

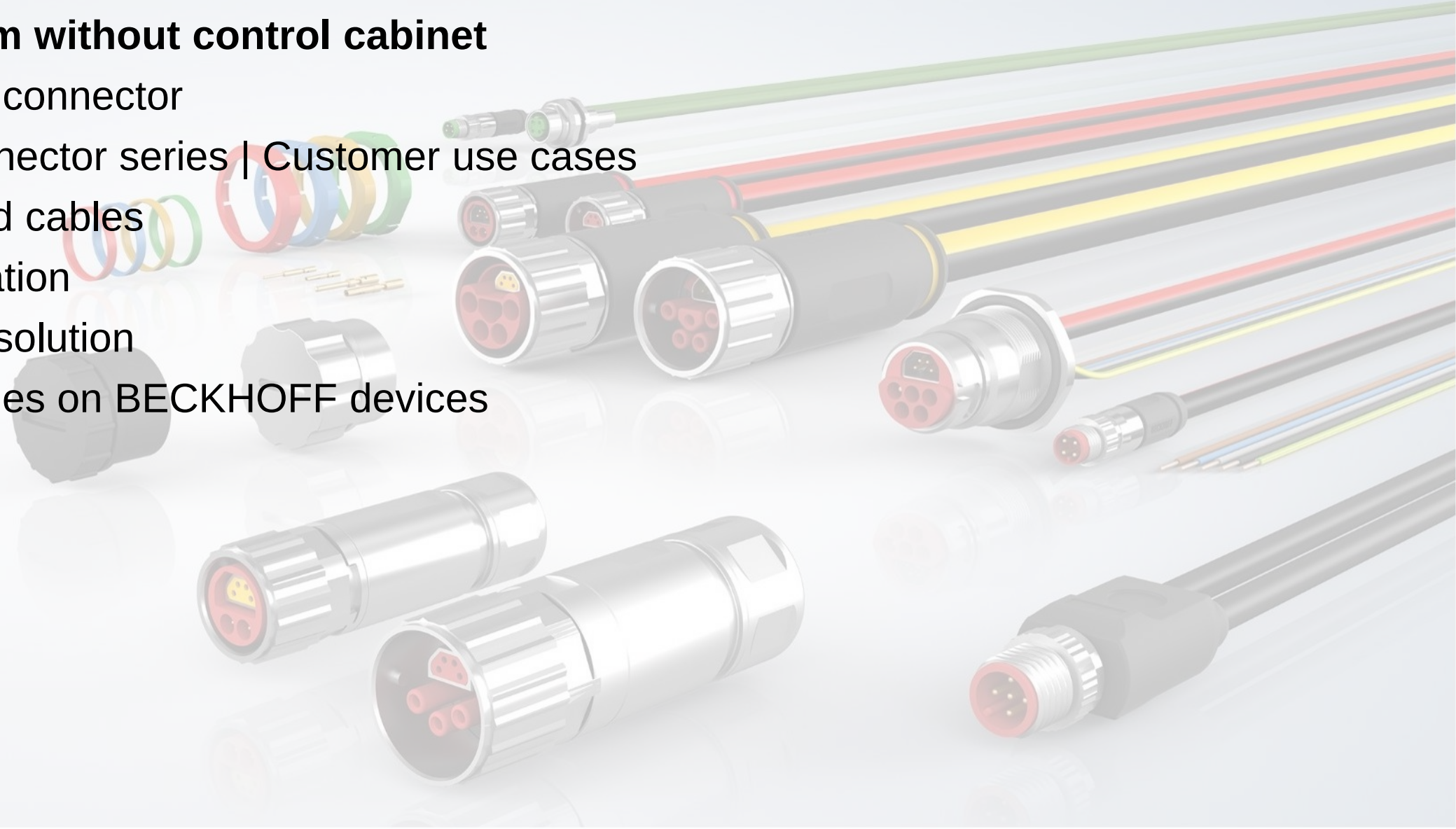




Philipp Bertling

- Apprenticeship as electronics for devices and systems at BECKHOFF Automation GmbH & Co. KG in 2006
- Studying electrical engineering at university in Bielefeld (B.Eng)
- Start working as product manager at BECKHOFF in the I/O Productmanagement in 2014
- Studying technology and innovation management part-time (M.Sc)

1. **The system without control cabinet**
2. The hybrid connector
3. Hybrid connector series | Customer use cases
4. Customized cables
5. Standartization
6. Two cable solution
7. Hybrid cables on BECKHOFF devices



The system without control cabinet

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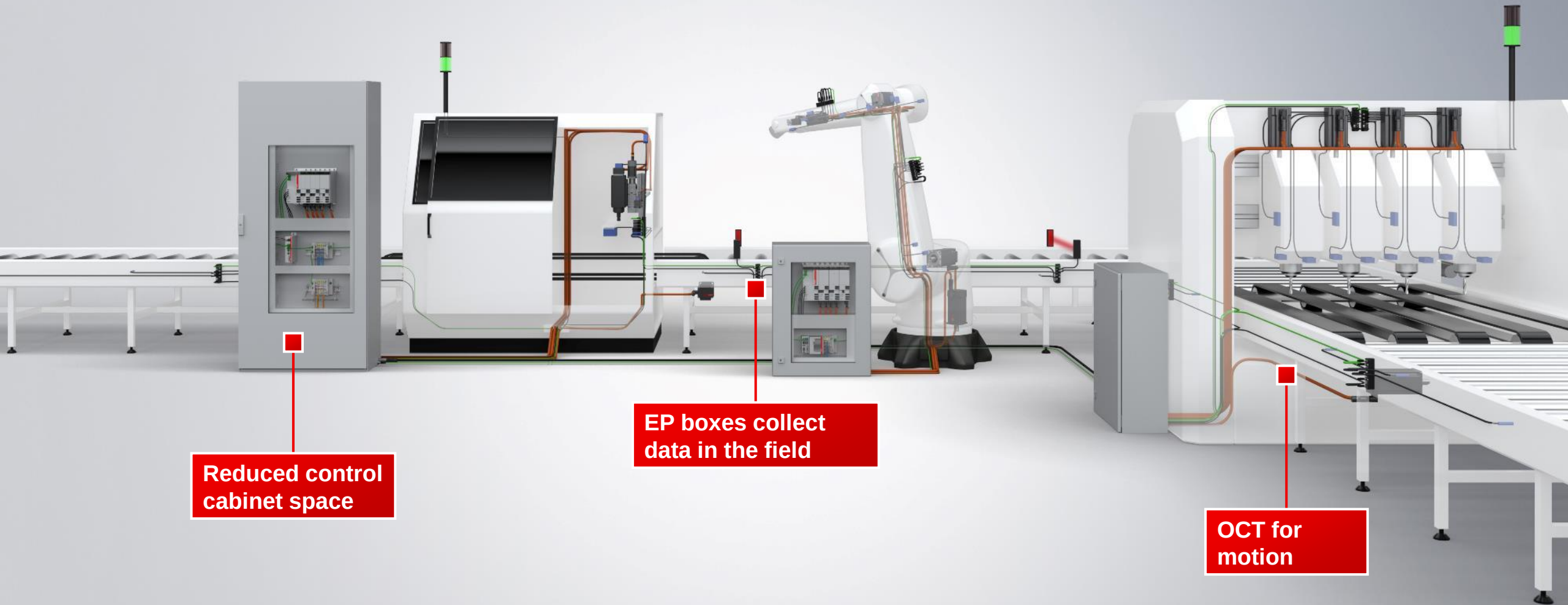


Automation centralized
in large control cabinet

Separate EtherCAT, motion
and power cables

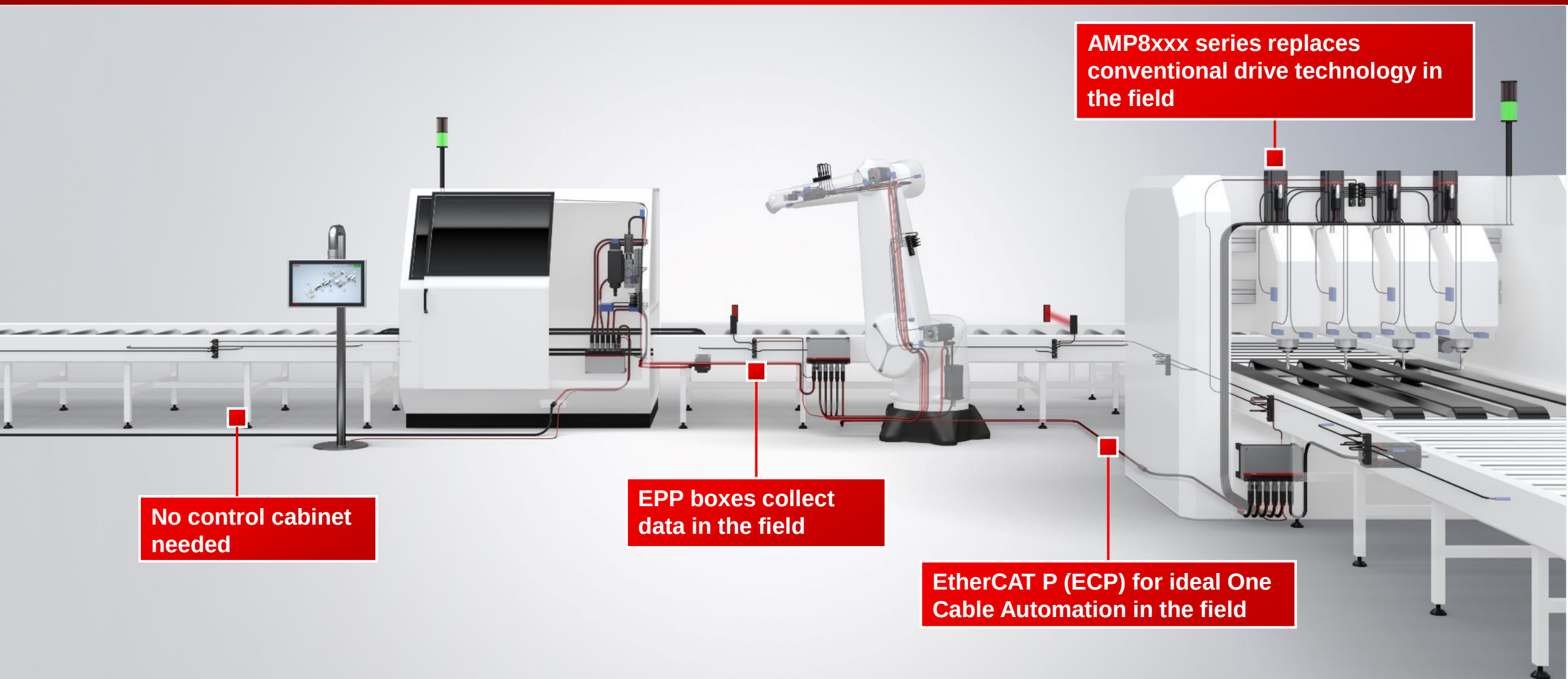
The system without control cabinet

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The system without control cabinet

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AMP8xxx series replaces conventional drive technology in the field

No control cabinet needed

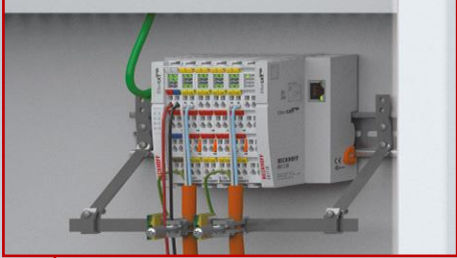
EPP boxes collect data in the field

EtherCAT P (ECP) for ideal One Cable Automation in the field

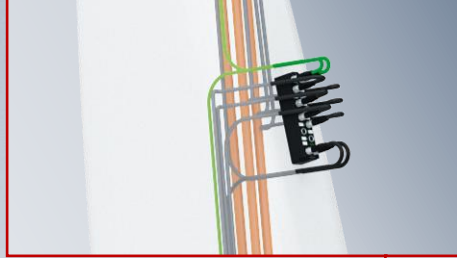
The ideal cabling solution for every system installation

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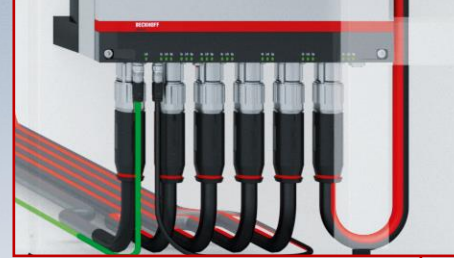
IP 20 shielding
connection in a control
cabinet



