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PRODUCT CATALOGUE

# **PMA<sup>®</sup> Flexible cable protection systems**

For applications with high requirements

**PMA**



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**PMA® cable protection products from ABB can be used in an extremely wide range of applications. The list is virtually endless, including rail vehicles and infrastructure, industrial machines, electrical systems on ships, solar and wind energy generation installations, telecommunications, construction and medical equipment. Wherever cables are installed and exposed to mechanical stresses and environmental hazards. Today and tomorrow we guarantee best quality regarding products, technical support, service and delivery.**

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# Introduction

## A swiss manufacturer with a global presence

There is no better reference than satisfied customers. PMA® cable protection provides customized specific solutions for customers worldwide.

ABB's PMA manufacturing site is located in Uster (Switzerland), close to Zurich. The majority of what we produce for the world market is made at this location. Also our research and development department is located here.

Thanks of our large network of professional partners in all of the major industrialised countries around the globe, we are able to guarantee best quality regarding products, technical support, service and fast delivery.

ABB is focused on providing solutions that address the critical issues in every area of operations, allowing customers to focus on plant sustainability, cost, quality, flexibility, safety and regulatory challenges.







#### Setting new standards and trends

Customer needs are a top priority at ABB, and we work every day to ensure all our customer requirements are met in our products. We offer cable protection solutions and services that are tailored to meet requirements in every type of application. Our range extends from basic items right up to the most demanding high-tech products. We can develop system solutions and special products that are designed to meet specific customer requirements. Our intensive research and development activities, which include the field of new materials, are a major reason why PMA products from ABB continue to set new standards and trends in the cable protection marketplace. These efforts together with excellent quality and service have helped us build up an outstanding reputation with leading corporations around the world.

#### From pioneer to market leader

ABB has been developing, producing, and selling top-quality PMA cable protection systems since 1975. Our high-quality Swiss products have rapidly earned us an excellent reputation worldwide and established us as the market leader. Our range of more than 6,500 products gives customers the protection they need in railway, mechanical engineering, and shipbuilding applications worldwide. PMA products are also the solution of choice in automation, building installations and other projects where power and data cables require dependable protection.

#### Unique benefits of PMA products from ABB

Service to the customer is what motivates us. In addition to series production, PMA can build fittings and conduits to meet individual requirements as a special service to our customers.

- A safe, reliable system that is easy to install
- Vibration-proof connections
- System connection strength
- Ingress protection conforming to recognized test methods
- High impact strength even at low temperatures
- High compression strength (peak load)
- Long-term reversed-bending resistance
- Good chemical resistance
- Fire protection (flammability and smoke generation)
- Good weather resistance
- Long wearing
- ...and much more

**Introduction**

Areas of applications



**Mechanical engineering**

A considerable number of PMA cable protection systems are used in mechanical engineering. A few examples illustrate how varied the range of mechanical engineering applications are; you will find our products in machine tools, packaging machines, printing machines, as well as heating, ventilation, conveyer, and filling systems. PMA products also make a vital contribution to the smooth operation of high voltage and emergency power systems, can production machinery and woodworking machines, etc. PMA cable protection solutions safeguard cables, wires and data links against heat, cold, tensile stress, pressure stress, and other external influences in the important mechanical engineering industry.

**Rail vehicles/Rail infrastructure**

PMA products from ABB have proven their dependability in railway construction projects around the world. This is the reason why large corporations including Siemens, Alstom, Bombardier, PESA, CSR/CNR, Deutsche Bahn, and SNCF have chosen us as supplier over a period of many years. Our special railway engineering product line provides protection and safety on signalling systems, couplings, trucks, and gangways, as well as roof, and underfloor equipment.

The range of applications is very extensive. PMA products contribute to the safe operation of trams, locomotives, freight cars, high-speed trains, and even roller coasters.

**Worldwide recognitions**

All PMA products are rigorously tried and tested to meet the demands of industry worldwide.







### **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 massive reduction in torsional forces. There is good reason why leading robotics manufacturers rely on ABB technology.















### **Countless applications**

PMA cable protection products from ABB can be used in an extremely wide range of applications. The list is virtually endless and includes industries such as telecommunications, construction equipment and medical equipment. Wherever there is a need for cable protection, the PMA product portfolio provides safe, dependable, forward-looking solutions or will develop them specially for you to meet your individual needs.

# PMA® conduits

## Conduit guide

Products				PMAFLEX Pro			PMAFLEX					
Application areas				PHT	POH	PSX	CYL	ESD	PCL	PEL	PIS/PIH	POS
Machine building 	General applications	static				●		●				
		dynamic	●			●		●		●	●	
	Heavy loads	static										
		dynamic										
	Outdoor applications	static									●	
		dynamic									●	
	Antistatic requirements	static					●					
		dynamic					●					
Traction vehicles 	Outdoor applications with sunlight exposure	static								●		
		dynamic								●		
	Outdoor applications	static	●							●		
		dynamic	●							●		
	Indoor applications	static		●								
Rail infrastructure 	Outdoor applications with sunlight exposure	static										
	Indoor and tunnel applications	static		●								
Automation/ Robotics 	Moving systems	dynamic	●			●		●		●		
	Systems with extreme movements	dynamic								●		
	Moving systems with antistatic requirements	dynamic					●					
Ship + Off-shore 	Outdoor general applications	static								●		
		dynamic	●							●		
	Indoor applications	static				●		●				
		dynamic				●		●		●		
	Passenger area	static		●		●		●				
Energy 	Outdoor applications with sunlight exposure	static										
	Indoor applications	static		●		●		●		●		
	Exposed to radiation	static			●							
Food & Beverage 	General applications	static										
		dynamic										
Others     	Vehicle building	static	●									
	Telecommunications	indoor				●			●			
		outdoor										
	Building constructions	indoor		●								
		outdoor										
	Ex hazardous areas (ATEX, IECEx)	static						●				
	High temperature applications	static	●		●							





# PMA® conduits

## Conduit guide

Products		PMAFLEX Pro			PMAFLEX						
		PHT	POH	PSX	CYL	ESD	PCL	PEL	PIS/PIH	POS	
Material properties	Ductility										
	Reversed bending resistance										
	Compression resistance										
	Low temperature performance										
	High temperature performance										
	Resistance to weathering										
Approvals	Bi-National Recognition File UL1696 & CSA C22.2 No. 227.3-05 CSA C22.2 No. 227.3-05 Bi-National Listing File UL1660 & CSA C22.2 No. 227.2.1										
			Free from halogens, REACH + RoHS compliant	●	●	●	●	●	●	●	
			Non flame propagating EN61386		●		●		●		
	EN 45545-2 NFPA 130 (ASTM E162 – ASTM E662) BSS 7239/SMP 800-C ASTM E1354 PN-K 2511 GOST 12.1.044-89										
			DNV (Type approved)		●	●	●	●	●		
			Lloyd's Register (Type approved)		●	●	●	●	●		
			Bureau Veritas (Type approved)		●	●	●	●	●		
	Hazardous	ATEX IECEx									
				Food & Beverage	NSF Ecolab						
	Temperature range	Continuous operating temperature (acc. to DO 9.21-4510) Short term max. operating temperature 168h (acc. to DO 9.21-4360)	Min. (-) Max. (+)				-50	-25	-100	-40	-40
180				120	200	105	90	105	60	95	95
Sizes	Nominal width min.	07	10	10	07	07	07	10	07	07	
	Nominal width max.	48	48	48	125	95	125	48	125	95	
	Metric size min.	10	12	12	10	10	10	12	10	10	
	Metric size max.	50	50	50	146	106	146	50	146	106	
Page no.		15	15	16	17	17	18	19	20	21	



PMAFLEX								PMAFLEX Multilayer								PMA overextruded			PMAFLEX Plus (UL-Listed)		Divisible System		PMA Smart Line						
PUE	PVD	VAM	VAML	VCS	VOH	PLR		XESX	XPCL	XR90	XTPC	XSOL	XVCS1H	XVCS2H	XVCSF	XPCS	XPCSF	JFBD	JXPCSF	JLLPA		CUS	PUS	PACOF	PPCOF		LLPA	LLPF	
-60	-40	-40	-40	-50	-40	-40		-50	-50	-40	-40	-50	-50	-50	-40	-50		-18	-50	-18		-40	-50	-40	-20		-40	-40	
50	150	105	105	105	105	105		90	105	95	105	95	90	90	105	95	95	90	95	105		105	95	105	105		105	105	
-	-	160	160	160	160	160		150	160	150	150	150	120	120	160	150	150	120	150	-		160	150	160	150		160	160	
17	10	10	10	07	07	07		10	12	17	17	12	12	12	10	10	07	12	12	12		17	17	07	07		07	07	
70	29	48	125	95	125	48		48	48	48	70	48	48	48	48	48	48	48	48	48		48	48	70	70		125	48	
20	12	12	12	10	10	10		12	16	20	20	16	16	16	12	12	12	16	16	16		20	20	10	10		10	10	
80	32	50	146	106	146	50		50	50	50	80	50	50	50	50	50	50	30	50	50		50	50	80	80		146	50	
21	22	22	23	23	24	24		*	25	**	**	25	26	26	27	27	28	29	29	30		31	31	32	33		34	35	

\* See PMA Ex-System brochure  
 \*\* See PMA Automation brochure

Key  
 correct

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# PMA® conduits

## Overview

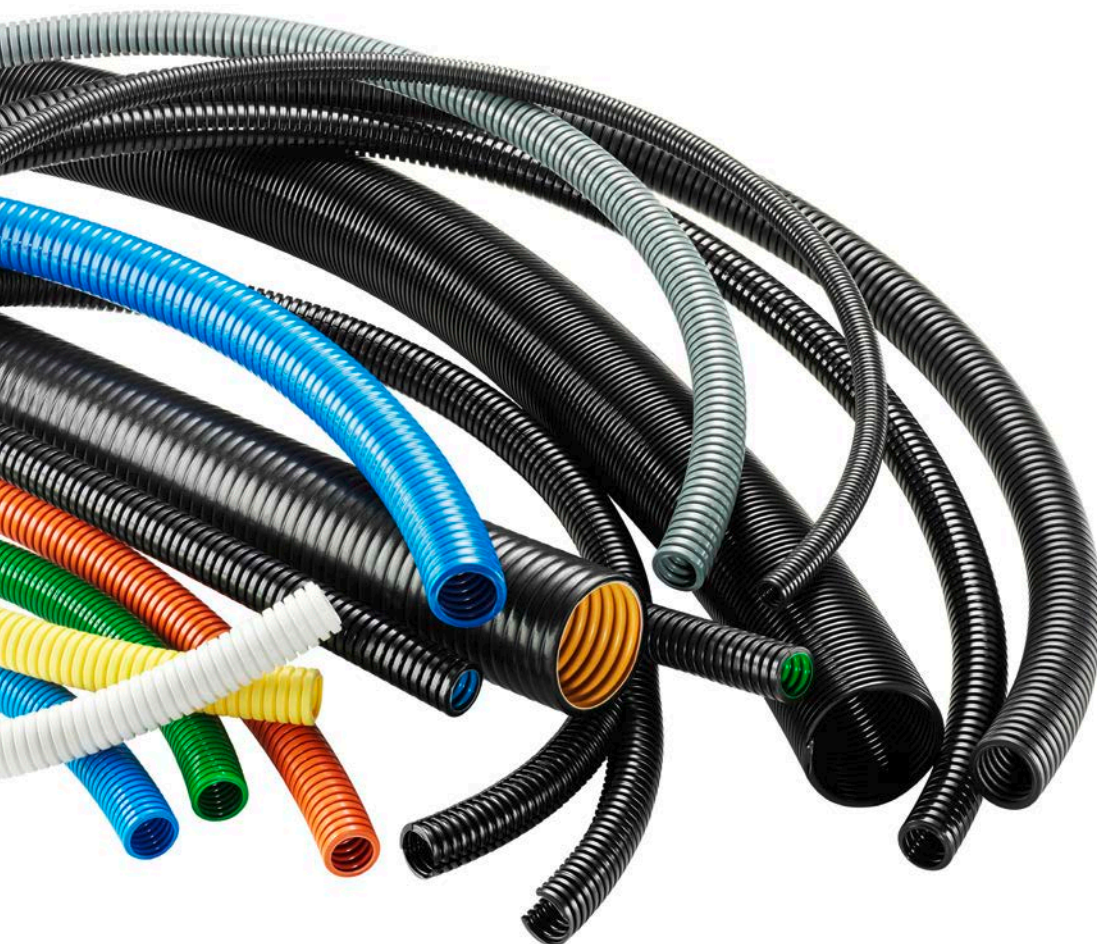
Conduits to protect cables. We offer many different conduit types for diverse applications with various technical requirements.

The product groups:

- PMAFLEX Pro
- PMAFLEX
- PMAFLEX PLUS
- PMAFLEX Multilayer
- PMA Divisible System
- PMA Smart Line
- PMA overbraided
- PMA overextruded

Many conduits are specially approved, e.g. CSA, UL Recognition, DNV, Lloyds, Bureau Veritas etc. All conduits are REACH and RoHS compliant.

Conduit sizes range from 6mm to 125mm Ø, from lightweight to heavyweight, and from pliable to highly flexible. PMA also offers slit and divisible conduits. Standard colours are black and grey.





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**PMA® CONDUITS**

PMA offers a large range of very different mono- and multilayer conduit types which fulfill high technical demands to protect humans and cables.

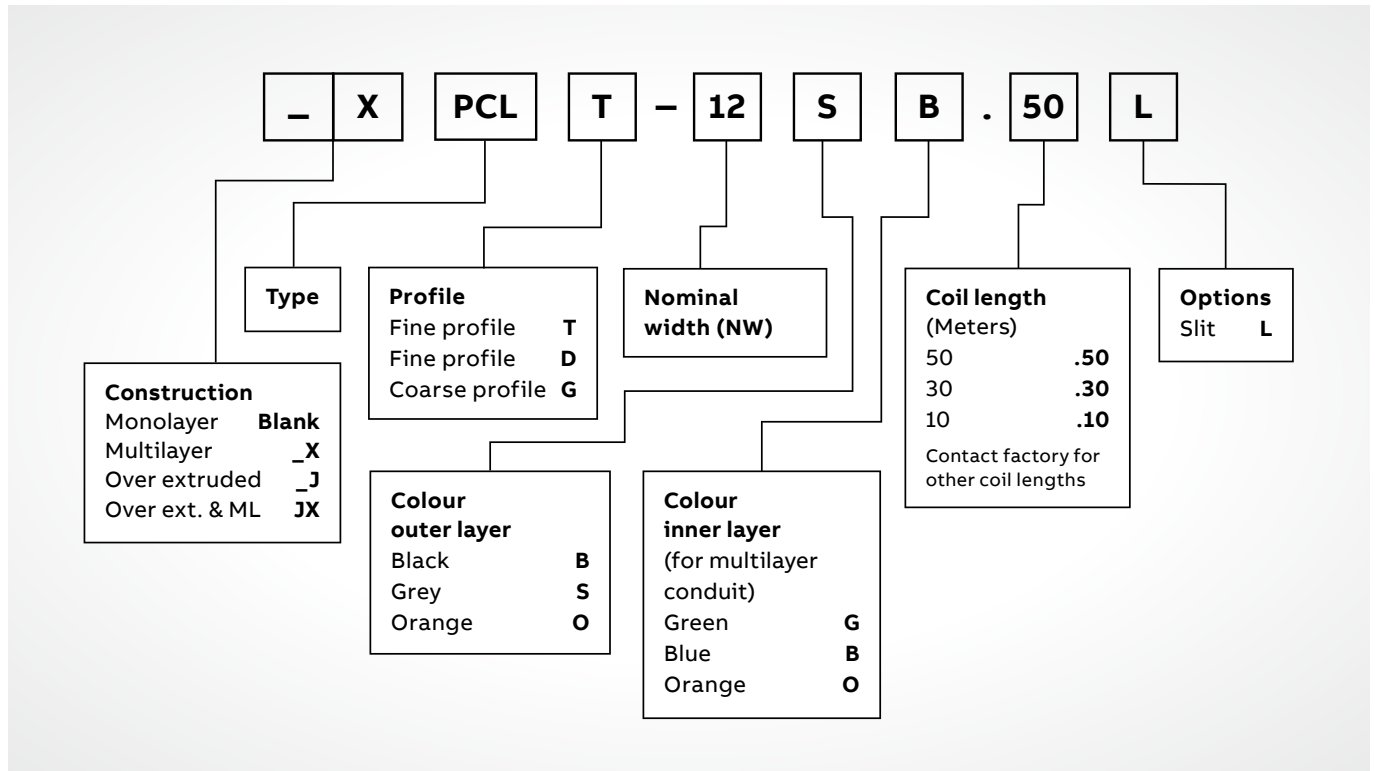




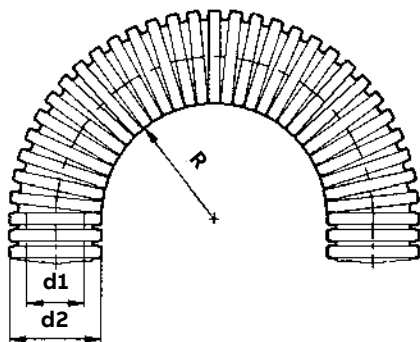
## PMA conduits

### Part number codes

For part number explanation only, not to be used as a configuration tool.



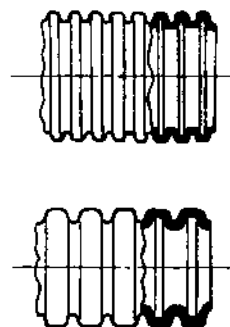
#### Radius



**Stat. radius** = Lowest recommended bending radius for static (fixed) installation.

**Dyn. radius** = Lowest recommended bending radius for dynamic (flexible) installation.

#### Profile




**Fine profile T**  
Tight bending radius.

**Coarse profile G**  
High pull-out strength.

## PMAFLEX Pro

### Type PHT & POH conduit

#### Type PHT - Highly flexible, medium/heavy-duty

	Order no. (black)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./Dyn. radius (mm)	PU (m)
		NW	Metric				
	PHTT-07B	07	10	6.7	10.0	15/40	50
	PHTT-10B	10	12	9.7	12.8	20/50	50
	PHTT-12B	12	16	12.1	15.6	25/65	50
	PHTT-17B	17	20	16.8	21.1	35/85	50
	PHTT-23B	23	25	23.3	28.4	45/110	50
	PHTG-17B	17	20	15.6	21.1	40/85	50
	PHTG-23B	23	25	22.0	28.4	50/110	50
	PHTG-29B	29	32	27.9	34.5	60/135	50
	PHTG-36B	36	40	36.2	42.4	75/170	30
	PHTG-48B	48	50	47.3	54.5	90/220	30


#### PHT Index

min.	max.
Ductility	
Fatigue reversed bending	
Compression resistance (PHTT-17B)	
Compression resistance (PHTG-17B)	
Low temperature performance	
Weathering resistance	

For applications at high and very low temperatures / dynamic applications  
 Specially formulated polyamide elastomer. Both excellent flexibility and high compression strength  
 Enhanced temperature range compared to standard polyamides  
 High resistance to ultra violet rays and weathering

Materials	Temperature range	Colour
Specially formulated polyamide elastomer	-50°C to +135°C	Black
Certification	Short-term to: +180°C	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Impact resistance	High
	Extremely good at low temperatures	

#### Type POH - Very flexible, medium-duty

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric				
	POHT-10B	POHT-10S	10	12	10.0	12.8	20	50
	POHT-12B	POHT-12S	12	16	12.3	15.6	25	50
	POHG-17B	POHG-17S	17	20	16.0	21.1	40	50
	POHG-23B	POHG-23S	23	25	22.1	28.4	50	50
	POHG-29B	POHG-29S	29	32	28.0	34.5	60	50
	POHG-36B	POHG-36S	36	40	36.4	42.4	75	30
	POHG-48B	POHG-48S	48	50	47.0	54.5	90	30

#### POH Index

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


For highest fire and passenger safety requirements  
 Excellent fire safety characteristics acc. to BS 6853 1a (interior)  
 Good ductility and reversed bending characteristics

Materials	Temperature range	Colour
Specially modified polypropylene	-25°C to +95°C	Black/Grey
Certification	Short-term to: +120°C	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Fire performance	-
	acc. to BS 6853 1a (interior)	

# PMAFLEX Pro

## Type PSX conduit

Type PSX - Flexible, light-duty

	Order no. (black)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
		NW	Metric				
	PSXT-10B	10	12	9.8	12.8	20	50
	PSXT-12B	12	16	12.2	15.6	25	50
	PSXT-17B	17	20	16.9	21.1	35	50
	PSXG-23B	23	25	21.9	28.4	45	50
	PSXG-29B	29	32	27.9	34.5	55	50
	PSXG-36B	36	40	36.2	42.4	65	30
	PSXG-48B	48	50	47.0	54.5	85	30

For applications with highest fire safety performance requirements / with extreme temperature conditions / exposed to radiation.  
 Chemical resistance: To oils, fats, acids, alcohols and hot water (good resistance to hydrolysis)  
 Excellent high and low temperature properties  
 High radiation resistance  
 Very good ductility

### PSX Index

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


Materials	Temperature range	Colour
Specially modified polyetherimide	-100°C to +170°C	Black
Certification	Short-term to: +200°C	
Free from halogens, REACH compliant and RoHS compliant	Fire performance	UV Resistance
	Low smoke density and toxicity	-



