

# MECHTRIC

## Automation





## Automation: Powered by Mechtrics Expertise and Global Partnerships

With over 60 years of industry experience, Mechtrics proudly partners with world-class manufacturers to deliver innovative solutions.

Mechtrics supplies a comprehensive **Automation** portfolio, including PLCs, HMIs, industrial PCs, servo drives and motors, as well as communication modules. Motion control is further supported by precision gearboxes and rotary encoders, ensuring accurate and efficient operation. To simplify system development, powerful software tools such as Codex and Dia-Designer provide intuitive configuration and programming environments. Together, these solutions deliver flexibility, scalability, and reliable performance across industrial applications.

Through these partnerships, Mechtrics delivers high-quality products, competitive pricing, and unparalleled technical support, empowering your business to perform at its best.



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# Automation

C

## PLC & HMI's

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## Programmable logic controllers (slim-type)



DVP14SS...



DVP12SA2...



DVP28SA211R

**DVP series: Programmable Logic Controllers (PLCs) - Slim-type**

**Delta DVP series** Programmable Logic Controllers (PLCs) offer high-speed, stable, and highly reliable control in various industrial automation applications. In addition to fast logic operation, bountiful instructions and multiple function cards, the cost-effective DVP-PLC supports various communication protocols.

The module-type unit affords tremendous space-saving, allowing simple, clip-on expansion possibilities. The PLC's high performance and extensive I/O units represent a high-value solution for machine control and industrial automation.

**Common characteristics:**

- 32-bit CPU for high-speed processing
- Software: ISPSoft
- Plug-in terminals for ease of wiring and maintenance
- Built-in high-speed counters up to 100 kHz (*model dependent*)
- Compact dimensions (H) 90 mm x (D) 60 mm - DIN-rail mounting
- Clip-on extension modules - general (*right-side*) - high-speed (*left-side*) **SA2 only**
- Supports Modbus RS485: Can connect up to 16 slave devices (VFD, temp controller, PLC)
- Program language: (IL) Instruction list, (LD) Ladder diagram, (SFC) Sequential function chart

type	supply	inputs	outputs	description	output type
		(DI)	(DO)		

**Programmable Logic Controllers (PLCs) - SS2 series**

The compact and economic DVP-SS2 series slim-type PLC provides basic sequential control functions with fast execution speed and enhanced real-time monitoring capability. For use in applications such as textile machines, conveyor belts and winding machines.

Accepts - general (*right-side*) expansion modules only

- Ultra-slim: 25.2 mm
- Max. I/O: 480 points
- Data register: 5k words
- Program capacity: 8k steps
- Built-in RS-232 and RS-485 ports (*Master/Slave*)
- Max. execution speed of basic instructions: 0.35  $\mu$ s
- Supports standard MODBUS ASCII / RTU protocol and PLC Link function

**Motion control functions:**

- 4 points of 10kHz pulse output
- 8 points of high-speed counters: 20 kHz / 4 points, 10 kHz / 4 points

**SS2 series - Economic, compact ultra-slim PLC**

(H) 90 x (D) 60 mm

DVP14SS211R	24 VDC	8	6	compact ultra-slim PLC	relay
DVP14SS211T	24 VDC	8	6	compact ultra-slim PLC	transistor (NPN)
DVP12SS211S	24 VDC	8	4	compact ultra-slim PLC	transistor (PNP)

**Programmable Logic Controllers (PLCs) - SA2 series**

DVP-SA2 series offers larger program capacity and execution efficiency, offering 100 kHz high-speed output and counting functions. It is expandable with DVP-S series left-side and right-side extension modules. For use in applications such as printing machines, dying machines, container fillers and workstation monitoring in the production line.

**DVP12SA** supports general (*right-side*) and high-speed (*left-side*) expansion modules

**DVP28SA** supports general expansion modules (*right-side*) only

- Data register: 10k words
- Program capacity: 16k steps
- Ultra-slim: DVP12SA... / 37.4 mm wide
- Ultra-slim: DVP28SA... / 46 mm wide
- Max. execution speed of basic instructions: 0.35  $\mu$ s
- Built-in 1 x RS-232 and 2 x RS485 ports (*12SA only*)
- Supports standard Modbus ASCII / RTU protocol and PLC Link function
- No battery required: RTC function operates for up to 15 days after power off

**Motion control functions:**

- Supports 2-axis linear and arc interpolation
- 4 points of high-speed pulse output: 100 kHz / 2 points, 10 kHz / 2 points
- 8 points of high-speed pulse input: 100 kHz / 2 points, 10 kHz / 6 points, 1 set of A/B phase 50 kHz

**SA2 series - Advanced compact slim PLC**

(H) 90 x (D) 60 mm

DVP12SA211R	24 VDC	8	4	advanced slim PLC	relay
DVP12SA211T	24 VDC	8	4	advanced slim PLC	transistor (NPN)
DVP28SA211R*	24 VDC	16	12	advanced slim PLC	relay
DVP28SA211T*	24 VDC	16	12	advanced slim PLC	transistor (NPN)

\* Right-hand side expansion only, 1 x RS485 port

Programming cables, see communication cables for PLCs and HMIs page





DVP12SE11R



DVP28SV3...



DVP20SX3...



## DVP series: Programmable Logic Controllers (PLCs) - Slim-type

**Delta DVP series** PLCs now expanded to include the new 3rd generation of SX3 and SV3 PLCs delivering more innovative products while meeting the requirements of various applications. Delta PLCs offer a broad range of controllers and modules featuring high-performance CPUs, multiple built-in functions and efficient program editing tools.

In addition to the user-friendly programming software (DIADesigner) and faster execution speed, Delta provides complete industry-focused motion control and industrial fieldbus solutions with new 3rd generation PLC series.

- Compact dimensions - DIN-rail mounting
- Clip-on extension modules - general (*right-side*) - high-speed (*left-side*)

type	supply	digital		analog		description	output type
		inputs	outputs	inputs	outputs		

## Programmable Logic Controllers (PLCs) - SE series

Most complete network type slim PLC in the industry. Typical applications include remote device monitoring, production line monitoring, building automation, printing machines and container fillers.

- Program capacity: 16k steps      Data register: 12k words
- Software: ISPSoft
- Ultra slim: **DVP12SE** - 37.4 mm / **DVP26SE** - 46 mm wide
- No battery required: RTC function operates for up to 15 days after power off
- 2 x RS485 ports, Ethernet port supports Modbus TCP and EtherNet/IP (*explicit message*)

## SE series - Network type slim PLC

		built-in Ethernet				(H) 90 x (D) 60 mm
<b>DVP12SE11R</b>	24 VDC	8	4	—	—	network type PLC relay
<b>DVP12SE11T</b>	24 VDC	8	4	—	—	network type PLC transistor (NPN)
<b>DVP26SE11R*</b>	24 VDC	14	12	—	—	network type PLC relay
<b>DVP26SE11T*</b>	24 VDC	14	12	—	—	network type PLC transistor (NPN)

\* Right-hand side expansion only, 1 x RS485 port, supports Ethernet/IP adaptor

## Programmable Logic Controllers (PLCs) - SV3 series

SV3/SX3 series high-end PLC providing larger program capacities and data registers for more demanding, complex applications. Increases many motion control instructions to meet high-speed applications, high-precision positioning control for labelling, packaging and printing machines.

- Program capacity: 64k steps      Data register: 64k words
- Delta special driver: Controls 8 Delta servos and 8 Delta motor drives via CANopen
- Built-in mini USB, Micro SD card, 2x RS-485 com ports, CANbus port
- Supports EtherNet/IP, Modbus TCP, CANopen DS301 (*controls up to 64 slaves*)
- Motion control functions high-speed pulse output: 4 axes of 200 kHz pulse output

## SV3 series - High performance slim PLC

						(H) 90 x (D) 60 mm
<b>DVP28SV311R</b>	24 VDC	16	12	—	—	high perform. PLC relay
<b>DVP28SV311T</b>	24 VDC	16	12	—	—	high perform. PLC transistor (NPN)
<b>DVP28SV311S</b>	24 VDC	16	12	—	—	high perform. PLC transistor (PNP)

## Programmable Logic Controllers (PLCs) - SX3 series

- Built-in 4 analog inputs / 2 analog outputs (*12-bit resolution*)

## SX3 series - Analog I/O slim PLC

		with highly efficient PID control				
<b>DVP20SX311R</b>	24 VDC	8	6	4	2	analog PLC relay
<b>DVP20SX311T</b>	24 VDC	8	6	4	2	analog PLC transistor (NPN)
<b>DVP20SX311S</b>	24 VDC	8	6	4	2	analog PLC transistor (PNP)

## SV3/SX3 - Delta's new 3rd Gen. PLC

- Enhance your machinery with the Delta DVP 3rd generation PLC, featuring a more powerful CPU, expanded program capacity and advanced communication capabilities.



1. Powered by Delta 32 bit CPU 64k steps, supported in DIADesigner
2. SD card support for data logging and PLC program backup
3. Ethernet port for Industrial communication, EtherNet/IP / ModbusTCP
4. Built-in CANopen / CANbus





DVP08SM11N



DVP04DA-S2



DVP04PT-S



DVP02TK...

DVP02TU...



DVPDT01-S

**DVP series: Extension modules and accessories (right-side mounting)**

Extension modules simply clip onto CPUs to add many additional functions, including additional digital and/or analog I/O's, industrial communication, temperature measurement and load cell monitoring.

type	supply	inputs	outputs	description	output type
		(DI)	(DO)		

**Extension modules for SS/SA/SE/SX/SV/MC PLCs****Digital input extension modules**

DVP08SM11N	24 VDC	8	—	extension module	—
DVP16SM11N	24 VDC	16	—	extension module	—
DVP32SM11N*	24 VDC	32	—	extension module	—
UB-10-ID32A	MIL con	32		terminal module for above	DVP32SM
UC-ET010-24A	MIL con	1 met		I/O connection cable for above	DVP32SM/SN

**Digital output extension modules**

DVP06SN11R	24 VDC	—	6	extension module	relay (6A)
DVP08SN11R	24 VDC	—	8	extension module	relay (1.5A)
DVP08SN11T	24 VDC	—	8	extension module	transist (NPN)
DVP16SN11T	24 VDC	—	16	extension module	transist (NPN)
DVP16SN11TS	24 VDC	—	16	extension module	transist (PNP)
DVP32SN11TN*	24 VDC	—	32	extension module	transist (NPN)

\* Pinhead terminations, see page C-18

**Digital I/O extension modules**

DVP08SP11R	24 VDC	4	4	extension module	relay (1.5A)
DVP16SP11R	24 VDC	8	8	extension module	relay (1.5A)
DVP08SP11T	24 VDC	4	4	extension module	transist (NPN)
DVP16SP11T	24 VDC	8	8	extension module	transist (NPN)
DVP16SP11TS	24 VDC	8	8	extension module	transist (PNP)

**Analog I/O extension modules**

±10V / ±20mA (output: 0 to 10V or 0/4 to 20 mA)

Built-in RS-485 interface		(AI)	(AO)		
DVP04AD-S2	24 VDC	4	—	extension module	—
DVP06AD-S	24 VDC	6	—	extension module	—
DVP04DA-S2	24 VDC	—	4	extension module	analog
DVP06XA-S2	24 VDC	4	2	extension module	analog

**Positioning control module**

- Single axis, 200kHz

DVP01PU-S	single-axis, 200kHz	servo/stepper position control module
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**Temperature measurement modules**

Resolution:	0.1°C	inputs	outputs		sensor
DVP04PT-S*	24 VDC	4	—	RTD temperature module	PT100/1000
DVP06PT-S	24 VDC	6	—	RTD temperature module	PT100/1000
DVP04TC-S*	24 VDC	4	—	thermocouple temp. module	(J,K,R,S,T)

\* Built-in RS-485 interface for stand-alone applications

**DVP02 series - Temperature control modules (universal input)**

DVP02 series offers reliable and flexible integration into complex automation systems, ensuring accurate and optimal temperature regulation.

