MOTION CONTROL PRODUCTS

CONFIDENT. CONSISTENT. CAPABLE OF MORE.
BE CAPABLE OF MORE

If you’re a machine builder or equipment user, you know all about high expectations, limited resources and tight deadlines. Your success depends on suppliers who respond with precisely the right products, delivered with consistency and reliability that never fails.

Yaskawa has been putting this brand of customer success in motion for 100 years. It shows in today’s commitment to innovative automation technology, to engineering expertise, and to the operational strength that is the proof behind our promise.

CONFIDENT

PRODUCTS THAT PERFORM

Product performance is more than just a specification. It is the confidence that your machines will work as expected ... every time ... in a way that consistently outperforms your competition.

Breakthrough performance. Your machine functions at a level that can’t be achieved with other automation solutions.

A competitive price. You can provide an effective, trustworthy solution at a cost that makes your machine an exceptional value.

Quality, right out of the box. Your systems work as expected, the first time and every time.

CONSISTENT

EXCELLENCE IN OPERATION

Problems with component quality, supply chain hiccups and downtime surprises are simply unacceptable. You need a partner with the operational rigor and expertise to engineer them out of existence.

Inventory for faster fulfillment. Your products are available precisely when and where you need them.

Legendary quality. Your equipment continues to operate reliably and without intervention.

Global service and support. You can rely on timely, helpful technical assistance wherever you or your equipment may be.

CAPABLE

ENGINEERING EXPERTISE. RIGHT NOW

Focus your engineers on their core competencies while still delivering effective machine automation, thanks to a team of Yaskawa engineers who can instantly add power to automation design, development and support.

Motion application expertise. Call on proven automation experts to assist with electromechanical design and development.

Software development. Turn to a team of automation software specialists to streamline your development process.

Engineered systems. Implement complete mechanical and electrical sub-systems that are fully supported for the life of your machine.

“IT’s Personal” is our commitment to giving you a great experience each time you deal with Yaskawa.

We train people, create products and treat customers with the belief that everything we do matters. With an attitude like this, it’s only natural to see everything we do as an intensely personal act.

We commit to that at Yaskawa. We make it happen. Because to us ... it’s personal.
PRODUCTS THAT PERFORM
POWER UP
YOUR PRODUCTIVITY
WHEN MORE IS NOT ENOUGH

In a rapidly changing global marketplace, today’s landmarks for world-class machine performance are tomorrow’s everyday expectations. Your customers demand the maximum in machine effectiveness, throughput and quality, regardless of a machine’s mechanical and design limitations. Your job is to do it all, and at a competitive cost.

YOUR NEED:
PERFORMANCE PLUS

To stay ahead of competition, you need to continually push the edge of the envelope on machine performance. This extraordinary effort consumes your time, stresses machine mechanisms and impacts the reliability of your finished product. The result is a risk of lost revenue, or of disappointing your key customers.

This environment leaves no room for components that can’t be trusted, or for suppliers that create delays in development and delivery.

WHAT IF …

• You could significantly reduce, or completely eliminate, the time spent optimizing the motion performance of your machine?
• Your servo system could overcome the mechanical limitations of your design?
• You could confidently achieve the highest attainable levels of throughput and effectiveness?

YOUR GAIN:
A BOOST IN PRODUCTIVITY

With motion control systems from Yaskawa, you have access to solutions that provide real impact on equipment effectiveness. You enjoy confidence that your machines will work as expected every time, which gives you an advantage over your competitors.

TUNING TIME SAVINGS

Yaskawa’s well-earned reputation for the best performance in the industry is enhanced by our Tuning-less Mode, that keeps your machine running at peak efficiency for life by eliminating the need to optimize tuning gains. Electronic Vibration Suppression automatically compensates for limitations in a machine’s mechanical design, creating consistent performance in a machine’s output.

INITIAL QUALITY

The definition of initial quality is simple: you get what you expect. Yaskawa products ship on time, work out of the box every time, perform as expected, and continue to do so for the life of your machine.

COMPETITIVE PRICE

Yaskawa maintains a #1 market share in some of the world’s most price-sensitive industries, which is proof of Yaskawa’s superior balance between operational performance and return on your investment.

PRODUCT PERFORMANCE IS MORE THAN JUST A SPECIFICATION

BE CONFIDENT
YOUR GAIN:
GLOBAL EXCELLENCE
Yaskawa has a long track record for reliable quality, responsive support and rapid product availability. The reason behind these achievements is a simple one: our customers can’t afford to settle for anything less.

INVENTORY FOR FASTER FULFILLMENT
Yaskawa maintains a $14M inventory of motion products in the US, for 95%+ on-time response to customer requests.

A LEGACY OF QUALITY
Yaskawa’s award-winning quality has been the motion industry’s quality benchmark for decades. Yaskawa products practically never fail, and we can stand behind this statement with 100 years of evidence.

GLOBAL SERVICE AND SUPPORT
As a truly global company, Yaskawa can offer local service and support worldwide. Whether your machine is installed in Asia, Europe or the Americas, Yaskawa can help reduce service costs by providing expert service anywhere you need it.

YOUR NEED:
SPEED AND SUCCESS
When your customers are demanding instant perfection, you can’t afford to work with ordinary suppliers. Everyone in your supply chain must be completely reliable in supply and rapid in response to any customer question.

Quality problems simply cannot be part of the equation. Nor can a shortage in engineering support in a fast-tracked machine design process.

WHAT IF...
- You had no worries about the reliability of your automation system?
- You could reduce your machine lead time and spare parts inventory?
- You had expert service and support wherever your machines might be located?

TODAY, QUALITY IS ONLY THE BEGINNING
Your global customer base means your machines must operate anywhere in the world. Your customers’ cultures may be different, but they share one thing in common: the need for instant gratification when it comes to product availability, flawless product performance and immediate 24/7 service and support.

EXCELLENCE IN OPERATION
RESOURCES, RESPONSIVENESS AND RELIABILITY

YASKAWA QUALITY IS THE INDUSTRY BENCHMARK
From 2011 to 2013, Yaskawa shipped nearly 150,000 Sigma-5 motors in North America with only 10 warranty failures.

