



PMA® Cable Protection for the robotics and automation industry

Boosting productivity, preserving safety across production cycles.



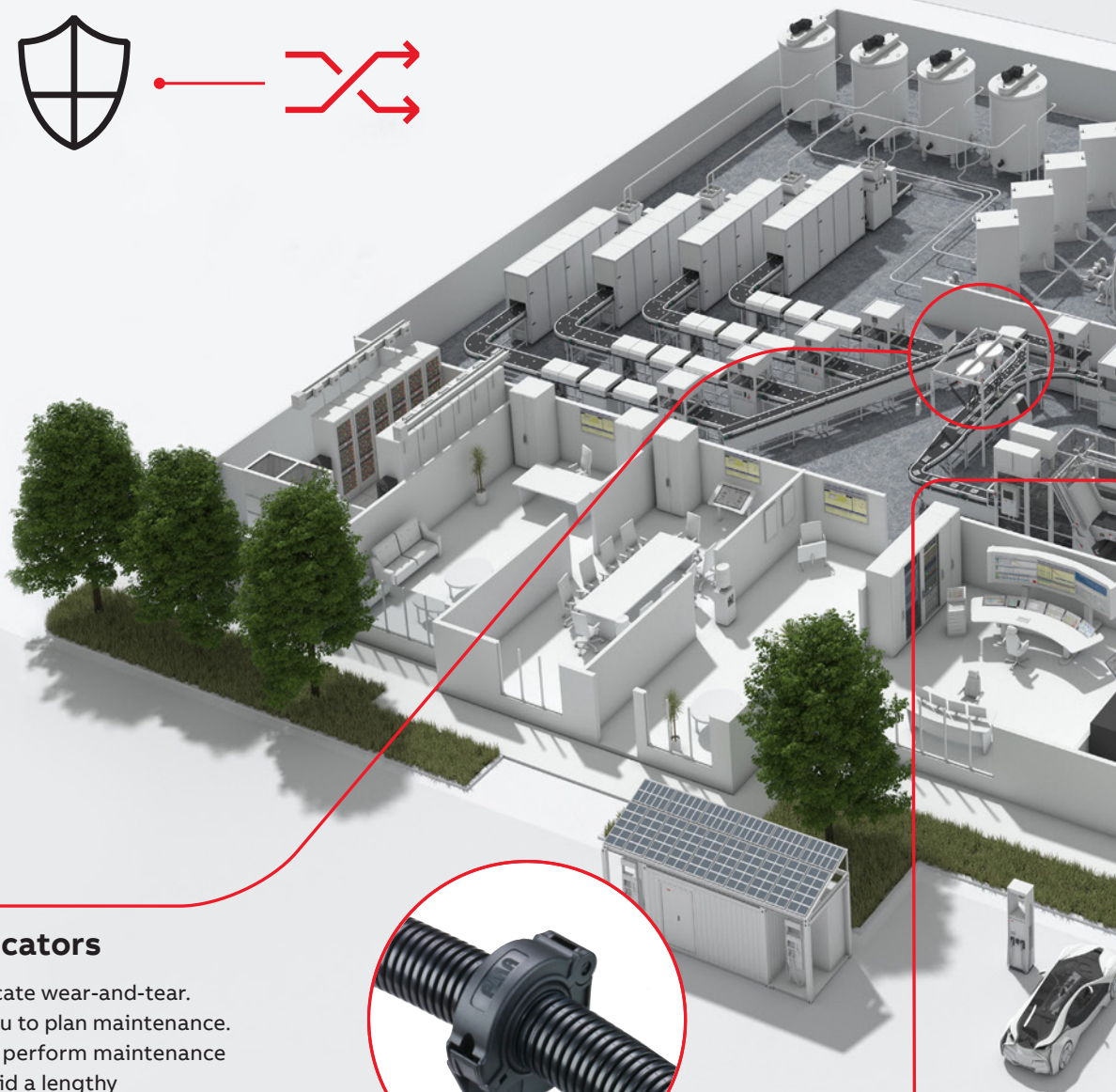
Maintenance indicators

Smart functionalities indicate wear-and-tear. The yellow layer notifies you to plan maintenance. The red layer urges you to perform maintenance as soon as possible to avoid a lengthy production downtime.



Easy-to-replace

ABB helps to reduce costly downtime in robotics operation by offering easy to replace installation products.





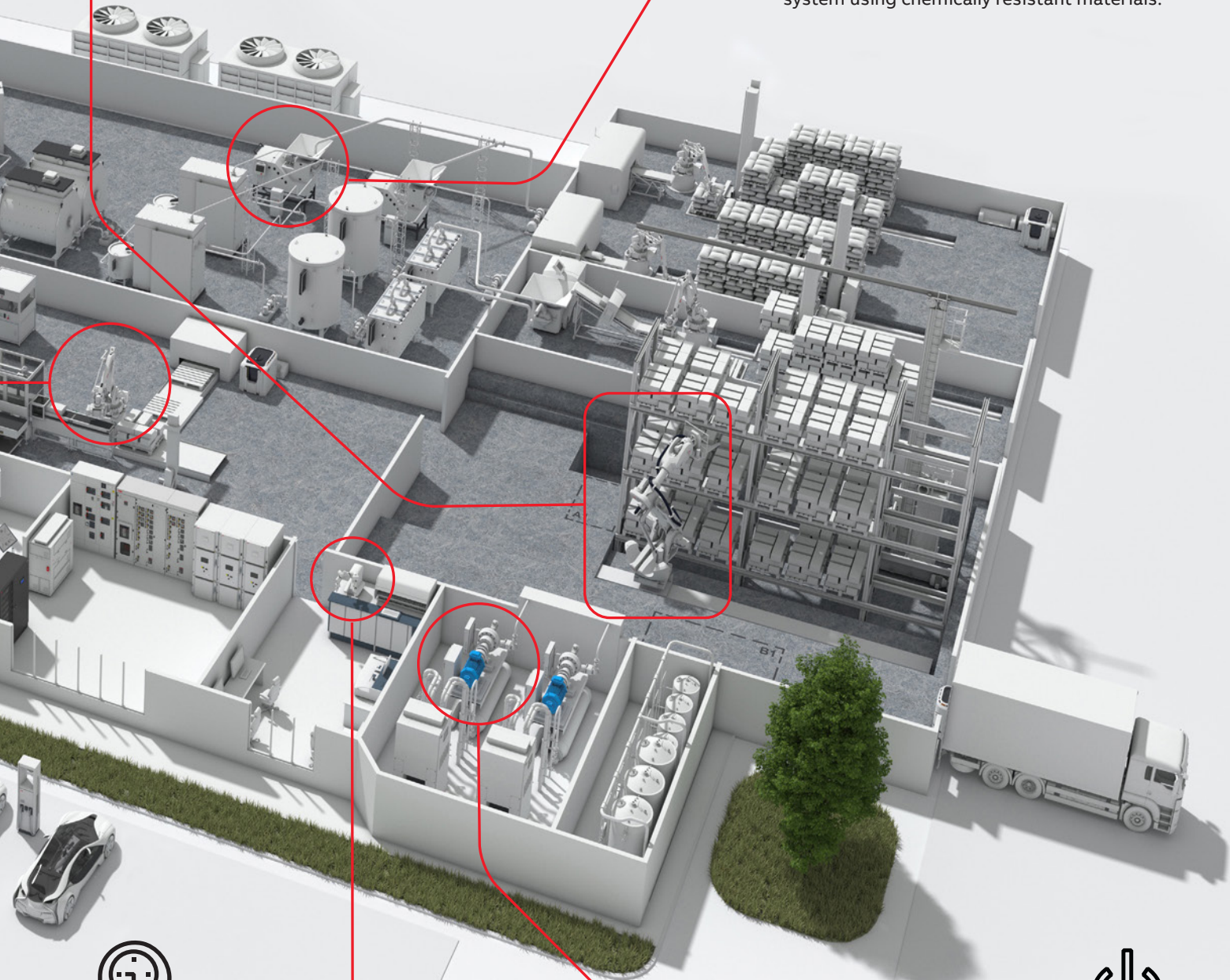
Maximum flexibility

PMA's hose pack systems for Robots and Cobots allow the holder a high degree of movement freedom. This enables the robot and cobots movements to be frictionless, resulting in increased uptime and productivity.



Chemical resistance

Cleaning and sanitation crews in F&B often use high-pressure wash down cleaning equipment with high-temperature chemical solutions. With these processes in mind, ABB constructed a food and beverage system using chemically resistant materials.



Industry specific solutions

A broad and extensive portfolio has dedicated solutions for product applications operating directly in the field. To balance costs and regulatory pressures, operations should be viewed holistically. Adaptability is essential for complex and constantly changing industries.

