
|---------------|----------------|
| Absolute Move | Wait Move Done |
| Relative Move | Set Output |
| Velocity Move | Wait Time |
| Force Move | Wait Input |
| Home | Set Parameter |

Cam Tables

Camming is an effective way to produce repetitive motion synchronized to an external device. A pre-defined cam table of slave positions is typically cycled through by a master encoder connected to the drive. The drive performs linear interpolation between points to minimize cam table size.



Digital Drive

Comprehensive Drive Range

Copley offers a complete range of digital drives for brushless, brush and stepper motors. Xenus, Accelnet and Stepnet feature CANopen for distributed control.

PLUS versions also incorporate EtherCAT and offer expanded feedback options.

PLUS drives feature high resolution A/D converters for optimal current control as well as fast, hardware-based position capture and setpoint trigger output.

Technology Edge

Field Oriented Control

- Optimal orientation of magnetic fields
- Motors run faster and cooler

Servo & PWM Performance

- High bandwidth nested loops
- Biquad filter for notch or low pass filters
- High efficiency dynamic PWM
- Edge filter accessories for low emissions

Stepper Technology

- Smooth, low audible noise
- Precision microstepping, low resonance
- Servo mode for closed loop control
- Detent torque compensation

Feature	Xenus	Accelnet
Motor	Brushless/Brush	Brushless/Brush
Input Power	100-240 VAC	20-180 VDC
Continuous Current	1-20 A	1-12 A
Feedback*	E, R, S, A	E, R, S, A
Ruggedized Version	•	•
CANopen, DeviceNet	•	•
EtherCAT, MACRO	•	•
Indexer	•	•
Camming	•	•
Gearing	•	•
Step/Direction	•	•
PWM velocity/current	•	•
±10V velocity/current	•	•

* E=Incremental Encoder, R=Resolver, S=Analog Encoder,

Custom Drive Designs

A broad spectrum of technology expertise enables Copley to respond rapidly and cost-effectively to OEM needs. Custom capabilities include:

- Optimized Packaging: connectors and form factor
- Power Ratings: custom current and voltage
- Multi-Axis: rack systems and 2-4 axis packages
- Java Beans: custom indexer functions
- Feedback: special encoders
- Enhanced Firmware: custom compensation filters

Installation Flexibility

Copley provides high power density panel-mount and PCB-mount packaging options. Multi-axis modules are available for optimal flexibility. Both AC and DC powered versions are available.



AC Powered



DC Powered

Stepnet	Accelus	Junus
Stepper	Brushless/Brush	Brush
VAC, VDC	20-180 VDC	20-180 VDC
2-10 A	3-12 A	5-15 A
E	E	V
•		
•		
•		
•		
•	•	
•	•	
•	•	•
•	•	•

A=Absolute Encoder, V=Back-EMF

Ruggedized Drives

R-Series drives are ruggedized versions of Xenus and Accelnet. Designed to endure temperature extremes, high humidity, vibration and shock, the R-Series finds application in COTS military, nautical, aviation, oil refining and vehicle based systems.

Ambient Temp.	-40°C to 70°C
Thermal Shock	-40°C to 70°C in 1 minute
Relative Humidity	95% non-condensing at 60°C
Vibration	5 Hz to 500 Hz, up to 3.85 grms
Altitude	-400 m to 5,000 m
Shock	40 g peak acceleration



Xenus

XTL Panel



Model	VAC	Ic	Ip
XTL-230-18	100-240	6	18
XTL-230-36	100-240	12	36
XTL-230-40	100-240	20	40

XSJ Micro Panel



Model	VAC	Ic	Ip
XSJ-230-02	100-240	1	2
XSJ-230-06	100-240	3	6
XSJ-230-10	100-240	5	10

Control Modes

- Indexer, Point-to-Point, PVT
- Camming, Gearing
- Position, Velocity, Torque

Command Interface

- CANopen/DeviceNet
- ASCII and discrete I/O
- Stepper commands
- $\pm 10V$ position/velocity/torque command
- PWM velocity/torque command
- Master encoder [Gearing/Camming]

Communications

- CANopen/DeviceNet
- RS-232

Accessories

- External regen resistors
- External edge filter

Feedback

- Digital quad A/B encoder
- Aux. encoder / encoder out
- Analog sin/cos encoder [-S option]
- Resolver [-R option]
- Digital Halls

