

BECKHOFF New Automation Technology

EtherCAT P – Ultra-fast Communication and Power in One Cable

One Cable Automation for the Field Level



Ether**CAT**®  P

EtherCAT P: Ultra-fast communication and power in one cable



EtherCAT P

- 100 % EtherCAT-compatible
- 100 Mbit/s full duplex
- Processing on the fly
- High-precision synchronisation with distributed clocks
- Cascadable in all topologies (star, line, tree)

Dual power supply

- U_S (system and sensor supply) = 24 V DC/3 A, U_P (peripheral voltage for actuators) = 24 V DC/3 A
- Daisy-chained power supply through EtherCAT P devices

EtherCAT[®] P



One cable solution: EtherCAT P

Cost-reduction potentials

- Elimination of separate supply cables
- Reduced material and assembly costs
- Minimised installation space for drag-chains, control cabinets and machine footprint
- Lowered connection costs with outstanding EtherCAT performance

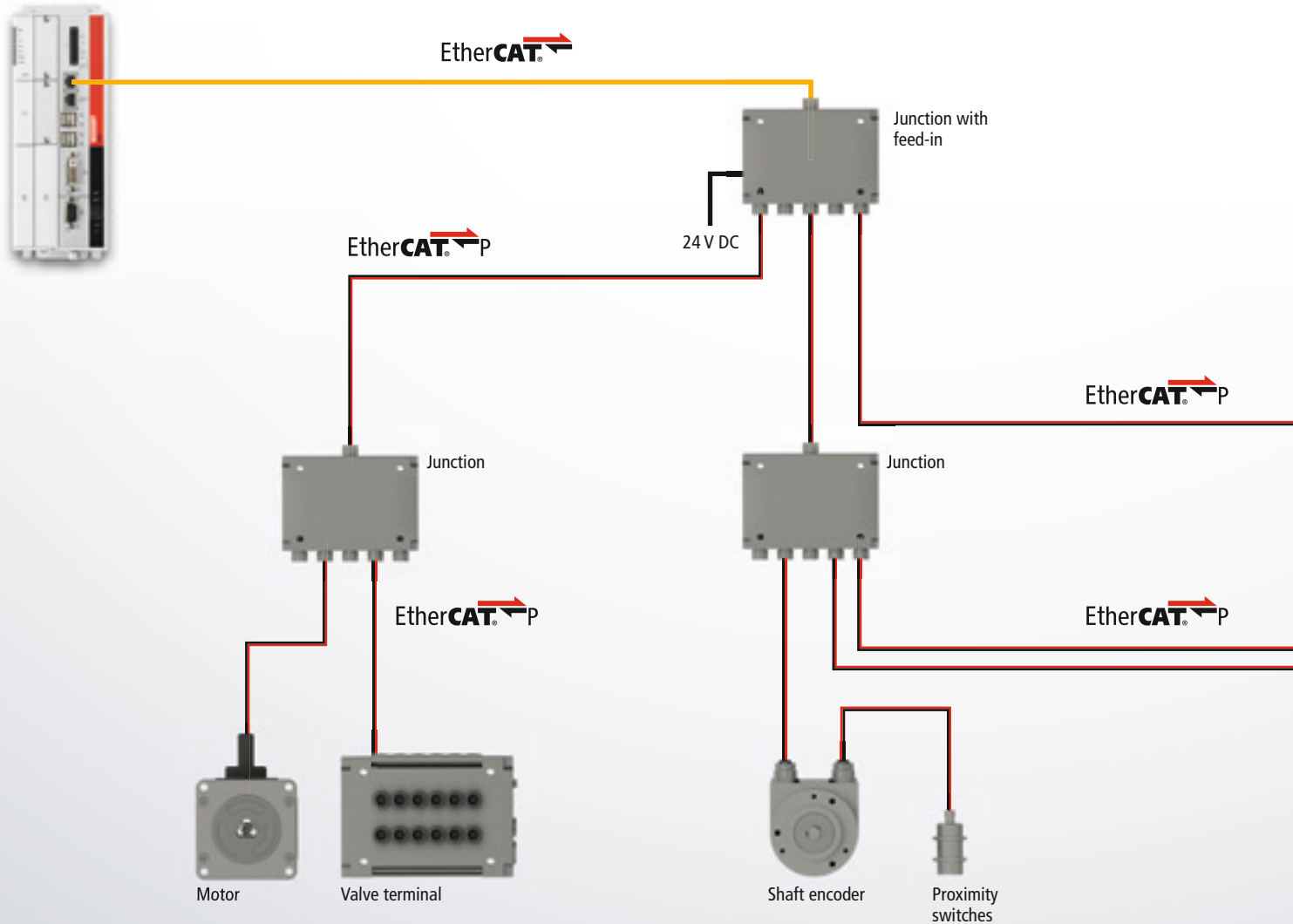
Connectors and cables

- Industrial CAT5 cables in AWG22 and AWG24
- Ultrathin cables for short distances
- EtherCAT-P-coded M8 connector
- Easy assembly in the field

- One cable solution for the field level
- Cascadable in all topologies
- EtherCAT-compatible
- Dual power supply
- Optimised for automation devices

EtherCAT P: The sensor, actuator and measurement

EtherCAT master



EtherCAT P for actuators

- AC and DC motors
- Actuators
- Valve terminals

EtherCAT P for sensors

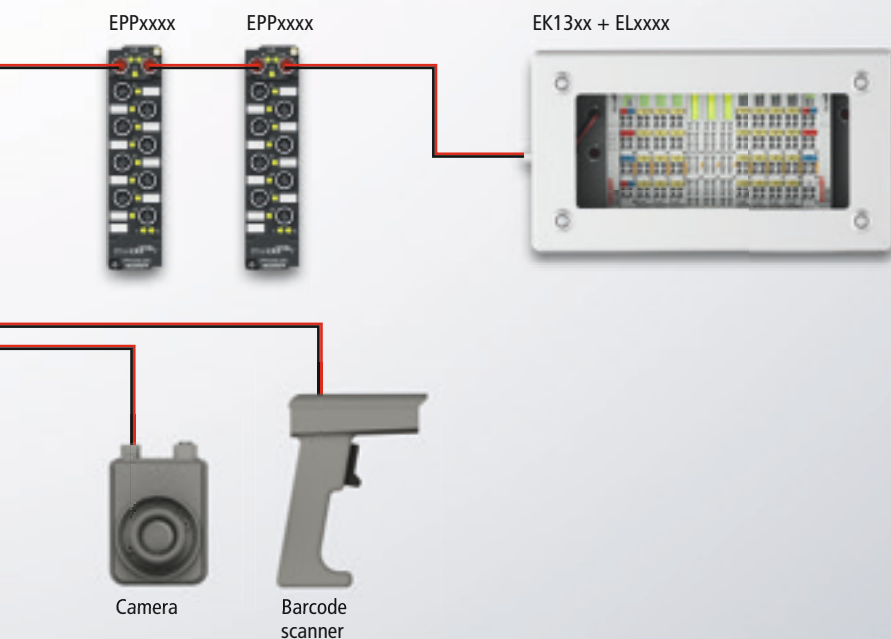
- Proximity switches
- Light barriers
- Shaft encoders

With EtherCAT P, Beckhoff combines communication and power in a single 4-wire standard Ethernet cable. The 24 V DC supply of the EtherCAT P slaves and of the connected sensors and actuators is integrated: U_S (system and sensor supply) and U_P (peripheral voltage for actuators) are electrically isolated from each other and can each supply a

current of up to 3 A to the connected components. At the same time, all the benefits of EtherCAT, such as freedom in topology design, high speed, optimum bandwidth utilisation, telegram processing on-the-fly, highly precise synchronisation, extensive diagnostics functionality, etc., are all retained. The currents of U_S and U_P are coupled directly

nt bus

Technical data	EtherCAT P
Voltages	Nominal 2 x 24 V DC according to IEC 61131 (-15 %/+20 %), max. 3 A each per U _S and U _P
Connectors	Incorrect connections are ruled out with the new EtherCAT-P-coded M8 connector.
Topology	No point-to-point connection, as with PoE, but cascable in all topology variants
Network planning	Tool-based calculation of currents and voltages, resulting in optimum design and distribution of feed-in points
Process data	EtherCAT process data scalable from 1 bit...64 kbyte per device
Devices	Up to 65,535 devices in one network
Performance	Cycle times of < 100 µs, distributed clocks synchronisation << 1 µs, signal sampling with oversampling << 1 µs with n = 1...1000



EtherCAT P for vision

- Cameras
- Barcode scanners
- 3-D scanners

EtherCAT P for I/O

- Connections in IP 67
- Connections in IP 20

into the wires of the 100 Mbit/s line, enabling the realisation of a highly cost-effective and compact connection. EtherCAT P offers benefits both for connection of remote, smaller I/O stations in the terminal box and for decentralised I/O components locally in the process. A connector family was specially developed for EtherCAT P, in order to prevent

potential damage caused by incorrect connection with standard EtherCAT slaves. It covers all applications from the 24 V I/O level up to drives with 400 V AC or 600 V DC and a current of up to 64 A.