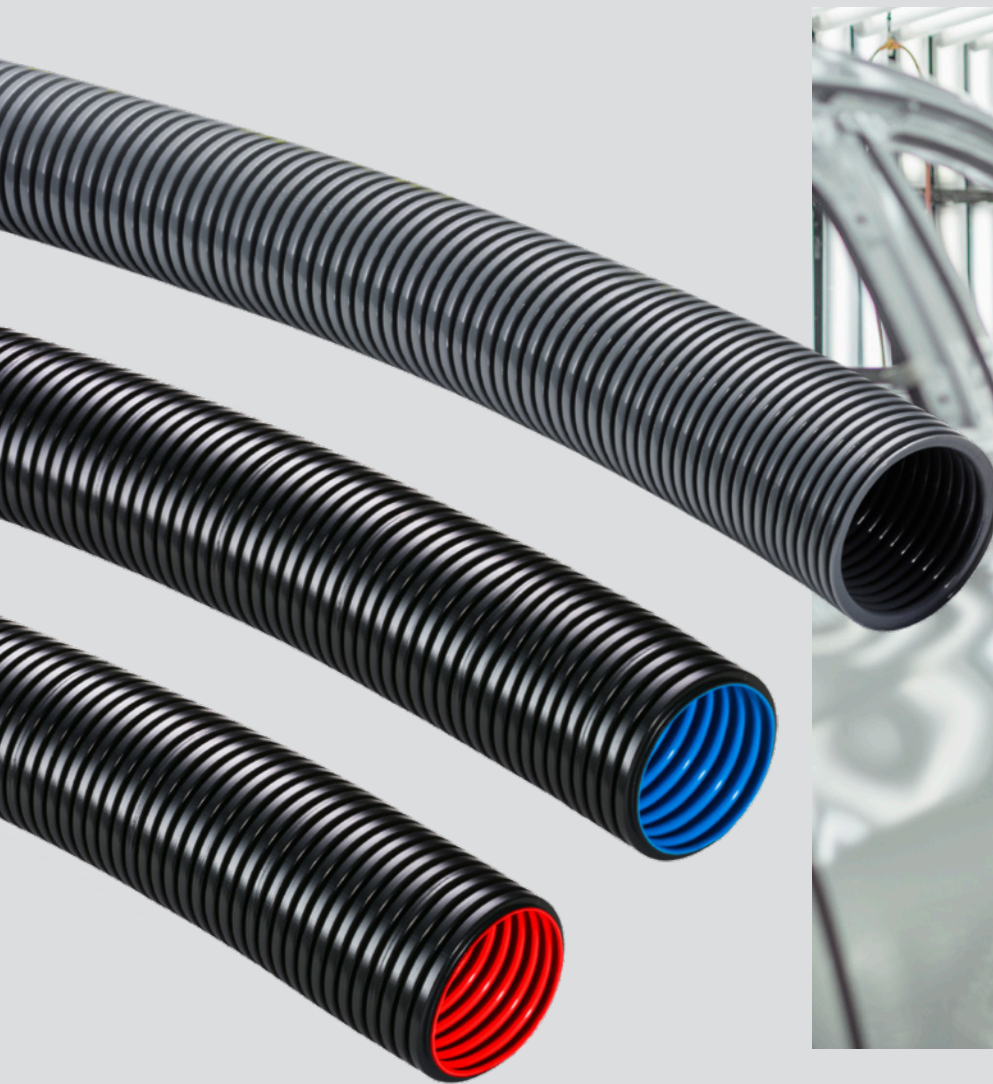


Reliability

Processing plants require a high reliability level from their electrical systems, because shutdowns can cost from minutes' to days' worth of production if a batch must be scrapped.



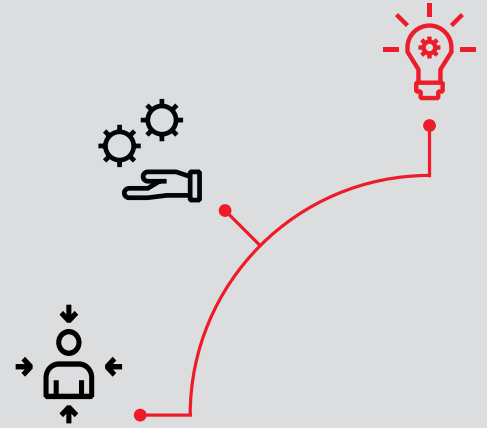
PMA® Cable protection solutions
From pioneer to market leader. High performance, reliability and safety in cable protection for the automotive industry.



Automotive industry

Robotics and automation

The ability to adjust technology to meet the market demand.



Performance, quality and technical support

Today's automotive business demands high-quality product output, increased profitability, and the ability to adjust technology to meet business needs and market demand.

In the automotive industry, growing global competition requires flexibility from manufacturers who need production and logistic systems to serve the ever-increasing demand for model diversity. To further meet that demand, auto manufacturers must expand and even redefine their core competencies in order to adapt to Industry 4.0 developments, demographic change and data-driven production.

PMA® Cable Protection System for Automation applications has been developed to protect cables and wires in extreme automation and robotic installations. Through different conduit types for various requirements, system supports and a range of special accessories, torsion can be avoided and the stresses upon the cables reduced to a minimum.

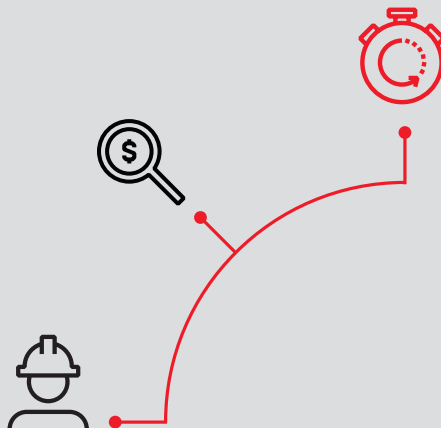


New construction methods

Robotics and automation

Meeting the specific needs of construction.

SEE MORE



Construction industry

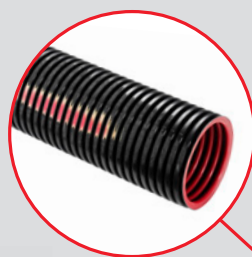
In construction environments, there are ever-increasing demands for solutions that are faster and easier to install. These solutions must also meet safety, technical performance and the specific requirements of municipal buildings and infrastructure projects.

PMA® helps to develop new construction methods. Digital fabrication technologies from the research stage to their practical architectural application.

As part of the DFAB HOUSE construction project, researchers at ETH Zurich are working together with experts and planning specialists from the building industry to research and test how digital fabrication can alter the design and construction process. ABB Robotics and ABB PMA® cable protection are both playing an important role in this new digital fabrication technology.



The cable protection solutions developed by PMA® for automation applications satisfy the demanding mechanical requirements in key aspects.



PMA® Multilayer conduit
The abrasion indicator allows maintenance to be scheduled without incurring lengthy production downtimes.





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Wooden building modules are pre-fabricated in ETH's Robotic Fabrication Laboratory by two ABB robots equipped with PMA®'s cable protection products.

Gramazio Kohler Research, ETH Zurich.



A complete cable protection system for automation solutions

Specially designed conduits, clamps and abrasion protection sleeves provide highly effective protection for all moving parts, massively reducing torsional forces.



Copyright Roman Keller / NCCR Digital Fabrication.



Copyright Roman Keller / NCCR Digital Fabrication.

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The 'Spatial Timber Assemblies' process was used during construction. The wooden building modules were pre-fabricated in ETH's Robotic Fabrication Laboratory by two ABB robots equipped with PMA®'s cable protection products.

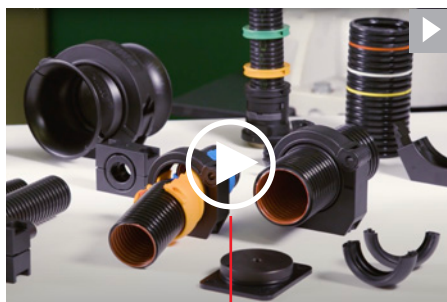
Next generation cable protection

for robotics and automation

PMA® cable protection system for automation has been developed to protect cables and wires in extreme automation and robotic installations. Different conduit types are available for various requirements, system supports and a range of special accessories, so torsion and cable stress can be minimised. Special conduit designs, supports and abrasion protection sleeves provide optimal protection along the entire length of moving elements, enabling engineers to significantly reduce torsion forces.

[SEE MORE](#)

PMA® Conduits for robotic applications
Protecting cables and wires in extreme automation and robotic installations.

[SEE MORE](#)

PMA® Accessories for cable protection in robotic applications
Dependable protection against abrasion and preventing wearing through insulation.



PMA® the next generation of cable protection for robotics and automation



3
Layers



Multilayer conduit

Consists of 3 protective layers

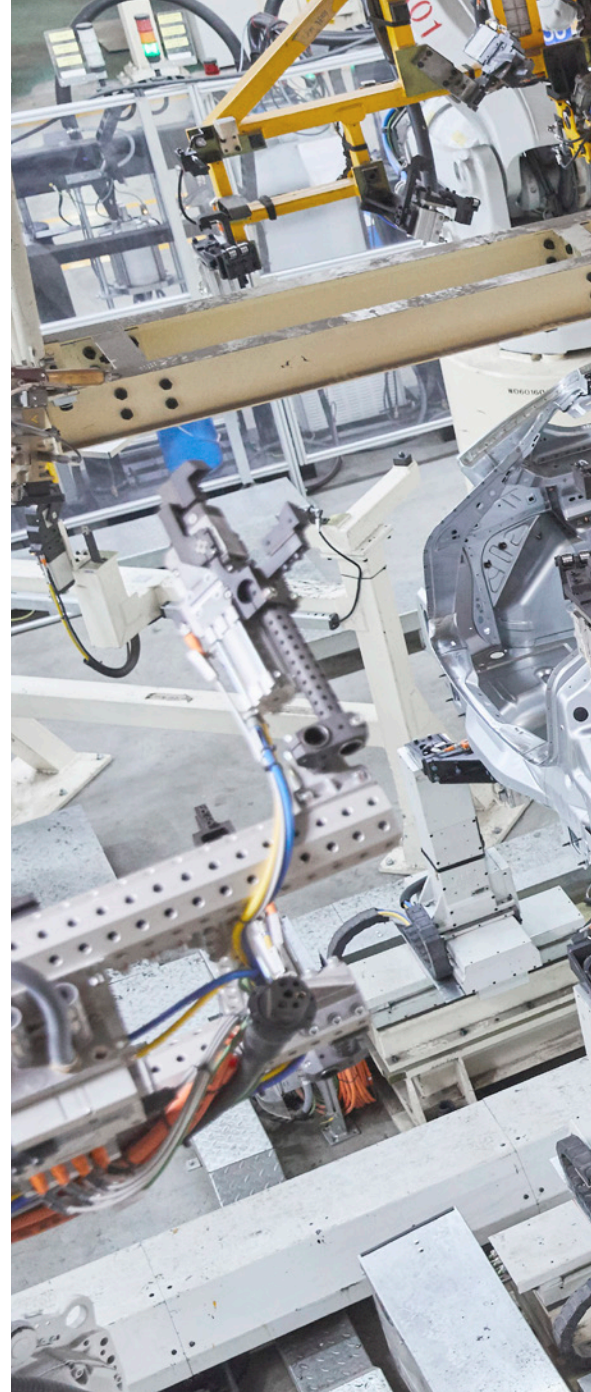
PMA Multilayer conduit provides optimal cable protection in robotics and all of your automation applications, including dependable protection:

- Holds up against abrasion
- Prevents insulation wear
- Provides maximum flexibility and
- Extends service life in motion-intensive applications.



