

YASKAWA

YASKAWA News

Newest Products and Solutions



YASKAWA News

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Preface



For the past one hundred years, we at YASKAWA have been living up to our claim of providing society and industry with innovative technological products to help them address their daily challenges with an optimistic and forward-looking mindset.

Electrical motors have always been at the core of our product portfolio. We started out in Japan, with an induction motor for mining. In the years that followed, we launched special motor types such as low-inertia DC motors and highly dynamic servo motors. Over the decades, YASKAWA has expanded its offering around our core product and developed generations of inverters, servo controllers and machine control systems to make our motors available for precise and dynamic uses in sophisticated applications.

Almost 50 years ago, YASKAWA engineers initiated a paradigm shift with the launch of “mechatronics” as an approach to address technical challenges. This innovative approach has allowed us to develop and market a series of outstanding new products. Today, “mechatronics” is an established key concept in the international engineering community.

“Mechatronics” has allowed YASKAWA to provide highly sophisticated solutions: for industrial production, for the semi-conductor market, and for products such as centrifuges, vacuum pumps, or lift & crane control systems.

The 1970s saw a breakthrough in mechatronics with the launch of the first electromechanical industrial robot. This innovation led to rapid developments in industrial production.

Building on this foundation, YASKAWA was able to position the company as the leading specialist for drive and

automation solutions – a position we still hold today. With a track record of more than 350,000 installed robots, YASKAWA sets the benchmark in the market.

What does that mean today? How can YASKAWA contribute to enhancing the future evolution of industry and society?

While mechatronics is still at the core of our philosophy, we are now taking the next step. Under the term “humanics”, YASKAWA engineers put a stronger focus on the human factor when developing products and application solutions. This improves man-machine interaction and helps to develop new, collaborative robots, or even revolutionary novelties – such as products for the rehabilitation of people with physical handicaps.

Once more we are proud to offer our customers a wide range of innovations covering all product segments: from the latest generation of GA700 inverter drives to the extension of our successful Sigma-7 servo family; from the new VIPA SLIO motion controller & the VIPA MICRO M13C controller to new industrial robots and collaborative robots like the HC10, which was introduced in Europe this year.

Our mission continues:

We strive to offer our customers innovative technology with first-class performance characteristics in the proven YASKAWA quality. Even after more than one hundred years!

In addition, we continue to drive our transformation from a mere “Best-in-Class” supplier of components to a supplier of systems, and a partner of “Total Solutions”.

“ We strive to offer our customers innovative technology with first-class performance characteristics in the proven YASKAWA quality. Even after more than one hundred years! ”

Our extended service portfolio is in tune with our organizational development. Under the name “VIPA Controls” Division, our control technology subsidiary VIPA is now being integrated into the YASKAWA Europe organization, a move that includes the harmonization of both corporate identity and product branding. This sends a clear message to our customers: whether you need control technology, drive technology, or robotics – our new products are visually identifiable system components from one source: YASKAWA.

Manfred Stern

CEO of YASKAWA Europe
Corporate Vice President YASKAWA Electric Corporation

YASKAWA New Products

Sigma-7

The New Sigma-Series



Quick

Presets in the amplifier software simplify commissioning. The advanced 'tuning-less' function allows immediate use of the Sigma-7 without the need for complex parametrisation or special knowledge of control equipment, while an auto-tuning function ensures quick adjustment.



Fast

Faster, more accurate and with shorter settling time. Sigma-7 offers higher machine efficiency and faster settling time, resulting in higher throughput.

The Sigma-7 systems can synchronize a high number of axes and automatically adjust to the load.



Reliable

Due to the high reliability of our products, maintenance costs are lowered and machine downtimes are reduced.

Built-in functions like vibration suppression, as well as friction- and ripple compensation make for increased machine reliability.



YASKAWA

SERVOPACK 400V

SGD7S-5R4DA0A
000F64



RUN ERR

L/A
A

B



CHARGE



CN
3

YASKAWA

SIGMA-7

Quick, Fast, Reliable

The development of the new Sigma-7 series focused on three main goals: consistently simple and fast commissioning, maximum machine throughput with high precision and maximum operational reliability.

The prerequisites for this are created by intelligent functions like auto-tuning, automatic load adjustment and integrated vibration suppression. The bookstyle housing also supports gapless side-by-side mounting of several amplifiers within a small space, enabling a high power density in the switch cabinet.

Sigma-7 offers both the mechanical engineer and the customer in the manufacturing industry an efficient answer to current market requirements. At the same time this new generation combines the experience from 25 years of development know-how and nine million servo products in the field.

200 V

- Power range from 50 W to 15 kW
- 100 % compatible with Sigma-5, up to 20 % more compact
- 24-bit absolute encoder
- IP67 by default
- Very low heat generation
- Single- & dual-axis amplifiers available

400 V

- Power range from 200 W to 15 kW
- Quick setup in just 3 minutes
- Space saving bookstyle for side-by-side mounting
- European connectors
- Single- & dual-axis amplifiers available



Sigma-7 200 V



Sigma-7 400 V



GA700

Limitless Possibilities

Incredibly reliable, easy to use and powerful!

At YASKAWA, we know your time is valuable. That's why we've designed the GA700. Offering world class YASKAWA quality, along with intuitive interaction and high flexibility, our new GA700 is meant to easily handle nearly any application. Discover the limitless possibilities of GA700!

With flexible motor control, powerful and extendable functionality, and a broad power range up to 630 kW, the GA700 is the drive of choice for almost any task, ranging from simple transportation, presses and others up to complex systems with network connected drives or the demand for higher levels of safety.

Equally impressive to its robust, powerful and flexible design are innovative features like the tuning-less vector control, the haptic keypad with guided configuration and DriveWizard Mobile, the app for smartphones and tablets.

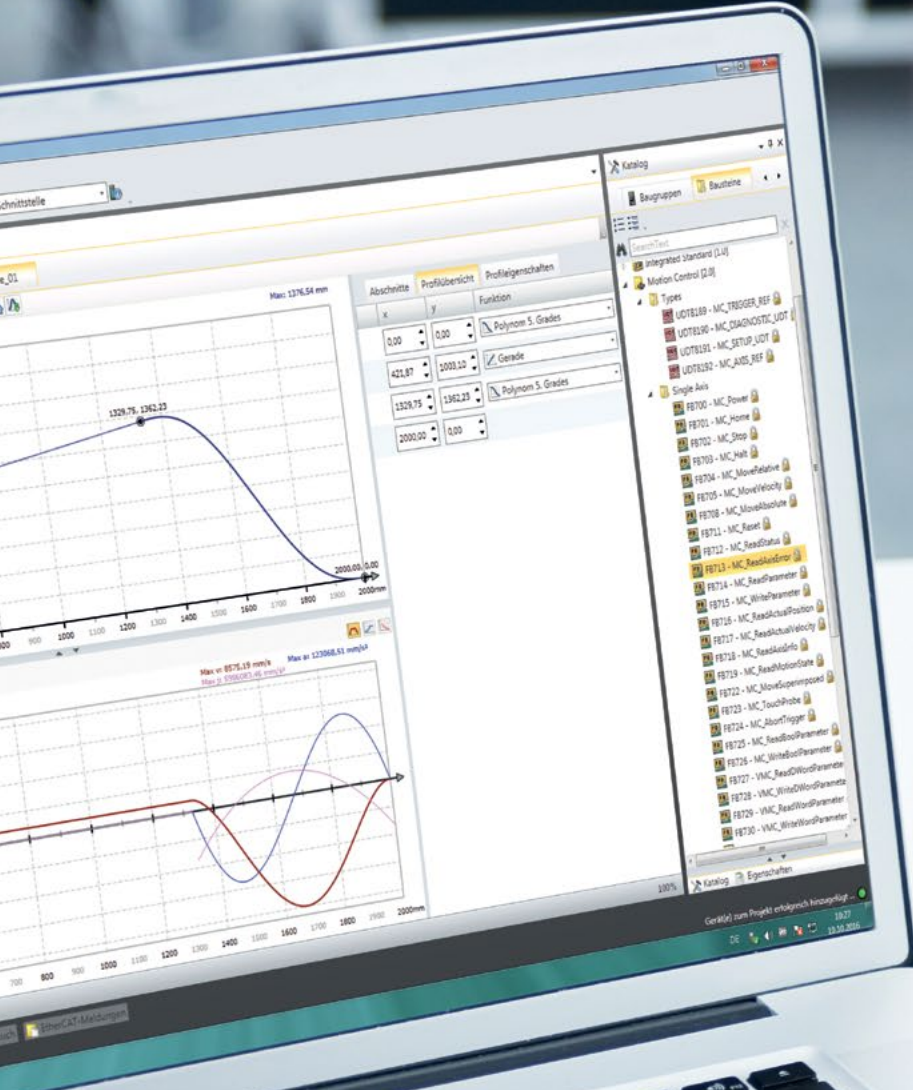
Combine all this with modern safety features and a variety of environmental solutions, and you will need to look no further than GA700 for all your variable speed needs.