# PMAFLEX

## Type CYL & ESD conduit

### Type CYL - Very flexible, medium-duty conduit

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric				
	CYLT-07B	CYLT-07S	07	10	6.6	10.0	15	50
	CYLT-10B	CYLT-10S	10	12	9.8	12.8	20	50
	CYLT-12B	CYLT-12S	12	16	12.1	15.6	25	50
	CYLT-17B	CYLT-17S	17	20	16.8	21.1	35	50
	CYLT-23B	CYLT-23S	23	25	23.2	28.4	45	50
	CYLT-29B	CYLT-29S	29	32	28.8	34.5	55	50
	CYLT-36B	CYLT-36S	36	40	36.7	42.4	65	30
	CYLT-48B	CYLT-48S	48	50	48.2	54.5	80	30
	CYLG-23B	CYLG-23S	23	25	21.9	28.4	50	50
	CYLG-29B	CYLG-29S	29	32	27.8	34.5	60	50
	CYLG-36B	CYLG-36S	36	40	36.1	42.4	75	30
	CYLG-48B	CYLG-48S	48	50	46.9	54.5	90	30
	CYLG-56B	CYLG-56S	56	68	56.7	67.5	120	30
	CYLG-70B	CYLG-70S	70	80	67.5	79.6	140	10
	CYLG-95B	CYLG-95S	95	106	91.6	107.0	190	10
	CYLG-125B	CYLG-125S	125	146	125.5	146.0	260	06

#### Approvals




#### CYL Index

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

For machine building and installation industries / static and slightly dynamic applications  
 Very good ductility and good reversed bending characteristics  
 Good mechanical characteristics even under extreme conditions, such as low temperatures and low humidity

Materials	Temperature range	Colour
Specially formulated polyamide 6	-40°C to +105°C	Black/Grey
Certification	Short-term to: +160°C	
Free from halogens, REACH compliant and RoHS compliant	Self extinguishing	UV Resistance
	acc. to UL 94 V2	-

### Type ESD - Very flexible, medium-duty conduit

	Order no. (black)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./Dyn. radius (mm)	PU (m)
		NW	Metric				
	ESDT-07B	07	10	6.7	10.0	15/40	50
	ESDT-10B	10	12	9.7	12.8	20/50	50
	ESDT-12B	12	16	12.0	15.6	25/65	50
	ESDT-17B	17	20	16.6	21.1	35/85	50
	ESDT-23B	23	25	23.0	28.4	40/110	50
	ESDT-29B	29	32	28.7	34.5	50/135	50
	ESDT-36B	36	40	36.8	42.4	60/170	30
	ESDT-48B	48	50	48.0	54.5	75/220	30
	ESDG-56B	56	68	55.8	67.5	110/270	30
	ESDG-70B	70	80	67.4	79.6	130/320	10
	ESDG-95B	95	106	91.5	107.0	170/430	10

#### ESD Index

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


For dynamic applications in robotics and automation where electrostatic charge and uncontrolled discharge need to be avoided  
 Prevents electrostatic charging. For indoor and outdoor use (very good cold temperature performance)

Materials	Temperature range	Colour
Specially modified polyamide 12	-40°C to +90°C	Black
Certification	Short-term to: +150°C	
Free from halogens, REACH compliant and RoHS compliant	Fatigue resistance	UV Resistance
	Excellent fatigue resistance	Excellent

# PMAFLEX

## Type PCL conduit

Type PCL - Very flexible, medium-duty

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric				
	PCLT-07B	PCLT-07S	07	10	6.6	10.0	15	50
	PCLT-10B	PCLT-10S	10	12	9.8	12.8	20	50
	PCLT-12B	PCLT-12S	12	16	12.1	15.6	25	50
	PCLT-17B	PCLT-17S	17	20	16.8	21.1	35	50
	PCLT-23B	PCLT-23S	23	25	23.2	28.4	45	50
	PCLT-29B	PCLT-29S	29	32	28.8	34.5	55	50
	PCLT-36B	PCLT-36S	36	40	36.7	42.4	65	30
	PCLT-48B	PCLT-48S	48	50	48.2	54.5	80	30
	PCLG-17B	PCLG-17S	17	20	15.8	21.1	40	50
	PCLG-23B	PCLG-23S	23	25	21.9	28.4	50	50
	PCLG-29B	PCLG-29S	29	32	27.8	34.5	60	50
	PCLG-36B	PCLG-36S	36	40	36.1	42.4	75	30
	PCLG-48B	PCLG-48S	48	50	46.9	54.5	90	30
	PCLG-56B	PCLG-56S	56	68	56.7	67.5	120	30
	PCLG-70B	PCLG-70S	70	80	67.5	79.6	140	10
PCLG-95B	PCLG-95S	95	106	91.6	107.0	190	10	
PCLG-125B	PCLG-125S	125	146	125.5	146.0	260	6	

### Approvals



### PCL Index

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


For machine building, installation and vehicle building industries / static and slightly dynamic applications  
 Very good ductility and good reversed bending characteristics. Very good long-term properties  
 Very good mechanical characteristics even under extreme conditions, such as low temperatures and low humidity

Materials	Temperature range	Colour
Specially formulated polyamide 6	-50°C to +105°C	Black/Grey
Certification	Short-term to: +160°C	
Free from halogens, REACH compliant and RoHS compliant	Self extinguishing	UV Resistance
	acc. to UL 94 V2	-

# PMAFLEX

## Type PEL conduit

Type PEL - Highly flexible, light-duty, soft

	Order no. (grey)	Order no. (grey, slit)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric				
	PELT-10S	PELT-10SL	10	12	9.8	12.8	20	50
	PELT-12S	PELT-12SL	12	16	12.2	15.6	25	50
	PELT-17S	PELT-17SL	17	20	16.8	21.1	30	50
	PELT-23S	PELT-23SL	23	25	23.2	28.4	40	50
	PELT-29S	PELT-29SL	29	32	28.9	34.5	45	30
	PELT-36S	PELT-36SL	36	40	37.0	42.4	55	30
	PELT-48S	PELT-48SL	48	50	48.2	54.5	70	30

For electrical cabinets and appliance construction

Very good ductility

Suitable for small bending radii

Good resistance against strong acids and bases

### PEL Index

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


Materials	Temperature range	Colour
Specially modified polyethylene	-50°C to +60°C	Grey
Certification		UV Resistance
Free from halogens, REACH compliant and RoHS compliant		-



# PMAFLEX

## Type PIS/PIH conduit

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

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./dyn. radius (mm)	PU (m)
			NW	Metric				
	PIST-07B	PIST-07S	07	10	6.7	10.0	15/40	50
	PIST-10B	PIST-10S	10	12	9.7	12.8	20/50	50
	PIST-12B	PIST-12S	12	16	12.0	15.6	25/65	50
	PIST-17B	PIST-17S	17	20	16.7	21.1	30/85	50
	PIST-23B	PIST-23S	23	25	23.2	28.4	40/110	50
	PIST-29B	PIST-29S	29	32	28.9	34.5	50/135	50
	PIST-36B	PIST-36S	36	40	36.8	42.4	60/170	30
	PIST-48B	PIST-48S	48	50	48.0	54.5	75/220	30
	PISG-17B	PISG-17S	17	20	15.8	21.1	35/85	50
	PISG-23B	PISG-23S	23	25	22.0	28.4	45/110	50
	PISG-29B	PISG-29S	29	32	27.8	34.5	55/135	50
	PISG-36B	PISG-36S	36	40	36.2	42.4	65/170	30
	PISG-48B	PISG-48S	48	50	47.1	54.5	85/220	30
	PIHG-56B	PIHG-56S	56	68	57.0	67.5	110/270	30
	PIHG-70B	PIHG-70S	70	80	68.0	79.6	130/320	30
	PIHG-95B	PIHG-95S	95	106	92.5	107.0	170/430	30
	PIHG-125B	PIHG-125S	125	146	126.9	146.0	230/580	20

**Approvals**



**PIS/PIH Index**

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


For robotics and automation applications. UL 94 V0. Excellent UV resistance and weathering characteristics  
 PIS: Medium-wall (Nominal width 07 to 48) / PIH: Heavy-wall (Nominal width 56 to 125)  
 Very good reversed bending characteristics. Good mechanical characteristics even under extreme conditions, such as low temperatures and low humidity

Materials	Temperature range	Colour
Specially modified polyamide 12	-50°C to +95°C	Black/Grey
Certification	Short-term to: +150°C	
Free from halogens, REACH compliant and RoHS compliant	Weathering characteristics	UV Resistance
	Excellent	Excellent

# PMAFLEX

## Type POS & PUE conduit

### Type POS - Highly flexible, medium-duty

	Order no. (black)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./Dyn. radius (mm)	PU (m)
		NW	Metric				
	POST-10B	10	12	9.9	12.8	20/50	50
	POST-12B	12	16	12.1	15.6	35/75	50
	POST-17B	17	20	16.7	21.1	30/85	50
	POST-23B	23	25	23.2	28.4	40/110	50
	POST-29B	29	32	28.8	34.5	50/135	50
	POST-36B	36	40	36.6	42.4	60/170	30
	POST-48B	48	50	48.2	54.5	75/220	30
	POSG-29B	29	32	27.8	34.4	55/135	50
	POSG-36B	36	40	36.2	42.4	65/170	30
	POSG-48B	48	50	47.2	54.5	85/220	30
	POSG-70B	70	80	67.4	79.6	130/320	30
	POSG-95B	95	106	92.3	106.0	170/430	30


#### POS Index

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

For automation as well as for machine building and industrial installations, especially where continuous movements occur  
 Excellent reversed bending performance and flexibility  
 Good impact resistance. Good resistance against strong acids

Materials	Temperature range	Colour
Specially modified polypropylene	-25°C to +95°C	Black
Certification	Short-term to: +130°C	
Free from halogens, REACH compliant and RoHS compliant	Fatigue resistance	UV Resistance
	-	-

### Type PUE - Highly flexible, medium-duty

	Order no. (black)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./Dyn. radius (mm)	PU (m)
		NW	Metric				
	PUET-23B	23	25	23.1	28.4	40/75	50
	PUET-29B	29	32	29.0	34.5	45/90	30
	PUET-36B	36	40	36.8	42.4	55/110	30
	PUET-48B	48	50	48.4	54.5	70/140	21
	PUEG-56B	56	68	57.2	67.5	90/170	30
	PUEG-70B	70	80	68.4	79.6	105/220	30

#### PUE Index

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


For robotic applications with multi-axial movements  
 Specially suitable for tight bending-radii  
 Highest reversed bending resistance  
 Excellent chafing characteristics

Materials	Temperature range	Colour
Specially formulated polyurethane	-60°C to +50°C	Black
Certification		
Free from halogens, REACH compliant and RoHS compliant	Fatigue resistance	UV Resistance
	-	-

# PMAFLEX

## Type PVD & VAM conduit

### Type PVD - Pliable, medium-duty

	Order no. (transparent)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
		NW	Metric				
	PVDT-10P	10	12	9.6	12.8	20	50
	PVDT-12P	12	16	12.0	15.6	25	50
	PVDT-17P	17	20	16.6	21.1	35	50
	PVDT-23P	23	25	23.0	28.4	45	50
	PVDT-29P	29	32	28.7	34.5	55	50


For long-term high temperature requirements in machine building applications  
 Excellent chemical resistance also at high temperatures  
 Very good abrasion resistance  
 High stiffness

#### PVD Index

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

Materials	Temperature range	Colour
Specially formulated PVDF	-60°C to +150°C	Transparent
Certification	Fire performance	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Self-extinguishing / free from cadmium	Excellent

### Type VAM - Flexible, heavy-duty

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric				
	VAMT-10B	VAMT-10S	10	12	9.6	12.8	25	50
	VAMT-12B	VAMT-12S	12	16	12.0	15.6	30	50
	VAMG-17B	VAMG-17S	17	20	15.5	21.1	45	50
	VAMG-23B	VAMG-23S	23	25	21.6	28.4	60	50
	VAMG-29B	VAMG-29S	29	32	27.6	34.5	70	50
	VAMG-36B	VAMG-36S	36	40	35.8	42.4	85	30
	VAMG-48B	VAMG-48S	48	50	46.6	54.5	110	30

For high fire and passenger safety requirements in interior applications such as passenger areas or public buildings  
 HL3 acc. to EN 45545-2  
 NFPA 130 compliant  
 High impact and compression strength  
 High stiffness

#### VAM Index

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


Materials	Temperature range	Colour
Specially formulated polyamide 6	-40°C to +105°C	Black/Grey
Certification	Fire performance	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Short-term to: +160°C Minimal development of smoke and gases	-



# PMAFLEX

## Type VAML & VCS conduit

### Type VAML - Flexible, medium-duty

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric				
	VAMLT-10B	VAMLT-10S	10	12	9.7	12.8	20	50
	VAMLT-12B	VAMLT-12S	12	16	12.1	15.6	25	50
	VAMLG-17B	VAMLG-17S	17	20	15.8	21.1	40	50
	VAMLG-23B	VAMLG-23S	23	25	21.9	28.4	50	50
	VAMLG-29B	VAMLG-29S	29	32	27.9	34.5	60	50
	VAMLG-36B	VAMLG-36S	36	40	36.2	42.4	75	30
	VAMLG-48B	VAMLG-48S	48	50	47.0	54.5	90	30
	VAMLG-56B	VAMLG-56S	56	68	56.9	67.5	120	30
	VAMLG-70B	VAMLG-70S	70	80	68.0	79.6	140	10
	VAMLG-95B	VAMLG-95S	95	106	92.5	107.0	190	10
	VAMLG-125B	VAMLG-125S	125	146	126.9	146.0	260	6


#### VAML Index

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

For high fire and passenger safety requirements in interior applications such as passenger areas or public buildings  
 HL3 acc. to EN 45545-2  
 NFPA 130 compliant  
 Good flexibility. Good impact strength

Materials	Temperature range	Colour
Specially formulated polyamide 6	-40°C to +105°C	Black/Grey
Certification	Short-term to: +160°C	
Free from halogens, REACH compliant and RoHS compliant	Fire performance	UV Resistance
	Minimal development of smoke and gases	-

### Type VCS - Flexible, heavy-duty

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric				
	VCST-07B	VCST-07S	07	10	6.6	10.0	20	100
	VCST-10B	VCST-10S	10	12	9.6	12.8	25	50
	VCST-12B	VCST-12S	12	16	12.0	15.6	30	50
	VCST-17B	VCST-17S	17	20	16.5	21.1	40	50
	VCSG-17B	VCSG-17S	17	20	15.7	21.1	45	50
	VCSG-23B	VCSG-23S	23	25	21.8	28.4	60	50
	VCSG-29B	VCSG-29S	29	32	27.6	34.5	70	50
	VCSG-36B	VCSG-36S	36	40	35.7	42.4	85	30
	VCSG-48B	VCSG-48S	48	50	46.7	54.5	110	30
	VCSG-56B	VCSG-56S	56	68	56.2	67.5	135	30
	VCSG-70B	VCSG-70S	70	80	67.1	79.6	160	10
	VCSG-95B	VCSG-95S	95	106	91.0	107.0	220	10

#### VCS Index

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


For static external installations  
 High compression and impact strengths at low temperatures and low humidity  
 Good ductility. Very good resistance to ultra violet rays and weathering

Materials	Temperature range	Colour
Specially formulated polyamide 6	-50°C to +105°C	Black/Grey
Certification	Short-term to: +160°C	
Free from halogens, REACH compliant and RoHS compliant	Fatigue resistance	UV Resistance
	-	Very good

# PMAFLEX

## Type VOH & PLR conduit

### Type VOH - Pliable, very heavy-duty

	Order no. (black)	Order no. (grey)	Conduit size			Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric	Profile				
	VOHD-07B	VOHD-07S	07	10		6.3	10.0	20	50
	VOHD-10B	VOHD-10S	10	12		9.5	12.8	25	50
	VOHD-12B	VOHD-12S	12	16		11.9	15.6	30	50
	VOHG-17B	VOHG-17S	17	20		15.1	21.1	45	50
	VOHG-23B	VOHG-23S	23	25		21.6	28.4	60	50
	VOHG-29B	VOHG-29S	29	32		27.3	34.5	70	50
	VOHG-36B	VOHG-36S	36	40		35.6	42.4	85	30
	VOHG-48B	VOHG-48S	48	50		46.5	54.5	110	30
	VOHG-56B	VOHG-56S	56	68		55.7	67.5	135	10
	VOHG-70B	VOHG-70S	70	80		67.0	79.6	160	10
	VOHG-95B	VOHG-95S	95	106		91.3	107.0	220	10
	VOHG-125B	VOHG-125S	125	146		125.4	146.0	300	6


For applications in heavy machine and plant construction  
 High compression resistance  
 Highest degree of mechanical protection  
 Very good UV and weathering resistance  
 Good fire safety characteristics

#### VOH Index

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

Materials	Temperature range	Colour
Specially modified polyamide 6	-40°C to +105°C	Black/Grey
Certification	Short-term to: +160°C	
Free from halogens, REACH compliant and RoHS compliant	Fire performance	UV Resistance
	Good	Very good

### Type PLR - flexible, medium-wall

	Order no. (black)	Order no. (grey)	Conduit size			Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric	Profile				
	PLRT-07B	PLRT-07S	07	10	T	6.8	10.0	15	50
	PLRT-10B	PLRT-10S	10	12	T	9.8	12.8	20	50
	PLRT-12B	PLRT-12S	12	16	T	12.2	15.6	25	50
	PLRG-17B	PLRG-17S	17	20	G	15.9	21.1	40	50
	PLRG-23B	PLRG-23S	23	25	G	22.0	28.4	50	50
	PLRG-29B	PLRG-29S	29	32	G	28.0	34.5	60	50
	PLRG-36B	PLRG-36S	36	40	G	36.3	42.4	75	30
	PLRG-48B	PLRG-48S	48	50	G	47.2	54.5	90	30

In light rail rolling stock applications e.g. Tram, Metro, Monorail  
 HL2 acc. to EN 45545-2  
 Good pressure resistance  
 Very good fire safety characteristics

#### PLR Index


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

Materials	Temperature range	Colour
Specially modified polyamide 6	-40°C to +105°C	Black/Grey
Certification	Short-term to: +160°C	
Free from halogens, REACH compliant and RoHS compliant	Fire performance	UV Resistance
	Self-extinguishing / Very good	-

## PMAFLEX Multilayer




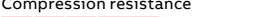

### Type XPCL & XSOL conduit

#### Type XPCL - Highly flexible, medium-duty


	Order no. (black/blue)	Order no. (grey/blue)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric				
	XPCLT-10BB	XPCLT-10SB	10	12	9.6	12.8	20	50
	XPCLT-12BB	XPCLT-12SB	12	16	11.9	15.6	25	50
	XPCLT-17BB	XPCLT-17SB	17	20	16.5	21.1	35	50
	XPCLG-17BB	XPCLG-17SB	17	20	15.7	21.1	40	50
	XPCLG-23BB	XPCLG-23SB	23	25	21.9	28.4	50	50
	XPCLG-29BB	XPCLG-29SB	29	32	27.6	34.5	60	50
	XPCLG-36BB	XPCLG-36SB	36	40	36.0	42.4	75	30
	XPCLG-48BB	XPCLG-48SB	48	50	47.1	54.5	90	30

For machine building and equipment with high requirements  
 Allows easy cable insertion due to low friction inner layer  
 Very good ductility and good reversed bending characteristics  
 Good mechanical characteristics even under extreme conditions, such as low temperatures and low humidity

#### XPCL Index

min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 6	-50°C to +105°C	Black/Blue
Fatigue reversed bending		Intermediate layer: Specially bonding compound	Short-term to: +160°C	Grey/Blue
Compression resistance		Inner layer: Specially modified polyethylene		
Low temperature performance		Certification	Fire performance	UV Resistance
Weathering resistance		Free from halogens, REACH compliant and RoHS compliant	Self-extinguishing	-

#### Type XSOL - Highly flexible, medium-duty



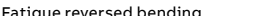


	Order no. (black/green)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
		NW	Metric				
	XSOLT-10BG	10	12	9.5	12.8	20	50
	XSOLT-12BG	12	16	11.9	15.6	25	50
	XSOLG-17BG	17	20	15.6	21.1	40	50
	XSOLG-23BG	23	25	21.9	28.4	50	50
	XSOLG-29BG	29	32	27.7	34.5	60	50
	XSOLG-36BG	36	40	36.4	42.4	75	30
	XSOLG-48BG	48	50	47.2	54.5	90	30

All-purpose, especially in long-term external applications, e.g. energy technology  
 Very good resistance to UV and weathering  
 Very high ductility and reversed bending resistance  
 Very good mechanical strength  
 High impact resistance even under extreme conditions, such as low temperatures and low humidity

#### Approvals




#### XSOL Index

min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 12	-50°C to +95°C	Black/Green
Fatigue reversed bending		Intermediate layer: Specially bonding compound	Short-term to: +150°C	
Compression resistance		Inner layer: Specially modified polyamide 6		
Low temperature performance		Certification	Fire performance	UV Resistance
Weathering resistance		Free from halogens, REACH compliant and RoHS compliant	Good fire safety characteristics Self-extinguishing	Very good