- Optimised for direct connection of EtherCAT P devices in the field
- Time savings by lower wiring effort
- Reduced error sources
- Smaller sensors and actuators through the elimination of separate supply cables
- Simple connection of components

The diagram illustrates a distributed EtherCAT P system architecture. It consists of three main components: a control cabinet, a central junction unit, and two machine modules (Machine module 2 and Machine module 3).

Control cabinet: A rack-mounted unit with a red Ethernet cable connected to the central junction unit. A CD-ROM labeled "EtherCAT -3" is shown next to it.

Central Junction Unit: A rack-mounted unit with multiple ports. It is labeled "2-port EtherCAT P junction with feed-in EK1322" and "1-port EtherCAT P extension with feed-in EK1310". It has three "24 V DC" power inputs.

Machine module 2: A rack-mounted unit containing several modules. It is labeled "EtherCAT P junction EPP1322" and "EPP2008-0001". It has a "24 V DC" power input.

Machine module 3: A rack-mounted unit containing several modules. It is labeled "EPP2008-0001", "EPP3174-0002", "EPP1008-0002", and "EtherCAT P junction with refresh EPP1332". It has a "24 V DC" power input.

Connections: The control cabinet is connected to the central junction unit via an "EtherCAT" line. The central junction unit is connected to Machine module 2 via an "EtherCAT P" line. Machine module 2 is connected to Machine module 3 via an "EtherCAT P" line. The "EtherCAT P" line also connects back to the control cabinet.

extension (with feed-in) for conversion of EtherCAT to EtherCAT P. The EPPxxxx EtherCAT P modules in protection class IP 67 cover the typical range of requirements for I/O signals: digital inputs (3.0 ms or 10 μ s filter), digital outputs with 0.5 A output current, combination modules with digital inputs and outputs, analog inputs and outputs with

Machine module 1

EtherCAT P
Coupler
EK1300

EtherCAT P
Coupler
EK1300



EtherCAT[®] P

EPP2008-
0001

EP2809-
0021

EP2809-
0022

EtherCAT P
to EtherCAT

24 V DC

EtherCAT[®]

EtherCAT[®] P

Machine module 4

EPPxxx-006x

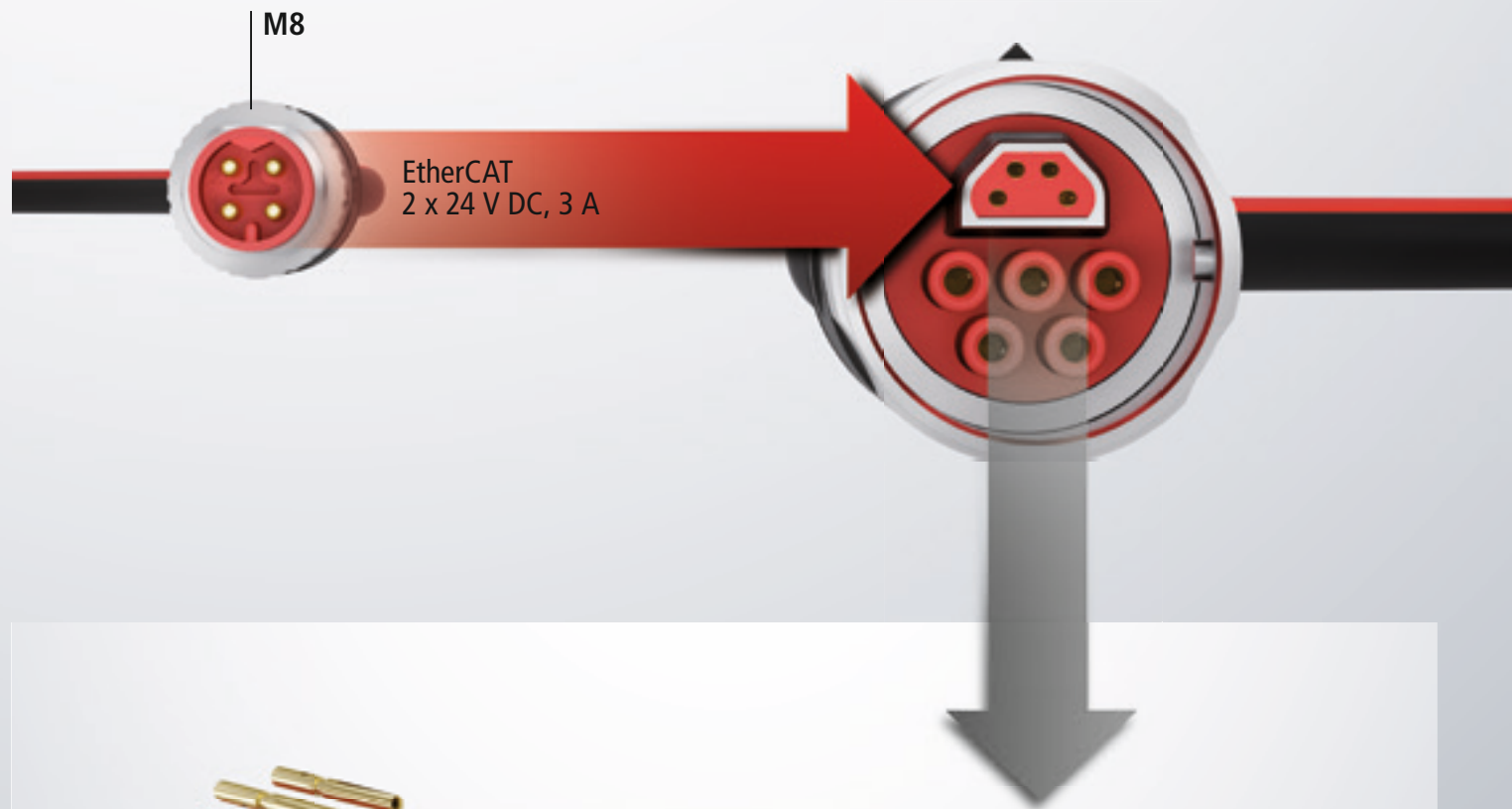
EPPxxx-006x

16-bit resolution, thermocouple and RTD inputs. The EPP13xx EtherCAT P junctions are available for flexible topology configurations. The current carrying capacity of 3 A per EtherCAT P segment already enables a wide range of sensors/actuators to be used. If a power supply boost is required, the EPP1332-0001 EtherCAT P junction can be used to

feed in both U_S and U_P at any point. The EPP1342-0001 should be used for branches without voltage refresh.