One for all

- Power range:
400 V: 0.55 kW to 630* kW
200 V: 0.55 kW to 110 kW
- Gapless side-by-side mounting
- 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
- Controller functionality without a PLC

* in development





SPEED7 STUDIO

Engineering at its finest

SPEED7 Studio – the new engineering software, with which any SPEED7 controller can be used more economically and efficiently.

The new intelligent hardware configuration, the intuitive user interface and the system openness make SPEED7 Studio a powerful and easy-to-use tool. Optimize automation tasks, reduce development costs to a minimum, and save time- and cost-intensive software training. The user can focus on his actual engineering tasks.

SPEED7 Studio is systematically based on user-friendliness. Everything has been freshly designed, from the hardware configuration, programming and networking to the parametrization of frequency inverters and drives, and even visualization. All functions, properties and libraries are automatically prepared and displayed in the SPEED7 Studio editor view.

In addition to motion control functions (YASKAWA drives, CAM editor, PLCopen blocks), the SPEED7 PRO version also offers an efficient diagnostic option in the form of the fully integrated logic analyzer.

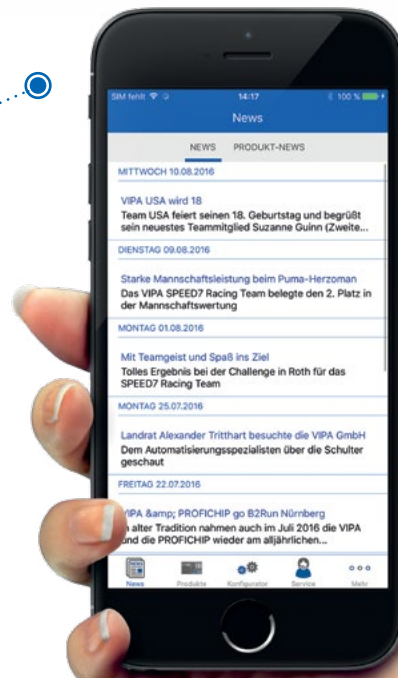
Unique SPEED7 tools make the software attractive and efficient. High-speed applications are compiled even more ergonomically in the SPEED-Bus functions.

EtherCAT is fully integrated. The EtherCAT configurator quickly and safely configures applications, automatically reads them and labels them with standard symbols. Integrated SLIO functionalities such as automatic calculation of power consumption and integrated process image calculation, make SPEED7 Studio a highly efficient tool that holistically integrates the products of the SPEED7 world.



VIPA MICRO M13C

Modern, compact and fast



With VIPA MICRO, VIPA Controls presents a very compact and extremely fast micro control system. The design has a definite wow-factor and opens up completely new paths as regards operating and status display. Thus the VIPA MICRO M13C is the starting signal for the new controller generation from YASKAWA VIPA Controls.

Designed as a stand-alone PLC it stands out because of its modern design, its compact size, its high performance, and its high channel density. The design of the VIPA MICRO M13C contains a new display and operating concept that enables the user to see the essential control information of the system at a glance. With a width of less than 72 millimeters it's up to 50 % smaller than typical micro controllers. With 30 integrated digital and analog I/O channels on board it offers multifarious usage options as a stand-alone CPU too, and can be expanded with up to eight modules. For the product launch there will be digital modules available which will be expanded continuously by all well-established types of modules.

Firm hold by spring terminal technology

The connection plugs are individually detachable and therefore suitable for the pre-wiring in the series launch. Equipped with the convenient push-in technology they can be mounted and replaced quickly, easily and without tools. The allocation of the I/O display LEDs directly on the appropriate plug connection allows the user an easy and clear allocation of the channel status even at such a high channel density. Additionally VIPA Controls offers the user an easy and up-to-date diagnosis access via an optional bluetooth adapter. This enables fast and easy access to the visualization and operation via commercial smartphones and tablets as well as detailed diagnosis. This is even easier with the new free VIPA app.

There is an active 2-port-switch for online access, programming, and communication. This switch is prepared for future applications of PROFINET – PROFINET Ready. VIPA MICRO M13C communicates via Ethernet TCP/IP as standard. The user also has the option of using the PROFIBUS slave function, PtP and MPI with an expansion module. Further functionalities can be enabled using the multiple award winning VIPA Set Card (VSC).

Specifications

- Stand-alone PLC
- Up to date, pleasing, and functional design
- Extremely compact construction size
- Very high performance with SPEED7 technology
- Fast backplane bus connection of 48 Mbit/s
- 30 integrated I/Os on board
- CPU expandable up to max. 8 modules
- Detachable connection plug with spring terminal and push-in technology
- Bluetooth communication for diagnosis and visualization (optional)
- 2-port Ethernet switch
- Optional 2x RS485 module for MPI and PtP and optional PROFIBUS slave
- 64 up to 128 kByte remanent work memory and 128 kByte load memory
- Full STEP7 compatible – supports IL, LAD, FBD, SCL and GRAPH7

VIPA SLIO 013C

The new super class of compact CPUs – compact, fast and efficient!



With its new VIPA SLIO 013C, VIPA Controls has set new standards, especially in terms of speed and compact design. Just one year after the initial launch, VIPA Controls would like to raise the bar again and provide the user with additional features.

New features

Just in time for the SPS IPC Drives 2016, the VIPA SLIO 013C has brand new features: two active (open communication, Modbus TCP etc.) and four passive (PG/OP) Ethernet connections, PROFINET-Ready (prepared for a following feature update), DHCP support and PROFIBUS master functionality. With these additional features, as well as the further currently developed and planned future features, users get even more possibilities to equip their systems even in the smallest space with maximum performance.



VIPA SLIO 013C

The 013C combines a PLC CPU with integrated SPEED7 technology, 30 digital and analog I/O channels as well as specific channels with special technological functions. The well-known interface options of the existing VIPA SLIO CPUs, together with an extremely fast backplane bus and stable mounting on a 35 mm standard profile rail are of course still a part of the CPU 013C. The option to configure the work memory and the fieldbus connection with the VIPA SET Card (VSC) has also been adopted in this new CPU.

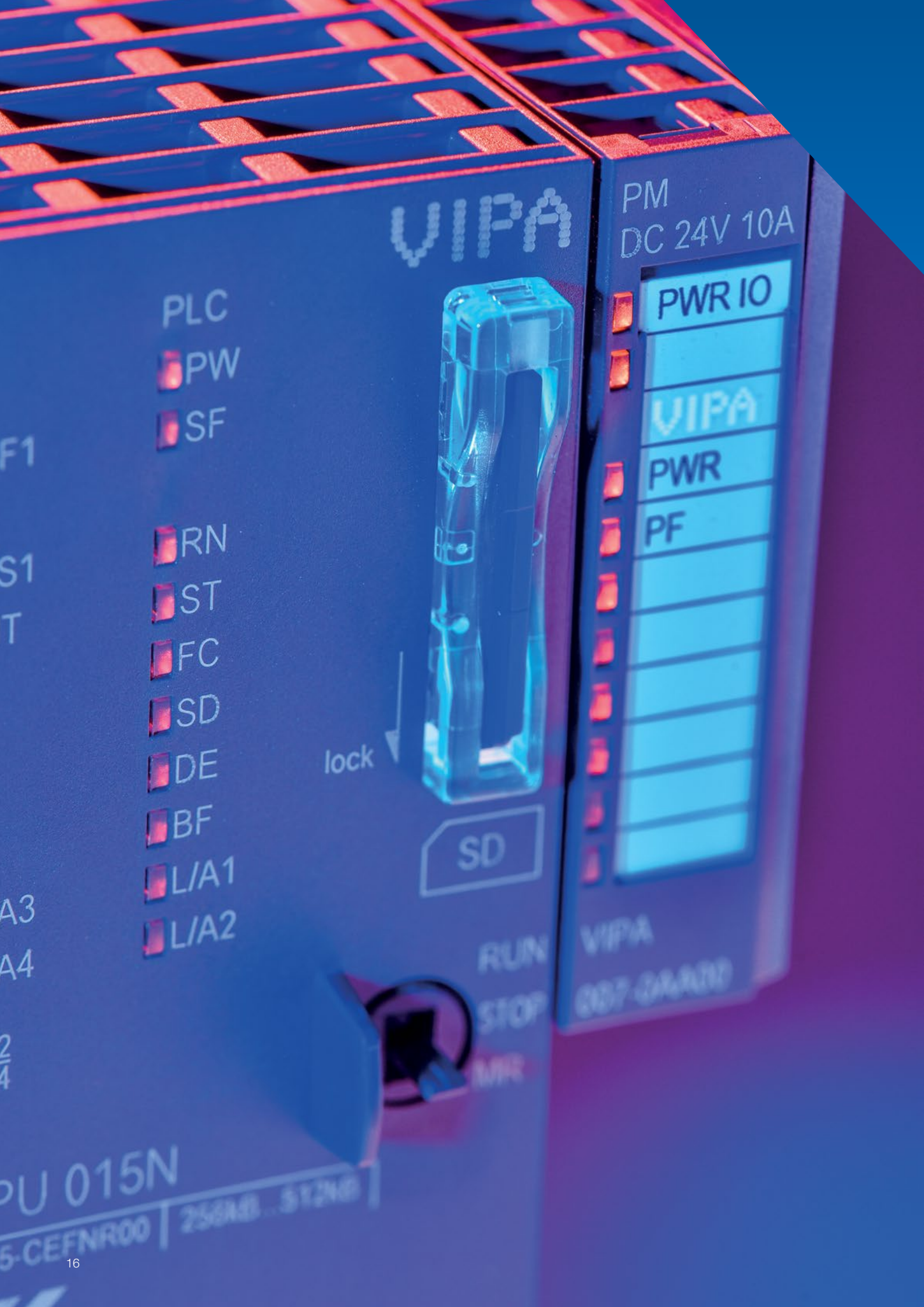
The basic version has 64 kByte and can be expanded up to a maximum of 128 kByte. 128 kByte are integrated as load memory.