## PMAFLEX Multilayer

### Type XVCS1H & XVCS2H conduit

#### Type XVCS1H - Flexible, heavy-duty


	Order no. (black/green)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
		NW	Metric				
	XVCS1H-10BG	10	12	9.5	12.8	20	50
	XVCS1H-12BG	12	16	11.8	15.6	25	50
	XVCS1H-17BG	17	20	15.5	21.1	40	50
	XVCS1H-23BG	23	25	21.7	28.4	50	50
	XVCS1H-29BG	29	32	27.5	34.5	60	50
	XVCS1H-36BG	36	40	35.8	42.4	75	30
	XVCS1H-48BG	48	50	47.1	54.5	90	30

For track side applications and other exterior static applications  
 Easy layouting through: High conduit ductility and formability / Low friction inner layer facilitates cable insertion  
 Excellent impact characteristics at low temperatures

#### XVCS1H Index

min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 6	-50°C to +90°C	Black/Green
Fatigue reversed bending		Intermediate layer: Specially bonding compound	Short-term to: +120°C	
Compression resistance		Inner layer: Specially modified polyolefin		
Low temperature performance		Certification	Atmospheric corrosion resistance	UV Resistance
Weathering resistance		Free from halogens, REACH compliant and RoHS compliant	Very good	Very good

#### Type XVCS2H - Flexible, heavy-duty

	Order no. (black/green)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
		NW	Metric				
	XVCS2H-10BG	10	12	9.2	12.8	20	50
	XVCS2H-12BG	12	16	11.7	15.6	25	50
	XVCS2H-17BG	17	20	15.2	21.1	35	50
	XVCS2H-23BG	23	25	22.0	28.4	40	50
	XVCS2H-29BG	29	32	27.7	34.5	50	50
	XVCS2H-36BG	36	40	35.8	42.4	60	30
	XVCS2H-48BG	48	50	46.8	54.5	70	30

For track side applications and other exterior static applications with high UV exposure  
 Easy layouting through: High conduit ductility and formability / Low friction inner layer facilitates cable insertion  
 Excellent impact characteristics at low temperatures

#### XVCS2H Index


min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 12	-50°C to +90°C	Black/Green
Fatigue reversed bending		Intermediate layer: Specially bonding compound	Short-term to: +120°C	
Compression resistance		Inner layer: Specially modified polyolefin		
Low temperature performance		Certification	Atmospheric corrosion resistance	UV Resistance
Weathering resistance		Free from halogens, REACH compliant and RoHS compliant	Excellent	Excellent



## PMAFLEX Multilayer

### Type XVCSF & XPCS conduit

#### Type XVCSF - Flexible, heavy-duty

	Order no. (black/blue)	Profile (T/G)	Conduit size		rec. fitting thread size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	Weight (kg/100m)	PU (m)
			NW	Metric	PG	Metric					
	XVCSFT-07BB	T	7	9	9	M12x1.5	6.7	10.0	15	2.5	50
	XVCSFT-10BB	T	10	12	9	M12x1.5	9.6	12.8	20	3.1	50
	XVCSFT-12BB	T	12	16	11	M16x1.5	11.9	15.6	25	4.2	50
	XVCSFG-17BB	G	17	20	16	M20x1.5	15.6	21.1	40	7.5	50
	XVCSFG-23BB	G	23	25	21	M25x1.5	21.5	28.4	50	12.0	50
	XVCSFG-29BB	G	29	32	29	M32x1.5	27.7	34.5	60	15.0	50
	XVCSFG-36BB	G	36	40	36	M40x1.5	35.9	42.4	75	19.0	30
	XVCSFG-48BB	G	48	50	48	M50x1.5	46.8	54.5	90	25.0	30

Multilayer conduit for external rail applications

Rail static external applications such as under carriage, bogie, etc.






High compression and impact strengths at low temperature and low humidity

Good flexibility and very good UV resistance and weathering characteristics


Compatible with PMAFIX Pro, PMAFIX, PMA Smart Line and accessories

EN 45545-2 HL2 (R22 & R23)

#### XVCSF Index

min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 6	-50°C to +105°C	Black/Blue
Fatigue reversed bending		Inner layer: Specially modified polyamide 6	Short-term to: +160°C	
Compression resistance				
Low temperature performance				
Weathering resistance				
		Certification	Fire performance	UV Resistance
		Free from halogens and cadmium	Self-extinguishing	Very good
		RoHS and REACH compliant		

#### Type XPCS - Very flexible, heavy-duty

	Order no. (black/green)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	Dyn. radius (mm)	PU (m)
		NW	Metric					
	XPCST-07BG	7	10	6.9	10.0	15	40	50
	XPCST-10BG	10	12	9.8	12.8	20	50	50
	XPCST-12BG	12	16	12.1	15.6	25	65	50
	XPCSG-17BG	17	20	15.8	21.1	35	85	50
	XPCSG-23BG	23	25	21.9	28.4	45	110	50
	XPCSG-29BG	29	32	27.7	34.5	55	135	50
	XPCSG-36BG	36	40	36.6	42.4	65	170	30
	XPCSG-48BG	48	50	47.5	54.5	85	220	30
	XPCSG-56BG.30	56	68	56.7	67.5	110	270	30
XPCSG-70BG.30	70	80	67.5	79.6	130	320	10	

For dynamic outside applications in railway vehicles

For outdoor applications with highest requirements to UV and weathering resistance





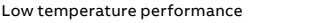
Extensive railway approvals

Good mechanical characteristics even under extreme conditions, such as low temperatures and low humidity

HL2 acc. to EN 45545-2

NFPA 130 compliant


#### XPCS Index

min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 12	-40°C to +95°C	Black/Green
Fatigue reversed bending		Inner layer: Specially formulated polyamide 6	Short-term to: +150°C	
Compression resistance				
Low temperature performance				
Weathering resistance				
		Certification	Fire performance	UV Resistance
		Free from halogens, REACH compliant	Self-extinguishing	Excellent
		and RoHS compliant		

## PMAFLEX Multilayer



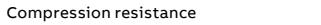


### Type XPCSF & XTPC conduit

#### Type XPCSF - Very flexible, heavy-duty


	Order no. (black/orange)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	Dyn. radius (mm)	PU (m)
		NW	Metric					
	XPCSFT-07BO	07	10	6.5	10.0	15	40	100
	XPCSFT-10BO	10	12	9.6	12.8	20	50	50
	XPCSFT-12BO	12	16	11.8	15.6	25	65	50
	XPCSFG-17BO	17	20	15.5	21.1	35	85	50
	XPCSFG-23BO	23	25	21.5	28.4	45	110	50
	XPCSFG-29BO	29	32	27.4	34.5	55	135	50
	XPCSFG-36BO	36	40	36.0	42.4	65	170	30
	XPCSFG-48BO	48	50	47.1	54.5	85	220	30

For dynamic outside applications in railway vehicles  
 For outdoor applications with highest requirements to UV and weathering resistance  
 Extensive railway approvals  
 Excellent flexibility  
 Very good mechanical characteristics even under extreme conditions, such as low temperatures and low humidity  
 HL3 acc. to EN 45545-2

#### XPCSF Index




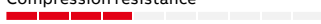
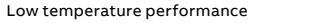
min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 12	-40°C to +95°C	Black/Orange
Fatigue reversed bending		Inner layer: Specially formulated polyamide 12	Short-term to: +150°C	
Compression resistance				
Low temperature performance				
Weathering resistance				
		Certification	Fire performance	UV Resistance
		Free from halogens, REACH compliant and RoHS compliant	Self-extinguishing	Excellent

#### Type XTPC - Highly flexible, medium-duty

	Order no. (black/orange)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	Dyn. radius (mm)	PU (m)
		NW	Metric					
	XTPCG-17BB.50	17	20	15.2	21.1	30	75	50
	XTPCG-23BB.50	23	25	21.2	28.4	40	100	50
	XTPCG-29BB.50	29	32	26.8	34.5	50	120	50
	XTPCG-36BB.50	36	40	35.5	42.4	60	150	30
	XTPCG-48BB.50	48	50	46.5	54.5	80	190	30
	XTPCG-56BB.50	56	68	56.2	67.5	105	235	30
	XTPCG-70BB.50	70	80	67.3	79.6	120	280	30

For dynamic conduit systems in robotics and automation industry  
 For outdoor applications with good requirements to UV and weathering resistance  
 With 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


#### XTPC Index

min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Thermoplastic copolyester	-40°C to +105°C	Black/Blue
Fatigue reversed bending		Inner layer: Thermoplastic copolyester	Short-term to: +150°C	
Compression resistance				
Low temperature performance				
Weathering resistance				
		Certification	Fire performance	UV Resistance
		Free from halogens, REACH compliant and RoHS compliant	Self-extinguishing	Good

# PMA overextruded conduits

## Type JFBD & JXPCSF conduit

### Type JFBD - Flexible, medium-duty

	Order no.	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	Dyn. radius (mm)	PU (mm)
		NW	Metric					
	JFBTD-12C01	12	16	12.0	16.0	40	100	50
	JFBDG-17C01	17	20	15.7	21.5	55	125	50
	JFBDG-23C01	23	25	21.8	28.7	75	170	50
	JFBDG-29C01	29	32	27.6	34.9	90	210	50
	JFBDG-36C01	32	40	36.3	43.0	110	260	30
	JFBDG-48C01	48	50	47.3	54.8	140	330	30

#### Approvals




Smooth easy to clean out layer  
 High reversed bending stresses  
 Excellent flexibility in combination with high strength  
 High resistance to chemicals and cleaning agents  
 For indoor food zone – non contact  
 Outer layer made from FDA compliant material  
 Corrosion free

#### JFBD Index

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

Materials	Colour
Conduit: made from high-grade, specially formulated polyamide 12	Corrugated conduit: blue
Overextrusion: made from modified polyamide elastomer	Overextrusion: blue, translucent
Certification	UV Resistance
FDA 21 CFR / EU 10/2011 compliant outer layer material; ECOLAB certificate	-

### Type JXPCSF - Highly flexible, heavy-duty

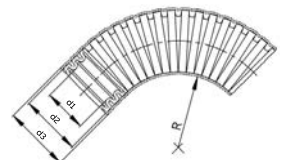
	Order no. (black/orange)	Profile (T/G)	Conduit size			d1 (mm)	d2 (mm)	d3 (mm)	Stat. radius (mm)	Dyn. radius (mm)	Weight (kg/100m)	PU (m)
			NW	Metric								
	JXPCSFT-12BO	T	12	16	11.8	15.6	16.0	40	100	4.9	50	
	JXPCSFG-17BO	G	17	20	15.5	21.1	21.6	55	125	8.6	50	
	JXPCSFG-23BO	G	23	25	21.5	28.4	28.8	75	170	13.5	50	
	JXPCSFG-29BO	G	29	32	27.4	34.5	34.8	90	210	16.7	50	
	JXPCSFG-36BO	G	36	40	36.0	42.4	42.8	110	260	21.6	30	
	JXPCSFG-48BO	G	48	50	47.1	54.5	54.8	140	330	29.4	30	

Over-extruded conduit for rail applications designed specifically to prevent the accumulation of ice under extreme climate conditions  
 For dynamic or static external applications in railway vehicles - on the roof, between carriages and on bogies  
 Excellent flexibility. Smooth outer layer prevents accumulation of ice  
 Easy cleaning and high resistance to chemicals and cleaning agents. Compatible with PMAFIX Pro and accessories  
 EN 45545-2 HL3 (R22 & R23)

#### JXPCSF Index

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


Materials	Temperature range	Colour
Multi layer conduit: specially formulated polyamide 12	-50°C to +95°C	Black/Orange
Overextrusion: specially formulated polyamide 12	Short-term to: +150°C	
Certification	Fire performance	UV Resistance
Free from halogens and cadmium RoHS and REACH compliant	Self-extinguishing	Excellent



# PMA overextruded conduits

## Type JLLPA conduit

Type JLLPA - Flexible, heavy-duty

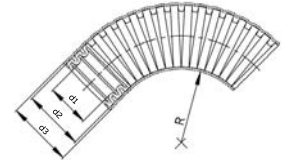
	Order no. (black)	Conduit size		d1 (mm)	d2 (mm)	d3 (mm)	Stat. radius (mm)	Weight (kg/100m)	PU (m)
		NW	Metric						
	JLLPA-12A	12	16	12.1	15.6	15.8	40	4.5	50
	JLLPAG-17A	17	20	15.8	21.1	21.2	55	7.4	50
	JLLPAG-23A	23	25	21.9	28.4	28.5	75	11.4	50
	JLLPAG-29A	29	32	27.8	34.5	34.7	90	15.4	50
	JLLPAG-36A	36	40	36.1	42.4	42.6	110	18.6	30
	JLLPAG-48A	48	50	46.9	54.5	54.6	140	27.4	30

Flexible, smooth over-extruded conduit for applications with cleaning requirements  
 For static applications in machine building, installation and construction industries  
 For general applications with cleaning requirements  
 Smooth outer layer for easy cleaning, good resistance to chemicals and cleaning agents. Corrosion free  
 Flexibility in combination with high strength. Compatible with PMAFIX Pro  
 UL Recognition according to UL 1696 (file E80294)

### JLLPA Index

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

Materials	Temperature range	Colour
Conduit: High-grade, specially formulated polyamide 6	-18°C to +105°C	Black
Overextrusion: modified polyamide 6	Short-term to: +160°C	
Certification	Fire performance	UV Resistance
Free from halogens and cadmium	Self-extinguishing	Very good
RoHS and REACH compliant		






## PMAFLEX Plus

### Type CUS & PUS conduit

#### Type CUS - Very flexible, medium-duty

	Order no. (black)	Order no. (grey)	Conduit size			Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m/ft)
			Inch	NW	Metric				
	CUSG-17B	CUSG-17S	½	17	20	15.5	21.1	40	31/100
	CUSG-23B	CUSG-23S	¾	23	25	21.7	28.4	50	31/100
	CUSG-29B	CUSG-29S	1	29	32	27.4	34.5	60	31/100
	CUSG-36B	CUSG-36S	1 ¼	36	40	35.5	42.4	75	31/100
	CUSG-48B	CUSG-48S	1 ½	48	50	46.5	54.5	90	31/100

For machine building and installation industries  
 For electrical installations, especially in the US market  
 Inexpensive solution for requirements acc. to UL 1660 (UL Listing)  
 Good ductility and reversed bending characteristics  
 Very good mechanical properties even under extreme conditions, such as low temperatures and low humidity

#### Approvals




#### CUS Index

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

Materials	Temperature range	Colour
Specially modified polyamide 6	-40°C to +105°C	Black/Grey
Certification	Short-term to: +160°C	
Fire protection	Self-extinguishing, acc. to UL 94 V2	UV Resistance
Free from halogens, REACH compliant and RoHS compliant		-

#### Type PUS - Very flexible, heavy-duty

	Order no. (black)	Order no. (grey)	Conduit size			Inside Ø (mm)	Outside Ø (mm)	Stat./Dyn. radius (mm)	PU (m/ft)
			Inch	NW	Metric				
	PUSG-17B	PUSG-17S	½	17	20	15.5	21.1	35/85	31/100
	PUSG-23B	PUSG-23S	¾	23	25	21.6	28.4	45/110	31/100
	PUSG-29B	PUSG-29S	1	29	32	27.5	34.5	55/135	31/100
	PUSG-36B	PUSG-36S	1 ¼	36	40	35.9	42.4	65/170	31/100
	PUSG-48B	PUSG-48S	1 ½	48	50	47.0	54.5	85/220	31/100

For long-term external applications with approval acc. to UL 1660 (UL Listing)  
 For dynamic applications  
 Very good reversed bending resistance  
 Very good mechanical strength at low temperatures  
 Excellent resistance to ultra violet rays and weathering  
 cULUS listed

#### Approvals



#### PUS Index


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

Materials	Temperature range	Colour
Specially modified polyamide 12	-50°C to +95°C	Black/Grey
Certification	Short-term to: +150°C	
Fire protection	Self-extinguishing, acc. to UL 94 V2	UV Resistance
Free from halogens, REACH compliant and RoHS compliant		Excellent

# PMAFLEX Plus

## Type PACOF conduit

Type PACOF - Flexible, divisible

	Order no. (black)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
		NW	Metric				
	PACOF-07B	07	10	5.6	10.0	30	50
	PACOF-10B	10	12	8.5	12.8	33	50
	PACOF-12B	12	16	11.0	15.6	35	50
	PACOF-17B	17	20	15.5	21.1	45	50
	PACOF-23B	23	25	22.1	28.4	70	50
	PACOF-29B	29	32	27.2	34.5	120	50
	PACOF-36B	36	40	32.0	42.4	145	30
	PACOF-48B	48	50	43.9	54.1	150	30
	PACOF-70B	70	80	62.0	79.0	190	10

HL3 according to EN45545-2  
NFPA 130 compliant

For machine building and plant construction  
For trouble-free retrofitting and applicable for repairs  
Can be opened and closed again in longitudinal direction any time  
Good ductility  
Good compression resistance

### PACOF Index


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

Materials	Temperature range	Colour
Specially modified polyamide 6	-40°C to +105°C	Black
Certification	Short-term to: +160°C	
Free from halogens, REACH compliant and RoHS compliant	Fire performance	UV Resistance
	-	-

# PMA Divisible System

## Type PPCOF conduit

### Type PPCOF - Flexible, divisible

	Order no. (black)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
		NW	Metric				
	PPCOF-07B	07	10	5.6	10.0	25	50
	PPCOF-10B	10	12	8.5	12.8	28	50
	PPCOF-12B	12	16	11.0	15.6	35	50
	PPCOF-17B	17	20	15.1	21.1	45	50
	PPCOF-23B	23	25	22.1	28.4	60	50
	PPCOF-29B	29	32	26.6	34.5	100	50
	PPCOF-36B	36	40	31.8	42.4	120	30
	PPCOF-48B	48	50	43.9	54.1	140	30
	PPCOF-70B	70	80	60.5	78.0	200	10

### PPCOF Index

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


For machine building and plant construction  
 For trouble-free retrofitting and applicable for repairs  
 Can be opened and closed again in longitudinal direction any time  
 Good reversed bending resistance


Materials	Temperature range	Colour
Specially modified polypropylene PP	-20°C to +105°C	Black
	Short-term to +150°C	
Certification	Fire performance	UV Resistance
-	-	-

# PMA Smart Line

## Type LLPA conduit

Type LLPA - Very flexible, medium-duty Smartline

	Order no. (black)	Order no. (grey)	Conduit size			Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric	Profile				
	LLPA-07A	LLPA-07S	07	10	T	6.6	10.0	15	50
	LLPA-10A	LLPA-10S	10	12	T	9.8	12.8	20	50
	LLPA-12A	LLPA-12S	12	16	T	12.1	15.6	25	50
	LLPA-17A	LLPA-17S	17	20	T	16.8	21.1	35	50
	LLPA-23A	LLPA-23S	23	25	T	23.2	28.4	45	50
	LLPA-29A	LLPA-29S	29	32	T	28.8	34.5	55	50
	LLPA-36A	LLPA-36S	36	40	T	36.7	42.4	65	30
	LLPA-48A	LLPA-48S	48	50	T	48.2	54.5	80	30

	LLPAG-17A	LLPAG-17S	17	20	G	15.8	21.1	40	50
	LLPAG-23A	LLPAG-23S	23	25	G	21.9	28.4	50	50
	LLPAG-29A	LLPAG-29S	29	32	G	27.8	34.5	60	50
	LLPAG-36A	LLPAG-36S	36	40	G	36.1	42.4	75	30
	LLPAG-48A	LLPAG-48S	48	50	G	46.9	54.5	90	30
	LLPAG-56A	LLPAG-56S	56	68	G	56.7	67.5	120	30
	LLPAG-70A	LLPAG-70S	70	80	G	67.5	79.6	140	10
	LLPAG-95A	LLPAG-95S	95	106	G	91.6	107.0	190	10
	LLPAG-125A	LLPAG-125S	125	146	G	125.5	146.0	260	06

### Approvals



### LLPA Index

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

For machine building, installation and construction industries  
 Good ductility  
 Good mechanical characteristics


Materials	Temperature range	Colour
Specially modified polyamide 6	-40°C to +105°C	Black/Grey
Certification	Self extinguishing	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Short-term to: +160°C acc. to UL 94 V2	-



## PMA Smart Line

### Type LLPF

Type LLPF - Very flexible, medium-duty

	Order no. (black)	Order no. (grey)	Conduit size			Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric	Profile				
	LLPF-07A	LLPF-07S	7	10	T	6.8	10.0	15	50
	LLPF-10A	LLPF-10S	10	12	T	9.8	12.8	20	50
	LLPF-12A	LLPF-12S	12	16	T	12.2	15.6	25	50
	LLPF-17A	LLPF-17S	17	20	T	16.8	21.1	35	50
	LLPF-23A	LLPF-23S	23	25	T	23.4	28.4	45	50
	LLPF-29A	LLPF-29S	29	32	T	29.1	34.5	55	50
	LLPFG-17A	LLPFG-17S	17	20	G	15.8	21.1	40	50
	LLPFG-23A	LLPFG-23S	23	25	G	21.9	28.4	50	50
	LLPFG-29A	LLPFG-29S	29	32	G	27.8	34.5	60	50
	LLPFG-36A	LLPFG-36S	36	40	G	36.1	42.4	75	30
	LLPFG-48A	LLPFG-48S	48	50	G	46.9	54.5	90	30

#### LLPF Index

min.	max.
Ductility	Good pressure resistance
Fatigue reversed bending	Very good fire safety characteristics
Compression resistance	
Low temperature performance	
Weathering resistance	

For machine building, installation and construction industries  
For applications with high fire safety requirements  
UL 94 V0

Good pressure resistance  
Very good fire safety characteristics

Materials	Temperature range	Colour
Specially modified polyamide 6	-40°C to +105°C	Black/Grey
Certification	Short-term to: +160°C	
Free from halogens, REACH compliant and RoHS compliant	Fire protection	UV Resistance
	Self-extinguishing	-

## PMA overbraided conduits

### PMA stainless steel overbraiding for conduits

#### PMA stainless steel overbraiding for conduits

Order no. (black)	Conduit size		for conduit profile	fits to metal connector	braid spec (mm)	d1 Ø (mm)	d2 Ø (mm)	weight net without conduit (kg/100 m)	PU (m)
	NW	Metric							
xxxT-12x/S	12	16	T	MONK-M162	24 x 8 x 0.30	*	17.5	11.9	50
xxxT-17x/S	17	20	T	MONK-M207	32 x 7 x 0.30	*	23.0	13.8	50
xxxG-17x/S	17	20	G	MONK-M207	32 x 7 x 0.30	*	23.0	13.8	50
xxxG-23x/S	23	25	G	MONK-M253	36 x 8 x 0.30	*	31.0	17.8	50
xxxG-29x/S	29	32	G	MONK-M329	36 x 10 x 0.30	*	36.0	22.2	50
xxxG-36x/S	36	40	G	MONK-M406	36 x 12 x 0.30	*	44.5	26.7	30
xxxG-48x/S	48	50	G	MONK-M508	36 x 14 x 0.30	*	58.5	30.7	30

Our customer service or your local distribution partner will be pleased to help you concerning product availability and lead time

Application: in machine and railway construction; for high mechanical loads; in areas with hot swarf and flying sparks

Characteristics: increased mechanical conduit protection; extremely high abrasion resistance

Coverage: > 90%

Suitable for PMAFLEX, PMA Smart Line; Special metal fittings (MONK)

Materials	Temperature range	Colour
Braid made with stainless steel AISI	-70°C to +1000°C	Metal
Certification	Fire performance	UV Resistance
RoHS compliant	-	-







# PMAFIX Pro

## Introduction

Next generation cable protection. The extremely successful and technically proven PMAFIX System has been developed further to create the PMAFIX Pro product range.