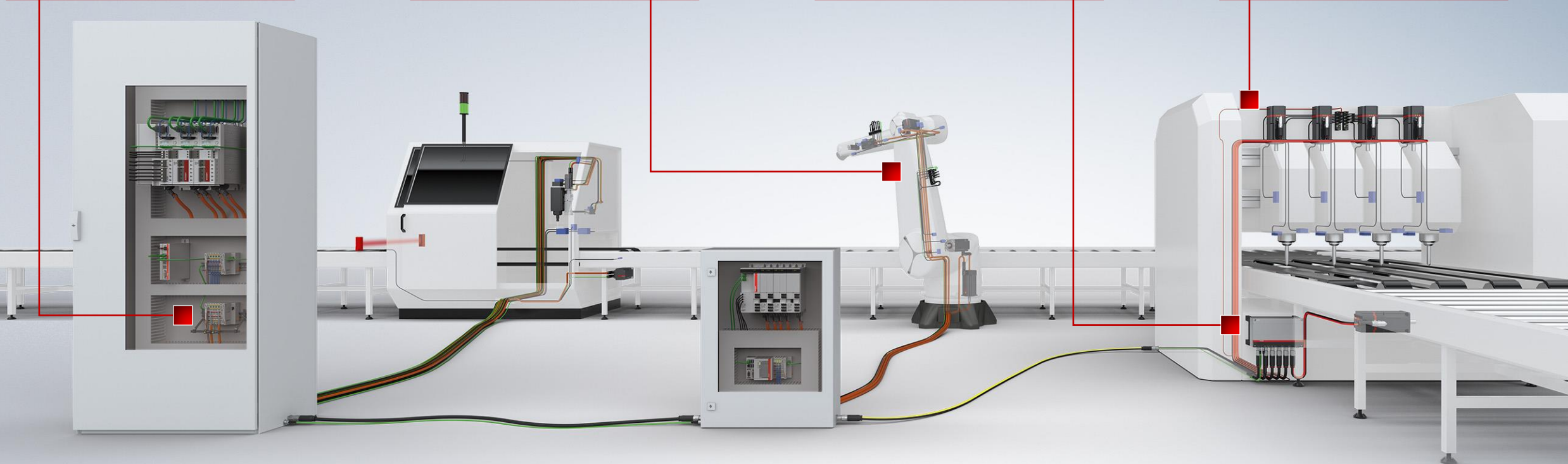
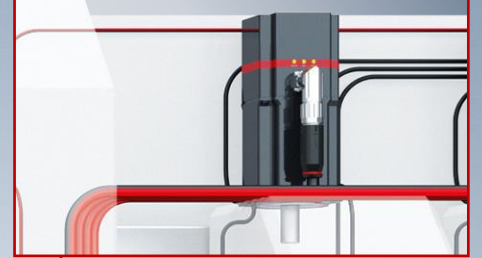
cables for robot appli-
cations to connect
IP 65/67 box modules



hybrid cables for
distributed data and
power transmission



B23 hybrid cable to
connect AMP8000 Servo
Drives



The hybrid connector

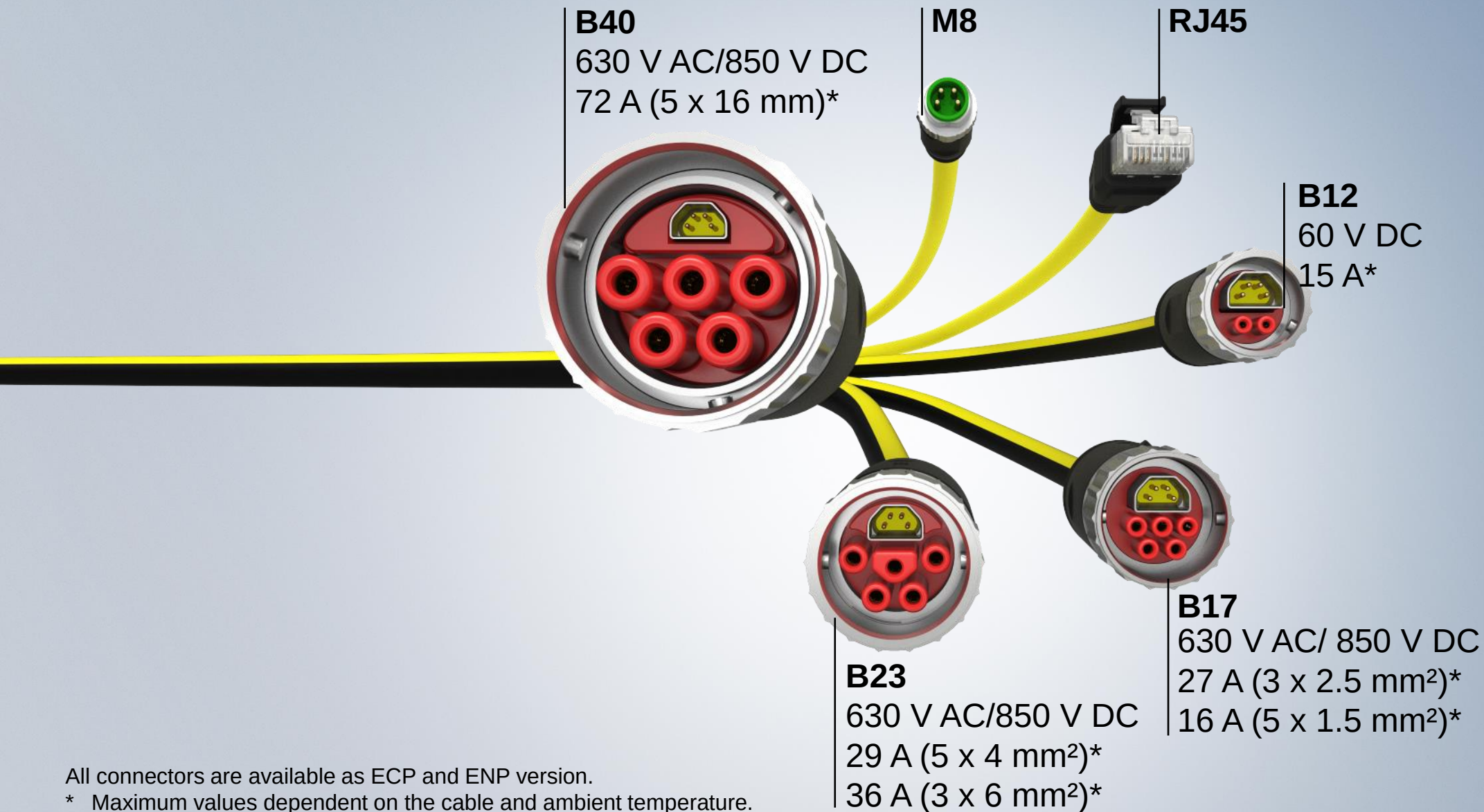
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EtherCAT/Ethernet (ENP)

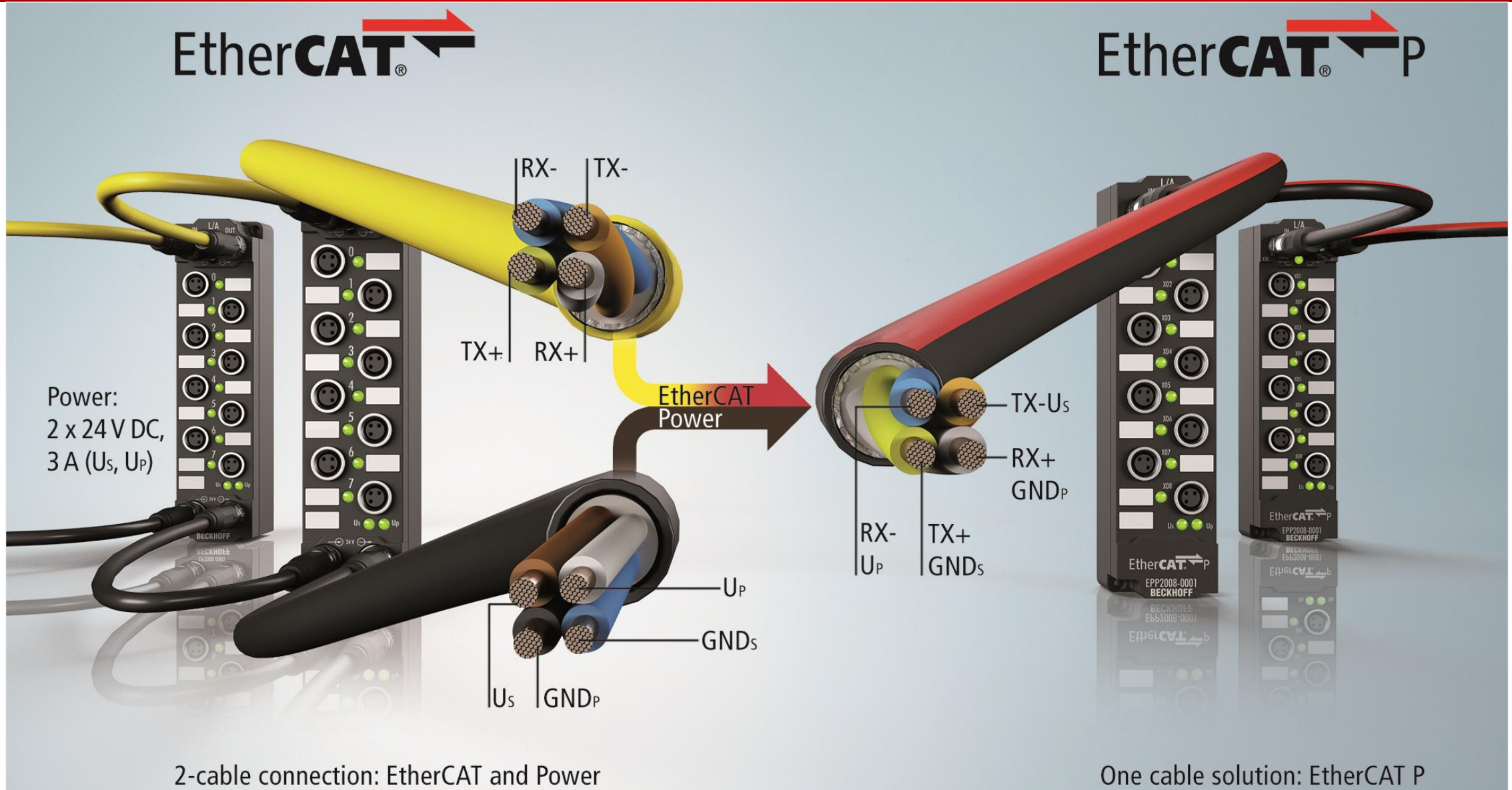
Matching connectors for every performance class

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EtherCAT + Power = EtherCAT P

