

**YASKAWA**

# Metalworking

Best in Class-Products and Solutions for Metalworking



# Best performance for every process

The machining of metals presents a multitude of challenges for automation: precision and high throughput with durable, low-maintenance technology. With best-in-class products and an open and ready-to-connect architecture, YASKAWA creates important prerequisites for excellent and energy-efficient solutions. And has done so for decades.

**Discover the limitless possibilities with YASKAWA.**



## **Robots for welding, cutting and handling**

MOTOMAN robots from YASKAWA are providing outstanding solutions for the requirements of metalworking. Whether transporting and handling components or welding and cutting in a wide variety of processes - you can always rely on the flexibility, precision and speed of MOTOMAN robots.



## **The latest generation of frequency inverters for industrial applications**

Flexibility, ease of use and sustainable design for maximum added value in your application. The latest generation of frequency inverters GA700 stands for easy commissioning and energy-saving drive of conveyor belts, fans and many additional applications.



### Frequency inverter

- Frequency inverter for precise control of motors in a wide speed range
- Energy-efficient operation of all motor types

### Servo drives

- Motors with high water resistance, protected against ingress of dust particles, can be used under harsh environmental conditions (motors with oil seal ring optionally available)
- Connection of the amplifiers to a variety of established controls and fieldbuses
- Space-saving book form for gapless mounting
- High reliability for minimum downtime

### Robots

- Proven robot technology for high reliability
- Integration into existing control concepts without additional programming effort
- Highest throughput even with batch size 1 and individually shaped parts due to fully automatic handling

### Controlling and monitoring

- Classic IEC machine controllers or SLIO CPU small controllers or servo amplifiers with integrated motion controller
- Wide range of touch screens and panel PCs



### High-precision servo systems for metal forming and cutting

Sigma-7 servo drives offer solutions for machine builders and end customers. In bending machines and press brakes, they ensure precise positioning of the backgauge stops. In cutting machines, efficient vibration suppression ensures high path accuracy.

### Machine controllers for a variety of tasks

Whether classic IEC machine control, mini PLC with motion functionality or the new servo amplifier with integrated motion controller. YASKAWA offers scalable components for the ideal metalworking machine.



### YASKAWA in numbers:

More than **14,500** employees worldwide

More than **1,350** employees in the worldwide service network

More than **1,600** employees in Europe



# Energy-efficient frequency inverters for spindle drives, winders and transport

Whether in control cabinets or on the wall, in a clean or harsh environment: the flexible product design of YASKAWA frequency inverters ensures reliable operation under a wide range of environmental conditions.

## Limitless possibilities

Flexible motor control, extensive and expandable functions and a power range up to 630 kW: V1000 and A1000 frequency inverters and the successor GA700 are suitable for a wide range of applications, from simple conveyor belts to complex systems with networked drives.

## Easy integration into your control system

- Supports all common protocols and topologies
- Cost-effective networking of up to five frequency inverters via a single fieldbus card

## Cost savings through built-in interface

- RS-485 MEMOBUS/Modbus Protocol
- Communication speeds of 115.2 kBit/s

## Full control even in the event of a power failure

- Integrated +24 VDC input
- Programming and monitoring without main power supply

## Effortless network integration

- Supports all major networks with a cost effective network integration feature:
  - CANopen
  - CC-Link
  - DeviceNet
  - EtherCAT
  - Ethernet/IP
  - MECHATROLINK-II
  - MECHATROLINK-III
  - Modbus/TCP
  - POWERLINK
  - PROFIBUS-DP
  - PROFINET



Energy-efficient and powerful spindle drives are easy to implement with YASKAWA frequency inverters. With an output frequency of up to 1000 Hz and corresponding gearboxes, spindle applications up to high-speed range are possible.

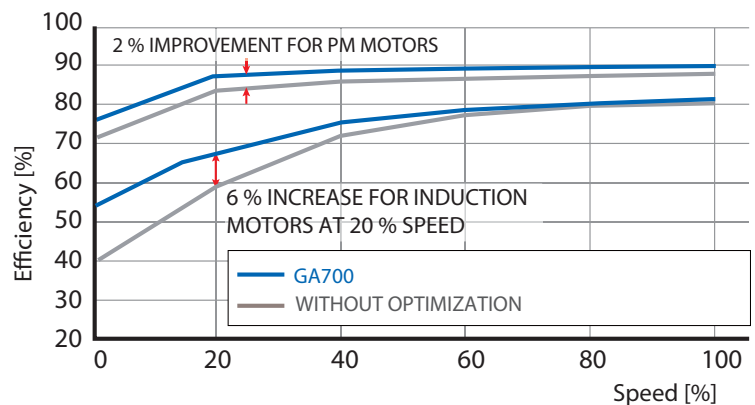


A special edition of our frequency inverters meets the special requirements of winding and unwinding systems. Asynchronous and permanent magnet motors can be controlled with or without speed sensor and enable precise winding of textiles, paper, foils, wires etc.