The new generation fittings are the product of experience gained over many years in the most varied application areas. 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 IP69 even in applications where there is long term continuous movement. PMAFIX Pro is manufactured by using multiple component injection moulding process.

### Key features

- Meets all ingress protection categories up to and including IP68 and IP69, also when the conduit connection is continually in motion
- Manufactured with newest 2-component injection moulding technology
- Fulfills highest international quality and standard requirements
- Intelligent safety locking mechanism
- Allows simple “push-in” installation of conduits
- Due to the integrated conduit supports, conduit remains centralised with little deformation even when bent sharply directly at the fitting









# PMAFIX Pro

## General technical details

—  
01 patent  
—  
02 Up to 100 bar

### Material

- Fittings made from specially modified polyamide 6
- Threads made from nickel-plated brass or polyamide 6
- Sealings made from cross linked polyester elastomer
- Self-extinguishing
- Free from halogens, REACH + RoHS compliant
- Temperature range: -50°C to +105°C, short-term to +160°C

### Characteristics

- Highest assembly reliability – the fitting only locks when the sealing element is fully inserted
- Highest operational safety assured through visual and acoustic correct assembly controls
- Excellent resistance to ultra violet rays and weathering
- Highest impact resistance through fully closed design
- Highest conduit pull out strength
- Vibration-proof connection to PMA conduits
- Fits conduit profiles – fine (T) and coarse (G)
- To avoid accidental opening, disassembling only possible with a screwdriver



—  
01

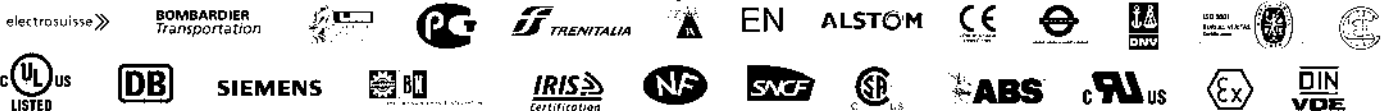


—  
02

—  
IP68 + IP69

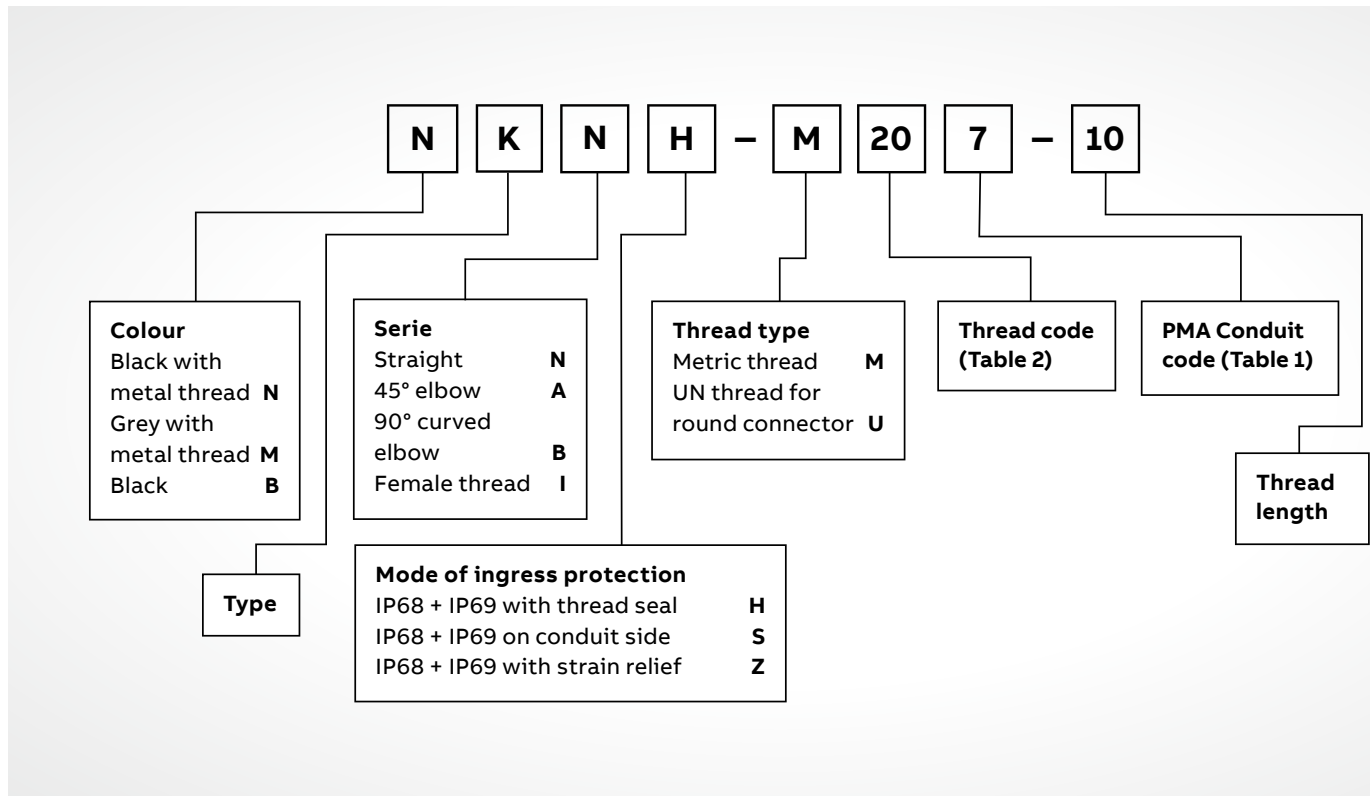
### Static + dynamic

- Highest sealing through fully closed system also in highest dynamic applications
- Extra long ribbed sealing areas (cross linked material)
- 360° locking and sealing element shields against high pressure water jets (up to 100 bar)
- Content of delivery: Locking and sealing element and thread seal for male threads (O-Ring and/or flat gasket)

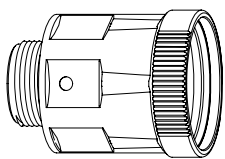


## PMAFIX Pro

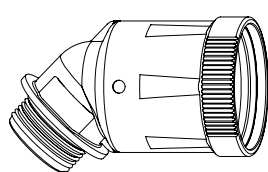
### Part number codes



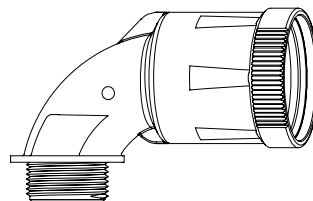
### Connector series IP68 + IP69



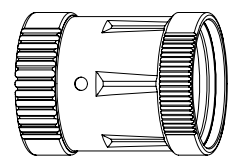
01



02



03



04

- 01 Straight (N)
- 02 45° elbow (A)
- 03 90° curved elbow (B)
- 04 Female thread (I)

# PMAFIX Pro

## Size codes, installation

Table 1: Conduit codes

Nominal width	Metric size	PMA code
10	12	0
12	16	2
17	20	7
23	25	3
29	32	9
36	40	6
48	50	8

Table 2: Thread codes

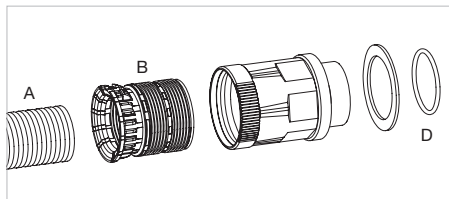
Thread Metric	PMA code
M12x1.5	M12
M16x1.5	M16
M20x1.5	M20
M25x1.5	M25
M32x1.5	M32
M40x1.5	M40
M50x1.5	M50
M63x1.5	M63

Thread UN	PMA code
7/8-20 UNEF	U21
1-20 UNEF	U24
1 3/16-18 UNEF	U29
1 7/16-18 UNEF	U35
1 3/4-18 UNS	U43
2-18 UNS	U50
2 1/4-16 UN	U56

Additional code for female thread connectors

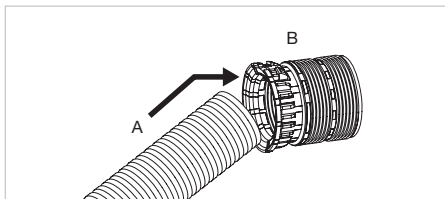
Type	PMA code
With O-ring groove (MIL C 5015)	G

## Installation IP68 + IP69



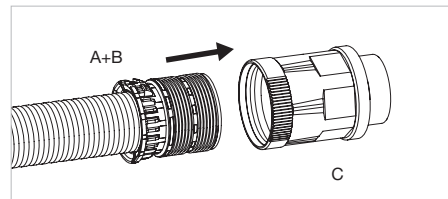
01

A = Corrugated conduit  
 B = Sealing and locking element  
 C = Fitting body  
 D = Thread seal (O-ring or flat gasket\*)



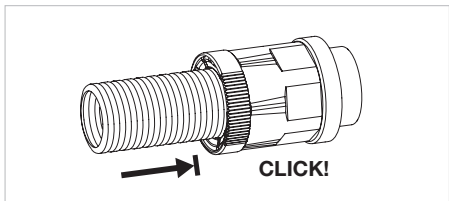
02

Place corrugated conduit (A) at a slight angle against the sealing element (B), then push right into the end.



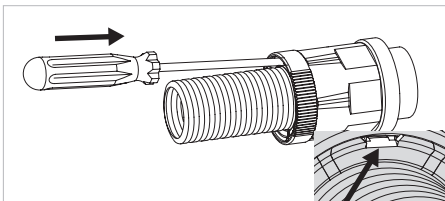
03

Push the conduit and sealing element (A+B) together into the outer body of the fitting (C). Water or a lubricating agent can help facilitate the push-in process.



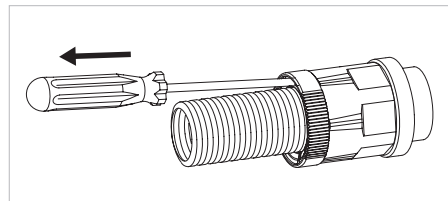
04

The locking mechanism engages when the sealing element is pushed in fully.



05

To disengage the locking mechanism introduce a size 1 screwdriver parallel to the conduit into the opening shown in the detail drawing.

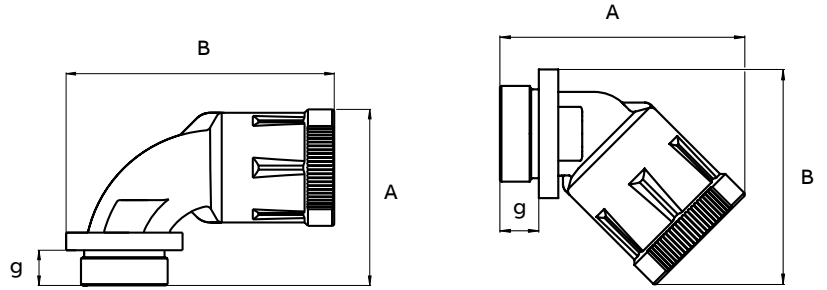


06

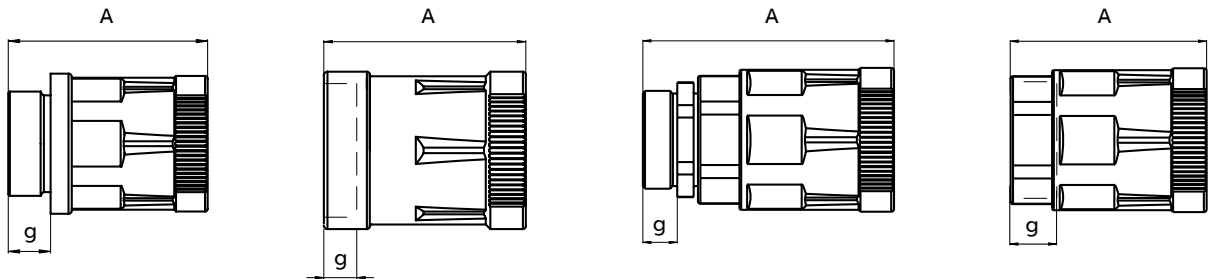
Pull the conduit and screwdriver out of the fitting together keeping the screwdriver parallel to the conduit.

**PMAFIX Pro**

Connectors metric, metal thread



g = Thread length  
A x B = External dimensions



g = Thread length  
A = Overall length

**Type KNH - Connector straight, metric metal thread**

	Order no. black IP68 + IP69	Order no. grey IP68 + IP69	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	NKNH-M120-10	MKNH-M120-10	M12 x 1.5	10	12	10.0	45.0
	NKNH-M160-10	MKNH-M160-10	M16 x 1.5	10	12	10.0	45.0
	NKNH-M162-10	MKNH-M162-10	M16 x 1.5	12	16	10.0	50.5
	NKNH-M202-10	MKNH-M202-10	M20 x 1.5	12	16	10.0	50.5
	NKNH-M207-10	MKNH-M207-10	M20 x 1.5	17	20	10.0	56.0
	NKNH-M257-11	MKNH-M257-11	M25 x 1.5	17	20	11.0	57.0
	NKNH-M253-11	MKNH-M253-11	M25 x 1.5	23	25	11.0	59.5
	NKNH-M323-13	MKNH-M323-13	M32 x 1.5	23	25	13.0	61.5
	NKNH-M329-13	MKNH-M329-13	M32 x 1.5	29	32	13.0	67.0
	NKNH-M409-13	MKNH-M409-13	M40 x 1.5	29	32	13.0	68.5
	NKNH-M406-13	MKNH-M406-13	M40 x 1.5	36	40	13.0	74.0
	NKNH-M506-14	MKNH-M506-14	M50 x 1.5	36	40	14.0	75.0
	NKNH-M508-14	MKNH-M508-14	M50 x 1.5	48	50	14.0	81.0
	NKNH-M638-14	MKNH-M638-14	M63 x 1.5	48	50	14.0	81.0

**Approvals**



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength




## Connectors metric, metal thread

### Type KNZ

Type KNZ - Connector straight with strain relief, metric metal thread



	Order no. IP68 + IP69 Compl., black	Order no. fitting*	Order no. insert	Thread metric	Fits to conduit size		Terminal range (mm)	Thread length (mm)	Overall length (mm)
					NW	Metric			
	NKNZ-M120/P1	NKNZ-M120R/P	EK 150p7	M12 x 1.5	10	12	4.0–6.5	5.0	53.5
	NKNZ-M120/P2		EK 150p8	M12 x 1.5	10	12	5.0–8.0	5.0	53.5
	NKNZ-M120/P3		EK 150p9	M12 x 1.5	10	12	6.5–9.5	5.0	53.5
	NKNZ-M160/P1	NKNZ-M160R/P	E 150p7	M16 x 1.5	10	12	4.0–6.5	6.0	54.5
	NKNZ-M160/P2		E 150p8	M16 x 1.5	10	12	5.0–8.0	6.0	54.5
	NKNZ-M160/P3		E 150p9	M16 x 1.5	10	12	6.5–9.5	6.0	54.5
	NKNZ-M202/P1	NKNZ-M202R/P	E 152p7	M20 x 1.5	12	16	4.0–6.5	6.5	60.5
	NKNZ-M202/P3		E 152p9	M20 x 1.5	12	16	6.5–9.5	6.5	60.5
	NKNZ-M202/P4		E 152p11	M20 x 1.5	12	16	7.0–10.5	6.5	60.5
	NKNZ-M207/P3	NKNZ-M207R/P	E 152p9	M20 x 1.5	17	20	6.5–9.5	6.5	66.5
	NKNZ-M207/P4		E 152p11	M20 x 1.5	17	20	7.0–10.5	6.5	66.5
	NKNZ-M207/P5		E 152p13	M20 x 1.5	17	20	9.0–13.0	6.5	66.5
	NKNZ-M257/P4	NKNZ-M257R/P	E 153p11	M25 x 1.5	17	20	7.0–10.5	7.5	67.5
	NKNZ-M257/P5		E 153p13	M25 x 1.5	17	20	9.0–13.0	7.5	67.5
	NKNZ-M257/P6		E 153p16	M25 x 1.5	17	20	11.5–15.5	7.5	67.5
	NKNZ-M253/P5	NKNZ-M253R/P	EK 154p13	M25 x 1.5	23	25	9.0–13.0	7.5	75.0
	NKNZ-M253/P6	NKNZ-M253R1/P	EK 154p16	M25 x 1.5	23	25	11.5–15.5	7.5	75.0
	NKNZ-M323/P2	NKNZ-M323R/P	E 154p13	M32 x 1.5	23	25	9.0–13.0	8.0	76.0
	NKNZ-M323/P4		E 154p18	M32 x 1.5	23	25	14.0–18.0	8.0	76.0
	NKNZ-M323/P5	NKNZ-M323R1/P	E 154p20	M32 x 1.5	23	25	17.0–20.5	8.0	76.0
	NKNZ-M329/P2	NKNZ-M329R/P	EK 155p18	M32 x 1.5	29	32	14.0–18.0	8.0	83.0
	NKNZ-M329/P3		EK 155p20	M32 x 1.5	29	32	17.0–20.5	8.0	83.0
	NKNZ-M329/P4		EK 155p25	M32 x 1.5	29	32	20.0–25.0	8.0	83.0
	NKNZ-M409/P1	NKNZ-M409R/P	E 155p16	M40 x 1.5	29	32	11.5–15.5	8.0	83.0
	NKNZ-M409/P2		E 155p18	M40 x 1.5	29	32	14.0–18.0	8.0	83.0
	NKNZ-M409/P3		E 155p20	M40 x 1.5	29	32	17.0–20.5	8.0	83.0
	NKNZ-M409/P4		E 155p25	M40 x 1.5	29	32	20.0–25.0	8.0	83.0
	NKNZ-M409/P5		E 155p28	M40 x 1.5	29	32	24.0–28.0	8.0	83.0
	NKNZ-M406/P1	NKNZ-M406R/P	E 156p25HF	M40 x 1.5	36	40	20.0–25.0	9.0	87.5
	NKNZ-M406/P2		EK 156p28	M40 x 1.5	36	40	24.0–28.0	9.0	87.5
NKNZ-M506/P1	NKNZ-M506R/P	E 156p32	M50 x 1.5	36	40	27.0–32.0	10.0	90.0	
NKNZ-M506/P3		E 156p36	M50 x 1.5	36	40	32.0–36.0	10.0	90.0	
NKNZ-M508/P2	NKNZ-M508R/P	E 157p36HF	M50 x 1.5	48	50	32.0–36.0	10.0	100.0	
NKNZ-M508/P3		E 157p40HF	M50 x 1.5	48	50	36.0–40.0	10.0	100.0	
NKNZ-M638/P1	NKNZ-M638R/P	E 158pm1x35	M63 x 1.5	48	50	32.0–35.0	10.0	100.0	
NKNZ-M638/P2		E 158p44	M63 x 1.5	48	50	39.0–44.0	10.0	100.0	

SR US

#### Approvals



\* without insert

For applications in railway vehicles and heavy machine construction

For the separation of damp and dry areas

Sealing inserts are made from TPE-V

With integrated strain relief and optimal ingress protection at the cable (up to IP68/10 bar)

High thread and system connection strength

Temperature range sealing insert Pflitsch: -40°C to +135°C


**Note:** For several conductors multiple sealing inserts MDE are available. R/P version of fitting has to be used in combination with multiple sealing inserts