**General features:**

- Analog inputs: 0 - 10V, 0 - 5V, 0 - 50mV, 0 - 20mA, 4 - 20mA
- Resolution: Analog 16-bit, Sensor: 0.1°C
- Thermocouple: J, K, R, S, T, E, N, B, C, L, U, TXK, PLII
- Built-in PID program control / manual control
- Control modes: Pt100, JPt100, Pt1000, Cu50, Cu100, Ni100, Ni1000, LG-Ni1000

**DVP02TK series - Built-in RTU-485**

		(AI)	(AO)		
i DVP02TKL-S	24 VDC	2	2	analog output	voltage/current
DVP02TKN-S	24 VDC	2	—	NPN output	4 x digital out
DVP02TKR-S	24 VDC	2	—	relay output	4 x digital out

**DVP02TU series - Expansion module for DVP02TK Series (Max. 8 modules)**

DVP02TUL-S	24 VDC	2	2	analog output	voltage/current
DVP02TUN-S	24 VDC	2	—	NPN output	4 x digital out
DVP02TUR-S	24 VDC	2	—	relay output	4 x digital out

EtherCAT Modbus EtherNet/IP



DVP202LC-SL



RTU-485



RTU-ECAT



DVP08ST11N

## DVP series: Extension modules and accessories

Extension modules simply clip onto CPUs to add many additional functions, additional analog I/Os, communication and load cell monitoring.

- Simply clips onto and derives supply from main the CPU - analogue cards require separate supply

type	supply	inputs	outputs	description	output type
		(AI)	(AO)		

### High-speed extension modules for SA/SE/SX/SV PLCs (left-side mount)

#### Analog I/O extension modules (left-side high-speed)

- Signal range: Input: 1-5V, 0-5V,  $\pm 5V$ , 0-10V,  $\pm 10V$ , 4-20mA, 0-20mA,  $\pm 20mA$   
Output: 0-10V,  $\pm 10V$ , 4-20mA, 0-20mA
- Resolution: 16-bit
- Conversion time: 250  $\mu s$  / Channel

DVP04AD-SL	24 VDC	4	—	extension module	—
DVP04DA-SL	24 VDC	—	4	extension module	analog

#### Load cell modules (left-side high-speed)

- Resolution: 24-bit
- Measurable range: 0 - 80mV/V
- Connectable to: 4-wire / 6-wire load cell sensor
- Easy to use LCSof for configuration and monitoring load cell module (RS-232, RS-485)
- DVP211LC-SL has programmable DI/O (*tare, max etc.*) and AO (*retransmission*)

DVP201LC-SL	24 VDC	1	—	load cell input module	—
DVP211LC-SL	24 VDC	1	1	load cell input module	2DI / 4DO
DVP202LC-SL	24 VDC	2	—	load cell input module	—

#### Communication modules (left-side high-speed)

DVPEN01-SL	Ethernet / Modbus TCP	communication module	10/100Mbps
DVPDNET-SL	DeviceNet	communication module	500kbps
DVPCOPM-SL	CANopen	communication module	1Mbps
DVPSCM12-SL	RS-485/RS-422	serial communication module	460kbps
DVPSCM52-SL	BACnet MS/TP	slave communication module	460kbps

#### Remote I/O communication modules

RTU-485	Modbus RS-485	max. 8 special modules and 128DI and 128DO
RTU-EN01	Modbus TCP/IP	max. 8 special modules and 128DI and 128DO
RTU-PD01	PROFIBUS-DP	max. 8 special modules and 128DI and 128DO
RTU-ECAT	EtherCAT	max. 8 special modules and 128DI and 128DO

### Accessories for S series PLCs

#### Power supply modules (DIN-rail mounting)

	input	output		
DVPPS01	100-240 VAC	24 VDC	1A	power supply module
DVPPS02	100-240 VAC	24 VDC	2A	power supply module
DVPPS05	100-240 VAC	24 VDC	5A	power supply module

#### Accessories and cables

UC-PRG020-12A	8-pin mini-DIN+female DB9 connector to USB (type A) connector	2 meter
UC-PRG030-01A	mini USB connector to USB (type A) connector	3 meter
UC-MS030-01A	8-pin mini-DIN connector to female DB9 connector RS-232	3 meter
IFD6530	RS-485 to USB (type A) converter module	
DVP08ST11N	8-point input selector switch module for DVP-S series	
DVPPCC01	program-data backup memory card for all DVP series (64k words)	

## DIAStudio

### Smart Machine Suite

DIAStudio is a unified engineering platform by Delta that streamlines automation system development. It integrates programming, parameter configuration, and HMI programming, simplifying processes and saving time and costs for machine makers.





## Programmable logic controllers (mid-range)



NEW



AS164...



AS228R-A



NEW



AX-304ELA0PA1P

**AS series: Programmable Logic Controllers (PLCs) - Mid-range**

The AS series is a high-performance multi-purpose controller designed for all types of automated equipment. It features 32-bit SoC CPUs for enhanced execution speed (40k steps/ms), supporting up to 32 extension modules or up to 1,024 inputs/outputs. Providing accurate positioning control for up to 8 axes via CANopen motion network and 6 axes via pulse control (200kHz). Widely used in diverse automated equipment, electronics manufacturing, labelling, food packaging, and textile machines.

Equipped with CANopen and EtherNet/IP network communication for high-speed data transmission. The professional yet simple editing software DIADesigner delivers quick hardware and network configuration with built-in function blocks for different industries with multi-layer password protection for enhanced system security.

- Max. execution speed of basic instructions: 25 ns
- Built-in mini USB, micro SD slot RS-232 / 2x RS-485 com ports (*Master/Slave*), Ethernet IP (*Adaptor and scanner*)
- Rackless design (*no-backplane*) direct DIN-rail mounting, patented DIN-rail clips for fast module installation

type	supply	digital		analog		description	output type
		inputs	output	inputs	output		

**AS series - Compact modular mid-range PLC**

**AS100 series - CPU** (64k steps / 64k words) (H) 88 x (W) 156/207/250 x (D) 75mm

- Communication ports: USB, Ethernet, 2 x RS-485, CANopen
- PLC width: **AS13 (156 mm) / AS14 (207 mm) / AS16 (250 mm)**

<b>AS132R-A</b>	100-240 VAC	16	16	—	—	AS100 CPU module	relay
<b>AS132P-A</b>	100-240 VAC	16	16	—	—	AS100 CPU module	transist (PNP)
<b>AS148R-A</b>	100-240 VAC	24	24	—	—	AS100 CPU module	relay
<b>AS148P-A</b>	100-240 VAC	24	24	—	—	AS100 CPU module	transist (PNP)
<b>AS164R-A</b>	100-240 VAC	32	32	—	—	AS100 CPU module	relay
<b>AS164P-A</b>	100-240 VAC	32	32	—	—	AS100 CPU module	transist (PNP)

**AS200 series - CPU** (64k steps / 64k words) (H) 88 x (W) 88 x (D) 96mm

- Communication ports: USB, Ethernet, 2 x RS-485, CANopen
- Plug-in terminals: Screwless (*push-in*) terminals for ease of wiring and maintenance

<b>AS228R-A</b>	24 VDC	16	12	—	—	AS200 CPU module	relay
<b>AS228T-A</b>	24 VDC	16	12	—	—	AS200 CPU module	transist (NPN)
<b>AS228P-A</b>	24 VDC	16	12	—	—	AS200 CPU module	transist (PNP)
<b>AS218RX-A</b>	24 VDC	8	6	2	2	AS200 CPU module	relay
<b>AS218TX-A</b>	24 VDC	8	6	2	2	AS200 CPU module	transist (NPN)
<b>AS218PX-A</b>	24 VDC	8	6	2	2	AS200 CPU module	transist (PNP)

**AS300 series - CPU** (128k steps / 64k words) (H) 88 x (W) 88 x (D) 96mm

- Communication ports: USB, Ethernet, 2 x RS-485, (*accepts 2 x AS-F function cards*)
- Plug-in terminals: Screwless (*push-in*) terminals for ease of wiring and maintenance

<b>AS300N-A</b>	24 VDC	—	—	—	—	AS300 CPU module	—
<b>AS320T-B</b>	24 VDC	8	12	—	—	AS300 CPU module	transist (NPN)
<b>AS320P-B</b>	24 VDC	8	12	—	—	AS300 CPU module	transist (PNP)
<b>AS332T-A*</b>	24 VDC	16	16	—	—	AS300 CPU module	transist (NPN)
<b>AS332P-A*</b>	24 VDC	16	16	—	—	AS300 CPU module	transist (PNP)
<b>AS324MT-A♦</b>	24 VDC	12	12	—	—	AS300 CPU module	differential type

\* Highdensity MIL terminal block, see page C-12

♦ 2 axes 4MHz + 4 axes 200kHz output / 2 channels 4MHz + 4 channels 200kHz input

**CODESYS solution** (8MB program capacity)

- Communication ports: USB, RS-232/485, Ethernet (*switch*), EtherCAT (**AX-3xxE only**)
- Built-in encoder interface: 2 x Incremental encoder / 1 x SSI absolute encoder
- Pulse train interface: 200kHz pulse output: 4 axes / 200kHz high-speed counters: 6 CHs
- Plug-in terminals: Screwless (*push-in*) terminals for ease of wiring and maintenance

**AX-3 motion CPU**

<b>AX-300NA0PA1</b>	24 VDC	—	—	—	—	AX3 CPU module	transist (PNP)
<b>AX-324NA0PA1P</b>	24 VDC	16	8	—	—	AX3 CPU module	transist (PNP)

**AX-3 EtherCAT CPU**

<b>AX-304ELA0PA1P</b>	24 VDC	16	8	—	—	4 axes P2P CPU	transist (PNP)
<b>AX-308EA0MA1T</b>	24 VDC	16	8	—	—	8 axes AX3 CPU	transist (NPN)

**AX-8 motion control system** (1GB program capacity)

- Motion control: Supports up to 16 Delta EtherCAT servos (*min. sync time: 1ms / 16 axes*)
- Motion commands: Position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, G-code

<b>AX-816EP0CB1P</b>	24 VDC	8	8	—	—	16 axes AX8 CPU	transist (PNP)
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Up to 128 axes on request





