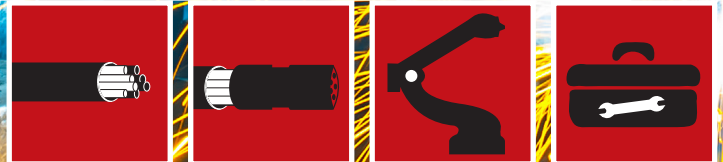


# robotic

solutions GmbH

a HEW-KABEL Company

## Accessories catalog Robotic systems





## Headquarters Kamp Lintfort

Robotic Solutions Ltd. in Kamp Lintfort provides robotics services for the automotive and supplier industry.

In the robotics business field, our range of services extends from consulting to assembly. We design, plan and manufacture energy supply systems and fastening elements according to customer requirements individually for all robot types and application areas. We supply you with robot cables by the meter or ready-assembled cables. Our employees will support you in optimizing your systems.

Robotic Solutions Ltd. is your specialist in the field of robot technology. Sophisticated support components give the robot the necessary freedom of movement for high working speeds and precise repeatability with a long service life. Our materials specially developed for robotics and the special geometry of the products, combined with many years of experience in manufacturing, are a guarantee for first-class quality.

Universally applicable fastening elements for all common robots can be combined to create individual designs that provide the necessary support for the hydraulic, pneumatic and electrical components of the hose assemblies. The specially developed cable protection hoses for complex robot applications withstand extreme loads and movements. Specially modified materials and the special hose geometry ensure the best protection and durability.

## Robotics

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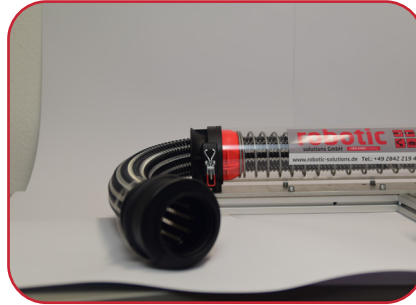
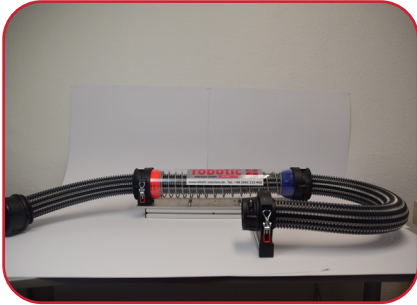


## + System box with spare parts and additional equipment

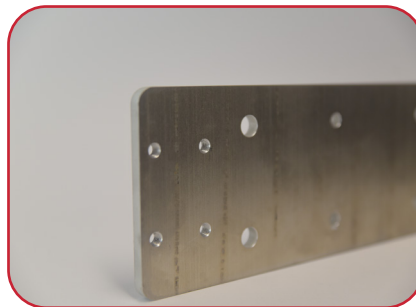
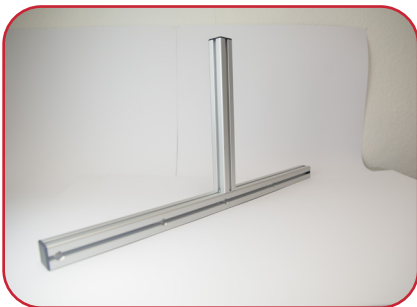




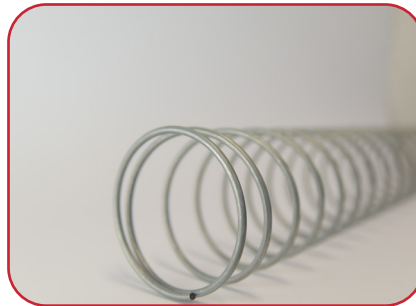
## System box



System box for hose sizes  
M40/P36 and M50/P48  
System box for hose sizes  
NW 56 and NW 70  
Item number: 60602661



Accessories and spare parts  
to the system box:  
1) Frame  
Item number: 90003039-2  
2) Adapter plate made of ALU  
Item number: 90005032



1) Acrylic tube 120/114,  
L = 600 mm  
Item number: 60904024  
2) Conical compression spring,  
galvanized spring steel wire  
D = 5, L = 600 mm  
Item number: 60921014





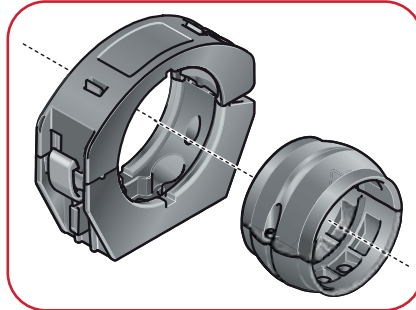
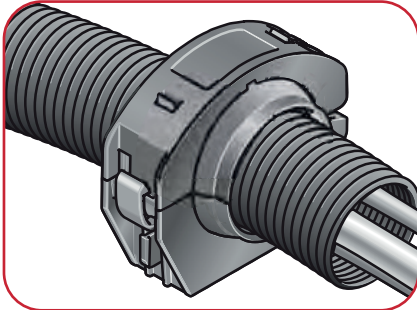


## + Accessories

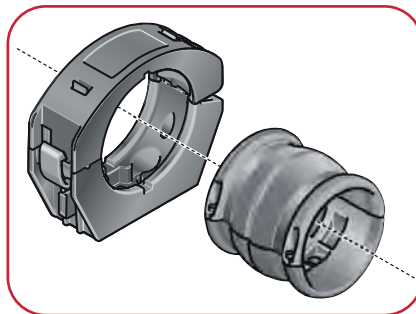
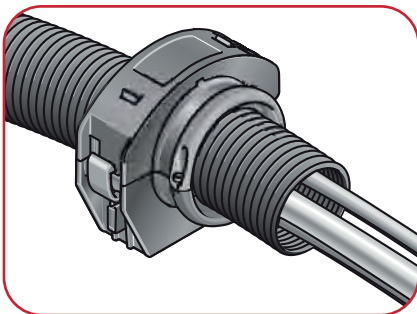




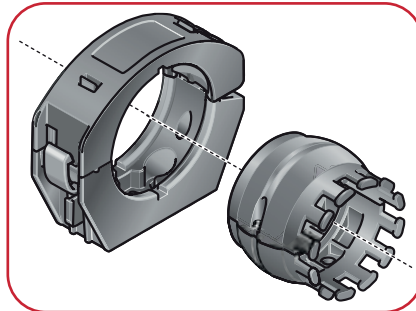
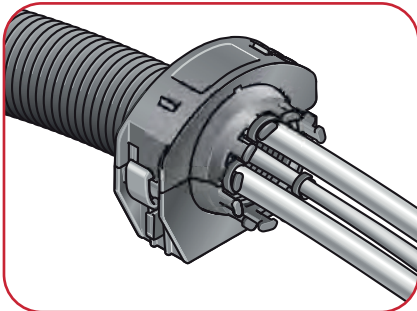
## System holder SH-P/M25-M32



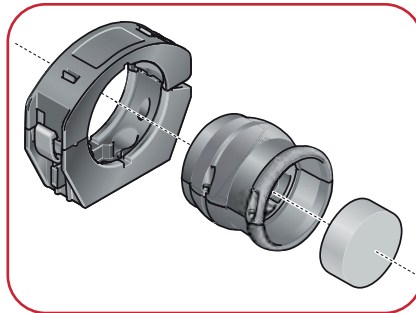
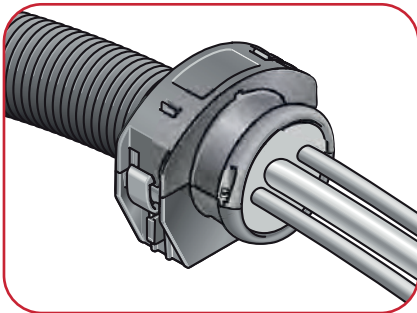
- +
- System holder with ball center joint for the assembly of a corrugated hose.
- 1) System holder SH
  - 2) Center ball center joint fixed KMG-F  
(Hose fixed in axial direction)



- +
- System holder with center ball joint for the assembly of a corrugated hose.
- 1) System holder SH
  - 3) Center ball center joint sliding KMG-G  
(hose sliding axially)



- +
- System holder with end ball joint for mounting a corrugated hose.
- 1) System holder SH
  - 4) End ball joint with integrated strain relief KEG-ZL  
(hose fixed)

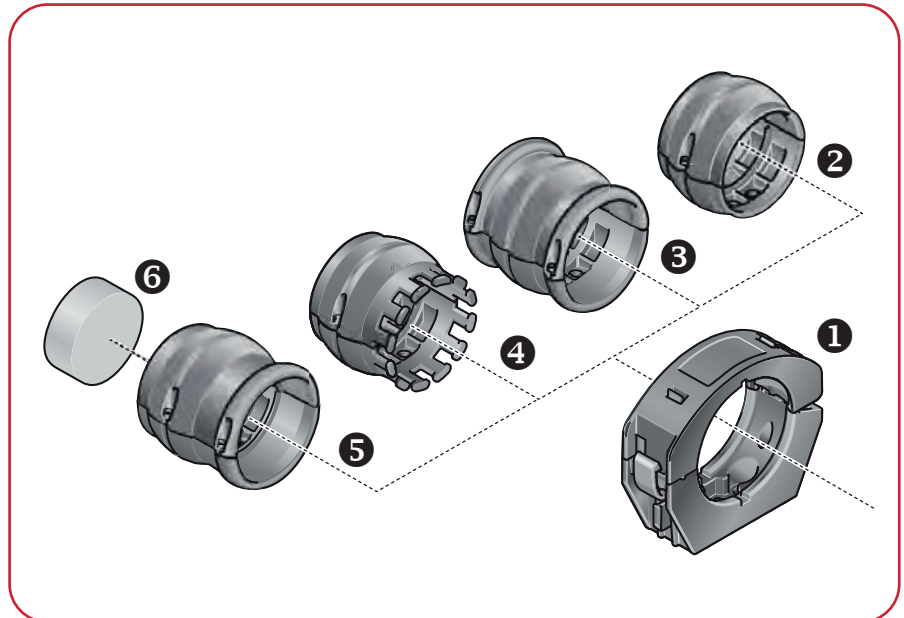


- +
- System holder with end ball joint for mounting a corrugated hose.
- 1) System holder SH
  - 5) End ball joint for Cable star strain relief KEG-K  
(hose fixed)
  - 6) Strain relief for Self-assembly ZL / N1

## System holder SH-P/M25-M32

The SH system holder is the core of a modular hose holder system that can be adapted to a wide variety of applications in automation and robotics equipment technology by means of four different ball joints (inlays):

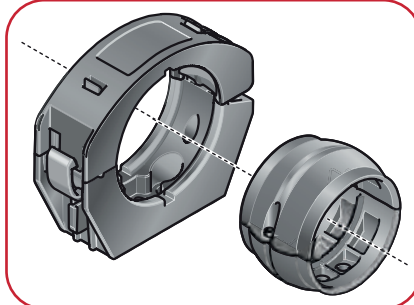
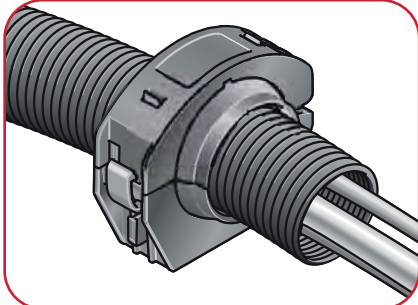
For dynamic use with high mobility of the dress-pack at the attachment point as well as for a rigid application with safely guided cables and hoses, with or without strain relief. The entire system offers the highest performance in terms of stability, flexibility and durability.



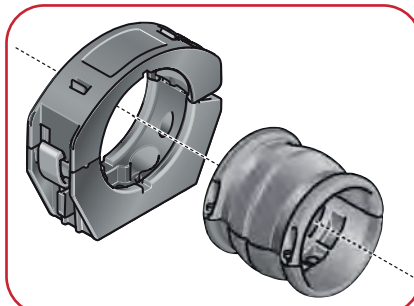
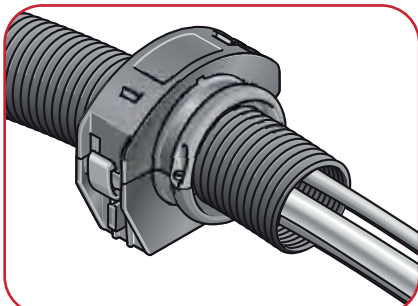
Schematic representation, individual parts may differ in detail

Position	Type	Item-Nr.	Color	Material	Execution
System holder					
1	SH-P/M25-M32	60601462	Black	PA	without insert rib
Ball joints (inlays)					
Center ball joint (fixed) for fixing cable protection conduits					
2	KMG-F M25/P21	60601658	Black	PA	
2	KMG-F M32/P29	60601660	Black	PA	
Center ball joint (sliding) for length-compensating guidance of cable protection conduits					
3	KMG-G M25/P21	60601858	Black	PA	
3	KMG-G M32/P29	60601860	Black	PA	
End ball joint with integrated strain relief					
4	KEG-ZL M25/P21	60602258	Black	PA	
4	KEG-ZL M32/P29	60602260	Black	PA	
End ball joint for cable star strain relief					
5	KEG-K M25/P21	60602458	Black	PA	
5	KEG-K M32/P29	60602460	Black	PA	
Strain relief as a blank for self-assembly					
6	ZL/N1 21/29	60901606	Black	TPE	

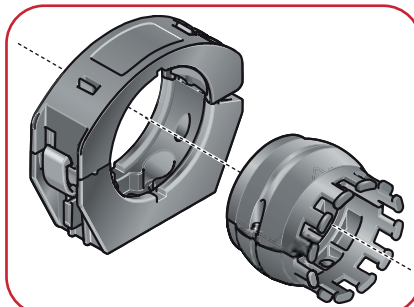
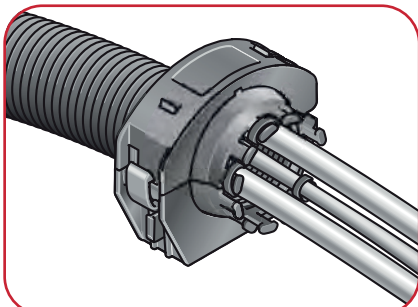
## System holder SH-P/M40-M50



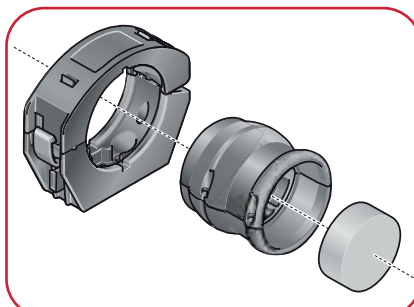
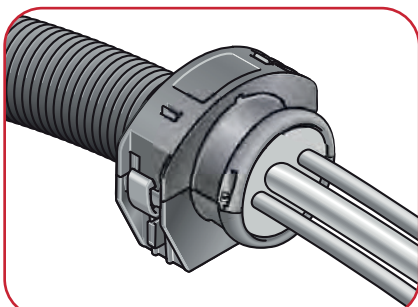
- System holder with center ball joint for the assembly of a corrugated hose.
- 1) System holder SH
  - 2) Center ball joint fixed KMG-F (Hose fixed in axial direction)



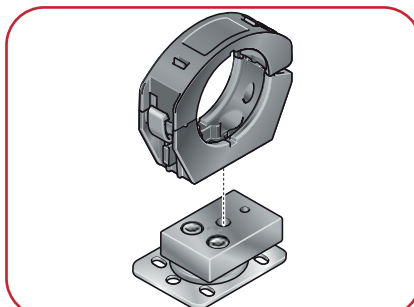
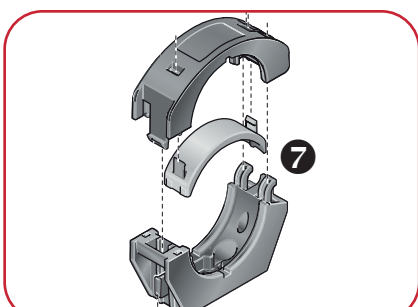
- System holder with center ball joint for the assembly of a corrugated hose.
- 1) System holder SH
  - 3) Center ball joint sliding KMG-G (Tube sliding axially)



- System holder with end ball joint for mounting a corrugated hose.
- 1) System holder SH
  - 4) End ball joint with integrated strain relief KEG-ZL (hose fixed)



- System holder with end ball joint for mounting a corrugated hose.
- 1) System holder SH
  - 5) End ball joint for cable star strain relief KEG-K (Hose fixed)
  - 6) Strain relief for Self-assembly ZL / N1