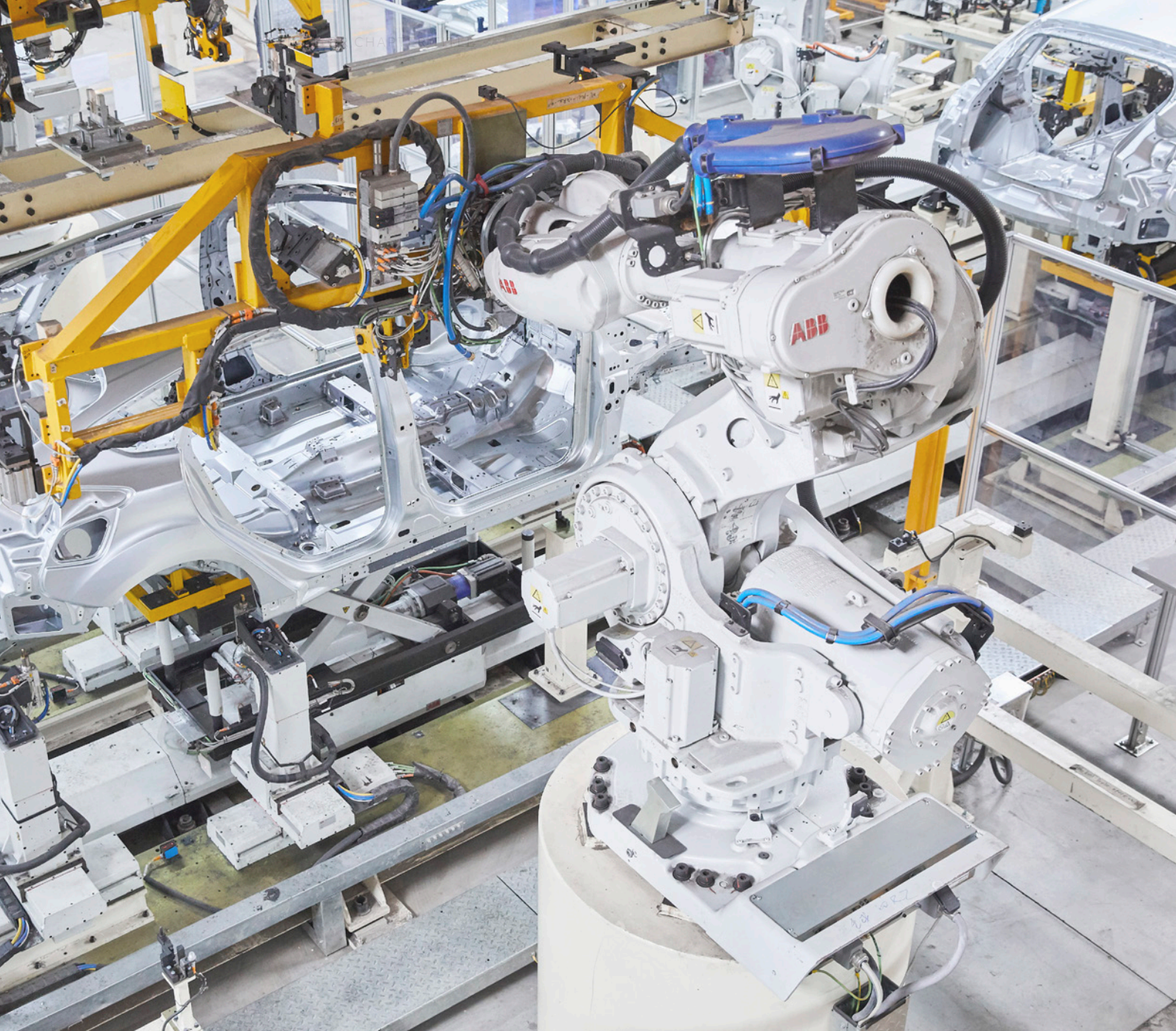
PMAFIX Pro fittings

The PMAFIX Pro has two components, an outer body and an inner sealing element. The sealing element functions both as a seal and as a locking mechanism providing all ingress protection grades up to IP68 and IP69K, even in applications where there is long term continuous movement. PMAFIX Pro is manufactured by using a multiple component injection moulding process.



Tube clamps, ball-joints, and half shell inserts

The range includes the BSH tube clamp, which serves as a fixation for functional inserts. The BTK ball joint sleeve offers additional flexibility and reduces mechanical stress on the conduit. BSSK ball joint half shells provide additional freedom of movement for corrugated conduits fixed in BSH automation tube clamps.



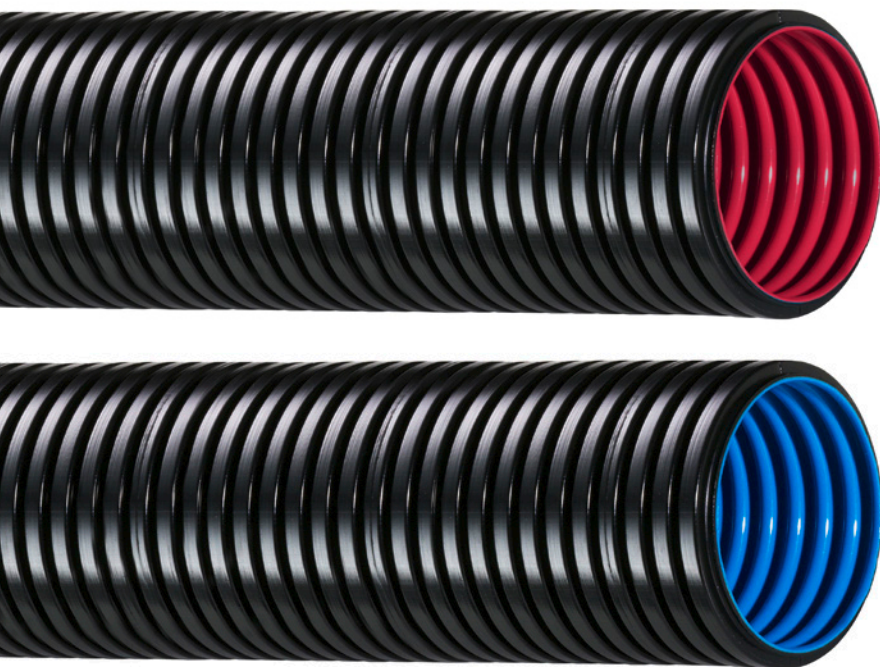
Abrasion sleeves and other accessories

Accessories include the BSS/BSV abrasion protection sleeve, providing abrasion protection for corrugated conduits in positions exposed to chafing. The BKS cable stars are tailored and designed-to-order.





**Very flexible
multilayer conduit**
for robotics and
automation applications
subject to mechanical
wear and elongation
created by the
movement of axis 2
and/or 5, featuring wear
indication function.

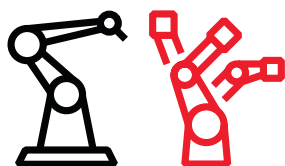


XR90, XTPC conduits

These new conduits provide previously unattained performance levels. The XR90 & XTPC ranges offer multilayer conduits for demanding technical applications and special requirements. The new PMAFLEX multilayer conduits (X-Series) are based upon advanced multi-layer-extrusion technology allowing the manufacture of three-layer corrugated conduits combining the best characteristics of different materials on inner and outer layers.

Automation/Robotics

In the field of automation, there is a need for products that can withstand the stress of motion-intensive applications. Solutions developed by ABB for the automation industry fully meet these requirements. Special conduit designs, supports and abrasion protection sleeves provide optimal protection along the entire length of all moving elements, enabling engineers to achieve a reduction in torsional forces.