5
ENGINEERING EXPERTISE, NOW
INSIGHT AND INNOVATION. INSTANTLY.

TOP RESOURCES FOR TOUGH PROBLEMS

Today’s companies face an acute talent shortage. At the same time, the demand for innovative solutions and effective technologies is stronger than ever. New designs must be brought to market in months or weeks instead of years, all while increasing efficiency, flexibility and quality.

Few companies can afford the luxury of a large engineering staff. True automation expertise is increasingly rare, and the competition for hiring automation engineers is stiff.

ENGINEERS, OR FIREFIGHTERS?

Your engineering staff needs to focus on your company’s core competencies. Instead, they are distracted with putting out fires when they should be creating innovations. These limitations slow the development of automation solutions. They also lead to unreliable long-term operation of your machine. Trial and error in the development process is no longer an option. Nor is downtime or lost production.

WHAT IF …

- You could add expert automation engineers to your staff at the exact moment you need them?
- Responsibility for designing and supporting your automation could be handed off to someone you trusted?
- Your engineering staff was free to focus on areas where they can truly add value?

YOUR GAIN: EFFECTIVE INNOVATION

For the past 100 years of industrial history, Yaskawa engineers have worked side-by-side with machine builders and end users in manufacturing. Then as now, we’ve functioned as an extension of your engineering staff to create elegant, reliable automation.

The Yaskawa commitment begins by listening, fully understanding your application and process, the results you need to achieve, your time frame and cost structure. This effort to understand your design and process is unique. It’s what sets us apart, and it results in a set of tangible benefits that go directly to your engineering bottom line.

MOTION APPLICATION EXPERTISE

Yaskawa’s engineering expertise can be applied to any stage of machine development.

- System concept design
- Component selection
- Electrical design
- Mechatronic design
- Machine start-up
- Programming
- Optimization
- Troubleshooting

SOFTWARE DEVELOPMENT

Software design and development can be the key to an automated machine’s success or the reason for its failure. Yaskawa software expertise makes the difference, thanks to a staff of engineers who understand proper software design and the ways it can impact real-world machine operation.

ENGINEERED SYSTEMS

Under the banner of Engineered Systems, Yaskawa offers a range of advanced products and services. They include complete machine retrofits, enclosure design and manufacturing, electromechanical assembly design, and integration of Yaskawa servo technology into a “purpose built” mechanism for your application.

BE CAPABLE OF MORE

YOU NO LONGER HAVE THE LUXURY OF A LARGE ENGINEERING STAFF
GLOBAL OVERVIEW

YASKAWA—GLOBAL LEADER IN AUTOMATION, DRIVE TECHNOLOGY, AND ROBOTICS

Yaskawa is one of the world’s leading manufacturers of drive technology, industrial automation, and robotics. Founded in 1915, Yaskawa has been a pioneer in the drive to optimize the productivity and efficiency of machines and industrial systems.

- $4B/year in global sales
- 800,000 servo amplifiers per year
- 1 million servo motors per year
- 1.8 million inverters per year
- 20,000 robots per year
- Over 14,500 associates worldwide
- Yaskawa Sales, Service, and Manufacturing companies in 25 countries

YASKAWA GLOBAL LOCATIONS

<table>
<thead>
<tr>
<th>NORTH AMERICA &amp; SOUTH AMERICA</th>
<th>AFRICA</th>
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<tr>
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<tr>
<td>Turkey</td>
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Over the past 30 years, Yaskawa has produced more than 10 million servo amplifiers, 18 million variable frequency drives, and 300,000 robots.

PRODUCT PORTFOLIO: TOTAL SYSTEM SOLUTIONS

SOFTWARE
MotionWorks® IEC, Yaskawa’s IEC61131-3 programming environment, gives a programmer the best of several programming languages in one development platform.

MACHINE CONTROLLERS
MPIec Machine Controllers integrate Yaskawa’s powerful motion engine with the IEC61131-3 and PLCopen programming standards, for control from 1 to 62 axes.

I/O
Yaskawa VIPA SLIO is one of the most effective and modern decentralized I/O systems available, providing exceptional usability in an extremely compact and functional design.

SIGMA SERIES SERVO SYSTEMS
Rotary, Linear and Direct Drive servos from 3W to 55kW offer advanced features, including Tuning-less Mode, vibration suppression, ripple and friction compensation.

INVERTER DRIVES
Yaskawa drives incorporate the latest technological advancements in variable speed AC motor control, with power ranges from fractional HP to 2250 HP.

ROBOTICS
The Yaskawa Robotic product portfolio ranges from 4-15 axis industrial robots with load capacities of 2 to 800 kg to special machines, devices and turnkey systems.
PRODUCT OVERVIEW

MPIEC MACHINE CONTROLLERS

EASY FOR YOU. CONSISTENT FOR EVERYONE.

To stay a step ahead of the competition, you need programming software that is easy to learn, familiar in format and efficient to work with.

Your controller hardware must be readily accessible to peripheral devices anywhere in the world, yet keep functional control and user experience perfectly consistent from machine to machine.

THE DEMAND: FLEXIBLE AND RELIABLE

Today’s customers need to keep a finger on the pulse of their machines at all times. Success means maintaining peak productivity, total reliability and endless freedom to interact with the systems they control.

WHAT IF …

• Key elements of code are already written for you, using a standard, globally recognized programming language?
• Your customers can safely access your machine controller from anywhere in the world?
• Programming one of your machines easily leads to programming all your machines?

YASKAWA CONTROL: WHAT YOU GAIN

With easy-to-learn MotionWorks' IEC software and MPIec hardware, your engineers start programming quicker and stay connected more easily.

The result? Faster machine commissioning and more rapid machine delivery to market.

A FAMILIAR PROGRAMMING STANDARD

MotionWorks IEC complies with IEC61131-3, and provides five globally recognized standard programming languages. It includes motion function blocks that adhere to the PLCopen standard. Experienced control engineers will find this software comfortably familiar, and learning to program with MotionWorks IEC has never been easier.

BUILT-IN YASKAWA TOOLBOXES

Yaskawa toolboxes make programming common functions so easy, it’s like having a Yaskawa engineer working by your side. Development time is reduced because standard code elements are already written and ready for use.

A REUSABLE CODE LIBRARY

Import and re-use previously developed logic to speed up new projects. Re-use your own work or draw on logic created by others.

EASY CONNECTIVITY, WORLDWIDE

An MPIec controller is your gateway to full control of a machine at any remote location with internet access. Keep a constant finger on the pulse of machine operation, from your own factory floor or anywhere worldwide.