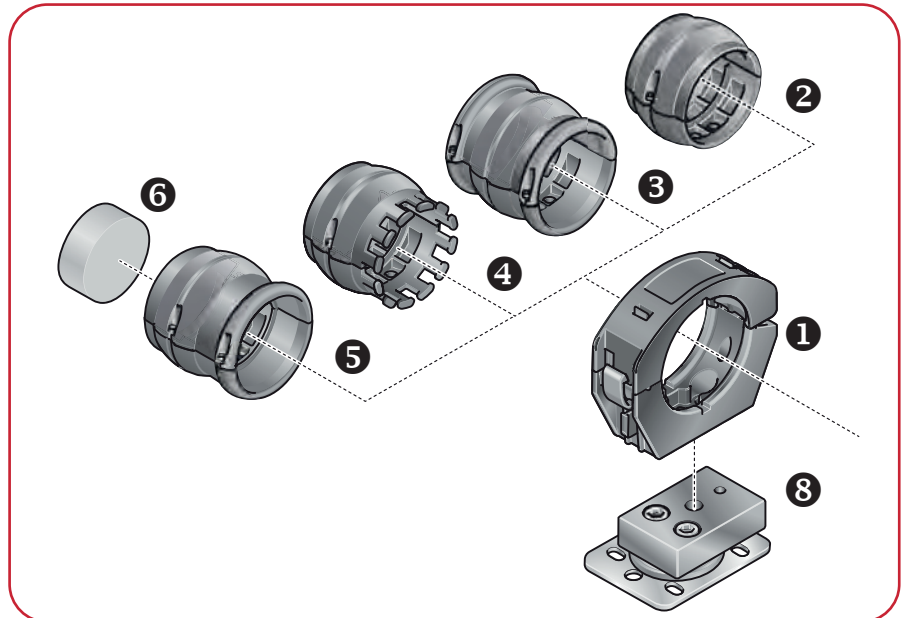
- System holder with insert rib.
- 1) System holder SH
  - 7) Inlay rib ELR limits the mobility of the ball joints on radial rotation
  - system holder on pivot bearing 1
  - 1) System holder SH
  - 8) Pivot bearing with intermediate plate DZM



## System holder SH-P/M40-M50

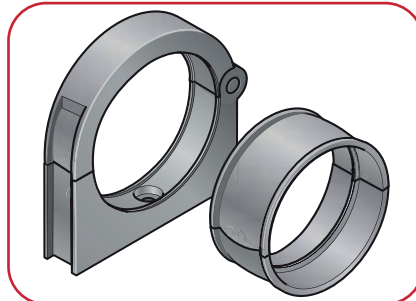
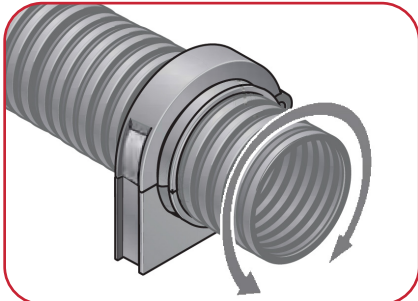
The SH system holder is the core of a modular hose holder system that can be adapted to a wide variety of applications in automation and robotics equipment technology by means of four different ball joints (inlays):

For dynamic use with high mobility of the dress-pack at the attachment point as well as for a rigid application with safely guided cables and hoses, with or without strain relief. The entire system offers the highest performance in terms of stability, flexibility and durability.

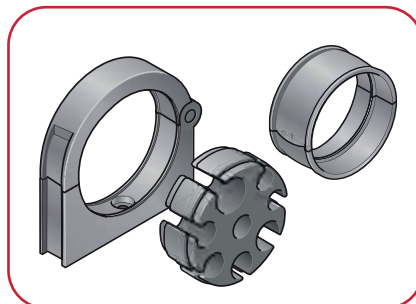
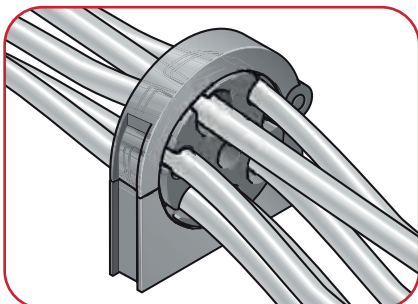


Schematic representation, individual parts may differ in detail

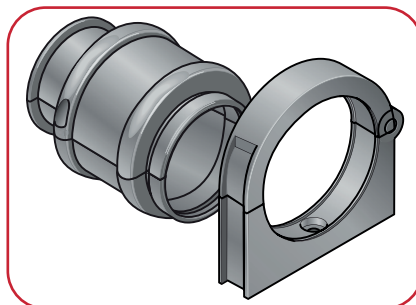
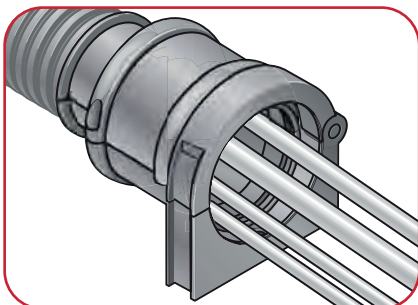
Position	Type	Item-Nr.	Color	Material	Execution
<b>System holder</b>					
1.1	SH-P/M40-M50	60601460	Black	PA	without insert rib
1.2	SH-F/M40-M50	60601450	Black	PA	with insert rib
1.3	SH-PF/M40-M50	60601470	Black	PA	Inlay rib included
<b>Ball joints (inlays)</b>					
<b>Center ball joint (fixed) for fixing cable protection conduits</b>					
2	KMG-F M40/P36	60601662	Black	PA	
2	KMG-F M50/P48	60601664	Black	PA	
<b>Center ball joint (sliding) for length-compensating guidance of cable protection conduits</b>					
3	KMG-G M40/P36	60601862	Black	PA	
3	KMG-G M50/P48	60601864	Black	PA	
<b>End ball joint with integrated strain relief</b>					
4	KEG-ZL M40/P36	60602262	Black	PA	
4	KEG-ZL M50/P48	60602264	Black	PA	
<b>End ball joint for cable star strain relief</b>					
5	KEG-K M40/P36	60602462	Black	PA	
5	KEG-K M50/P48	60602464	Black	PA	
<b>Strain relief as a blank for self-assembly</b>					
6	ZL/N1 36/48	60901610	Black	TPE	
<b>Inlay rib</b>					
7	ELR M40-M50	60601480	Red	PA	
<b>Pivot bearing with intermediate plate</b>					
8	DZM	60902214	Silver/Black	Steel	



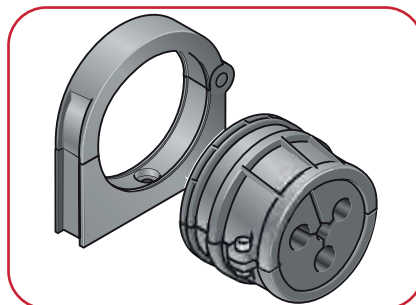
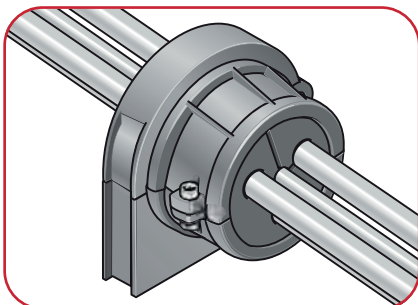
- +
- System holder with combination jaw for assembling a Corrugated hose NW 70.
- 1) System holder SHK 70
  - 2) Combination jaw KMB-70 (Hose rotating radially)



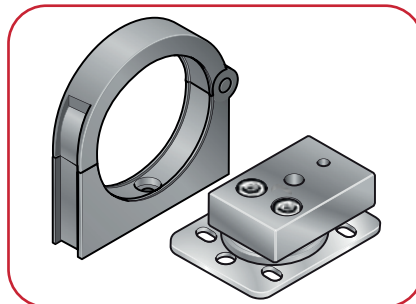
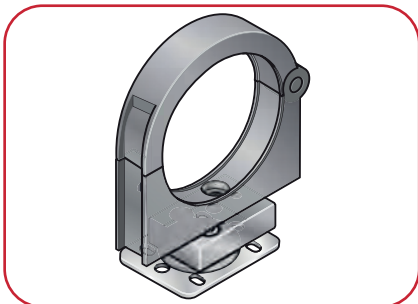
- +
- System holder with strain relief for fixing the installed cables.
- 1) System holder SHK 70
  - 2) Combi jaw KMB-70
  - 3) Strain relief ZL 70



- +
- System holder with swivel articulated piece for the assembly of a corrugated hose NW 70.
- 1) System holder SHK 70
  - 5) Joint piece GSA-56 and GSA-70



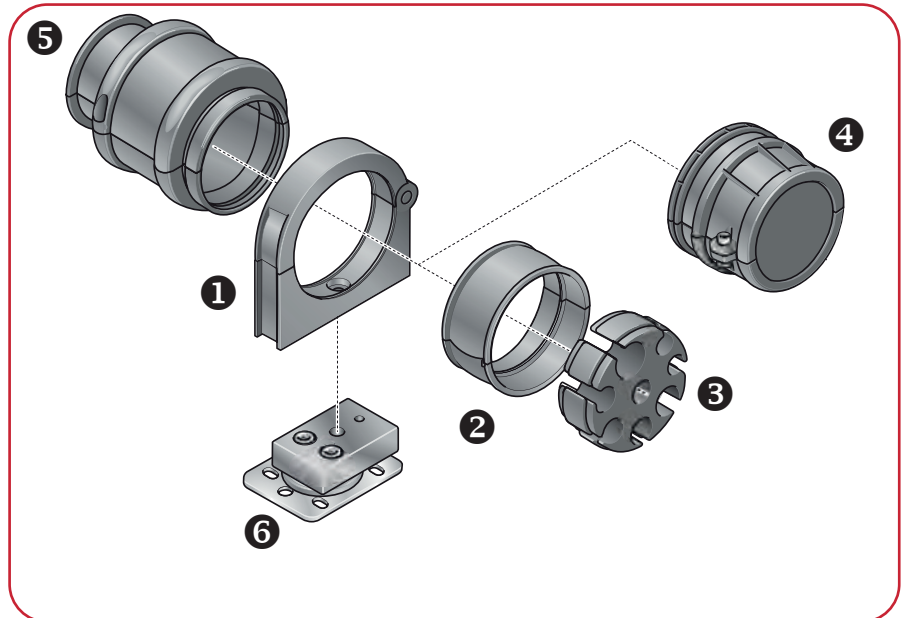
- +
- System holder with strain relief for fixing the installed cables.
- 1) System holder SHK 70
  - 4) Strain relief ZL3 70



- +
- System holder on spherical mounted pivot bearing. Can be swiveled through 360 °.
- 1) System holder SHK 70
  - 6) Pivot bearing with intermediate plate

## System holder NW 70

Combination examples of the SHK 70 system holder for the mounting of dress-packs with nominal width 70. The different combination possibilities with the system holder make it possible to find the ideal solution for the application.

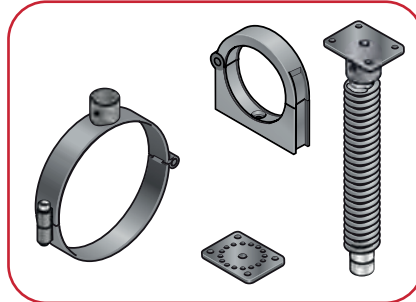
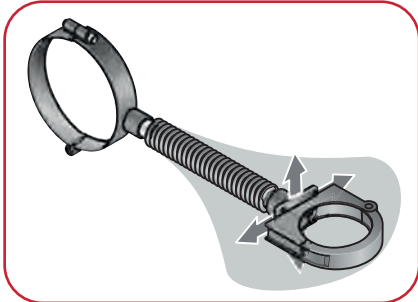


Schematic representation, individual parts may differ in detail

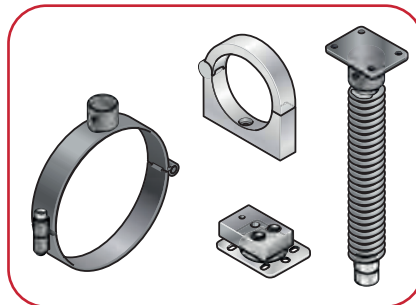
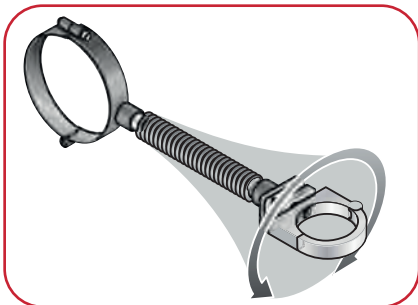
Position	Type	Item-Nr.	Color	Material	
System holder					
1	SHK 70-RM	60901014	Black	PA	
1.1	SHK 70-RK	60901015	Black	PA	
Half shell					
2	for corrugated hose and strain relief	KMB-70	60611307	Black	PA
2.1	only for corrugated hose	MBB-70	60611300	Black	PA
Strain relief					
3		ZL 70	see page 34	Black	TPE
Strain relief with blank					
4		ZL3 70	60901628	Black	PA, TPE
Joint piece					
5		GSA-70	60901214	Black	PA, POM
5.1		GSA-56	60901213	Black	PA, POM
Pivot bearing with intermediate plate					
6		DZM	60902214	Silver/Black	Steel



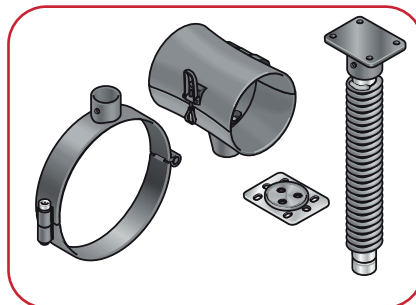
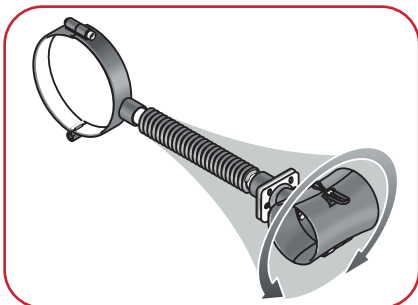
## Spring package (axis 4)



- +
- Spring package as flexible Attachment option axis 4.
- 1) Clamp SSO
  - 2) Spring package FDP
  - 5) System holder SHK
  - 7) Base plate FKG



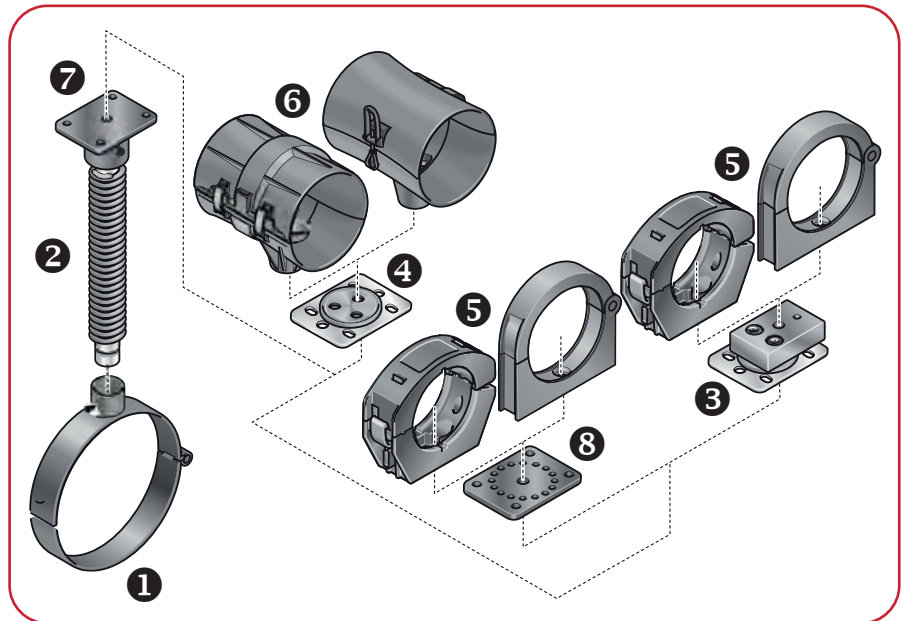
- +
- Spring package as flexible can be attached to axis 4.
- 1) Clamp SSO
  - 2) Spring package FDP
  - 3) Pivot bearing with intermediate plate DZM
  - 5) System holder SHK



- +
- Spring package as flexible can be attached to axis 4.
- 1) Clamp SSO
  - 2) Spring package FDP
  - 4) Pivot bearing DLM
  - 6) Trumpet TRO 70

## Spring package (axis 4)

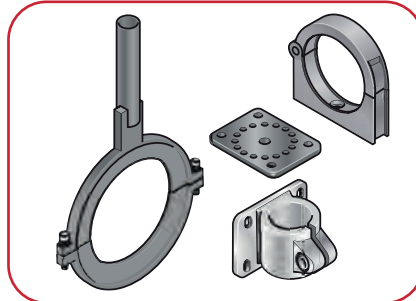
The spring assembly can be fastened to the axle 4 with the clamp. The spring element offers mobility to the hose assembly. The spring element compensates for changes in length and prevents or reduces tension on the hose assembly.