Over
500,000
Robots installed
worldwide

Technical specifications

Material

- Specially formulated polyamide 6
- Free from halogens, REACH + RoHS compliant
- Temperature range: -40 °C to +105 °C, short term to +160 °C

Characteristics

- Reduce wear to guidance and control elements
- Increase the degree of freedom of robotic installations
- Allow optimal layout of cables along moving elements
- Increase the lifetime of moving installations
- Allow quick and easy installation



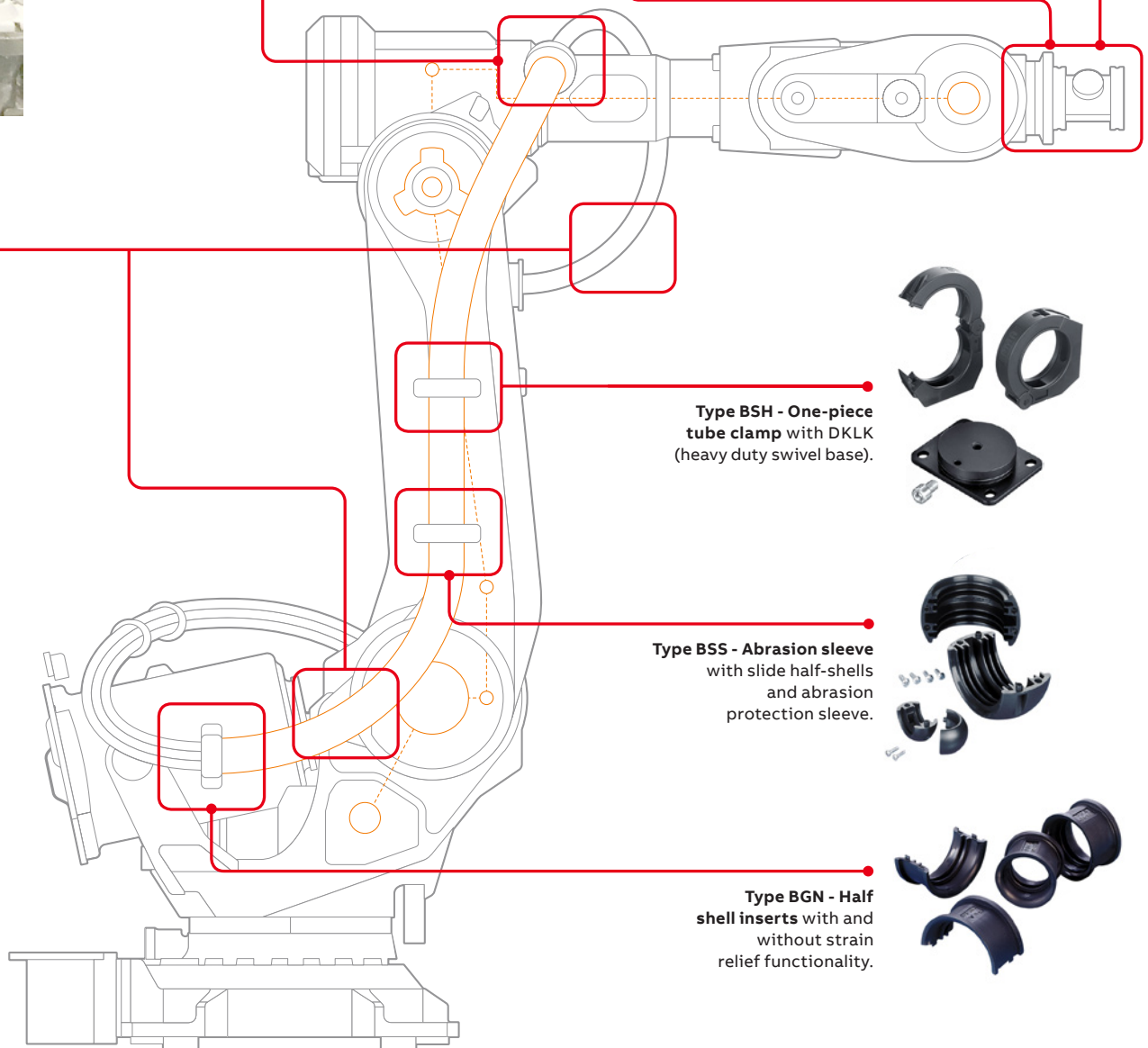
Type BTK - Ball joint sleeve allowing axial and / or rotational movements of the conduit.



Type BKE - Ball joint termination allowing rotational movements.



BBSR Ball Strain Relief for securing cables and tubes in industrial robot applications.



PMA® Cable protection in robotics and automation



BBSR ball strain relief

For securing cables and tubes at the 6th axis, with BSH Tube clamps.



BKE ball joint termination

Provides additional relief to conduit and cables due to reduced mechanical stress, with BSH Tube clamps.

PMA® Cable Protection System for automation is designed to protect cables and wires in extreme automation and robotic installations.

PMA® conduits

Highly flexible to accommodate continuous bending, especially suitable for narrow bending radii, with abrasion resistance and wear indicator.



Tube clamp with ball joint sleeve

Offers additional flexibility and reduces mechanical stress on the conduit.



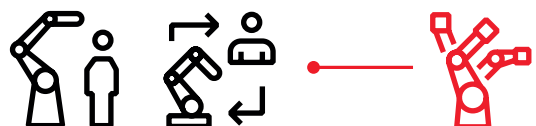
BKS cable star

Use to reduce the lateral movement and strain of the cables and prevent any debris from entering the exposed conduit end.

SEE MORE



Learn more about the features and benefits in this PMA® robotic animation video.



Type XR90

PMAFLEX multilayer conduit



Very flexible, medium-duty conduit

For dynamically moving conduit systems in robotics and automation industry.



Wear indication function

Very flexible conduit with a unique wear indication function, especially suitable for applications with a pullback system.

- Wear indication function
- High resistance to continuous bending
- No abrupt conduit failure due to high tear propagation resistance
- High abrasion resistance
- High resistance to torsion
- Suitable for applications with a pullback system
- Long service life

Type XR90 - Very flexible, medium-duty



XR90 Index

min.	max.
Ductility	
Fatigue reversed bending	
Compression resistance	
Low temperature performance	
Weathering resistance	

- **Material:** Outer, intermediate and inner layer made from high-grade, specially formulated polyamide 12
- **Temperature range:** -40°C to +95°C continuous, short-term to +150°C
- **Compatible with:** PMA Automation Products, PMAFIX Pro, PMAFIX fittings, PMAGRIP Flange, PMA Accessories
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

Approvals



SEE MORE



Type PIS/PIH

Highly flexible,
heavy-duty conduit

Highly flexible UL recognised conduits*
ideal for dynamic applications in robotic
and automation industry.



Highly flexible, heavy-duty conduit

Excellent mechanical
characteristics, also
under extreme
climatic conditions
(low temperature and
low humidity).

* PIS: Medium-wall
(Nom. width 07 to 48) /
PIH: Heavy-wall
(Nom. width 56 to 125).



- Very good reversed bending characteristics
- Good mechanical characteristics even under extreme conditions, such as low temperatures

- **Material:** High-grade, specially formulated polyamide 12
- **Temperature range:** -50 °C to +95 °C, short-term to +150 °C
- **Compatible with:** PMAFIX Pro, PMAFIX fittings, PMAGRIP flange, PMA accessories
- **Conforms to:** UL94 V0, UL1696 (UL File E80294)
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

Approvals



Type PIS/PIH - Highly flexible, medium- and heavy-duty

PIS/PIH Index

min.	max.
Ductility	
Fatigue reversed bending	
Compression resistance	
Low temperature performance	
Weathering resistance	



Type PPCOF

Flexible, divisible conduit

Divisible conduit ideal for
retrofit and repairs.

Type PPCOF / PMA Divisible System - Flexible, divisible

PPCOF Index

min.	max.
Ductility	
Fatigue reversed bending	
Compression resistance	
Low temperature performance	
Weathering resistance	



- **Material:** Specially modified polypropylene PP
- **Temperature range:** -20°C to +105°C continuous, short-term to +150°C
- Can be opened and closed again in longitudinal direction any time
- Good reversed bending resistance
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

Approvals



SEE MORE



Type XTPC

PMAFLEX Multilayer conduit



Highly flexible, medium-duty conduit

Especially suitable for narrow bending radii.



Wear indication function

Highly flexible conduit for robotic applications with high resistance to abrasion and wear indication function.

- Wear indication function
- High resistance to continuous bending
- No abrupt conduit failure due to high tear propagation resistance
- Very high abrasion resistance
- High resistance to torsion
- Suitable for tight bending-radii
- Long service life

Type XTPC - Highly flexible, medium-duty



XTPC Index

min.	max.
Ductility	████████████████████
Fatigue reversed bending	████████████████████
Compression resistance	████████████████████
Low temperature performance	████████████████████
Weathering resistance	████████████████████

- **Material:** Outer, intermediate and inner layer made from high-grade, specially modified Thermoplastic copolyester elastomer
- **Temperature range:** -40°C to +105°C continuous, short-term to +150°C
- **Compatible with:** PMA Automation Products, PMAFIX Pro, PMAFIX fittings, PMAGRIP flange, PMA Accessories
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

Approvals



SEE MORE



Type ESD

Highly flexible,
light-grade conduit



Highly flexible, light-grade conduit

For indoor and outdoor use
(very good cold temperature
performance).

For dynamic robotic
applications where
electrostatic charge and
uncontrolled discharge
need to be avoided.

- **Material:** Specially modified polyamide 12
- Prevents electrostatic charging
- High dynamic load resistance
- For indoor and outdoor use (very good cold temperature performance)
- Excellent UV-resistance
- **Environmental properties:** Free from halogens, RoHS and REACH compliant
- **Temperature range:** -40 °C to +90 °C, short-term to +150 °C

[SEE MORE](#)

Approvals



Type ESD - Very flexible, medium-duty conduit

ESD Index

min.	max.
Ductility	
Fatigue reversed bending	
Compression resistance	
Low temperature performance	
Weathering resistance	



Type PUE

Highly flexible,
soft-grade conduit



Highly flexible, soft-grade conduit

Especially suitable for
tight bending radii.

Highly flexible conduit
for robotic applications
with multi-axial
movements and excellent
chafing characteristics.