### Maximum efficiency

By simply using speed control instead of gearboxes, valves or similar options, YASKAWA frequency inverters open up enormous energy saving potentials. In addition, they automatically optimize motor efficiency, regardless of load or speed.



### The right inverter for every task

- Power range from 0.1 to 630 kW
- 200 V and 400 V input voltage
- Gapless mounting
- Compact V1000 frequency inverter for simple applications
- 1000 Hz versions for V1000 and A1000
- Special solutions for winder applications with A1000 inverters
- A1000 Inverter with special software for positioning tasks

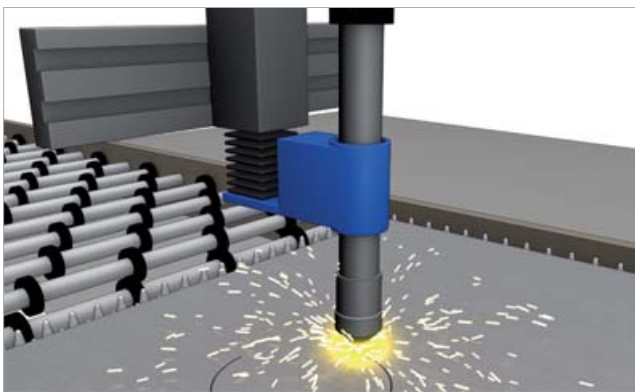
### Additional features of the GA700 frequency inverter

- Integrated peripherals (Braking transistor [up to 75 kW], EMC filter, DC reactor [22 kW and above] ...)
- Reduce set-up time with an intuitive keypad, navigation and start-up wizards
- Parameter management via PC or smartphone (GA700 only)



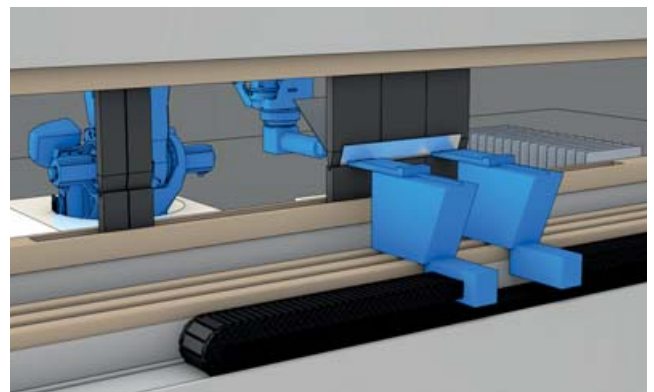
# Servo drive technology for high-precision cutting and forming

With more than 12 million servo systems installed worldwide, YASKAWA has extensive experience and technical know-how in the field of motion control. The result: excellent performance and an extremely low failure rate.



## Precise laser cutting

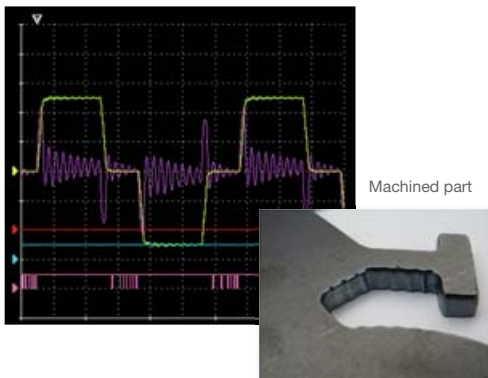
High torque combined with highly efficient vibration suppression ensures extreme path accuracy even at high product throughput rates.



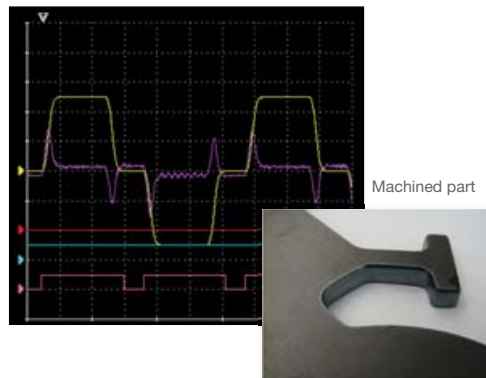
## High throughput in bending presses

Sigma-7 servo motors position the backgauge in bending presses at lightning speed, thus ensuring a perfect result.