I/O - Digital

- XTL: 11-14 inputs, 4 outputs
- XSJ: 11-14 inputs, 4 outputs

Regen

- XTL: internal transistor, external resistor
- XSJ: internal dissipation

Dimensions: mm [in]

- XTL: 191 x 140 x 64 [7.5 x 5.5 x 2.5]
- XSJ: 126 x 90 x 53 [5.0 x 3.5 x 2.1]

Xenus^{PLUS}

XPL, XEL
Panel



Model	VAC	Ic	Ip
XPL-230-18	100-240	6	18
XPL-230-36	100-240	12	36
XPL-230-40	100-240	20	40

EtherCAT

Model	VAC	Ic	Ip
XEL-230-18	100-240	6	18
XEL-230-36	100-240	12	36
XEL-230-40	100-240	20	40

Xenus^{PLUS} sets new levels of performance, connectivity and flexibility. Both Ethernet based EtherCAT and CANopen versions are available. A wide range of absolute encoder interfaces are built in including EnDat, Hiperface and BiSS.

High resolution A/D converters ensure optimal current loop performance. Both isolated and high-speed non-isolated I/O are provided. For safety critical applications, redundant power stage enable inputs can be employed.

Control Modes

- Indexer, Point-to-Point, PVT
- Camming, Gearing
- Position, Velocity, Torque

Command Interface

- EtherCAT [XEL]
- CANopen/DeviceNet [XPL]
- ASCII and discrete I/O
- Stepper commands
- $\pm 10V$ position/velocity/torque command
- PWM velocity/torque command
- Master encoder [Gearing/Camming]

Communications

- EtherCAT [XEL]
- CANopen/DeviceNet [XPL]
- RS-232

Accessories

- External regen resistors
- External edge filter

Feedback

- Digital quad A/B encoder
- EnDat, Hiperface, BiSS, SSI, Absolute A encoders
- Aux. encoder / encoder out
- Analog sin/cos encoder
- Resolver [-R option]
- Digital Halls

Safety Disable

- Conforms to EN 954-1 & ISO 13849-1 standards
- Two active inputs enable power stage
- One output confirms power stage status

I/O - Digital

- 16 inputs, 6 outputs

I/O - Analog

- 2, 16 bit inputs
- 1, 12 bit output

Dimensions: mm [in]

- 202 x 139 x 52 [7.9 x 5.5 x 2.3]

Accelnet

ADP Panel



Model	VDC	Ic	Ip
ADP-055-18	20-55	6	18
ADP-090-09	20-90	3	9
ADP-090-18	20-90	6	18
ADP-090-36	20-90	12	36
ADP-180-09	20-180	3	9
ADP-180-18	20-180	6	18

ACJ Micro Panel



Model	VDC	Ic	Ip
ACJ-055-09	20-55	3	9
ACJ-055-18	20-55	6	18
ACJ-090-03	20-90	1	3
ACJ-090-09	20-90	3	9
ACJ-090-12	20-90	6	12

ACM Module



Model	VDC	Ic	Ip
ACM-055-18	20-55	6	18
ACM-090-09	20-90	3	9
ACM-090-24	20-90	12	24
ACM-180-09	20-180	3	9
ACM-180-18	20-180	6	18
ACM-180-20	20-180	10	20

ACK Micro Module



Model	VDC	Ic	Ip
ACK-055-06	20-55	3	6
ACK-055-10	20-55	5	10
ACK-090-04	20-90	2	4
ACK-090-08	20-90	4	8

Control Modes

- Indexer, Point-to-Point, PVT
- Camming, Gearing
- Position, Velocity, Torque

Command Interface

- CANopen/DeviceNet
- ASCII and discrete I/O
- Stepper commands
- ±10V position/velocity/torque command
- PWM velocity/torque command
- Master encoder [Gearing/Camming]

Communications

- CANopen/DeviceNet
- RS-232

Feedback

- Digital quad A/B encoder
- Resolver [-R option]
- Aux. encoder / encoder out [ADP, ACJ]
- Analog encoder [ADP, ACJ -S option]
- Digital Halls

I/O - Digital

- 8-12 inputs, 2-4 outputs

Dimensions: mm [in]