## Connectors metric, metal thread

### Type KNZ

Type KNZ - Connector straight with strain relief, metric long metal thread



	Order no. IP68 + IP69 Compl., black	Order no. fitting*	Order no. insert	Thread metric	Fits to conduit size		Terminal range (mm)	Thread length (mm)	Overall length (mm)
					NW	Metric			
	NKNZ-M160/P1-L	NKNZ-M160R/P-L	E 150p7	M16 x 1.5	10	16	4.0–6.5	15.0	63.5
	NKNZ-M160/P2-L		E 150p8	M16 x 1.5	10	16	5.0–8.0	15.0	63.5
	NKNZ-M160/P3-L		E 150p9	M16 x 1.5	10	16	6.5–9.5	15.0	63.5
	NKNZ-M202/P1-L	NKNZ-M202R/P-L	E 152p7	M20 x 1.5	12	20	4.0–6.5	15.0	69.0
	NKNZ-M202/P3-L		E 152p9	M20 x 1.5	12	20	6.5–9.5	15.0	69.0
	NKNZ-M202/P4-L		E 152p11	M20 x 1.5	12	20	7.0–10.5	15.0	69.0
	NKNZ-M207/P3-L	NKNZ-M207R/P-L	E 152p9	M20 x 1.5	17	20	6.5–9.5	15.0	75.0
	NKNZ-M207/P4-L		E 152p11	M20 x 1.5	17	20	7.0–10.5	15.0	75.0
	NKNZ-M207/P5-L		E 152p13	M20 x 1.5	17	20	9.0–13.0	15.0	75.0
	NKNZ-M257/P5-L	NKNZ-M257R/P-L	E 153p13	M25 x 1.5	17	25	9.0–13.0	15.0	75.0
	NKNZ-M257/P6-L		E 153p16	M25 x 1.5	17	25	11.5–15.5	15.0	75.0
	NKNZ-M323/P2-L	NKNZ-M323R/P-L	E 154p13	M32 x 1.5	23	32	9.0–13.0	15.0	83.0
	NKNZ-M323/P4-L		E 154p18	M32 x 1.5	23	32	14.0–18.0	15.0	83.0
	NKNZ-M323/P5-L	NKNZ-M323R1/P-L	E 154p20	M32 x 1.5	23	32	17.0–20.5	15.0	83.0
	NKNZ-M329/P2-L	NKNZ-M329R/P-L	EK 155p18	M32 x 1.5	29	32	14.0–18.0	15.0	90.0
	NKNZ-M329/P3-L		EK 155p20	M32 x 1.5	29	40	17.0–20.5	15.0	90.0
	NKNZ-M409/P3-L	NKNZ-M409R/P-L	E 155p20	M40 x 1.5	29	40	17.0–20.5	15.0	90.0
	NKNZ-M409/P4-L		E 155p25	M40 x 1.5	29	40	20.0–25.0	15.0	90.0
	NKNZ-M409/P5-L		E 155p28	M40 x 1.5	29	50	24.0–28.0	15.0	90.0
	NKNZ-M506/P1-L	NKNZ-M506R/P-L	E 156p32	M50 x 1.5	36	50	27.0–32.0	15.0	95.0
NKNZ-M506/P3-L		E 156p36	M50 x 1.5	36	50	32.0–36.0	15.0	95.0	
NKNZ-M508/P2-L	NKNZ-M508R/P-L	E 157p36HF	M50 x 1.5	48	50	32.0–36.0	15.0	105.0	
NKNZ-M508/P3-L		E 157p40HF	M50 x 1.5	48	50	36.0–40.0	15.0	105.0	
NKNZ-M638/P1-L	NKNZ-M638R/P-L	E 158pm1x35	M63 x 1.5	48	63	32.0–35.0	15.0	105.0	
NKNZ-M638/P2-L		E 158p44	M63 x 1.5	48	63	39.0–44.0	15.0	105.0	

c  
R  
US

#### Approvals



\* without insert

For applications in railway vehicles and heavy machine construction

For the separation of damp and dry areas

Sealing inserts are made from TPE-V

With integrated strain relief and optimal ingress protection at the cable (up to IP68/10 bar)

High thread and system connection strength


Temperature range sealing insert Pflitsch: -40°C to +135°C

**Note:** For several conductors multiple sealing inserts MDE are available. R/P version of fitting has to be used in combination with multiple sealing inserts

## Connectors metric, metal thread

### Type KAH & KBH

#### Type KAH - Connector 45° elbow, metric metal thread


	Order no. black IP68 + IP69	Order no. grey IP68 + IP69	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
KAH, patent 	NKAH-M120-10	MKAH-M120-10	M12 x 1.5	10	12	10.0	55.5 x 43.0
	NKAH-M160-10	MKAH-M160-10	M16 x 1.5	10	12	10.0	55.5 x 45.0
	NKAH-M162-10	MKAH-M162-10	M16 x 1.5	12	16	10.0	62.5 x 50.0
	NKAH-M202-10	MKAH-M202-10	M20 x 1.5	12	16	10.0	62.5 x 52.0
	NKAH-M207-10	MKAH-M207-10	M20 x 1.5	17	20	10.0	71.0 x 59.5
	NKAH-M257-11	MKAH-M257-11	M25 x 1.5	17	20	11.0	72.0 x 62.5
	NKAH-M253-11	MKAH-M253-11	M25 x 1.5	23	25	11.0	80.0 x 68.0
	NKAH-M323-13	MKAH-M323-13	M32 x 1.5	23	25	13.0	82.0 x 72.0
	NKAH-M329-13	MKAH-M329-13	M32 x 1.5	29	32	13.0	93.0 x 79.5
	NKAH-M409-13	MKAH-M409-13	M40 x 1.5	29	32	13.0	94.5 x 85.5
	NKAH-M406-13	MKAH-M406-13	M40 x 1.5	36	40	13.0	105.5 x 93.5
	NKAH-M506-14	MKAH-M506-14	M50 x 1.5	36	40	14.0	106.5 x 98.5
	NKAH-M508-14	MKAH-M508-14	M50 x 1.5	48	50	14.0	120.0 x 111.0
	NKAH-M638-14	MKAH-M638-14	M63 x 1.5	48	50	14.0	120.0 x 114.0

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength

#### Type KBH - Connector 90° curved elbow, metric metal thread

	Order no. black IP68 + IP69	Order no. grey IP68 + IP69	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
KBH, patent 	NKBH-M120-10	MKBH-M120-10	M12 x 1.5	10	12	10.0	44.0 x 62.5
	NKBH-M160-10	MKBH-M160-10	M16 x 1.5	10	12	10.0	44.0 x 64.5
	NKBH-M162-10	MKBH-M162-10	M16 x 1.5	12	16	10.0	47.5 x 72.0
	NKBH-M202-10	MKBH-M202-10	M20 x 1.5	12	16	10.0	47.5 x 74.0
	NKBH-M207-10	MKBH-M207-10	M20 x 1.5	17	20	10.0	53.0 x 81.0
	NKBH-M257-11	MKBH-M257-11	M25 x 1.5	17	20	11.0	54.0 x 84.0
	NKBH-M253-11	MKBH-M253-11	M25 x 1.5	23	25	11.0	63.0 x 92.0
	NKBH-M323-13	MKBH-M323-13	M32 x 1.5	23	25	13.0	65.0 x 96.0
	NKBH-M329-13	MKBH-M329-13	M32 x 1.5	29	32	13.0	75.0 x 108.0
	NKBH-M409-13	MKBH-M409-13	M40 x 1.5	29	32	13.0	76.5 x 114.0
	NKBH-M406-13	MKBH-M406-13	M40 x 1.5	36	40	13.0	87.5 x 126.0
	NKBH-M506-14	MKBH-M506-14	M50 x 1.5	36	40	14.0	88.5 x 131.0
	NKBH-M508-14	MKBH-M508-14	M50 x 1.5	48	50	14.0	101.0 x 145.5
	NKBH-M638-14	MKBH-M638-14	M63 x 1.5	48	50	14.0	101.0 x 148.5

#### Approvals





For applications in railway vehicles and heavy machine construction  
High thread and system connection strength  
Smooth elbow allows easy threading of wires and cables

## Connectors, female polyamide UNEF thread

### Type KIHG

Type KIHG - Connector straight, UN female thread for MIL-C5015


	Order no. black IP68 + IP69	Thread UN	Shell size MIL	Fits to conduit size		Thread length (mm)	Overall length (mm)	
				NW	Metric			
	BKIHG-U212	7/8"-20 UNEF	16	12	16	9.0	47.0	
	BKIHG-U217	7/8"-20 UNEF	16	17	20	9.0	52.5	
	BKIHG-U242	1"-20 UNEF	18	12	16	9.0	47.0	
	BKIHG-U247	1"-20 UNEF	18	17	20	9.0	52.5	
	BKIHG-U243	1"-20 UNEF	18	23	23	9.0	55.5	
	BKIHG-U292	1 3/16"-18 UNEF	20	12	16	9.0	50.5	
	BKIHG-U297	1 3/16"-18 UNEF	20	17	20	9.0	52.5	
	BKIHG-U293	1 3/16"-18 UNEF	20	23	25	9.0	55.5	
	BKIHG-U299	1 3/16"-18 UNEF	20	29	32	9.0	61.0	
	BKIHG-U357	1 7/16"-18 UNEF	24	17	20	9.0	58.0	
	BKIHG-U353	1 7/16"-18 UNEF	24	23	25	9.0	55.5	
	BKIHG-U359	1 7/16"-18 UNEF	24	29	32	9.0	61.0	
	BKIHG-U433	1 3/4"-18 UNS	32	23	25	10.0	62.5	
	BKIHG-U439	1 3/4"-18 UNS	32	29	32	10.0	62.0	
	BKIHG-U503	2"-18 UNS	36	23	25	10.0	67.0	
	BKIHG-U509	2"-18 UNS	36	29	32	10.0	67.5	
	<b>Approvals</b>	BKIHG-U506	2"-18 UNS	36	36	40	10.0	67.0
		BKIHG-U508	2"-18 UNS	36	48	50	10.0	73.5
		BKIHG-U566	2 1/4"-16 UN	40	36	40	10.0	72.0
		BKIHG-U568	2 1/4"-16 UN	40	48	50	10.0	73.5

For applications in railway vehicles and heavy machine construction  
Suitable for MIL connector, series C5015

## Connectors metric, female metal thread

### Type KIS

#### Type KIS - Connector straight, metric metal female thread

	Order no. black IP68 + IP69	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NKIS-M162	M16 x 1.5	12	16	9.0	49.0
	NKIS-M207	M20 x 1.5	17	20	10.5	56.0
	NKIS-M253	M25 x 1.5	23	25	10.5	58.5
	NKIS-M329	M32 x 1.5	29	32	11.0	65.5
	NKIS-M406	M40 x 1.5	36	40	13.5	72.0
	NKIS-M508	M50 x 1.5	48	50	15.0	83.0
	NKIS-M638	M63 x 1.5	48	50	17.5	84.0

#### Approvals




For applications in railway vehicles and heavy machine construction  
 High thread and system connection strength  
 No seal on female thread side



## Connectors nylon straight fitting

### Type JKNH & JKBH

#### Type JKNH - Connector two-piece, straight, IP69, metric thread


	Order no. blue	Thread size metric	Fits to conduit size NW	Dimensions						Weight kg/100 pcs	Packing unit/pcs
				g (mm)	Ø ID (mm)	Ø D (mm)	L max. (mm)	sw (mm)			
	JKNH-M162	M16 x 1.5	12	11.0	11.0	28.5	47.5	25	0.8	10	
	JKNH-M202	M20 x 1.5	12	12.5	11.0	28.5	47.5	25	0.9	10	
	JKNH-M207	M20 x 1.5	17	14.5	11.0	35.0	53.5	32	1.4	10	
	JKNH-M257	M25 x 1.5	17	16.5	12.0	35.0	54.5	32	1.5	10	
	JKNH-M253	M25 x 1.5	23	19.0	12.0	42.0	57.0	38	1.7	10	
	JKNH-M323	M32 x 1.5	23	23.0	15.0	43.0	60.5	38	2.0	10	
	JKNH-M329	M32 x 1.5	29	26.0	15.0	51.5	65.5	46	3.2	10	
	JKNH-M409	M40 x 1.5	29	29.0	19.0	51.5	69.5	46	3.7	10	
	JKNH-M406	M40 x 1.5	36	32.0	19.0	65.0	75.0	60	5.9	10	
	JKNH-M506	M50 x 1.5	36	37.5	19.0	65.0	75.0	60	6.2	10	
JKNH-M508	M50 x 1.5	48	42.0	19.0	75.0	81.0	70	7.5	10		
JKNH-M638	M63 x 1.5	48	48.5	19.0	75.0	81.0	70	7.8	10		

#### Approvals



Very high impact resistance - easy push-in assembly  
Corrosion-free  
Excellent conduit pull-out strength  
IP69 system protection for indoor splash zone areas

#### Type JKBH - 90° curved elbow, IP69, metric thread

	Order no. blue	Thread size metric	Fits to conduit size NW	Dimensions									Weight kg/100 pcs	Packing unit/pcs
				g (mm)	d1 (mm)	d2 (mm)	d3 (mm)	SW (mm)	A (mm)	B (mm)	R (mm)			
	JKBH-M162	M16 x 1.5	12	11	8.0	28.5	24.0	15.0	44.5	72.0	28.0	1.5	10	
	JKBH-M202	M20 x 1.5	12	11	11.8	28.5	28.0	15.0	44.5	74.0	28.0	1.3	10	
	JKBH-M207	M20 x 1.5	17	11	11.5	35.0	29.0	20.0	50.0	81.0	29.5	2.5	10	
	JKBH-M257	M25 x 1.5	17	12	16.5	35.0	35.0	20.0	51.0	84.0	29.5	2.2	10	
	JKBH-M253	M25 x 1.5	23	12	16.0	43.0	35.0	26.0	59.5	92.0	35.0	3.9	10	
	JKBH-M323	M32 x 1.5	23	15	22.5	43.0	40.0	26.0	63.0	94.5	35.0	3.2	10	
	JKBH-M329	M32 x 1.5	29	15	23.0	51.5	43.0	33.0	73.0	108.0	41.5	6.8	10	
	JKBH-M409	M40 x 1.5	29	19	28.5	51.5	51.0	33.0	77.0	112.0	41.5	6.0	10	
	JKBH-M406	M40 x 1.5	36	19	29.5	60.5	55.0	41.0	87.5	126.0	49.0	11.0	10	
	JKBH-M506	M50 x 1.5	36	19	37.0	60.5	59.0	41.0	87.5	128.0	49.0	9.0	10	
JKBH-M508	M50 x 1.5	48	19	38.5	73.0	69.0	46.0	100.5	145.5	55.5	18.0	10		
JKBH-M638	M63 x 1.5	48	19	48.0	73.0	75.0	55.0	100.5	148.5	55.5	14.0	10		

#### Approvals



Very high impact resistance - easy push-in assembly  
Corrosion-free  
Excellent conduit pull-out strength  
IP69 system protection for indoor splash zone areas

# PMAFIX IP66, IP68 (IP69)

## General technical details

PMAFIX connectors. The designation PMAFIX describes a very large range of connectors for PMA conduits with the patented PMA safety clip system.

Connectors are available for degrees of ingress protection IP66 and IP68 according to IEC 60529. IP66 connectors are fitted with a pre-installed universal safety clip which ensures a quick “push-in” installation. IP68 connectors for increased requirements will be delivered with a special conduit seal cap. The new PMAFIX IP68GT fittings combine simplest push-in assembly with highest sealing performance. It is also possible to upgrade to IP69 by retrofitting water impact protection.

### Material

- Fittings made from specially formulated polyamide 6
- Threads made from nickel-plated brass or polyamide 6
- Self-extinguishing
- Free from halogens, REACH + RoHS compliant
- Very good chemical properties
- Temperature range: –40°C to +105°C, short-term to +160°C

### Characteristics

- Excellent conduit pull-out strength
- High impact resistance
- Vibration-proof connection to PMA corrugated conduits
- Fits conduit profiles – fine (T) and coarse (G)
- To avoid accidental opening, disassembly is only possible with a screwdriver









## PMAFIX

### General technical details



—  
Patent

#### IP66

##### IP66 static

##### IP54 dynamic

- One piece fitting
- Conical sealing method
- Easy “push-in” installation
- Pre-installed safety clip AFN2
- Content of delivery: Connector with pre-installed safety clip



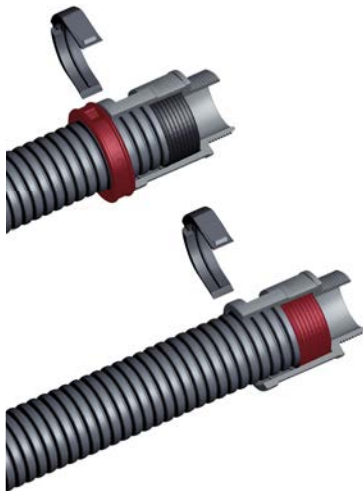
—  
Patent

#### IP68GT

##### IP68, IP69 static

##### IP67, IP69 dynamic

- The single piece PMAFIX IP68GT fitting with integrated sealing cap and pre-installed locking clip
- Simple push-in assembly (as with the proven PMAFIX IP66 system)
- The extra long sealing cap guarantees the highest level of ingress protection
- Identical approvals as for the PMAFIX IP68 system component version
- Fast modification of specification drawings through simple addition of “GT” to the existing order number (e.g. BVNV-M257 → BVNV-M257GT)
- Additional water protection ring WPS for IP69 ingress protection in conjunction with the IP68 system to be applied right after the IP68 connector onto the conduit
- Content of delivery: Connector with integrated sealing cap, pre-installed safety clip and thread seal for male thread (O-ring and/or flat gasket)



—  
Patent

#### IP68

##### IP68, IP69 static

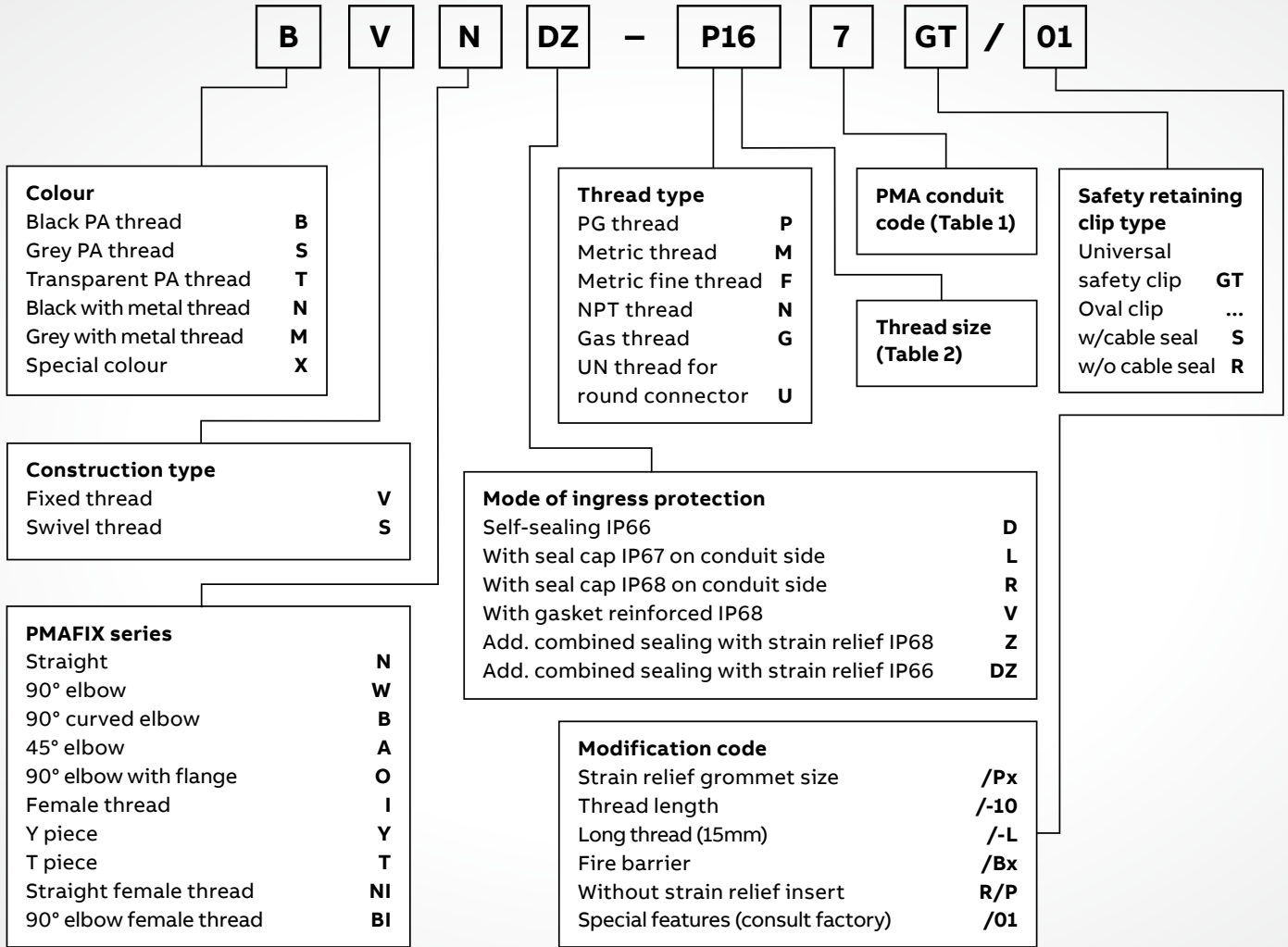
##### IP67, IP69 dynamic

- High sealing through additional seal cap
- For highest dynamic applications
- Additional water protection ring WPS for IP69 ingress protection in conjunction with the IP68 system to be applied right after the IP68 connector onto the conduit
- Content of delivery: Connector with sealing cap, safety clip and thread seal for male thread (O-ring and/or flat gasket)

# PMAFIX connectors

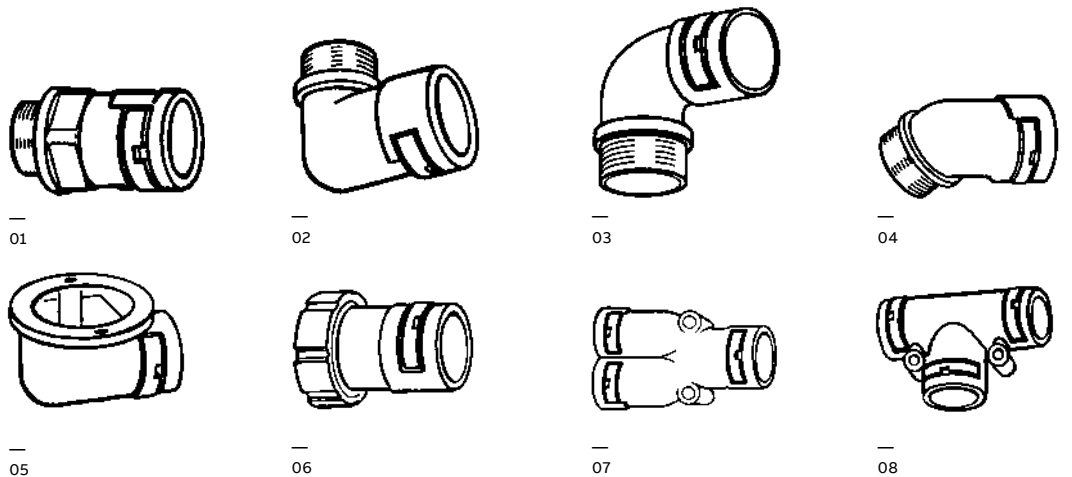
## Part number codes

For part number explanation only, not to be used as a configuration tool.