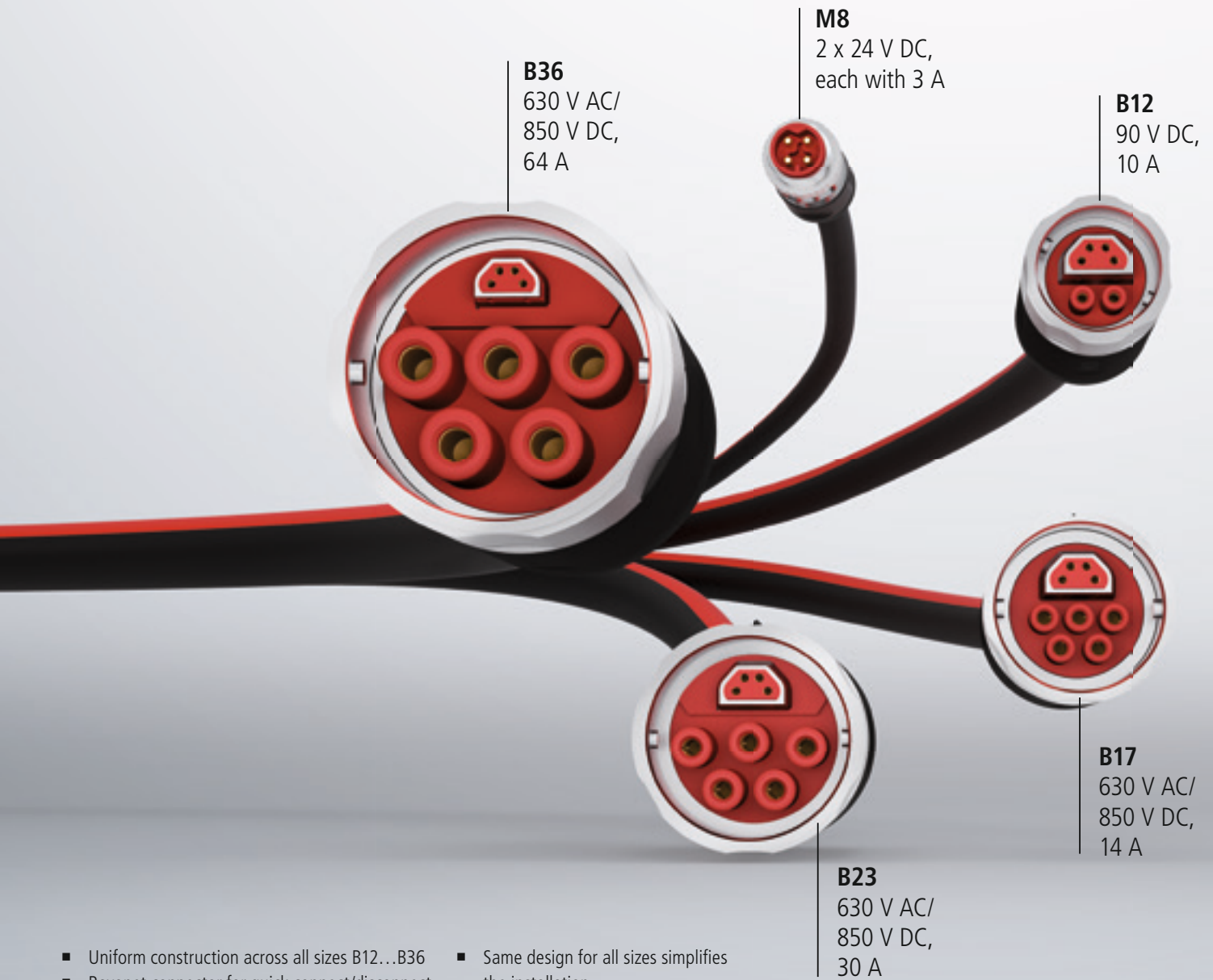
- Free choice of topology in IP 20 and IP 67
- Compact design of the EPPxxx modules in IP 67
- Numerous module variants for different signal types
- Sensor/actuator supply directly via EtherCAT P

EtherCAT P: From the 24 V sensor to the 600 V drive

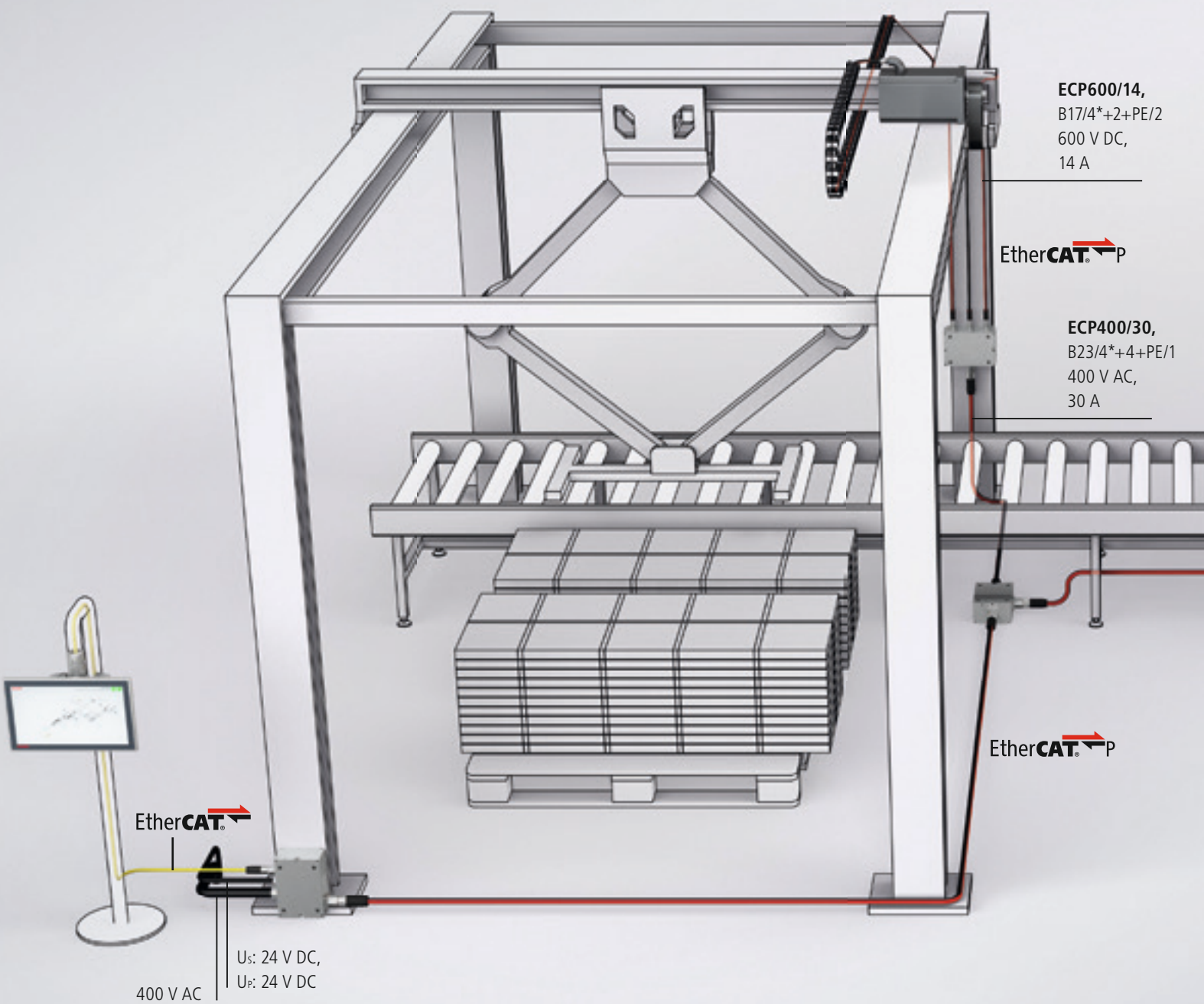


- Trapezoidal EtherCAT P element enables high packing density, resulting in improved current-carrying capacity and dielectric strength of the power pins
- Seamless and consistent 360° shielding of the connector
- Uniform EtherCAT P element for all sizes B12...B36

EtherCAT P: Matching connectors for every performance class



- Uniform construction across all sizes B12...B36
- Bayonet connector for quick connect/disconnect
- Shielded and unshielded (outer shield) variants available
- Large variety of pin and socket combinations
- Mechanical keying (up to 3 mechanical keys per size and pole count)
- Visual marking via exchangeable coloured rings on connector body
- Thinner cables by reducing the number of wires per cable with EtherCAT P
- Connectors for field assembly
- Same design for all sizes simplifies the installation.
- Reduced assembly effort due to
 - Pre-configuration of the cable
 - Coloured wires and matching identification in the connector
 - Poka-yoke principle for the individual components
- Flange socket with standard flange dimensions (front, rear and PCB assembly versions)



Example: Robot Performance class ECP400/64, size B36, pole number 4 x EtherCAT P + 4 x power + PE, for max. 400 V AC with 64 A