Schematic representation, individual parts may differ in detail

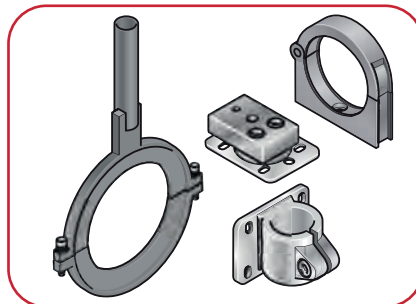
Position	Type	Item-Nr.	Color	Material	Execution
Clamp without pipe					
1.1	SSO 227	60902650	Black	Steel	Ø 227 mm
suitable for KUKA robot Types: KR 140 comp; KR1 125; KR1 150; KR1 200					
1.2	SSO 243	60902654	Black	Steel	Ø 243 mm
suitable for KUKA robot Types: KR 100P; KR 150-2; KR 180-2; KR 210-2; KR 240-2					
1.3	SSO 305	60902662	Black	Steel	Ø 305 mm
suitable for KUKA robot Types: KR 360; KR 500					
Spring package					
2.1	FDP 125	60902690	Silver/Black	Steel/spring steel	Spring length 125 mm
2.2	FDP 250	60902694	Silver/Black	Steel/spring steel	Spring length 250 mm
Pivot bearing					
3 with intermediate plate	DZM	60902214	Silver/Black	Steel	
4	DLM	60902210	Silver	Steel	
System holder					
5.1	SH-P/M25-M32	60601462	Black	PA	without insert rib
5.2	SH-P/M40-M50	60601460	Black	PA	without insert rib
5.3	SH-F/M40-M50	60601450	Black	PA	with insert rib
5.4	SHK 70-RM	60901014	Black	PA	
further system holders see page 29					
Trumpet					
6.1	TRO 70-M	60902414	Black	Aluminium	
6.2	TRO 70-K	60602004	Black	PA	
Retaining plate for spring package					
7	HPF	60902648	Black	Steel	
Base plate					
8	FKG	60902620	Black	Steel	

## Clamp (axis 6)



Clamp for assembly  
Axis 6.

- 1) Clamp SSR
- 2) System holder SHK
- 3) Flange clamp FKM
- 5) Base plate FKG



Clamp for mounting on axis 6.  
The system holder remains rotatable.

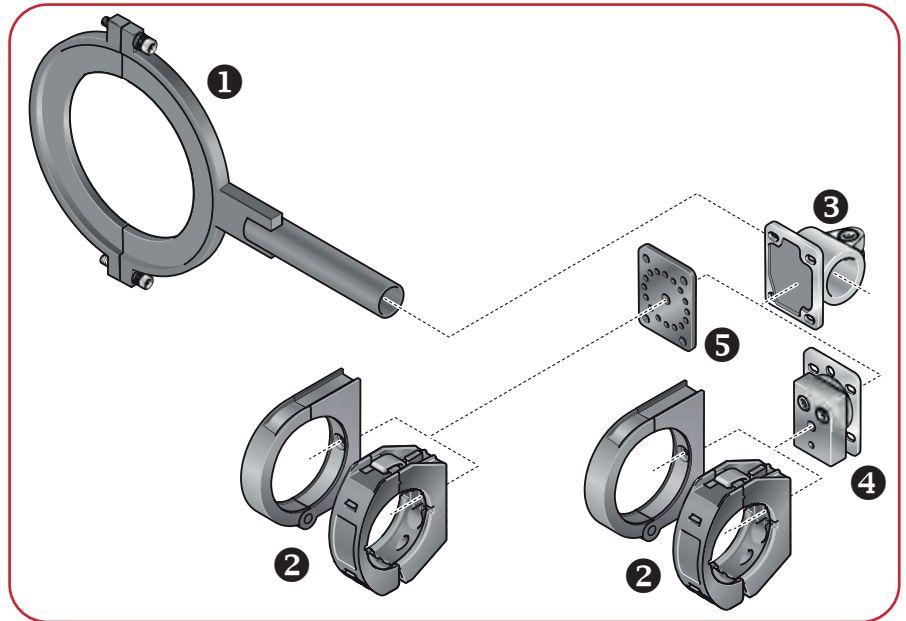
- 1) Clamp SSR
- 2) System holder SHK
- 3) Flange clamp FKM
- 4) Pivot bearing with intermediate plate DZM

Position	Type	Item-Nr.	Color	Material	Execution
Clamp with pipe					
1.1	SSR 160 Pipe D32	60902628	black burnished	Steel	Inside Ø 160 mm, angled
suitable for ABB-Roboter Type: 6400					
1.2	SSR 160 Pipe D32	60902630	black burnished	Steel	Inside Ø 160 mm, angled
suitable for ABB robot Type: 6600/175/2.8 as well as for FANUC robot Types: R2000 iA/165F; iA/200F; iA/210F					
1.3	SSR 180 Pipe D32	60902632	black burnished	Steel	Inside Ø 180 mm, straight
suitable for COMAU robots Smart H2					
1.4	SSR 190 Pipe D32	60902638	black burnished	Steel	Inside Ø 190 mm, angled
suitable for KUKA robot Types: KR 140 comp; KR 150-2; KR 180-2; KR 210-2; KR 240-2					
1.5	SSR 200 Pipe D32	60902642	black burnished	Steel	Inside Ø 200 mm, angled
suitable for KUKA robot Types: KR1 125; KR1 150; KR1 200 as well as for ABB robots Type: 6620; 6640					
1.6	SSR 220 Pipe D32	60902633	black burnished	Steel	Inside Ø 220 mm, angled
suitable for FANUC robot Types M 900					
1.7	SSR 250 Pipe D32	60902646	black burnished	Steel	Inside Ø 250 mm, angled
suitable for KUKA robot Types: KR 350-2; KR 360					
1.8	SSR 100 Pipe D34	60912651	black powder-coated	Steel	Inside Ø 100 mm, straight
1.9	SSR 115 Pipe D34	60912652	black powder-coated	Steel	Inside Ø 115 mm, straight
1.10	SSR 125 Pipe D34	60912653	black powder-coated	Steel	Inside Ø 125 mm, straight
1.11	SSR 160 Pipe D34	60912654	black powder-coated	Steel	Inside Ø 160 mm, angled
1.12	SSR 190 Pipe D34	60912655	black powder-coated	Steel	Inside Ø 190 mm, straight
1.13	SSR 200 Pipe D34	60912656	black powder-coated	Steel	Inside Ø 200 mm, angled
1.14	SSR 250 Pipe D34	60912657	black powder-coated	Steel	Inside Ø 250 mm, straight
Pipe length 250 mm					
for other robots / robot Types on request					
Galvanized version on request					



## Clamp (axis 6)

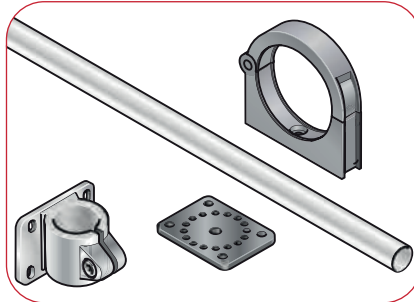
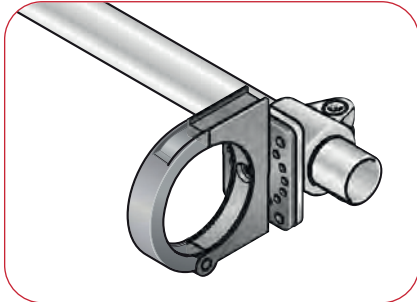
The SSR clamp is used for attaching a fastening point on the axle 6. With the flange clamp various attachments can be mounted on clamp.



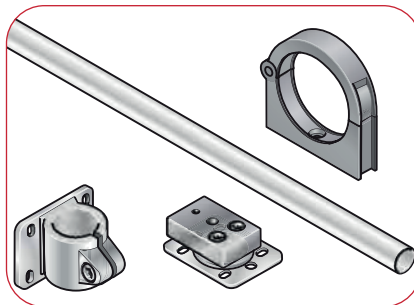
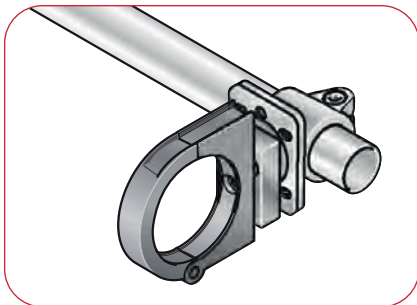
Schematic representation, individual parts may differ in detail

Position	Type	Item-Nr.	Color	Material	Execution
<b>System holder</b>					
2.1	SH-P/M25-M32	60601462	Black	PA	without insert rib
2.2	SH-P/M40-M50	60601460	Black	PA	without insert rib
2.3	SH-F/M40-M50	60601450	Black	PA	with insert rib
2.4	SH-PF/M40-M50	60601470	Black	PA	Inlay rib included
2.5	SHK 70-RM	60901014	Black	PA	
For further system holders see page 29					
<b>Flange clamp</b>					
3	FKM 32	60902610	Silver	Aluminium	
<b>Pivot bearing with intermediate plate</b>					
4	DZM	60902214	Silver/Black	Steel	
<b>Base plate</b>					
5	FKG	60902620	Black	Steel	

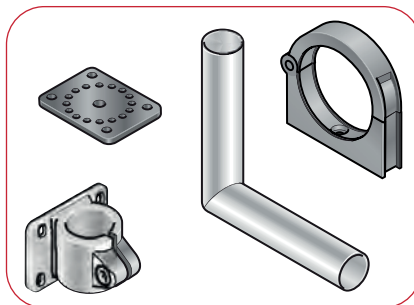
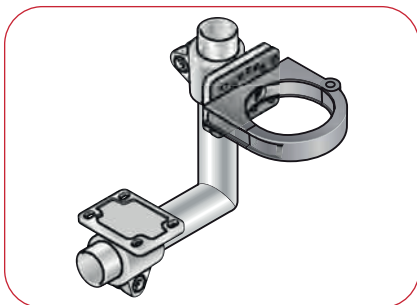
## Flange clamp



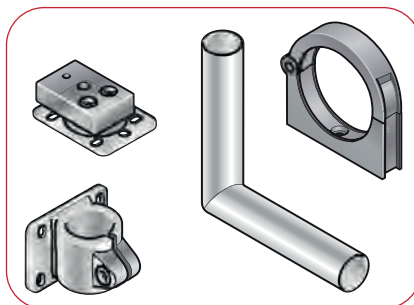
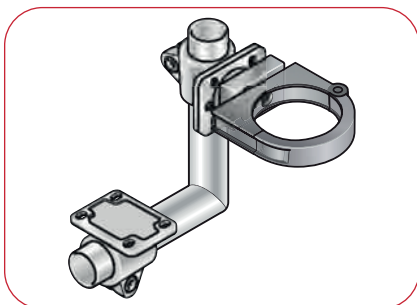
- +
- Flange clamp for rigid attachment of corrugated hoses.
- 1) Flange clamp FKM
  - 2) Base plate FKG
  - 4) System holder SHK
  - 5) Precision tube straight RG



- +
- Flange clamp with pivot bearing for flexible attachment of corrugated hoses.
- 1) Flange clamp FKM
  - 3) Pivot bearing with intermediate plate DZM
  - 4) System holder SHK
  - 5) Precision tube straight RG



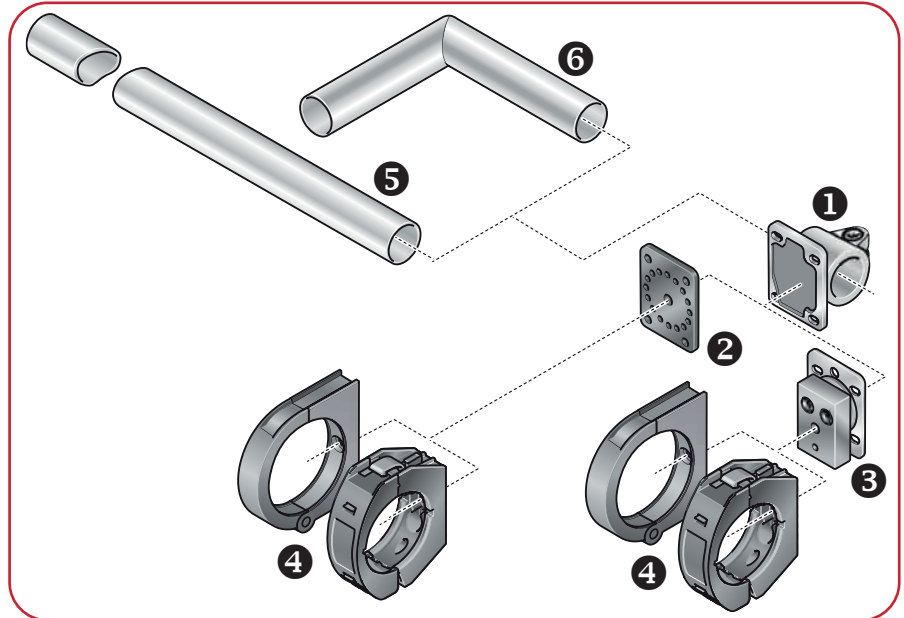
- +
- Flange clamp for rigid attachment of corrugated hoses.
- 1) Flange clamp FKM
  - 2) Base plate FKG
  - 4) System holder SHK
  - 6) Precision tube 90° RW



- +
- Flange clamp with pivot bearing for flexible attachment of corrugated hoses.
- 1) Flange clamp FKM
  - 3) Pivot bearing with intermediate plate DZM
  - 4) System holder SHK
  - 6) Precision tube 90° RW

## Flange clamp

The Flange clamp FKM 40 is used for fastening the precision tube. The mounting flange is used to accommodate the pivot bearing DZM or the base plate FKG.



Schematic representation, individual parts may differ in detail

Position	Type	Item-Nr.	Color	Material	Execution
Flange clamp					
1	FKM 40	60902612	Silver	Aluminium	
Base plate					
2	FKG	60902620	Black	Steel	
Pivot bearing with intermediate plate					
3	DZM	60902214	Silver/Black	Steel	
System holder					
4.1	SH-P/M25-M32	60601462	Black	PA	without insert rib
4.2	SH-P/M40-M50	60601460	Black	PA	without insert rib
4.3	SH-F/M40-M50	60601450	Black	PA	with insert rib
4.4	SH-PF/M40-M50	60601470	Black	PA	Inlay rib included
4.5	SHK 70-RM	60901014	Black	PA	
further system holders see page 29					
Precision tube					
5	Precision tube straight				
5.1	RG40 1000	60902810	Silver	Steel	
5.2	RG40 1200	60902814	Silver	Steel	
5.3	RG40 1500	60902818	Silver	Steel	
6	Precision tube 90° angled				
6.1	RW40 250	60902830	Silver	Steel	
6.2	RW40 350	60902834	Silver	Steel	





620RB\_200 S

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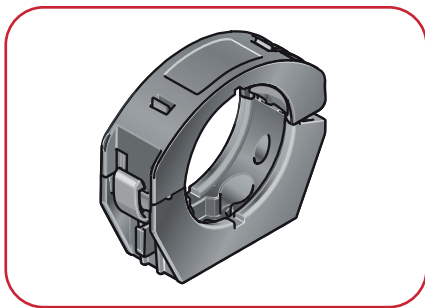
## System holder



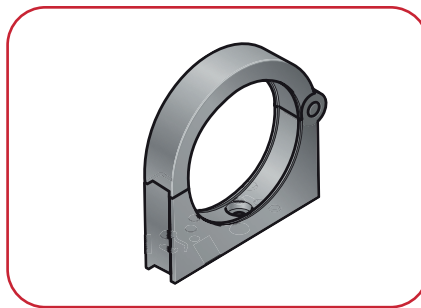
PA

In combination with various joints / inlays, the system holder is the main component for holding and protecting cables in a cable protection conduit.

- System holder SH-P: without insert rib, enables radial rotation and simultaneous axial dynamic deflection of the hose in all directions up to a maximum of 20°.
- System holder SH-F: with insert rib, statically anchored system for precise guidance of the hose, the radial rotatability is maintained.
- System holder SHK xx-RK: one-piece holder with plastic fastener
- System holder SHK xx-RM: one-piece holder with metal fastener for easy opening and closing



SH-F/M40-M50



SHK xx-RK

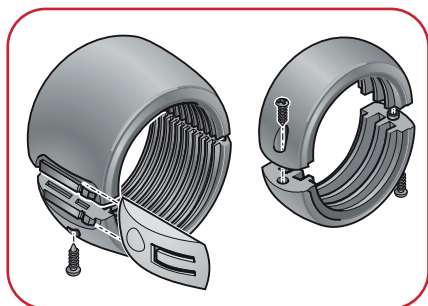
Type	Item-Nr.	Nominal size mm	Color	Material	Corrugated hose
System holder SH without insert rib - Inlays can be moved axially and radially					
SH-P/M25-M32	60601462		Black	PA	Depending on the inlay
SH-P/M40-M50	60601460		Black	PA	Depending on the inlay
System holder SH with insert rib - Radially rotatable inlays					
SH-F/M40-M50	60601450		Black	PA	Depending on the inlay
System holder SH with included insert rib - configurable mobility of the inlays					
SH-PF/M40-M50	60601470		Black	PA	Depending on the inlay
Inlay rib ELR for system holder SH					
ELR M40-M50	60601480		Red	PA	
System holder SHK with metal lock or plastic lock					
SHK 29-RK	60901008	23-29	Black	PA	
SHK 36-RK	60901009	36-42	Black	PA	
SHK 52-RK	60901011	36-52	Black	PA	
SHK 70-RK	60901015	68-70	Black	PA	
SHK 90-RK	60901013	90	Black	PA	

## Protector / hose connector

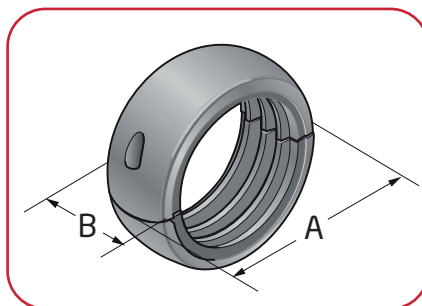


The protectors secure cable protection hoses and dress-packs against impacts and reduce abrasion. This significantly increases the service life of the dress-packs. They serve as impact protection and at the same time enable the connection of two cable protection conduits.