- ADP: 168 x 99 x 31 [6.6 x 3.9 x 1.2]
- ACJ: 97 x 64 x 33 [3.8 x 2.5 x 1.3]
- ACM: 102 x 69 x 25 [4.0 x 2.7 x 1.0]
- ACK: 64 x 41 x 16 [2.5 x 1.6 x 0.6]

Accelnet^{PLUS}

AEP Panel



EtherCAT

Model	VDC	Ic	Ip
AEP-055-18	20-55	6	18
AEP-090-09	20-90	3	9
AEP-090-18	20-90	6	18
AEP-090-36	20-90	12	36
AEP-180-09	20-180	3	9
AEP-180-18	20-180	6	18

APM, AEM Single-Axis Modules



Model	VDC	Ic	Ip
APM-090-06	20-90	3	6
APM-090-14	20-90	7	14
APM-090-24	20-90	12	24

EtherCAT

Model	VDC	Ic	Ip
AEM-090-06	20-90	3	6
AEM-090-14	20-90	7	14
AEM-090-24	20-90	12	24

AP2, AE2 Dual-Axis Modules



Model	VDC	Ic	Ip
AP2-090-06	20-90	3	6
AP2-090-14	20-90	7	14

EtherCAT

Model	VDC	Ic	Ip
AE2-090-06	20-90	3	6
AE2-090-14	20-90	7	14

Control Modes

- Indexer, Point-to-Point, PVT
- Camming, Gearing
- Position, Velocity, Torque

Command Interface

- CANopen/DeviceNet, EtherCAT
- ASCII and discrete I/O
- Stepper commands
- ±10V position/velocity/torque command
- PWM velocity/torque command
- Master encoder [Gearing/Camming]

Communications

- EtherCAT [AEP, AEM, AE2]
- CANopen/DeviceNet [APM, AP2]
- RS-232

Feedback

- Digital quad A/B encoder
- EnDat, Hiperface, BiSS, SSI, Absolute A encoders
- Aux. encoder / encoder out
- Analog sin/cos encoder
- Resolver [-R option]
- Digital Halls

I/O

- Digital: 16 inputs, 6 outputs
- Analog: two 12 bit inputs

Dimensions: mm [in]

- AEP: 202 x 139 x 52 [7.9 x 5.5 x 2.3]
- APM, AEM: 77 x 59 x 23 [3.0 x 2.3 x 0.9]
- AP2, AE2: 114 x 73 x 23 [4.5 x 2.9 x 0.9]

Stepnet

STX Panel



Model	VAC	Ic	Ip
STX-115-07	100-120	5	7
STX-230-07	100-240	5	7

STP Micro Panel



Model	VDC	Ic	Ip
STP-075-07	20-75	5	7
STP-075-10	20-75	10	10

STM Module



Model	VDC	Ic	Ip
STM-075-07	20-75	5	7

STL Micro Module



Model	VDC	Ic	Ip
STL-055-04	20-55	3	4.5
STL-075-03	20-75	2	3

ST3 3-Axis



Model	VDC	Ic	Ip
ST3-055-04	20-55	2	4

The open frame design of the new multi-axis ST3 delivers simple connectivity and optimal cost per axis for the control of three NEMA 17/23 stepper

motors. ST3 accepts step/direction commands as well as PVT vectors via the CANopen network. ST3 can also operate in Indexer mode.

Stepnet

Control Modes

- Indexer, Point-to-Point, PVT
- Camming, Gearing
- Position, Velocity, Torque [Servo Mode]
- Position [Microstepping]

Command Interface

- CANopen/DeviceNet
- ASCII and discrete I/O
- Stepper commands
- ±10V position/velocity/torque cmdnd. [STX, STM]
- PWM velocity/torque command
- Master encoder [Gearing/Camming]

Feedback

- Digital quad A/B encoder [Servo Mode]

Communications

- CANopen/DeviceNet
- RS-232

I/O - Digital

- STX, STP, STM, STL: 12 inputs, 4 outputs
- ST3: 15 inputs, 6 outputs

Dimensions: mm [in]

- STX: 146 x 119 x 55 [5.7 x 4.7 x 2.2]
- STP: 138 x 78 x 39 [5.4 x 3.1 x 1.5]
- STM: 102 x 69 x 25 [4.0 x 2.7 x 1.0]
- STL: 64 x 41 x 16 [2.5 x 1.6 x 0.6]
- ST3: 121 x 70 x 27 [4.8 x 2.8 x 1.1]