## Connector series

- 01 Serie N
- 02 Serie W
- 03 Serie B
- 04 Serie A
- 05 Serie O
- 06 Serie I
- 07 Serie Y
- 08 Serie T





## PMAFIX

### Size codes

Table 1: Conduit codes

Nominal width	Metric size	PMA code
07	10	M
10	12	0
12	16	2
17	20	7
23	25	3
29	32	9
36	40	6
48	50	8

Additional code for female thread connectors

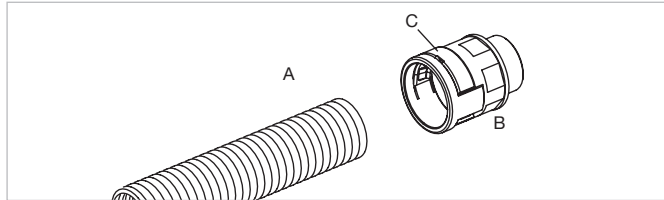
Type	PMA code
AMP	A
Souriau (ex Burndy) UTG 6	B
With O-ring groove (MIL C 5015)	G
Souriau UTO/UTS	S

Table 2: Thread codes

Thread metric	PMA code	Thread PG	PMA code	Thread Gas	PMA code	Thread NPT	PMA code	Thread UN	PMA code
		PG07	P07	G ¼	G00				
M12 x 1.5	M12	PG09	P09	G ⅜	G01				
M16 x 1.5	M16	PG11	P11	G ½	G02	N ½	N02	½-28 UNEF	U12
M20 x 1.5	M20	PG13.5	P13	G ¾	G04	N ¾	N04	9/16-24 UNEF	U13
		PG16	P16	G 1	G06	N 1	N06	5/8-24 UNEF	U15
M25 x 1.5	M25	PG21	P21	G 1¼	G07	N 1¼	N07	11/16-24 UNEF	U16
M32 x 1.5	M32	PG29	P29	G 1½	G08	N 1½	N08	¾-20 UNEF	U18
M40 x 1.5	M40	PG36	P36	G 2	G09	N 2	N09	13/16-20 UNEF	U20
M50 x 1.5	M50	PG42	P42	G 2¼	G10			7/8-20 UNEF	U21
M63 x 1.5	M63	PG48	P48	G 2½	G11			15/16-20 UNEF	U23
								1-20 UNEF	U24
								1¼-18 UNEF	U26
M 8 x 1.0	F08							3/16-18 UNEF	U29
M12 x 1.0	F12							1/4-18 UNEF	U30
M18 x 1.0	F18							15/16-18 UNEF	U32
								13/8-18 UNEF	U34
								17/16-18 UNEF	U35
								15/8-18 UNEF	U40
								1¾-18 UNS	U43
								2-18 UNS	U50
								2¼-16 UN	U56
								23/8-12 UN	U57
								2½-12 UN	U62

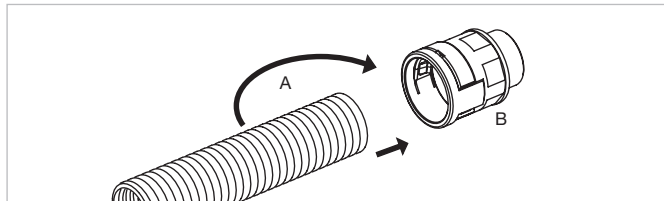
**PMAFIX**  
Installation

Installation IP66



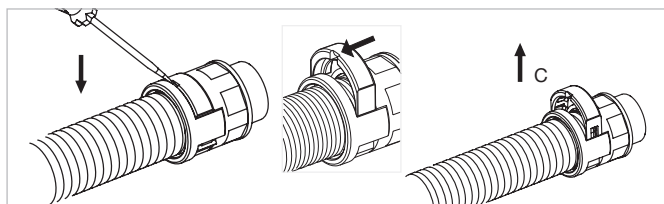
01

A = Conduit  
B = Fitting  
C = Universal safety clip



02

Push in the conduit (A) with a slight twist until the stop.

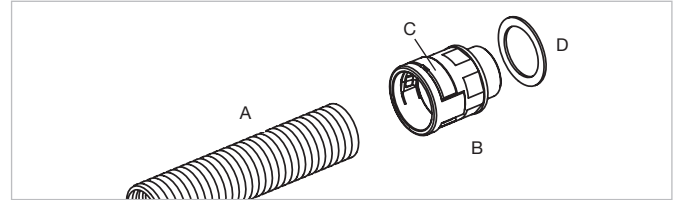


03

To re-open use a screwdriver.  
The screwdriver slot in the oval clip (C) should be on the conduit side.

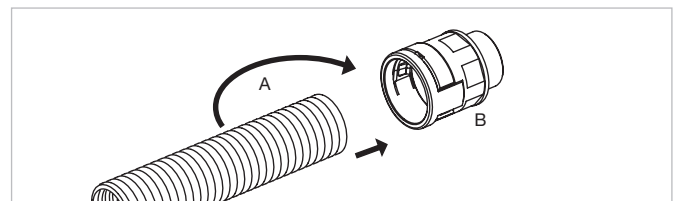
Locking clip pre-installed in all IP66 connectors.

Installation IP68GT



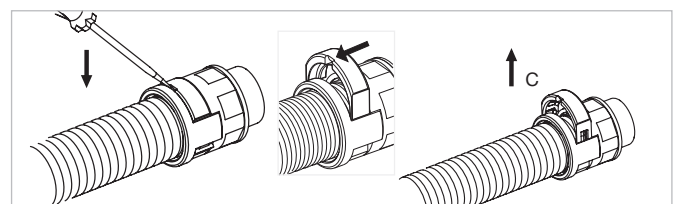
01

A = Conduit  
B = Fitting with integrated sealing cap  
C = Universal safety clip  
D = Thread seal (either O-ring or flat gasket\*, not both)



02

Push in the conduit (A) right into the end of the fitting (B) with a slight twist. Additional insertion resistance will be felt when the end of the fitting has been reached.



03

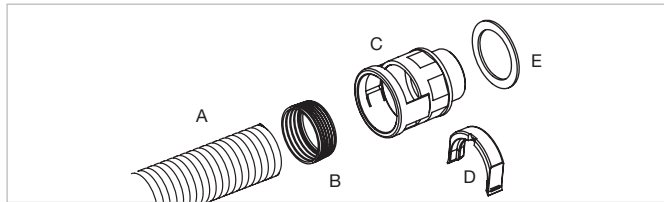
To re-open use a screwdriver.  
The screwdriver slot in the oval clip (C) should be on the conduit side.

Pre-installed sealing cap and locking clip in all IP68GT connectors.

\* Ensure to follow O-ring manufacturers guidelines when using O-rings for sealing purposes.

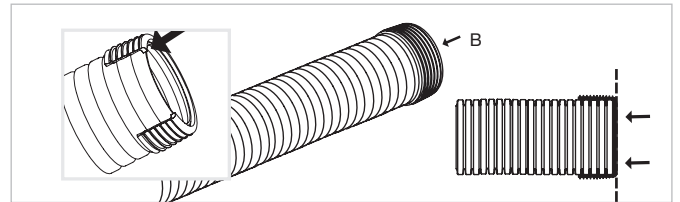
**PMAFIX**  
Installation

Installation IP68 (IP69)



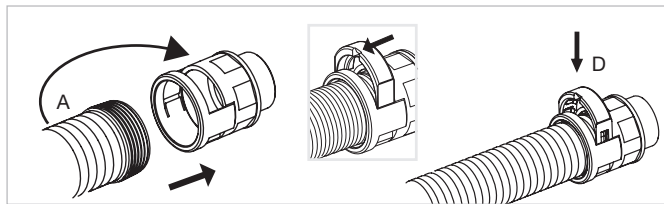
01

- A = Conduit
- B = Sealing cap
- C = Fitting
- D = Oval clip
- E = Thread seal (O-ring or flat seal\*)



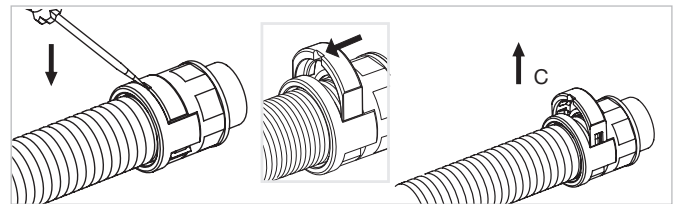
02

Push sealing cap (B) completely onto the conduit in order to achieve IP68.



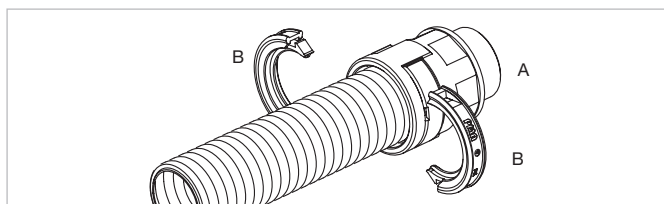
03

Push in the conduit (A) with a slight twist until the stop. Insert oval clip (D) in the locking element window and click into place. Screwdriver slot in the oval clip should be on conduit side.



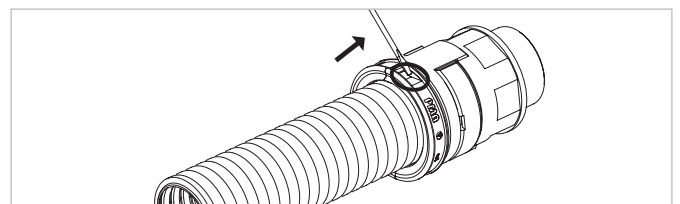
04

To re-open use a screwdriver.



05

- For IP69:
- Based on IP68 System
- A = Conduit with IP68 fitting
- B = WPS half shells



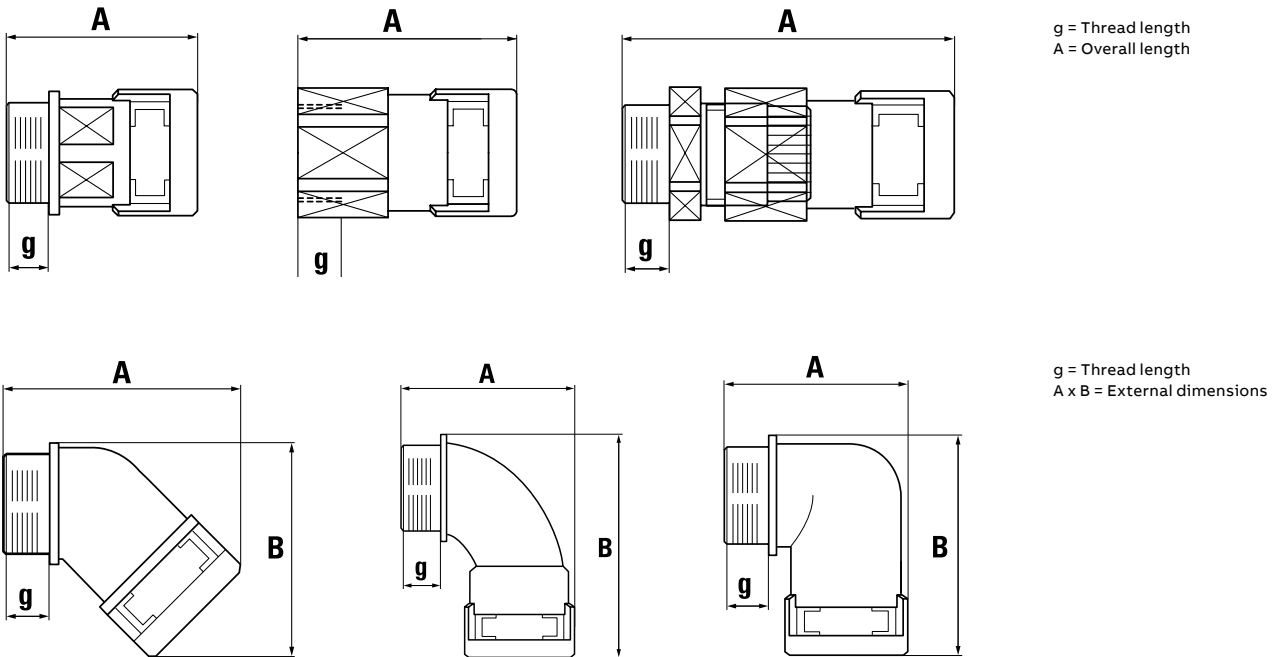
06

To re-open use a screwdriver.

\* For safety reasons, oval clip will not fit if seal cap is not fully installed.

Ensure to follow O-ring manufacturers guidelines when using O-rings for sealing purposes.


## Fitting dimensions



## PMAFIX

## Connectors metric, polyamide thread

## Type VN - Connector straight, metric thread

	Order no. IP66 ①	Order no. IP68* ① ②	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BVND-M12MGT	BVNV-M12M	M12 x 1.5	07	10	11.0	34.5
	BVND-M120GT	BVNV-M120	M12 x 1.5	10	12	11.0	36.5
	BVND-M160GT	BVNV-M160	M16 x 1.5	10	12	11.0	36.5
	BVND-M162GT	BVNV-M162	M16 x 1.5	12	16	11.0	39.5
	BVND-M200GT	BVNV-M200	M20 x 1.5	10	12	11.0	36.5
	BVND-M202GT	BVNV-M202	M20 x 1.5	12	16	11.0	39.5
	BVND-M207GT	BVNV-M207	M20 x 1.5	17	20	11.0	47.5
	BVND-M203GT	BVNV-M203	M20 x 1.5	23	25	11.0	51.0
	BVND-M257GT	BVNV-M257	M25 x 1.5	17	20	12.0	48.5
	BVND-M253GT	BVNV-M253	M25 x 1.5	23	25	12.0	52.0
	BVND-M323GT	BVNV-M323	M32 x 1.5	23	25	15.0	55.5
	BVND-M329GT	BVNV-M329	M32 x 1.5	29	32	15.0	56.0
	BVND-M409GT	BVNV-M409	M40 x 1.5	29	32	19.0	60.0
	BVND-M406GT	BVNV-M406	M40 x 1.5	36	40	19.0	72.5
	BVND-M506GT	BVNV-M506	M50 x 1.5	36	40	19.0	72.0
	BVND-M508GT	BVNV-M508	M50 x 1.5	48	50	19.0	72.5
BVND-M638GT	BVNV-M638	M63 x 1.5	48	50	19.0	72.0	

For cable protection systems in a wide range of applications

## Approvals




- ① Please replace "B" for black with "S" for grey in front of the order no.  
② IP68GT available. Please add "GT" after the order no.

## Connectors metric, polyamide thread

### Type VNDZ/VNZ & VA

#### Type VNDZ/VNZ - Connector straight with strain relief, metric thread

	Order no. IP66 ①	Order no. IP68 ① ③	Thread metric	Fits to conduit size		Terminal range	Thread length (mm)	Overall length (mm)
				NW	Metric			
	BVNDZ-M160GT	–	M16 x 1.5	10	12	5.0–10.0	8.0	62.0
	BVNDZ-M162GT	BVNZ-M162S	M16 x 1.5	12	16	5.0–10.0	8.0	62.0
	BVNDZ-M207GT	BVNZ-M207S	M20 x 1.5	17	20	10.0–14.0	8.0	72.0
	BVNDZ-M253GT	BVNZ-M253S	M25 x 1.5	23	25	13.0–18.0	8.0	81.0
	BVNDZ-M329GT	BVNZ-M329S	M32 x 1.5	29	32	18.0–25.0	10.0	85.0
	BVNDZ-M406GT	BVNZ-M406S	M40 x 1.5	36	40	22.0–32.0	10.0	108.5
	BVNDZ-M508GT	BVNZ-M508S	M50 x 1.5	48	50	30.0–38.0	12.0	119.5
	BVNDZ-M638GT	BVNZ-M638S	M63 x 1.5	48	50	34.0–44.0	12.0	119.5

For machine and plant construction


For separation of damp and dry areas

Integrated strain relief optimally holds and seals cables

If several conductors are used with the connector multiple sealing inserts should be considered

**Note:** For several conductors multiple sealing inserts MDE are available

#### Type VA - Connector 45° elbow, metric thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BVAD-M120GT	–	M12 x 1.5	10	12	11.0	43.5 x 37.0
	BVAD-M160GT	BVAV-M160	M16 x 1.5	10	12	11.0	43.5 x 38.0
	BVAD-M162GT	BVAV-M162	M16 x 1.5	12	16	11.0	48.0 x 40.0
	BVAD-M202GT	BVAV-M202	M20 x 1.5	12	16	11.0	48.0 x 41.5
	BVAD-M207GT	BVAV-M207	M20 x 1.5	17	20	11.0	55.5 x 51.5
	BVAD-M253GT	BVAV-M253	M25 x 1.5	23	25	12.0	65.0 x 58.5
	BVAD-M329GT	BVAV-M329	M32 x 1.5	29	32	15.0	73.5 x 66.5
	BVAD-M406GT	BVAV-M406	M40 x 1.5	36	40	19.0	92.5 x 85.5
	BVAD-M506GT	BVAV-M506	M50 x 1.5	36	40	19.0	92.5 x 89.5
	BVAD-M508GT	BVAV-M508	M50 x 1.5	48	50	19.0	100.0 x 96.0
	BVAD-M638GT	BVAV-M638	M63 x 1.5	48	50	19.0	100.0 x 104.0

#### Approvals



① Please replace "B" for black with "S" for grey in front of the order no.

② IP68GT available. Please add "GT" after the order no.


③ IP68GT available. Please replace "S" at the end with "GT" (e.g. BVNZ-M207GT)



## Connectors metric, polyamide thread

### Type VB & VW

#### Type VB - Connector 90° curved elbow, metric thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	BVBD-M207GT	BVBV-M207	M20 x 1.5	17	20	11.0	47.5 x 73.0
	BVBD-M257GT	BVBV-M257	M25 x 1.5	17	20	12.0	48.5 x 76.0
	BVBD-M253GT	BVBV-M253	M25 x 1.5	23	25	12.0	57.5 x 83.0
	BVBD-M323GT	BVBV-M323	M32 x 1.5	23	25	15.0	61.0 x 87.5
	BVBD-M329GT	BVBV-M329	M32 x 1.5	29	32	15.0	70.5 x 93.0
	BVBD-M409GT	BVBV-M409	M40 x 1.5	29	32	19.0	74.5 x 98.5
	BVBD-M406GT	BVBV-M406	M40 x 1.5	36	40	19.0	85.0 x 121.0
	BVBD-M506GT	BVBV-M506	M50 x 1.5	36	40	19.0	85.0 x 125.0
	BVBD-M508GT	BVBV-M508	M50 x 1.5	48	50	19.0	98.5 x 130.0
	BVBD-M638GT	BVBV-M638	M63 x 1.5	48	50	19.0	98.5 x 138.0


#### Approvals



For cable protection systems in a wide range of applications  
Smooth elbow allows easy threading of wires and cables

**Note:** For smaller conduit sizes NW 10 to NW 12 appropriate standard elbows of type VW are also available

#### Type VW - Connector 90° elbow, metric thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	BVWD-M12MGT	BVWV-M12M	M12 x 1.5	07	10	11.0	32.0 x 35.0
	BVWD-M120GT	BVWV-M120	M12 x 1.5	10	12	11.0	34.0 x 39.5
	BVWD-M160GT	BVWV-M160	M16 x 1.5	10	12	11.0	34.0 x 40.5
	BVWD-M162GT	BVWV-M162	M16 x 1.5	12	16	11.0	38.5 x 46.0
	BVWD-M200GT	–	M20 x 1.5	10	12	11.0	34.0 x 42.5
	BVWD-M202GT	BVWV-M202	M20 x 1.5	12	16	11.0	38.5 x 47.5
	BVWD-M207GT	BVWV-M207	M20 x 1.5	17	20	11.0	43.5 x 58.5
	BVWD-M253GT	BVWV-M253	M25 x 1.5	23	25	12.0	54.0 x 65.0
	BVWD-M329GT	BVWV-M329	M32 x 1.5	29	32	15.0	64.5 x 73.0
	BVWD-M406GT	BVWV-M406	M40 x 1.5	36	40	19.0	78.0 x 96.0
	BVWD-M508GT	BVWV-M508	M50 x 1.5	48	50	19.0	91.5 x 106.0

#### Approvals



For cable protection systems in a wide range of applications


**Note:** For sizes NW 17 to NW 48 curved elbows of type VB are also available

- ① Please replace "B" for black with "S" for grey in front of the order no.
- ② IP68GT available. Please add "GT" after the order no.