In addition, VIPA SLIO 013C can be expanded by up to 64 modules, which allows the user to select from the entire range of SLIO module types, which now has more than 100 different modules. This also covers a great variety of special requirements.

The new compact CPU is particularly suitable for use in small to medium-sized plants and machines, especially where the already integrated I/Os cover many requirements.

Highlights

- Compact and space-saving design
- Proven SPEED7 technology for the highest clock rates, precise positioning and a multitude of control functions
- Extremely fast backplane bus with 48 Mbit/s transmission rate
- Expansion options for up to 64 modules, all module types of the SLIO system deployable
- 30 Integrated I/O channels
- 2 Port Ethernet switch (PROFINET-Ready)



VIPA

PM
DC 24V 10A

PLC

PW

SF

RN

ST

FC

SD

DE

BF

L/A1

L/A2

lock

SD

RUN

STOP

MFR

PWR IO

VIPA

PWR

PF

VIPA

007-0A00

U 015N

5-CEFNR00 | 256A0...512A0

VIPA SLIO MOTION CONTROLLER

A new interpretation of motion control

The VIPA SLIO Motion Controller combines the know-how in the area of PLC control technology with the expertise in motion control. It allows direct implementation of motion control functions in the PLC control. For this solution from a single source, three new SLIO motion modules are available, which additionally extend the motion control options with a PLC.

New motion modules

The new SLIO motion modules – DC motor, pulse train and stepper – together with the VIPA SLIO motion controller, are the best prerequisites for users to realize motion control projects. The SLIO DC motor module allows the direct operation of two DC motors, including the possibility of encoder evaluation. The latter also features the new SLIO pulse train module in addition to the direct connection of a drive inverter. With the last of the three new modules, the SLIO stepper module, the user has the possibility to operate step motors with simple encoder feedback. Thanks to these new SLIO motion modules, the motion control functions with a PLC have been extended and thus open up completely new application possibilities.

VIPA SLIO Motion Controller

The VIPA SLIO Motion Controller consists of three components: A VIPA SLIO 015N, a Sigma-7 servo drive and the SPEED7 Studio programming and configuration tool. The motion controller is based on the standard functionality of the VIPA SLIO 015N, i.e. PG/OP communication, function blocks, supported protocols for Ethernet communication, and configuration of the CPU via the VIPA Set Card (VSC). Communication between the CPU and the drive modules takes place via EtherCAT.

Highlights

- A CPU for standard and motion control applications
- Fully integrated EtherCAT master
- Proven SPEED7 technology for maximum clock rates
- Clock synchronisation operation and multi-axis applications via EtherCAT
- Programmable with SPEED7 Studio
- Highly flexible and modular system
- Single-source solution for control and drive components
- 3 new motion modules: DC motor module, pulse train module, stepper module



VIPA SLIO 017PN

More memory and performance in the control cabinet



The SLIO product family has been upgraded in terms of memory and performance. With the new VIPA SLIO 017PN, VIPA Controls offers its customers a powerful platform for current applications, as well as future functions and features.

Specifications

- Up to 2 MB of memory (512 – 2,048 kB)
- 25 – 50 % higher CPU performance
- 2 – 4x higher performance data (peripheral area 8 kB, bit memory 16 kB, counter / times 2,048 kB etc.)
- 2-way PROFINET switch: up to 128 devices, 768 IO bytes, up to 24 productive connections, PN V2.3
- 2-way Ethernet switch: up to 4 productive connections (S7, open communication)
- In each case 8 Ethernet PG / OP connections
- DHCP support
- 2x RS485 interface: MPI, USS master, ASCII, ETX / STX, 3964R, Modbus master / slave (optional PROFIBUS master / slave)
- Expandable by up to 64 SLIO modules
- Fully STEP7 compatible – supports AWL, LAD, FBD, SCL, and GRAPH7

The new VIPA SLIO 017PN is a further development of the VIPA SLIO 015PN and provides a memory that is up to four times larger. This makes it perfect for extensive and complex user programs.

In addition to the memory expansion, the 017PN is characterized by two to four times higher performance data, more communication connections, and a 25 to 50 % higher CPU performance compared to the 015PN. This gives the customer the highest performance in the middle control segment.

A further special feature is that the 017PN has a 2-port switch for PROFINET and for standard Ethernet as well as two RS485 interfaces for optional use of PROFIBUS master / slave. In addition, the user can add up to 64 expansion modules to the new CPU and choose from almost 100 modules – thus there is the right module for every application.

The new CPU 017PN is “best-in-class” in the area of decentralized control systems in the S7 segment.

Target application

The VIPA SLIO 017PN is particularly suitable for use in machine and plant construction, in building technology, as well as in serial machines with PROFINET and / or several Ethernet productive connections thanks to its high performance and the larger memory.

VIPA 300S+

Added value for the classic



In order to take into account the latest developments in the control market, VIPA Controls has significantly improved its 300S product family. The result is PLC CPUs in the classic S7-300 size, which have gained in memory size and additional benefits, but without adding to the price. On the contrary: the EtherCAT versions are 20 to 30 % cheaper compared to the previous models.

Highlights

- Enhancement of the 300S product family
- Double and threefold memory expansion
- Support of standard SD cards
- Front connectors are now part of the scope of delivery
- Revision of the integrated web interfaces
- Cost reduction for EtherCAT CPUs by 20 to 30 %

Double and threefold memory expansion

The memory capacity of the integrated memory with the VIPA 300SC compact CPUs is doubled in the basic version, with the standard and NET CPUs of the 317 series it is even tripled. This allows us to meet the requirements of many users to have sufficient storage capacity even for larger user programs, without the need for external storage media. If the expanded memory still does not suffice, the memory of the VIPA 300S+ CPUs can still expand flexibly with the aid of the VIPA-MCC. In the VIPA 300S+ CPUs, commercially available SD cards are now supported as external storage media.

Front connectors are now part of the scope of delivery

The compact CPUs of the 300S+ family are now delivered together with matching front connectors for the integrated I/O channels. This means that the users no longer need to worry about the amount and type of the required front connectors. The benefit of this is that the VIPA 300S+ compact CPUs were not increased in price.