- **Material:** Specially formulated polyurethane
- **Temperature range:** continuous -60°C to +50°C
- **Compatible with:** PMAFIX Pro, PMAFIX fittings, PMAGRIP flange, PMA Accessories
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

[SEE MORE](#)

Approvals



Type PUE - Highly flexible, medium-duty

PUE Index

min.	max.
Ductility	
Fatigue reversed bending	
Compression resistance	
Low temperature performance	
Weathering resistance	



Type BSH

One-piece tube clamp



One-piece tube clamp
Serves as a fixation for functional inserts.

Approvals



To be used with BGN half-shells to optimally fix/guide conduits.



- Single-piece, robust construction
- Easy installation
- To be used in combination with other accessories like BGN
- Space saving design allows optimum installation in applications
- Reduces mechanical stress on the cable harness extending the lifespan of the application
- Also serves as a fixation for functional inserts (BTK, BKE) reducing mechanical stresses

- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:** PMAFLEX Pro Conduits, PMAFLEX Multilayer Conduits, PMAFLEX Conduits
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

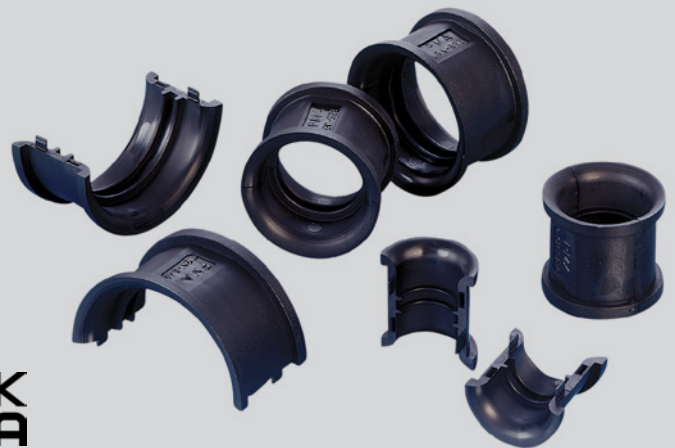
Type BGN

Half-Shell Inserts



Strain relief half-shell inserts
Possibility to block axial movement of the conduit to reduce stress and torsion.

Approvals



Half shell inserts for BSH Tube clamp for conduit guiding or strain relief.



- Provide axial strain relief for conduits but allowing rotation
- Easy installation
- Especially suitable for dynamic applications
- Flexible combination with system blocks
- Variety of fixation possibilities
- Excellent impact strength

- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:** PMAFLEX Pro Conduits, PMAFLEX Multilayer Conduits, PMAFLEX Conduits, PMA Smart Line Conduits

Type BSS/BSV

Abrasion protection sleeve



Abrasion protection sleeve
Increases the life time of moving conduits.

Approvals



Abrasion protection for corrugated conduits in positions exposed to chafing.

- Increases the life time of moving conduits
- Excellent chafing characteristics
- Very good chemical properties
- Fits both conduit profiles - fine (T) and coarse (G)
- Conforms to: EN 45545-2 HL3 (R22 & R23), NFPA 130, UL 94 (V0)

- **Material:** High-grade, specially formulated polyamide 6
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant
- **Compatible with:** PMAFLEX Pro Conduits, PMAFLEX Multilayer Conduits, PMAFLEX Conduits, PMA Smart Line Conduits



Type BSS-OS

Screwless protection sleeve



Screwless abrasion protection sleeve
An easy-to-install, metal / screw-free solution to protect corrugated conduits against abrasion and chafing.

Approvals



Screwless and metal free abrasion protection for corrugated conduits in positions exposed to chafing.

- Increases lifetime of moving conduits in dynamic applications
- Optimised for high impact resistance
- No metal parts, no screws
- Tool-free installation
- Easy (re-)positioning without full disassembly
- Excellent chafing characteristics
- Fits both conduit profiles - fine (T) and coarse (G)

- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:** PMAFLEX Pro Conduits, PMAFLEX Multilayer Conduits, PMAFLEX Conduits, PMA Smart Line Conduits
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant



Type BTK

Ball joint sleeve



Strain relief functionality possible via additional BTR
Possibility to block axial movement of the conduit to reduce stress and torsion.

Approvals



Ball joint sleeve used in BSH tube clamps for gliding and guiding PMA conduits.

- Increased degree of freedom for cable packs
- The ball joint offers additional flexibility and reduces mechanical stress on the conduit
- Can be used with strain relief insert BTR to block conduit movement in axial direction
- Easy to install and exchange

- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:** BSH Tube clamp, PMAFLEX Pro Conduits, PMAFLEX Multilayer Conduits, PMAFLEX Conduits
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant



Type BTR

Strain relief insert



Strain relief inserts
Possibility to block axial movement of the conduit to reduce stress and torsion.

Approvals



Used to fix the conduit against axial movements in BTK ball joint sleeves. Rotation of the conduit remains possible.

- Increased degree of freedom for cable packs
- The ball joint offers additional flexibility and reduces mechanical stress on the conduit
- Can be used with strain relief insert TR to fix the conduit in axial direction
- Easy to install and exchange
- Used in BSH tube clamps for gliding and guiding PMA conduit

- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:** BSH Tube clamp, BKS Grommets, PMAFLEX Pro Conduits, PMAFLEX Multilayer Conduits, PMAFLEX Conduits
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant



Type BKE

Ball joint termination



Strain relief functionality possible via additional BKS cable star

A grommet can be inserted directly into this termination to hold and strain-relief the cables.

Approvals



Provides additional relief to conduit and cables due to reduced mechanical stress.



- Increased degree of freedom for cable packs
- Optimum solution for cable guidance in automation applications
- Reduces mechanical stress on the cable harness extending the lifespan of the application
- Easy to install and exchange
- Strain relief of cables and wires
- A grommet can be inserted directly into this termination to hold and strain-relief the cables
- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:** BSH Tube clamp, BKS Grommets, PMAFLEX Pro Conduits, PMAFLEX Multilayer Conduits, PMAFLEX Conduits
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

Type BSSK

Ball joint half shells



Strain relief ball joint half shells

Allowing axial movement of the conduit to reduce stress and torsion.

Approvals



Providing additional freedom of movement for corrugated conduits fixed in BSH automation tube clamps.



- Increases freedom of movement for conduits
- Optimum solution for cable guidance in automation applications
- Extends lifetime of conduit and cables due to reduced mechanical stress
- Easy to install and exchange
- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:** PMA Accessories, tube clamp BSH
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

Type BBSR

Ball strain relief



Ball strain relief
Ensures reliable cable management at the critical 6th axis.

Approvals



Ball strain relief for securing cables and tubes in combination with BSH tube clamps.



- Secure PMA conduits at axis 6 with integrated option for strain relief using cable ties
- Easy fit into BSH Tube Clamp, enabling connection between PMA conduits and robot axis
- High-grade, UL94 V0 compliant, specially formulated polyamide 6
- Freely rotating inside BSH Tube Clamp and around conduit axis
- Fits G- and T conduit profile
- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:**
 - PMAFLEX Pro Conduits
 - PMAFLEX Multilayer Conduits
 - PMAFLEX Conduits
 - PMA Automation BSH Tube clamp
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

Type BFH-0

One-piece system support



One-piece system support
Allowing optimal axial strain relief and impact resistance.

Approvals



One-piece system support, with safety lid.



- Hiece construction
- High impact resistance
- Optimal axial strain relief due to integrated rib
- Suitable for overhead installations due to safety lid
- High retention forces
- Quick mounting due to single hole fixing
- Very good chemical properties
- Fits both conduit profiles - fine (T) and coarse (G)
- Fits to PMACLIP - BFHS - Rail for system support
- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:**
 - PMAFLEX Pro Conduits,
 - PMAFLEX Multilayer Conduits,
 - PMAFLEX Conduits,
 - PMA Smart Line Conduits
- **Environmental properties:** Free from halogens and cadmium, RoHS and REACH compliant

Type BKS

Cable stars



Tailor-made strain relief

The BKS cable stars are designed-to-order, reducing strain and lateral movements.

Approvals



Customized solutions for arrangement and strain relief of a loom of hoses and leads of given dimensions in cable assemblies.

- Rubber inserts that are used at the conduit end to reduce the lateral movement and strain of the cables
- Prevents any debris from entering the exposed conduit end
- The rubber disc is held by strain relief half shells BGS or ball joint termination BKE

- **Material:** Special polymer
- **Compatible with:** Compatible with BKE and BTK (based on sizes) and BGS half shells
- **Environmental properties:** Free from halogens and cadmium



Type DKLK

Heavy duty swivel base



Heavy duty swivel base

Reduces wear to guidance and control elements.

Approvals



For BSH clamps.
Allows 360° rotation of cable packages.

- Robust construction
- Sealed high quality bearing with minimal play
- Allows rotation of cable pack supports
- Suitable for high mechanical forces in all assembly positions
- BSH tube clamp easy to install on the bearing with central screw
- Cylinder pin prevents twisting of the clamp on the bearing

- **Material:** Black anodised aluminium
- **Compatible with:** BSH - Tube clamp
- **Temperature range:** -50 °C to +105 °C
- **Environmental properties:** Free from halogens and cadmium
RoHS and REACH compliant

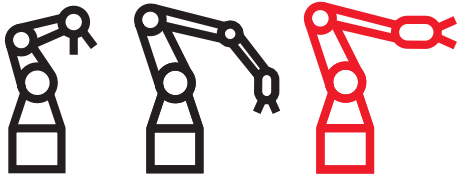


PMA® CobotProtect™

Dresspack solution for collaborative robots



PMA® BCCH universal cobot conduit holder
With Velcro™ strap. For fixing PMA® conduits along a variety of cylindrical & elliptical shaped collaborative robot (cobot) arms.