### AS series: Extension modules and accessories

Includes digital I/O modules (*output/input/mix*), analog I/O modules (*output/input/mix*), temperature measurement modules, load cell modules, communication modules and function cards.

type	supply	inputs	output	module width	description	output type
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### AS series - Input/output (I/O) modules and accessories

- Plug-in, screwless (*push-in*) terminals (32 and 64 I/O modules have high-density MIL connectors)

#### Digital input modules

(H) 88 x (D) 92 mm

AS08AM10N-A	24 VDC	8 DI	—	25 mm	digital input module	—
AS16AM10N-A	24 VDC	16 DI	—	35 mm	digital input module	—
AS32AM10N-A*	24 VDC	32 DI	—	25 mm	digital input module	—
AS64AM10N-A*	24 VDC	64 DI	—	35 mm	digital input module	—

#### Digital output modules

AS08AN01R-A	24 VDC	—	8 DO	25 mm	digital output mod.	relay (2A)
AS08AN01T-A	24 VDC	—	8 DO	25 mm	digital output mod.	transist (NPN)
AS08AN01P-A	24 VDC	—	8 DO	25 mm	digital output mod.	transist (PNP)
AS16AN01R-A	24 VDC	—	16 DO	35 mm	digital output mod.	relay (2A)
AS16AN01T-A	24 VDC	—	16 DO	35 mm	digital output mod.	transist (NPN)
AS16AN01P-A	24 VDC	—	16 DO	35 mm	digital output mod.	transist (PNP)
AS32AN02T-A*	24 VDC	—	32 DO	25 mm	digital output mod.	transist (NPN)
AS64AN02T-A*	24 VDC	—	64 DO	35 mm	digital output mod.	transist (NPN)

\* High-density MIL terminal block, see page C-12

#### Digital mixed I/O modules

AS16AP11R-A	24 VDC	8 DI	8 DO	35 mm	digital I/O mod.	relay (2A)
AS16AP11T-A	24 VDC	8 DI	8 DO	35 mm	digital I/O mod.	transist (NPN)
AS16AP11P-A	24 VDC	8 DI	8 DO	35 mm	digital I/O mod.	transist (PNP)

#### Analog I/O modules

(H) 88 x (W) 35 x (D) 95 mm

- Single channel on/off setting to enhance overall conversion efficiency
- Wire break detection at 1-5V and 4-20mA
- Voltage in:** 1-5V, 0-5V, -5...5V, 0-10V, -10...10V **Current in:** 4-20mA, 0-20mA, -20...20mA
- Voltage out:** 0-10 VDC,  $\pm 10$  VDC **Current out:** 4-20mA, 0-20mA

#### Analog input module

Hardware resolution: 16-bit

AS02ADH-A	24 VDC	2 AI	—	(20 $\mu$ s) conversion time	voltage and current input
AS04AD-A	24 VDC	4 AI	—		voltage and current input
AS08AD-B	24 VDC	8 AI	—		voltage input
AS08AD-C	24 VDC	8 AI	—		current input

#### Analog output module

Hardware resolution: 12-bit

AS04DA-A	24 VDC	—	4 AO	35 mm	voltage and current output
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#### Analog mixed I/O module

Hardware resolution: 16-bit (input) / 12-bit (output)

AS06XA-A	24 VDC	4 AI	2 AO	35 mm	voltage and current input/output
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#### Temperature measurement modules

resolution: 0.1°C

(H) 88 x (W) 35 x (D) 95 mm

#### Pt, Ni temperature sensor

 $\pm 0.1\%$  overall accuracy

- Pt100/1000, Ni100/1000, JPt100, LG-Ni1000, Cu50/100, resistor 0-300/3000 $\Omega$

AS04RTD-A	24 VDC	4 CH	—	35 mm	Pt, Ni temperature sensor module
AS06RTD-A	24 VDC	6 CH	—	35 mm	Pt, Ni temperature sensor module

#### Thermocouple temperature sensor

 $\pm 0.5\%$  overall accuracy

- Thermocouple - J, K, R, S, T, E, N, B;  $\pm 100$ mV

AS04TC-A	24 VDC	4 CH	—	35 mm	Thermocouple temperature sensor module
AS08TC-A	24 VDC	8 CH	—	35 mm	Thermocouple temperature sensor module

#### Power supply modules (clips onto left-side of CPU)

(H) 88 x (D) 92 mm

AS-PS02	100-240 VAC	24 VDC	2A	70 mm	power supply
AS-PS02A	100-240 VAC	24 VDC	1.5A	70 mm	power supply
AS-ATXB*	moves the CPU power connector from left-side to the bottompower adaptor				

\* Used with external power supplies for PLC racks requiring more than 2A supply



AS04AD-A



AS08TC-A



AS-PS02

**AS series: Extension modules and accessories**

Includes digital I/O (*output/input/mix*), analog I/O (*output/input/mix*), temperature measurement, load cell, communication and function cards.

For applications including electronics manufacturing, labelling, food packaging, and textile machines.

type	supply	inputs	output	description
------	--------	--------	--------	-------------

**AS series - Input/output (I/O) modules and accessories****Communication and function modules**

(H) 88 x (W) 56 x (D) 75 mm

- Accepts 2 x AS-F communication and/or analog function cards
- Supports standard Modbus protocols and user-defined protocols

<b>AS00SCM-A</b>	24 VDC			function card module for CPU / remote I/O interface
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**Communication / Function cards (isolated)**

(H) 37 x (W) 24 x (D) 59.3 mm

- Plug directly into AS300 main CPU or AS00SCM-A extension module

**Communication cards**

<b>AS-F232</b>	RS-232			RS-232 interface for AS300 or AS00SCM-A
<b>AS-F485</b>	RS-485			RS-485 interface for AS300 or AS00SCM-A
<b>AS-FCOPM</b>	CANopen			Canopen DS301 interface for AS300 or AS00SCM-A
<b>AS-PPFN02*</b>	Profinet			Profinet Slave interface for AS300 or AS00SCM-A
<b>AS-FEN02*</b>	Ethernet			E/IP adaptor or Modbus TCP interface for AS300 or AS00SCM-A
<b>AS-FFTP01*</b>	Ethernet			MQTT Client, FTP, OPC-UA and Web Servers for AS300
<b>AS-FECAT*</b>	EtherCAT			Ethercat 16 Axes point-to-point positioning for AS300

\* Occupies both function card slots

**Analog I/O function cards**plug directly into main **AS300** CPU or **AS00SCM-A** module

<b>AS-F2AD</b>	analog	2 AI	—	0-10V (12-bit), 4-20mA (11-bit)
<b>AS-F2DA</b>	analog	—	2 AO	0-10V, 4-20mA (12-bit)

**DeviceNet communication module**

(H) 88 x (W) 35 x (D) 84 mm

- DeviceNet protocol
- Master / Slave modes
- RTU function

<b>AS01DNET-A</b>	DeviceNet			supports master / slave modes, supports RTU function
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**EtherCAT remote I/O module**

(H) 88 x (W) 56 x (D) 95 mm

- EtherCAT Protocol
- Supports PDO, SDO, Hot connect
- Built-in 8 DI (2CH 200kHz) / 8 DO (2 axes 200kHz)
- Supports right-side extension with AS series modules

<b>ASRTU-EC16AP1TA</b>	EtherCAT	8 DI	8 DO	EtherCAT remote I/O module	NPN
<b>ASRTU-EC16AP1PA</b>	EtherCAT	8 DI	8 DO	EtherCAT remote I/O module	PNP

**Load cell module**

(H) 88 x (W) 35 x (D) 95 mm

- Max load cell distance: 100m
- Selectable signal input ranges: 0...1 / 2 / 4 / 20 / 40 / 80 mV/V
- High-speed dynamic measurement: 2.5 - 400 ms conversion time
- Supports 4 wire / 6 wire load cell sensor

<b>AS02LC-A</b>	24 VDC	2 CH		16bit load cell module
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**IO-Link module**

(H) 88 x (W) 35 x (D) 95 mm

- 4 IO-link ports
- Supported baud rates: 4.8 / 38.4 / 230.4 kbps
- Max. process data size: 32 bytes (*channel*) / 128 bytes (*module*)

<b>AS04SIL-A</b>	24 VDC	4 CH		I/O link master module
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**Motion modules**

(H) 88 x (W) 35 x (D) 95 mm

**Position module (pulse unit module)**

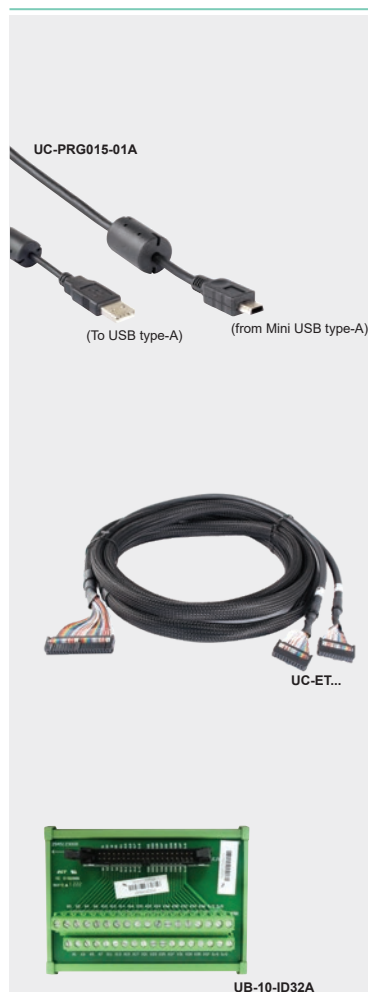
- Output: 200 kHz x2
- Input: 200 kHz x 1

<b>AS02PU-A</b>	24 VDC	2 CH		differential pulse/position module
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**High-speed counter module**

- Open collector / Differential
- Incremental / absolute (SSI)

<b>AS02HC-A</b>	24 VDC	2 CH		200kHz, high-speed counter module
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**AS series: Extension modules and accessories**

type	from connector	description	to connector	cable length
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**AS series - Cables and termination accessories**
**PLC programming cables**

<b>UC-PRG015-01A</b>	mini USB	PLC to PC communication cable	USB type A	1.5 m
<b>UC-PRG030-01A</b>	mini USB	PLC to PC communication cable	USB type A	3 m
<b>UC-PRG030-20A</b>	RJ45	PLC/HMI to PC comm. cable	RJ45	3 m

**Network cables**

<b>UC-CMC003-01A</b>	RJ45	CANopen / DeviceNet / DMCNET	RJ45	0.3 m
<b>UC-CMC005-01A</b>	RJ45	CANopen / DeviceNet / DMCNET	RJ45	0.5 m
<b>UC-CMC010-01A</b>	RJ45	CANopen / DeviceNet / DMCNET	RJ45	1 m
<b>UC-CMC020-01A</b>	RJ45	CANopen / DeviceNet / DMCNET	RJ45	2 m
<b>UC-CMC030-01A</b>	RJ45	CANopen / DeviceNet / DMCNET	RJ45	3 m
<b>UC-EMC005-02C</b>	RJ45	EtherCAT ( <i>high noise immunity</i> )	RJ45	0.5 m
<b>UC-EMC010-02C</b>	RJ45	EtherCAT ( <i>high noise immunity</i> )	RJ45	1 m
<b>UC-EMC020-02C</b>	RJ45	EtherCAT ( <i>high noise immunity</i> )	RJ45	2 m
<b>UC-EMC050-02C</b>	RJ45	EtherCAT ( <i>high noise immunity</i> )	RJ45	5 m
<b>UC-EMC005-02B</b>	RJ45	EtherCAT communication cable	RJ45	0.5 m
<b>UC-EMC010-02B</b>	RJ45	EtherCAT communication cable	RJ45	1 m
<b>UC-EMC020-02B</b>	RJ45	EtherCAT communication cable	RJ45	2 m