WEB SERVER UPDATES

MPIec controllers allow loading of programs and updating of firmware from any web browser, with no other software required. Browser-based controller status data helps reduce maintenance time and cost.

SCALEABILITY

All our single-axis to multi-axis MPIec controllers utilize the same MotionWorks IEC software platform, making programming and maintenance consistent for all machine sizes.

THREE NETWORKS TO CHOOSE FROM

MPIec controllers include the MECHATROLINK motion network, plus Modbus TCP and EtherNet/IP communication networks at no extra cost. This ensures an economical way of connecting to all the devices in your machine.
A CONTROLLER THAT GETS YOU TO THE POSITION YOU WANT, WHEN YOU WANT IT:
- Deterministic high speed MECHATROLINK network
- MECHATROLINK retry function
- Dedicated CPU for your motion needs
- High CPU scan rate

PROGRAM ALL OF YOUR CONTROLLERS THE SAME WAY EVERY TIME:
- Standard IEC 61131-3 programming languages
- Reusable PLCopen function blocks
- Reusable standard Yaskawa toolboxes
- Decades of high quality motion experience

YOUR ENTIRE MACHINE AT YOUR FINGERTIPS WITH YASKAWA CONTROLLERS:
- Sigma-7 servos via MECHATROLINK
- Built in web server
- OPC server
- EtherNet/IP
- Modbus TCP
- Wide range of HMIs and I/Os
ELECTRONIC CAMMING CONTROLS
SOFTWARE

Electronic camming controls the positional relationship of a pair of axes based on a master/slave lookup table.

MotionWorks IEC includes 10 function blocks dedicated to camming. Yaskawa creates customizations based on the PLCopen specification, previous controller cam technology, and decades of synchronized motion experience. The function blocks fall into one of four functional topics:

- **CAM DATA MANAGEMENT**
  - CamfFileSelect
  - CamStructSelect
  - ReleaseCam

- **ON-THE-FLY ADJUSTMENTS**
  - CamShift
  - CamScale
  - SlaveOffset

- **CAM ENGAGEMENT**
  - CamIn
  - CamOut

- **CAM DATA TRANSFER**
  - ReadCamTable
  - WriteCamTable

**SEQUENTIAL FUNCTION CHART**
Sequential Function Chart (SFC) is one of the standardized languages available in IEC 61131-3 and is supported in the Professional version of MotionWorks’ IEC.

SFC allows the programmer to graphically represent program elements, for easier organization of steps, actions and transitions. Active steps are indicated in red to simplify troubleshooting of complex operations.

**STANDARD PROGRAMMING ENVIRONMENT**
MotionWorks IEC software complies to the IEC 61131-3 standard. It also has motion function blocks that adhere to the PLCopen standard, which is your assurance that programs will be developed and executed with predictable behavior.

**CAM EDITOR**
Let Yaskawa handle the hard work of camming applications with a Cam Editor built into MotionWorks IEC Pro. Create, edit, export and import Cam profiles, or convert Cam tables back and forth from ST code for programming use.

**REUSABLE CODE AND YASKAWA APPLICATION-SPECIFIC TOOLBOXES**
Drawing on decades of motion experience, Yaskawa created toolboxes with pre-developed code for specific applications. Leverage Yaskawa expertise to minimize programming time and effort. Libraries also enable importing and re-use of logic you’ve previously developed, saving even more time on subsequent projects.

**TABLE OF MOTION COORDINATES**

<table>
<thead>
<tr>
<th>CAM DISK</th>
<th>90</th>
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<tr>
<td>MASTER ENCODER INPUT (STANDARD)</td>
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<tr>
<td>Master Position</td>
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<tr>
<td>Configurable I/O Task Assignment: Yes</td>
</tr>
<tr>
<td>Auto Save Setting: Yes</td>
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<tr>
<td>Debug PowerFlow: Yes</td>
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<tr>
<td>Password Protection: Yes</td>
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<td>POU Grouping: No</td>
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<td>Configurable Task Priority: No</td>
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<tr>
<td>Configurable I/O Task Assignment: No</td>
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<td>Auto Save Setting: No</td>
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<td>Debug PowerFlow: No</td>
</tr>
<tr>
<td>Password Protection: No</td>
</tr>
<tr>
<td>Project Comparison: No</td>
</tr>
</tbody>
</table>
All MPiec Machine Controllers are equipped with the MECHATROLINK motion network. MECHATROLINK combines the speed of modern motion networks with unmatched noise immunity and robust performance. The within-cycle RETRY function of MECHATROLINK responds to a communication error by automatically resending the packet within the same cycle. This creates far fewer gaps in the flow of data, even in extremely high noise environments. Without the RETRY function, all data for all slaves are eliminated and slaves must wait for the next cycle. The master must retransmit at a higher rate to compensate for dropped information. The result can be poor quality in machined parts, as shown in the test data at left.

**CONTROLLER-CENTRIC COMMISSIONING**

The MECHATROLINK motion network provides a conduit to configure the machine from a single location with one software tool, resulting in minimal commissioning time.

**REMOTE I/O**

Interface with the system using Yaskawa’s own MECHATROLINK I/O, VIPA SLIO I/O, or third-party remote I/O modules from Phoenix, Wago or Opto 22 via MECHATROLINK or Ethernet.

**LOCAL I/O**

MPiec controller hardware can be expanded to include your choice of eight option cards to accommodate most automation requirements.

**IEC ON THE DRIVE**

The MP2600iec Option Card, used in combination with a Yaskawa SERVOPACK amplifier, offers a compact controller/amplifier combination, providing standardized programming on Yaskawa’s latest high quality servo system.

**SCALABILITY**

The use of one software platform for all MPiec Machine Controllers enables users to easily scale up their applications from single to multi-axis control.

**PROGRAMMABLE AMPLIFIER OUTPUTS**

The controller can operate local outputs on a SERVOPACK, reducing panel cost and saving panel space when only a few outputs are necessary.

**WEB-BASED SYSTEM ACCESS**

MPiec Machine Controllers have a built-in web interface for better system access. Plug into a local network and adjust parameters using any web browser, or log in anywhere in the world via a secure Internet connection.