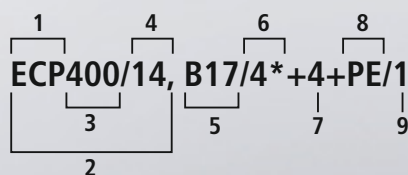
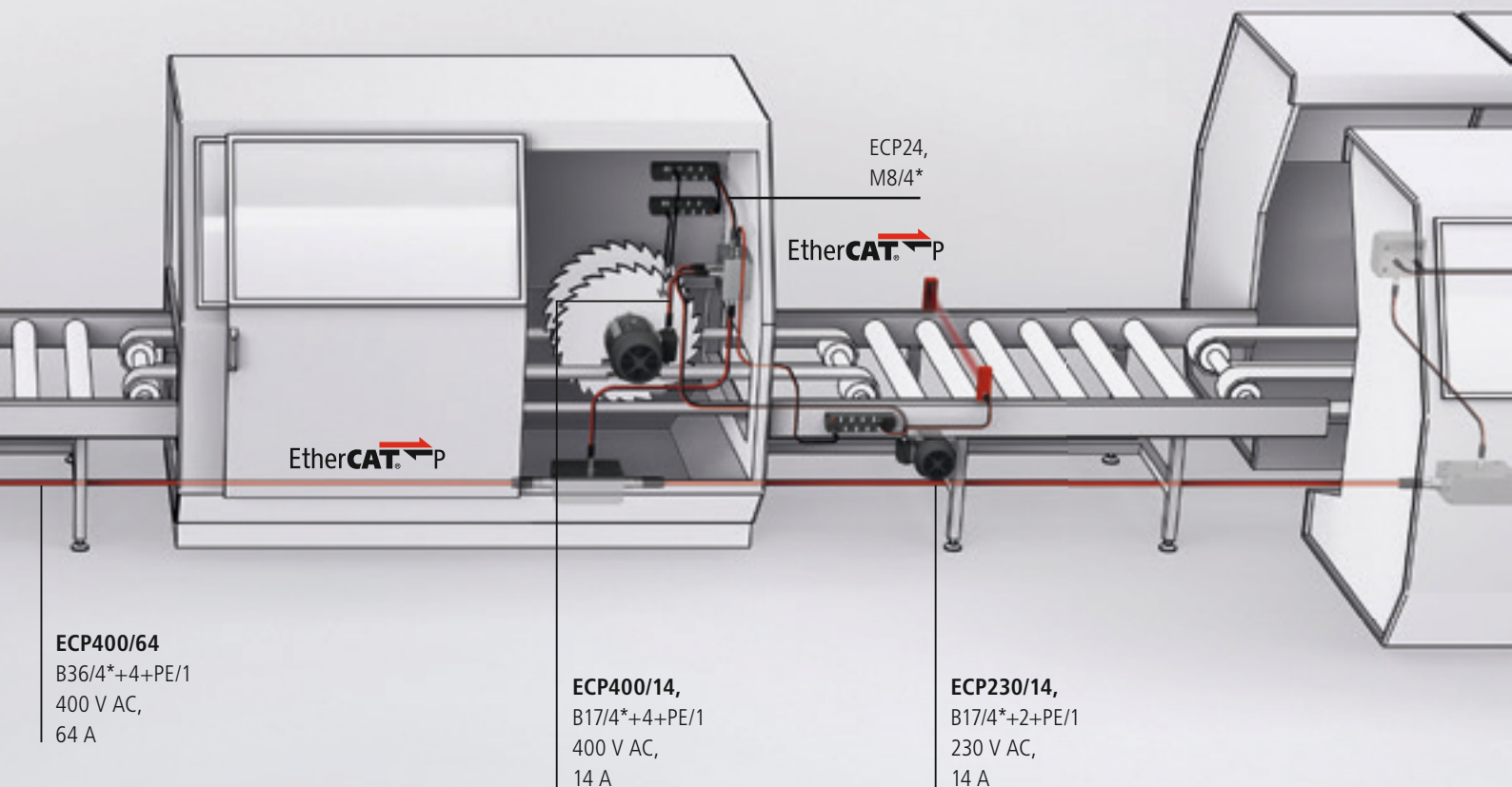
Example: Control cabinet Performance class ECP400/30, size B23, pole number 4 x EtherCAT P + 4 x power + PE, for max. 400 V AC with 30 A



Example: Asynchronous motor with frequency converter Performance class ECP230/14, size B17, pole number 4 x EtherCAT P + 2 x power + PE, for max. 230 V AC with 14 A



One Cable Automation for the field level



- 1 Connector family
- 2 Performance class
- 3 Operating voltage in volts
- 4 Rated current in amps
- 5 Size

- 6 Number of pins in the EtherCAT P element with EtherCAT + 2 x 24 V DC/3 A (U_P , U_S)
- 7 Number of power pins
- 8 PE (optionally according to performance class)
- 9 Keying

*EtherCAT plus 2 x 24 V DC/3 A (U_P , U_S)

Example: Stepper with controller

Performance class ECP48/10, size B12, pole number 4 x EtherCAT P + 2 x power, for max. 48 V DC with 10 A



Example: Sensor Performance class ECP24, size M8, pole number 4 x EtherCAT P



- Consistent connector system
- Performance class ECPxxx/xx with specification of the operating voltage and the rated current
- Size Bxx with specification of the EtherCAT P pins, power pins and keying

Highlights, advantages and technical data

EtherCAT[®]  P



- One Cable Connection: EtherCAT plus 2 x 24 V DC (U_P , U_S) on just 4 wires
- Daisy-chained power supply through EtherCAT P devices
- Reduced material and assembly costs
- Plug family ideally scalable from 24 V to 600 V and 64 A
- Lowered connection costs with outstanding EtherCAT performance
- Flexible network topology of EtherCAT is retained
- Elimination of separate supply cables
- Reduction of error sources
- Minimised wiring
- Optimised space utilisation
 - For drag-chains
 - In the control cabinet
 - Of cable trays
 - Of the machine
- Smaller sensors and actuators due to:
 - Elimination of the separate power supply
 - Devices with a single M8 plug are possible
 - Very small connection footprint



- Nominal voltages 2 x 24 V DC according to IEC 61131 (-15 %/+20 %), max. 3 A for U_s (system and sensor supply) and U_p (peripheral voltage for actuators)
 - The value may fall below the lower limit of -15 %, if the application and the EtherCAT P slaves permit this.
 - Incorrect connection is prevented due to the new EtherCAT-P-coded M8 plugs.
- No pure point-to-point connection, as in PoE, but cascable in all topology variants
- Tool-based system design, therefore minimised material and system costs
- Tool-based calculation of currents and voltages, resulting in optimum design and distribution of feed-in points
- Based on two-pair standard Ethernet CAT5 cable
- 100 Mbit/s full-duplex EtherCAT right into the sensor/actuator
- EtherCAT process data scalable from 1 bit to 64 kbyte per device
- Up to 65,535 devices cascable in a network
- Cycle times < 100 µs
- Distributed clocks enable high-precision synchronisation << 1 µs.
- Dynamic process data processing

One connector system for all applications

Sizes (Bxx)

- Complete product family with different sizes: B12, B17, B23 and B36
- Uniform EtherCAT P element for all sizes B12...B36
- Seamless and consistent 360° shielding



Contact versions

- Different number of power pins per size
 - 2 (size B12)
 - 2 + PE (size B17)
 - 3 + PE (size B17)
 - 4 + PE (size B17...B36)
 - 5 + PE (size B23, B36) (not shown)



Ethernet version (ENPxxx)

- Version for Industrial Ethernet
- Trapezoidal element inverse to EtherCAT P version (ECPxxx)
- Protection against incorrect connection



Visual marking

- Visual marking with coloured rings possible
- Exchangeable



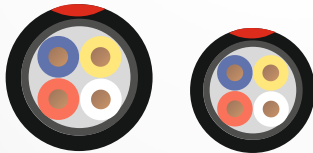
Mechanical keying

- Flexible and uniform mechanical keying across all sizes
- Mechanical keying position (2 to 3 keying positions available, depending on size and number of poles)



EtherCAT P cable for size M8

- Cable configuration (1 x 4 x AWG22) and (1 x 4 x AWG24)
- Reduced cable diameter for AWG24 cables
- Reduced bending radius for one-time fixed installation 4.5 x outer diameter
- Drag-chain suitable



EtherCAT P cable for sizes B12 and B17

- Cable configuration:
 - 2 x 0.75 mm² + (1 x 4 x AWG22)
 - 3 G 1,5 mm² + (1 x 4 x AWG22)
 - 5 G 1,5 mm² + (1 x 4 x AWG22)
- Reduced bending radius for one-time fixed installation 4 x outer diameter
- Drag-chain suitable
- Fully shielded versions possible
- Less filling material, therefore simplified handling during field assembly of connectors



Connectors for field assembly

- Simplified installation based on the poka-yoke principle
- Simple and safe assembly at the machine:
 - Cables can be connected without wiring plan.
 - Cables can be prepared and assembled without having to attach connector parts.