**I/O extension cables**
*for connecting I/O modules and external terminal modules*

<b>UC-ET020-24B</b>	ID 40pin	I/O extension cable ( <i>shielded</i> )	ID 40pin	2 m
<b>UC-ET030-24B</b>	ID 40pin	I/O extension cable ( <i>shielded</i> )	ID 40pin	3 m
<b>UC-ET020-24D</b>	ID 40pin	I/O extension cable ( <i>shielded</i> )	2x ID20pin	2 m
<b>UC-ET030-24D</b>	ID 40pin	I/O extension cable ( <i>shielded</i> )	2x ID20pin	3 m

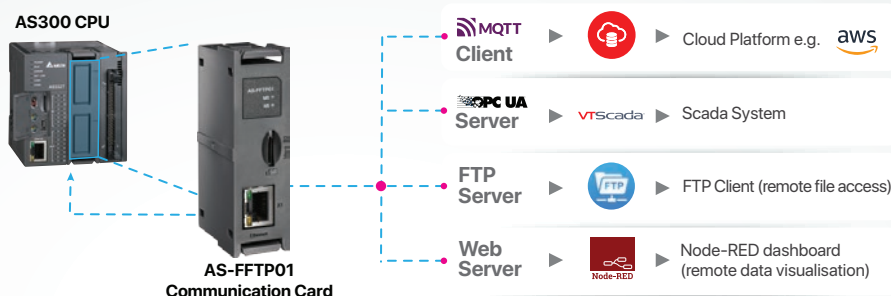
**External terminal modules**
*external terminal modules for digital modules*

H x W

<b>UB-10-OR16A</b>	ID 20pin	16 relay outputs ( <i>NPN to relay</i> )	screw	87 x 113
<b>UB-10-OR16B</b>	ID 20pin	16 relay outputs ( <i>PNP to relay</i> )	screw	87 x 113
<b>UB-10-ID16A</b>	ID 20pin	16 inputs/outputs ( <i>NPN / PNP</i> )	screw	87 x 67
<b>UB-10-ID32A</b>	ID 40pin	32 inputs	screw	87 x 113
<b>UB-10-OT32A</b>	ID 40pin	32 transistor outputs ( <i>NPN out</i> )	screw	87 x 113
<b>UB-10-IO32D</b>	ID 40pin	32 transistor outputs ( <i>NPN out</i> )	screw	87 x 113

**Communications modules - AS300 series**
**Industrial Internet of Things (IIoT) Solution:**

AS-FFTP01 communication card allows for remote data access, connectivity to SCADA via OPC-UA, and connectivity to cloud via MQTT


**EtherCAT P2P Positioning Solution:**

AS-FECAT communication card provides up to 16 axes P2P positioning with Delta Drives and remote I/Os via Ethercat





## Human machine interface (touch screens)

**HMI (Human Machine Interface) touch screens**

DOP-100 series HMIs are a versatile and robust touch screen interface that can be combined with over 30 other 3rd party brands and models of PLCs or controllers for effortless communication and reliable operation.

- FTP/email supported: Simple data transmission and real-time status updates-support gmail
- PCB coating: Coating for enhanced durability and to protect against humidity and dust
- Power isolation: Built-in power isolation circuits provides protection against accidental external spikes
- Isolated comm. Interface: built-in serial communication port and Ethernet isolation circuits to protect against noise
- Supports VNC: For remote operation



DOP-103BQ



DOP-107WV



DOP-107WV



DOP-115MX


**DIAScreen**

type	display size	version	Ethernet	host ports SD/USB	description
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**DOP-100 series - HMI (Human Machine Interface) 4.3" / 7" touch screens****4.3 inch - HMI (standard)**

(H) 103 x (W) 137 x (D) 37.1 mm

- Resolution: 480 x 272 pixels
- Panel cutout: 92.8 x 118.8 mm

<b>DOP-103BQ</b>	<b>4.3"</b>	basic	—	USB	2x COM ports
<b>DOP-103WQ</b>	<b>4.3"</b>	advanced	Yes	USB	2x COM ports

**7 inch - HMI (standard)**

(H) 161 x (W) 215 x (D) 26.2 mm (BV) / 51.2 mm (EV)

- Resolution: 800 x 480 pixels
- Panel cutout: 142.9 x 196.9 mm

<b>DOP-107BV</b>	<b>7"</b>	basic	—	USB	2x COM ports
<b>DOP-107EV</b>	<b>7"</b>	standard	Yes	USB	3x COM ports

**7 inch - HMI (squared)**

(H) 144 x (W) 184 x (D) 42.8 mm

- Panel cutout: 132.4 x 172.4 mm

<b>DOP-107EG</b>	<b>7"</b>	standard	Yes	SD/USB	3x COM ports
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**7 inch - HMI (narrow border)**

(H) 136 x (W) 196 x (D) 32 mm

- Panel cutout: 126.8 x 186.8 mm

<b>DOP-107WV</b>	<b>7"</b>	advanced	Yes	SD/USB	3x COM ports
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**DOP-100 series - HMI (Human Machine Interface) 10" touch screens****10 inch - HMI (standard)**

(H) 200 x (W) 272 x (D) 51.9 mm (CS) / 46 mm (IS)

- Resolution: 1024 x 600 pixels
- Panel cutout: 189.3 x 261.3 mm

<b>DOP-110CS</b>	<b>10"</b>	basic	—	—	3x COM ports
<b>DOP-110IS</b>	<b>10"</b>	standard	Yes	SD/USB	3x COM ports

**10 inch - HMI (narrow border)**

(H) 180 x (W) 270 x (D) 39 mm

- Panel cutout: 170.5 x 255.5 mm

<b>DOP-110WS</b>	<b>10"</b>	advanced	Yes	SD/USB	3x COM ports
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**DOP100-MX Multi-media type**

**DOP100-MX** series adopts a "narrow frame", wide screen design with advanced communication capabilities (*multilingual inputs*) and enhanced multi-media functions.

- 1024 x 768 pixel 8GB ROM
- 1G RAM DDR3 1000Mhz
- Multi-media functions: Camera (*analog / IP*), video playback, VGA input, event trigger
- Multiple Interfaces: 4 COM ports, 2 Ethernet ports, 1 Mini USB Slave 2.0 / 1 USB Host 2.0

**12 inch - HMI (advanced)**

(H) 246.4 x (W) 317.4 x (D) 44 mm

- Panel cutout: 228.7 x 302.7 mm

<b>DOP-112MX</b>	<b>12"</b>	advanced	Yes	SD/USB	4 x COM ports
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**15 inch - HMI (advanced)**

(H) 295.7 x (W) 387.7 (D) 55 mm

- Panel cutout: 283.7 x 372.4 mm

<b>DOP-115MX</b>	<b>15"</b>	advanced	Yes	SD/USB	4 x COM ports
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**DIAScreen - New intergrated software platform for DOP100 HMI's - download via DIASudio**

The DIAScreen application, part of the DIASudio software suite, allows configuration of Delta DOP, TP, and AX series soft-HMI controllers.

Key features include variable tag sharing with DIADesigner, a user-friendly interface with a 3D image library, improved software download speeds, support for various control elements and functions including recipes and macros, multilingual support, and enhanced security with password and permission features





IOT

NEW



DOP-3S10S3E2



TP04G-AS2



TP04P-16TP1R



TP70P-16TP1R

### Advance HMI (Human Machine Interface) touch screens

Delta's DOP-300 Series HMIs, available in 7" and 10" models, feature dual-core high-speed processors with built-in Wi-Fi and 4G capabilities, enabling seamless ground-to-cloud connectivity. The series integrates with Delta's DIACloud platform to create a secure IIoT ecosystem, providing real-time monitoring and efficient data management for smart manufacturing applications.

- Supports MQTT, OPC UA transfer protocols
- Supports Wi-Fi and 4G for easy data collection
- Ultra-wide full-color display with fully laminated design for upgraded visuals and touch
- Web Interface Editor DIAWebDesigner, allowing users to customize interfaces and monitor real-time data from equipment and production lines



Scan to watch video

Applications: Data Collection and Remote Monitoring: Ideal for applications such as air compressors and water pumps, Medical, Pharmaceutical, Food & Beverages: Meets the demands of smart manufacturing with its advanced features and connectivity options.

type	display size	version	Ethernet DIACloud	host ports SD/USB	description
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### DOP-300 series - HMI (Human Machine Interface) touch screens

**7 inch - HMI (advanced)** (H) 136 x (W) 196 x (D) 39 mm

Panel cutout:	126.8 x 186.8 mm				
<b>DOP-3S07S3E2</b>	<b>7"</b> (1024 x 600)	IIoT	Yes	SD/USB	3 x COM ports

**10 inch - HMI (advanced)** (H) 180.9 x (W) 270 x (D) 47.25 mm

Panel cutout:	170 x 255 mm				
<b>DOP-3S10S3E2</b>	<b>10"</b> (1024 x 600)	IIoT	Yes	SD/USB	3 x COM ports

### TP series - Text Panel HMI (standard)

Text Panel monochrome text and graphical panel interface between people and machines. Although it is not a vivid and colourful graphical interface, it can still convert many program codes into text and graphics to display on the Text Panel.

type	display size inch / (mm)	function keys	text lines	description
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### 4.1 inch TP series - Operation interface panel

- Programmable function keys
- RS-232/422/485 communication ports

<b>TP04G-AL2</b>	<b>4.1"</b> (102 x 35)	10	4-line	operational interface panel
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### 4.1 inch Text Panel with built-in PLC functionality (102 x 35 mm) STN-LCD

The TP04P series is a 4-Line Text Panel HMI with built-in PLC. It adopts a built-in DIO/AIO and combines the functions of a programmable logic controller and touch panel in one device.

- 2 x RS-485 communication ports
- Program capacity: 8K steps / 5K words

type	digital		analog		function keys	description
	inputs	outputs	inputs	outputs		
<b>TP04P-16TP1R</b>	8	8	—	—	10	text panel/PLC
<b>TP04P-22XA1R</b>	8	8	4	2	10	text panel/PLC
<b>TP04P-32TP1R</b>	16	16	—	—	10	text panel/PLC

### TP series - Text Panel HMI (advanced)

TP70P HMI/PLC adopts the core of DVP series PLC combined with a 7-inch HMI touch panel.