## Connectors metric, metal thread

### Type VNV

#### Type VNV - Connector straight, NPT metal thread

	Order no. IP68, black <sup>4</sup>	Order no. IP68, grey <sup>4</sup>	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	NVNV-M120-10	MVNV-M120-10	M12 x 1.5	10	12	10.0	40.0
	NVNV-M120-5	MVNV-M120-5	M12 x 1.5	10	12	5.0	35.0
	NVNV-M160-10	MVNV-M160-10	M16 x 1.5	10	12	10.0	40.0
	NVNV-M160-5	MVNV-M160-5	M16 x 1.5	10	12	5.0	35.0
	NVNV-M162-10	MVNV-M162-10	M16 x 1.5	12	16	10.0	43.0
	NVNV-M162-5	MVNV-M162-5	M16 x 1.5	12	16	5.0	38.0
	NVNV-M202-10	MVNV-M202-10	M20 x 1.5	12	16	10.0	43.0
	NVNV-M202-6	MVNV-M202-6	M20 x 1.5	12	16	6.0	39.0
	NVNV-M207-10	MVNV-M207-10	M20 x 1.5	17	20	10.0	51.0
	NVNV-M207-6	MVNV-M207-6	M20 x 1.5	17	20	6.0	47.0
	NVNV-M257-11	MVNV-M257-11	M25 x 1.5	17	20	11.0	52.0
	NVNV-M257-7	MVNV-M257-7	M25 x 1.5	17	20	7.0	48.0
	NVNV-M253-11	MVNV-M253-11	M25 x 1.5	23	25	11.0	54.0
	NVNV-M253-7	MVNV-M253-7	M25 x 1.5	23	25	7.0	50.0
	NVNV-M323-13	MVNV-M323-13	M32 x 1.5	23	25	13.0	56.0
	NVNV-M323-8	MVNV-M323-8	M32 x 1.5	23	25	8.0	51.0
	NVNV-M329-13	MVNV-M329-13	M32 x 1.5	29	32	13.0	57.3
	NVNV-M329-8	MVNV-M329-8	M32 x 1.5	29	32	8.0	52.3
	NVNV-M409-13	MVNV-M409-13	M40 x 1.5	29	32	13.0	57.3
	NVNV-M409-8	MVNV-M409-8	M40 x 1.5	29	32	8.0	52.3
	NVNV-M406-13	MVNV-M406-13	M40 x 1.5	36	40	13.0	71.4
	NVNV-M406-8	MVNV-M406-8	M40 x 1.5	36	40	8.0	66.4
	NVNV-M506-14	MVNV-M506-14	M50 x 1.5	36	40	14.0	72.4
	NVNV-M506-9	MVNV-M506-9	M50 x 1.5	36	40	9.0	67.4
	NVNV-M508-14	MVNV-M508-14	M50 x 1.5	48	50	14.0	72.4
	NVNV-M508-9	MVNV-M508-9	M50 x 1.5	48	50	9.0	67.4
NVNV-M638-14	MVNV-M638-14	M63 x 1.5	48	50	14.0	72.4	
NVNV-M638-10	MVNV-M638-10	M63 x 1.5	48	50	10.0	68.4	

#### Approvals




For applications in railway vehicles and heavy machine construction  
High thread and system connection strength

<sup>4</sup> IP68GT available. Please add  
"GT" prior to the thread length  
(for example NVNV-M120GT-10)

## Connectors NPT, metal thread

### Type VNV

#### Type VNV - Connector straight, metric metal thread

	Order no. IP68, black <sup>4</sup>	Thread NPT	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NVNV-N022	½"	12	16	15.4	48.1
	NVNV-N027	½"	17	20	15.4	56.4
	NVNV-N043	¾"	23	25	15.7	58.7
	NVNV-N069	1"	29	32	19.6	63.9
	NVNV-N076	1¼"	36	40	20.2	78.6
	NVNV-N088	1½"	48	50	20.6	79.0
	NVNV-N098	2"	48	50	21.4	79.8

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength


<sup>4</sup> IP68GT available. Please add  
"GT" prior to the thread length  
(for example NVNV-N022GT)

## Connectors with strain relief, metric, metal thread

### Type VNZ

Type VNZ - Connector straight with strain relief, metric metal thread



	Order no. IP68 Compl., black ⑤	Order no. fitting* ⑤	Order no. insert	Thread metric	Fits to conduit size		Terminal range (mm)	Thread length (mm)	Overall length (mm)
					NW	Metric			
	NVNZ-M120S/P1	NVNZ-M120R/P	EK 150p7	M12 x 1.5	10	12	4.0–6.5	5.0	48.5
	NVNZ-M120S/P2		EK 150p8	M12 x 1.5	10	12	5.0–8.0	5.0	48.5
	NVNZ-M120S/P3		EK 150p9	M12 x 1.5	10	12	6.5–9.5	5.0	48.5
	NVNZ-M160S/P1	NVNZ-M160R/P	E 150p7	M16 x 1.5	10	12	4.0–6.5	6.0	49.5
	NVNZ-M160S/P2		E 150p8	M16 x 1.5	10	12	5.0–8.0	6.0	49.5
	NVNZ-M160S/P3		E 150p9	M16 x 1.5	10	12	6.5–9.5	6.0	49.5
	NVNZ-M202S/P1	NVNZ-M202R/P	E 152p7	M20 x 1.5	12	16	4.0–6.5	6.0	54.0
	NVNZ-M202S/P3		E 152p9	M20 x 1.5	12	16	6.5–9.5	6.0	54.0
	NVNZ-M202S/P4		E 152p11	M20 x 1.5	12	16	7.0–10.5	6.0	54.0
	NVNZ-M207S/P3	NVNZ-M207R/P	E 152p9	M20 x 1.5	17	20	6.5–9.5	6.5	60.0
	NVNZ-M207S/P4		E 152p11	M20 x 1.5	17	20	7.0–10.5	6.5	60.0
	NVNZ-M207S/P5		E 152p13	M20 x 1.5	17	20	9.0–13.0	6.5	60.0
	NVNZ-M253S/P5	NVNZ-M253R/P	EK 154p13	M25 x 1.5	23	25	9.0–13.0	7.5	72.5
	NVNZ-M253S/P6		EK 154p16	M25 x 1.5	23	25	11.5–15.5	7.5	72.5
	NVNZ-M257S/P4	NVNZ-M257R/P	E 153p11	M25 x 1.5	17	20	7.0–10.5	7.5	61.5
	NVNZ-M257S/P5		E 153p13	M25 x 1.5	17	20	9.0–13.0	7.5	61.5
	NVNZ-M257S/P6		E 153p16	M25 x 1.5	17	20	11.5–15.5	7.5	61.5
	NVNZ-M323S/P4	NVNZ-M323R/P	E 154p18	M32 x 1.5	23	25	14.0–18.0	8.0	73.0
	NVNZ-M323S/P5	NVNZ-M323R1/P	E 154p20	M32 x 1.5	23	25	17.0–20.5	8.0	73.0
	NVNZ-M329S/P2	NVNZ-M329R/P	EK 155p18	M32 x 1.5	29	32	14.0–18.0	8.0	73.0
	NVNZ-M329S/P3		EK 155p20	M32 x 1.5	29	32	17.0–20.5	8.0	73.0
	NVNZ-M329S/P4		EK 155p25	M32 x 1.5	29	32	20.0–25.0	8.0	73.0
	NVNZ-M406S/P1	NVNZ-M406R/P	E 156p25HF	M40 x 1.5	36	40	20.0–25.0	9.0	87.0
	NVNZ-M406S/P2		EK 156p28	M40 x 1.5	36	40	24.0–28.0	9.0	87.0
	NVNZ-M409S/P1	NVNZ-M409R/P	E 155p16	M40 x 1.5	29	32	11.5–15.5	8.0	73.0
	NVNZ-M409S/P2		E 155p18	M40 x 1.5	29	32	14.0–18.0	8.0	73.0
	NVNZ-M409S/P3		E 155p20	M40 x 1.5	29	32	17.0–20.5	8.0	73.0
	NVNZ-M409S/P4		E 155p25	M40 x 1.5	29	32	20.0–25.0	8.0	73.0
	NVNZ-M409S/P5		E 155p28	M40 x 1.5	29	32	24.0–28.0	8.0	73.0
	NVNZ-M506S/P1	NVNZ-M506R/P	E 156p32	M50 x 1.5	36	40	27.0–32.0	9.0	89.5
NVNZ-M506S/P3		E 156p36	M50 x 1.5	36	40	32.0–36.0	9.0	89.5	
NVNZ-M508S/P2	NVNZ-M508R/P	E 157p36HF	M50 x 1.5	48	50	32.0–36.0	9.0	92.0	
NVNZ-M508S/P3		E 157p40HF	M50 x 1.5	48	50	36.0–40.0	9.0	92.0	
NVNZ-M638S/P1	NVNZ-M638R/P	E 158pm1x35	M63 x 1.5	48	50	32.0–35.0	10.0	90.5	
NVNZ-M638S/P2		E 158p44	M63 x 1.5	48	50	39.0–44.0	10.0	90.5	

\*without insert

For applications in railway vehicles and heavy machine construction

For the separation of damp and dry areas

Sealing inserts are made from TPE-V

With integrated strain relief and optimal ingress protection at the cable (up to IP68/10 bar)

High thread and system connection strength

Temperature range sealing insert Pflitsch: -40°C to +135°C

**Note:** For several conductors multiple sealing inserts MDE are available. R/P version of fitting has to be used in combination with multiple sealing inserts

⑤ IP68GT available. Please replace "S" or "R" with "GT" (e.g. NVNZ-M120GT/P1, NVNZ-M120GT/P)

## Fire barrier connectors with strain relief, metric, metal thread

### Type VNZ

Type VNZ - Fire barrier connector straight with strain relief, metric metal thread



	Order no. IP68 Compl., black <sup>5</sup>	Thread metric	Fits to conduit size		Terminal range (mm)	Thread length (mm)	Overall length (mm)
			NW	Metric			
	NVNZ-M120S/B1	M12 x 1.5	10	12	4.0–6.5	5.0	48.5
	NVNZ-M120S/B2	M12 x 1.5	10	12	5.0–8.0	5.0	48.5
	NVNZ-M120S/B3	M12 x 1.5	10	12	6.5–9.5	5.0	48.5
	NVNZ-M160S/B1	M16 x 1.5	10	12	4.0–6.5	6.0	49.5
	NVNZ-M160S/B2	M16 x 1.5	10	12	5.0–8.0	6.0	49.5
	NVNZ-M160S/B3	M16 x 1.5	10	12	6.5–9.5	6.0	49.5
	NVNZ-M202S/B1	M20 x 1.5	12	16	4.0–6.5	6.0	54.0
	NVNZ-M202S/B3	M20 x 1.5	12	16	6.5–9.5	6.0	54.0
	NVNZ-M202S/B4	M20 x 1.5	12	16	7.0–10.5	6.0	54.0
	NVNZ-M207S/B1	M20 x 1.5	17	20	4.0–6.5	6.5	60.0
	NVNZ-M207S/B2	M20 x 1.5	17	20	5.0–8.0	6.5	60.0
	NVNZ-M207S/B3	M20 x 1.5	17	20	6.5–9.5	6.5	60.0
	NVNZ-M207S/B4	M20 x 1.5	17	20	7.0–10.5	6.5	60.0
	NVNZ-M207S/B5	M20 x 1.5	17	20	9.0–13.0	6.5	60.0
	NVNZ-M253S/B5	M25 x 1.5	23	25	9.0–13.0	7.5	72.5
	NVNZ-M253S/B6	M25 x 1.5	23	25	11.5–15.5	7.5	72.5
	NVNZ-M257S/B4	M25 x 1.5	17	20	7.0–10.0	7.5	61.5
	NVNZ-M257S/B5	M25 x 1.5	17	20	9.0–13.0	7.5	61.5
	NVNZ-M257S/B6	M25 x 1.5	17	20	11.5–15.5	7.5	61.5
	NVNZ-M323S/B4	M32 x 1.5	23	25	14.0–18.0	8.0	73.0
	NVNZ-M323S/B5	M32 x 1.5	23	25	17.0–20.5	8.0	73.0
	NVNZ-M329S/B2	M32 x 1.5	29	32	14.0–18.0	8.0	73.0
	NVNZ-M329S/B3	M32 x 1.5	29	32	17.0–20.5	8.0	73.0
	NVNZ-M329S/B4	M32 x 1.5	29	32	20.0–25.0	8.0	73.0
	NVNZ-M406S/B1	M40 x 1.5	36	40	20.0–25.0	9.0	87.0
	NVNZ-M406S/B2	M40 x 1.5	36	40	24.0–28.0	9.0	87.0
	NVNZ-M409S/B1	M40 x 1.5	29	32	11.5–15.5	8.0	73.0
	NVNZ-M409S/B2	M40 x 1.5	29	32	14.0–18.0	8.0	73.0
	NVNZ-M409S/B3	M40 x 1.5	29	32	17.0–20.5	8.0	73.0
	NVNZ-M409S/B4	M40 x 1.5	29	32	20.0–25.0	8.0	73.0
	NVNZ-M409S/B5	M40 x 1.5	29	32	24.0–28.0	8.0	73.0
	NVNZ-M506S/B1	M50 x 1.5	36	40	27.0–32.0	9.0	89.5
	NVNZ-M506S/B3	M50 x 1.5	36	40	32.0–36.0	9.0	89.5
NVNZ-M508S/B2	M50 x 1.5	48	50	32.0–36.0	9.0	92.0	
NVNZ-M508S/B3	M50 x 1.5	48	50	36.0–40.0	9.0	92.0	
NVNZ-M638S/B1	M63 x 1.5	48	50	32.0–35.0	10.0	90.5	
NVNZ-M638S/B2	M63 x 1.5	48	50	39.0–44.0	10.0	90.5	

\*without insert

Fire barrier function, according to standard EN45545-2/-3

For applications in railway vehicles and heavy machine construction

For the separation of damp and dry areas

Sealing inserts are made from T80S

With integrated strain relief and optimal ingress protection at the cable (up to IP68/10 bar)

High thread and system connection strength

Temperature range sealing insert Pflitsch: -40°C to +135°C

**Note:** For several conductors multiple sealing inserts MDE are available.

R/P version of fitting has to be used in combination with multiple sealing inserts

<sup>5</sup> IP68GT available. Please  
replace "S" or "R" with "GT"  
(e.g. NVNZ-M120GT/P1,  
NVNZ-M120GT/P)




## Connectors with strain relief, metric, long metal thread

### Type VNZ

Type VNZ - Connector straight with strain relief, metric long metal thread



	Order no. IP68 Compl., black ⑤	Order no. fitting* ⑤	Order no. insert	Thread metric	Fits to conduit size		Terminal range (mm)	Thread length (mm)	Overall length (mm)
					NW	Metric			
	NVNZ-M120S/P1-L	NVNZ-M120R/P-L	EK 150p7	M12 x 1.5	10	12	4.0–6.5	15.0	66.5
	NVNZ-M120S/P3-L			M12 x 1.5	10	12	6.5–9.5	15.0	66.5
	NVNZ-M160S/P1-L	NVNZ-M160R/P-L	E 150p7	M16 x 1.5	10	12	4.0–6.5	15.0	58.5
	NVNZ-M160S/P2-L		E 150p8	M16 x 1.5	10	12	5.0–8.0	15.0	58.5
	NVNZ-M160S/P3-L		E 150p9	M16 x 1.5	10	12	6.5–9.5	15.0	58.5
	NVNZ-M202S/P1-L	NVNZ-M202R/P-L	E 152p7	M20 x 1.5	12	16	4.0–6.5	15.0	62.5
	NVNZ-M202S/P3-L		E 152p9	M20 x 1.5	12	16	6.5–9.5	15.0	62.5
	NVNZ-M202S/P4-L		E 152p11	M20 x 1.5	12	16	7.0–10.5	15.0	62.5
	NVNZ-M207S/P3-L	NVNZ-M207R/P-L	E 152p9	M20 x 1.5	17	20	6.5–9.5	15.0	68.5
	NVNZ-M207S/P4-L		E 152p11	M20 x 1.5	17	20	7.0–10.5	15.0	68.5
	NVNZ-M207S/P5-L		E 152p13	M20 x 1.5	17	20	9.0–13.0	15.0	68.5
	NVNZ-M257S/P5-L	NVNZ-M257R/P-L	E 153p13	M25 x 1.5	17	20	9.0–13.0	15.0	69.0
	NVNZ-M257S/P6-L		E 153p16	M25 x 1.5	17	20	11.5–15.5	15.0	69.0
	NVNZ-M323S/P4-L	NVNZ-M323R/P-L	E 154p18	M32 x 1.5	23	25	14.0–18.0	15.0	80.0
	NVNZ-M323S/P5-L	NVNZ-M323R1/P-L	E 154p20	M32 x 1.5	23	25	17.0–20.5	15.0	80.0
	NVNZ-M329S/P2-L	NVNZ-M329R/P-L	E 155p18	M32 x 1.5	29	32	14.0–18.0	15.0	91.0
	NVNZ-M329S/P3-L		E 155p20	M32 x 1.5	29	32	17.0–20.5	15.0	91.0
	NVNZ-M409S/P3-L	NVNZ-M409R/P-L	E 155p20	M40 x 1.5	29	32	17.0–20.5	15.0	80.0
	NVNZ-M409S/P4-L		E 155p25	M40 x 1.5	29	32	20.0–25.0	15.0	80.0
	NVNZ-M409S/P5-L		E 155p28	M40 x 1.5	29	32	24.0–28.0	15.0	80.0
	NVNZ-M506S/P1-L	NVNZ-M506R/P-L	E 156p32	M50 x 1.5	36	40	27.0–32.0	15.0	94.5
	NVNZ-M506S/P3-L		E 156p36	M50 x 1.5	36	40	32.0–36.0	15.0	94.5
	NVNZ-M508S/P2-L	NVNZ-M508R/P-L	E 157p36HF	M50 x 1.5	48	50	32.0–36.0	15.0	97.0
	NVNZ-M508S/P3-L		E 157p40HF	M50 x 1.5	48	50	36.0–40.0	15.0	97.0
	NVNZ-M638S/P1-L	NVNZ-M638R/P-L	E 158pm1X35	M63 x 1.5	48	50	32.0–35.0	15.0	95.5
	NVNZ-M638S/P2-L		E 158p44	M63 x 1.5	48	50	39.0–44.0	15.0	95.5

\*without insert

For applications in railway vehicles and heavy machine construction

For the separation of damp and dry areas

Sealing inserts are made from TPE-V

With integrated strain relief and optimal ingress protection at the cable (up to IP68/10 bar)

High thread and system connection strength

Temperature range sealing insert Pflitsch: -40°C to +135°C

**Note:** For several conductors multiple sealing inserts MDE are available


R/P version of fitting has to be used in combination with multiple sealing inserts

⑤ IP68GT available. Please  
replace "S" or "R" with "GT"  
(e.g. NVNZ-M120GT/P1-L)

## Connectors metric, metal thread

### Type VAV

#### Type VAV - Connector 45° elbow, metric metal thread

	Order no. IP68, black <sup>4</sup>	Order no. IP68, grey <sup>4</sup>	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	NVAV-M120-10	MVAV-M120-10	M12 x 1.5	10	12	10.0	48.5 x 37.0
	NVAV-M120-5	MVAV-M120-5	M12 x 1.5	10	12	5.0	43.5 x 37.0
	NVAV-M162-10	MVAV-M162-10	M16 x 1.5	12	16	10.0	53.0 x 40.5
	NVAV-M162-5	MVAV-M162-5	M16 x 1.5	12	16	5.0	48.0 x 40.5
	NVAV-M207-10	MVAV-M207-10	M20 x 1.5	17	20	10.0	60.5 x 51.5
	NVAV-M207-6	MVAV-M207-6	M20 x 1.5	17	20	6.0	56.5 x 51.5
	NVAV-M253-11	MVAV-M253-11	M25 x 1.5	23	25	11.0	70.0 x 60.5
	NVAV-M253-7	MVAV-M253-7	M25 x 1.5	23	25	7.0	66.0 x 60.5
	NVAV-M329-13	MVAV-M329-13	M32 x 1.5	29	32	13.0	77.0 x 68.0
	NVAV-M329-8	MVAV-M329-8	M32 x 1.5	29	32	8.0	72.0 x 68.0
	NVAV-M406-13	MVAV-M406-13	M40 x 1.5	36	40	13.0	94.0 x 87.5
	NVAV-M406-8	MVAV-M406-8	M40 x 1.5	36	40	8.0	89.0 x 87.5
	NVAV-M508-14	MVAV-M508-14	M50 x 1.5	48	50	14.0	102.0 x 101.0
	NVAV-M508-9	MVAV-M508-9	M50 x 1.5	48	50	9.0	97.0 x 101.0
	NVAV-M638-14	MVAV-M638-14	M63 x 1.5	48	50	14.0	102.0 x 104.0
NVAV-M638-10	MVAV-M638-10	M63 x 1.5	48	50	10.0	98.0 x 104.0	

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength

<sup>4</sup> IP68GT available. Please add "GT" prior to the thread length (e.g. NVAV-M120GT-10, NVBV-M120GT-10)







PMA® CABLE PROTECTION

PMA provides information and guidance on application specific challenges, and develops products to meet the needs of the industry.