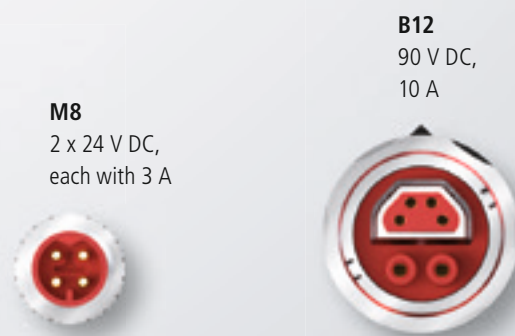


Vertical flange

- Flange socket with standard flange dimensions
 - Front assembly
 - Rear assembly
 - PCB assembly
- Angled versions



One connector system for all applications



Size M8 | EtherCAT P

Technical data	ECP24	ECP48
Operating voltage	24 V DC	48 V DC
Size	M8	M8
Key	1	2
EtherCAT P pins	4	4
Power pins	–	–
Locking	screwed	screwed
System voltage	24 V DC	24 V DC
Peripheral voltage	24 V DC	48 V DC
Rated current at 40 °C	3 A	3 A
Transmission characteristics	CAT5 (IEC 11801:2002), 100 Mbit/s	CAT5 (IEC 11801:2002), 100 Mbit/s
Rated impulse voltage	0.8 kV	0.8 kV

Size B12 | Power connector with EtherCAT P element*

Technical data	ECP24/10	ECP48/10
Operating voltage	24 V DC	48 V DC
Size	B12	B12
Key	1	2
EtherCAT P pins	4	4
Power pins	2	2
Locking	bayonet	bayonet
Rated current at 40 °C	10 A	10 A
Rated voltage DC	90 V DC	90 V DC
Rated voltage AC	–	–
Max. connection cross-section	0.75 mm ²	0.75 mm ²
Rated impulse voltage	1.5 kV	1.5 kV

B17

630 V AC/
850 V DC, 14 A

**B23**

630 V AC/
850 V DC, 30 A

**B36**

630 V AC/
850 V DC, 64 A



Size B17 | Power connector with EtherCAT P element*

Technical data	ECP230/14	ECP400/14	ECP600/14
Operating voltage	230 V AC	400 V AC	600 V DC
Size	B17	B17	B17
Key	1	1	2
EtherCAT P pins	4	4	4
Power pins	2 + PE	4 + PE	4 + PE
Locking	bayonet	bayonet	bayonet
Rated current at 40 °C	14 A	14 A	14 A
Rated voltage DC	850 V DC	850 V DC	850 V DC
Rated voltage AC	630 V AC	630 V AC	630 V AC
Max. connection cross-section	1.5 mm ²	1.5 mm ²	1.5 mm ²
Rated impulse voltage	6 kV	6 kV	6 kV

Size B23, B36 | Power connector with EtherCAT P element*

Technical data	ECP400/30	ECP600/30	ECP400/64	ECP600/64
Operating voltage	400 V AC	600 V DC	400 V AC	600 V DC
Size	B23	B23	B36	B36
Key	1	2	1	2
EtherCAT P pins	4	4	4	4
Power pins	4 + PE	4 + PE	4 + PE	4 + PE
Locking	bayonet	bayonet	bayonet	bayonet
Rated current at 40 °C	30 A	30 A	64 A	64 A
Rated voltage DC	850 V DC	850 V DC	850 V DC	850 V DC
Rated voltage AC	630 V AC	630 V AC	630 V AC	630 V AC
Max. connection cross-section	4 mm ²	4 mm ²	10 mm ²	10 mm ²
Rated impulse voltage	6 kV	6 kV	6 kV	6 kV

*Technical data of the EtherCAT P element see ECP24

i EK13xx | EtherCAT P products in IP 20

The EK13xx EtherCAT P Couplers in IP 20 enable EtherCAT P to be used from the control cabinet right to the machine.

EK1300 | EtherCAT P Coupler

The EK1300 coupler integrates EtherCAT Terminals (ELxxxx) in the EtherCAT P network. The upper EtherCAT P interface is used to connect the coupler to the network, the lower EtherCAT-P-coded M8 socket is used for optional continuation of the EtherCAT P topology. Since EtherCAT P integrates the power supply and the communication on a single line, an additional power supply for the coupler via the terminal points is no longer required. Depending on the application, the system and sensor supply U_S or the peripheral voltage for actuators U_P can be bridged to the power contacts. In addition to the Run LED and the link and activity status, status LEDs indicate the state of the U_S and U_P voltages, as well as overload and short-circuit events.

EK1322 | 2-port EtherCAT P junction with feed-in

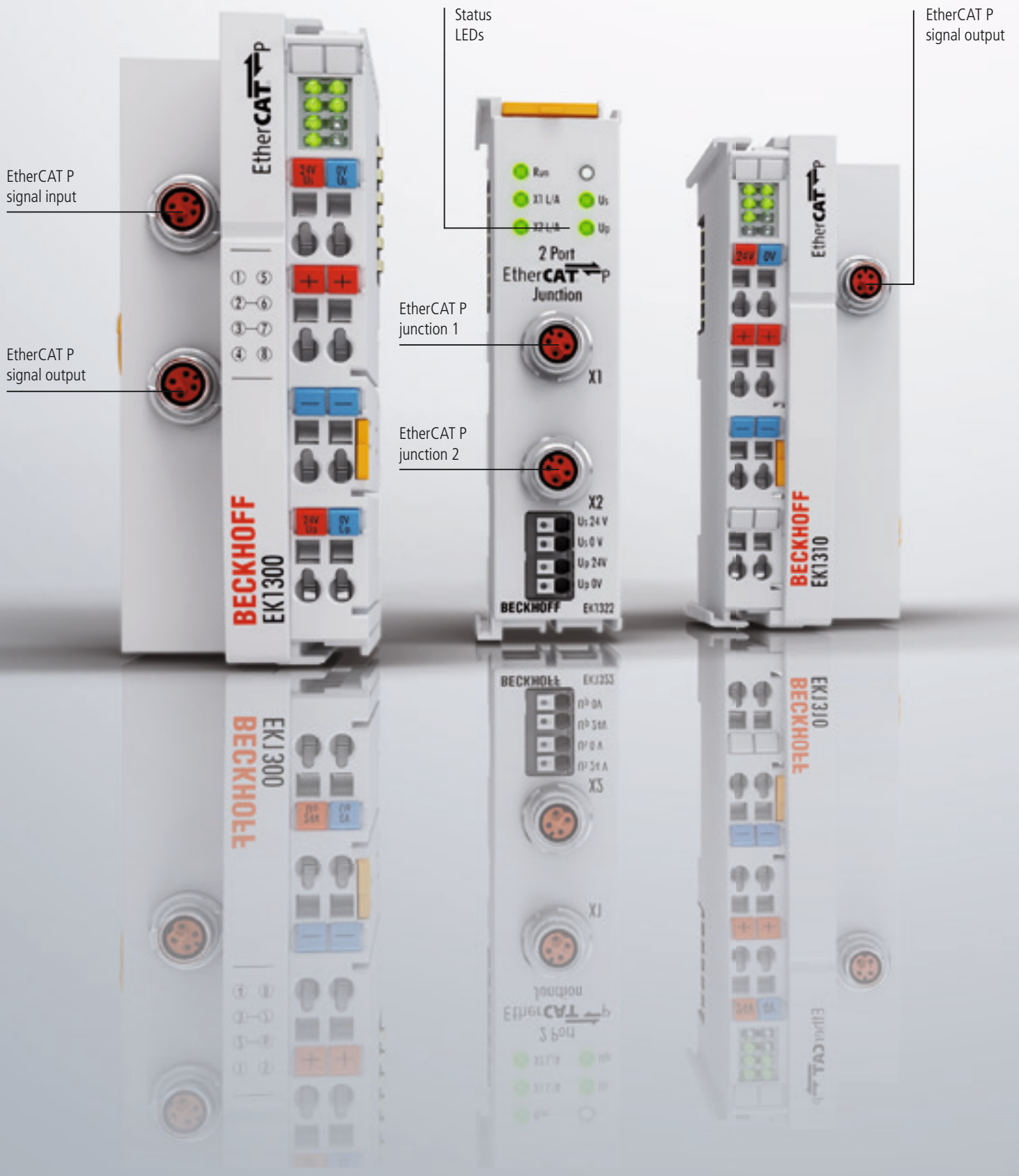
The 2-port EK1322 EtherCAT P junction enables configuration of EtherCAT P star topologies. The ports can be used to connect individual EtherCAT P devices or whole EtherCAT P strands. The EK1322 can be installed at any point in an EtherCAT strand between the EtherCAT Terminals (ELxxxx). The front terminal points are used for the system and sensor supply U_S and the peripheral voltage for actuators U_P for the EtherCAT P outputs. In addition to the Run LED and the link and activity status of the respective port, two status LEDs indicate the state of the U_S and U_P voltages, as well as overload and short-circuit events.

EK1310 | 1-port EtherCAT P extension with feed-in

The EK1310 EtherCAT P feed-in unit enables conversion from EtherCAT to EtherCAT P or extension of an EtherCAT P network. Terminal points are used to supply the U_S (system and sensor supply) and the U_P (peripheral voltage for actuators) for the EtherCAT P circuit. In addition to the Run LED and the link and activity status, status LEDs indicate the state of the U_S and U_P voltages, as well as overload and short-circuit events.