- Built-in USB and 2 communication ports
- Provides 2 sets 10kHz high-speed pulse input

type	digital		analog		PT100 inputs	description
	inputs	outputs	inputs	outputs		

### 7 inch Touch panel HMI with built-in PLC (65 535 colour LCD touchscreen)

<b>TP70P-16TP1R</b>	8	8	—	—	—	combination HMI/PLC
<b>TP70P-32TP1R</b>	16	16	—	—	—	combination HMI/PLC
<b>TP70P-22XA1R</b>	8	8	4	2	—	combination HMI/PLC

# GL Series

## Switch Disconnectors and Changeover Switches

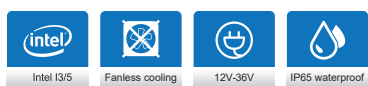
**FROM 100A TO 1000A**

- Motorised changeover switches from 100A to 315A
- Three or four-pole versions available
- From 160A to 1000A AC23
- Compact dimensions



### WIDE RANGE OF ACCESSORIES

A wide choice of auxiliary contacts, terminal covers, phase barriers, terminal clamps, bridging bars, shafts and handles are available to satisfy every installation need.



TPC150-W1010



TPC238-W1010

### Industrial Panel PC (PPC)

Unlike regular PCs, industrial panel PCs (PPC) are built to withstand harsh conditions such as extreme temperatures, moisture, dust, and vibration. It is often used in manufacturing plants, warehouses, transportation systems, and other industrial settings where standard computers would be unsuitable.

TPC range of panel PC are designed (*all-in-one structure*) with an integrated industrial monitor and a fanless embedded PC. With capacitive touchscreens for easy interaction, allowing operators to control machinery or monitor processes without the need for external peripherals like keyboards or mice.

### Advantages of Industrial Panel PC

- Durability:** Offer a combination of durability, usability, and functionality for a wide range of industrial applications, contributing to increased efficiency, productivity, and safety in industrial environments.
- Versatility:** Options for different screen sizes, processor capabilities, input / output ports, and expansion slots allow for tailored solutions for various industrial applications.
- Integration:** Panel PCs seamless integration with industrial equipment such as PLCs (*Programmable Logic Controllers*) and SCADA (*Supervisory Control and Data Acquisition*) systems. This allows for real-time monitoring and control of industrial processes, improving efficiency and productivity.
- VTScada:** Discover the perfect synergy between TPC Industrial Panel PCs and VTScada software. Designed to meet and exceed all recommended system requirements, ensuring seamless and optimal performance for VTScada operations.  
See **Category G** for more information

### Applications:

- Factory and warehouse digitalisation
- Logistic applications
- Inspection and monitoring of electronic equipment
- Equipment monitoring systems

type	display size	hard drive capacity	(OS) system	CPU intel	dimensions (mm)		
					(H)	(W)	(D)

### Industrial Panel PC (PPC) series

The overall use of a flat aluminium alloy panel, a fanless, fully enclosed integrated design, meets different equipment requirements in various environments.

- 3 mm super thin front bezel (*best for embedded cabinet*)
- Pure flat panel IP65 dust-proof and waterproof
- High-precision aluminium alloy material
- Self-developed fanless X86 architecture industrial motherboard

### General features:

- CPU core: I3 2-core (2.10 GHz) / I5 4-core (1.6 GHz)
- RAM: 15" - 8GB / 19" - 16GB
- Serial COM: 2 x RS232
- Operating system: Win 11 included
- Resolution (pixels): 15" - 1024 x 768 / 19" - 1440 x 900 / 23" - 1920 x 1080 TFT LCD
- Supports Mini-PCIe bus: for WiFi communication expansion and more
- Built-in ports: 4 x USB 3.0 / 2 x Intel® I211 Gigabit Ethernet Controller RJ45

Standard Panel PC (PPC)		(capacitive touch)		IP65 (front panel)			
TPC150-W1010	15"	512GB SSD	Win 11	I3 (10th GEN)	298	379	65
Advanced Panel PC (PPC)		(capacitive touch)		IP65 (front panel)			
TPC190-W1010	19"	1TB M.2	Win 11	I5 (10th GEN)	380	451	63
TPC238-W1010	23"	1TB M.2	Win 11	I5 (10th GEN)	308	475	57

### Panel PC - Features



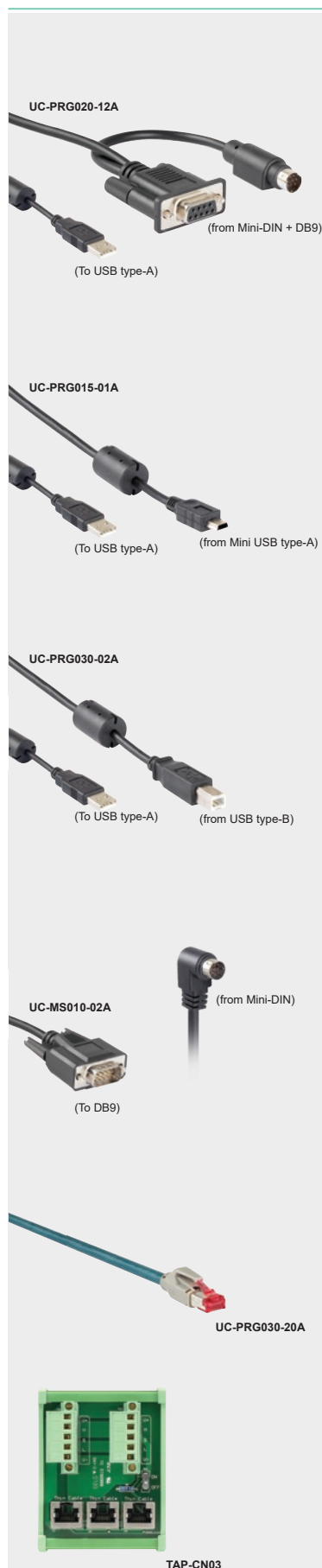
Wifi	Industrial terminal	GNDU	POWER	DC 12-36V	USB-2.0
SB 3.0	LAN	HD/SM	VGA	Audio Out	COM

- **Built for Harsh Environments**  
Designed with industrial-grade protection, capable of performing in extreme and rugged conditions
- **IP65-Rated Dust and Water Protection**  
Pure flat-panel construction with IP65 certification, providing robust resistance to dust and water
- **High-Quality Aluminium Alloy Build**  
Crafted from precision aluminium alloy for superior durability and strength
- **Fanless X86 Industrial Motherboard**  
Self-engineered, fanless X86 architecture ensures quiet, reliable operation in industrial settings





## Communication cables for PLCs &amp; HMIs



## Communication cables for PLCs

from	8-pin mini-DIN (male)	DB9 (female)	DB9 (male)	RS-485	RS-422	RJ45	Mini USB	USB Type-B	to	DB9 (female)	DB9 (male)	USB Type-A	RS-232	RJ45	Length (met)	for PLC/HMI	DVP-SS2/SA2/SV2	DVP-ES2/EX2/EC3	DVP-SV3/SX3	DVP-SE	DVP-MC	AS200/300	AH500	TP SERIES	DOP-100	DOP-112 / DOP-115
Programming cables																										
UC-PRG020-12A	•	•										•			2		•	•			•			•	•	
UC-PRG015-01A							•					•			1.5					•		•	•	•	•	•
UC-PRG030-01A							•					•			3					•		•	•			•
UC-PRG030-02A								•				•			3									•	•	
UC-PRG030-10A		•								•					3								•	•	•	
UC-PRG030-20A					•								•		3						•	•	•	•	•	•
IFD6500				•								•					•	•		•	•	•	•	•	•	
IFD8500-A				•	•								•				•	•	•	•	•	•	•	•	•	
Communication cables																										
UC-MS010-02A*	•									•					1		•	•			•				•	•
UC-MS020-06A	•									•					2		•	•			•			•	•	
UC-MS030-01A	•										•				3		•	•			•			•	•	
UC-MS030-03A		•									•				3									•	•	
UC-MS030-04A			•								•				3									•	•	
UC-MS030-06A	•									•					3		•	•			•				•	•

\* 90° angled connector

## Programming cables PLC to PC \ HMI to PC

type	from	to	description	length
<b>For PLCs - SS, SA, SV, SX, MC, ES, EC, AS200/300, AH500 (need male -&gt; male adaptor)</b>				
UC-PRG020-12A	mini-DIN	USB (type-A)	program. cable PLC to PC	2 meter
<b>For PLCs - SE, SX, AS200/300, AH500, DOP-100</b>				
UC-PRG015-01A	mini-USB	USB (type-A)	program. cable PLC to PC	1.5 meter
UC-PRG030-01A	mini-USB	USB (type-A)	program. cable PLC to PC	3 meter
UC-PRG030-02A	USB (type-B)	USB (type-A)	program. cable HMI to PC	3 meter
UC-PRG030-20A	RJ45	RJ45	program. cable HMI to PC	3 meter
UC-PRG030-10A	DB9 (female)	DB9 (female)	RS-232 program. cable	3 meter

## Communication cables (RS-232) PLC to HMI

For PLCs - SS, SA, SV, SX, MC, ES, EC, MC

UC-MS010-02A*	male mini-DIN	female DB9	cable PLC to HMI	1 meter
UC-MS030-01A	male mini-DIN	female DB9	cable PLC to HMI	3 meter
UC-MS030-03A	female DB9	male DB9	cable PLC to HMI	3 meter
UC-MS030-04A	male DB9	male DB9	cable PLC to HMI	3 meter

\* 90° mini-DIN plug (male)

## Exclusive to DOP103 HMI (RS-232)

UC-MS020-06A	male mini-DIN	male DB9	cable PLC to HMI	2 meter
UC-MS030-06A	male mini-DIN	male DB9	cable PLC to HMI	3 meter

## Industrial network cables

UC-CMC003-01A	RJ45	RJ45	CANopen comm. cable	0.3 meter
UC-CMC005-01A	RJ45	RJ45	CANopen comm. cable	0.5 meter
UC-CMC010-01A	RJ45	RJ45	CANopen comm. cable	1 meter
UC-CMC020-01A	RJ45	RJ45	CANopen comm. cable	2 meter
UC-CMC030-01A	RJ45	RJ45	CANopen comm. cable	3 meter

## Adaptors, splitters and terminal resistors

TAP-CN03	DeviceNet CANopen distribution box, (RJ45) 1 to 4 (Terminator 121Ω)
TAP-TR01	CANopen (Terminator, 121 W)

## Communication cables - Connector's type



8-pin mini-DIN



DB9 (female)