- Monitor vital control status, diagnostic and alarm information
- Change settings or update firmware remotely
- Connect via cable and enjoy on-site control with your favorite browser, or access from any remote location
- Connect via Ethernet on a computer, an Android™ or Apple® tablet

You need powerful processing to meet today’s needs and prepare for tomorrow’s innovations. At the same time, your machine control must offer outstanding ease of use and an extensive track record of automation success. MPiec machine control offers both, plus extra features that add industry-leading user flexibility.
MPiec Machine Controllers offer a wide range of hardware for applications ranging from 1 to 62 axes. All controllers are equipped with the reliable MECHATROLINK motion network.

**Controller Hardware**

**MP2600IEC / SIGMA-7 SIEC**
- **SERVOPACK amplifier and motion controller in one device**
- **Processor Speed**: 200 MHz
- **Motion Network**: Dual Port RAM access
- **Motion Networks Speed**: As fast as 0.25 ms
- **Network Capability**: OPC, EtherNet/IP, Modbus TCP
- **Axis Count**: 1.5 / 1

**MP2300IEC / MP2310IEC**
- **Processor Speed**: 200 MHz
- **Motion Network**: MECHATROLINK-II
- **Motion Networks Speed**: As fast as 0.25 ms
- **Network Capability**: OPC, EtherNet/IP, Modbus TCP
- **Axis Count**: 4, 8 or 16
- **Option Card Slots**: 1 or 3

**MP3000IEC**
- **Processor Speed**: 400/900 MHz
- **Motion Network**: MECHATROLINK-III
- **Motion Network Speed**: As fast as 0.25 ms
- **Network Capability**: OPC, EtherNet/IP, Modbus TCP
- **Axis Count**: 4, 8, 20 or 52
- **Option Card Slots**: 1 or 3

**MP3200IEC**
- **Processor Speed**: 1 GHz
- **Motion Network**: MECHATROLINK-III
- **Motion Network Speed**: As fast as 0.25 ms
- **Network Capability**: OPC, EtherNet/IP, Modbus TCP
- **Axis Count**: 4, 8, 16, 32 or 62
- **Option Card Slots**: 3, 5 or 8

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**System Components**

**MECHATROLINK-II Network Components**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Notes</th>
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<tbody>
<tr>
<td>CPU Module</td>
<td>PMC-U-MP225-00</td>
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<tr>
<td>Power Supply Module</td>
<td>JEMPC-PIC3000-00</td>
<td>(D) Input Power D: 400/200 VAC</td>
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<tr>
<td>Option Module Rack</td>
<td>JEMPC-BU3000-00</td>
<td>(D) Slot number 3.5 slots &amp; 8 slots</td>
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</table>

**MECHATROLINK-III Network Components**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>Controller</td>
<td>PMC-U-MP225-00</td>
<td>(D) Maximum number of MECHATROLINK Axes: 04:4 • 08: 8 • 16:16</td>
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<tr>
<td>Option Card</td>
<td>JAPMC-AN2300-00</td>
<td>(D) Maximum number of MECHATROLINK Axes: 04:4 • 08: 8 • 16:16</td>
</tr>
</tbody>
</table>

**Software**

- MotionWorks IEC Express
- MotionWorks IEC Pro
- MotionWorks IEC OPC
- MotionWorks IEC OPC Pro

**Option Cards**

- Analog Inputs (AI-01) (8) channels; +/- 10V or 16-bit resolution; 0 to 20mA or 4 to 20mA
- Analog Outputs (AO-01) (8) channels; +/- 10V or 16-bit resolution; 4.2mA loan load current
- Output Module (MO-01) (64) 24VDC sinking outputs; 500mA/output
- Encoder Counter (EC-01) (16) 24VDC sinking or sourcing inputs; 24VDC sinking or sourcing outputs; 500mA/output
- IO Module (MO-01) (16) 24VDC sinking or sourcing inputs; 24VDC sinking or sourcing outputs; 500mA/output
- Encoder Counter (EC-02) (16) 24VDC sinking or sourcing inputs; 24VDC sinking or sourcing outputs; 500mA/output
- IO Module (MO-01) (32) 24VDC sinking or sourcing inputs; 24VDC sinking or sourcing outputs; 500mA/output
- Encoder Counter (EC-03) (16) 24VDC sinking or sourcing inputs; 24VDC sinking or sourcing outputs; 500mA/output
- IO Module (MO-01) (32) 24VDC sinking or sourcing inputs; 24VDC sinking or sourcing outputs; 500mA/output
- Multi-Function (MF-01) 8-bit I/O / 8-bit Digital I/O (1) Ethernet port 10 MBit; (1) RS232 port

**Terminal Block Conversion Kits**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Notes</th>
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<tbody>
<tr>
<td>CBK-U-MP225-00</td>
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<td>(D) Cable Length As: 0.5m • 1m • 2m • 3m</td>
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<td>CBK-U-MP2300-00</td>
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<tr>
<td>CBK-U-MP3000-00</td>
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</tbody>
</table>
EASY WEB INTERFACE
SLIO diagnostic and status information is accessible through a web interface, delivering complete system status data from any EtherNet/IP or Modbus TCP fieldbus module into a standard browser. Remote access via Internet is also available.

HIGH SPEED BACKPLANE BUS
Achieve reaction times as fast as 20 microseconds with VIPA SLIO’s high speed backplane bus. Connect as many as 64 modules at a time, while maintaining speeds up to 48 Mbit/s.

ONE-TOUCH HARDWARE CONFIGURATOR
VIPA SLIO puts an end to hours of tedious manual I/O configuration. The MotionWorks IEC VIPA SLIO Hardware Configurator sets up a complete I/O system with the touch of a single button.

INSTALLER FRIENDLY DESIGN
Engineered for error-free installation, SLIO can be installed by an average technician without consulting a machine designer or installation engineer.
- Easy, safe assembly with no tools required
- Staircase-shaped wiring level saves space, eases connection
- Clamp terminal assignment is clearly printed on each module
- Labeling strips clearly indicate module function, replace easily after a reconfiguration

The SLIO system is designed for customers who want to modularize and standardize, yet remain flexible at the same time. SLIO can help reduce setup time and minimize user errors.

RECONFIGURE WITHOUT REWIRING
Updating or amending a SLIO system is as easy as removing an existing module and snapping in a new one. System functions can be changed without removing the wiring from the contact block.