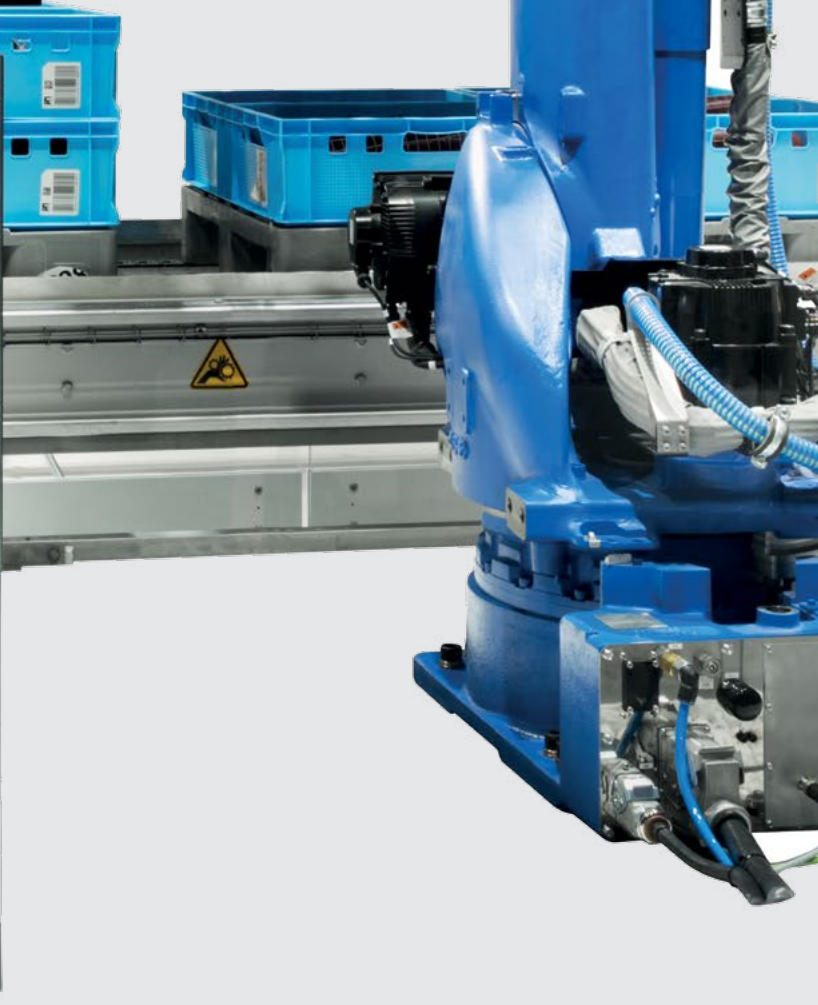
Revision of the integrated web interface

The integrated web interface of the CPUs has been completely redesigned with a simpler diagnosis. This makes it possible to read out and diagnose all modules connected to the CPU. Laborious error reading directly on site is a thing of the past, a look at the web interface and the user can react immediately.

Cost reduction for EtherCAT CPUs

In order to meet the growing importance of the market for EtherCAT networking in the field of control technology, VIPA Controls reduces the list prices of the EtherCAT CPUs VIPA 315SN/EC, VIPA 315SN/EC ECO and VIPA 317SN/EC by 20 to 30 % as further incentive for this network technology.

The familiar features from the 300S family have also been adopted into the 300S+ family. In addition, the CPUs of the 300S family can be replaced one to one by the CPUs of the 300S+ family in the case of service or replacement.



MOTOLOGIX

Controlling software for Motoman Robots

MotoLogix is a software and hardware interface that enables users to control and program the robot through a PLC and offers an innovative approach for a control of all-axis coordinated robot motion, similarly to a traditional robot controller.

MotoLogix has two components

- MotoLogix Runtime – This enables the MotoLogix interface on the YASKAWA DX200 robot controller, using the fieldbus of your choice for communication with the PLC
- MotoLogix PLC Library – Comprehensive set of function blocks for writing your robot application logic in the PLC

Virtualisation

Using the powerful combination of MotoLogix and MotoVRC you can test your entire PLC/HMI robot application without the need of the completely assembled machine*

- Shorter commissioning time on-site
- Discover design or application issues in an early stage

Specifications

- All DX200 robots can be controlled
- Up to 4 robots (or external axes) for each MotoLogix system
- Number of MotoLogix systems per PLC is only limited by PLC and fieldbus capacity
- Number of interference zones: 32
- Robot controller cycle time: 4 ms
- 436 byte consistent data is cyclically exchanged between PLC and each MotoLogix system
- Required available PLC memory: 512 kB



*A YASKAWA robot controller is needed.



MOTOMAN HC10

Human-Collaborative robot

MOTOMAN HC10 is a 6-axis human-collaborative robot with a payload of 10 kg. Operator safety is assured by a Power and Force Limit technology that stops the robot in case of contact with an operator.

The robot arm can be hand guided by an operator and robot positions and gripper operation can be registered via so called “Easy Teaching Smart HUB”. These features offer time savings during the robot programming. The robots arm geometry was designed to avoid pinch points (finger).

The MOTOMAN HC10 can operate without additional protective measures like a safety fence, depending on the risk assessment. This saves space and costs. Its installation area is very flexible and therefore able to operate at different workplaces.



Highlights

High safety

- Contact force between operator and robot is limited to a safe level
- Arm geometry designed to avoid pinch points (finger protection)
- Safety standards – applications for Industrial robots: ISO 10218-1 (5.10.5 Power and Force limiting)
- Safety functions industrial robot controller: ISO 13849-1, PLd
- Compliant to technical specification for collaborative robot operation: TS15066

Easy teaching

- Move the robot arm directly via hand guiding function: easy teaching mode with a Smart HUB

No safety fence

- Depending on the application, the HC10 can be used without a safety fence

Features in the future

- Transfer between various workplaces via a mobile platform



MOTOMAN GP SERIES

Handling & general application

YASKAWA expands its range of Motoman industrial robots to include the new GP series. Introducing the GP7 and GP8 models. The two robots with a load capacity of 7 kg and 8 kg are not only the fastest in their class, but are also fully designed with IP67 protection class in mind. It can be used without further modifications even in harsh environments for handling and other automation tasks.

The slim and curvy design allows the manipulator to dive deep into work areas, while the smooth surfaces make cleaning the GP robots easier. Only one robot cable is required for the connection between the manipulator and the controller. The advantages of this solution are reduced wear and reduced space requirements, as well as reduced maintenance costs and smaller required spare parts stock.

The robots of the GP series are controlled by the new Motoman YRC1000 control unit. The new drive technology reduces the time required for the actuation process with the aid of minimized movement changes due to different speeds. This extremely compact controller allows for optimal space utilization and is designed to set new standards with robot acceleration and speed.

The YRC1000 controller programmer provides improved cable routing. With only 730 g, it is the lightest programming device in its category and can confirm robot positions via the 3D robot model display. The touch screen allows intuitive operation and thus easy movement and scrolling with the cursor.

Highlights

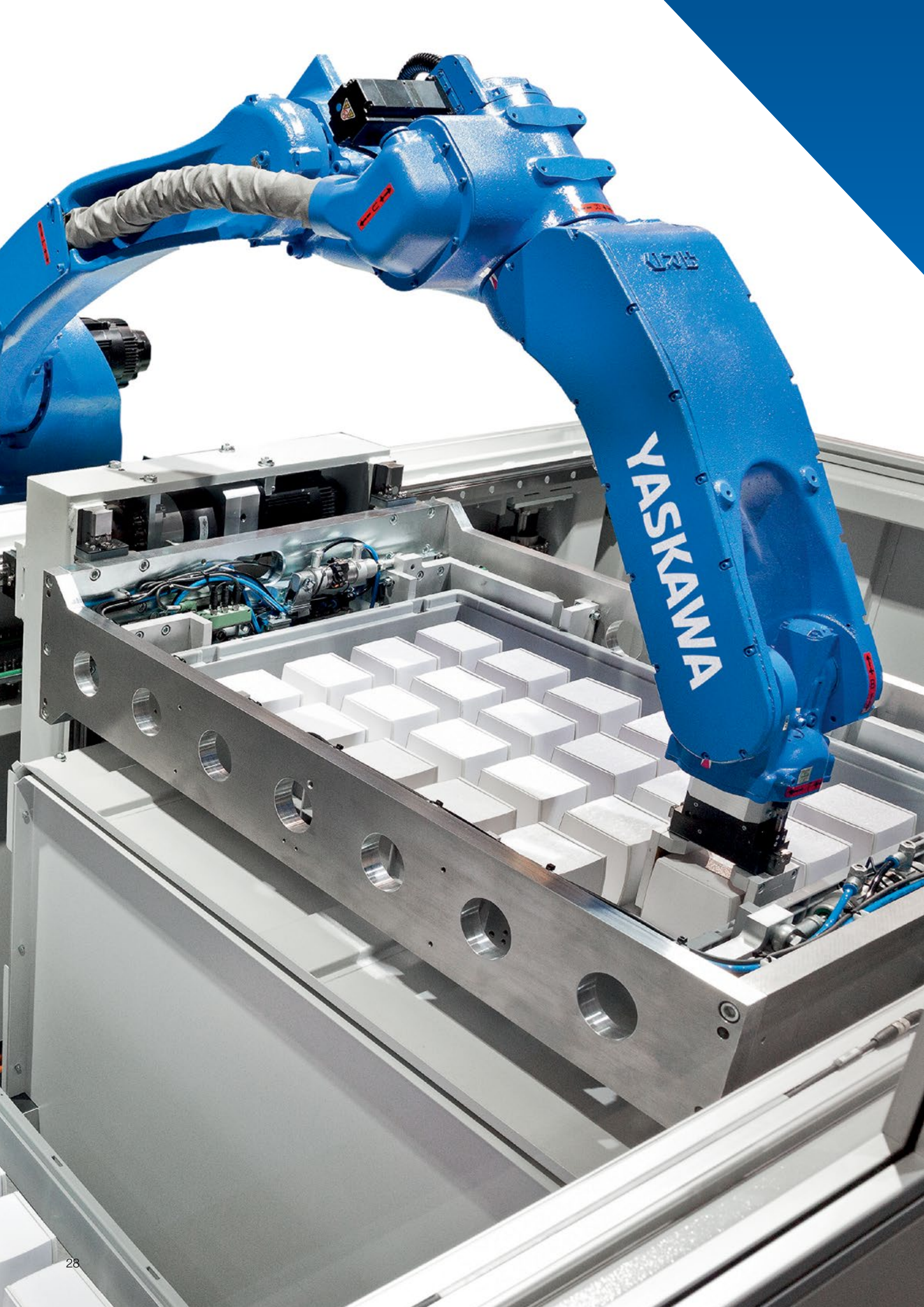
- Increase productivity: A variety of work-pieces can be transferred and different grippers can be mounted with 7 kg and 8 kg payloads and 38 % greater allowable moment
- More compact equipment: Slim and easy-to-use structure
- Easy set-up
- Robot surface is designed to prevent adherence of dust
- High environmental performance: Its structure can resist dust and coolants due to its IP67 standard protection class
- Easy maintenance: Data saving feature enables to replace the wire harness in the robot without having to connect to a battery