Stepnet^{PLUS}

SPM, SEM
Single-Axis
Modules



Model	VDC	Ic	Ip
SPM-090-07	20-90	5	7

EtherCAT

Model	VDC	Ic	Ip
SEM-090-07	20-90	5	7

SP2, SE2
Dual-Axis
Modules



Model	VDC	Ic	Ip
SP2-090-07	20-90	5	7

EtherCAT

Model	VDC	Ic	Ip
SE2-090-07	20-90	5	7

Control Modes

- Indexer, Point-to-Point, PVT
- Camming, Gearing
- Position, Velocity, Torque [Servo Mode]
- Position [Microstepping]

Command Interface

- EtherCAT [SEM, SE2]
- CANopen/DeviceNet [SPM, SP2]
- ASCII and discrete I/O
- Stepper commands
- ±10V position/velocity/torque command
- PWM velocity/torque command
- Master encoder [Gearing/Camming]

Feedback

- Digital quad A/B encoder [Servo Mode]

Communications

- EtherCAT [SEM, SE2]
- CANopen/DeviceNet [SPM, SP2]
- RS-232

I/O - Digital

- SPM, SEM: 10 inputs, 6 outputs
- SP2, SE2: 20 inputs, 6 outputs

Dimensions: mm [in]

- SPM, SEM: 77 x 59 x 23 [3.0 x 2.3 x 0.9]
- SP2, SE2: 114 x 73 x 23 [4.5 x 2.9 x 0.9]

MACRO Drives

Xenus^{PLUS}
XML
Panel



Model	VAC	Ic	Ip
XML-230-18	100-240	6	18
XML-230-36	100-240	12	36
XML-230-40	100-240	20	40

Accelnet^{PLUS}
AMP
Panel



Model	VDC	Ic	Ip
AMP-055-18	20-55	6	18
AMP-090-09	20-90	3	9
AMP-090-18	20-90	6	18
AMP-090-36	20-90	12	36
AMP-180-09	20-180	3	9
AMP-180-18	20-180	6	18

Control Modes

- Indexer, Point-to-Point, PVT
- Camming, Gearing
- Position, Velocity, Torque

Command Interface

- MACRO
- ASCII and discrete I/O
- Stepper commands
- $\pm 10V$ position/velocity/torque command
- PWM velocity/torque command
- Master encoder [Gearing/Camming]

Communications

- MACRO
- RS-232

Accessories [XML]

- External regen resistors
- External edge filter

Safety Disable [XML]

- Two active inputs enable power stage
- One output confirms power stage status

Feedback

- Digital quad A/B encoder
- EnDat, Hiperface, BiSS, SSI, Yaskawa & Panasonic encoders
- Aux. encoder / encoder out
- Analog sin/cos encoder
- Resolver option [XML]
- Digital Halls

I/O - Digital

- XML: 16 inputs, 6 outputs
- AMP: 11 inputs, 4 outputs

I/O - Analog

- XML: 2, 16 bit inputs
- AMP: 2, 12 bit inputs
- XML: 1, 12 bit output

Dimensions: mm [in]

- XML: 202 x 139 x 52 [7.9 x 5.5 x 2.3]
- AMP: 196 x 99 x 31 [7.7 x 3.9 x 1.2]

Accelus

ASP Panel



Model	VDC	Ic	Ip
ASP-055-18	20-55	6	18
ASP-090-09	20-90	3	9
ASP-090-18	20-90	6	18
ASP-090-36	20-90	12	36
ASP-180-09	20-180	3	9
ASP-180-18	20-180	6	18

ASC Card



Model	VDC	Ic	Ip
ASC-055-18	20-55	6	18
ASC-090-09	20-90	3	9

Control Modes

- Gearing, Position, Velocity, Torque

Command Interface

- Stepper commands
- $\pm 10V$ position/velocity/torque command
- PWM velocity/torque command
- Master encoder [Gearing]

Communications

- RS-232

Feedback

- Digital quad A/B encoder
- Digital Halls

I/O - Digital

- 6 inputs, 2 outputs

Dimensions: mm [in]

- ASP: 168 x 99 x 31 [6.6 x 3.9 x 1.2]
- ASC: 153 x 89 x 31 [6.0 x 3.5 x 1.2]