RJ45



USB Type-A

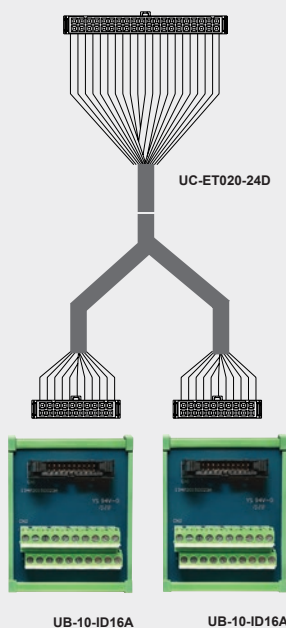


USB Type-B



Mini USB





### I/O external screw terminal module

terminal module	Input unit	Output unit	applicable module / CPU	cable
<b>UB-10-ID16A</b> Supports I/O cards through terminal	16 or 16		AS332 CPU, AS32AM, AS32AN AS64AM, AS64AN, DVP32SN11TN AH32AN, AH64AN	UC-ET0-0-24D UC-ET010-24C
<b>UB-10-ID32A</b> Supports I/O cards through terminal	32	—	AS32AM, AS64AM, DVP32SM AH32AM10N-5C, AH64AM10N-5C	UC-ET0-0-24B UC-ET010-24A
<b>UB-10-OR16A</b> Supports Output Cards NPN switching	—	16 relay	AS332T-A, AS32AN02T-A, AS64AN02T-A, DVP32SN11TN, AH32AN02T-5C, AH64AN02T-5C	UC-ET0-0-24D UC-ET010-24C
<b>UB-10-OR16B</b> Supports Output Cards PNP switching	—	16 relay	AS332P-A, AH32AN02P-5C, AH64AN02P-5C	UC-ET0-0-24D UC-ET010-24C
<b>UB-10-OT32A</b> Supports I/O cards through terminal	—	32	AS32AN02T-A, AS64AN02T-A DVP32SN11TN, AH32AN02T-5C, AH32AN02P-5C, AH64AN02T-5C, AH64AN02P-5C	UC-ET0-0-24B UC-ET010-24A
<b>UB-10-IO32D</b> Supports I/O cards through terminal	16 and 16		AS332 CPU	Adaptor board

**Note:** Replace (♦) 2 (meters) or 3 (meters) to the part number

### Cables for terminal modules PLC to terminal board

type	from	to	description	length
<b>UC-ET010-24C</b>	32 ID40	2 x 16 ID20	ribbon cable for terminal module	1 meter
<b>UC-ET020-24D</b>	32 ID40	2 x 16 ID20	shielded cable for term. module	2 meter
<b>UC-ET030-24D</b>	32 ID40	2 x 16 ID20	shielded cable for term. module	3 meter
<b>UC-ET010-24A</b>	32 ID40	32 ID40	ribbon cable for terminal module	1 meter
<b>UC-ET020-24B</b>	32 ID40	32 ID40	shielded cable for term. module	2 meter
<b>UC-ET030-24B</b>	32 ID40	32 ID40	shielded cable for term. module	3 meter
<b>UC-ET010-13B</b>	MDR36	MDR36	cable for <b>UB-10-IO16C</b> board	1 meter
<b>UC-ET010-15B</b>	MDR50	MDR50	cable for <b>UB-10-IO24C</b> board	2 meter

### For motion control modules

type	inputs conn.	outputs conn.	output type	cable type
<b>UB-10-IO16C</b>	differential	MDR36	transistor	<b>UC-ET010-13B</b>
<b>UB-10-IO24C</b>	differential	MDR50	transistor	<b>UC-ET010-15B</b>

### Accessory selection for high-density modules

Part number	
AS332T-A AS332P-A AS324MT-A	UC-ET010-24 C(1M) UC-ET010-24 D(1M) UC-ET020-24 D(2M) UC-ET030-24 D(3M)

EtherCAT

CANopen

**ASD series - Servo drives (100 W - 15 kW) (high-precision, total control)**

The Standard Delta Servo System features high tolerance, stable operation, and high-precision motion control functions. Creating a highly efficient, user-friendly operating environment for equipment while optimising production efficiency and output value.

- Optimised performance - high response bandwidth
- Vibration suppression functions
- For servo cable selection chart
- Self-Diagnosis and adaptation



ASD-B3A-0421-E



ASD-A3-0421-E



ASD-A3-1521-M



ASD-A3-2043-M

series	part No last digit	PT Mode pulse train	PR Mode	RS-485	analog voltage control	EtherCAT	CAN open	full closed loop control	E-CAM	STO
B3A	-E (EtherCAT)	•	•	—	•	•	—	—	—	•
	-M (CANopen)	•	•	•	•	—	•	—	—	•
A2	-M (CANopen)	•	•	•	•	—	•	•	•	—
A3	-E (EtherCAT)	—	•	—	—	•	—	•	•	•
	-M (CANopen)	•	•	•	•	—	•	•	•	•

type	input power	supply	frequency response	motion network
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**B3A series - Econo servo drives**

**CANopen - M** PT/PR mode, RS-485, analog voltage control, CANopen, STO

<b>ASD-B3A-0421-M</b>	400 W	220V 1ph	3.1kHz	CANopen motion control
<b>ASD-B3A-0721-M</b>	750 W	220V 1ph	3.1kHz	CANopen motion control
<b>ASD-B3A-1021-M</b>	1.0 kW	220V 1ph	3.1kHz	CANopen motion control
<b>ASD-B3A-1521-M</b>	1.5 kW	220V 1ph	3.1kHz	CANopen motion control

**EtherCAT - E** PT/PR mode, analog voltage control, EtherCAT, STO

<b>ASD-B3A-0421-E</b>	400 W	220V 1ph	3.1kHz	EtherCAT motion control
<b>ASD-B3A-0721-E</b>	750 W	220V 1ph	3.1kHz	EtherCAT motion control
<b>ASD-B3A-1021-E</b>	1.0 kW	220V 1ph	3.1kHz	EtherCAT motion control
<b>ASD-B3A-1521-E</b>	1.5 kW	220V 1ph	3.1kHz	EtherCAT motion control

**A3 series - Advanced servo drives**

3rd generation slim-line servo drive

As the automated manufacturing market evolves, the demand for servo products with enhanced performance, speed, precision, bandwidth, and functionality continues to grow. Delta introduces the ASDA-A3 series advanced AC Servo drives, designed to deliver multi-functionality, high performance, energy efficiency, and a compact form factor.

**General features:**

- Auto-tuning and a user-friendly interface for system analysis
- 3.1kHz of bandwidth and employs a 24-bit type encoder,
- Advanced Motion Control E-CAM & 99 sophisticated motion profiles

**EtherCAT - E**

- PR mode, EtherCAT, Full closed loop control, E-CAM, STO

<b>ASD-A3-0121-E</b>	100 W	220V 1ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-0421-E</b>	400 W	220V 1ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-0721-E</b>	750 W	220V 1ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-1021-E</b>	1.0 kW	220V 1ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-1521-E</b>	1.5 kW	220V 1ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-2043-E</b>	2.0 kW	400V 3ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-3043-E</b>	3.0 kW	400V 3ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-4543-E</b>	4.5 kW	400V 3ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-5543-E</b>	5.5 kW	400V 3ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-7543-E</b>	7.5 kW	400V 3ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-1B43-E</b>	11.0 kW	400V 3ph	3.1kHz	EtherCAT motion control
<b>ASD-A3-1F43-E</b>	15.0 kW	400V 3ph	3.1kHz	EtherCAT motion control

**CANopen - M**

- PT/PR mode, RS-485, analog voltage control, CANopen, full closed loop control, E-CAM, STO

<b>ASD-A3-0121-M</b>	100 W	220V 1ph	3.1kHz	CANopen motion control
<b>ASD-A3-0421-M</b>	400 W	220V 1ph	3.1kHz	CANopen motion control
<b>ASD-A3-0721-M</b>	750 W	220V 1ph	3.1kHz	CANopen motion control
<b>ASD-A3-1021-M</b>	1.0 kW	220V 1ph	3.1kHz	CANopen motion control
<b>ASD-A3-1521-M</b>	1.5 kW	220V 1ph	3.1kHz	CANopen motion control
<b>ASD-A3-2043-M</b>	2.0 kW	400V 3ph	3.1kHz	CANopen motion control
<b>ASD-A3-3043-M</b>	3.0 kW	400V 3ph	3.1kHz	CANopen motion control
<b>ASD-A3-4543-M</b>	4.5 kW	400V 3ph	3.1kHz	CANopen motion control
<b>ASD-A3-5543-M</b>	5.5 kW	400V 3ph	3.1kHz	CANopen motion control
<b>ASD-A3-7543-M</b>	7.5 kW	400V 3ph	3.1kHz	CANopen motion control
<b>ASD-A3-1B43-M</b>	11.0 kW	400V 3ph	3.1kHz	CANopen motion control
<b>ASD-A3-1F43-M</b>	15.0 kW	400V 3ph	3.1kHz	CANopen motion control


**ECMA Motors** (for B3A, A2, A3 servo drives)

type	output power	rated speed rpm	rated torque (Nm)	max. torque (Nm)	dimensions (mm)		
					PCD	flange	shaft Ø

**A3/B3 servo motors - 24 bit incremental optical encoder**
**IP67 connector**
**Motors for single-phase 220 VAC servo drives**

ECM-B3L-C20401RJ1	100 W	3000	0.32	1.12	46	40 x 40	8
ECM-B3M-C20604RJ1	400 W	3000	1.27	4.45	70	60 x 60	14
ECM-B3M-C20807RJ1	750 W	3000	2.40	8.40	90	80 x 80	19
ECM-B3M-C21010RS1	1.0 kW	3000	3.18	9.54	115	100 x 100	22
ECM-B3M-E21315RS1	1.5 kW	3000	4.77	14.30	145	130 x 130	22

**Motors for single-phase 220 VAC servo drives- with built-in 24VDC brake**

ECM-B3M-C20604SJ1	400 W	3000	1.27	4.45	70	60 x 60	14
ECM-B3M-C20807SJ1	750 W	3000	2.40	8.40	90	80 x 80	19

**Motors for three-phase 400 VAC servo drives**

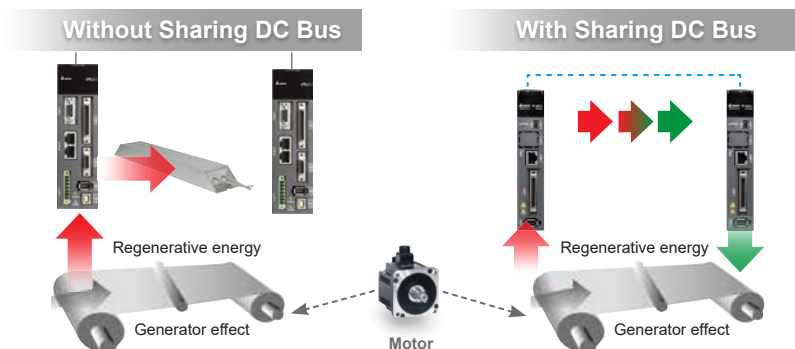
ECM-B3M-K21320RS1	2.0 kW	2000	9.55	28.65	145	130 x 130	22
ECM-B3M-L21830RS1	3.0 kW	1500	19.1	57.29	200	180 x 180	35
ECM-B3M-L21845RS1	4.5 kW	1500	28.65	71.6	200	180 x 180	35
ECM-B3M-L21855RS1	5.5 kW	1500	35.01	105	200	180 x 180	42
ECM-B3M-LA1875RS1	7.5 kW	1500	47.75	119	200	180 x 180	42
ECM-B3M-LA221BR31	11 kW	1500	70.03	175	235	220 x 220	42
ECM-B3M-LA221FR31	15 kW	1500	95.49	238.5	235	220 x 220	55

**A3/B3 servo motors - 20 bit incremental encoder**
**Motors for three-phase 400 VAC servo drives - with 24 VDC brake**

ECMA-K11320SS	2.0 kW	2000	9.55	28.65	145	130 x 130	22
ECMA-L11830SS	3.0 kW	1500	19.10	57.29	200	180 x 180	35
ECMA-L11845SS	4.5 kW	1500	28.65	71.6	200	180 x 180	35

**Energy-Saving and Compact - Size Design**
**DC-bus Sharing Feature**

- ▶ The regenerative energy will be collected to DC-bus for other axes to increase energy efficiency
- ▶ Smaller resistor installed is possible for the system, which can save cost and installation space



## Delta A3 Servo Series:

### Unmatched Precision and Performance for Modern Automation

As the market of automated manufacturing rapidly develops, the need for servo products with higher performance, speed, precision, bandwidth, and functionality is widely increasing. To meet the requirements of the motion control market for industrial manufacturing machines, Delta presents a new high-end AC servo system, the ASDA-A3 series, with features such as multi-functionality, high-performance, energy-efficiency (DC-Bus sharing), and compact design.