PMA cobot dresspack solution:
one design to dress them all. Easy to
install and flexible positioning along
the cobot arm. A flexible holder base
ensures compatibility with most
widely-used cobots on the market.

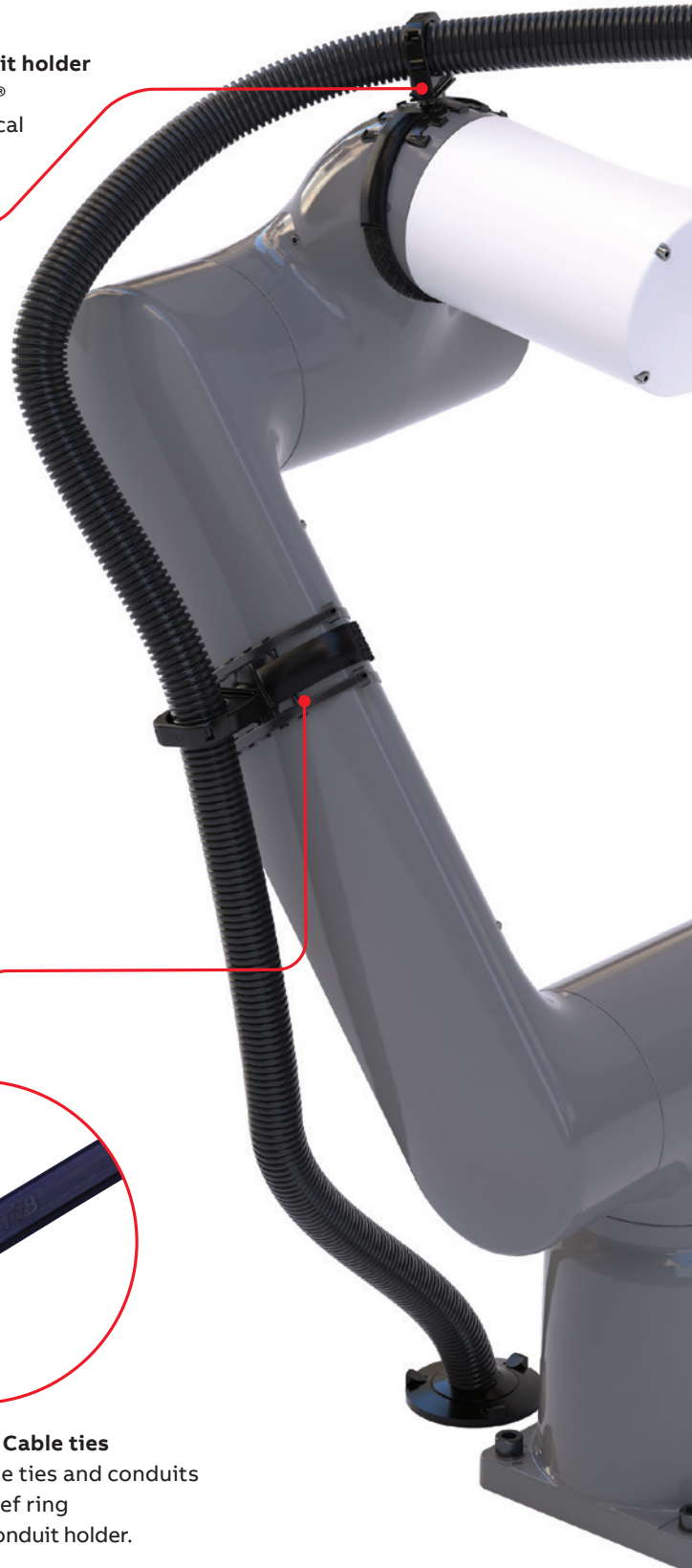
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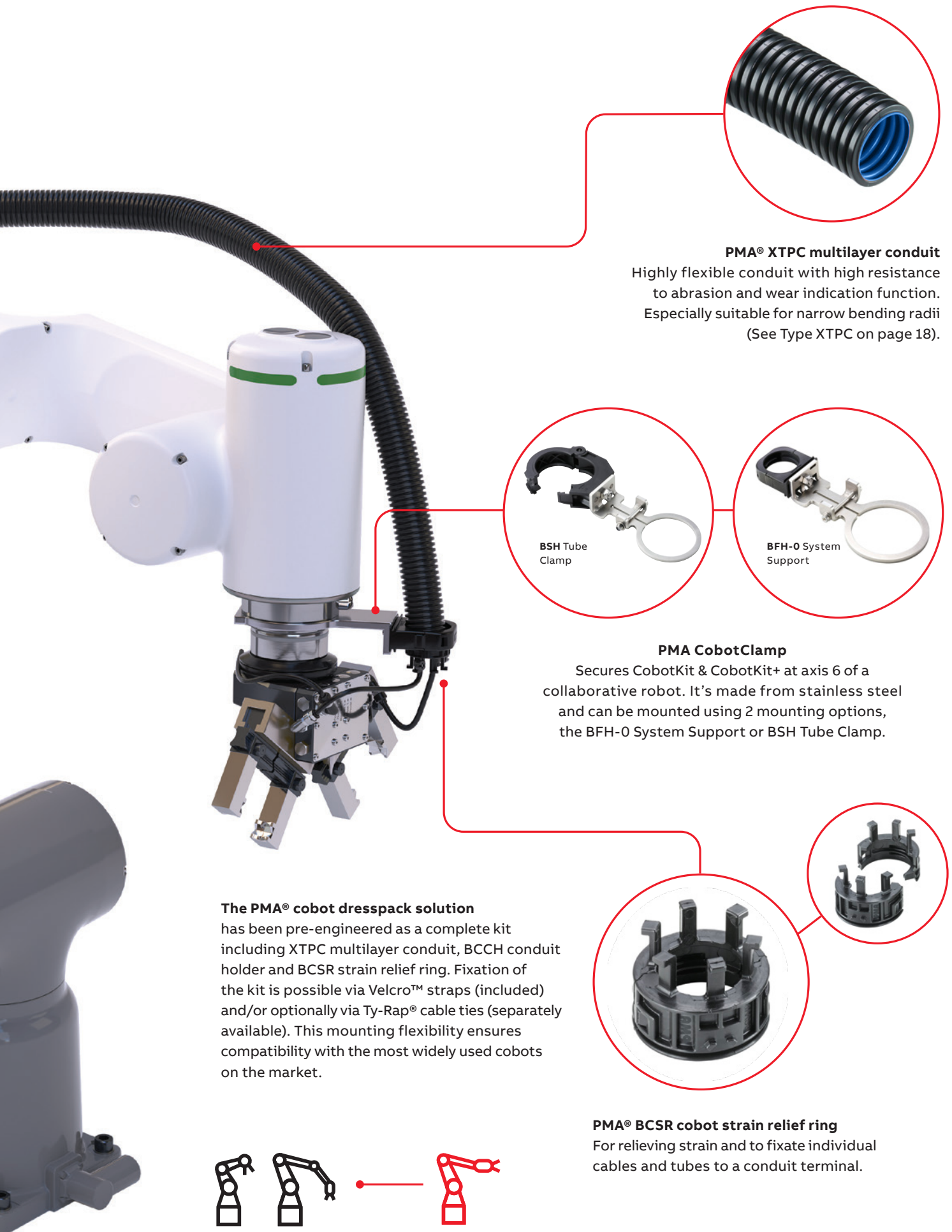


Learn more
about the features
and benefits in
this cobot
animation video.



Optional Ty-Rap® Cable ties
For fastening cable ties and conduits
to BCSR strain relief ring
and BCCH cobot conduit holder.





PMA® XTPC multilayer conduit

Highly flexible conduit with high resistance to abrasion and wear indication function. Especially suitable for narrow bending radii (See Type XTPC on page 18).

BSH Tube Clamp

BFH-0 System Support

PMA CobotClamp

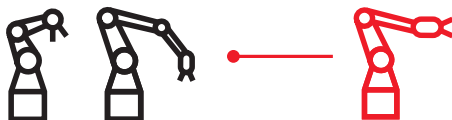
Secures CobotKit & CobotKit+ at axis 6 of a collaborative robot. It's made from stainless steel and can be mounted using 2 mounting options, the BFH-0 System Support or BSH Tube Clamp.