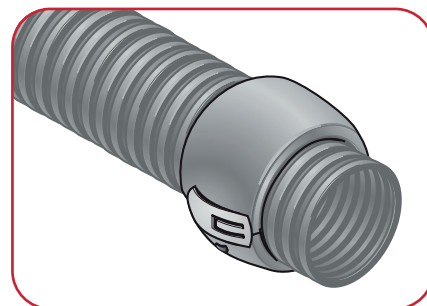
- Model with screw fastening of type PRB
- Model with sliding lock and locking screw of the type PR/SV



PR/SV



PRB



Protector Application example

Type	Item-Nr. Color Black	Item-Nr. Color Grey	Execution	Material	Corrugated hose	A mm	B mm
Flate execution for cable protection conduits with standard corrugation Type EW-xx							
PR/SV-EW 21	60601058	60601018	flat	PA	M25/P21	51,6	51,2
PR/SV-EW 29	60601060	60601020	flat	PA	M32/P29	57,9	51,0
PR/SV-EW 36	60601062	60601022	flat	PA	M40/P36	66,0	51,5
PR/SV-EW 48	60601064	60601024	flat	PA	M50/P48	78,0	49,5
PR/SV-EW 56	60601065	60601025	flat	PA	NW 56	90,8	51,0
Flate execution for cable protection conduits with high corrugation Type EWX-xx							
PR/SV-EWX 21	60601258	60601218	flat	PA	M25/P21	51,6	51,2
PR/SV-EWX 29	60601260	60601220	flat	PA	M32/P29	57,9	51,0
PR/SV-EWX 36	60601262	60601222	flat	PA	M40/P36	66,0	51,5
PR/SV-EWX 48	60601264	60601224	flat	PA	M50/P48	78,0	49,5
PR/SV-EWX 56	60601265	60601225	flat	PA	NW 56	90,8	51,0
Flate execution for cable protection conduits with high corrugation type EWX-xx-70 Jumbo and Standard corrugation type EW-xx-70 Jumbo							
PR/SV-UNI 70	60601267	60601227	flat	PA	NW 70	103,5	51,4
Flate execution for cable protection conduits with standard corrugation Type PARB and PURB							
PRB-36F	60601300		flat	PA	NW 36		
PRB-36G	60601301		flat	PA	NW 36		
PRB-48F/G	60601302		flat	PA	NW 48		
PRB-52	60601303		flat	PA	NW 52		
PRB-68	60601304		flat	PA	NW 68		
PRB-70	60601305		flat	PA	NW 70		
PRB-90	60601306		flat	PA	NW 90		

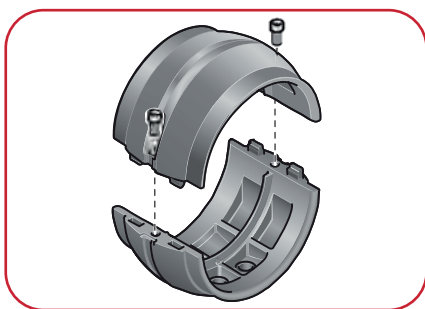


## Ball joint

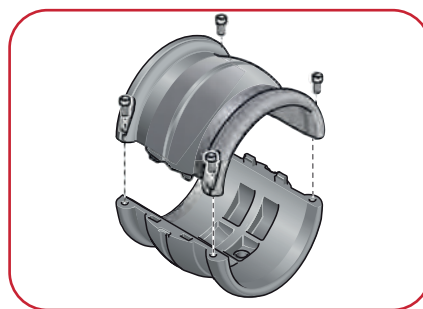


Centre ball joints enable dynamic use with high mobility of the dresspacks at the attachment point as well as a rigid application with safely guided cables and hoses.

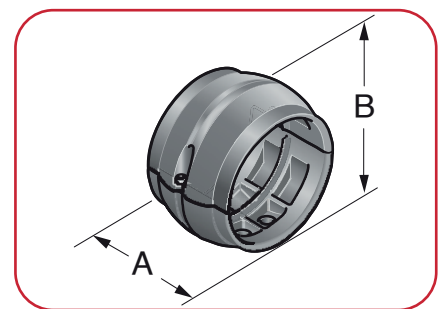
- For robotic applications and handling devices
- Quick, easy assembly and disassembly



Center ball joint Type KMG-F



Center ball joint Type KMG-G



Schematic dimensioning

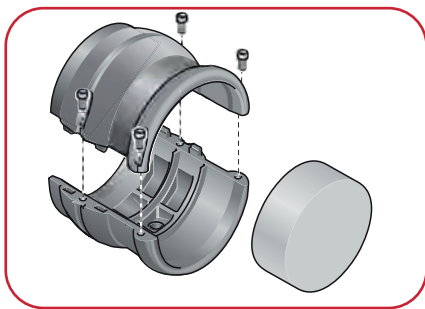
Type	Item-Nr.	Color	Material	Matching Corrugated hose	Matching System holder	A mm	B Ø mm
Center ball joint (inlay) (fixed) for fixing cable protection conduits							
KMG-F M25/P21	60601658	Black	PA	M25/P21	SH-P M25-M32	27,5	42,5
KMG-F M32/P29	60601660	Black	PA	M32/P29	SH-P M25-M32	27,5	42,5
KMG-F M40/P36	60601662	Black	PA	M40/P36	SH-(F/P/PF) M40-M50	44,0	69,0
KMG-F M50/P48	60601664	Black	PA	M50/P48	SH-(F/P/PF) M40-M50	44,0	69,0
Center ball joint (inlay) (sliding) for length-compensating guidance of cable protection conduits							
KMG-G M25/P21	60601858	Black	PA	M25/P21	SH-P M25-M32	36,0	42,0
KMG-G M32/P29	60601860	Black	PA	M32/P29	SH-P M25-M32	36,0	42,0
KMG-G M40/P36	60601862	Black	PA	M40/P36	SH-(F/P/PF) M40-M50	70,0	70,0
KMG-G M50/P48	60601864	Black	PA	M50/P48	SH-(F/P/PF) M40-M50	70,0	70,0

## Ball joint

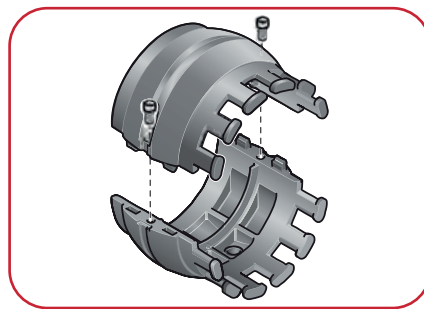


End ball joints are used wherever cables or media hoses protrude from the cable protection conduit. Types with integrated or optional strain relief are available.

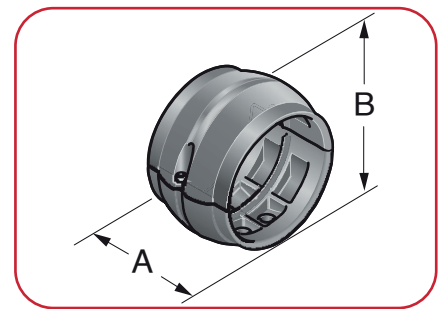
- For robotic applications and handling equipments
- Fast, simple assembly and disassembly



End ball joint Type KEG-K



End ball joint Type KEG-ZL



Schematic dimensioning

Type	Item-Nr.	Color	Material	Matching Corrugated hose	Matching System holder	A mm	B Ø mm
End ball joint (inlay) for cable star strain relief *							
KEG-K M25/P21	60602458	Black	PA	M25/P21	SH-P M25-M32	48,5	46,5
KEG-K M32/P29	60602460	Black	PA	M32/P29	SH-P M25-M32	48,5	46,5
KEG-K M40/P36	60602462	Black	PA	M40/P36	SH-(F/P/PF) M40-M50	67,0	70,0
KEG-K M50/P48	60602464	Black	PA	M50/P48	SH-(F/P/PF) M40-M50	67,0	70,0
* The optional strain relief blank ZL / N1 for self-assembly must be ordered separately.							
End ball joint (inlay) with integrated strain relief							
KEG-ZL M25/P21	60602258	Black	PA	M25/P21	SH-P M25-M32	38,5	42,5
KEG-ZL M32/P29	60602260	Black	PA	M32/P29	SH-P M25-M32	38,5	42,5
KEG-ZL M40/P36	60602262	Black	PA	M40/P36	SH-(F/P/PF) M40-M50	56,5	69,0
KEG-ZL M50/P48	60602264	Black	PA	M50/P48	SH-(F/P/PF) M40-M50	56,5	69,0

## Strain relief

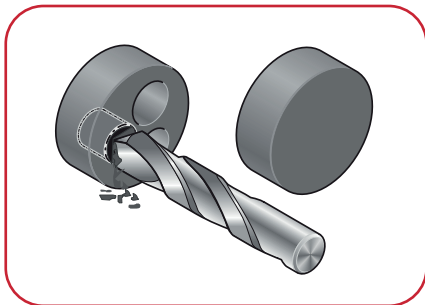


PA, TPE

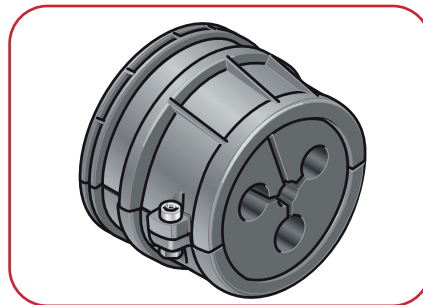
Strain reliefs to fix the lines in the dress-packs.

The cables can be easily mounted in the elastic cable star.

- ZL/N1 for assembly in the end ball joints of type KEG-K in combination with the holder SH- (F/P/PF) system. You can drill holes for the required cable diameters by yourself.
- ZL3 as a strain relief mount for the system boxes 36/48/56/70 ZL3 for mounting in the holder SHK 70-RM system without additional components.



ZL/N1



ZL3 70



Strain relief ZL

Type	Item-Nr.	Color	Material	Matching ball joint / Matching System holder	Line-/hose-Ø mm
Strain relief as a blank for self-assembly					
ZL/N1 21/29	60901606	Black	TPE	KEG-K M25/P21 + KEG-K M32/P29	variable 0 - 28,0
ZL/N1 36/48	60901610	Black	TPE	KEG-K M40/P36 + KEG-K M50/P48	variable 0 - 45,0
Strain reliefs recording complete with blank for self-assembly					
ZL3 70 Strain relief with blank*	60901628	Black	PA/TPE	SHK 70-RM	
Type Strain reliefe	Item-Nr.	Color	Material	Nominal size mm	Comment Ø mm
ZL 23 Blank	60901348	Black	TPE	23	Blank
ZL 29 Blank	60901349	Black	TPE	29	Blank
ZL 36 B01	60901350	Black	TPE	36	1x6 / 2x7,5 / 1x10 / 1x22,5
ZL 36 Blank	60901351	Black	TPE	36	Blank
ZL 52 B01	60901352	Black	TPE	52	1x10 / 2x12,5 / 2x20
ZL 52 B02	60901353	Black	TPE	52	3x12,5 / 2x20
ZL 52 B03	60901354	Black	TPE	52	1x10 / 3x12,5 / 1x20
ZL 52 B04	60901355	Black	TPE	52	2x11 / 4x12,5
ZL 52 Blank	60901356	Black	TPE	52	Blank
ZL 70 B01	60901357	Black	TPE	70	4x14 / 4x20 / 1x28,5
ZL 70 B02	60901358	Black	TPE	70	1x7,5 / 1x10 / 2x12,5 / 4x20 / 1x22,5
ZL 70 B03	60901359	Black	TPE	70	1x12,5 / 1x14 / 2x15,5 / 3x20 / 1x22,5
ZL 70 B04	60901360	Black	TPE	70	2x7,5 / 1x10 / 1x12,5 / 2x15,5 / 2x20 / 1x22,5
ZL 70 B05	60901360	Black	TPE	70	1x12,5 / 2x14 / 1x15,5 / 2x17 / 2x20 / 1x25,5
ZL 70 B06	60901360	Black	TPE	70	1x12,5 / 2x14 / 1x17 / 4x20 / 1x28,5
ZL 70 B07	60901360	Black	TPE	70	1x12,5 / 2x15,5 / 1x17 / 4x20 / 1x28,5
ZL 70 Blank	60901361	Black	TPE	70	Blank

\* On request, we can assemble the blank according to your specifications



## Blind plug

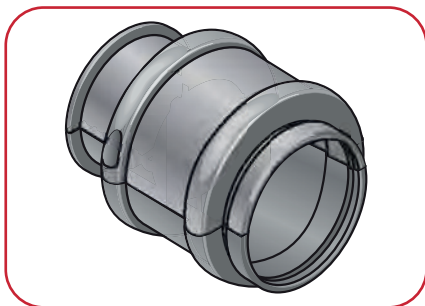
Type	Item-Nr.	Color	Material	Comment Ø mm
BS-7,5	60911361	Black	TPE	7,5
BS-10	60911362	Black	TPE	10,0
BS-12,5	60911363	Black	TPE	12,5
BS-14	60911364	Black	TPE	14,0
BS-15,5	60911365	Black	TPE	15,5
BS-19,5	60911366	Black	TPE	19,5
BS-22	60911367	Black	TPE	22,0
BS-28	60911368	Black	TPE	28,0

## Joint piece axis 6

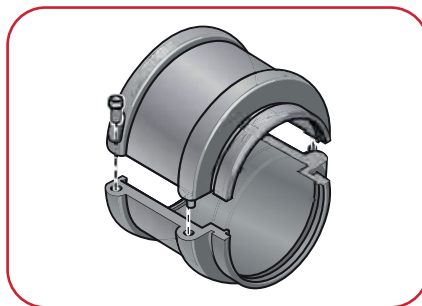


PA, POM

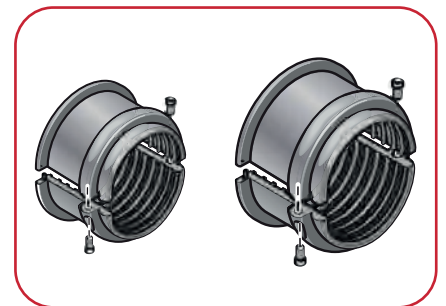
The joint piece GSA offers a length compensation of approx. 30 mm. The hose connector can be swiveled by approx. 15 ° in all directions and thus adapts to the movements of the hose package.



GSA-56 & GSA-70



GSA-DK



GSA-56GS

GSA-70GS

Type	Item-Nr.	Color	Corrugated hose	Matching System holder
GSA-56	60901213	Black	NW 56	SHK 70-RM
GSA-70	60901214	Black	NW 70	SHK 70-RM
GSA-DK	60901215	Black	NW 56/70	SHK 70-RM
GSA-56GS	60901216	Black	NW 56	
GSA-70GS	60901217	Black	NW 70	

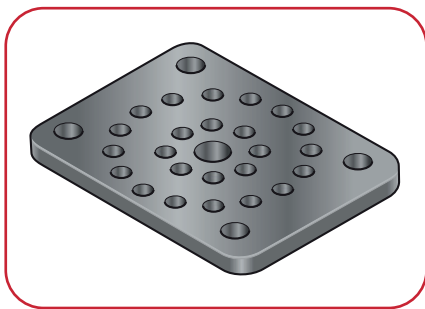
## Base plate



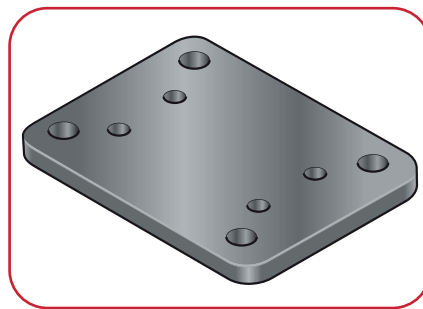
Steel, coated

The base plate is used to hold the system holder SH or SHK. All system holders can be fixed to the base plate at an angle of 45° using the threaded holes of the inner ring. The mounting holes are matched to the flange clamp type FKM.