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Difference ECP / ENP

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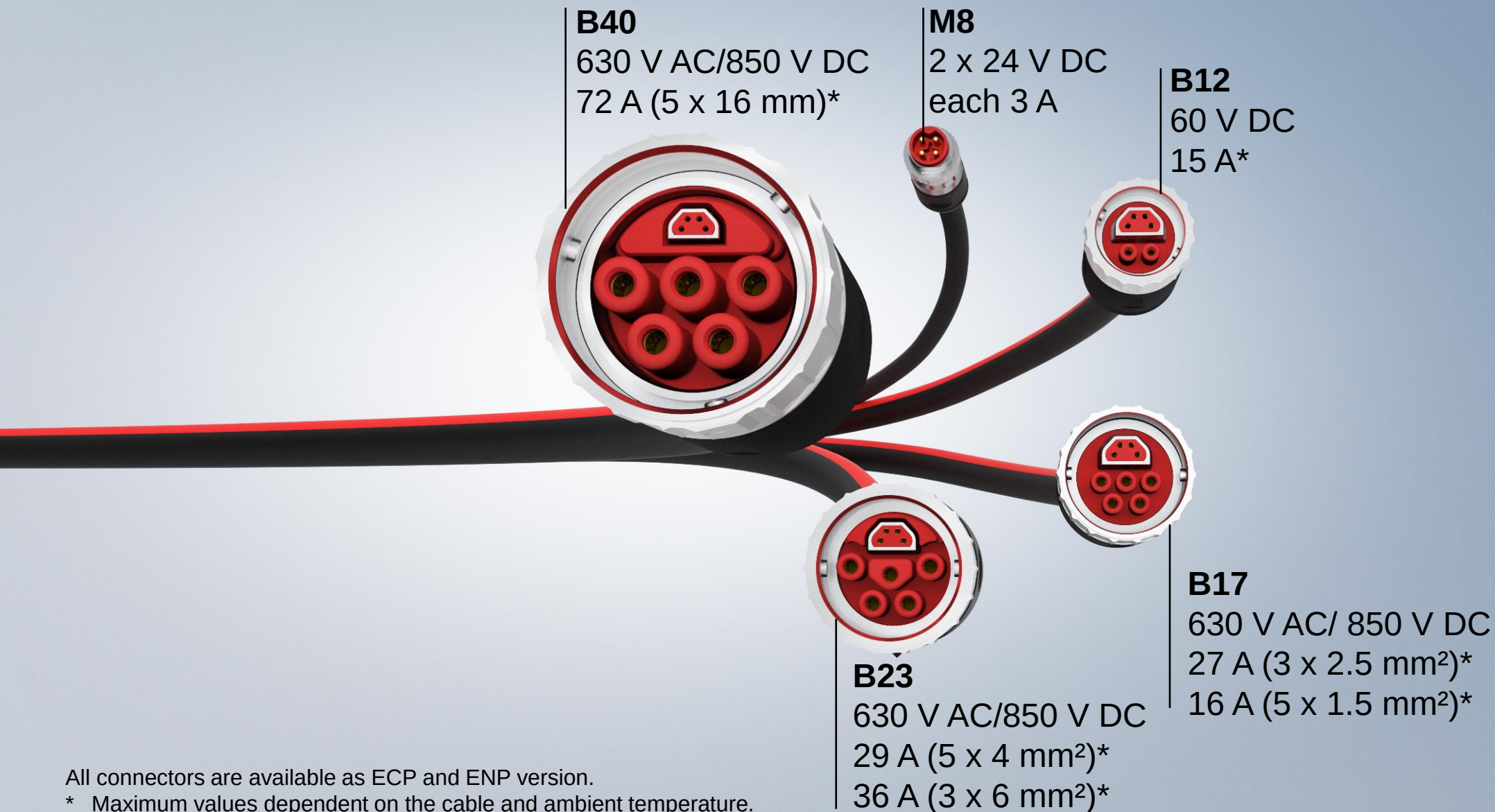
- connector families with uniform design across all sizes – a basis of One Cable Automation (OCA)
- high current carrying capacity and dielectric strength of power pins
- Cat. 5-enabled Ethernet element in trapezoidal form with seamless shielding



EtherCAT P (ECP)

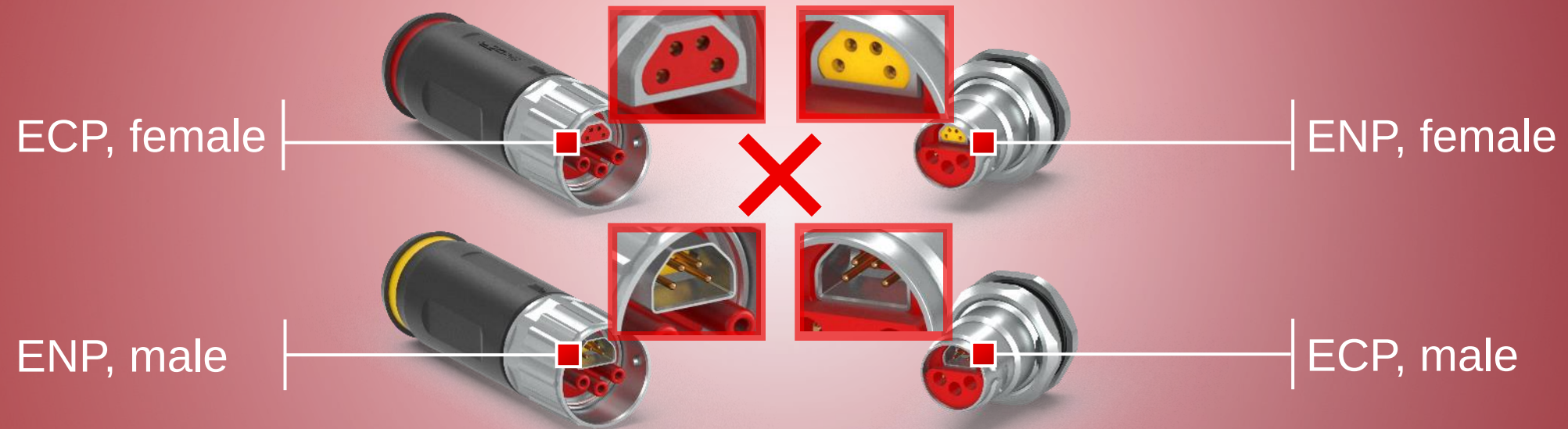
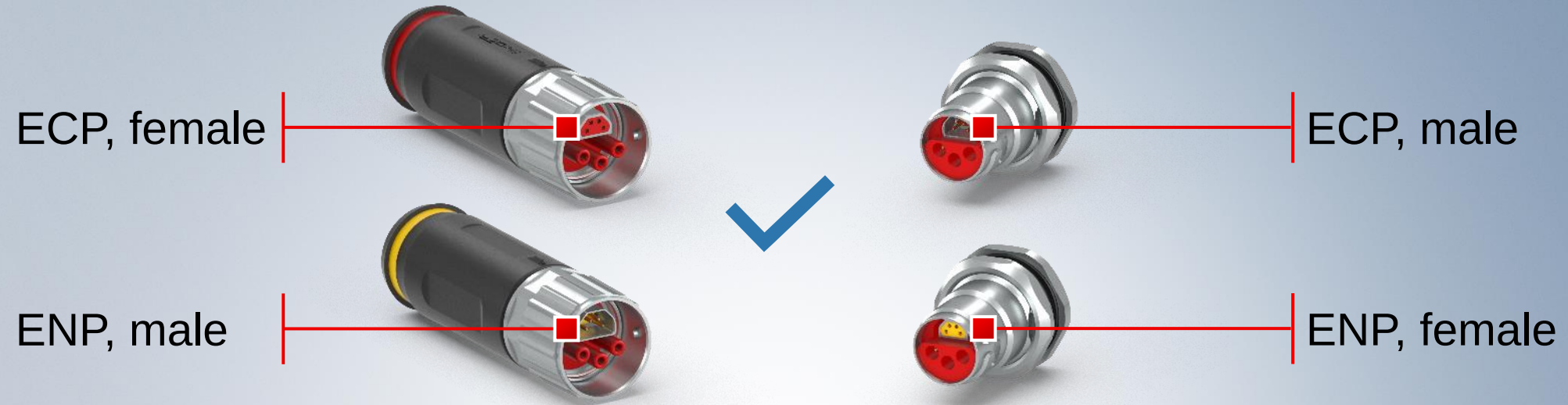
Matching connectors for every performance class

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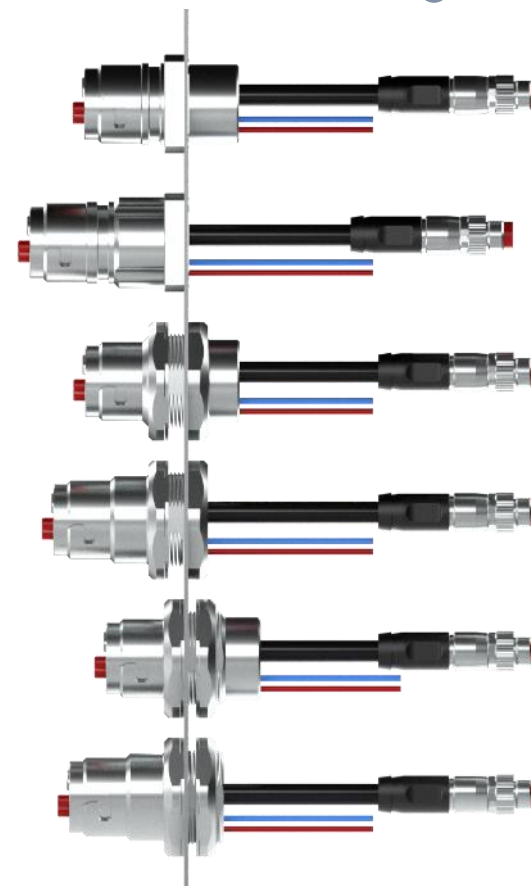
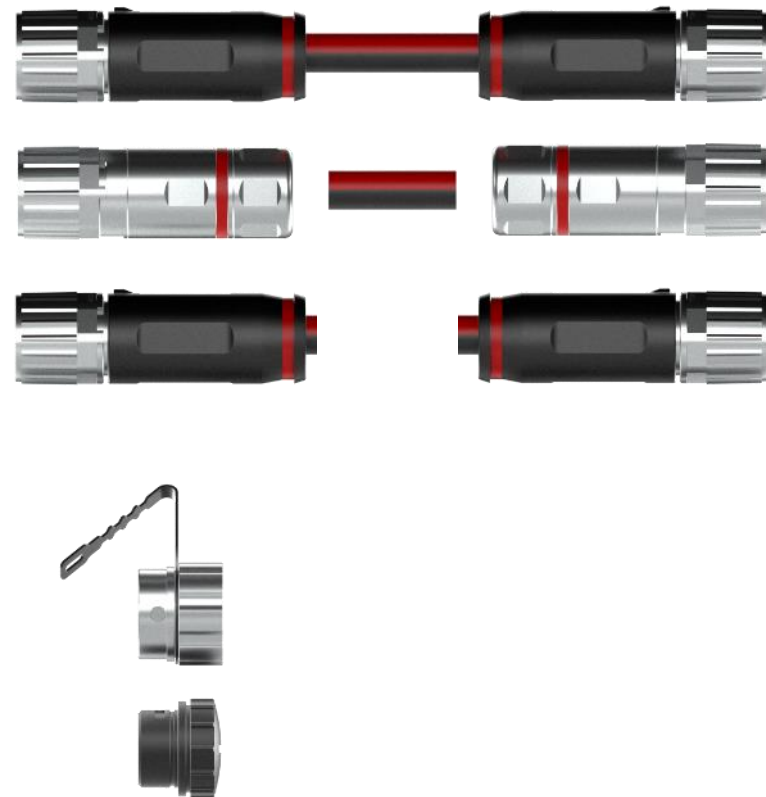
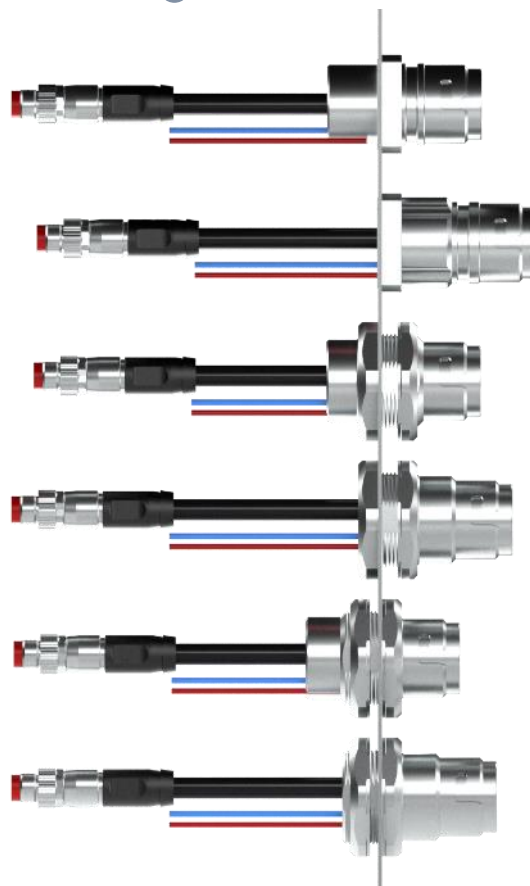
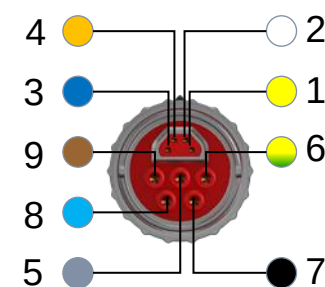
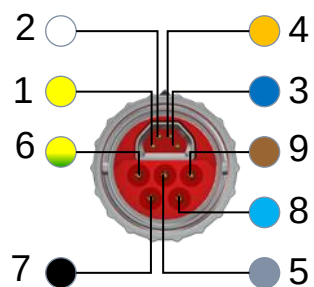
Difference ECP / ENP