MPIEC MACHINE CONTROLLERS
VIPA SLIO I/O
If you’ve wished that Input/Output could be FASTER and EASIER, VIPA SLIO is for you. Yaskawa’s new decentralized I/O system is full of features that make connection simpler and I/O function more efficient.
MPIEC MACHINE CONTROLLERS

VIPA SLIO I/O

MODULAR CONSTRUCTION FOR QUICK ASSEMBLY

Compact: Width 12.9 mm, height 109 mm, depth 76.5 mm
Standardized: Direct mounting on 35 mm standard profile rail
Extensible: The flexible design of SLIO makes it easy to expand as needed; add up to 64 signal and function modules per interface.

INTERCHANGEABLE FUNCTION MODULES

Choose from a selection of 120+ interchangeable signal and function modules, ready to be snapped into an existing contact block for instant reconfiguration to a new function.

- Analog and digital inputs and outputs
- Communication processor modules
- Coupler modules
- Potential distributor modules
- Power modules
- Temperature modules
- Future modules add tomorrow’s functions with the same snap-in interconnection

<table>
<thead>
<tr>
<th>MODULES SUPPORTED BY MOTIONWORKS IEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus Module</td>
</tr>
<tr>
<td>EtherNet/IP, 10 A (3 A bus supply)</td>
</tr>
<tr>
<td>Power Modules</td>
</tr>
<tr>
<td>DC 24V, 10 A</td>
</tr>
<tr>
<td>DC 24V, 4 A (2A bus supply)</td>
</tr>
<tr>
<td>Digital Input</td>
</tr>
<tr>
<td>DC 24V</td>
</tr>
<tr>
<td>DC 24V (2 us to 4 ms)</td>
</tr>
<tr>
<td>DC 24V (3 wire)</td>
</tr>
<tr>
<td>DC 24V (NPN)</td>
</tr>
<tr>
<td>Digital Output</td>
</tr>
<tr>
<td>DC 24V, 0.5 A</td>
</tr>
<tr>
<td>DC 24V, 2 A</td>
</tr>
<tr>
<td>DC 24V, 0.5 A (NPN)</td>
</tr>
<tr>
<td>DC 24V, 0.5 A (PWM)</td>
</tr>
<tr>
<td>DC 30 /AC 230 V/3A (Relay)</td>
</tr>
<tr>
<td>Analog Input</td>
</tr>
<tr>
<td>0 to 10V, 12 Bit</td>
</tr>
<tr>
<td>0 (4) to 20mA, 12 Bit</td>
</tr>
<tr>
<td>0 (4) to 20mA (2 wire), 12 Bit</td>
</tr>
<tr>
<td>+/- 10V, 12 Bit</td>
</tr>
<tr>
<td>Thermocouple, 16 Bit</td>
</tr>
<tr>
<td>Ohm Resistance, 16 Bit</td>
</tr>
<tr>
<td>0 to 10V, 16 Bit</td>
</tr>
<tr>
<td>0 (4) to 20mA, 16 Bit</td>
</tr>
<tr>
<td>+/- 10V, 16 Bit</td>
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<tr>
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<tr>
<td>0 to 10V, 12 Bit</td>
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</tr>
<tr>
<td>0 to 10V, 16 Bit</td>
</tr>
<tr>
<td>+/- 10V, 16 Bit</td>
</tr>
</tbody>
</table>
Every Sigma Series SERVOPACK is equipped with a tuning-less function that is enabled from the moment you pull it out of the box. This function allows the amplifier to detect load inertia and automatically adjust servo gains at the update rate of the position loop (a lightning fast 62.5 microseconds). You may never need to tune a Yaskawa servo; not at installation and never again over years of precise, productive operation.

VIBRATION SUPPRESSION
Sigma series SERVOPACKs neutralize vibration, both from the motor’s motion artifacts and from resonances within the machine. It detects actual vibration frequencies and cancels them out of the motion command, creating a new machine cycle that is quicker, quieter and more efficient.

FIGHT FRICTION, RESONANCE, RIPPLES
Every Sigma-7 SERVOPACK is equipped with a complete set of compensation algorithms that virtually eliminate mechanical impediments which rob a servo of speed, accuracy and smoothness of movement.

- Anti-resonance compensation counteracts the effects of a machine’s natural mechanical resonances
- Ripple compensation eliminates the oscillations caused by motor cogging and other motor-based vibration effects
- Friction model compensation automatically corrects for changes in machine operation caused by component wear and other effects of friction over time

BETTER NOISE PROTECTION
Sigma-7 is equipped with nine discrete filters to protect against electrical noise, vibration and resonance. The result is more reliable performance, faster response and greater accuracy despite long cable runs, noisy equipment and everyday variations in a machine’s mechanical condition.
SIGMA SERIES SERVO MOTORS

PACKED WITH PERFORMANCE

MORE TORQUE IN LESS SPACE, FOR AN EASIER FIT IN YOUR TIGHTEST APPLICATION

- Yaskawa’s segmented stator core design and automated winding techniques pack nearly twice the copper into the stator gap, for much more torque output from every square millimeter of space
- Encapsulated windings prevent shorts between windings, improving heat dissipation
- Precise machining is used to minimize the air gap between rotor magnets and stator windings, for higher running torque and reduced cogging torque
- By reducing the space taken up by the end turns of the winding, overall motor length is significantly reduced
- Neodymium-Iron-Boron rotor magnets optimize flux density in the motor

ELIMINATE MECHANICAL BREAKDOWNS

Simplify your machine’s design, decrease part counts and cut assembly time by replacing mechanical linkages with reliable, flexible servo control.

- Designed to accommodate up to a 30:1 inertia mismatch
- Reduce gearbox size, or eliminate gearboxes altogether
- Reduce maintenance points in machinery and improve safety

7 SIGMA ADVANTAGES

The new generation of Sigma Series servo motors offers power, precision and reliability unmatched by anything in the automation industry. Better still, new Sigma-7 motors are completely compatible with Yaskawa’s industry-leading Sigma-5 products. An easy replacement can lead to an instant boost in machine productivity.