## Cables for servo drives &amp; motors



ASD-CAPWA205



ASD-CAEN1105



ASD-CAEN1005



ASD-BM-50A

type	for drive	motor		with brake	description	cable length
		frame size	rating			
Cables and accessories for Servo drives and motors						
Power cables						
ACS3-CAPW1105	A3/B3	F40-80	100-750 W	—	motor power cable	5 m
ACS3-CAPW5105	A3/B3	F40-80	100-750 W	—	IP67 motor power cable	5 m
ACS3-CAPWA205	A3/B3	F100-130	1-2 kW	—	motor power cable	5 m
ACS3-CRPWA305	A3/B3	F100-130	1-2 kW	—	cable with 90° connector	5 m
ACS3-CAPWC405	A3	F180	3/4.5 kW	—	motor power cable	5 m
ACS3-CRPWC405	A3	F180	3/4.5 kW	—	cable with 90° connector	5 m
ACS3-CAPWE605	A3	F180-220	5.5-15 kW	—	motor power cable	5 m
Brake cables						
ACS3-CAPW2105	A3/B3	F40-80	100-750 W	yes	motor brake cable	5 m
ACS3-CAPW6105	A3/B3	F40-80	100-750 W	yes	IP67 motor brake cable	5 m
ASD-CAPW1105	A2	F100-130	1-1.5 kW	yes	motor brake cable	5 m
ASD-CAPW1305	A2	F130	2 kW	yes	motor brake cable	5 m
ASD-CAPW2305	A2	F180	3-4.5 kW	yes	motor brake cable	5 m
Encoder cables						
ACS3-CAEN0105	A3/B3	F40-80	100-750 W		standard encoder cable	5 m
ACS3-CAEN1105	A3/B3	F40-80	100-750 W		encoder cable IP67 conn.	5 m
ACS3-CAENA105	A3/B3	F100-220	1-15 kW		standard encoder cable	5 m
ASD-CAEN1005	A2	F100-130	1-1.5 kW		standard encoder cable	5 m
Power connectors - for servo drives and motors						
ASDBCAPW0000	A2/A3/B3	F40-80	100-750 W	—	std power connector	—
ASDBCAPW0100	A2/A3/B3	F40-80	100-750 W	yes	brake power connector	—
ACS3-CNPW1A00	A3/B3	F40-80	100-750 W	yes	IP67 power connector	—
ACS3-CAPWA000	A3/B3	F100-130	1-2 kW	—	Mil-spec power conn.	—
ACS3-CRPWA000	A3/B3	F100-130	1-2 kW	—90°	Mil-spec power conn.	—
ACS3-CAPWC000	A3/B3	F180	3-4.5 kW	—	Mil-spec power conn.	—
ACS3-CAPWE000	A3/B3	F180-220	7.5-15 kW	—	Mil-spec power conn.	—
ASD-CAPW1000	A2	F100-130	1-2 kW	yes	Mil-spec power conn.	—
ASD-CAPW2000	A2	F180-220	3-7.5 kW	yes	Mil-spec power conn.	—
Encoder connectors						
ACS3-CNENC200	A3/B3	F40-220	0.1-15 kW		encoder connection to drive	—
ACS3-CNEN2A00	A3/B3	F40-80	100-750 W		IP67 connection to motor	—
ACS3-CAENA000	A3/B3	F100-180	1-15 kW		Mil-spec power conn.	—
ASD-ABEN0000	A2	F40-80	100-750 W		connection to motor	—
ASD-CAEN1000	A2	F100-130	1-1.5 kW		connection to motor	—
Servo drive accessories						
ACS3-CNADC150	50-pin CN1 I/O connector			for series	ASD-A3-M	—
ASD-CNSC0026	26-pin CN1 I/O connector			for series	ASD-A3-E	—
ACS3-IFSC5020	20-pin CN1 quick connector			for series	ASD-A3-M	—
ACS3-MDTB5000	50-pin CN1 break out module			for series	ASD-A3-M	—
ACS3-CAADC1	A2 to A3 CN1 conversion cable			for series	ASD-A3	—
ACS3-CAADC2	A2 to A3 CN2 conversion cable			for series	ASD-A3	—
ACS3-CAADC5	A2 to A3 CN5 conversion cable			for series	ASD-A3	—
ACS3-CNTB0500	26-pin CN1 I/O connector			for series	ASD-B3A	—
ACS3-IFSC2626	26-pin CN1 quick connector			for series	ASD-B3A	—
ACS3-MDTD2600	26-pin CN1 break out module			for series	ASD-B3A	—
ACS3-CABDC2	B2 to B3 CN2 conversion cable			for series	ASD-B3A	—
UC-CMC010-01A	CANopen comms cable RJ45			for series	ASD-M	1 m
UC-EMC010-02B	EtherCAT comms cable RJ45			for series	ASD-E	1 m
TAP-CN03	Canopen distribution box			for series	ASD-A2-M	—
UC-PRG030-02A	USB type A - USB type B			for series	ASD-A2-M	—
ASD-CARS0003	9-pin D-SUB female - Firewire			for series	ASD-A2-M	—
ASD-CNIE0B06	RS-485 Splitter 2x RJ45			for series	ASD-A2-M	—



Choosing the right **A3 servo drive and motor** combination is key to getting the best performance. This guide breaks it down into four simple steps:

- ▶ **Select the Servo Drive** – Pick the right drive based on power and control needs. The A3 series offers high-speed response, stability, and precise motion control.
- ▶ **Select the Servo Motor** – Choose a matching **ECM-A3 servo motor** based on torque, speed, and whether you need a brake.
- ▶ **Select the Power Cable** – Make sure you've got the right power cable, whether for a standard or brake motor.
- ▶ **Select the Encoder Cable** – Get the correct encoder cable to ensure proper feedback and smooth operation.

## Servos and Complimentary - Products



## Servo combination selection chart

Step 1: Select a Servo Drive		Step 2: Select a Servo Motor				Step 3: Select Power Cable				Step 4: Select Encoder Cable	
Servo Drive	A3/B3 Motor	OR	A3/B3 Motor + Brake IP67	OR	A2 Motor+ Brake	Power Cable A3/ B3 Motor IP67	B3/A3 Power Cable + Brake IP67	Power Cable + Brake A2	Encoder Cable A3/ B3 IP67	Encoder Cable A2	
ASD-B3A-0121-x	ECM-B2L-CM0401RJ1					ACS3-CAPW5105			ACS3-CAEN1105	ACS3-CAEN1105	
ASD-B3A-0421-x	ECM-B2M-CM0604RJ1		ECM-B3M-CM0604SJ1			ACS3-CAPW5105	ACS3-CAPW6105		ACS3-CAEN1105	ACS3-CAEN1105	
ASD-B3A-0721-x	ECM-B2W-CM0807RJ1		ECM-B3M-CM0807SJ1		ECMA-C10807SS	ACS3-CAPW5105	ACS3-CAPW6105	ASD-ABPW0105	ACS3-CAEN1105	ASD-ABEN0005 + ACS3-CABDC2	
ASD-B3A-1021-x	ECM-B2W-C21010RS1				ECMA-C11010SS	ACS3-CAPWA205		ASD-CAPW1105	ACS3-CAENA105	ASD-CAEN1005 + ACS3-CABDC2	
ASD-B3A-1521-x	ECM-B2M-E21315RS1				ECMA-E11315SS	ACS3-CAPWA205		ASD-CAPW1105	ACS3-CAENA105	ASD-CAEN1005 + ACS3-CABDC2	
ASD-A3-0121-x	ECM-B2L-CM0401RJ1					ACS3-CAPW5105			ACS3-CAEN1105	ACS3-CAEN1105	
ASD-A3-0421-x	ECM-B2M-CM0604RJ1		ECM-B3M-CM0604SJ1			ACS3-CAPW5105	ACS3-CAPW6105		ACS3-CAEN1105	ACS3-CAEN1105	
ASD-A3-0721-x	ECM-B2W-CM0807RJ1		ECM-B3M-CM0807SJ1		ECMA-C10807SS	ACS3-CAPW5105	ACS3-CAPW6105	ASD-ABPW0105	ACS3-CAEN1105	ASD-ABEN0005 + ACS3-CAADC2	
ASD-A3-1021-x	ECM-B3W-C21010RS1				ECMA-C11010SS	ACS3-CAPWA205		ASD-CAPW1105	ACS3-CAENA105	ASD-CAEN1005 + ACS3-CAADC2	
ASD-A3-1521-x	ECM-B3M-E21315RS1				ECMA-E11315SS	ACS3-CAPWA205		ASD-CAPW1105	ACS3-CAENA105	ASD-CAEN1005 + ACS3-CAADC2	
ASD-A3-2043-x	ECM-B3W-K21320RS1				ECMA-K11320SS	ACS3-CAPWA205		ASD-CAPW1305	ACS3-CAENA105	ASD-CAEN1005 + ACS3-CAADC2	
ASD-A3-3043-x	ECM-B3W-L21830RS1				ECMA-L11830SS	ACS3-CAPWC405		ASD-CAPW2305	ACS3-CAENA105	ASD-CAEN1005 + ACS3-CAADC2	
ASD-A3-4543-x	ECM-B3W-L21845RS1				ECMA-L11845SS	ACS3-CAPWC405		ASD-CAPW2305	ACS3-CAENA105	ASD-CAEN1005 + ACS3-CAADC2	
ASD-A3-5543-x	ECM-B3W-L21855RS1					ACS3-CAPWE605			ACS3-CAENA105	ACS3-CAENA105	
ASD-A3-7543-x	ECM-B3M-LA1875RS1					ACS3-CAPWE605			ACS3-CAENA105	ACS3-CAENA105	
ASD-A3R-1B43-x	ECM-B3M-LA221BR31					ACS3-CAPWE605			ACS3-CAENA105	ACS3-CAENA105	
ASD-A3R-1F43-x	ECM-B3W-LA221FR31					ACS3-CAPWE605			ACS3-CAENA105	ACS3-CAENA105	

**Gearboxes for ECMA series servo motors**

High-precision gearboxes are widely used in robotics, machine tools and other industrial automation. Gearboxes in precision positioning applications are used to provide higher torques and higher resolutions in a compact package and at reduced power requirements.