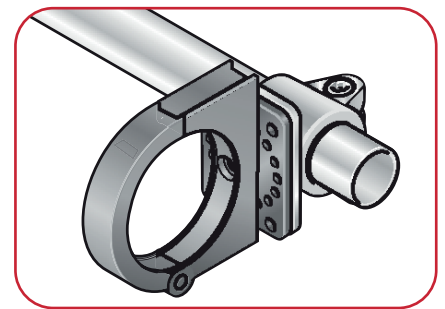
- In the center: threaded hole M10
- Inner ring: threaded holes M8
- Outer ring: through holes 6.2 mm - no function
- Mounting holes in the corners: threaded holes M8



FKG



FKG-DH



Base plate application example

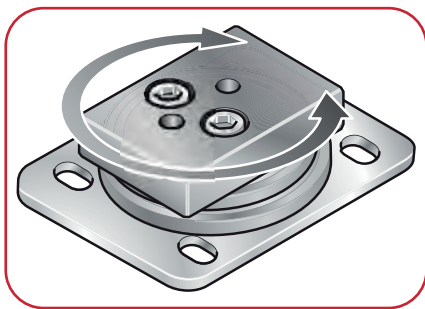
Type	Item-Nr.	Color	Material	A mm	B mm
FKG	60902620	Black	Steel	110,0	80,0
FKG-DH	60902621	Black	Steel	110,0	80,0

## Pivot bearing

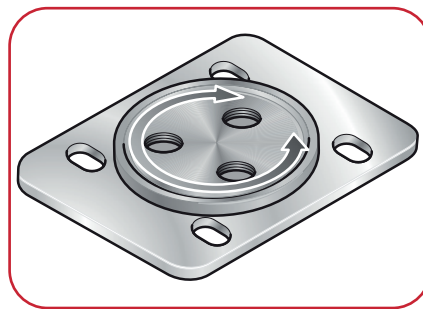


Steel, PA

- DZM: Pivot bearing with intermediate plate to accommodate system holders of the types SH and SHK, freely rotatable without angle limitation
- DLM: Pivot bearing individually for use with trumpet, freely rotatable without angle limitation



DZM (Schematic representation)



DLM

Type	Item-Nr.	Color	Material	Length Pivot bearing mm	Width Pivot bearing mm	Through holes Pivot bearing mm
DZM	60902214	Silver/Black	Steel	120,0	85,0	8,5
DLM	60902210	Silver	Steel	120,0	85,0	8,5
Intermediate plate for holding system holders type						
SH-P/M25-M32	Axially arranged and rotated 40° in a Ø 6 mm hole (1 x threaded hole and 1 x cylinder hole)					
SH-P/M25-M32	Axially arranged with 2 x cylindrical pins * Ø 6 mm in threaded hole M8					
SH-P/M25-M32	Arranged asymmetrically with a cylinder pin * Ø 6 mm in the hole (1 x threaded hole and 1 x cylindrical pin *)					
SH-P/SH-F/SH-PF/M40-M50	Symmetrically arranged with 2 x M8 cylinder screws in M8 bore (can also be fastened with a cylindrical pin *)					
SHK 70	Axially arranged with 2 x M8 Allen screws (can also be fastened with 2 x cylindrical pins * Ø 6 mm hole)					

\* Dowel pins are not available from UPAS

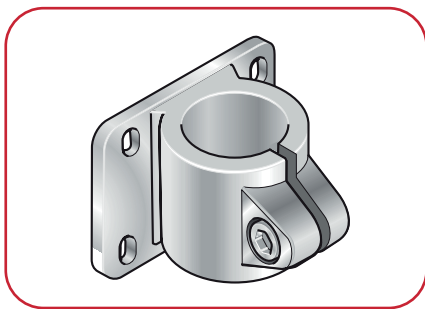


## Flange clamp

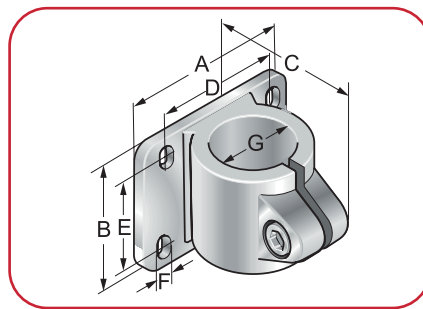


AISI

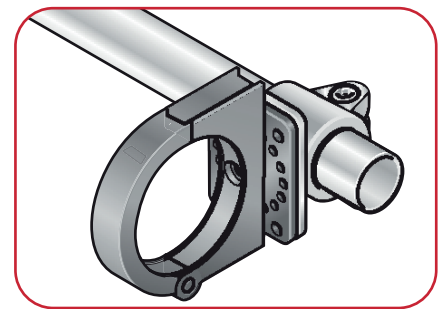
With the Flange clamp FKM, clamps of the type SSR and straight or at an angle of 90° abangled Precision tube Rx be connected to other components. The clamping takes place on the entire pipe circumference. With mounting flange for pivot bearing or base plate.



FKM



Schematic dimensioning



Flange clamp application example

Type	Item-Nr.	Color	Material	A mm	B mm	C mm	D mm	E mm	F mm	G mm
FKM 30	60902609	Silver	Aluminium	110,0	80,0	85,0	80,0	52,0	8,5	30,0
FKM 32	60902610	Silver	Aluminium	110,0	80,0	85,0	80,0	52,0	8,5	32,0
FKM 34	60902611	Silver	Aluminium	110,0	80,0	85,0	80,0	52,0	8,5	34,0
FKM 40	60902612	Silver	Aluminium	110,0	80,0	85,0	80,0	52,0	8,5	40,0

## Trumpet and spring end piece

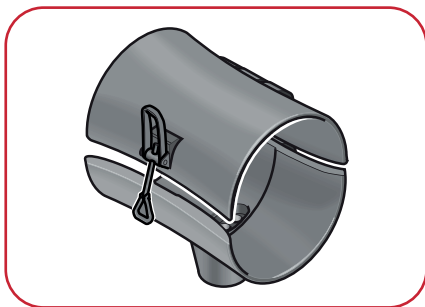


Aluminium, coated  
PA, POM

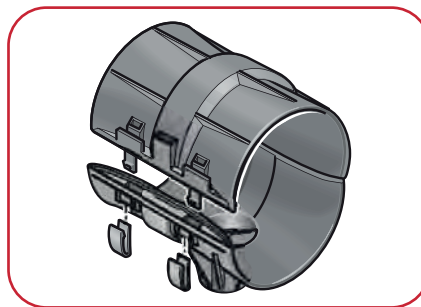
Trumpet for guiding dress-packs.

The spring end pieces FES-K (two-part) and FES-M (one-part) are used to fix the spring in the trumpet.

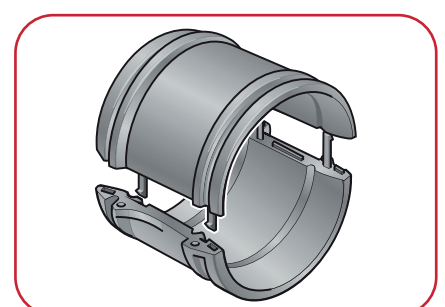
- Aluminum variant with plastic coating for improved gliding performance
- Plastic variant with safety clips for a secure connection



TRO 70-M



TRO 70-K



FES-K

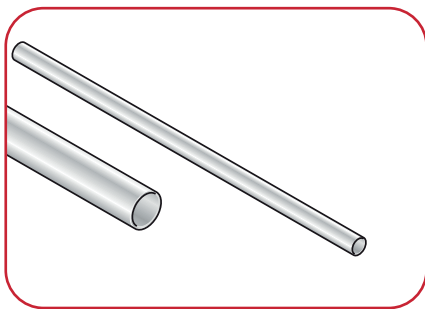
Type	Item-Nr.	Color	Material	Corrugated hose	Comment
Trumpet					
TRO 70-M	60902414	Black	Aluminium	NW 70	
TRO 70-K	60602004	Black	PA	NW 70	
Spring end piece					
FES-M	60904001	Black	POM	NW 70	Suitable for TRO 70-M
FES-K	60904000	Black	PA	NW 70	Divisible, suitable for TRO 70-K

## Precision tube

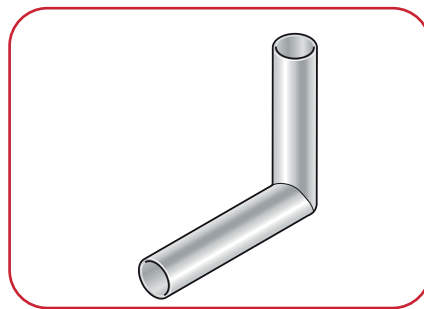


Steel, galvanized

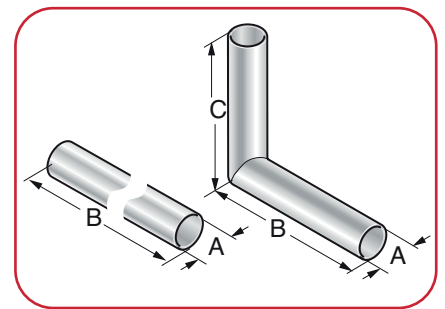
Different precision tubes are available as extensions. These can be combined with the flange clamp FKM 40.



RG



RW



Schematic dimensioning

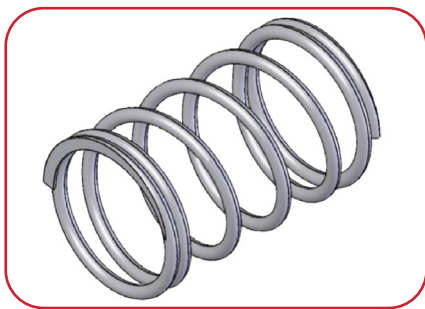
Type	Item-Nr.	Color	Material	A mm	B mm	C mm
Precision tube straight						
RG40 1000	60902810	Silver	Steel	40,0	1000,0	-
RG40 1200	60902814	Silver	Steel	40,0	1200,0	-
RG40 1500	60902818	Silver	Steel	40,0	1500,0	-
Precision tube 90° angled						
RW40 250	60902830	Silver	Steel	40,0	400,0	250,0
RW40 350	60902834	Silver	Steel	40,0	500,0	350,0

## Compression spring



Steel

Compression springs in conjunction with a spring end piece of type FES-K, FES-M and FHB are used for retracting the dress-pack on a robot.



DF

Type	Item-Nr.	Length approx. mm	Wire Ø mm	Classification
DF-70-1000	60921002	1.000	5,0	reinforced
DF-70-1000	60921003	1.000	4,2	medium
DF-70-550	60921004	550	4,5	medium
DF-52-1000	60921005	1.000	4,0	reinforced
DF-52-1000	60921006	1.000	4,0	medium
DF-36-400	60921007	410	2,8	medium
DF-36-400	60921008	380	2,5	light
DF-36-600	60921009	600	2,6	medium
DF-29-600	60921010	600	2,3	medium
DF-29-400	60921011	410	2,25	light
DF-23-600	60921012	610	2,0	light





620RB\_200 S

KUKA

robotic

KUKA

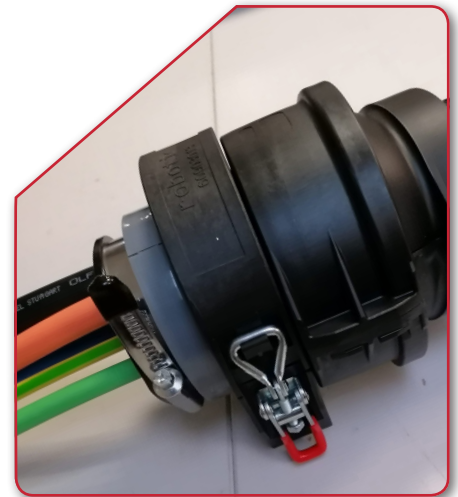
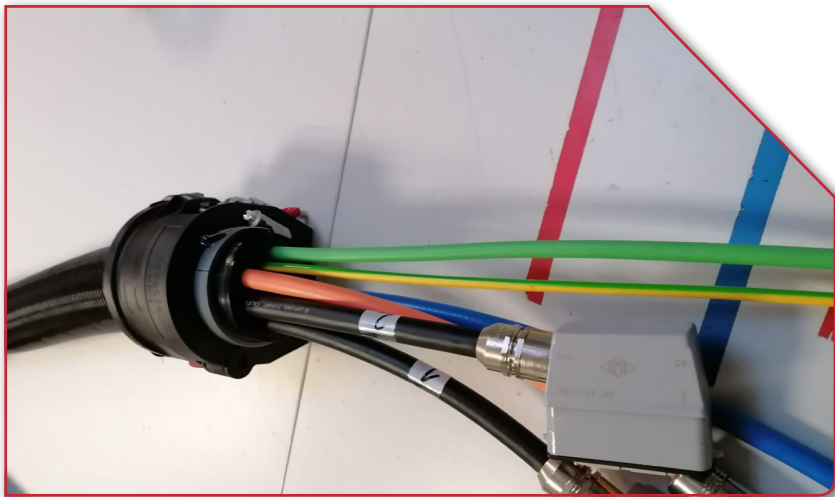
During

During

TEL: 044 44 44 44



## + Cable protection hose



## Cable protection hose Type EW-PAE



-40 °C to +120 °C,  
briefly +150 °C



mod. Polyamid PA12



HB

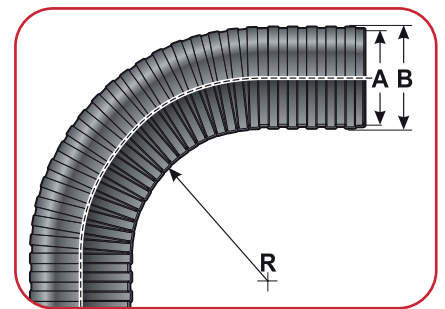
Cable protection hose for the highest dynamic and medium mechanical load. Ideal for extreme applications in robotics.

Characteristics:

- For high demands in robotics
- High abrasion resistance

Applications:

- Robots
- Handling systems
- In energy chains



EW-PAE

Type	Item-Nr.	Color	Material	A Ø mm	B Ø mm	R mm stat.	R mm dyn.	Weight kg/100 m
EW-PAE-06	60181650	Black	PA	7,0	10,0	15,0	40,0	1,8
EW-PAE-M10/P7	60181652	Black	PA	8,2	11,5	20,0	45,0	2,1
EW-PAE-M12/P9	60181654	Black	PA	9,8	12,7	21,0	51,0	2,6
EW-PAE-M16/P11	60181656	Black	PA	12,1	15,7	28,0	68,0	3,6
EW-PAE-M20/P16	60181658	Black	PA	15,7	21,0	36,0	70,0	5,3
EW-PAE-M25/P21	60181660	Black	PA	21,7	28,2	49,0	109,0	9,0
EW-PAE-M32/P29	60181662	Black	PA	27,4	34,2	67,0	142,0	12,2
EW-PAE-M40/P36	60181664	Black	PA	35,3	42,3	81,0	191,0	16,2
EW-PAE-M50/P48	60181666	Black	PA	46,3	53,9	102,0	237,0	22,3
EW-PAE-56 Jumbo	60181678	Black	PA	56,0	68,0	-	-	37,0
EW-PAE-70 Jumbo	60181680	Black	PA	66,0	78,8	200,0	390,0	48,0
EW-PAE-95 Jumbo	60181682	Black	PA	89,5	105,2	265,0	500,0	80,0
EW-PAE-06	60181610	Grey	PA	7,0	10,0	15,0	40,0	1,8
EW-PAE-M10/P7	60181612	Grey	PA	8,2	11,5	20,0	45,0	2,1
EW-PAE-M12/P9	60181614	Grey	PA	9,8	12,7	21,0	51,0	2,6
EW-PAE-M16/P11	60181616	Grey	PA	12,1	15,7	28,0	68,0	3,6
EW-PAE-M20/P16	60181618	Grey	PA	15,7	21,0	36,0	70,0	5,3
EW-PAE-M25/P21	60181620	Grey	PA	21,7	28,2	49,0	109,0	9,0
EW-PAE-M32/P29	60181622	Grey	PA	27,4	34,2	67,0	142,0	12,2
EW-PAE-M40/P36	60181624	Grey	PA	35,3	42,3	81,0	191,0	16,2
EW-PAE-M50/P48	60181626	Grey	PA	46,3	53,9	102,0	237,0	22,3
EW-PAE-70 Jumbo	60181640	Grey	PA	66,0	78,8	200,0	390,0	48,0
EW-PAE-95 Jumbo	60181642	Grey	PA	89,5	105,2	265,0	500,0	80,0

## Cable protection hose Type EWX-PAE (high curl)



-40 °C to +120 °C,  
briefly +150 °C



mod. Polyamid PA12



HB

This cable protection hose is specially designed for robotic applications where extreme movements take place. The special corrugated geometry offers improved performance: Extremely small bending radiuses with extremely high flexibility and extreme bending fatigue resistance. In addition, high abrasion resistance and high crest pressure resistance. Also available with longitudinal slot.