Junus

JSP Panel



Model	VDC	Ic	Ip
JSP-090-10	20-90	5	10
JSP-090-20	20-90	10	20
JSP-180-10	20-180	5	10
JSP-180-20	20-180	10	20
JSP-180-30	20-180	15	30

Control Modes

- Velocity, Torque

Command Interface

- $\pm 10V$ velocity/torque command
- PWM velocity/torque command

Communications

- RS-232

Feedback

- Back-EMF [velocity mode]

I/O - Digital

- 5 inputs, 1 output

Dimensions: mm [in]

- 130 x 82 x 31 [5.1 x 3.2 x 1.2]

Analog Amp

Introduction

Copley offers a comprehensive range of analog amplifiers for both brushless and brush motors. AC powered brushless amplifiers are available with UV current command inputs for high precision applications. DC powered brushless torque amplifiers are trapezoidally commutated from digital Halls. Brush amplifiers accept tachometer feedback for velocity mode operation.

Amplifier Technology

- Excellent linearity
- High PWM switching frequency
- Temperature drift compensation
- Zero deadband
- Internal edge filter option

The compact, high power density PCB-mounted Bantam module is configured by both discrete and analog input signals. Panel mounted amplifiers incorporate potentiometers, dip-switches and component headers which can be preconfigured for OEM applications. Monitoring output signals simplify tuning and provide diagnostics.

Protection

- Output short circuit
- Current limiting: continuous, peak, time
- Overtemperature
- Overvoltage shutdown
- Undervoltage shutdown

AC Powered Brushless Amplifiers

7000 Series amplifiers accept current commands for both the U and V motor windings. The amplifier synthesizes the commanded current for the W

winding. The UV commands are sinusoidally commutated by an external controller which also closes the position and velocity loops.



Model	VAC	Ic	Ip
7225AC	100-120	10	20
7425AC	100-240	10	20

Control Mode: Torque
Command Interface: UV
Commutation: Sinusoidal
Dimensions: 191 x 176 x 69 [7.5 x 6.9 x 2.7]

Digital In: Enable, Reset, Motemp
Digital Out: Amp OK, Current Limiting
Analog In: REF (UV)
Analog Out: Motor Currents (UV)

Amplifiers

DC Powered Brushless Amplifiers

Bantam Module



Model	VDC	Ic	Ip
BTM-055-20	20-55	10	20
BTM-090-10	20-90	5	10

Control Mode: Torque
 Command Interface: $\pm 10V$
 Commutation: Trapezoidal
 Feedback: Digital Halls
 Dimensions: 53 x 46 x 15 [2.1 x 1.8 x 0.6]

Digital In: Enable, Limits, Inductance Select
 Digital Out: Amp OK, Regen, Brake
 Analog In: REF, Balance, Ic/Ip/I2t Limits
 Analog Out: Motor Current, Ref. Current

503 Panel



Model	VDC	Ic	Ip
503	18-55	5	10

Control Mode: Torque
 Command Interface: $\pm 10V$
 Commutation: Trapezoidal
 Feedback: Digital Halls
 Dimensions: 120 x 84 x 33 [4.7 x 3.3 x 1.3]

Digital In: Enable, Limits, Reset
 Digital Out: Amp OK
 Analog In: REF
 Analog Out: Motor Current

DC Powered Brush Amplifiers

400 Series Panel



Model	VDC	Ic	Ip
412CE	20-90	10	20
413CE	20-90	15	30
421CE	24-180	5	10
422CE	24-180	10	20

Control Mode: Velocity, Torque
 Command Interface: $\pm 10V$
 Feedback: Tachometer, Back-EMF
 Dimensions: 130 x 84 x 36 [5.1 x 3.3 x 1.4]

Digital In: Enable, Limits, Reset
 Digital Out: Fault, HI/LO Output Voltage
 Analog In: REF, Tach
 Analog Out: Motor Current, Ref. Current, Voltage

ServoTube A

ServoTube

Copley linear motors and actuators set a new standard for performance and simplicity in linear motion, delivering fast, quiet, clean actuation at low cost. ServoTube achieves up to 12 micron repeatability from a built-in sensor. A linear encoder is not required.