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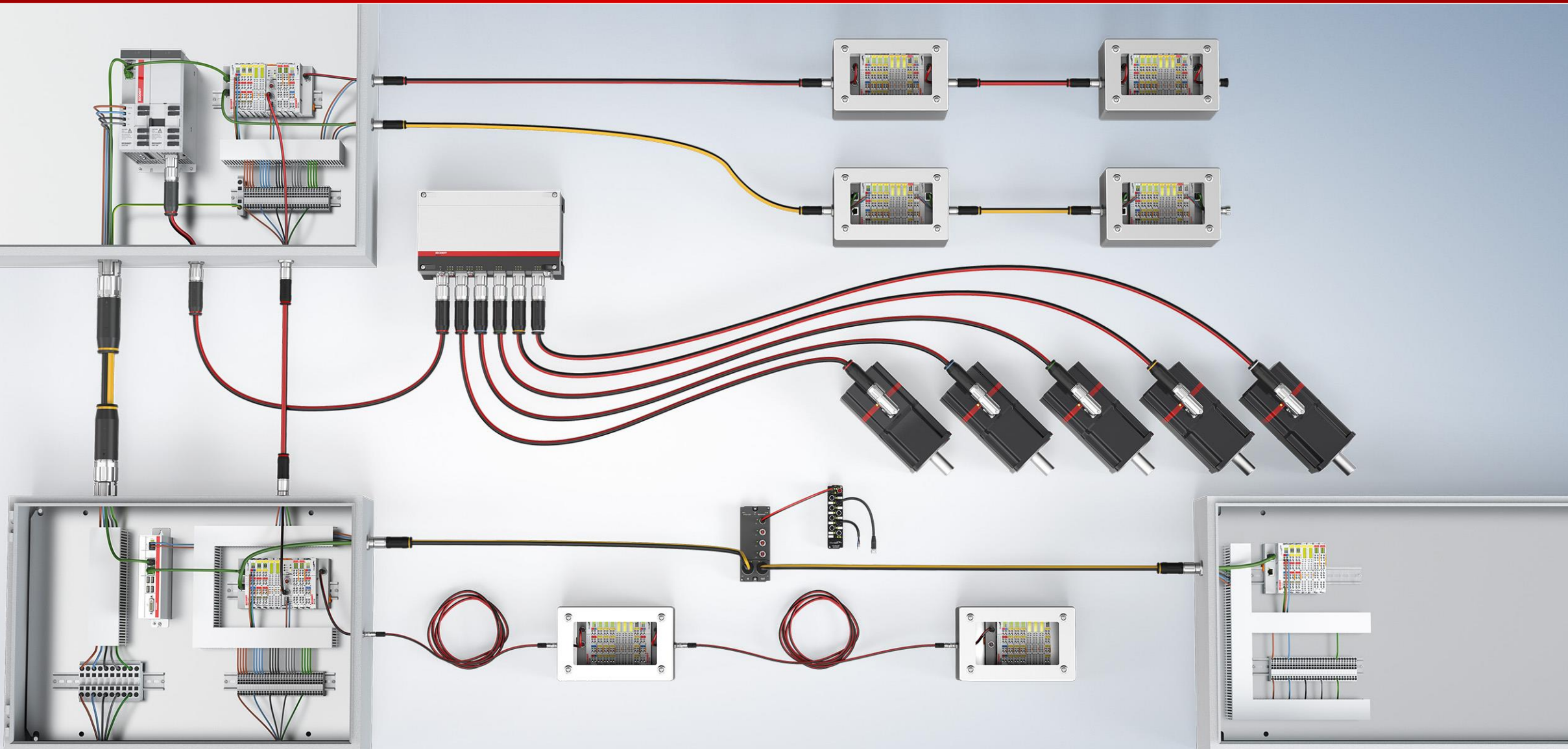
B17 | ECP 5-pin 1.5 mm² overview

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Cabling with OCA

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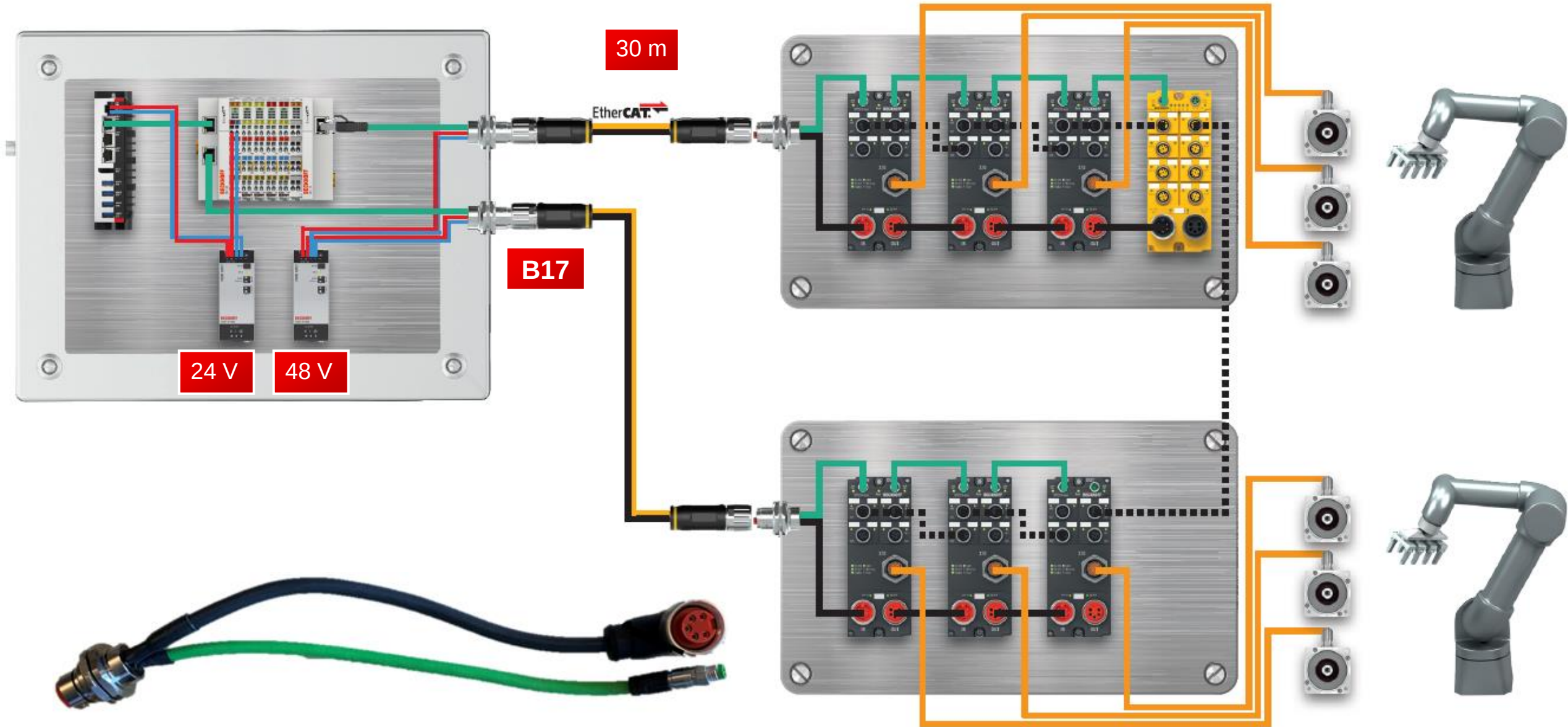
System concept with B12: Handheld

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System concept with B17: Gripper on robot arm

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System concept with B23, B40: Fish farming

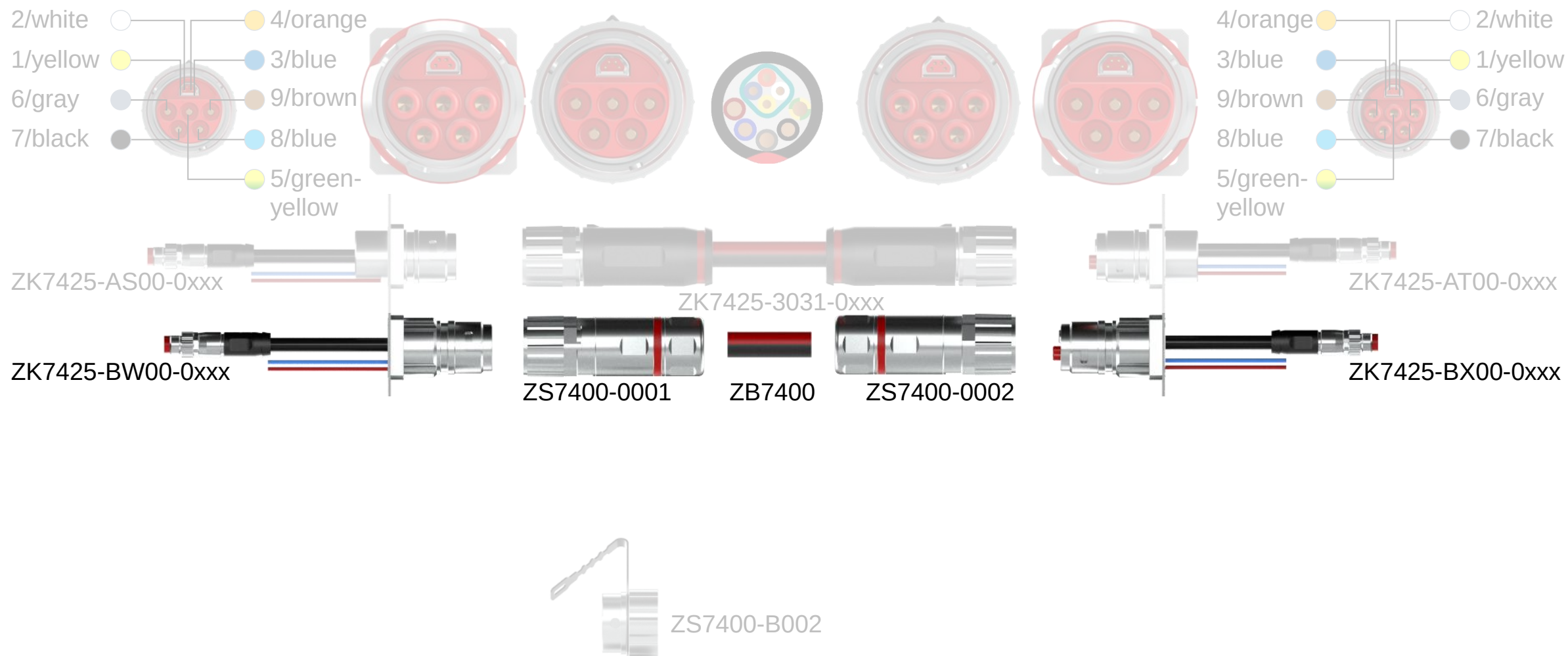
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41 kW needed

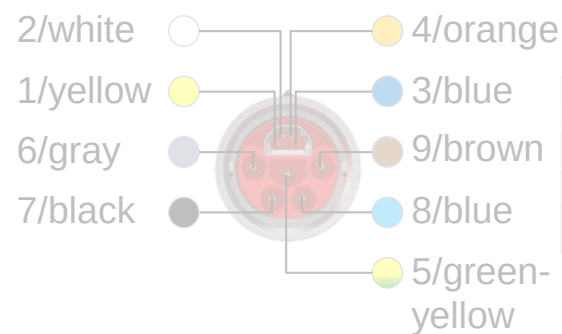
System concept with B23, B40: Fish farming

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System concept with B23, B40: Fish farming

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ZK7314-AS00-0xxx

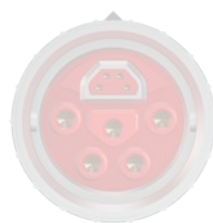
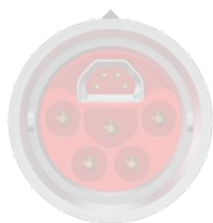
ZK7314-BW00-0xxx