Applications:

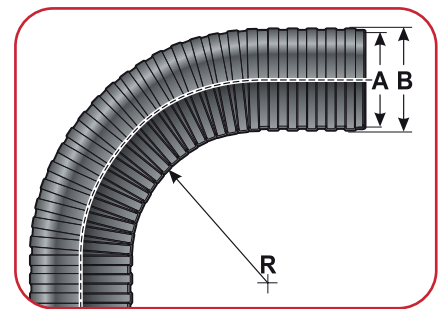
- Robots
- Handling systems
- In energy chains



EWX-PAE



EWX-PAE-LS



Type	Item-Nr.	Color	Material	A Ø mm	B Ø mm	R mm stat.	R mm dyn.	Weight kg/100 m
EWX-PAE M25/P21	60182058	Black	PA	19,8	28,1	49,0	104,0	11,0
EWX-PAE M32/P29	60182060	Black	PA	24,1	34,5	57,0	117,0	13,8
EWX-PAE M40/P36	60182062	Black	PA	29,7	42,1	71,0	146,0	18,2
EWX-PAE M50/P48	60182064	Black	PA	38,0	54,1	87,0	167,0	24,0
EWX-PAE 56	60182078	Black	PA	52,0	68,0	95,0	220,0	40,0
EWX-PAE 70	60182080	Black	PA	64,0	80,0	115,0	235,0	55,0
EWX-PAE 95	60182082	Black	PA	87,0	105,0	220,0	450,0	92,5
EWX-PAE M25/P21	60182018	Grey	PA	19,8	28,1	49,0	104,0	11,0
EWX-PAE M32/P29	60182020	Grey	PA	24,1	34,5	57,0	117,0	13,8
EWX-PAE M40/P36	60182022	Grey	PA	29,7	42,1	71,0	146,0	18,2
EWX-PAE M50/P48	60182024	Grey	PA	38,0	54,1	87,0	167,0	24,0
mit Längsschlitz								
EWX-PAE-LS M25/P21	60182258	Black	PA	19,8	28,1	49,0	104,0	11,0
EWX-PAE-LS M32/P29	60182260	Black	PA	24,1	34,5	57,0	117,0	13,8
EWX-PAE-LS M40/P36	60182262	Black	PA	29,7	42,1	71,0	146,0	18,2
EWX-PAE-LS M50/P48	60182264	Black	PA	38,0	54,1	87,0	167,0	24,0
EWX-PAE-LS 56	60182278	Black	PA	52,0	68,0	95,0	220,0	40,0
EWX-PAE-LS 70	60182280	Black	PA	64,0	80,0	115,0	235,0	55,0



## Cable protection hose Type EW-HY



-50 °C to +150 °C,  
briefly +180 °C



Thermoplastic elastomer

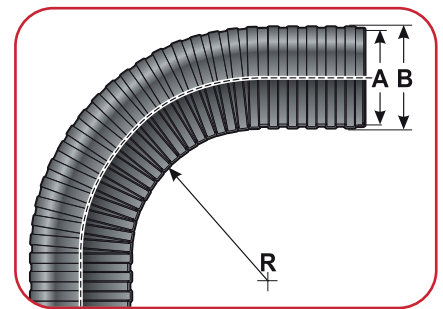


HB

Cable protection conduit for medium mechanical loads and highest flexibility. Ideal for robot applications in higher ambient temperatures.

Applications:

- Robots
- Handling systems
- In energy guiding chains
- Vehicle construction



EW-HY

Type	Item-Nr.	Color	Material	A Ø mm	B Ø mm	R mm stat.	R mm dyn.	Weight kg/100 m
EW-HY-M12 / P9	60121050	Black	TPE	9,9	12,5	21,0	51,0	2,6
EW-HY-M16 / P11	60121052	Black	TPE	12,3	15,5	28,0	68,0	3,4
EW-HY-M20 / P16S *	60121054	Black	TPE	16,6	21,0	38,0	95,0	6,3
EW-HY-M25 / P21	60121056	Black	TPE	21,7	28,0	49,0	109,0	9,0
EW-HY-M32 / P29	60121058	Black	TPE	27,2	34,1	67,0	142,0	12,5
EW-HY-M40 / P36	60121060	Black	TPE	34,7	42,0	81,0	191,0	14,8
EW-HY-M50 / P48	60121062	Black	TPE	46,9	53,7	102,0	237,0	20,0
EW-HY-70	60121066	Black	TPE	66,5	79,5	140,0	330,0	51,5
EW-HY-95	60121070	Black	TPE	91,0	105,5	150,0	400,0	90,0
EW-HY-M12 / P9	60121010	Grey	TPE	9,9	12,5	21,0	51,0	2,6
EW-HY-M16 / P11	60121012	Grey	TPE	12,3	15,5	28,0	68,0	3,4
EW-HY-M20 / P16S *	60121014	Grey	TPE	16,6	21,0	38,0	95,0	6,3
EW-HY-M25 / P21	60121016	Grey	TPE	21,7	28,0	49,0	109,0	9,0
EW-HY-M32 / P29	60121018	Grey	TPE	27,2	34,1	67,0	142,0	12,5
EW-HY-M40 / P36	60121020	Grey	TPE	34,7	42,0	81,0	191,0	14,8
EW-HY-M50 / P48	60121022	Grey	TPE	46,9	53,7	102,0	237,0	20,0
EW-HY-70	60121026	Grey	TPE	66,5	79,5	140,0	330,0	51,5
EW-HY-95	60121030	Grey	TPE	91,0	105,5	150,0	400,0	90,0

\* narrow curl

## Cable protection hose Type EWX-HY (high curl)



-50 °C to +150 °C,  
briefly +180 °C



Thermoplastic elastomer

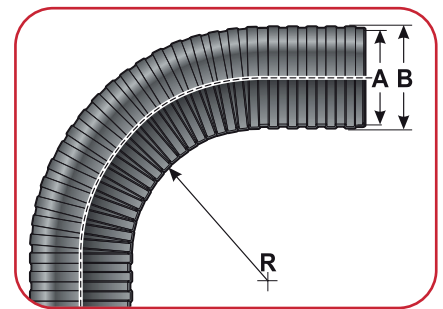


HB

Cable protection conduit for medium mechanical loads and highest flexibility. Ideal for robot applications in higher ambient temperatures.

Applications:

- Robots
- Handling systems
- In energy guiding chains
- Vehicle construction



EWX-HY

Type	Item-Nr.	Color	Material	A Ø mm	B Ø mm	R mm stat.	R mm dyn.	Weight kg/100 m
EWX-HY M25 / P21	60121258	Black	TPE	19,8	28,1	49,0	104,0	11,0
EWX-HY M32 / P29	60121260	Black	TPE	24,1	34,5	57,0	117,0	17,5
EWX-HY M40 / P36	60121262	Black	TPE	29,7	42,1	71,0	146,0	22,0
EWX-HY M50 / P48	60121264	Black	TPE	38,0	54,1	87,0	167,0	30,4
EWX-HY-56	60121278	Black	TPE	52,0	68,0	95,0	220,0	52,1
EWX-HY-70	60121280	Black	TPE	64,0	80,0	115,0	235,0	63,0
EWX-HY-95	60121282	Black	TPE	87,0	105,5	220,0	670,0	89,0

## Cable protection hose Type EW-PRF



-50 °C to +105 °C,  
briefly +150 °C



mod. Polyamid PA12

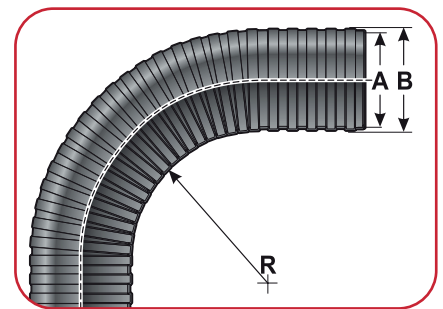
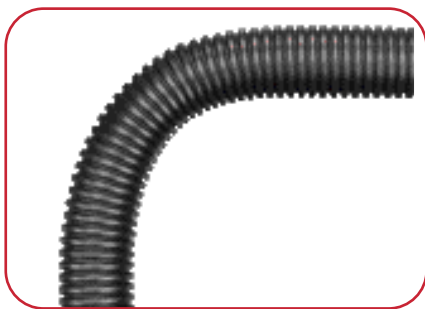


VO

Cable protection hose for medium to high mechanical loads with high flexibility. UR listed in rail transport technology approved, self-extinguishing hose. Particularly suitable for dynamic routing in rail vehicles.

Applications:

- Robots
- Handling systems
- In energy chains
- Rail technology



EW-PRF

Type	Item-Nr.	Color	Material	A Ø mm	B Ø mm	R mm stat.	R mm dyn.	Weight kg/100 m
EW-PRF-M10 / P7	60181252	Black	PA	8,4	11,6	21,0	46,0	2,1
EW-PRF-M12 / P9	60181254	Black	PA	9,8	12,9	22,0	51,0	2,6
EW-PRF-M16 / P11	60181256	Black	PA	12,2	15,8	28,0	68,0	3,6
EW-PRF-M20 / P16	60181258	Black	PA	15,6	21,1	38,0	95,0	5,3
EW-PRF-M20 / P16S *	60181260	Black	PA	15,7	21,1	35,0	90,0	5,6
EW-PRF-M25 / P21	60181262	Black	PA	22,3	28,3	49,0	109,0	9,6
EW-PRF-M25 / P21S *	60181462	Black	PA	23,1	28,0	44,0	104,0	9,6
EW-PRF-M32 / P29	60181264	Black	PA	27,5	34,5	67,0	142,0	12,2
EW-PRF-M32 / P29S *	60181464	Black	PA	29,2	34,5	62,0	132,0	14,0
EW-PRF-M40 / P36	60181266	Black	PA	35,4	43,0	81,0	191,0	16,2
EW-PRF-M50 / P48	60181268	Black	PA	47,3	54,7	102,0	237,0	22,3
EW-PRF-70	60181272	Black	PA	67,2	79,5	200,0	390,0	48,0
EW-PRF-95	60181274	Black	PA	90,0	105,2	265,0	500,0	80,0
EW-PRF-M10 / P7	60181212	Grey	PA	8,4	11,6	21,0	46,0	2,1
EW-PRF-M12 / P9	60181214	Grey	PA	9,8	12,9	22,0	51,0	2,6
EW-PRF-M16 / P11	60181216	Grey	PA	12,2	15,8	28,0	68,0	3,6
EW-PRF-M20 / P16	60181218	Grey	PA	15,6	21,1	38,0	95,0	5,3
EW-PRF-M20 / P16S *	60181220	Grey	PA	15,7	21,1	35,0	90,0	5,6
EW-PRF-M25 / P21	60181222	Grey	PA	22,3	28,3	49,0	109,0	9,6
EW-PRF-M25 / P21S *	60181422	Grey	PA	23,1	28,0	44,0	104,0	9,6
EW-PRF-M32 / P29	60181224	Grey	PA	27,5	34,5	67,0	142,0	12,2
EW-PRF-M32 / P29S *	60181424	Grey	PA	29,2	34,5	62,0	132,0	14,0
EW-PRF-M40 / P36	60181226	Grey	PA	35,4	43,0	81,0	191,0	16,2
EW-PRF-M50 / P48	60181228	Grey	PA	47,3	54,7	102,0	237,0	22,3
EW-PRF-70	60181232	Grey	PA	67,2	79,5	200,0	390,0	48,0
EW-PRF-95	60181234	Grey	PA	90,0	105,2	265,0	500,0	80,0

\* narrow curl

## Cable protection conduit type UPARB



-40 °C to +120 °C,  
briefly +150 °C



Polyamid PA12



HB

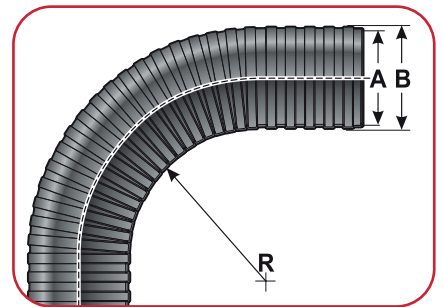
Cable protection hose for the highest dynamic and medium mechanical load. Ideal for extreme applications in robotics.

Characteristics:

- For high demands in robotics
- High abrasion resistance

Applications:

- Robots
- Handling systems
- In energy chains



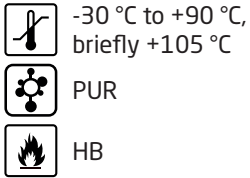
EW-PRF

Type	Item-Nr.	Color	NW mm	A Ø mm	B Ø mm	R mm stat.	R mm dyn.	Weight kg/100 m
UPARB-07G	60182000	Black	7,0	6,4	10,0	15,0	40,0	2,4
UPARB-10F	60182001	Black	10,0	9,6	13,0	20,0	50,0	2,6
UPARB-12F	60182002	Black	12,0	11,8	15,7	25,0	65,0	3,5
UPARB-17F	60182003	Black	17,0	16,7	21,7	30,0	80,0	5,3
UPARB-23F	60182004	Black	23,0	23,0	28,4	35,0	90,0	9,4
UPARB-23G	60182005	Black	23,0	21,8	28,3	40,0	100,0	10,0
UPARB-29F	60182006	Black	29,0	28,2	34,2	45,0	120,0	13,0
UPARB-29G	60182007	Black	29,0	28,1	34,1	50,0	120,0	12,0
UPARB-36F	60182008	Black	36,0	35,8	42,5	55,0	110,0	18,0
UPARB-36G	60182009	Black	36,0	35,5	42,3	60,0	180,0	16,5
UPARB-48F	60182010	Black	48,0	47,6	54,5	65,0	190,0	24,0
UPARB-48G	60182011	Black	48,0	46,5	54,5	70,0	200,0	23,0
UPARB-52G	60182012	Black	52,0	52,4	62,5	125,0	300,0	38,0
UPARB-70G	60182013	Black	70,0	69,3	82,5	150,0	350,0	55,0
UPARB-95G	60182014	Black	90,0	89,1	105,7	170,0	400,0	81,0

F= Fine profile  
G= Rough profile



## Cable protection conduit type UPURB



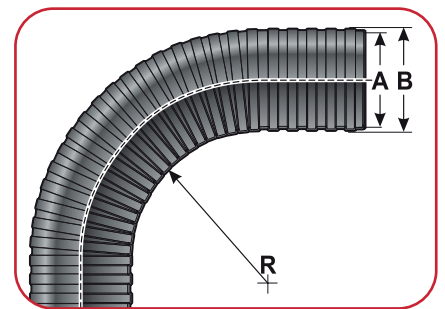
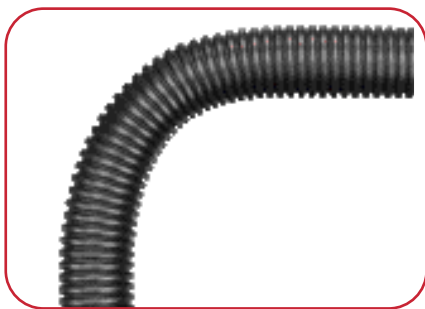
Cable protection hose for the highest dynamic and medium mechanical load. Ideal for extreme applications in robotics.