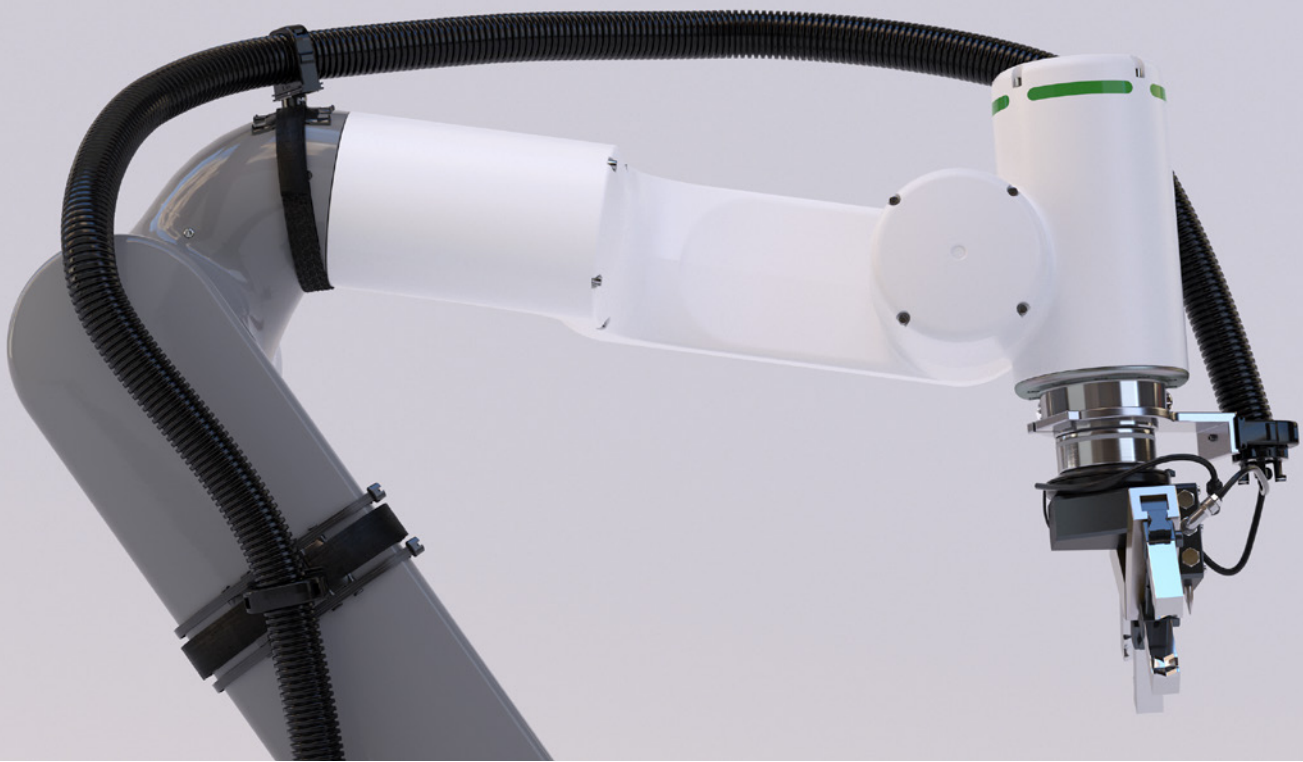
The PMA® cobot dresspack solution

has been pre-engineered as a complete kit including XTPC multilayer conduit, BCCH conduit holder and BCSR strain relief ring. Fixation of the kit is possible via Velcro™ straps (included) and/or optionally via Ty-Rap® cable ties (separately available). This mounting flexibility ensures compatibility with the most widely used cobots on the market.

PMA® BCSR cobot strain relief ring

For relieving strain and to fixate individual cables and tubes to a conduit terminal.





PMA® CobotProtect™

Dresspack solution for collaborative robots

Cable protection kit, suitable for the most widely used collaborative robots on the market.

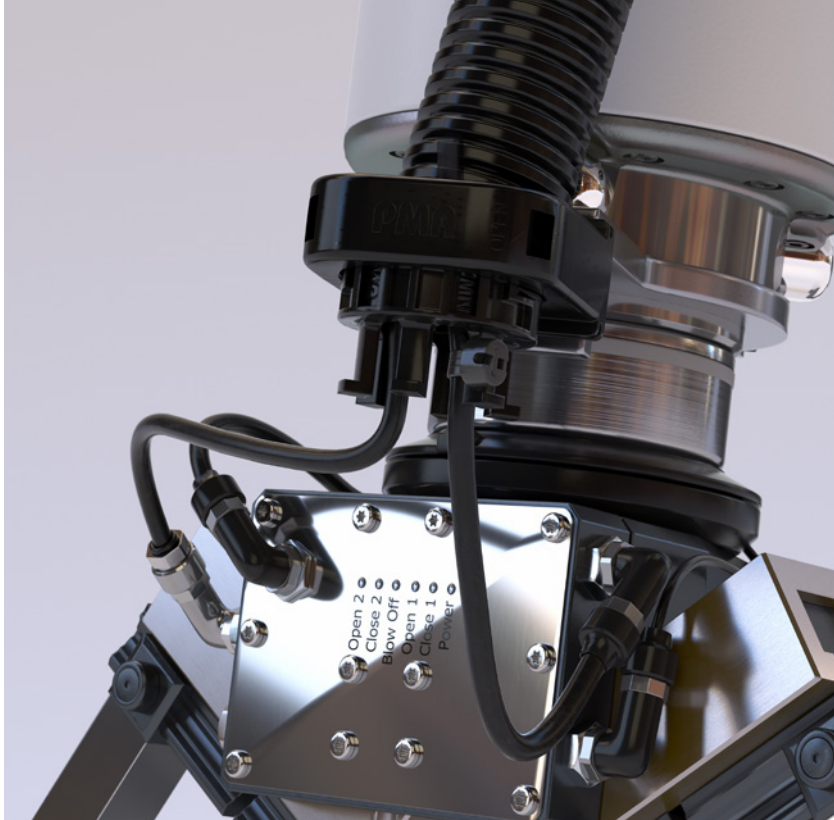
PMA CobotProtect™

The PMA CobotProtect™ cobot dresspack solution has been pre-engineered as a complete kit including XTPC multilayer conduit, BCCH conduit holder and BCSR strain relief ring. The special design of the base of BCCH conduit holder combined with the option to mount it via Velcro™ strap (included) and/or Ty-Rap® cable ties (separately available) makes it highly flexible and compatible with the most widely used cobots on the market.

Kit includes:

- 3 meter XTPC multilayer conduit
- 2x BCCH conduit holder with Velcro™ strap
- 1x BCSR strain relief ring
- 1x BFH Mounting





PMA® BCCH cobot conduit holder for fixing PMA® conduits along cobot arms

Easy to install and to exchange PMA® conduit holder for fixing PMA® conduits along a variety of cylindrical & elliptical shaped collaborative robot (cobot) arms. Flexible design of swivel base ensures compatibility with cobot models of most widely used cobot manufacturers. Fastening along cobot arm with Velcro™ and/or cables ties. 360° swiveling of BFH-0 clip gives flexibility and reduces mechanical stress induced by cobot movements. 10° tilt angle of FH-clip in any direction.

[SEE MORE](#)



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More information
about the **PMA®**
Cable protection
Dresspack solution for
collaborative robots.



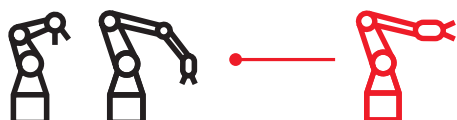
PMA® BCSR cobot strain relief ring

To relief strain and to fixate individual cables and tubes to a conduit terminal In automation applications. For fastening of individual cables/tubes to a conduit terminal via cable ties (not included). Can be be used freely rotating around conduit axis, or in “lock” mode using a BFH-0 clip. Easy to install and to exchange.



CobotClamp for fixation of PMA CobotKit at cobots

This metal clamp is specifically designed for collaborative robots (cobots) to securely attach PMA CobotProtect™ – CobotKit & CobotKit+ at the cobot's end of the arm (6th axis, tool output flange).



Type KIT-CCH

PMA CobotProtect™ CobotKit



Complete cable protection kit
For use on every collaborative robot.

Approvals



Easy-to-use dress pack for collaborative robots, allowing to fasten, rout and protect cables.



- The PMA CobotProtect™ cobot solution has been pre-engineered as a complete kit including XTPC multilayer conduit, BCCH conduit holder and BCSR strain relief ring
- The highly flexible PMA CobotProtect™ kit with Velcro strap (included) and Ty-Rap® cable ties (optional) for fixation, incorporates features which ensures to compatibility with most widely used collaborative robot on the market

- **PMA CobotProtect™ CobotKit:**
 - 3 metre XTPC multilayer conduit
 - 2 x BCCH conduit holders with Velcro strap
 - 1 x BFH-0 system support
 - 1 x BCSR strain relief ring
- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:**
 - PMAFLEX Pro Conduits
 - PMAFLEX Multilayer Conduits
 - PMAFLEX Conduits
 - PMA Smart Line Conduits

Type KIT-CCH+

PMA CobotProtect™ CobotKit+



Complete cable protection kit
For use on long reach collaborative robots.

Approvals



More cable protection for high payload & long reach collaborative robots.



- The PMA® CobotKit+ solution for long reach cobots has been pre-engineered as a complete kit including XTPC multilayer conduit, BCCH conduit holder and BCSR strain relief ring
- The highly flexible CobotKit+ BBCH conduit holder with extended Velcro® strap length and a BCSR Strain Relief Ring, incorporates features which ensures to compatibility with most widely used collaborative robot on the market

- **PMA CobotProtect™ CobotKit+ for heavy payload, long reach cobots:**
 - 4 meter XTPC multilayer conduit
 - 4 x BCCH conduit holders with extended 700mm Velcro® strap
 - 1 x BFH-0 System Support
 - 1 x BCSR Strain Relief Ring
- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:**
 - PMAFLEX Pro Conduits
 - PMAFLEX Multilayer Conduits
 - PMAFLEX Conduits
 - PMA Smart Line Conduits

Type BCCH

Cobot conduit holder



Cobot conduit holder

Fixes conduit along collaborative robot (cobot) arms.

Approvals



Conduit holder for fixing PMA conduits along cylindrical & elliptical shaped collaborative robot (cobot) arms.



- Flexible design of swivel base ensures compatibility with cobot models of most widely used brands (e.g. ABBTM, URTM, Omron™, etc.)
- Fastening along cobot arm with Velcro® and/or cables ties
- 360° swiveling of BFH-0 clip gives flexibility and reduces mechanical stress induced by cobot movements
- 10° tilt angle of FH-clip in any direction
- Fits G- and T conduit profile
- Easy to install and to exchange

- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:**
PMAFLEX Pro Conduits
PMAFLEX Multilayer Conduits
PMAFLEX Conduits
PMA Smart Line Conduits
- **Environmental properties:**
Free from halogens and cadmium
RoHS and REACH compliant

Type BCSR

Cobot strain relief ring



Strain relief ring

Relieves strain on cables connected to a collaborative robot.