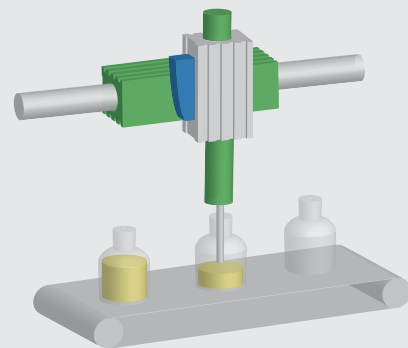
- Built-in position sensor
- Integral bearing (Actuator)
- IP67 rated
- Built-in heatsink
- Mount load directly to housing
- Standard 3 phase windings
- Standard sin/cos position output



Installation Flexibility

ServoTube is available as a moving-rod actuator with integral bearing and as a moving-forcer linear motor. The actuator bearing is lubricant-free and rated up to 64,000 km.

ServoTube accepts a wide range of industry-standard mounting accessories for simple drop-in pneumatic cylinder replacement. In moving-forcer applications, loads can be mounted directly to the rugged housing.



Advantage



Positioning Solution

Copley provides a complete solution for linear actuation. Position control is made easy with a flexible range of DC or AC powered drives complete with cabling. The drives have indexer capability built in and integrate seamlessly into both PLC and PC-based system architectures.

Getting the ServoTube up and running with a Copley drive could not be simpler. A powerful self-tuning routine ensures optimal out-of-the-box performance.



Rigid Actuator

A high-rigidity actuator is available with integrated outrigger bearings for applications with higher side loading. Ball bushings with steel bearing rails provide maximum support. Polymer bushings with aluminum rails are also available for weight critical vertical axes.

Four models deliver continuous force from 61-119 N with peak forces up to 860 N. Twelve stroke lengths are available from 28-310 mm.



ServoTube Actuator

With its moving-rod and fixed forcer, ServoTube Actuator is ideal for push/pull/lift material handling applications. Faster than a ballscrew, ServoTube is a cost-effective alternative to air cylinders in applications requiring greater control flexibility.

An internal dry bearing provides clean, quiet, maintenance-free performance. Life expectancy far exceeds typical ballscrew solutions. The actuator accepts a range of industry-standard accessories for easy mechanical integration.

STA11



Parameter	Unit	1104	1108	1112	1116
Peak Force	N	46	62	69	92
Continuous Force	N	6.0	10.8	15.2	19.3
Maximum Velocity	m/s	5.3	5.6	5.4	4.7
Forcer L	mm	124	175	226	277
Stroke	mm		14 - 232		
Forcer W x H	mm		28 x 61		
Rod Diameter	mm		11		

STA25



Parameter	Unit	2504	2506	2508	2510
Peak Force	N	312	468	624	780
Continuous Force	N	51	70	87	103
Maximum Velocity	m/s	5.9	5.3	4.7	4.2
Forcer L	mm	189	240	291	342
Stroke	mm		27 - 309		
Forcer W x H	mm		95 x 54		
Rod Diameter	mm		25		

XTA38



Parameter	Unit	3804	3806	3808	3810
Peak Force	N	744	1116	1488	1860
Continuous Force	N	137	187	232	276
Maximum Velocity	m/s	4.7	3.8	3.1	2.6
Forcer L	mm	258	329	400	471
Stroke	mm		33 - 318		
Forcer W x H	mm		122 x 70		
Rod Diameter	mm		38		

ServoTube Linear Motor

The ServoTube linear motor is an ideal solution for easy integration into pick-and-place gantries and material handling machines. The load mounts directly to the forcer, supported by a single bearing rail. The rod is mounted at each end like a ballscrew.

ServoTube delivers the speed of a belt-drive system with the reliability and stiffness of a linear motor. Familiar form factor, integral position feedback, large air gap and balanced magnetic forces make installation straightforward.

STB11



Parameter	Unit	1104	1108	1112	1116
Peak Force	N	46	62	69	92
Continuous Force	N	6.0	10.8	15.2	19.3
Maximum Velocity	m/s	5.2	4.9	3.9	3.1
Maximum Travel *	mm	372	321	270	219
Forcer L	mm	124	175	226	277
Forcer W x H	mm	28 x 61			
Rod Diameter	mm	11			

STB25



Parameter	Unit	2504	2506	2508	2510
Peak Force	N	312	468	624	780
Continuous Force	N	51	70	87	103
Maximum Velocity	m/s	8.7	6.5	5.4	4.6
Maximum Travel *	mm	1180	1129	1078	1027
Forcer L	mm	160	211	262	313
Forcer W x H	mm	95 x 54			
Rod Diameter	mm	25			