GP7



GP8



MOTOMAN MH12

Robot for highly dynamic applications

The flexible, high speed 6-axis robot MOTOMAN MH12F with its payload of up to 12 kg is newly added to the YASKAWA product line MOTOMAN MH-series. By realising the highest motion performance in its class, YASKAWA is contributing to the productivity development.

The hollow shaft structure is adopted to the upper-arm. By storing the cables in the arm, operation restriction due to the cable interference is reduced. Therefore, maintainability such as simplifying of the robot teaching operation or eliminating of the cable disconnection problems, etc. is improved.

Stream-lined structure adopted to the new type of arc welding purpose robot is also applied to this multipurpose-applicable robot. And this adoption contributes to reduce the interference area between the jigs and work pieces. Superior performance can be delivered in handling operations which for example requires the rotation of large work pieces.

The servo-float function enables, for example in plastic injection moulding machines, safe handling of work pieces which are pushed back by the ram, including the arm of the robot.

Handling, general application, packaging

- Expanded diameter of hollow wrist (50 mm)
- Fast and powerful (max. payload 12 kg)
- Reduced interference due to internal cable wiring
- Servo float possible
- Stream-lined structure
- Easy maintenance



Complete System Solutions with YASKAWA

Cleaning

The bottles go through the cleaning and sterilization process.

- PLC controller
- Frequency inverter

Filling

The bottles are transported to the filling machine on a conveyor belt.

- PLC controller
- Servo drives

Feeding

The empty bottles are fed into the plant using a handling system.

- PLC, I/O system, HMI
- Machine controller
- Servo drives

Machine controllers

Up to 62 axes,
IEC 61131-3 standard

PLC

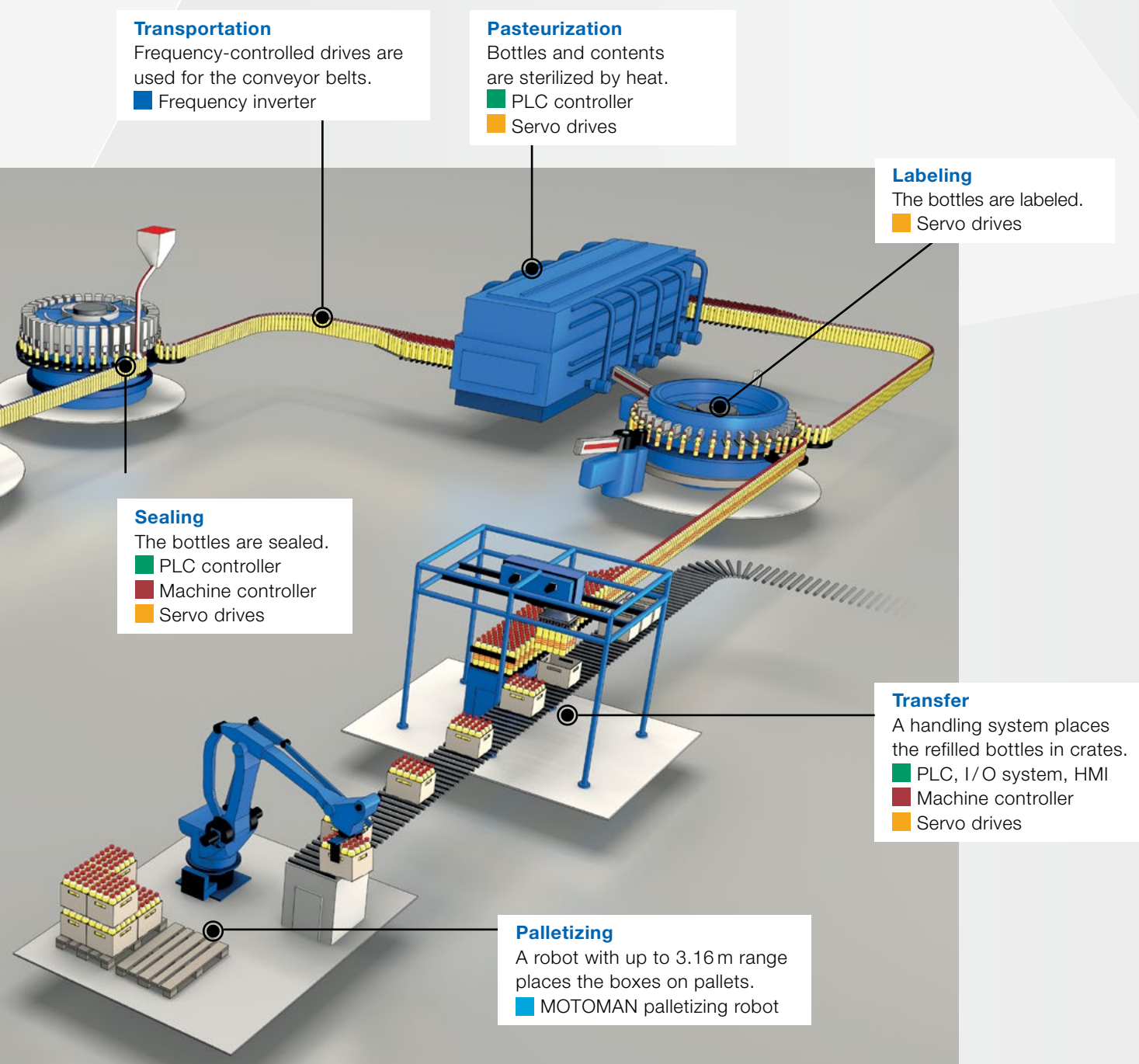
Control systems with SPEED7
processor for outstanding performance

HMIs

Line displays and touch panels

I/O systems

Numerous examples from different industries hint at the demands that machinery and plant place on control and drive technology. From production lines in the automotive and wood processing industries to the manufacture of particle board and packaging lines, controllers, drives and robots are used everywhere.



YASKAWA

Green Performance Solutions

As a Total System Solutions Provider with a focus on efficient, clean and reliable products, we can offer a variety of Green Performance Solutions, from Single Components to Complete Systems.

Efficiency in robotics, drive technology and automation means much more than merely saving energy. A more comprehensive efficiency concept is called for. The YASKAWA approach covers all facets of the subject, and the energy-saving potential is correspondingly diverse.



Energy Saving

SPRiPM | V1000 MMD

- Intelligent drive for implementing the ErP directive IEC / TS 60034-31
- Reliable combination of inverter drive with IE4+ Super Premium IPM-Motor



Energy Recovery

U1000 | D1000 | R1000

- Matrix technology for applications with regeneration (4Q) with U1000
- Relieves transformers and other components of power supply thanks to low harmonics
- Less waste heat reduces workload of the ventilation system
- Requires less maintenance work than systems with braking resistors



Energy Management

SLIO | HMI | EnMS

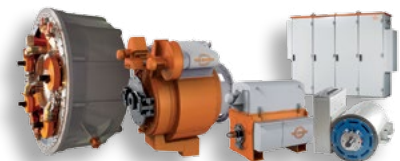
- Energy monitoring
- Energy measurement
- Intelligent process control
- Logging and evaluation of operating data



Energy Production

PMM | Frequency Converter

- Electrical drive package with permanent magnet or high speed induction motor with frequency converter
- Gearless applications
- Integrated solutions
- Wide speed range
- Energy saving and operationally reliable
- Fewer mechanical and electrical parts



YASKAWA

Product Overview



GA700

Sustainable, Flexible, Easy

Standard Inverter

The GA700 precisely controls induction, permanent magnet, and synchronous reluctance motors providing versatility to run a variety of applications with just one drive. The times of complex motor set-up are over. With the new EZ vector mode, the GA700 can run all of these motor types without comprehensive tuning.