Characteristics:

- For high demands in robotics
- High abrasion resistance

Applications:

- Robots
- Handling systems
- In energy chains



EW-PRF

Type	Item-Nr.	Color	NW mm	A Ø mm	B Ø mm	R mm stat.	R mm dyn.	Weight kg/100 m
UPURB-07G	60182015	Black	7,0	6,3	10,0	15,0	40,0	2,5
UPURB-10F	60182016	Black	10,0	9,3	13,0	20,0	50,0	3,7
UPURB-12F	60182017	Black	12,0	11,6	15,7	25,0	65,0	4,5
UPURB-17F	60182018	Black	17,0	14,8	21,1	25,0	75,0	8,5
UPURB-17G	60182019	Black	17,0	15,3	21,6	30,0	80,0	9,0
UPURB-23F	60182020	Black	23,0	22,4	28,6	40,0	100,0	14,2
UPURB-23G	60182021	Black	23,0	21,4	28,4	40,0	100,0	14,2
UPURB-29F	60182022	Black	29,0	28,4	34,0	50,0	120,0	17,5
UPURB-29G	60182023	Black	29,0	27,7	34,1	50,0	120,0	17,0
UPURB-36F	60182024	Black	36,0	35,6	42,6	55,0	170,0	25,5
UPURB-36G	60182025	Black	36,0	35,3	43,2	60,0	180,0	23,5
UPURB-48F	60182026	Black	48,0	48,0	54,5	60,0	200,0	32,0
UPURB-48G	60182027	Black	48,0	46,5	55,0	70,0	200,0	32,0
UPURB-52G	60182028	Black	52,0	52,4	62,4	150,0	300,0	44,0
UPURB-68G	60182029	Black	68,0	66,2	79,2	170,0	350,0	58,0
UPURB-70G	60182030	Black	70,0	69,5	83,4	150,0	350,0	73,0
UPURB-95G	60182031	Black	95,0	89,0	106,4	180,0	410,0	101,0
Corrugated hose reinforced version								
UPURX-52G	60182032	Black	52,0	52,4	62,2	150,0	300,0	60,0
UPURX-70G	60182033	Black	70,0	68,6	82,5	200,0	400,0	100,0

F= Fine profile

G= Rough profile

## + Media hoses with accessories



## Media hose Type MS



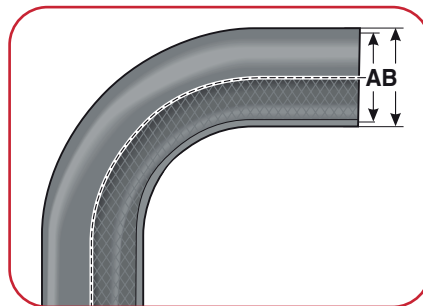
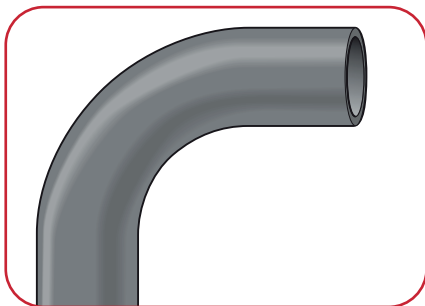
-40 °C to +80 °C



PUR

Reinforced, two-ply, self-locking polyurethane tubing for industrial applications. These hoses are specially designed for equipping robots and machine components. They are particularly suitable as a transmission medium for water, air and various gases.

- Free from substances that interfere with the wetting of paint
- Silicone-free, UV-resistant, flexible at low temperatures
- Resistant to oils, oxygen, ozone, acids and diluted alkalis



MS

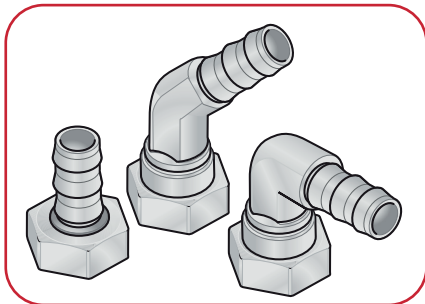
Type	Item-Nr.	Color	Material	A mm	A inch	B mm	max. operating pressure bar	min. burst pressure bar
MS 06 sw	60903020	Black	PUR	6,4	1/4	13,0	24,0	95,0
MS 10 sw	60903040	Black	PUR	9,5	3/8	16,0	20,0	81,0
MS 13 sw	60903060	Black	PUR	12,5	1/2	19,0	20,0	81,0
MS 06 gn	60903022	Green	PUR	6,4	1/4	13,0	24,0	95,0
MS 10 gn	60903042	Green	PUR	9,5	3/8	16,0	20,0	81,0
MS 13 gn	60903062	Green	PUR	12,5	1/2	19,0	20,0	81,0
MS 06 rt	60903024	Red	PUR	6,4	1/4	13,0	24,0	95,0
MS 10 rt	60903044	Red	PUR	9,5	3/8	16,0	20,0	81,0
MS 13 rt	60903064	Red	PUR	12,5	1/2	19,0	20,0	81,0
MS 06 bl	60903026	Blue	PUR	6,4	1/4	13,0	24,0	95,0
MS 10 bl	60903046	Blue	PUR	9,5	3/8	16,0	20,0	81,0
MS 13 bl	60903066	Blue	PUR	12,5	1/2	19,0	20,0	81,0
MS 10 gr	60903048	Grey	PUR	9,5	3/8	16,0	20,0	81,0

## Hose nozzle type MS and bulkhead screw connection

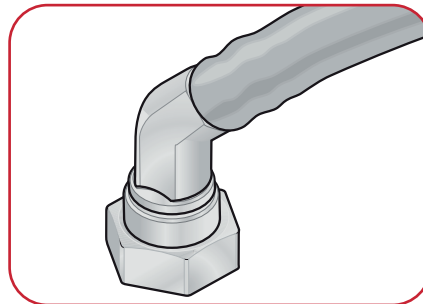


Brass, Steel

Hose nozzle for mounting the media hoses of type MS. The media hose is pushed onto the push-in plug until it stops and locks itself in place. An additional hose clamp, for applications up to the max. operating pressure of the media hoses, is not required.



MS

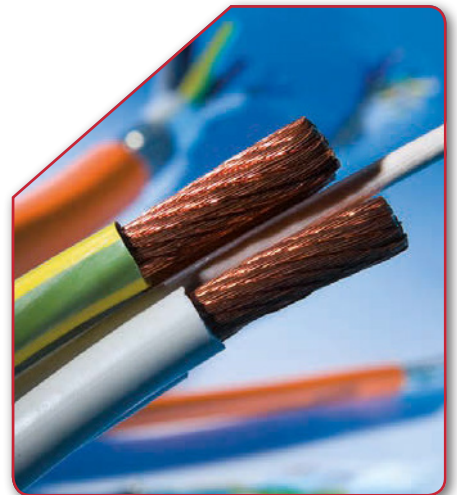
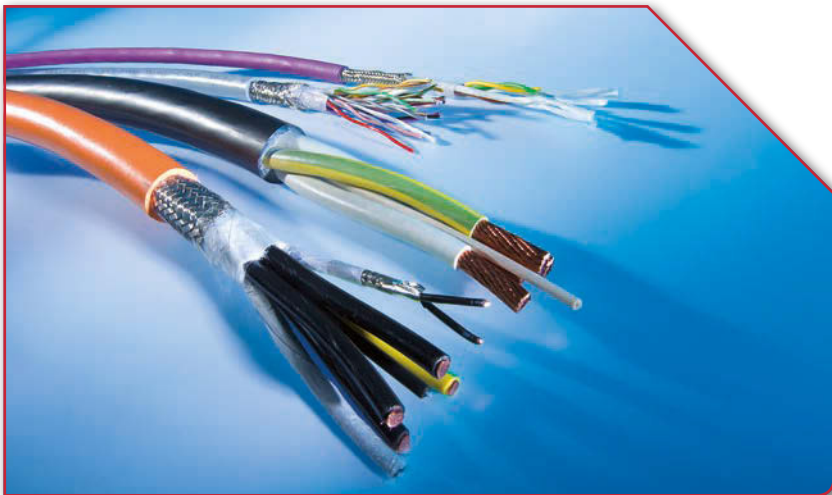


Hose nozzle application example

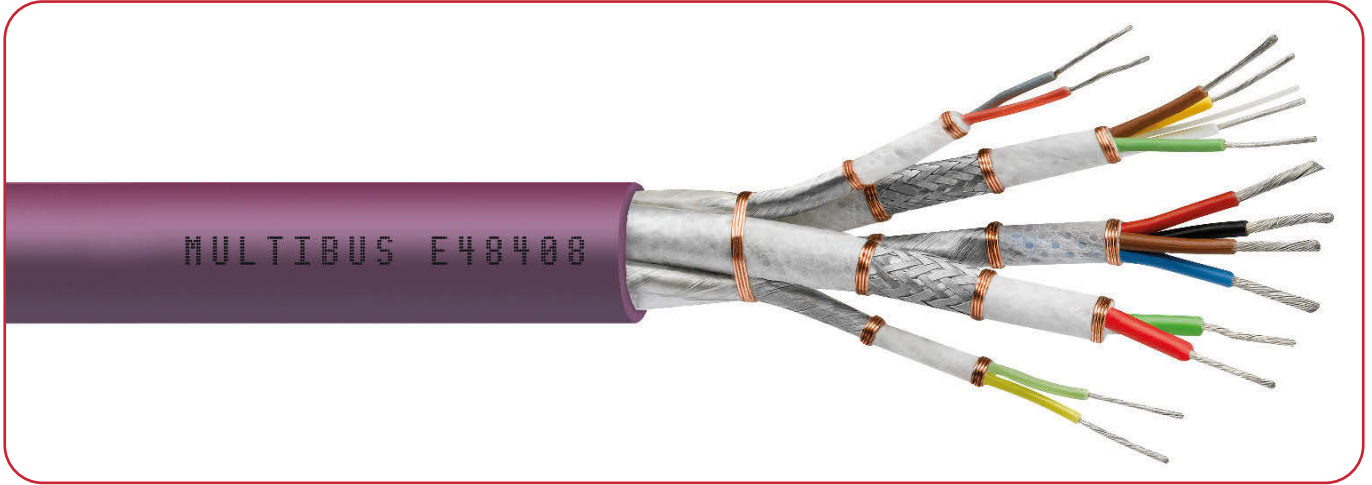
Type	Item-Nr.	Execution	Threaded connection	Hose connection	Comment
Schlauchtülle					
MS/G M12/G1/4	60902901	straight	M12 x1,5	G 1/4"	Union nut
MS/G M14/G3/8	60902902	straight	M14x1,5	G 3/8"	Union nut
MS/G M16/G3/8	60902903	straight	M16x1,5	G 3/8"	Union nut
MS/G M20/G1/2	60902904	straight	M20x1,5	G 1/2"	Union nut
MS/G M22/G1/2	60902905	straight	M22x1,5	G 1/2"	Union nut
MS/45 M16/G3/8	60902906	angled 45°	M16x1,5	G 3/8"	Union nut
MS/45 M22/G1/2	60902907	angled 45°	M22x1,5	G 1/2"	Union nut
MS/90 M16/G3/8	60902908	angled 90°	M16x1,5	G 3/8"	Union nut
MS/90 M22/G1/2	60902909	angled 90°	M22x1,5	G 1/2"	Union nut
MS/G M14/G3/8	60902910	straight	M14x1,5	G 3/8"	External thread
MS/G M16/G3/8	60902911	straight	M16x1,5	G 3/8"	External thread
MS/G M22/G1/2	60902912	straight	M22x1,5	G 1/2"	External thread
MS/G G1/4/G1/4	60902913	straight	G 1/4"	G 1/4"	Union nut
MS/G G3/8/G3/8	60902914	straight	G 3/8"	G 3/8"	Union nut
MS/G G1/2/G1/2	60902915	straight	G 1/2"	G 1/2"	Union nut
MS/45 G3/8/G3/8	60902916	angled 45°	G 3/8"	G 3/8"	Union nut
MS/45 G1/2/G1/2	60902917	angled 45°	G 1/2"	G 1/2"	Union nut
MS/90 G1/4/G1/4	60902918	angled 90°	G 1/4"	G 1/4"	Union nut
MS/90 G3/8/G3/8	60902919	angled 90°	G 3/8"	G 3/8"	Union nut
MS/90 G1/2/G1/2	60902920	angled 90°	G 1/2"	G 1/2"	Union nut
MS/G G3/8/G3/8	60902921	straight	G 3/8"	G 3/8"	External thread
MS/G G1/2/G1/2	60902922	straight	G 1/2"	G 1/2"	External thread
Bulkhead screw connection					
M16/M16	60902923	straight	M16x1,5	M16x1,5	External thread
M22/M22	60902924	straight	M22x1,5	M22x1,5	External thread
G3/8/G3/8	60902925	straight	G 3/8"	G 3/8"	External thread
G1/2/G1/2	60902926	straight	G 1/2"	G 1/2"	External thread



## + Robot cables



## Robot cables



## Cabel

Robotic Solutions Ltd. supplies a wide range of standard cables as well as special cables for all industrial applications. If a cable is not in stock, we will manufacture robot or special cables for you from a minimum production quantity of 100 metres.

### An overview of our delivery program:

- Primary lines
- Control lines
- Interbus and multibus cables
- Cable for screwdriver systems
- Optical fiber
- Servo, encoder and motor cables
- Water-cooled single-core cable (see accessories)
- High temperature resistant cables

## Robot cables

### Technical specifications

Nominal voltage	Temperature range	Minimum bending radius
U: 1.000 V	moves: -40°C to +80°C	moves: 10 x Line diameter
	Firmly laid: -40°C to +80°C	Firmly laid: 5 x Line diameter

Designation	Color	Item-Nr.	Ø mm
Primary line 1 x 25 mm <sup>2</sup>	Inner jacket Black / Outer jacket Black	70901010	10,5
Primary line 1 x 25 mm <sup>2</sup>	Inner jacket green-yellow / Outer jacket Black	70901011	10,5
Primary line 1 x 35 mm <sup>2</sup>	Inner jacket Black / Outer jacket Black	70901012	11,5
Primary line 1 x 50 mm <sup>2</sup>	Inner jacket Black / Outer jacket Black	70901013	15,8
Primary line 3 x 16 mm <sup>2</sup>	Black	70901014	21,5
Primary line 3 x 25 mm <sup>2</sup>	Black	70901015	22,3
Primary line 3 x 35 mm <sup>2</sup>	Orange	70901016	26,5
Primary line 3 x 50 mm <sup>2</sup>	Black	70901017	30,8

### Technical specifications

Nominal voltage	Temperature range	Minimum bending radius
U from 1,0 mm <sup>2</sup> : 500 V	moves: -40°C to +80°C	moves: 10 x Line diameter
	Firmly laid: -40°C to +80°C	Firmly laid: 5 x Line diameter

Designation	Item-Nr.	Ø mm
Multi-bus line 15-core combined	70901018	14,5
CAT 6 Ethernet cable 4 x 2 x AWG 26	70901019	9,0
Hybrid Ethernet cable 4 x 2 x AWG 26 + 4 x 1,0 mm <sup>2</sup>	70901020	12,6
Profinet line 2 x 2 x AWG 22	70901021	7,0
Devicenet line 2 x 0,24 mm <sup>2</sup> + 2 x 0,38 mm <sup>2</sup>	70901022	6,6
Interbus line 5 x (2 x 0,25 mm <sup>2</sup> ) + (4 x 1,0 mm <sup>2</sup> ) + 1,0 mm <sup>2</sup>	70901023	13,4
Interbus line 6 x (2 x 0,25 mm <sup>2</sup> ) + (4 x 1,0 mm <sup>2</sup> ) + 1,0 mm <sup>2</sup>	70901024	14,0
Fiber optic cable POF Plastic fiber optics 2P980/1000 Rugged Flex	70901025	8,0
Supply line LWL IBS PWR/5HD/F 5 x 1,5 mm <sup>2</sup>	70901026	10,0

Depending on the manufacturing process, there may be deviations in the outer diameter of the cables.

The right of technical changes reserved.

Further technical information on request.

The test voltage corresponds to the standard, at least 3.5 times the nominal voltage.

## Robot cables

### Technical specifications

Nominal voltage	Temperature range	Minimum bending radius
U ab 1,0 mm <sup>2</sup> : 500 V	moves: -40°C to +80°C	moves: 10 x Line diameter
	Firmly laid: -40°C to +80°C	Firmly laid: 5 x Line diameter

Designation	Item-Nr.	Ø mm
Control line 19 x 0,25 mm <sup>2</sup> + (2 x 1,5 mm <sup>2</sup> + 1 x 0,5 mm <sup>2</sup> )	70901027	10,8
Control line (2 x 0,5 mm <sup>2</sup> ) + (2 x 0,5 mm <sup>2</sup> )	70901028	8,5
Control line 13 x 0,5 mm <sup>2</sup> + 3 x 1,0 mm <sup>2</sup> + (2 x 0,5 mm <sup>2</sup> )	70901029	12,1
Control line 13 x 0,5 mm <sup>2</sup> + 2 x (3 x 0,5 mm <sup>2</sup> )	70901030	11,5
Control line 6 x 0,75 mm <sup>2</sup> + (3 x 0,75 mm <sup>2</sup> )	70901031	13,0
Control line 22 x 0,75 mm <sup>2</sup> + 5 x (2 x 0,75 mm <sup>2</sup> )	70901032	16,0
Control line (3 x 1,0 mm <sup>2</sup> ) + (2 x 1,0 mm <sup>2</sup> ) + 1,0 mm <sup>2</sup>	70901033	10,4
Control line 5 x 1,0 mm <sup>2</sup> + (2 x 1,0 mm <sup>2</sup> )	70901034	9,7
Control line 7 x 1,0 mm <sup>2</sup> + (2 x 0,5 mm <sup>2</sup> )	70901035	9,1
Control line 16 x 1,0 mm <sup>2</sup> + (2 x 1,0 mm <sup>2</sup> )	70901036	13,5
Control line 17 x 1,0 mm <sup>2</sup> + (2 x 1,0 mm <sup>2</sup> )	70901037	13,7
Control line 23 x 1,0 mm <sup>2</sup> + (2 x 1,0 mm <sup>2</sup> )	70901038	13,4
Control line 24 x 1,0 mm <sup>2</sup> + (2 x 1,0 mm <sup>2</sup> )	70901039	15,3
Servo line 4 x (2 x 0,25 mm <sup>2</sup> )	70901040	8,1
Servo line 8 x (2 x 0,25 mm <sup>2</sup> )	70901041	12,5
Servo line [4 x 0,75 mm <sup>2</sup> + 2 x (2 x 0,34 mm <sup>2</sup> )]	70901042	10,8
Motor line (4 x 2,5 mm <sup>2</sup> + 2 x 1,0 mm <sup>2</sup> )	70901043	11,7
Motor line (4 x 4,0 mm <sup>2</sup> + 2 x 1,0 mm <sup>2</sup> )	70901044	14,1
EMZ welding gun cable, 32-core [(3 x 2 x 0,25 mm <sup>2</sup> ) + 2 x 4 x 0,25 mm <sup>2</sup> + (4 x 0,5 mm <sup>2</sup> ) + (2 x 0,5 mm <sup>2</sup> ) + (4 x 1,5 mm <sup>2</sup> ) + (8 x 0,5 mm <sup>2</sup> )]	70901045	18,7
EMZ welding gun lead for 2 cables solution [(4 x 2 x 0,25 mm <sup>2</sup> ) + 2 x (2 x 0,5 mm <sup>2</sup> ) + (5 x 0,5 mm <sup>2</sup> ) + (5 x 0,75 mm <sup>2</sup> )]	70901046	15,9
EMZ welding gun lead for 2 cables solution [(4 x 2 x 0,25 mm <sup>2</sup> ) + 2 x (2 x 0,5 mm <sup>2</sup> ) + (5 x 0,5 mm <sup>2</sup> ) + (5 x 1,5 mm <sup>2</sup> )]	70901047	17,4
EMZ welding gun cable [(4 x 2 x 0,25 mm <sup>2</sup> ) + 2 x (2 x 0,5 mm <sup>2</sup> ) + (5 x 0,5 mm <sup>2</sup> ) + (5 x 2,5 mm <sup>2</sup> )]	70901048	19,2

Depending on the manufacturing process, there may be deviations in the outer diameter of the cables.