Technical data	EK1300	EK1322	EK1310
Task within EtherCAT system	coupling of EtherCAT Terminals (ELxxxx) to 100BASE-TX EtherCAT P networks	coupling of EtherCAT P junctions	conversion of the E-bus signals to 100BASE-TX Ethernet for extension of the EtherCAT P network
Data transfer medium	EtherCAT P cable, shielded, to 100BASE-TX EtherCAT P networks		
Bus interface	2 x M8 socket, shielded, screw type, EtherCAT-P-coded	2 x M8 socket, shielded, screw type, EtherCAT-P-coded	1 x M8 socket, shielded, screw type, EtherCAT-P-coded
Power supply	from EtherCAT P (24 V DC for U_S and U_P)	external supply: 24 V DC for U_S and U_P	external supply: 24 V DC for U_S and U_P
Total current	from EtherCAT P, max. 3 A per U_S and U_P	max. 3 A per U_S and U_P	max. 3 A per U_S and U_P
Current consumption from U_S	70 mA + (Σ E-bus current/4)	typ. 4 mA	typ. 4 mA
Current consumption from U_P	—		
Current rating per port	max. 3 A per U_S and U_P		
Current consumption E-bus	—	typ. 220 mA	typ. 130 mA
Operating/storage temperature	0...+55 °C/-25...+85 °C		
Approvals	CE		
Protect. class/installation pos.	IP 20/variable		
Further information	www.beckhoff.com/EK1300	www.beckhoff.com/EK1322	www.beckhoff.com/EK1310

i **Product announcement** for availability status see www.beckhoff.com



EPPxxxx | EtherCAT P Box modules in IP 67



The new EPPxxxx EtherCAT P box system offers significant savings opportunities in automation technology. The combination of communication and power through the integration of U_S (system and sensor supply) and U_P (peripheral voltage for actuators) in the EtherCAT line results in even more freedom in terms of system design:

- No power cable is required, i.e. only the EtherCAT P line has to be laid.
- Material and labour time are saved, while

valuable space is gained in the drag-chain.

- The system wiring becomes more transparent, despite offering more flexibility.

All the unique EtherCAT properties are included: outstanding performance, customisable topology and simple configuration. From a control perspective, the EtherCAT P Box modules behave exactly like the EtherCAT Box modules (EPxxxx). The communication can easily switch between EtherCAT and EtherCAT P, as required, as long as the input or output requi-

rements of U_S and U_P are observed. The tried and tested design of the modules, which are made of robust plastic and are fully sealed, enables them to be used directly at the machine, even in wet, dirty or dusty conditions. Control cabinets, terminal boxes and power leads are no longer required. Visually, the only differences between the EPP modules with otherwise identical dimensions and the EP modules are the red EtherCAT-P-coded M8 sockets and the lack of power supply.

EtherCAT[®] P



Pre-assembled cables simplify the EtherCAT P and signal wiring significantly. Very few wiring errors are made, so that commissioning is optimised. In addition to pre-assembled red/black EtherCAT P and standard sensor cables, field-configurable connectors and cable material are available for maximum flexibility. Depending on the application, the sensors and actuators are connected via M8 or M12 screw-type connectors or D-sub connectors, just like for the EtherCAT Box.

The EtherCAT P Box modules cover the typical range of requirements for IP 67 I/O signals: digital inputs with different filters (3.0 ms or 10 µs), digital outputs with 0.5 A output current, combination modules with digital inputs and outputs, analog inputs and outputs with 16-bit resolution, as well as thermocouple and RTD inputs. In addition, various EtherCAT P Box modules are available for system tasks such as encoder inputs or serial interfaces.

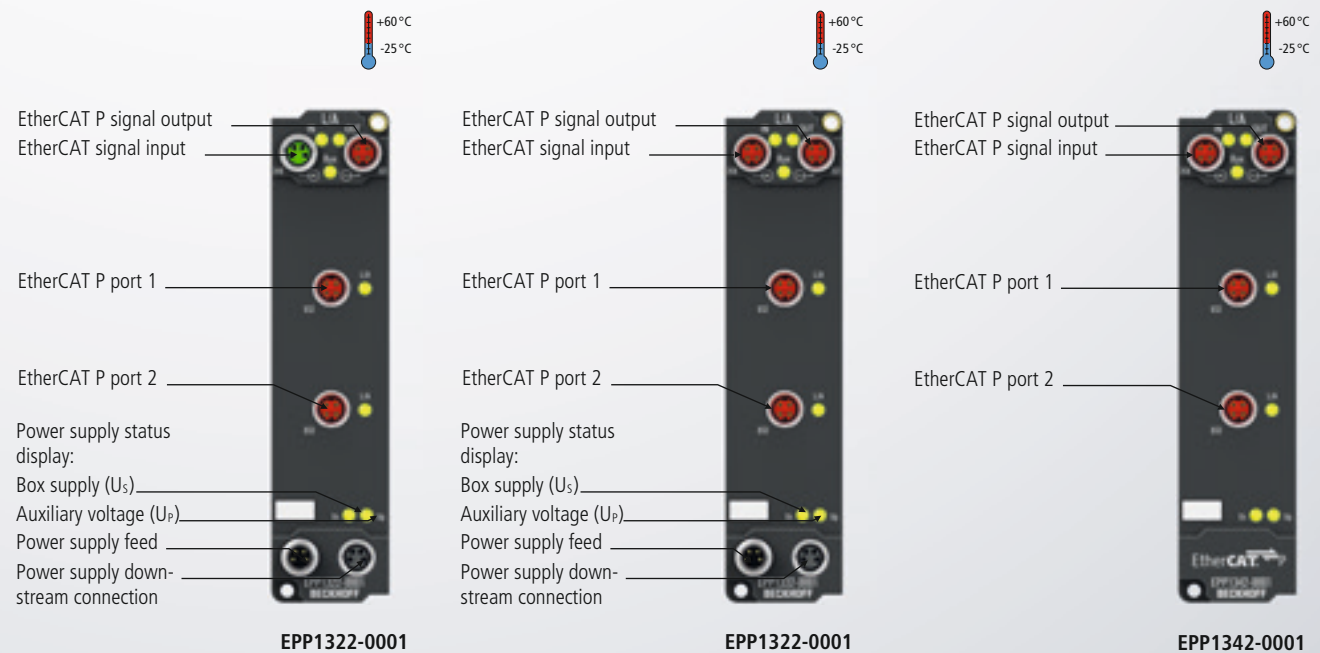


+60 °C
-25 °C

The EtherCAT P Box modules are qualified for the extended temperature range of -25 to +60 °C (storage temperature -40 to +85 °C).

► www.beckhoff.com/EPPxxxx

EPP13xx | EtherCAT P junctions



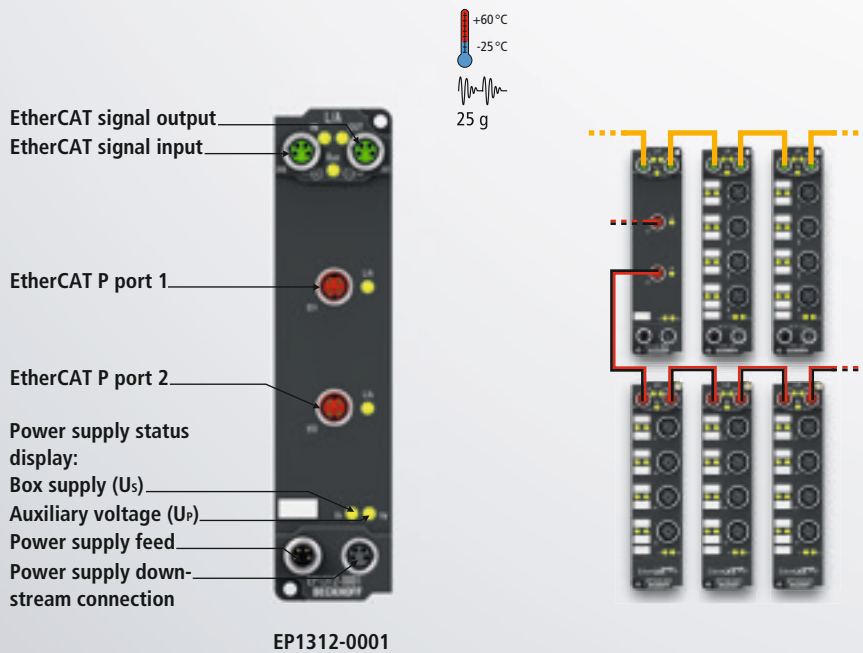
The EK13xx EtherCAT P Couplers in IP 20 or the EPP1322-0001 EtherCAT P junction in IP 67 are available for flexible topology configurations. The current carrying capacity of 3 A per EtherCAT P segment for U_s and U_p already enables a wide

range of sensors and actuators to be used. For larger or more branched machines/systems a power supply boost may be required. The EPP1332-0001 EtherCAT P junction with refresh feature can be used for feeding in U_s or U_p at any point in the

system. The EPP1342-0001 should be used for branches without the need for voltage boosting. All infrastructure box modules feature status LEDs for EtherCAT, U_s and U_p .