Features

- Easy set-up due to the integrated start-up wizard
- Integrated features (SIL 3, Braking transistor [up to 75 kW], EMC filter, DC reactor [22 kW and above] ...)
- Archive and retrieve parameter settings with comments on your smart device
- Worry-free data recovery: Parameter back-up / retrieval anytime via cloud service for registered drives

Technical Data	GA700
Motor power range [kW]	0.55 – 630
Induction motor (IM)	✓
Permanent magnet motor (PM)	✓
Synchronous reluctance motor	✓

J1000

The Compact Inverter

Standard Inverter

The J1000 is a compact inverter drive for use with induction motors. Thanks to its energy saving characteristics and the possibility for variable speed operation, the J1000 perfectly fulfills all the demands of compact applications. The J1000 series performs best in fan, pump and conveyor applications.



Technical Data	J1000
Motor power range [kW]	0.1 – 5.5
Induction motor (IM)	✓
Permanent magnet motor (PM)	—

Features

- Extremely small size
- Only some settings required for quick set-up



V1000

Best of Class Inverter Drive

Standard Inverter

The V1000 is a compact inverter drive suitable for operating induction motors and permanent magnet motors (Open Loop). The V1000 series is perfect for applications like hoists, extruders, HVAC, fans, pumps, compressors, conveyors and washing machines.

In combination with our SPRiPM the V1000 can be used as an outstanding energy saving package.

Features

- Open-loop-control for induction and permanent magnet motors
- Suitable for plenty of applications
- Perform PLC tasks directly on the drive
- Available in IP66 and fanless

Technical Data	V1000
Motor power range [kW]	0.1 – 18.5
Induction motor (IM)	✓
Permanent magnet motor (PM)	✓

A1000

Multi-Purpose, High Performance Inverter Drive

Standard Inverter

The inverter drives of the A1000 series are extremely versatile. They show their strong points especially in applications like extruders, cranes and hoists, HVAC, compressors and conveyors. The GL certification approves the use of A1000 drives under very tough conditions, like marine and offshore.



Technical Data	A1000
Motor power range [kW]	0.55 – 630
Induction motor (IM)	✓
Permanent magnet motor (PM)	✓

Features

- Open- and closed-loop-control for induction and permanent magnet motors
- Suitable for plenty of applications
- Perform PLC tasks directly on the drive
- Available as IP54 Wall Mount, IP54 Ready version and as fully pre-configured cabinet IP23/54 Floor Standing



L1000A

Multi-Purpose Lift Inverter

Lift Inverter

The lift inverter drive L1000A is the perfect solution for technical requirements of today's lifts. L1000A controls induction and permanent magnet motors and is the first choice for new installations, machine room less lifts and lift modernization.

Features

- Open- and closed-loop-control for IM and PM motors
- Large power range
- Programming in lift terminology and in 13 languages
- Displays parameter in lift-specific terms and units (m/s, m/s² ...)

Technical Data	L1000A
Motor power range [kW]	1.5 – 110
Induction motor (IM)	✓
Permanent magnet motor (PM)	✓

L1000V

Compact Lift Inverter

Lift Inverter

The compact L1000V is the economic solution for modernization and new installation of lifts with gear box motors without speed feedback. By sticking to the basics, this YASKAWA inverter drive combines usability and outstanding ride performance with a robust and durable design.



Technical Data	L1000V
Motor power range [kW]	4.0 – 15
Induction motor (IM)	✓
Permanent magnet motor (PM)	—

Features

- Open-loop-control for induction motors
- Programming in lift terminology and in 8 languages
- State-of-the-art motor control algorithms for a smooth ride and a precise stop

R1000



Energy Saving Regenerative Unit

Energy Recovery Unit

The R1000 regenerative unit with block switching is an ecological, sustainable alternative for braking resistors. Moreover, compared with conventional solutions, it saves space and reduces maintenance. The braking energy fed back into the net additionally reduces costs and protects the environment.

Features

- Allows 4-quadrant-operation without braking resistors
- Replacing braking resistors saves space and facilitates installation
- Since the resistors do not generate heat, less cooling is required for the switch cabinet; this saves energy and reduces costs
- Provides regenerative energy for other consumers in the plant, reducing total power consumption
- Quick amortisation of investments

Technical Data	R1000
Regeneration capacity [kW]	3.5 – 300
Supress power supply harmonics	—
Apply multiple drives	—



D1000



Regenerative Converter Unit with Low Harmonics

Energy Recovery Unit

The D1000 regenerative unit requires less space and saves energy. It's suitable for single drive applications with energy recovery, as well as for systems of inverter drives, servo axes and robots. Excess braking energy is fed back into the power grid sinusoidally instead of converting it to heat. This cuts down costs and helps protect the environment.

Features

- No need for braking transistors and resistors results in less space needed and less waste heat produced
- Sinusoidal energy supply and recovery reduces stress on power grid and components
- DC-bus for lower energy consumption – braking energy of one drive can be used by another motoric operating drive of the system

Technical Data	D1000
Regeneration capacity [kW]	5.0 – 630
Supress power supply harmonics	✓
Apply multiple drives	✓



U1000



The Drive for Maximum Efficiency

Matrix Converter

The U1000 is a highly efficient inverter drive based on latest Matrix converter technology. With full power regeneration capability it offers great energy saving potential while sinusoidal input currents and a power factor close to one reduce stress on grid components. With an ultra-compact shape, it is the first choice for innovative, energy-efficient drive solutions with or without power regeneration.

Features

- Innovative matrix technology
- Built-in power regeneration
- Compact and easy
- Clean power
- Built-in bypass operation
- Smaller transformers and generators needed
- Built-in functional safety

Technical Data	U1000
Regeneration capacity [kW]	2.2 – 500
Suppress power supply harmonics	√
Apply multiple drives	√



FSDrive-MV1000

Super Energy-Saving Medium-Voltage Drive

Medium-Voltage Drive

The MV1000 performs best in all kinds of applications with pumps, fans, blowers and compressors, but also with mills, test facilities, grinders, kiln drives, exhausters, crushers and extruders. The MV1000 is the smallest air-cooled multi-level inverter drive in the world. Its compactness, performance and energy efficiency make it the first choice for cost effective medium-voltage solutions.

Features

- Uses state-of-the-art technologies for medium voltage operation
- High performance and energy efficiency combined in a compact housing
- Perfect for reasonably priced medium-voltage solutions

Technical Data	MV1000
3 kV	200 – 3,700 kVA
6 kV	400 – 7,500 kVA
11 kV	660 – 12,000 kVA





Features

- High-precision open- and closed-loop-control of induction and permanent magnet motors
- Heat sink and cold plate versions for water cooler mounting available
- Pulse train output and pulse train speed reference for easy and effective synchronized line speed

T1000A

Multi-Purpose Textile Inverter

Textile Inverter

The T1000A is an inverter drive with current vector control specially designed for applications in the textile industry. The special hardware and software functionality are adapted to the needs and conditions of the textile industry.

Technical Data	T1000A
Motor power range [kW]	0.55 – 185
Induction motor (IM)	✓
Permanent magnet motor (PM)	✓

T1000V

Compact Textile Inverter

Textile Inverter

The T1000V is the compact solution for applications in the textile industry.

Technical Data	T1000V
Motor power range [kW]	0.1 – 18.5
Induction motor (IM)	✓
Permanent magnet motor (PM)	✓



Features

- For motors without encoder
- Heat sink and cold plate versions for water cooler mounting available
- Specially coated PCBs for textile applications

SPRiPM

Energy-Saving Drive Package

IE4+ Motor & Inverter Drive

The SPRiPM drive package consists of the highly efficient SPRiPM-Motor, the V1000 or A1000 inverter drive and an EMC filter. Upon receiving, the inverter drive is already preconfigured for the motor contained in the package. This environmentally friendly solution exceeds efficiency requirements of the highest class IE4 according to IEC / TS 60034-31 (super premium efficiency).