Approvals



Provides strain relief for fastening of individual cables to a conduit terminal via cable ties.



- Fastening of individual cables/tubes to a conduit terminal via cable ties (not included)
- To be used freely rotating around conduit axis, or in “lock” mode using a BFH-0 clip
- Fits G- and T conduit profile
- Easy to install and to exchange

- **Material:** High-grade, specially formulated polyamide 6
- **Compatible with:**
PMAFLEX Pro Conduits
PMAFLEX Multilayer Conduits
PMAFLEX Conduits
PMA Smart Line conduits
PMA Clip - BFH-0 - System support
PMA Trust - BGPM - System support
- **Environmental properties:**
Free from halogens and cadmium
RoHS and REACH compliant

Type EOA - BFH & BSH

CobotClamp for fixation of PMA CobotKit on cobots



Cobot clamp
Secures the CobotKit to a collaborative robot at axis 6.

Approvals



Metal clamp for securing PMA CobotKit & CobotKit+ at axis 6 of a collaborative robot.



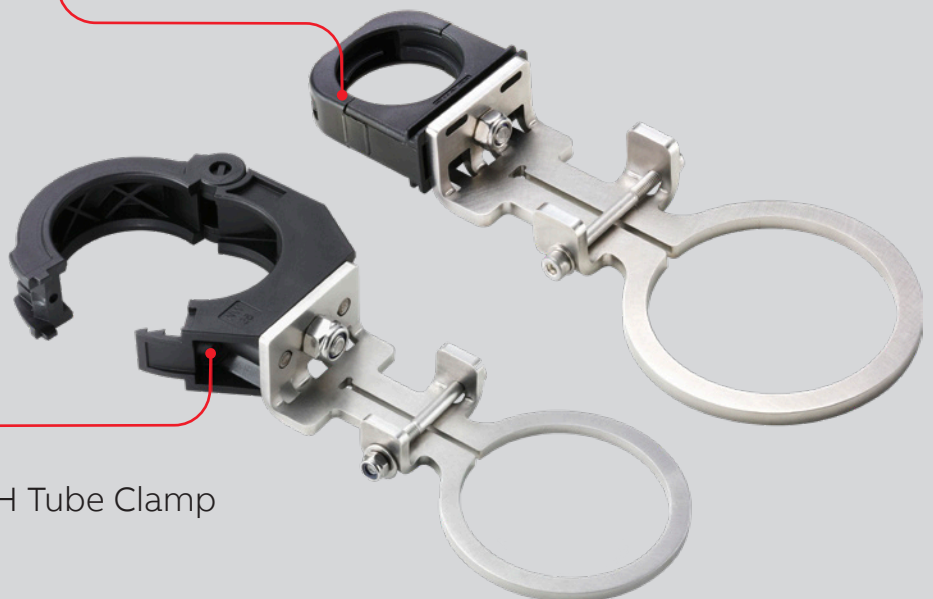
- This metal clamp is specifically designed for collaborative robots (cobots) to securely attach PMA CobotProtect™ - CobotKit & CobotKit+ at the cobot's end of the arm (6th axis, tool output flange)
- It's made from stainless steel and can be mounted using the BFH-0 System Support or BSH-R Tube Clamp
- The ISO-conform design (ISO 9409-1:2004) ensures easy installation and compatibility with cobot models of various payloads & reach
- BSH-R Tube Clamp is separately available, BFH-0 System Support is separately available or as part of PMA CobotProtect™ - CobotKit & CobotKit+
- **Material:** Stainless steel
- **Compatible with:**
CobotKit
CobotKit+
- **Conforms to:** ISO 9409-1:2004

Two mounting options for the CobotClamp

to increase the variety of application.

BFH-0 System Support

BSH Tube Clamp



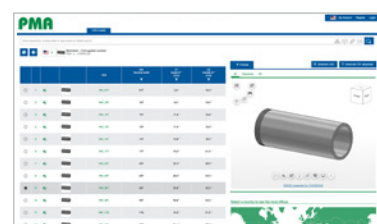
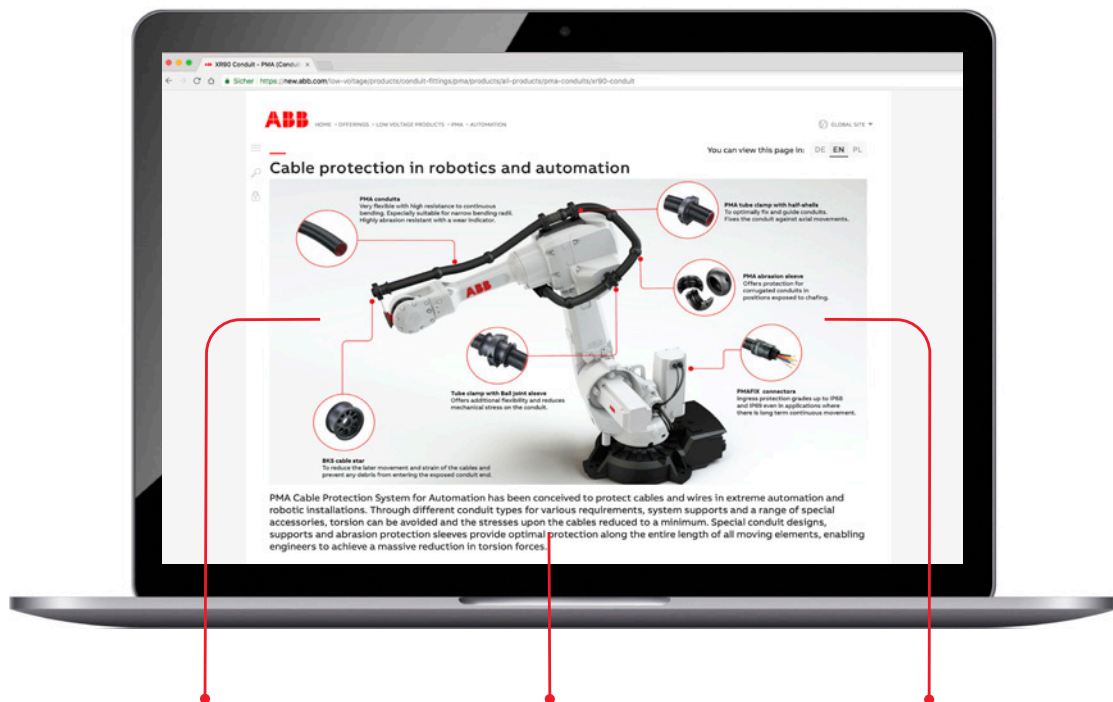
Further information

Visit our website

Visit the PMA web pages on ABB.com for our most up-to-date product line-up, and much more. This is the place to go to find all of the planning documents you need at your fingertips, including:

- Technical data sheets
- Brochure Automation Products
- CAD files
- Complete PMA automation product portfolio
- Videos

SEE MORE



PMA's tested and certified excellence in cable protection

Intensive testing, research and development activity is a top priority at PMA® every day. That's why PMA® is a market leader in the field of cable protection.

PMA cable protection from ABB are used globally, extensively in many areas and applications. The level of protection we have to offer to cables is constantly increasing. Extensive testing is therefore critical for research and development of new cable protection products as well as in quality control. Our products are tested to both international standards and internal test procedures. The internal PMA procedures are designed to supplement the international standards simulating real applications, testing to destruction finding the real limits of the product.

PMA cable protection delivers innovative, customised solutions that aim to streamline

testing processes:

- Product development based on market needs
- Two in-house test laboratories (Uster and Coleshill) dedicated only for conduits and fittings
- Broad range of available test installations
- Intensive product quality testing over specified periods

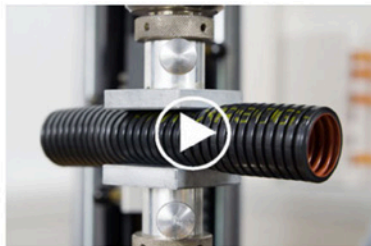
Our rigorous testing process helps ensure that your products align with all applicable requirements and expectations. To the extremes of cold to the extremes of heat and humidity. Our global team's knowledge helps to stay ahead of requirements, materials and technologies. It gives our customer the confidence that our products perform without failure or problems, meet their expectations and all regulations.

Customers' application-specific needs are a top priority at PMA. That's why PMA has more than 15 test procedures ("PMA DO") that enables us to perform cable protection-related, application-specific material and product tests.



PMA® Cable Protection

Test videos



PMA Test

Compression Strength



PMA Test

Resistance to Impact



PMA Test

Flexibility at Low Temperature



PMA Test

Resistance to Fatigue when Exposed to Continuous Bending 2



PMA Test

System Security – Pull-Out Strength



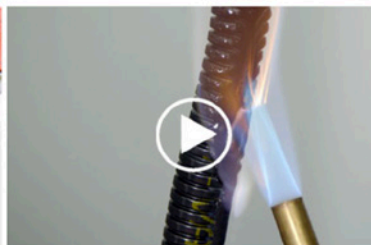
PMA Test

Ingress Protection for Static Applications



PMA Test

Resistance to Thermal Ageing



PMA Test

Flammability Tests



PMA Test

Flammability Test – Limited Oxygen Index



PMA Test

Resistance to Fatigue when Exposed to Continuous Bending



PMA Test

Ingress Protection for Dynamic Applications



PMA Test

Resistance to Chemicals





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