1. 20% more compact in size, for an easier fit in more applications
2. 16x better resolution radically improves positional accuracy
3. Nearly double the bandwidth yields faster speed, more throughput
4. New thermal sensors detect application problems before they affect motor life
5. Withstands ambient temperatures to 60°C for trustworthy performance in extreme environments
6. High-altitude friendly with full function assured at elevations of 2000 meters and above
7. IP67 rated for total protection against dust and the effects of water immersion to a depth of 1 m

PLUS: MATCHED GEARMOTORS

Every Sigma-7 rotary servo motor can be equipped with a companion gearmotor, custom-designed for peak performance in low speed, high torque applications.

- Available for all Sigma-7 rotary servo motors
- Five different ratios, six gearhead sizes
- Factory tested for guaranteed performance
REDUCE DOWNTIME
By eliminating gear reduction and creating a direct coupling to the machine load, direct drive motors simplify your machine’s design. Eliminating couplings and other components in the machine’s mechanical transmission will ultimately lead to fewer breakdowns and long-term reliability you can trust.

INCREASE PERFORMANCE
Direct drive motors eliminate the inefficiencies that develop as mechanical transmission components wear over time. Say goodbye to mechanical backlash as well. As compliance is reduced, the responsiveness of the servo system can be dramatically improved.

REDUCE SIZE AND COST
Directly coupling a compact direct drive servo motor to your machine load will save physical space, which can lead to a more space-efficient machine. When precision gearheads and other mechanical transmission components are gone, the cost of your machine will go down as well.

BOOST THE QUALITY OF YOUR DESIGN
Implementing direct drive motor technology leads to a host of improvements in the quality of your machine designs.
- Machines with direct drive motors typically emit less audible noise
- Eliminating mechanical transmissions reduces the need for preventive maintenance
- Overall efficiency and performance can be significantly increased, leading to a lower long term cost

TYPICAL APPLICATIONS
- ROTARY TABLE
- XY TABLE
- SEMICONDUCTOR HANDLING ROBOT

SIGMA SERIES SERVO MOTORS
DIRECT DRIVE SERVO MOTORS

A COMPLETE LINE OF LINEAR SOLUTIONS
Yaskawa linear servo motors replace the backlash, friction, inertia and wear of mechanical linkages with smooth, precise, high performance linear motion in a compact footprint. Any product in the Yaskawa linear servo family offers plug-and-play connection with Sigma-7 and Sigma-5 series SERVOPACK amplifiers, using automatic motor recognition and serial encoder technology to make implementation trouble free.

ENGINEERED SOLUTIONS
The Sigma Trac linear motor stage reduces machine design complexity and commissioning time.

YASKAWA OFFERS A FULL RANGE OF LINEAR SERVO PRODUCTS THAT ARE DESIGNED TO HANDLE THE MOST DEMANDING APPLICATIONS

NEED FOR SPEED?
If your application requires linear speeds and accelerations that go beyond the capabilities of traditional mechanisms, take a look at Yaskawa linear motors.

MORE PERFORMANCE
Direct coupling to the machine load eliminates mechanical linkages, significantly improving responsiveness and reliability.

SGLG CORELESS
Achieve smooth linear motion with an ironless design that eliminates motor cogging.
- 200V windings
- 40 to 3000 N of peak force
- Standard and high force magnetic ways
- Zero cogging for minimal force ripple

SGLF IRON CORE
A time-tested iron core design that delivers consistent reliability in a wide range of sizes and outputs.
- 200 or 400V windings
- 86 to 2400 N of peak force
- 5 m/s peak speed
- Very little cogging

SGLT DUAL MAGNET IRON CORE
An iron core design featuring dual magnets, producing high output in a compact footprint.
- 200V or 400V windings
- 380 to 7500 N of peak force
- 5 m/s peak speed
- Sub-micron repeatability

SGT SIGMA TRAC
A ready-to-implement solution, including every element needed for plug-and-play linear motion.
- Factory assembled, integrated stage
- 200 or 400V windings
- Stroke lengths from 80 mm to 2 m
- 220 to 1200 N of peak force
- Sub-micron repeatability

MORE PERFORMANCE
Direct coupling to the machine load eliminates mechanical linkages, significantly improving responsiveness and reliability.

ENGINEERED SOLUTIONS
The Sigma Trac linear motor stage reduces machine design complexity and commissioning time.

NEED FOR SPEED?
If your application requires linear speeds and accelerations that go beyond the capabilities of traditional mechanisms, take a look at Yaskawa linear motors.

MORE PERFORMANCE
Direct coupling to the machine load eliminates mechanical linkages, significantly improving responsiveness and reliability.

ENGINEERED SOLUTIONS
The Sigma Trac linear motor stage reduces machine design complexity and commissioning time.
TUNING-LESS FUNCTION

GET UP AND RUNNING QUICKLY

Right out of the box, the tuning-less function automatically compensates for mismatches in load to rotor inertia up to 30:1.

Settling time: 40 ms range

ADVANCED AUTOTUNING

MINIMIZE SETTLING TIME

Maximize smooth motion

Advanced auto tuning automatically adjusts nearly 20 gain and filter parameters to cancel vibration, rippling, friction and resonance.

Settling time: 4 ms range

ONE PARAMETER TUNING

PRECISE USER-DRIVEN ADJUSTMENT

Improve your machine’s performance even further with easy fine tuning adjustments that won’t throw off your existing operating parameters.

Settling time: 0 to 4 ms range

THE YASKAWA TUNING SUITE

Successfully commissioning and operating a servo axis requires more than a simple tuning algorithm. Yaskawa equips each SERVOPACK with a suite of software commissioning and tuning tools, aimed at achieving full functioning right out of the box, then continuing this superior performance in spite of all the vibration, resonance, friction and noise that a modern automated machine can dish out.

GET RID OF PERFORMANCE-ROBBING MECHANICAL EFFECTS

Automated motion naturally creates unwanted mechanical effects that rob a servo system of the quick, smooth and precise movement users demand. Yaskawa SERVOPACKs are equipped with a set of suppression features that automatically eliminate harmful artifacts.

VIBRATION

Machine vibrations are eliminated by Yaskawa Vibration Suppression, which samples the equipment’s natural oscillations and creates compensating frequencies to cancel them out.

COGGING

Motor cogging effects are addressed by Ripple Compensation, an especially important effect for systems that require minimum settling time and exceptionally precise positioning.

RESONANCE

Sigma-7 amplifiers have twice as many anti-resonance filters to more effectively repress a servo system’s natural medium-frequency resonances.