Features

- Energy saving
- Space saving
- Reduces costs
- Less weight

Technical Data	SPRiPM
Motor power range [kW]	1.5–37
Frame size	71–180

V1000 MMD

Flexible to operate

IP65 Motor Mounted Drive

The V1000 MMD is a frequency converter for decentralized use. It can be mounted directly on the motor, or installed directly next to the motor on the wall. Decentralized drive solutions are always in demand when a classic design in the control cabinet reaches its limits. Costs for wiring and cooling are minimized and no additional space is needed in the control cabinet. This solution also offers flexibility for energy-efficient retrofits on existing installations.



Technical Data	V1000 MMD
Motor power range [kW]	1.5–4
Induction motor (IM)	√
Permanent magnet motor (PM)	√

Features

- Decentralized installation
- Wall- or motor mounting
- Pre-set application parameters
- Installed C1 EMC filter



MP3300iec & MP3200iec

High Performance Automation Controllers

Machine Controller

The YASKAWA MP Controller series facilitate a new realm of possibilities in the world of machine control. They provide highest precision even in high speed applications.

Features

- IEC61131-3 programming standard for efficient software programming and -handling
- Control modes: positioning, electronic shaft, speed and CAM
- Acceleration: linear, exponential, with moving average
- Connectors: MECHATROLINK-III, Ethernet (100 Mbps)
- PLCopen function blocks
- Reusable code libraries enable the import of previously developed logic

MP2600iec

IEC on the Drive

Option Card

The MP2600iec is a small size and powerful controller option for Sigma-5 SERVOPACKs operating a single axis.



Features

- IEC61131-3 programming standard for efficient software handling
- 1.5 axis control
- Open standards Ethernet/IP and Modbus/TCP
- PLCopen function blocks
- Reusable code libraries enable the import of previously developed logic



VIPA MICRO

The Smart and Modular Control System

The new, very compact and extremely fast micro control system VIPA MICRO replaces the proven VIPA 100V system. It sets a shining example in terms of design and shows completely new paths in terms of operating and status display. The component size allows use in almost any automation environment.

VIPA 200V

The Modular Control System

With a central extension of a maximum of 32 modules directly to the CPU and up to 126 fieldbus slave modules with a further maximum of 32 modules per fieldbus slave module, 200V is highly flexible.

The module size allows use in almost any automation environment.



VIPA SLIO

The Compact Control System

SLIO combines high functionality with a clever mechanic concept in an extremely compact design. It is universally combinable and deployable with every established VIPA system and nearly all those of other producers.

VIPA 300S+

The High-Speed Control System

With the new 300S+ system family the 300S product family is significantly improved and ultimately replaced. The VIPA 300S+ CPUs have gained in memory size and additional benefits, without adding to the price. The familiar features from the 300S family have also been adopted into the 300S+ family. In the case of service the VIPA 300S CPUs are interchangeable one to one by the respective successor products.



Sigma-5

Precise, Scalable and Highly Dynamic

Servo Drives

The Sigma-5 series offers standard rotary motors as well as linear and rotary direct drives and linear sliders. This broad variety of drive systems covers all market demands with regards to compact size, high dynamics, high efficiency, low maintenance and outstanding reliability.

Sigma-5 Advantages

- Comprehensive motor and amplifier power range
- Speed loop bandwidth of 1.6 kHz
- The STO function is implemented by default in all Sigma-5 series servo amplifiers; more safety options can be added with the optional safety module SGDV-OSA01A
- High resolution encoders with 1,048,576 pulses per revolution for high positioning accuracy



Sigma-5 Mini

Ultra Compact AC Servo Drive

For applications with high dynamics and precision in smallest dimensions.

Features

- High speed (rated speed 3,000 rpm and maximum speed 6,000 rpm) improves device cycle time

Technical Data	Mini
Motor power range	3.3 – 30 W
Flange size	15 & 25 mm



Sigma-5 Standard

Proven and Versatile

For applications with high dynamics and accuracy, fast positioning and perfect multi-axes synchronisation.

Features

- Supports all major fieldbus systems

Technical Data	Standard
Motor power range	50 W – 15 kW

Sigma-5 Large Capacity

Powerful and Smart

The large-capacity AC servo drive is the consequent extension of the Sigma-5 Series up to 55 kW.

Features

- Supports all major fieldbus systems
- 20-bit encoder

Technical Data	Capacity
Motor power range	22 kW – 55 kW



Sigma-7

Quick – Fast – Reliable

Servo Drives

The development of the Sigma-7 series focused on three main goals: consistently simple and fast commissioning, maximum machine throughput with high precision and maximum operational reliability. The Sigma-7 series is now also available as a 400 V Series. This new generation combines the experience from 25 years of development know-how and nine million servo systems in the field.

YASKAWA motors offer an excellent power factor: at the same power, they are significantly smaller and reduce heat generation by up to 20 %. In combination with the amplifiers, the motors, which feature 24-bit encoders, meet the highest tracking and precision requirements. Sigma-7 SERVOPACKs can replace their predecessors without new mounting holes. This greatly reduces the cost of upgrading and simplifies the transition to a higher level of performance and precision.



Technical Data	200 V	400 V
Power range	50 W – 15 kW	200 W – 15 kW
Single-Axis	√	√
Dual-Axis	√	√
Embedded Fieldbus	Pulse train / analog input, MECHATROLINK-II, MECHATROLINK-III, EtherCAT	EtherCAT, MECHATROLINK-III, ProfiNet



200 V Series



400 V Series

SGLGW2 / SGLFW2

The iron-core linear motors combine high peak forces with a compact design and low energy consumption. The integrated temperature switch provides additional safety. The very low force ripple ensures precise, smooth movement. The automatic regulator tuning in the servo drive means that the linear motor can be put into operation quickly and easily.

Features

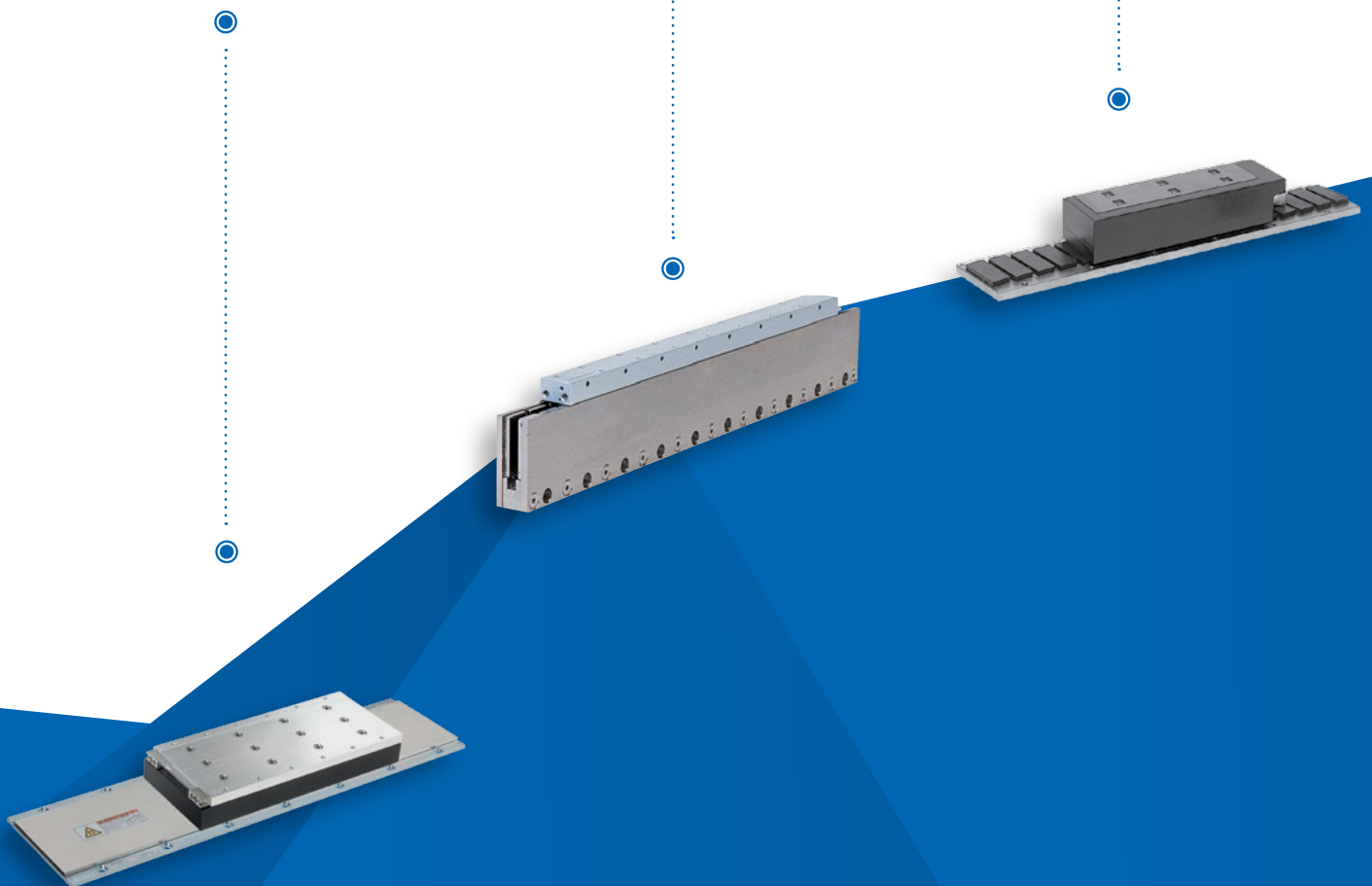
- Peak forces from 135 to 7,560 N
- Optional water cooling system
- Extremely low force ripple