ZK7314-AU00-0xxx

ZK7314-BZ00-0xxx

ZK7314-AW00-0xxx

ZK7314-CA00-0xxx



ZK7314-3031-0xxx



ZS7300-0001

ZB7304



ZS7300-0002



ZK7314-3000-0xxx



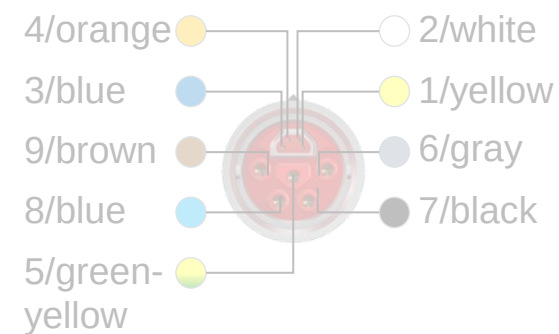
ZK7314-3100-0xxx



ZS7300-B002



ZS7300-B001



ZK7314-AT00-0xxx

ZK7314-BX00-0xxx

ZK7314-AV00-0xxx

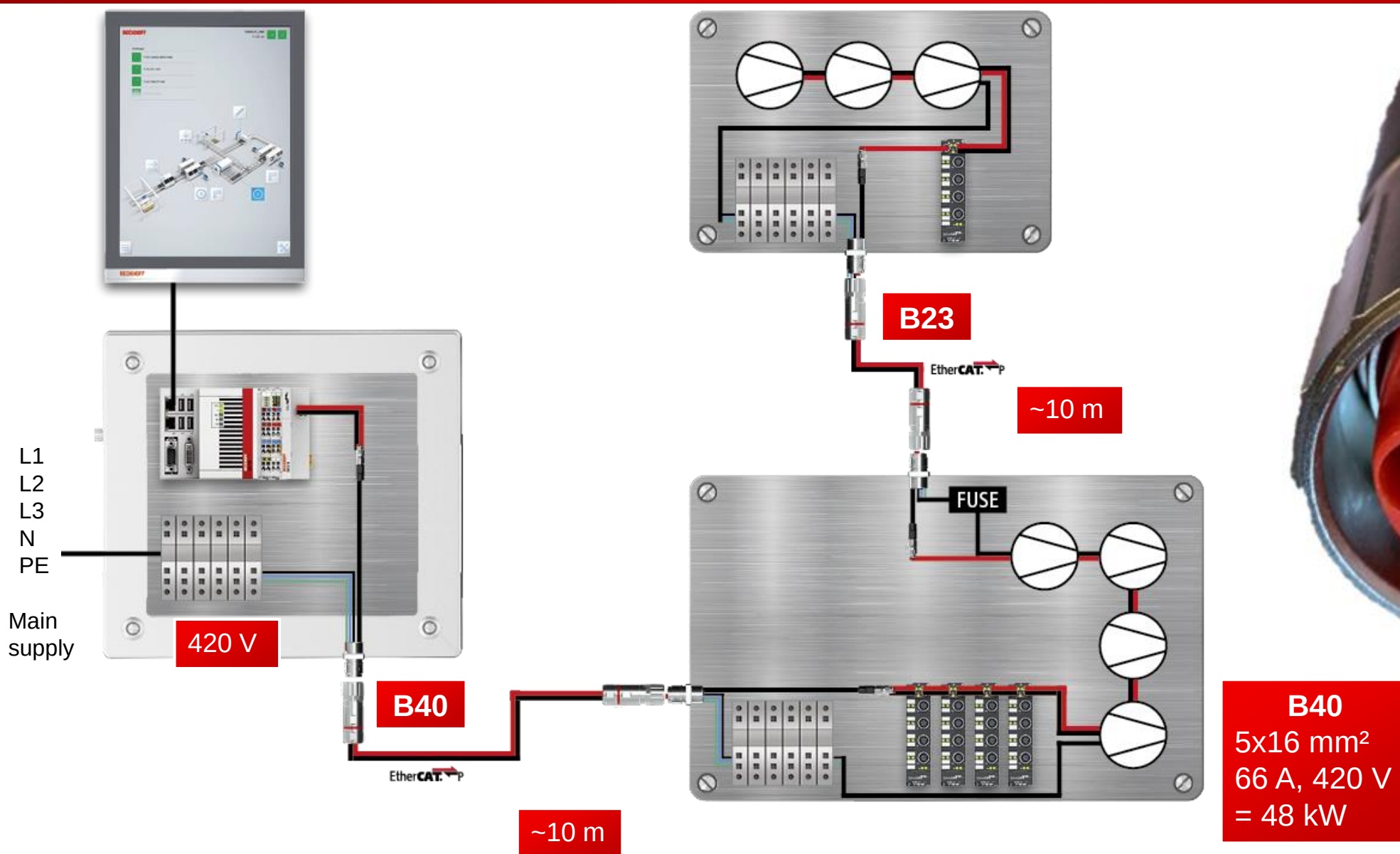
ZK7314-BY00-0xxx

ZK7314-AX00-0xxx

ZK7314-CB00-0xxx

System concept with B23, B40: Fish farming

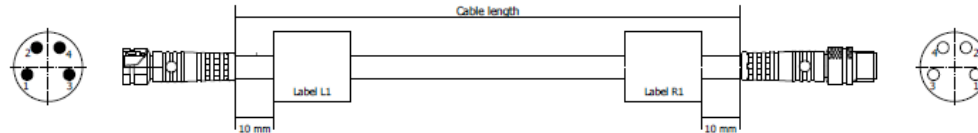
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Customized cables

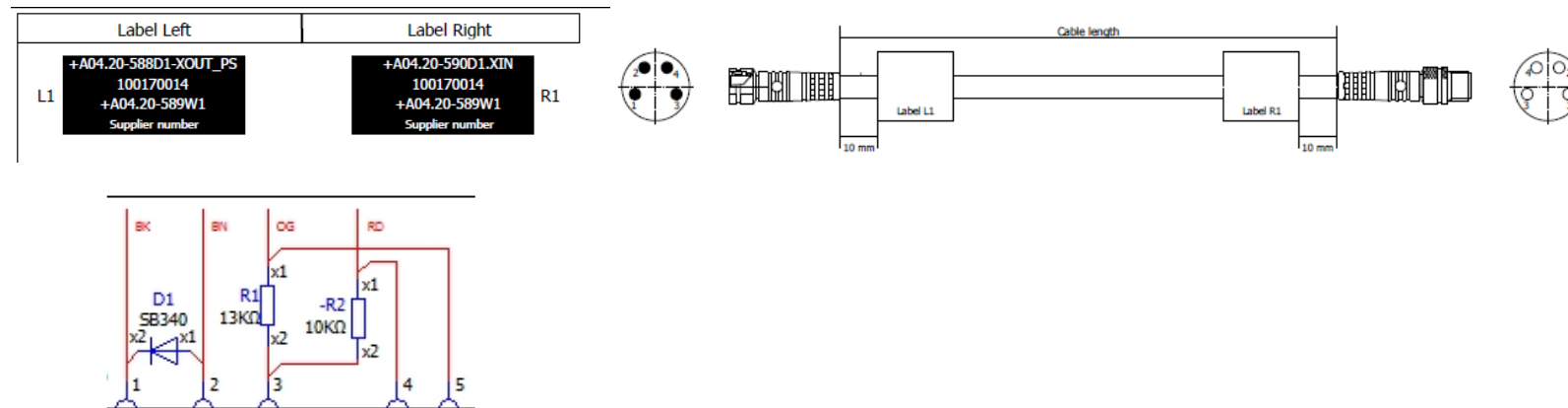
- Individual marked and labeled
 - Option 1: additional sticker
 - Option 2: pre-printed labels
 - Option 3: printing on the jacket

Label Left		Label Right	
L1	+A04.20-588D1-XOUT_PS	R1	+A04.20-590D1.XIN
	100170014		100170014
	+A04.20-589W1		+A04.20-589W1
	Supplier number		Supplier number



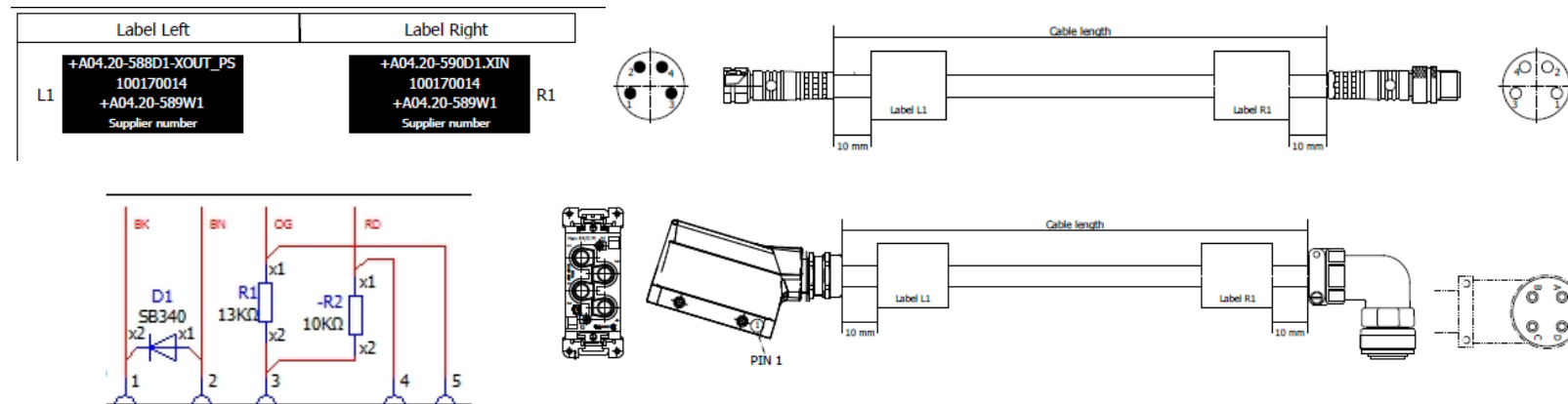
Customized cables

- Special pin-assignments
 - Individual pinouts
 - Double crimps, bridge circuits
 - Additional parts (e.g. resistors, etc.)



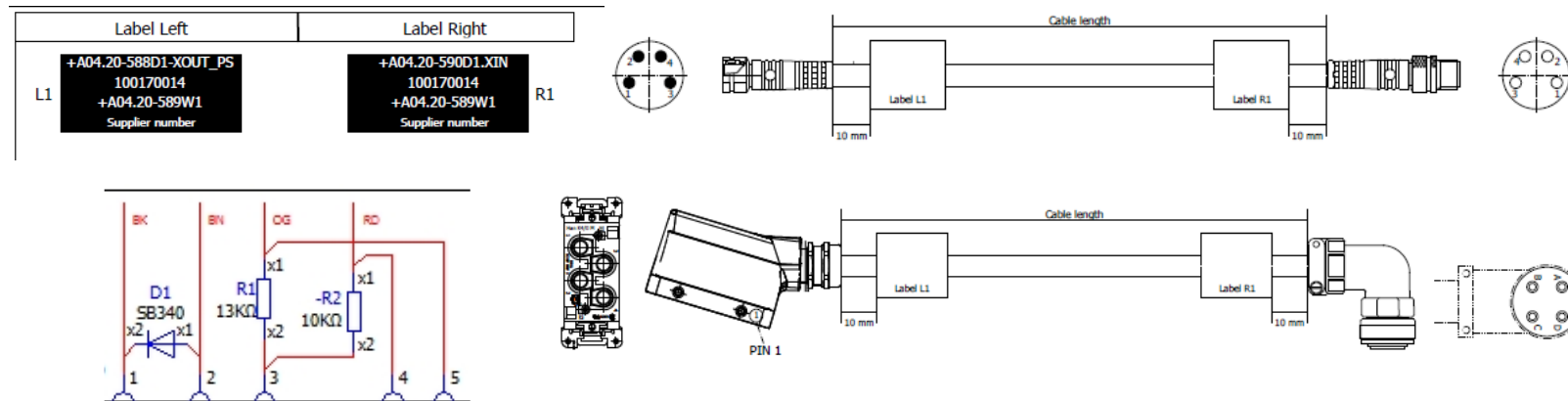
Customized cables

- Custom specific connectors
 - Heavy duty connectors e.g. HAN (Harting, etc.)
 - IP20 connectors e.g. Mini Fit jr., CombiCon (Molex, Phoenix, etc.)
 - Circular connectors



Defined cable sets

- Pre-assembled cable sets
 - Individual marked and labeled
 - Special pin-assignments
 - Custom specific connectors



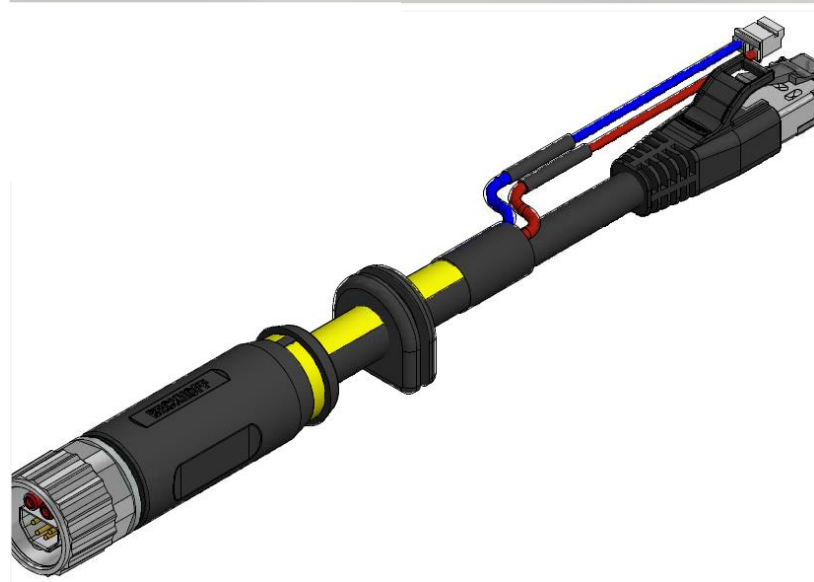
Customized cables

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Customized cables

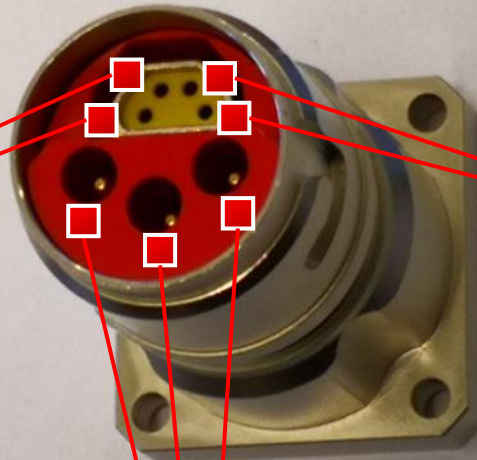
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Thermalcouple
Type „K“
chrome-nickel /
chrome contacts

230 V AC (L / N / PE)
Power supply

24 V DC
Bimetal contacts
for safety



Benefits using Beckhoff customized cables

- Based on standardized parts
- Accessories based on high standard of qualification
- Profit from feedback of our own system engineering department
- Special assemblies with different
 - pin assignments, various length and special functions
 - basically low minimum order quantity
- Founded experience in accessories
 - 7.000 different types from stock
 - more than 35,000 assemblies per week
 - handling of more than 10.000 km raw cable p.a.