XTB38



Parameter	Unit	3804	3806	3808	3810
Peak Force	N	744	1116	1488	1860
Continuous Force	N	137	187	232	276
Maximum Velocity	m/s	6.2	4.5	3.5	2.8
Maximum Travel *	mm	1362	1291	1219	1148
Forcer L	mm	218	289	360	431
Forcer W x H	mm	122 x 70			
Rod Diameter	mm	38			

* Consult factory for longer lengths

ServoTube



ServoTube modules are complete and ready to use, providing a quick route to integrating linear motor performance into conventional machine designs. The modules are an ideal solution for pick-and-place gantry and general purpose material handling applications.

The load is conveniently mounted directly to the forcer. For multi-axis applications ServoTube modules can be combined with minimal design effort.

The non-contact nature of the direct linear drive results in life expectancy far exceeding belt drive and ballscrew systems. ServoTube modules suffer no deterioration in accuracy or repeatability over the entire life of the system.

Module subsystems are equipped with long-life single bearing rail, limit switches and drag-chain. Laser-welded bellows and hard-anodizing are optional.

The ServoTube built-in position sensor delivers 12 micron repeatability and 350 micron absolute accuracy. For applications requiring higher levels of accuracy, a fully integrated optical encoder option provides 1 micron resolution.

Twelve models deliver continuous force of 6-276 N (1.3-62 lb) with peak force up to 1860 N (418 lb). Standard stroke lengths of 21-1323 mm are available.

Modules

ST11 Module



Parameter	Unit	1104	1108	1112	1116
Peak Force	N	46	62	69	92
Continuous Force	N	6.0	10.8	15.2	19.3
Maximum Velocity	m/s	10.8	9.5	7.9	8.2
Maximum Stroke	mm	825	774	722	672

ST25 Module



Parameter	Unit	2504	2506	2508	2510
Peak Force	N	312	468	624	780
Continuous Force	N	51	70	87	103
Maximum Velocity	m/s	8.5	6.4	5.3	4.5
Maximum Stroke	mm	1151	1100	1049	998

XT38 Module



Parameter	Unit	3804	3806	3808	3810
Peak Force	N	744	1116	1488	1860
Continuous Force	N	137	187	232	276
Maximum Velocity	m/s	5.9	4.2	3.3	2.6
Maximum Stroke	mm	1323	1252	1181	1110

Hygienic Act

Hygienic ServoTube

Hygienic ServoTube is a stainless steel, water-cooled, 600V version of the XTA38 actuator. Two models are available, delivering peak force up to 1860 N. With smooth surfaces and IP69K high-pressure wash-down rating, Servotube is ideal for material handling applications in the food & beverage and pharmaceutical industries.

The ruggedness and mechanical elegance of Hygienic ServoTube can bring significant cost savings to sterile environment applications. Simply mount the forcer directly to the machine. The food-safe dry bearings of the moving-rod actuator deliver quiet, long life and are conveniently field replaceable.

Stainless Steel

Free from contaminant-gathering recesses, the smooth stainless steel housing of the Hygienic Servotube delivers high resistance to corrosion and chemical attack.

IP69K High-Pressure Wash-Down

The IP69K rating defines the highest level of sealing against water ingress, facilitating high-pressure wash-down. High-pressure cleaning techniques use significantly less water and cleansing agents than typical low-pressure hose-down. The cleaning process itself is easier and quicker. High-pressure wash-down reduces cost and is more environmentally friendly.



uator



Water Cooling

Water cooling nearly triples the continuous force rating of the actuator. The stainless steel waterways inside the forcer require no special coolant - ordinary water can be used. Operating costs are minimal and there is no environmental impact.

Universal Interface

Hygienic ServoTube features a standard incremental encoder output and digital Halls. The encoder delivers 10 micron resolution with 25 micron repeatability. The drive power interface is three phase and can operate at 600V.

While drive connectivity and configuration is most straightforward with Copley drives, it is possible to use any third party drive with Hygienic ServoTube.

Ordering Guide

XHB



Parameter	Unit	3804	3810
Peak Force	N	744	1860
Continuous Force	N	199	420
Maximum Velocity	m/s	4.7	2.6
Forcer L	mm	236	455
Stroke	mm	33 - 318	
Forcer W x H	mm	108 x 72	
Rod Diameter	mm	38	

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