FRICTION

Coulomb friction and viscosity-related variables are effectively compensated for by Friction Model Compensation, which is especially effective in eliciting smooth start-up action in low speed or high rigidity machines.

ELECTROMAGNETIC INTERFERENCE

The number of interference filters has been increased by 225% to counteract the losses caused by data dropouts, EMI interference and artifacts caused by long cable runs.

VIBRATION

Machine vibrations are eliminated by Yaskawa Vibration Suppression, which samples the equipment’s natural oscillations and creates compensating frequencies to cancel them out.
SIGMA SERIES SERVOPACKS

FEATURE-PACKED FOR YOUR MACHINE

A CHOICE OF OPEN PROTOCOL, HIGH SPEED DETERMINISTIC DIGITAL NETWORKS

PRIMARY FEEDBACK OPTION
- 20 Bit serial absolute encoder
- Motor data stored in the encoder
- Simplified cable design

SECONDARY FEEDBACK OPTION
- Allows user to close position loop around secondary feedback device near the load
- Helps eliminate the effects of mechanical compliance and thermal variances
- Delivers more precise control and improved machine performance

FUNCTIONAL SAFETY
A Safe Torque Off (STO) circuit is standard equipment in every SERVOPACK. Safety functions SS1 (Safe Stop 1), SS2 (Safe Stop 2), and SLS (Safe Limited Speed) are integrated with selection of an optional safety module

WIDE RANGE
A power range from 10W to 55kW, with 100–480VAC operation.

SCALEABLE AS NEEDS CHANGE
Switching from a single axis controller to a multi-axis model is easier, thanks to the fact that programming from a single axis SERVOPACK can be used in any Yaskawa multi-axis controller without revision.

SIMPLE COMMISSIONING
An automatic motor recognition function uses data resident within Yaskawa servo motors to configure a SERVOPACK for safe and effective operation.

SIGMA SERIES SERVOPACKS

OR

FUNCTIONAL SAFETY
- Used with Yaskawa’s full line of IEC61131-3 Motion Controllers
- Superior immunity to noise in challenging industrial environments
- Retry function minimizes data drop-outs

MECHATROLINK
- Adheres to CoE device profile (CIAC02)
- Distributed clock for synchronized operation
- Variety of system architectures (cascade, line, star, ring)

ETHERCAT
- Adheres to CoE device profile (CIAC02)
- Distributed clock for synchronized operation
- Variety of system architectures (cascade, line, star, ring)

SGD7S SINGLE AXIS AMPLIFIER
- 200V operation
- 50W-15kW operating range
- Control interface options: EtherCAT, MECHATROLINK, analog

SGDV SINGLE AXIS AMPLIFIER
- 400V operation
- 500W-55kW operating range
- Control interface options: EtherCAT, MECHATROLINK, analog

SGD7W DUAL AXIS AMPLIFIER
- Control two servo axes with one amplifier
- Lower cost, component count
- Conserves cabinet space
- Regenerative power feature conserves energy

STGALOLOGIC™ WITH ETHERNET/IP
- Add On Instructions (AOIs) for use with Rockwell PLCs
- Dual EtherNet/IP ports onboard
- Perform automation functions without learning new software
- Basic point to point moves, blended speed moves, homing, jogging, electronic gearing

SIGMALOGIC™ 7 COMPACT
- Responds to Rockwell PLC Add On Instructions
- Compact size to save cabinet space
- Internal switch for daisy chaining
- One I/O point, no option card required, keeping component cost to a minimum

MP2600IEC / SIGMA-7 SIEC SINGLE AXIS CONTROLLERS
- Motion Controller and amplifier in one device
- IEC61131-3 compatibility for predictable behavior
- MotionWorks’ IEC software provides scalability between single and multi-axis control
- EtherNet/IP, Modbus TCP connectivity links to most PLCs and HMIs
- Sigma-7 SIEC: smaller footprint, fewer I/O points and no external encoder input to save cabinet space and minimize cost
### SIGMA-7 STANDARD ROTARY
The world’s largest manufacturer of servo motors brings 25 years of design innovation into each Sigma-7 rotary servo. Choose from a wide range of sizes, speeds and torque ratings, then add an amplifier and an MPiec controller to create a complete motion automation system.

<table>
<thead>
<tr>
<th>100/200V</th>
<th>400V</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>LOW INERTIA</em> ▼</td>
<td><em>LOW INERTIA</em> ▼</td>
</tr>
<tr>
<td><strong>SGMV</strong> 3W–30W</td>
<td><strong>SGMV</strong> 3W–30W</td>
</tr>
<tr>
<td><strong>SGM7P</strong> 100W-1.5kW</td>
<td><strong>SGM7A</strong> 200W-1kW</td>
</tr>
<tr>
<td><strong>SGM7J</strong> 50W-750W</td>
<td><strong>SGM7J</strong> 200W-13kW</td>
</tr>
<tr>
<td><strong>SGM7G</strong> 300W-15kW</td>
<td><strong>SGM7V</strong> 22kW-55kW</td>
</tr>
</tbody>
</table>

### SIGMA-7 DIRECT DRIVE ROTARY
Direct drive products save space, eliminate backlash and cut component costs, adding extra mechanical strength to stiffen dynamic applications.

<table>
<thead>
<tr>
<th>200V</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>SGM7F</em> (Iron Core) 4.0–25 Nm rated torque, 600 rpm max speed</td>
</tr>
<tr>
<td><em>SGM7S</em> (Coreless) 40–1000 N peak force, 5 m/s max speed</td>
</tr>
<tr>
<td><em>SGMCS</em> (Coreless) 2.0–200 Nm rated torque, 500 rpm max speed</td>
</tr>
<tr>
<td><em>SGMF</em> (Iron Core) 86–2400 N peak force, 5 m/s max speed</td>
</tr>
<tr>
<td><em>SGMC</em> (DoubleTrac) 380–7500 N peak force, 5 m/s max speed</td>
</tr>
<tr>
<td><em>Sigam Trac</em> Assembly 220-1200 N peak force, 5 m/s max speed</td>
</tr>
</tbody>
</table>

### SIGMA-7 DIRECT DRIVE LINEAR
Maximum speed and acceleration for linear motion. Choose from four designs to reduce compliance, replace mechanical linkages and create a better fit for your application.