Technical data	EPP1322-0001	EPP1332-0001	EPP1342-0001
Task within EtherCAT system	coupling to the EtherCAT network, EtherCAT P junction and supply of U_s and U_p	3-port EtherCAT P junction and refresh of U_s and U_p	3-port EtherCAT P junction
Number of channels	IN: 1 x EtherCAT, OUT: 3 x EtherCAT P	IN: 1 x EtherCAT P, OUT: 3 x EtherCAT P	IN: 1 x EtherCAT P, OUT: 3 x EtherCAT P
Bus interface	2 x M8 socket, shielded, screw type, EtherCAT-P-coded		
Nominal voltage	24 V DC (-15 %/+20 %)		
Total current	supply max. 4 A per U_s and U_p		
Current consumption from U_s	typ. 120 mA + current of the EtherCAT P ports		
Current rating per port	max. 3 A per U_s and U_p		
Power supply connection	feed: 1 x M8 male socket, 4-pin; downstream connection: 1 x M8 female socket, 4-pin	feed: 1 x M8 male socket, 4-pin; downstream connection: 1 x M8 female socket, 4-pin	not necessary
Operating/storage temperature	-25...+60 °C/-40...+85 °C		
Vibration/shock resistance	conforms to EN 60068-2-6/EN 60068-2-27		
EMC immunity/emission	conforms to EN 61000-6-2/EN 61000-6-4		
Protect. class/installation pos.	IP 65/66/67 (conforms to EN 60529)/variable		
Approvals	CE		
Further information	www.beckhoff.com/EPP1322	www.beckhoff.com/EPP1332	www.beckhoff.com/EPP1342

i EP1312-0001 | 2-port EtherCAT P junction



The 2-port EtherCAT P junction enables configuration of EtherCAT P topologies from an EtherCAT system. A modular EtherCAT P star can be realised by using several EP1312 in series. Individual devices

or complete EtherCAT P strands can be connected at the junction ports. The EtherCAT P junctions are connected via shielded, screw type EtherCAT-P-coded M8 connectors with direct display of link and

activity status. The Run LED indicates the status of the EP1312.

Technical data	EP1312-0001
Task within EtherCAT system	coupling of EtherCAT P junctions
Number of channels	IN: 1 x EtherCAT, OUT: 1 x EtherCAT, 2 x EtherCAT P
Bus interface	2 x M8 socket, shielded, screw type, 2 x EtherCAT-P-coded M8 socket, screw type
Nominal voltage	24 V DC (-15 %/+20 %)
Total current	feed-in max. 4 A per U_S and U_P
Current consumption from U_S	typ. 120 mA + current of the EtherCAT P ports
Current rating per port	max. 3 A per U_S and U_P
Power supply connection	feed: 1 x M8 male socket, 4-pin; downstream connection: 1 x M8 female socket, 4-pin
Operating/storage temperature	-25...+60 °C/-40...+85 °C
Vibration/shock resistance	conforms to EN 60068-2-6/EN 60068-2-27
EMC immunity/emission	conforms to EN 61000-6-2/EN 61000-6-4
Protect. class/installation pos.	IP 65/66/67 (conforms to EN 60529)/variable
Approvals	CE
Further information	www.beckhoff.com/EP1312

i **Product announcement** estimated market release 3rd quarter 2016

EPPxxxx | EtherCAT P Box modules

Ordering information		Plug
Digital input		
EPP1008-0001	EtherCAT P Box, industrial housing, 8-channel digital input 24 V DC, 3.0 ms	8 x M8
EPP1008-0002	EtherCAT P Box, industrial housing, 8-channel digital input 24 V DC, 3.0 ms	4 x M12
EPP1008-0022	EtherCAT P Box, industrial housing, 8-channel digital input 24 V DC, 3.0 ms	8 x M12
EPP1018-0001	EtherCAT P Box, industrial housing, 8-channel digital input 24 V DC, 10 µs	8 x M8
EPP1018-0002	EtherCAT P Box, industrial housing, 8-channel digital input 24 V DC, 10 µs	4 x M12
EPP1258-0001	EtherCAT P Box, industrial housing, 8-channel digital input with 2-channel timestamp	8 x M8
EPP1258-0002	EtherCAT P Box, industrial housing, 8-channel digital input with 2-channel timestamp	4 x M12
EPP1518-0002	EtherCAT P Box, industrial housing, 2-channel up/down counter 24 V DC, 1 kHz, 32 bit, adjustable input filters 0...100 ms	4 x M12
EPP1809-0021	EtherCAT P Box, industrial housing, 16-channel digital input 24 V DC, 3.0 ms	16 x M8
EPP1809-0022	EtherCAT P Box, industrial housing, 16-channel digital input 24 V DC, 3.0 ms	8 x M12
EPP1816-0008	EtherCAT P Box, industrial housing, 16-channel digital input 24 V DC, 10 µs	D-sub, 25-pin
EPP1816-3008	EtherCAT P Box, industrial housing, 16-channel digital input 24 V DC, 10 µs, 2 x 3-axis accelerometers, 16 bit	D-sub, 25-pin
EPP1819-0021	EtherCAT P Box, industrial housing, 16-channel digital input 24 V DC, 10 µs	16 x M8
EPP1819-0022	EtherCAT P Box, industrial housing, 16-channel digital input 24 V DC, 10 µs	8 x M12
Digital output		
EPP2008-0001	EtherCAT P Box, industrial housing, 8-channel digital output 24 V DC, $I_{MAX} = 0.5$ A	8 x M8
EPP2008-0002	EtherCAT P Box, industrial housing, 8-channel digital output 24 V DC, $I_{MAX} = 0.5$ A	4 x M12
EPP2008-0022	EtherCAT P Box, industrial housing, 8-channel digital output 24 V DC, $I_{MAX} = 0.5$ A	8 x M12
EPP2028-0001	EtherCAT P Box, industrial housing, 8-channel digital output 24 V DC, $I_{MAX} = 2$ A (Σ 4 A)	8 x M8
EPP2028-0002	EtherCAT P Box, industrial housing, 8-channel digital output 24 V DC, $I_{MAX} = 2$ A (Σ 4 A)	4 x M12
EPP2038-0001	EtherCAT P Box, industrial housing, 8-channel digital output 24 V DC, $I_{MAX} = 2$ A (Σ 4 A), with diagnostics	8 x M8
EPP2038-0002	EtherCAT P Box, industrial housing, 8-channel digital output 24 V DC, $I_{MAX} = 2$ A (Σ 4 A), with diagnostics	4 x M12
EPP2624-0002	EtherCAT P Box, industrial housing, 4-channel relay output 25 V AC/30 V DC	4 x M12
EPP2809-0021	EtherCAT P Box, industrial housing, 16-channel digital output 24 V DC, $I_{MAX} = 0.5$ A	16 x M8
EPP2809-0022	EtherCAT P Box, industrial housing, 16-channel digital output 24 V DC, $I_{MAX} = 0.5$ A	8 x M12
EPP2816-0004	EtherCAT P Box, industrial housing, 16-channel digital output 24 V DC, $I_{MAX} = 0.5$ A	M16, 19-pin
EPP2816-0008	EtherCAT P Box, industrial housing, 16-channel digital output 24 V DC, $I_{MAX} = 0.5$ A	D-sub, 25-pin
EPP2816-0010	EtherCAT P Box, industrial housing, 16-channel digital output 24 V DC, $I_{MAX} = 0.5$ A	2 x D-sub, 9-pin
EPP2817-0008	EtherCAT P Box, industrial housing, 24-channel digital output 24 V DC, $I_{MAX} = 1.0$ A	D-sub, 25-pin
Digital combi		
EPP2308-0001	EtherCAT P Box, industrial housing, 4 digital inputs 24 V DC, 3.0 ms, 4 digital outputs 24 V DC, $I_{MAX} = 0.5$ A	8 x M8
EPP2308-0002	EtherCAT P Box, industrial housing, 4 digital inputs 24 V DC, 3.0 ms, 4 digital outputs 24 V DC, $I_{MAX} = 0.5$ A	4 x M12
EPP2316-0003	EtherCAT P Box, industrial housing, 8 digital inputs 24 V DC, 10 µs, 8 digital outputs 24 V DC, $I_{MAX} = 0.5$ A	IP 20 connector
EPP2316-0008	EtherCAT P Box, industrial housing, 8 digital inputs 24 V DC, 10 µs, 8 digital outputs 24 V DC, $I_{MAX} = 0.5$ A	D-sub, 25-pin
EPP2318-0001	EtherCAT P Box, industrial housing, 4 digital inputs 24 V DC, 10 µs, 4 digital outputs 24 V DC, $I_{MAX} = 0.5$ A	8 x M8
EPP2318-0002	EtherCAT P Box, industrial housing, 4 digital inputs 24 V DC, 10 µs, 4 digital outputs 24 V DC, $I_{MAX} = 0.5$ A	4 x M12
EPP2328-0001	EtherCAT P Box, industrial housing, 4 x digital input and 4 x digital output 24 V DC, $I_{MAX} = 2$ A (Σ 4 A)	8 x M8
EPP2328-0002	EtherCAT P Box, industrial housing, 4 x digital input and 4 x digital output 24 V DC, $I_{MAX} = 2$ A (Σ 4 A)	4 x M12
EPP2338-0001	EtherCAT P Box, industrial housing, 8 digital inputs 24 V DC, 10 µs, or outputs 24 V DC, $I_{MAX} = 0.5$ A	8 x M8
EPP2338-0002	EtherCAT P Box, industrial housing, 8 digital inputs 24 V DC, 10 µs, or outputs 24 V DC, $I_{MAX} = 0.5$ A	4 x M12
EPP2338-1001	EtherCAT P Box, industrial housing, 8 digital inputs 24 V DC, 3.0 ms, or outputs 24 V DC, $I_{MAX} = 0.5$ A	8 x M8
EPP2338-1002	EtherCAT P Box, industrial housing, 8 digital inputs 24 V DC, 3.0 ms, or outputs 24 V DC, $I_{MAX} = 0.5$ A	4 x M12
EPP2339-0021	EtherCAT P Box, industrial housing, 16 digital inputs 24 V DC, 3.0 ms, or outputs 24 V DC, $I_{MAX} = 0.5$ A	16 x M8
EPP2339-0022	EtherCAT P Box, industrial housing, 16 digital inputs 24 V DC, 3.0 ms, or outputs 24 V DC, $I_{MAX} = 0.5$ A	8 x M12
EPP2349-0021	EtherCAT P Box, industrial housing, 16 digital inputs 24 V DC, 10 µs, or outputs 24 V DC, $I_{MAX} = 0.5$ A	16 x M8
EPP2349-0022	EtherCAT P Box, industrial housing, 16 digital inputs 24 V DC, 10 µs, or outputs 24 V DC, $I_{MAX} = 0.5$ A	8 x M12