Cables, connectors and accessories

IEC61076-2-118

NEW

Technology / Future advantage

- modularity
- simplified composition
- OCA for decentralized technology

User

- end user
- device manufacturer
- technology groups
- connector manufacturer

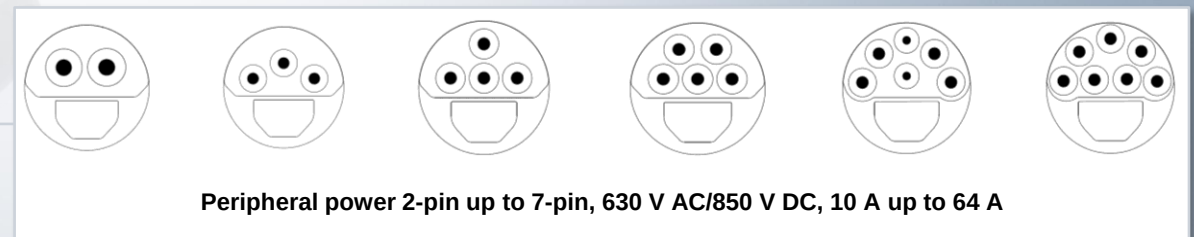
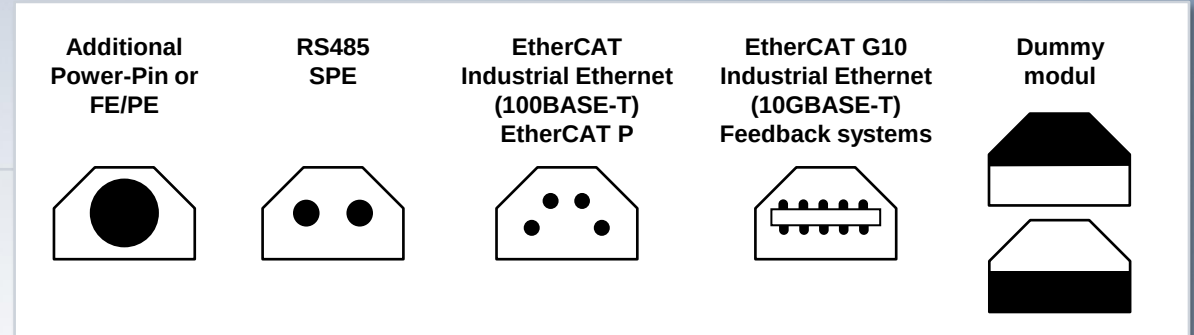
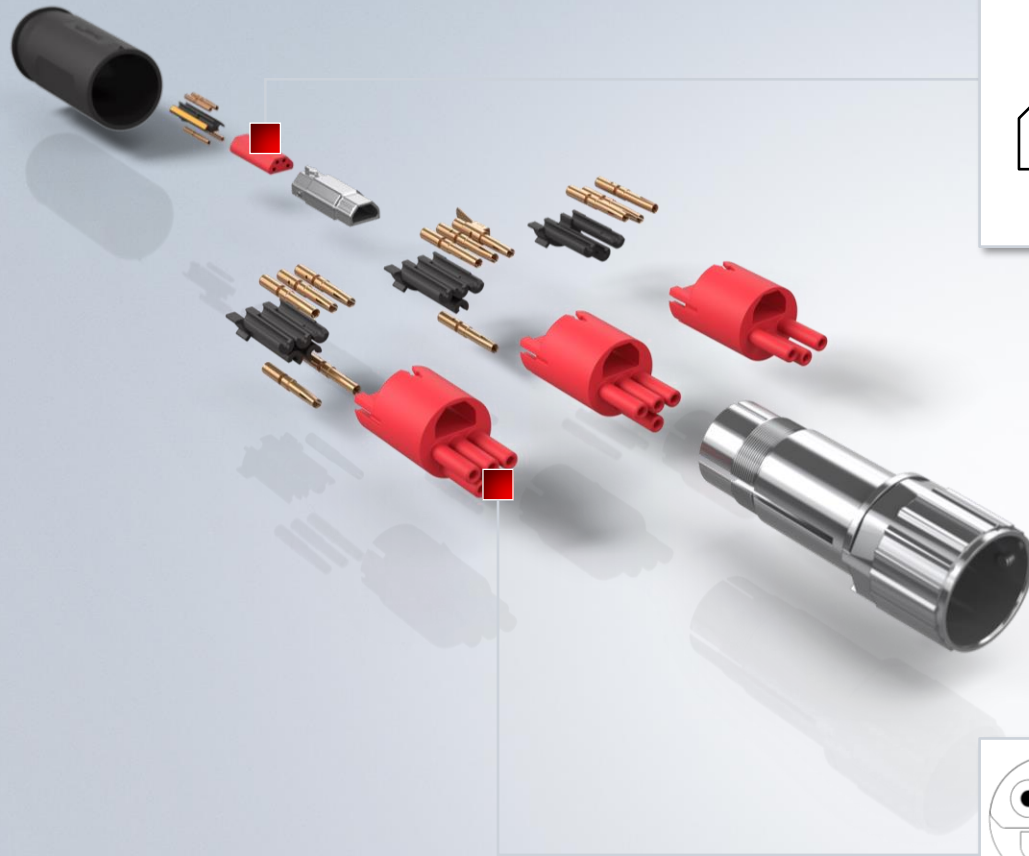
Standardization demand



Cables, connectors & accessories

Modularity of hybrid connectors and cables

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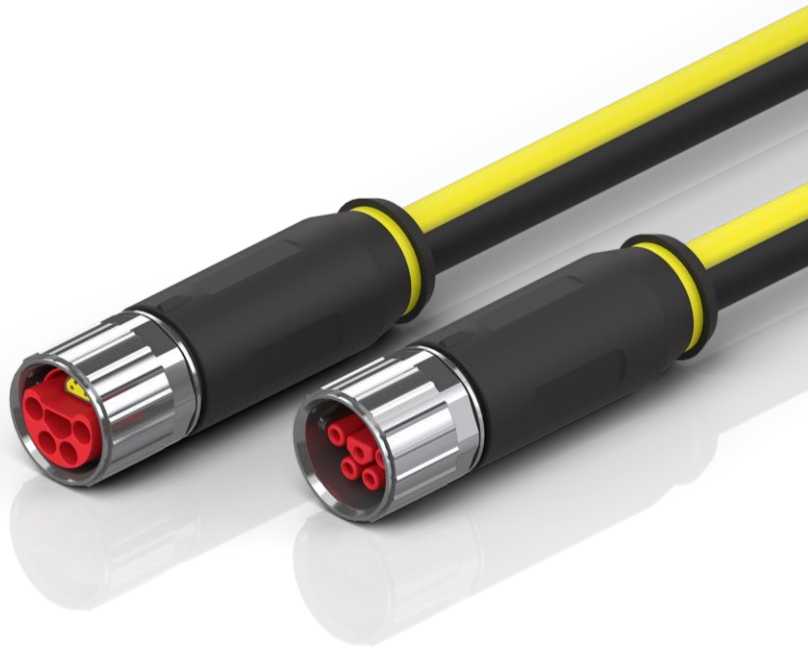


Two cable solution for hybrid connectors

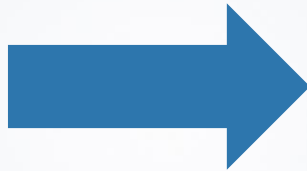
BECKHOFF



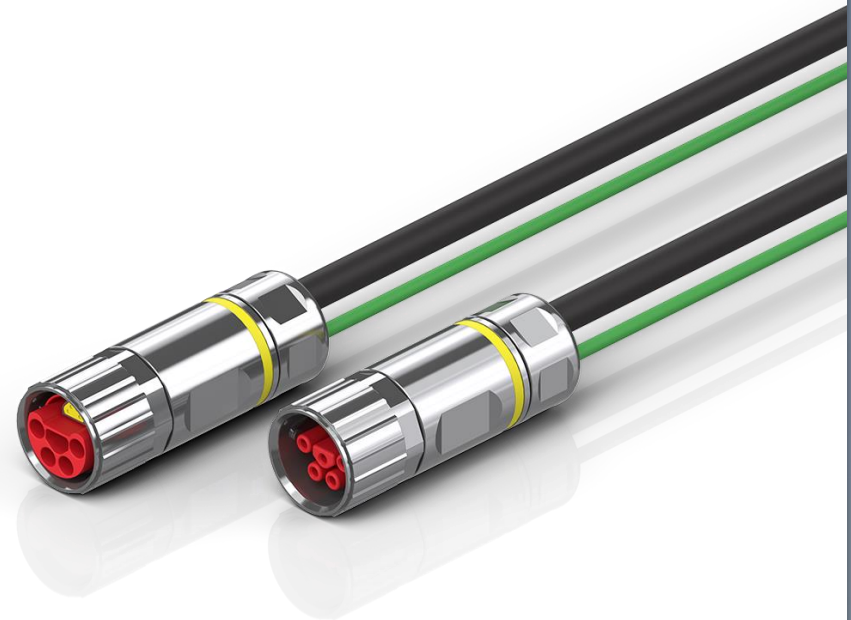
Hybrid cables and connectors



ZK7314-3031-Axxx



Two cables and hybrid connectors

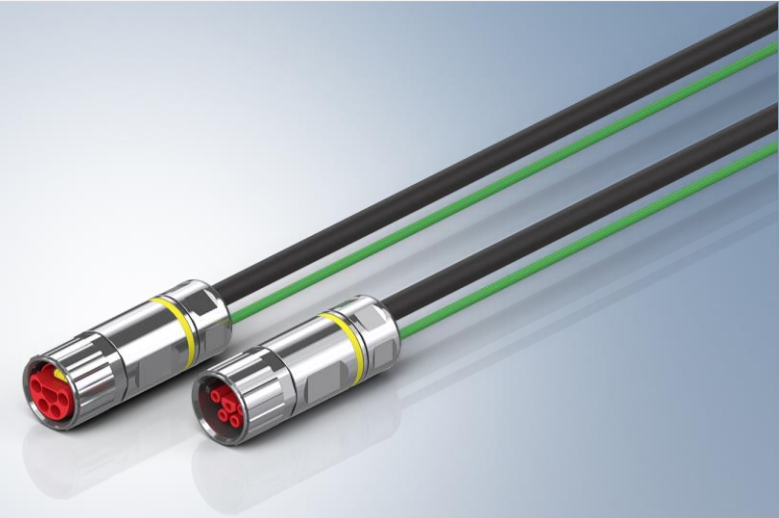


ZK7370-3031-Axxx

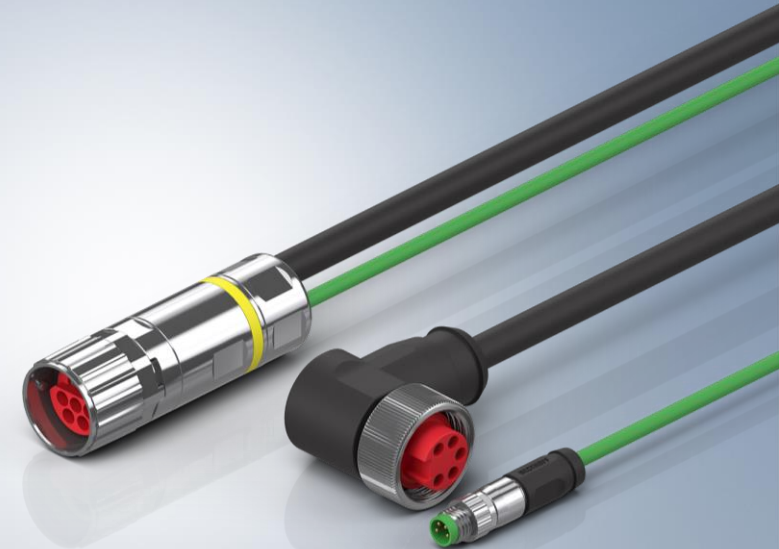
Two cable solution for hybrid connectors

BECKHOFF

- standard raw cable high in quantities
 - lower list price (~25 %)
- thinner cables
 - smaller bending radius
- flexible cable routing to various points
- assembly with different connector types
 - power: M8, M12, 7/8", ...
 - data: M8, M12, RJ45, ...