<table>
<thead>
<tr>
<th>200V</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>SGM7F</em> (Iron Core) 4.0–25 Nm rated torque, 600 rpm max speed</td>
</tr>
<tr>
<td><em>SGM7S</em> (Coreless) 40–1000 N peak force, 5 m/s max speed</td>
</tr>
<tr>
<td><em>SGMCS</em> (Coreless) 2.0–200 Nm rated torque, 500 rpm max speed</td>
</tr>
<tr>
<td><em>SGMF</em> (Iron Core) 86–2400 N peak force, 5 m/s max speed</td>
</tr>
<tr>
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</tr>
<tr>
<td><em>Sigam Trac</em> Assembly 220-1200 N peak force, 5 m/s max speed</td>
</tr>
</tbody>
</table>

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**Gear Motors** Available custom-fit for any rotary servo motor.

<table>
<thead>
<tr>
<th>SERVOPACKS</th>
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<th>SERVOPACKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 AXIS ▼</strong></td>
<td><strong>1 AXIS ▼</strong></td>
<td><strong>1 AXIS ▼</strong></td>
</tr>
<tr>
<td><strong>SGD7S</strong> 50W-15kW</td>
<td><strong>SGD7W</strong> 50W-1kW/axis</td>
<td><strong>SGD7S</strong> 50W-15kW</td>
</tr>
<tr>
<td><strong>SGD7W</strong> 200W-5kW/axis</td>
<td><strong>GDV</strong> 500W-5kW</td>
<td><strong>SGD7W</strong> 200W-1kW/axis</td>
</tr>
</tbody>
</table>

*Control Interface Options: EtherCAT, MECHATROLINK, Analog 100 V SERVOPACKs available from 50-400W*
### SMALL CAPACITY MODEL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Rotary Servo Motor Model</th>
<th>Rated Power</th>
<th>Rated Torque</th>
<th>Peak Torque</th>
<th>Rated Speed</th>
<th>Max Speed</th>
<th>Rotary Inertia</th>
<th>Model Rated Capacity</th>
<th>Model Rated Inertia</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGMV-3ZD</td>
<td>2.3W</td>
<td>0.0395</td>
<td>0.125</td>
<td>4000</td>
<td>6000</td>
<td>0.00089</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>127E</td>
<td>127E</td>
<td>0.024</td>
<td>0.024</td>
</tr>
<tr>
<td>SGMV-4ZD</td>
<td>3.0W</td>
<td>0.0542</td>
<td>0.165</td>
<td>4000</td>
<td>6000</td>
<td>0.00067</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>127E</td>
<td>127E</td>
<td>0.024</td>
<td>0.024</td>
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<tr>
<td>SGMV-5ZD</td>
<td>5.5W</td>
<td>0.0900</td>
<td>0.276</td>
<td>4000</td>
<td>6000</td>
<td>0.00066</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>127E</td>
<td>127E</td>
<td>0.024</td>
<td>0.024</td>
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<tr>
<td>SGMV-6ZD</td>
<td>7.0W</td>
<td>0.1308</td>
<td>0.387</td>
<td>4000</td>
<td>6000</td>
<td>0.00066</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>127E</td>
<td>127E</td>
<td>0.024</td>
<td>0.024</td>
</tr>
</tbody>
</table>

### MEDIUM/LARGE CAPACITY MODEL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Rotary Servo Motor Model</th>
<th>Rated Power</th>
<th>Rated Torque</th>
<th>Peak Torque</th>
<th>Rated Speed</th>
<th>Max Speed</th>
<th>Rotary Inertia</th>
<th>Model Rated Capacity</th>
<th>Model Rated Inertia</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGMV-3GD</td>
<td>1.5kW</td>
<td>4.90</td>
<td>14.7</td>
<td>3000</td>
<td>5000</td>
<td>2.00</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>124D</td>
<td>124D</td>
<td>0.035</td>
<td>0.035</td>
</tr>
<tr>
<td>SGMV-4GD</td>
<td>2.5kW</td>
<td>7.86</td>
<td>23.8</td>
<td>3000</td>
<td>5000</td>
<td>3.18</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>124D</td>
<td>124D</td>
<td>0.035</td>
<td>0.035</td>
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<tr>
<td>SGMV-5GD</td>
<td>3.5kW</td>
<td>9.84</td>
<td>30.0</td>
<td>3000</td>
<td>5000</td>
<td>4.36</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>124D</td>
<td>124D</td>
<td>0.035</td>
<td>0.035</td>
</tr>
<tr>
<td>SGMV-6GD</td>
<td>5.5kW</td>
<td>12.6</td>
<td>37.8</td>
<td>3000</td>
<td>5000</td>
<td>5.53</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>124D</td>
<td>124D</td>
<td>0.035</td>
<td>0.035</td>
</tr>
<tr>
<td>SGMV-7GD</td>
<td>7.0kW</td>
<td>15.6</td>
<td>47.6</td>
<td>3000</td>
<td>5000</td>
<td>6.70</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>124D</td>
<td>124D</td>
<td>0.035</td>
<td>0.035</td>
</tr>
<tr>
<td>SGMV-8GD</td>
<td>9.0kW</td>
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<td>54.4</td>
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<td>SGMV-9GD</td>
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<td>3000</td>
<td>5000</td>
<td>9.04</td>
<td>MEDIUM/LARGE</td>
<td>MEDIUM/LARGE Ultra-Capacity</td>
<td>124D</td>
<td>124D</td>
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### DIRECT DRIVE ROTARY SERVO SPECIFICATIONS

| Rotary Servo Motor Model | Rating Frame | Rated Torque | Peak Torque | Rated Speed | Max Speed | Rotary Inertia | SERVOPACK Model | SGD7-***
<table>
<thead>
<tr>
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<tr>
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<td>SGD7-90A</td>
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</table>
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We begin by understanding your application and process, the results you need to achieve, your time frame and cost structure. This level of understanding is what sets Yaskawa Engineered Systems apart, and makes us Capable of More.

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- Component Selection
- Electrical Design
- Mechatronic Design
- Machine Start-up
- Programming
- Optimization
- Troubleshooting

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- Upgrading your legacy machine controls and servos to the latest technologies
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*2014 Manufacturing Skills and Training Study, The Manufacturing Institute (affiliate of the National Association of Manufacturers.) A copy of the report is available on request.
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