Analog input		
EPP3174-0002	EtherCAT P Box, industrial housing, 4 analog inputs ± 10 V or 0/4...20 mA, parameterisable, differential input, 16 bit	4 x M12
EPP3184-0002	EtherCAT P Box, industrial housing, 4 analog inputs ± 10 V or 0/4...20 mA, parameterisable, single-ended, 16 bit	4 x M12
EPP3204-0002	EtherCAT P Box, industrial housing, 4 analog inputs for resistance thermometers (RTD), PT100...1000, Ni100, 16 bit	4 x M12
EPP3314-0002	EtherCAT P Box, industrial housing, 4 analog inputs thermocouple	4 x M12
EPP3744-0041	EtherCAT P Box, industrial housing, 6 digital inputs 24 V DC, 10 μ s, 2 digital outputs, 24 V DC, $I_{MAX} = 0.5$ A, 4 pressure inputs 0...1 bar, pressure measurement: 6 mm fitting	4 x M8
EPP3744-1041	EtherCAT P Box, industrial housing, 6 digital inputs 24 V DC, 10 μ s, 2 digital outputs, 24 V DC, $I_{MAX} = 0.5$ A, 4 pressure inputs 0...7 bar, pressure measurement: 6 mm fitting	4 x M8
Analog output		
EPP4174-0002	EtherCAT P Box, industrial housing, 4 analog outputs ± 10 V or 0/4...20 mA, parameterisable, 16 bit	4 x M12
EPP4374-0002	EtherCAT P Box, industrial housing, 2 analog inputs + 2 analog outputs ± 10 V or 0/4...20 mA, parameterisable, 16 bit	4 x M12
Position measurement		
EPP5101-0002	EtherCAT P Box, industrial housing, incremental encoder interface, differential input, 5 V	1 x M12
EPP5101-0011	EtherCAT P Box, industrial housing, incremental encoder interface, differential input, 5 V	D-sub, 15-pin
EPP5101-1002	EtherCAT P Box, industrial housing, incremental encoder interface, differential input, 24 V DC sensor supply	1 x M12
EPP5151-0002	EtherCAT P Box, industrial housing, incremental encoder interface, 24 V DC input	1 x M12
Communication		
EPP6001-0002	EtherCAT P Box, industrial housing, 1 serial interface RS232, RS422/RS485	4 x M12
EPP6002-0002	EtherCAT P Box, industrial housing, 2 serial interfaces RS232, RS422/RS485	4 x M12
Motion		
EPP7041-1002	EtherCAT P Box, industrial housing, Stepper motor module, 50 V DC, 1.5 A, with incremental encoder, 2 digital inputs, 1 digital output	4 x M12
EPP7041-3002	EtherCAT P Box, industrial housing, Stepper Motor module 50 V DC, 5 A, 2 phases, with incremental encoder, 2 digital inputs 24 V DC, 1 digital output 24 V DC, for high speed applications	4 x M12
EPP7342-0002	EtherCAT P Box, industrial housing, 2-channel DC motor output stage 50 V DC, 3.5 A, EtherCAT P Box, IP 67	4 x M12
System		
EPP1111-0000	EtherCAT P Box, industrial housing, with ID switch	

i EPPxxxx-006x | EtherCAT P Box modules

Ordering information		Plug	Pict.
Digital input			
EPP1004-0061	EtherCAT P Box, industrial housing, 4 digital inputs 24 V DC, 3.0 ms	4 x M8	A
Digital combi			
EPP2334-0061	EtherCAT P Box, industrial housing, 4 digital inputs, 24 V DC, 3.0 ms, or outputs 24 V DC, $I_{MAX} = 0.5\text{ A}$	4 x M8	B
System			
EPP9001-0060	EtherCAT P Box, industrial housing, EtherCAT P/EtherCAT, ECP/EC connector with power transmission	—	C
EPP9022-0060	EtherCAT P Box, industrial housing, 2 x diagnostics (U_s , U_r)	—	D



i Product announcement	estimated market release 4 th quarter 2016
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Pre-assembled cables

Accessories for EtherCAT P components include a wide range of cable assemblies. For clarity, the order numbers are listed without cable length information in the following tables.

M8 | EtherCAT P cable for flexible applications

AWG24

Ordering information	Sold by the metre
ZB7001	EtherCAT P cable, shielded, PUR, drag-chain suitable, (1 x 4 x AWG24/7), black with red stripe, OD = 5.2 mm (±0.2 mm)

Ordering information	AWG24 cable, pre-assembled with M8 plug (4-pin/straight), EtherCAT-P-coded, to	Pict.
ZK7001-0100-0xxx	open end	A
ZK7001-0101-0xxx	M8 plug (4-pin/straight), EtherCAT-P-coded	B
ZK7001-0102-0xxx	M8 socket (4-pin/straight), EtherCAT-P-coded	C
i ZK7001-0105-0xxx	M8 flange, socket (4-pin/straight), EtherCAT-P-coded	D

AWG22

Ordering information	Sold by the metre
ZB7000	EtherCAT P cable, shielded, PUR, drag-chain suitable, (1 x 4 x AWG22/7), black with red stripe, OD = 6.5 mm (±0.2 mm)

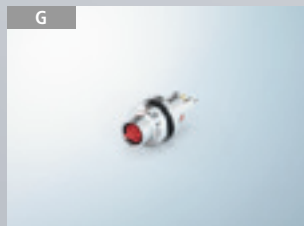
Ordering information	AWG22 cable, pre-assembled with M8 plug (4-pin/straight), EtherCAT-P-coded, to	Pict.
ZK7000-0100-0xxx	open end	A
ZK7000-0101-0xxx	M8 plug (4-pin/straight), EtherCAT-P-coded	B
ZK7000-0102-0xxx	M8 socket (4-pin/straight), EtherCAT-P-coded	C
i ZK7000-0105-0xxx	M8 flange, socket (4-pin/straight), EtherCAT-P-coded	D

M8 | EtherCAT P connectors, field assembly

Ordering information	EtherCAT P connectors IP 65/67	Pict.
ZS7000	M8 plug (4-pin/straight), EtherCAT-P-coded, EtherCAT P, metal version, IP 65/67, OD ≤ 6.5 mm	E
ZS7001	M8 socket (4-pin/straight), EtherCAT-P-coded, EtherCAT P, metal version, IP 65/67, OD ≤ 6.5 mm	F

M8 | EtherCAT P flanges

Ordering information	EtherCAT P flanges	Pict.
ZS7002-0001	EtherCAT P flange, M8 socket (4-pin/straight), EtherCAT-P-coded, rear assembly, PCB contact, soldered connection	



One Cable Automation for the field level:
EtherCAT P. See all information at
► www.beckhoff.com/EtherCATP

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