## Without vibration suppression



## With vibration suppression



## Enhanced vibration suppression

The previous functions for vibration suppression have been improved and extended to further optimize the settling time. This reduces vibrations and resonances during operation and stopping. This is reflected in the quality of the end products.





# SIGMA-7

## Servo drives for metalworking

High material throughput with consistent production quality is the goal in the development of modern machines.

Sigma-7 servo drives are ideally suited for this purpose: thanks to intelligent functions such as auto-tuning, automatic load adjustment and integrated vibration suppression. The bookstyle design enables gapless side-by-side mounting of several amplifiers in the smallest of spaces, thus ensuring a high power density in the control cabinet.

Sigma-7 offers suitable solutions to today's market requirements of machine manufacturers and end customers in the manufacturing industry.

### Servo motors

- Optimum mass inertia ratio for CNC applications
- Highest precision and maximum product output
- Extreme accuracy through perfect synchronization
- Available from 50 W to 15 kW
- High resolution 24-bit encoder
- IP67 as default
- Low self-heating effect



### Servo amplifiers

- Quick setup in just 3 minutes
- Single & dual axis amplifier
- Satisfies the requirements of SIL 3 and PL-e
- STO function integrated, SS1, SS2 and SLS can be integrated by using the safety module
- Power range up to 15 kW

#### 200 V Version

- Embedded fieldbus
  - » Pulse train / analog input
  - » MECHATROLINK-II
  - » MECHATROLINK-III
  - » EtherCAT

#### 400 V Version

- Space saving bookstyle for side-by-side mounting
- European connectors
- Daisy-chain-connection
- Embedded fieldbus
  - » MECHATROLINK-III
  - » EtherCAT



# Controlling and visualization

As machines become more powerful, it gets more important to monitor the condition of machines continuously and precisely. Machine controllers and integrated motion controllers from YASKAWA offer the optimum solution for every type of application. ecoPanels, professional panels and even panel PCs from VIPA Controls provide the suitable operating concepts for human-machine interaction.

## Machine controller MP3300iec

- IEC 61131-3 Programming standard
- Compact and flexible control for automation technology
- Up to 32 controlled axes
- Fieldbuses: MECHATROLINK-III and Ethernet (100 Mbps)
- Position control, electronic transmission, speed control, torque control and cam disk



## VIPA SLIO motion controller

- A CPU for standard and motion control applications
- Fully integrated EtherCAT master
- Proven SPEED7 technology for highest clock rate
- Clock synchronicity and multi-axis application via EtherCAT
- Programmable with SPEED7 Studio
- Highly flexible and modular system
- 3 Motion Modules: DG-Motor module, PulseTrain module and Stepper module





### Touch panels & Panel PCs

With the Panel PC series from VIPA Controls, you are optimally equipped for all control and monitoring tasks. The combination of an industrial PC with state-of-the-art performance features and a touch panel with optimum display options focuses high performance in the smallest space.



### Sigma-7C - Dual axis servo amplifier with integrated motion controller

- Low space requirement
- Dual axis amplifier from 200 W to 1 kW
- Use of regenerative energy between axes
- Motion control of up to 6 axes integrated
- Additional axes can be connected via MECHATROLINK-III fieldbus

# Robots for welding, cutting and handling

YASKAWA offers special welding robots, high quality positioners and gantry systems up to complete welding systems. In addition, the MOTOMAN robots from YASKAWA are also the optimum solution for handling and material feeding due to their speed, precision and cost-effectiveness.

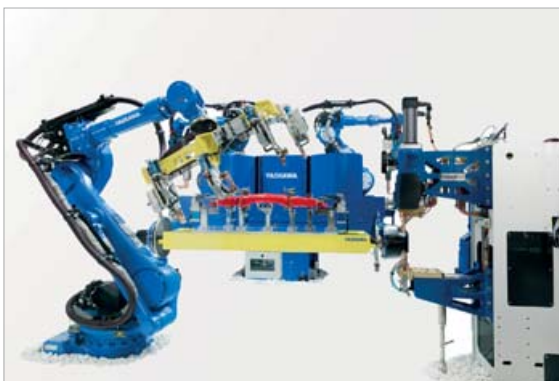
## Turnkey welding systems

With more than 30 years of experience and a market share of over 30%\*, YASKAWA is the No. 1 in automated path welding.

For the development and construction of systems, as well as robot programming, YASKAWA offers an all-round package according to customer requirements.