SGLGW / SGLGM

- Peak forces from 40 to 3,000 N
- Lack of magnetic attraction force extends the life of linear motion guides and minimizes noise
- Minimal force ripple

SGLFW / SGLFM

- Peak forces from 86 to 5,400 N
- The magnetic attraction force between the moving and stationary members can be used effectively to increase the rigidity of the linear guidance by preloading the linear motion bearings
- Improved deceleration and settling performance





MYS-Series

4-Axis Scara Robot

Picking, Packing & Handling

The MYS series offers superior performance in applications such as assembly, small part handling, case packing and lab automation. The Scara robot easily integrates with existing robot applications to expand current automated processes. It is ideal for large, multi-process systems requiring pick-and-place capability.

Features

- High speed
- Compact size

Technical Data	MYS-Series
Reach	450 – 850 mm
Payload	6 – 10 kg
Controlled axes	4

HP20F-CR

High-Speed, 6-Axis Robot

Handling & General Applications

The high-speed, 6-axis MOTOMAN HP20 robot offers superior performance in a variety of applications, such as handling, welding, machine tending, packaging, cutting and assembly, where small to medium sized parts are handled.



Technical Data	HP20F-CR
Reach	1,717 mm
Payload	20 kg
Controlled axes	6

Features

- High speed
- Compact size



Features

- Versatile, fast and flexible
- Perfect accessibility
- Large working range
- Variable payload
- Unique efficiency

EPX-Series

6-Axis Painting Robot

Painting & Coating

The MOTOMAN EPX-series are versatile, high-speed 6-axis robots offering superior performance in painting applications for car bodies, plastic components and work pieces of different sizes.

These robots feature a hollow wrist, which reduces cycle times and offers optimum accessibility. Furthermore, whilst the working envelope is relatively large, the installation only requires little space. In a smooth workflow, even and smooth surfaces are produced with high speed and unique efficiency.

Technical Data	EPX-Series
Reach	1,256 – 2,900 mm
Payload	5 – 20 kg
Controlled axes	6

MH-Series

High-Speed, 6-Axis Robot

Painting

The 6-axis MOTOMAN MH-series are versatile, powerful robots offering superior performance for a variety of applications. It provides a high payload of up to 600 kg and a wide motion range of up to 2,942 mm, which especially enables the handling of large and heavy work pieces.

Technical Data	MH-Series
Reach	532 – 2,942 mm
Payload	3 – 600 kg
Controlled axes	6



Features

- High speed
- Compact size
- Compact and powerful



Features

- High flexibility
- High speed
- Compact design allows maximum performance

SDA-Series

15-Axis Dual-Arm Robot

Flexible Applications

The SDA is a slim and agile 15-axis dual-arm robot providing “human-like” flexibility of movement and fast acceleration. Its powerful actuator based design with high wrist performance and fully integrated supply cables, makes it ideal for a wide variety of operations such as assembly, part transfer, machine tending, packaging and other handling tasks that formerly could only be done by people. Both robot arms can synchronously work together or simultaneously perform tasks independently. Due to its small footprint it can operate in confined spaces, saving valuable floor space.

Technical Data	SDA-Series
Reach	854 – 1,313 mm
Payload	5 – 20 kg
Axes	15

SIA-Series

7-Axis Single-Arm Robot

Flexible Applications

The slim and powerful MOTOMAN SIA 7-axis single-arm robot is perfect for automated processes such as assembly, inspection, machine tending and material handling. The revolutionary design with high wrist performance and internal supply cables make it possible to use it in confined spaces while providing unrivalled manoeuvring flexibility. It is even able to easily move around corners or reach into the machine.



Technical Data	SIA-Series
Reach	559 – 1,485 mm
Payload	5 – 50 kg
Axes	7

Features

- High flexibility
- High speed
- Compact design allows maximum performance



ES- /MS- /VS-Series

6- & 7-Axis Welding Robots

Robots for spot welding

The MOTOMAN ES is a versatile, high-speed robot offering superior performance in spot welding, material handling, machine tending and press tending. The ES robot offers a large work envelope and a high moment of inertia ratings. Fast axial speeds and acceleration reduce cycle times and increase production output. The compact, slim design allows the robot to reach into confined spaces, improving system productivity.

The MOTOMAN VS100 provides a unique, slim design which optimizes automotive spot welding applications. It is the industry's first 7-axis spot welding-robot which offers a highly flexible range of motion.

Features

- Fast, flexible and powerful
- High dynamic performance
- Ideal for spot welding, machine tending and material handling

Technical Data	ES- /MS- /VS-Series
Reach	2,236 – 3,140 mm
Payload	80 – 210 kg
Axes	7

MA-Series

Welding Robots

Robots for arc welding

The 6-axis MOTOMAN MA robot has been developed in order to achieve optimal results in extremely difficult conditions and especially for the high demands of arc welding applications.

With its superior wire feed system, internally routed cables and working envelopes ranging from 1,434 mm to 1,904 mm, the MA-series robots significantly improve welding quality. Its payloads range from 3 kg to 15 kg.

The high-precision tracking and integrated supply lines prevent collisions with workpieces and other robots in the room and minimise wear to the torch hose package. Fast motion sequences reduce welding cycle times.



Features

- High precision
- High speed

Technical Data	MA-Series
Reach	1,434 – 1,904 mm
Payload	3 – 15 kg
Axes	6 – 7



Features

- Minimal footprint
- Fast acceleration and high speed increase productivity
- Optional vision and conveyor tracking for maximum flexibility

MPP 3- & MPK-Series

Pick & Place Robots

Handling, Picking, Packing

The 4-axis high-speed robot MOTOMAN MPP3 with parallel kinematic system combines the speed of the delta design with a high payload capacity and a large working range.

The MOTOMAN MPK is a high-speed, 5-axis picking robot that provides superior performance and reliability for food handling, picking, packing and other high-speed material handling applications.

Technical Data	MPP3- & MPK-Series
Reach	860 – 1,893 mm
Payload	3 – 50 kg
Axes	4 – 5

MPL-Series

4- & 5-Axis Palletising Robots

Palletising Robots

The innovative, 4-axis palletizing robot MPL100 with its payload of up to 800 kg is a dynamic masterful mover and stands out due to its extremely high acceleration and axis speed values. Another important criterion is the low space requirement.

Technical Data	MPL-Series
Reach	2,061 – 3,159 mm
Payload	80 – 800 kg
Axes	4 – 5



Features

- Compact design
- High acceleration
- Increased durability of hose package by internal cable wiring

VIPA Touch Panels

The VIPA professionalPanels with 4.3" to 12.1" TFT-Display, Windows Embedded CE 6.0 operating system and Movicon 11 visualization system can be used universally.

VIPA SLIO I/O-System

SLIO stands for slice in- / output. The system is very compact and is tailored precisely to the requirements of the application. The system is designed for decentralized automation tasks.

The VIPA ecoPanels in four different display sizes from 4.3" to 15" are characterized by absolute reliability and flexibility and also special longevity and quality because of the special construction.

VIPA PanelPCs

The VIPA PanelPCs in the display sizes 15.6" to 21.5" are a combination of industrial PC with the most modern features and a touch panel with optimum display possibilities. The latest Intel Atom processor technology combined with Windows Embedded Compact 7 or Standard 7 operating systems correspond to state of the art in the PC world.



VIPA Remote Access

Teleservice modules offer access to your machines and plants worldwide as if you were on site. The modules are designed for all modern communication systems.



VIPA Industrial Ethernet

Ethernet Switches with 5 or 8 ports Unmanaged are entry level models which support the IEEE 802.3 / 802.3u / 802.3x with 10 / 100M, full- / half-duplex and RJ45 ports with automatic MDI / MDIX recognition. For PROFINET networks there are Managed PROFINET switches with 5 or 8 ports available.



VIPA Fieldbus

The PROFIBUS repeater family consists of advanced, flexible and robust network components for PROFIBUS DP installations. This allows the implementation of long spur lines with many users and network structures with star- / tree-shaped segments.



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