ZK7370-3031-Axxx

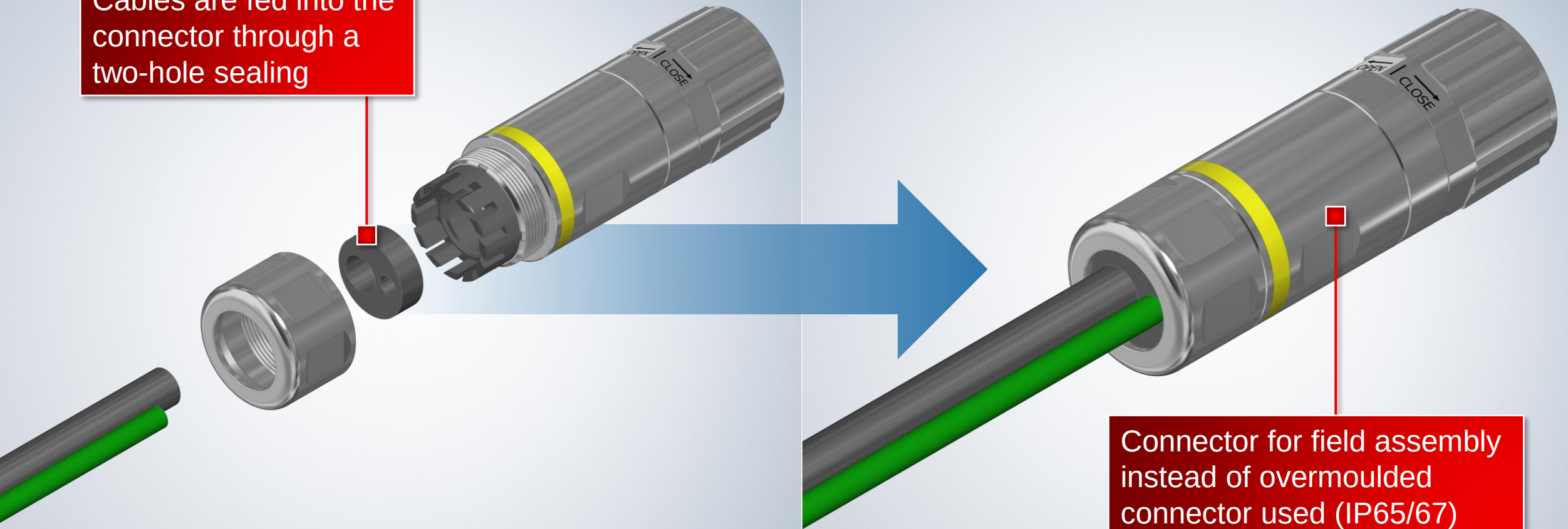


ZK7266-3015-Axxx

Two cable solution for hybrid connectors

BECKHOFF

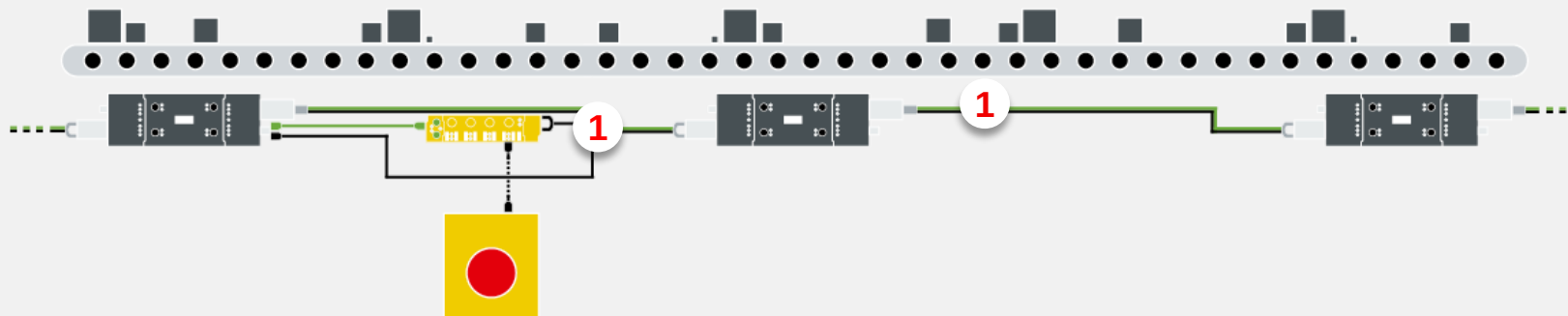
Cables are fed into the connector through a two-hole sealing



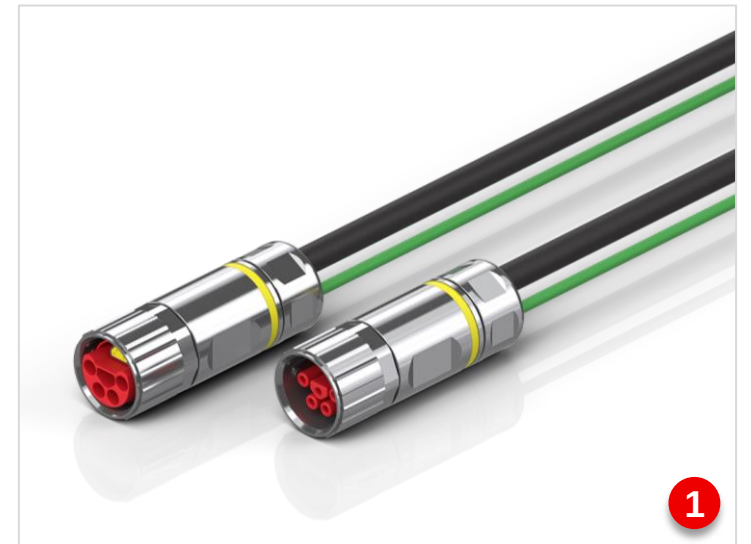
Connector for field assembly instead of overmoulded connector used (IP65/67)

Two cable solution for hybrid connectors

BECKHOFF



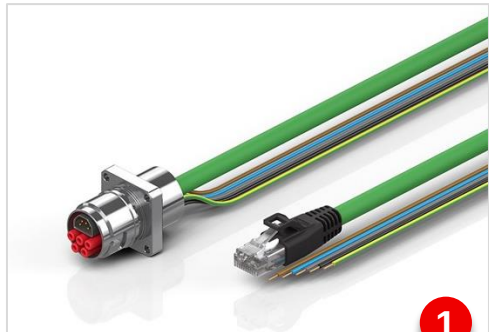
ZK7370-3031-Axxx



Two cable solution for hybrid connectors

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ZK7208-AS00-Axxx



1

ZK7208-3431-Axxx



2

ZB8805-0001

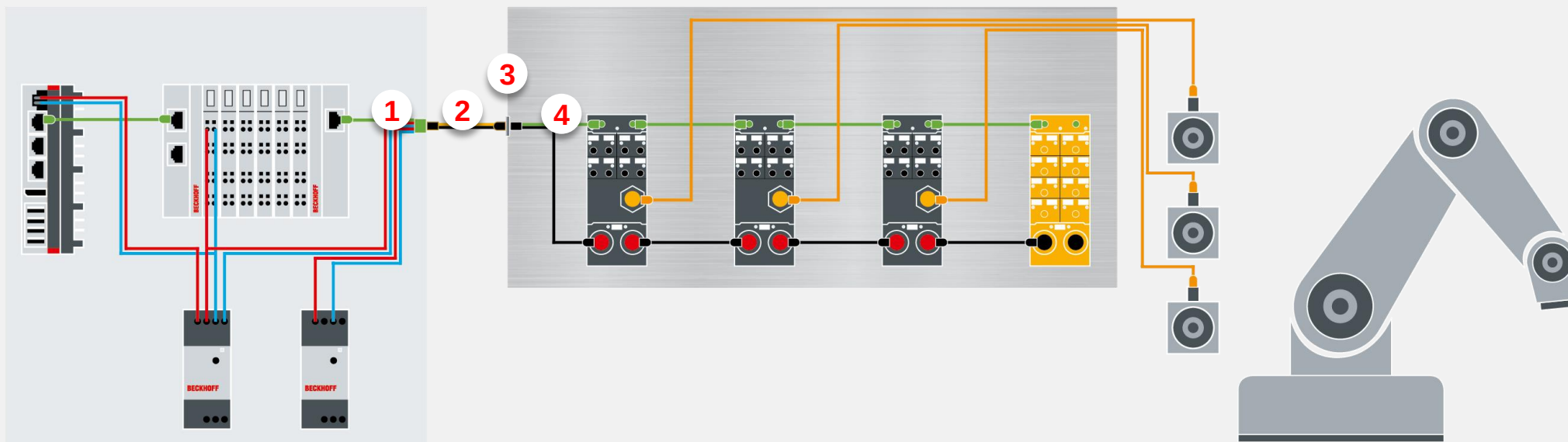


3

ZK7208-3114-Axxx



4



Ultra thin EtherCAT cable

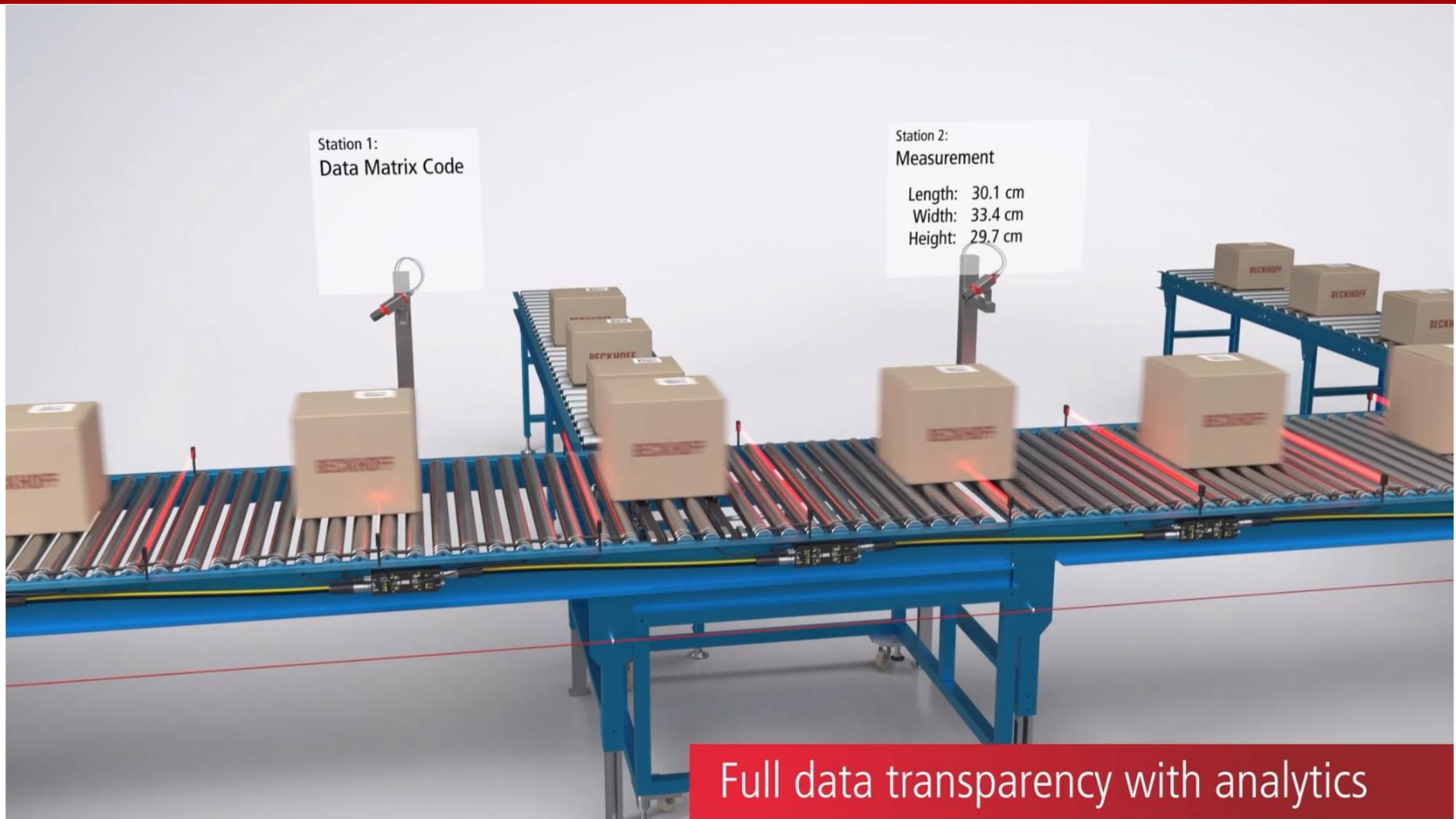
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- Ø3.6 mm
- Bending radius: 4 x OD