A geared motor will output more running and holding torque than an ungeared, standard motor with higher torque output and strengthened rigidity.

**Products features:**

- Low noise, helical gears allow for smooth and quiet gear meshing
- Planetary wheel with needle design increases the contact area to improve the rigidity and output torque
- Synthetic lubricating grease and sealed IP65 design requires no maintenance during the product's lifetime
- Gears are carburised and quenched to HRC62 with low carbon steel surface for optimum wear and impact toughness



type	ECMA motor	ratio	rated torque	backlash arcmin	dimensions (mm)		
					PCD	flange	shaft Ø
Straight gearboxes (helical gears)							
WAB-060-005-K-P1	200 - 400 W	5:1	60	≤3	70	60 x 60	16
WAB-060-007-K-P1	200 - 400 W	7:1	50	≤3	70	60 x 60	16
WAB-060-010-K-P1	200 - 400 W	10:1	40	≤3	70	60 x 60	16
WAB-090-003-K-P1	750 W	3:1	130	≤3	100	90 x 90	22
WAB-090-007-K-P1	750 W	7:1	140	≤3	100	90 x 90	22
WAB-090-010-K-P1	750 W	10:1	100	≤3	100	90 x 90	22
WAB-090-020-K-P1	750 W	20:1	140	≤3	100	90 x 90	22
WAB-090-040-K-P1	750 W	40:1	120	≤3	100	90 x 90	22
WAB-115-003-K-P1	1.5 - 2 kW	3:1	208	≤3	130	115 x 115	32
WAB-115-010-K-P1	1.5 - 2 kW	10:1	230	≤3	130	115 x 115	32
WAB-142-003-K-P1	3 - 4.5 kW	3:1	342	≤3	165	142 x 142	40
WAB-180-003-K-P1	5.5 kW	3:1	588	≤3	165	142 x 142	40

**Straight and angled gearbox accessories****WAB115-DZ-95-115-M8**

1 kW F100 adaptor frame for WAB-115

**Assembling the Planetary Gearbox with Motor**



HTR-3A...



HTR-5B...



HPN-6A-2500-3-PP



HTR-HN...



HJ-6X6



SCT...

### HTR series - Incremental encoders

Incremental encoders are devices that convert the angular motion or position of a shaft into an analog or digital value to determine position or motion. They are among the most commonly used rotary encoders, offering excellent speed and distance feedback. With fewer sensors involved, incremental encoders are both simple and cost-effective. However, incremental encoders are limited to providing only relative movement data, meaning a reference device is needed to determine absolute motion or position.

The range includes various optical encoders, such as solid shaft and hollow shaft models, with both light-duty and heavy-duty options. The HTR series encoders deliver precise positioning and speed-sensing capabilities, converting rotary motion or position data into electronic pulses for accurate speed and position detection. These high-quality incremental optical encoders are ideal for translating rotary or linear motion into a digital signal for monitoring or controlling speed, direction, distance, or position.

#### Common characteristics

- Output phase: ABZ phase (*std*)
- Output form: P: Push Pull HL: Line Driver 5 - 26 VDC
- Resolution: 5 - 5000 ppr (*pulse per revolution*) model and output dependant
- Protection: against polarity reversal

type	resolution (ppr)	supply voltage	detection system	description	dimensions Ø mm	
					body	shaft

#### Solid shaft type

Medium-duty incremental encoders (IP50)			push-pull type			
HTR-3A-100A-P	100	5 - 26 VDC	incremental	rotary encoder	38	6
HTR-3A-360A-P	360	5 - 26 VDC	incremental	rotary encoder	38	6
HTR-3A-500A-P	500	5 - 26 VDC	incremental	rotary encoder	38	6
HTR-3A-1024A-P	1024	5 - 26 VDC	incremental	rotary encoder	38	6
HTR-5B-360A-P	360	5 - 26 VDC	incremental	rotary encoder	50	8
HTR-5B-1024A-P	1024	5 - 26 VDC	incremental	rotary encoder	50	8
HTR-5B-2000A-P	2000	5 - 26 VDC	incremental	rotary encoder	50	8

Medium-duty incremental encoders (IP50)			line driver type			
HTR-5B-360A-H	360	5 - 26 VDC	incremental	rotary encoder	50	8
HTR-5B-1024A-H	1024	5 - 26 VDC	incremental	rotary encoder	50	8
HTR-5B-2000A-H	2000	5 - 26 VDC	incremental	rotary encoder	50	8

Other resolution (ppr) available on request

Heavy-duty incremental encoders			(IP64)	push-pull type			
• HPN square flange mount (63.5 x 63.5 mm)							
HPN-6A-2500-3-PP	2500	5 - 26 VDC	incremental	rotary encoder	63.5 □	10	
Other resolution (ppr) available on request							

Other resolution (ppr) available on request

Hollow shaft incremental encoders			IP50	push-pull type	hole	
HTR-HN-8-360A-P	360	5 - 26 VDC	incremental	rotary encoder	38	8
HTR-HN-8-500A-P	500	5 - 26 VDC	incremental	rotary encoder	38	8
HTR-HN-8-1024A-P	1024	5 - 26 VDC	incremental	rotary encoder	38	8
HTR-HM15-600-3-PP	600	5 - 26 VDC	incremental	rotary encoder	59	15
HTR-HM15-1024-3-PP	1024	5 - 26 VDC	incremental	rotary encoder	59	15
HTR-HD30-600-3-PP	600	8 - 26 VDC	incremental	rotary encoder	100	30
HTR-HD30-1024-3-PP	1024	8 - 26 VDC	incremental	rotary encoder	100	30

Other resolution (ppr) available on request

#### A series - Absolute encoders IP50

- Signal output G: Gray code
- Output form C: NPN open-collector

#### Rotary encoders

A2-G-256-C	256	10 - 26 VDC	absolute	rotary encoder	44	6
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Other resolution (ppr) available on request

#### Encoder accessories

type	material	rated torque (N.m)	bore (mm)	wrench torque (N.m)	dimensions Ø mm	
			hole Ø1	hole Ø2	body Ø	length

#### Flexible couplings

HJ-6X6	plastic	1.0	6	6	0.3	16	23
SCT-16-6X6	aluminium	0.3	6	6	0.7	16	23
SCT-20-8X8	aluminium	0.5	8	8	0.7	20	26
SCT-25-8X10	aluminium	1.0	8	10	1.7	25	31
SCT-25-10X10	aluminium	2.0	10	10	1.7	25	31



## Programmable logic controllers (brick-type)



LRD10RA240



LRD20R...



LRE08R...

### Programmable Logic Controllers (PLCs)

The Lovato's micro PLC is a compact, flexible, easy to use and highly cost-effective "intelligent relay". Base units with 10, 12 or 20 I/O points and can be expanded up to 44 digital I/O points with plug-in expansion modules.

Programming is simple and intuitive and can be done directly with the built-in keypad/display or by personal computer with **LRXSW** software and **LRXC03** programming USB cable.

Two common language logics are available for programming:

- LD (*relay ladder*) up to 300 lines of four instructions each
- FBD (*function block diagram*) up to 260 programmable blocks

#### Advantages:

System control and supervision

- Contact status viewing in simple and small screen display
- Possibility to add the micro PLC equipped with **LREP00** Modbus to systems integrated on data networks by using Synergy (*supervision and energy management software*)

Quick control board installation

- Fewer number of components
- Less wiring with minor number of connections

Repetitiveness

- Less errors during panel building
- Considerable time-saving

Flexibility

- Quick correction of abnormal conditions at final testing
- Fast changes on control boards

type	supply	inputs	outputs	description
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### Programmable Logic Controllers (PLCs)

- Addition-Subtraction on variables
- Multiplication-Division on variables
- Comparator on variables
- HMI display for parameter viewing and programming
- PWM output
- High-speed input (1kHz)
- PID function

#### LRD series - Base units

<b>LRD10RA240</b>	100 - 240 VAC	6	4	intelligent relay
<b>LRD20RA240</b>	100 - 240 VAC	12	8	intelligent relay
<b>LRD12RD024</b>	24 VDC	8*	4	intelligent relay
<b>LRD20RD024</b>	24 VDC	12*	8	intelligent relay
<b>LRD20RD012</b>	12 VDC	12*	8	intelligent relay
<b>LRD20RD024P1</b> ♦	24 VDC	12*	8	intelligent relay

\* 2/4 inputs can be analog (0-10 VDC)

♦ With built-in RS-485 modbus port

#### Expansion modules (plug-in)

Inputs and outputs of the base relay unit can be increased with plug-in expansion modules.

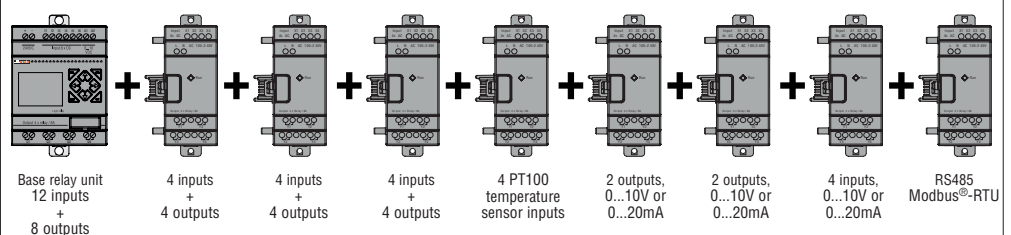
Up to three expansion modules can be added.

<b>LRE08RA240</b>	100 - 240 VAC	4	4	expansion module
<b>LRE08RD024</b>	24 VDC	4	4	expansion module
<b>LREP00</b>				modbus - RTU protocol communication unit

#### Accessories

<b>LRXC03</b>	cable: PC (USB) to LRD relay connecting cable (1.5 meters)
<b>LRXM00</b>	plug-in program backup memory module
<b>LRXP01</b>	HMI operator panel, 24 VDC, RS-232, RS-485
<b>LRXC02</b>	cable: PC (RS-232) - LRXP01 programming cable

#### Maximum combinations



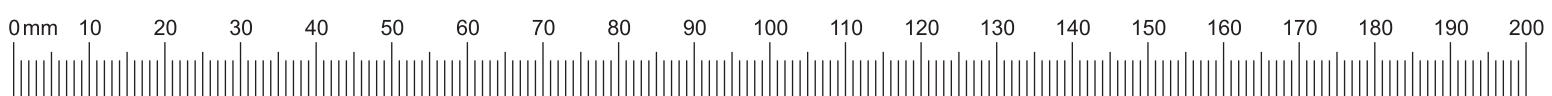
- 24 digital inputs (4 configurable as analog 0-10V input)
- 20 digital outputs (relay, transistor or mixed)
- 4 analog inputs for PT100 temperature sensors

- 4 analog outputs configurable as 0...10V or 0/4...20mA
- 4 analog inputs configurable as 0...10V or 0/4...20mA
- 1 RS485 slave communication module.

N.B. The sequence of the products given above must be respected for correct operation.



## Notes



*World Class Innovation, Local Commitment*

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