YASKAWA cooperates closely with almost all major welding technology suppliers for the automation sector. The devices and software are perfectly coordinated with the robots and represent state-of-the-art technology.

Even if there are only vague ideas about how to weld a workpiece, YASKAWA creates a concept for customers, integrates the necessary components and presents a solution that inspires.



## Example: Bending-Press handling

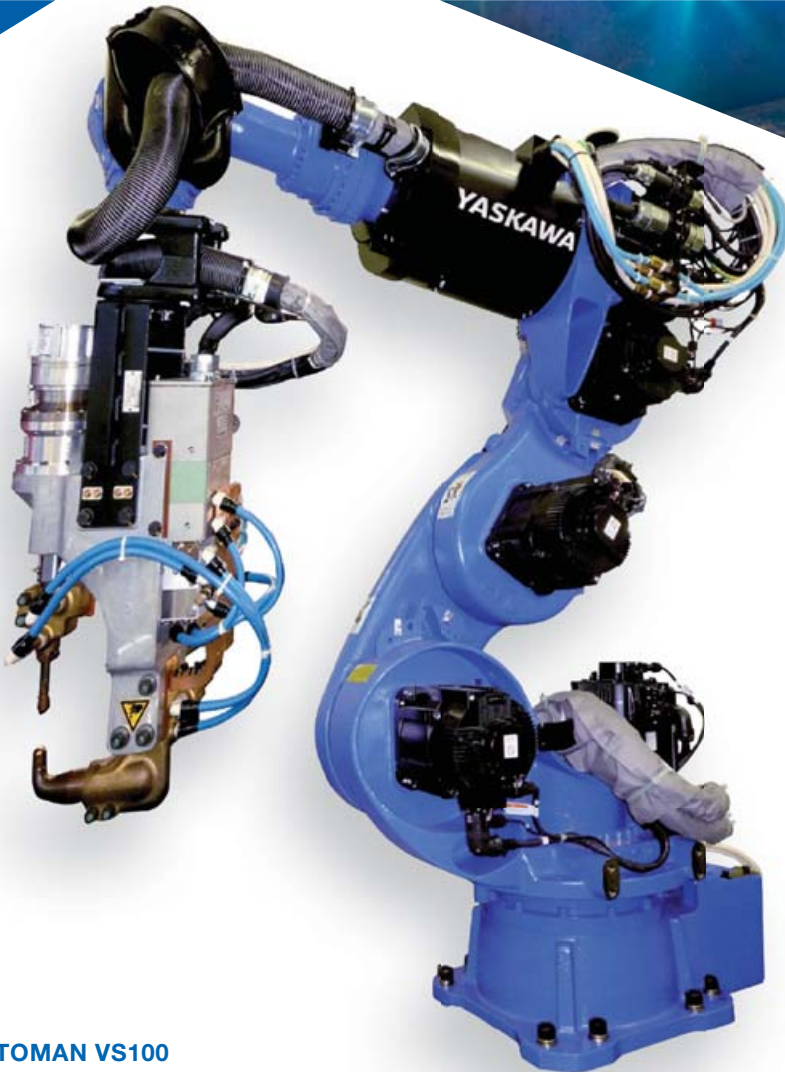
- Due to the modular programming structure and the gripper changing system, it can be used very flexibly and adapted to quickly changing production requirements.
- A sensor system guarantees high quality and the necessary protection against machine downtime, processing errors, scrap, etc. This enables identical handling for every workpiece.



## Material handling with robots

The MOTOMAN MH series offers flexible, 6-axis high-speed robots for a variety of applications such as handling, machine loading, processing and distribution applications.

\* (Source: IFR numbers for 2016)



### **MOTOMAN VS100**

The MOTOMAN VS100 has a payload of 110 kg and a reach of 2,236 mm. It is the world's first spot-welding robot in its class with 7 axes.

### **Solutions for metalworking**

A robot is the universal tool for a multitude of machining operations:

- Handling
- Drilling
- Cutting
- Workpiece feeding
- Spot welding
- arc welding
- Turn-key robot-based arc welding cells

### **Robotics competence and worldwide service**

- MOTOMAN robots from YASKAWA have been in use successfully for decades
- More than 350,000 robots installed worldwide
- As one of the world's largest manufacturers, YASKAWA produces 25,000 robots annually
- We have branch offices or partners almost everywhere that industrial production takes place

### **40 years of MOTOMAN**

- MOTOMAN robots from YASKAWA are known for highest quality and reliability
- Decades of application experience are stored in our controllers as optimal function blocks
- Additional software and simulation options facilitate planning and deployment



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09/2017  
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