2 channel motor controller box for roller conveyor systems

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Full data transparency with analytics

48 V, 40 A power supply for large loads in 4 variants

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NEW

MS6140-2202-2345

- 40 A for ATRO basis modul

MS6040-2202-2342

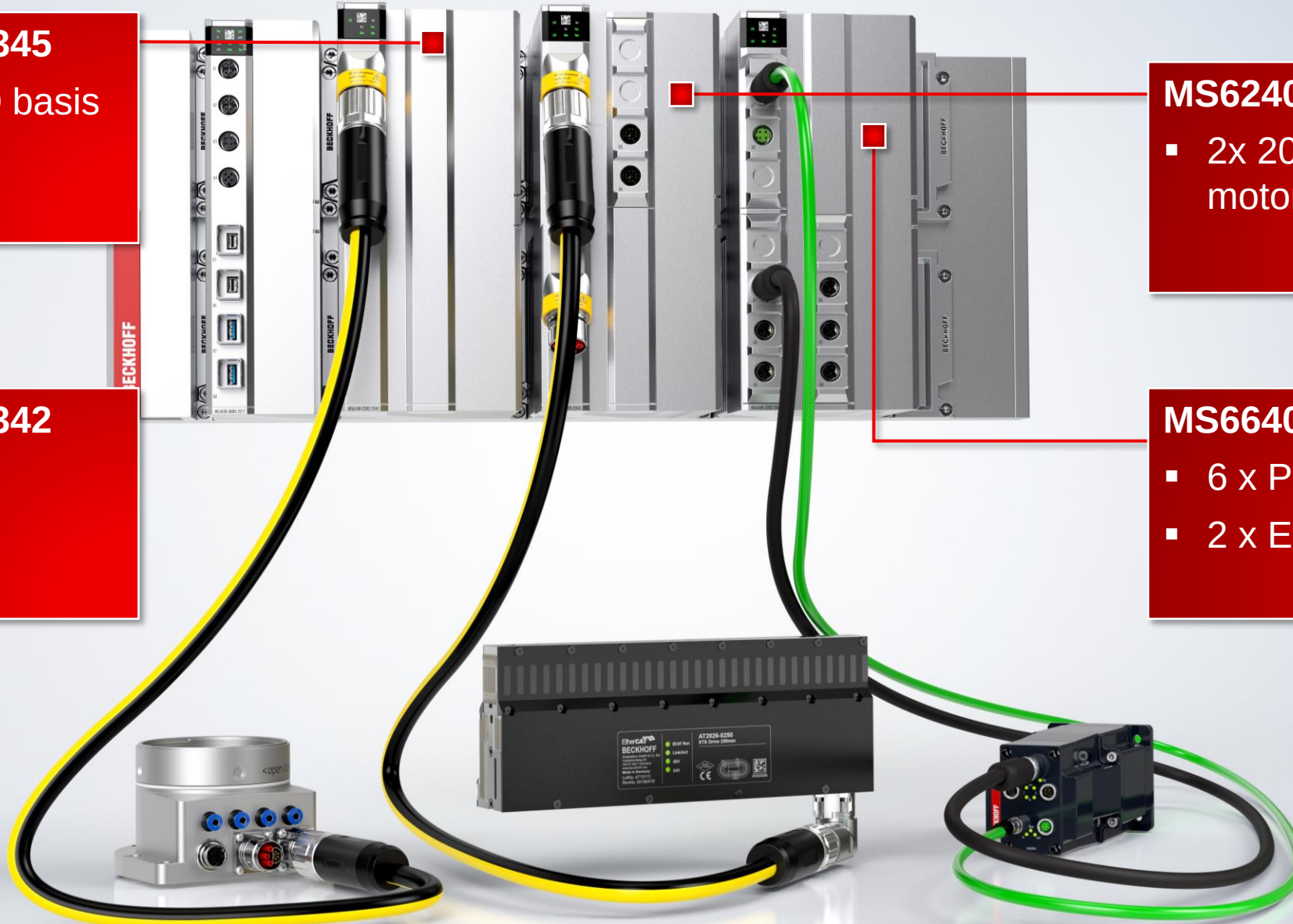
- 48 V/40 A for MX system backplane

MS6240-2205-2345

- 2x 20 A for 2 XTS-motor modules

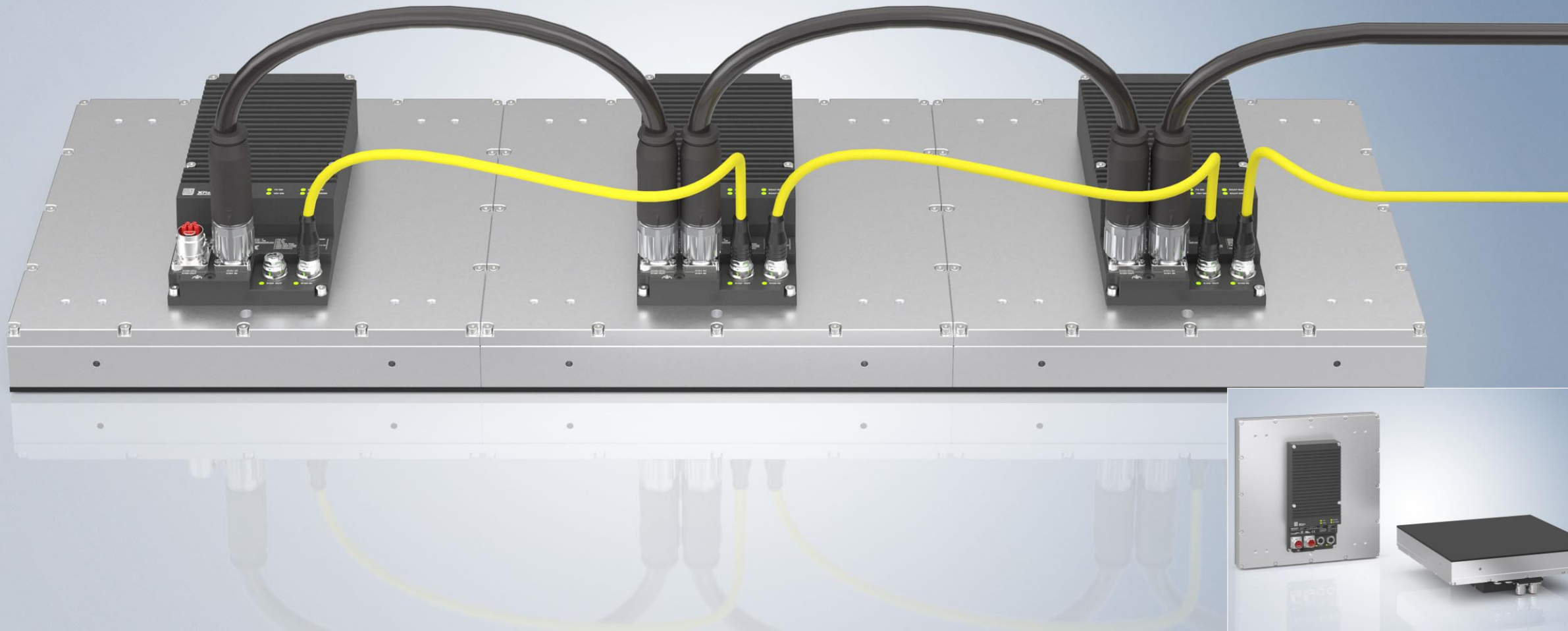
MS6640-2202-2342

- 6 x Power for AMI
- 2 x EtherCAT-Port



Xplanar tile

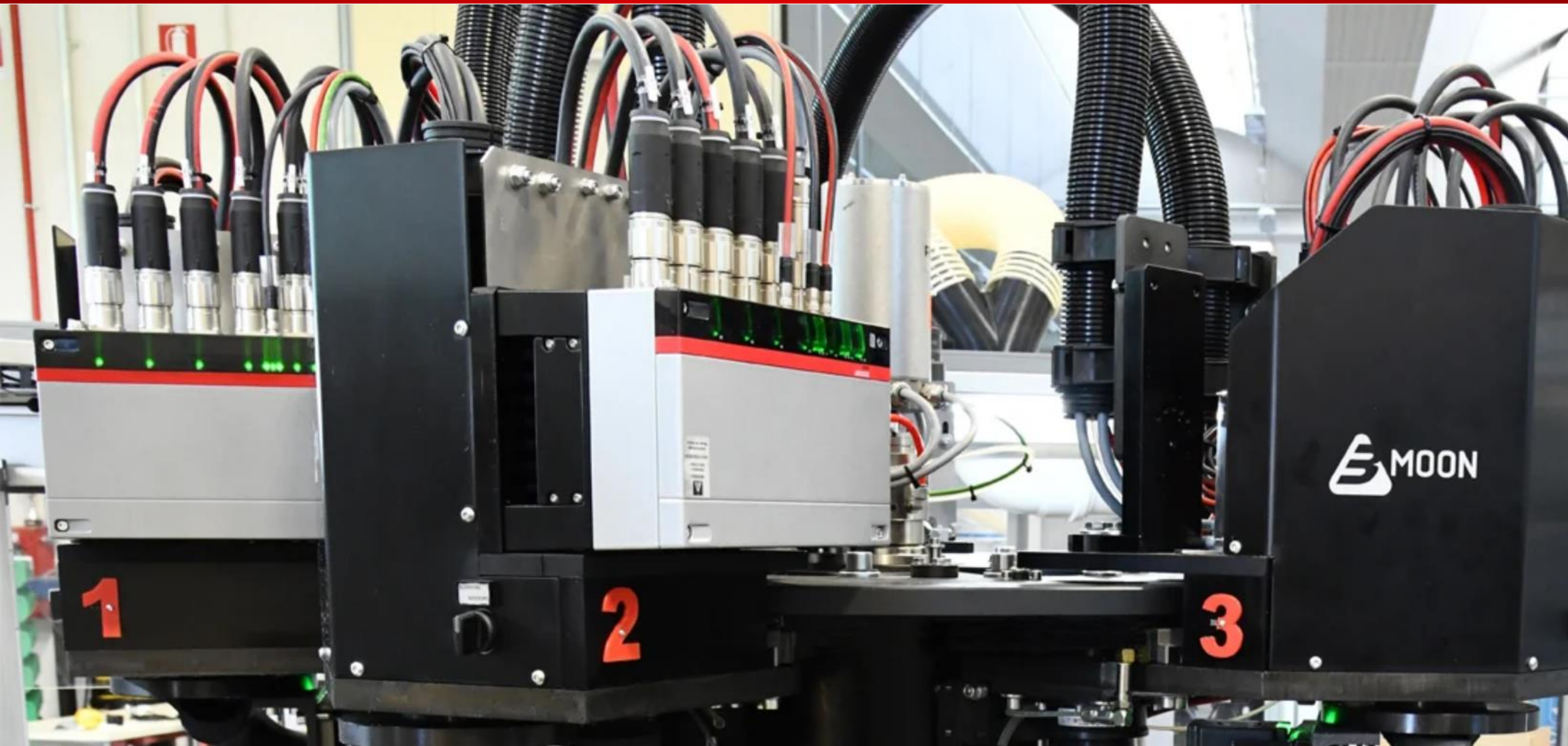
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Distributed servo drive technology and EtherCAT P facilitate production process overhaul

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Modularity of hybrid connectors and cables: A must-have for automation

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High performance directly in the field

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