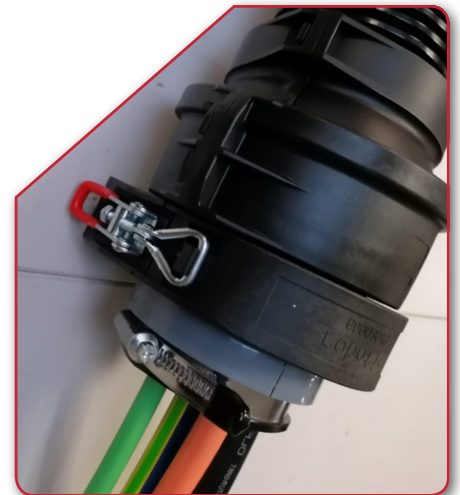
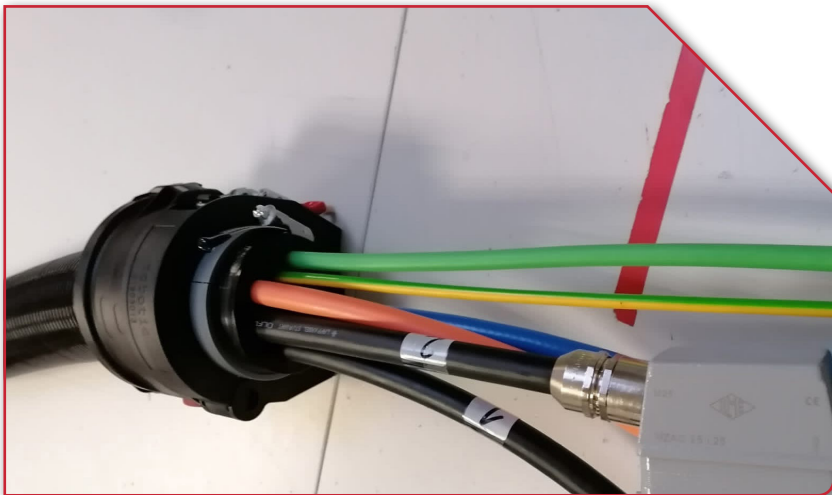
The right of technical changes reserved.

Further technical information on request.

The test voltage corresponds to the standard, at least 3.5 times the nominal voltage.



## + Additional product groups



- Energy supply
- Assembled cables
- Spark protection hoses
- Water-cooled single-core cables

## Energy supply



Our delivery program includes dress-packs with pneumatic, hydraulic and electrical components regardless of the robot type. Robotic Solutions Ltd. assembles the hose packages in all possible combinations as a standard solution or as a special solution specially tailored to your application.

We deliver for the following areas of application:

- Spot welding
- Stud welding
- Laser and gas shielded welding
- Handling
- Tool change systems
- Screwdriver applications
- Self-piercing rivets
- Adhesive applications
- Clinching applications
- Painting technology



## Dress-packs

In the case of the dress-packs, the components are protected by corrugated hoses specially developed for robot technology and thus ensure optimum protection of the dress-pack components on the robot. For our customers, we manufacture the dress-packs in such a way that the exchange of individual components is possible without great effort.

## Assembled cables



## Confection

### Assembly of cables of all kinds

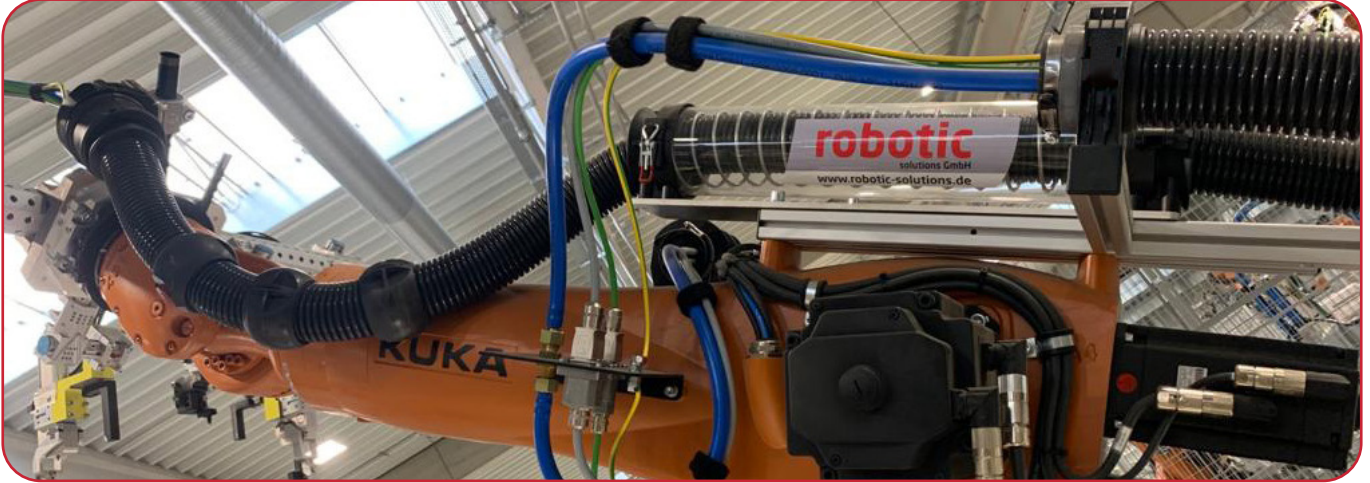
Robotic Solutions Ltd. assembles cables and wires in shielded and unshielded execution with power connectors for industrial use. We assemble primary lines, bus lines, motor lines and servo lines according to your requirements.

An extensive selection of plugs is available.

### Molded cable and connector

Injection-moulded cables and connectors Injection-moulded jackets protect cables and connectors from moisture and a high tensile strength is achieved. The overmoulded cables and conductors are customized and assembled ready for installation.

## Services



### Engineering

Robotic Solutions Ltd. not only supplies individual components for robots. From analysis to prototyping, we design complete robot systems and integrate them into existing systems. We are your partner for customized solutions in robot and automation technology.

### Installation and assembly

In order to avoid production downtimes, our experienced assembly staff can take over on request also the complete installation, optimization and acceptance of the energy supply on site.

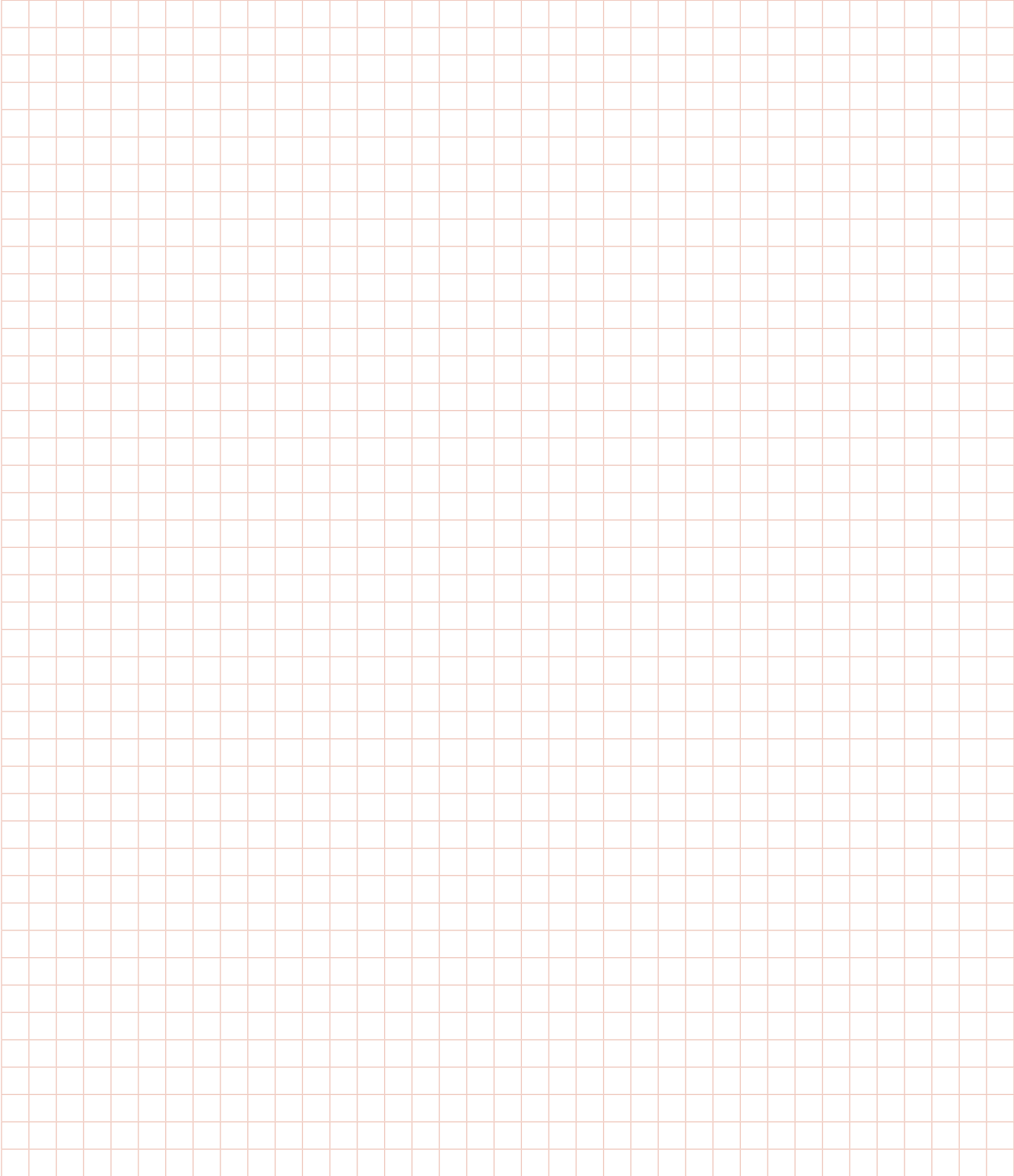
### Repair and maintenance

We offer regular maintenance and early repairs to ensure that operations run smoothly and you get a long service life for the systems. Robotic Solutions Ltd. offers you maintenance contracts for this. There is the possibility of a repair service for the defective energy supply and cables on site.





## Notes

A large grid of graph paper for taking notes, consisting of 20 columns and 30 rows of small squares.

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**Notes**

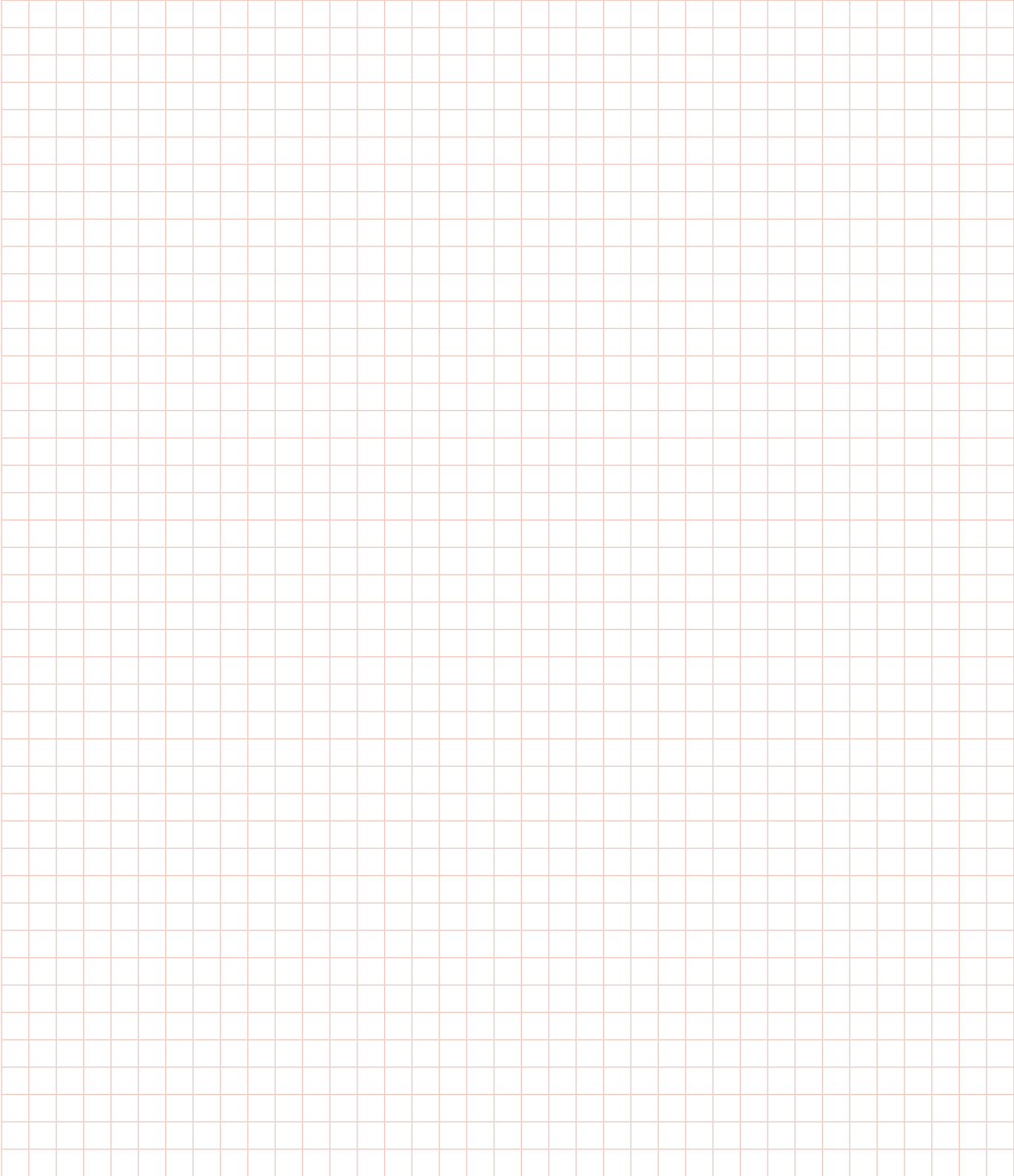
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All information in our brochures and catalogs as well as on the Internet are based on the current state of our knowledge of the products described.

The electronic data and files provided by Robotic Solutions, in particular CAD files, are based on the current state of our knowledge of the products described.

No legally binding assurance of specific properties or suitability for a specific purpose can be derived from this information.

All information on the chemical and physical properties of our products as well as advice on application technology, whether verbal, in writing or by means of tests, are given to the best of our knowledge.

They do not release the buyer from the obligation to carry out his own tests and trials in order to determine the specific suitability of the products for the intended use.

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Robotic Solutions assumes no liability for damage resulting from the use of the products result.

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In addition, our General Conditions of Sale apply.

# robotic

**solutions GmbH**  
a HEW-KABEL Company

Headquarters Kamp Lintfort  
Carl-Friedrich-Gauß-Str. 7  
47475 Kamp Lintfort

Telefon: +49 (0) 2842/21946-40  
Fax: +49 (0) 2842/21946-99

[www.robotic-solutions.de](http://www.robotic-solutions.de)  
[info@robotic-solutions.de](mailto:info@robotic-solutions.de)