## Connectors metric, metal thread

### Type VBV

#### Type VBV - Connector 90° curved elbow, metric metal thread

	Order no. IP68, black <sup>④</sup>	Order no. IP68, grey <sup>④</sup>	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	NVBV-M207-10	MVBV-M207-10	M20 x 1.5	17	20	10.0	51.0 x 73.0
	NVBV-M207-6	MVBV-M207-6	M20 x 1.5	17	20	6.0	47.0 x 73.0
	NVBV-M257-11	MVBV-M257-11	M25 x 1.5	17	20	11.0	52.0 x 76.0
	NVBV-M257-7	MVBV-M257-7	M25 x 1.5	17	20	7.0	48.0 x 76.0
	NVBV-M253-11	MVBV-M253-11	M25 x 1.5	23	25	11.0	62.5 x 85.0
	NVBV-M253-7	MVBV-M253-7	M25 x 1.5	23	25	7.0	58.5 x 85.0
	NVBV-M323-13	MVBV-M323-13	M32 x 1.5	23	25	13.0	64.5 x 89.0
	NVBV-M323-8	MVBV-M323-8	M32 x 1.5	23	25	8.0	59.5 x 89.0
	NVBV-M329-13	MVBV-M329-13	M32 x 1.5	29	32	13.0	74.0 x 94.5
	NVBV-M329-8	MVBV-M329-8	M32 x 1.5	29	32	8.0	69.0 x 94.5
	NVBV-M409-13	MVBV-M409-13	M40 x 1.5	29	32	13.0	75.5 x 100.5
	NVBV-M409-8	MVBV-M409-8	M40 x 1.5	29	32	8.0	70.5 x 100.5
	NVBV-M406-13	MVBV-M406-13	M40 x 1.5	36	40	13.0	86.5 x 123.0
	NVBV-M406-8	MVBV-M406-8	M40 x 1.5	36	40	8.0	81.5 x 123.0
	NVBV-M506-14	MVBV-M506-14	M50 x 1.5	36	40	14.0	87.5 x 130.0
	NVBV-M506-9	MVBV-M506-9	M50 x 1.5	36	40	9.0	82.5 x 130.0
	NVBV-M508-14	MVBV-M508-14	M50 x 1.5	48	50	14.0	100.5 x 135.0
	NVBV-M508-9	MVBV-M508-9	M50 x 1.5	48	50	9.0	95.5 x 135.0
	NVBV-M638-10	MVBV-M638-10	M63 x 1.5	48	50	14.0	100.5 x 138.0
	NVBV-M638-14	MVBV-M638-14	M63 x 1.5	48	50	10.0	96.5 x 138.0

#### Approvals



For applications in railway vehicles and heavy machine construction

High thread and system connection strength

Smooth elbow allows easy threading of wires and cables

**Note:** Appropriate standard elbows of type VW are available for smaller conduit sizes NW 10 to NW 12


<sup>⑤</sup> IP68GT available. Please add "GT" prior to the thread length (e.g. NVAV-M120GT-10, NVBV-M120GT-10)



## Connectors metric, metal thread

### Type VWV

#### Type VWV - Connector 90° elbow, metric metal thread

	Order no. IP68, black <sup>4</sup>	Order no. IP68, grey <sup>4</sup>	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	NVWV-M120-10	MVWV-M120-10	M12 x 1.5	10	12	10.0	37.5 x 39.5
	NVWV-M120-5	MVWV-M120-5	M12 x 1.5	10	12	5.0	32.5 x 39.5
	NVWV-M160-10	MVWV-M160-10	M16 x 1.5	10	12	10.0	37.5 x 41.5
	NVWV-M160-5	MVWV-M160-5	M16 x 1.5	10	12	5.0	32.5 x 41.5
	NVWV-M162-10	MVWV-M162-10	M16 x 1.5	12	16	10.0	42.0 x 46.5
	NVWV-M162-5	MVWV-M162-5	M16 x 1.5	12	16	5.0	37.0 x 46.5
	NVWV-M202-10	MVWV-M202-10	M20 x 1.5	12	16	10.0	42.0 x 49.0
	NVWV-M202-6	MVWV-M202-6	M20 x 1.5	12	16	6.0	38.0 x 49.0
	NVWV-M207-10	MVWV-M207-10	M20 x 1.5	17	20	10.0	47.0 x 58.5
	NVWV-M207-6	MVWV-M207-6	M20 x 1.5	17	20	6.0	43.0 x 58.5
	NVWV-M253-11	MVWV-M253-11	M25 x 1.5	23	25	11.0	59.0 x 67.0
	NVWV-M253-7	MVWV-M253-7	M25 x 1.5	23	25	7.0	55.0 x 67.0
	NVWV-M329-13	MVWV-M329-13	M32 x 1.5	29	32	13.0	68.0 x 74.5
	NVWV-M329-8	MVWV-M329-8	M32 x 1.5	29	32	8.0	63.0 x 74.5
	NVWV-M406-13	MVWV-M406-13	M40 x 1.5	36	40	13.0	80.5 x 98.0
	NVWV-M406-8	MVWV-M406-8	M40 x 1.5	36	40	8.0	75.5 x 98.0
NVWV-M508-14	MVWV-M508-14	M50 x 1.5	48	50	14.0	95.5 x 111.0	
NVWV-M508-9	MVWV-M508-9	M50 x 1.5	48	50	9.0	90.5 x 111.0	
NVWV-M638-14	MVWV-M638-14	M63 x 1.5	48	50	14.0	94.5 x 114.0	
NVWV-M638-10	MVWV-M638-10	M63 x 1.5	48	50	10.0	90.5 x 114.0	

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength

**Note:** Curved elbows of type VB are also available for sizes NW 17 to NW 48


<sup>4</sup> IP68GT available. Please add  
"GT" prior to the thread length  
(e.g. NVWV-M120GT-10)

## Connectors with strain relief, metric, metal thread

### Type VWZ

Type VWZ - Connector 90° elbow with strain relief, metric metal thread



	Order no. IP68 Compl., black ⑤	Order no. fitting* ⑤	Order no. insert	Thread metric	Fits to conduit size		Terminal range (mm)	Thread length (mm)	Overall length (mm)
					NW	Metric			
	NVWZ-M160S/P1	NVWZ-M160R/P	E 150p7	M16 x 1.5	10	12	4.0–6.5	8.0	65.0
	NVWZ-M160S/P2	–	E 150p8	M16 x 1.5	10	12	5.0–8.0	8.0	65.0
	NVWZ-M160S/P3	–	E 150p9	M16 x 1.5	10	12	6.5–9.5	8.0	65.0
	NVWZ-M202S/P1	NVWZ-M202R/P	E 152p7	M20 x 1.5	12	16	4.0–6.5	8.0	74.5
	NVWZ-M202S/P3	–	E 152p9	M20 x 1.5	12	16	6.5–9.5	8.0	74.5
	NVWZ-M202S/P4	–	E 152p11	M20 x 1.5	12	16	7.0–10.5	8.0	74.5
	NVWZ-M207S/P1	NVWZ-M207R/P	E 152p7	M20 x 1.5	17	20	4.0–6.5	8.0	81.0
	NVWZ-M207S/P3	–	E 152p9	M20 x 1.5	17	20	6.5–9.5	8.0	81.0
	NVWZ-M207S/P4	–	E 152p11	M20 x 1.5	17	20	7.0–10.5	8.0	81.0
	NVWZ-M207S/P5	–	E 152p13	M20 x 1.5	17	20	9.0–13.0	8.0	81.0
	NVWZ-M257S/P5	NVWZ-M257R/P	E 153p13	M25 x 1.5	17	20	9.0–13.0	8.0	84.0
	NVWZ-M257S/P6	–	E 153p16	M25 x 1.5	17	20	11.5–15.5	8.0	84.0

\*without insert

For applications in railway vehicles and heavy machine construction

For the separation of damp and dry areas

Straight connector: Specially formulated polyamide 6

90° elbow: Zinc diecast

Female thread and locknut: Nickel-plated brass

Pflitsch sealing insert: TPE-V

With integrated strain relief and optimal ingress protection at the cable (up to IP68/10 bar)

High thread and system connection strength


Temperature range sealing insert Pflitsch: –40°C to +135°C

⑤ IP68GT available. Please replace “S” or “R” with “GT” (e.g. NVWZ-M160GT/P1)

## Connectors PG, polyamide thread

### Type VN

Type VN - Connector straight, PG thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	BVND-P07MGT-11	BVNV-P07M	07	07	10	11.0	34.5
	BVND-P07MGT-8	–	07	07	10	8.0	31.5
	BVND-P070GT-11	BVNV-P070	07	10	12	11.0	36.5
	BVND-P070GT-8	–	07	10	12	8.0	33.5
	BVND-P072GT-11	BVNV-P072	07	12	16	11.0	39.0
	BVND-P072GT-8	–	07	12	16	8.0	36.0
	BVND-P09MGT-11	BVNV-P09M	09	07	10	11.0	34.5
	BVND-P09MGT-8	–	09	07	10	8.0	31.5
	BVND-P090GT-11	BVNV-P090	09	10	12	11.0	36.5
	BVND-P090GT-8	–	09	10	12	8.0	33.5
	BVND-P092GT-11	BVNV-P092	09	12	16	11.0	39.0
	BVND-P092GT-8	–	09	12	16	8.0	36.0
	BVND-P097GT-11	BVNV-P097	09	17	20	11.0	47.5
	BVND-P097GT-8	–	09	17	20	8.0	44.5
	BVND-P11MGT-11	BVNV-P11M	11	07	10	11.0	34.5
	BVND-P11MGT-8	–	11	07	10	8.0	31.5
	BVND-P110GT-11	BVNV-P110	11	10	12	11.0	36.5
	BVND-P110GT-8	–	11	10	12	8.0	33.5
	BVND-P112GT-11	BVNV-P112	11	12	16	11.0	39.0
	BVND-P112GT-8	–	11	12	16	8.0	36.0
	BVND-P117GT-11	BVNV-P117	11	17	20	11.0	47.5
	BVND-P117GT-8	–	11	17	20	8.0	44.5
	BVND-P13MGT-11	BVNV-P13M	13.5	07	10	11.0	34.5
	BVND-P13MGT-8	–	13.5	07	10	8.0	31.5
	BVND-P130GT-11	BVNV-P130	13.5	10	12	11.0	36.5
	BVND-P130GT-8	–	13.5	10	12	8.0	33.5
	BVND-P132GT-11	BVNV-P132	13.5	12	16	11.0	39.0
	BVND-P132GT-8	–	13.5	12	16	8.0	36.0
	BVND-P137GT-11	BVNV-P137	13.5	17	20	11.0	47.5
	BVND-P137GT-8	–	13.5	17	20	8.0	44.5
	BVND-P160GT-11	–	16	10	12	11.0	36.5
	BVND-P160GT-8	–	16	10	12	8.0	33.5
	BVND-P162GT-11	BVNV-P162	16	12	16	11.0	39.0
	BVND-P163GT-11	BVNV-P163	16	23	25	11.0	51.0
	BVND-P163GT-8	–	16	23	25	8.0	48.0
	BVND-P167GT-11	BVNV-P167	16	17	20	11.0	47.5
	BVND-P167GT-8	–	16	17	20	8.0	44.5
	BVND-P213GT	BVNV-P213	21	23	25	12.0	52.0
	BVND-P296GT	BVNV-P296	29	36	40	12.0	67.5
	BVND-P299GT	BVNV-P299	29	29	32	12.0	53.0
BVND-P366GT	BVNV-P366	36	36	40	13.0	66.0	
BVND-P368GT	BVNV-P368	36	48	50	13.0	68.5	
BVND-P428GT	BVNV-P428	42	48	50	13.0	68.5	
BVND-P488GT	BVNV-P488	48	48	50	13.0	66.5	

CS  
US

#### Approvals




- ① Please replace "B" for black with "S" for grey in front of the order no.
- ② IP68GT available. Please add "GT" after the order no.

For cable protection systems in a wide range of applications

## Connectors PG, polyamide thread

### Type VNDZ/VNZ & VA

#### Type VNDZ/VNZ - Connector straight with strain relief, PG thread

	Order no. IP66 ①	Order no. IP68 ① ③	Thread PG	Fits to conduit size		Terminal range	Thread length (mm)	Overall length (mm)
				NW	Metric			
	BVNDZ-P090GT	BVNZ-P090S	09	10	12	4.0–8.0	7.5	56.0
	BVNDZ-P112GT	BVNZ-P112S	11	12	16	5.0–10.0	8.0	60.5
	BVNDZ-P132GT	BVNZ-P132S	13.5	12	16	6.0–12.0	9.0	62.0
	BVNDZ-P137GT	BVNZ-P137S	13.5	17	20	6.0–12.0	9.0	69.0
	BVNDZ-P167GT	BVNZ-P167S	16	17	20	10.0–14.0	10.0	72.0
	BVNDZ-P163GT	BVNZ-P163S	16	23	25	10.0–14.0	10.0	79.0
	BVNDZ-P213GT	BVNZ-P213S	21	23	25	13.0–18.0	11.0	82.0
	BVNDZ-P299GT	BVNZ-P299S	29	29	32	18.0–25.0	11.0	85.0
	BVNDZ-P366GT	BVNZ-P366S	36	36	40	22.0–32.0	13.0	112.0
	BVNDZ-P488GT	BVNZ-P488S	48	48	50	34.0–44.0	14.0	112.0

For machine and plant construction


For separation of damp and dry areas

Integrated strain relief optimally holds and seals cables

If several conductors are used with the connector multiple sealing inserts should be considered

**Note:** For several conductors multiple sealing inserts MDE are available

#### Type VA - Connector 45° elbow, PG thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread PG	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BVAD-P090GT	BVAV-P090	09	10	12	11.0	43.5 x 37.0
	BVAD-P112GT	BVAV-P112	11	12	16	11.0	48.0 x 40.0
	BVAD-P132GT	BVAV-P132	13.5	12	16	11.0	48.0 x 41.5
	BVAD-P137GT	BVAV-P137	13.5	17	20	11.0	55.5 x 51.5
	BVAD-P167GT	BVAV-P167	16	17	20	11.0	55.5 x 51.5
	BVAD-P213GT	BVAV-P213	21	23	25	11.0	63.0 x 58.0
	BVAD-P299GT	BVAV-P299	29	29	32	12.0	69.0 x 66.0
	BVAD-P366GT	BVAV-P366	36	36	40	13.0	86.0 x 86.0
	BVAD-P488GT	BVAV-P488	48	48	50	13.0	94.0 x 100.0

#### Approvals



For cable protection systems in a wide range of applications

① Please replace "B" for black with "S" for grey in front of the order no.

② IP68GT available. Please add "GT" after the order no.


③ IP68GT available. Please replace "S" at the end with "GT" (e.g. BVNZ-P167GT).



## Connectors PG, polyamide thread

### Type VB

#### Type VB - Connector 90° curved elbow, PG thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	BVBD-P167GT	BVBV-P167	16	17	20	11.0	47.5 x 73.0
	BVBD-P213GT	BVBV-P213	21	23	25	12.0	57.5 x 85.0
	BVBD-P299GT	BVBV-P299	29	29	32	12.0	67.5 x 96.0
	BVBD-P366GT	BVBV-P366	36	36	40	13.0	79.0 x 123.0
	BVBD-P488GT	BVBV-P488	48	48	50	13.0	92.5 x 135.0

#### Approvals



For cable protection systems in a wide range of applications

Smooth elbow allows easy threading of wires and cables

**Note:** For smaller conduit sizes NW 07 to NW 12 appropriate standard elbows of type VW are also available


① Please replace "B" for black with "S" for grey in front of the order no.

② IP68GT available. Please add "GT" after the order no.

## Connectors PG, polyamide thread

### Type VW

Type VW - Connector 90° elbow, PG thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	BVWD-P07MGT-11	BVWV-P07M	07	07	10	11.0	32.0 x 35.0
	BVWD-P07MGT-8	-	07	07	10	8.0	29.0 x 35.0
	BVWD-P070GT-11	BVWV-P070	07	10	12	11.0	34.0 x 39.5
	BVWD-P070GT-8	-	07	10	12	8.0	31.0 x 39.5
	BVWD-P072GT-11	BVWV-P072	07	12	16	11.0	38.5 x 44.5
	BVWD-P072GT-8	-	07	12	16	8.0	35.5 x 44.5
	BVWD-P09MGT-11	BVWV-P09M	09	07	10	11.0	32.0 x 36.5
	BVWD-P09MGT-8	-	09	07	10	8.0	29.0 x 36.5
	BVWD-P090GT-11	BVWV-P090	09	10	12	11.0	34.0 x 39.5
	BVWD-P090GT-8	-	09	10	12	8.0	31.0 x 39.5
	BVWD-P092GT-11	BVWV-P092	09	12	16	11.0	38.5 x 44.5
	BVWD-P092GT-8	-	09	12	16	8.0	35.5 x 44.5
	BVWD-P11MGT-11	BVWV-P11M	11	07	10	11.0	32.0 x 38.0
	BVWD-P11MGT-8	-	11	07	10	8.0	29.0 x 38.0
	BVWD-P110GT-11	BVWV-P110	11	10	12	11.0	34.0 x 41.0
	BVWD-P110GT-8	-	11	10	12	8.0	31.0 x 41.0
	BVWD-P112GT-11	BVWV-P112	11	12	16	11.0	38.5 x 46.0
	BVWD-P112GT-8	-	11	12	16	8.0	35.5 x 46.0
	BVWD-P13MGT-11	BVWV-P13M	13.5	07	10	11.0	32.0 x 39.5
	BVWD-P13MGT-8	-	13.5	07	10	8.0	29.0 x 39.5
	BVWD-P130GT-11	BVWV-P130	13.5	10	12	11.0	34.0 x 42.5
	BVWD-P130GT-8	-	13.5	10	12	8.0	31.0 x 42.5
	BVWD-P132GT-11	BVWV-P132	13.5	12	16	11.0	38.5 x 47.5
	BVWD-P132GT-8	-	13.5	12	16	8.0	35.5 x 47.5
	BVWD-P137GT-11	BVWV-P137	13.5	17	20	11.0	43.5 x 58.5
	BVWD-P137GT-8	-	13.5	17	20	8.0	40.5 x 58.5
	BVWD-P167GT-11	BVWV-P167	16	17	20	11.0	43.5 x 58.5
	BVWD-P167GT-8	-	16	17	20	8.0	40.5 x 58.5
	BVWD-P213GT	BVWV-P213	21	23	25	12.0	54.0 x 67.0
	BVWD-P299GT	BVWV-P299	29	29	32	12.0	61.5 x 74.5
BVWD-P366GT	BVWV-P366	36	36	40	13.0	72.0 x 98.0	
BVWD-P488GT	BVWV-P488	48	48	50	13.0	85.5 x 111.0	

#### Approvals



For cable protection systems in a wide range of applications


**Note:** For sizes NW 17 to NW 48 curved elbows of type VB are also available

- ① Please replace "B" for black with "S" for grey in front of the order no.
- ② IP68GT available. Please add "GT" after the order no.

## Connectors PG, metal thread

### Type VNV

#### Type VNV - Connector straight, PG metal thread

	Order no. IP68, black <sup>②</sup>	Order no. IP68, grey <sup>②</sup>	Thread PG	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	NVNV-P090	MVNV-P090	09	10	12	12.0	42.0
	NVNV-P112	MVNV-P112	11	12	16	12.0	45.0
	NVNV-P137	MVNV-P137	13.5	17	20	13.0	54.0
	NVNV-P167	MVNV-P167	16	17	20	13.0	54.0
	NVNV-P213	MVNV-P213	21	23	25	14.0	57.0
	NVNV-P293	MVNV-P293	29	23	25	14.0	57.0
	NVNV-P299	MVNV-P299	29	29	32	14.0	58.5
	NVNV-P366	MVNV-P366	36	36	40	17.0	75.5
	NVNV-P488	MVNV-P488	48	48	50	17.0	75.5

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength

<sup>②</sup> IP68GT available. Please add  
"GT" after the order no.

## Connectors PG, with strain relief, metal thread

### Type VNZ

Type VNZ - Connector straight with strain relief, PG metal thread



	Order no. IP68 Compl., black ⑤	Order no. fitting* ⑤	Order no. insert	Thread PG	Fits to conduit size		Terminal range (mm)	Thread length (mm)	Overall length (mm)
					NW	Metric			
	NVNZ-P090S/P1	NVNZ-P090R/P	E 150p7	09	10	12	4.0–6.5	6.0	49.5
	NVNZ-P090S/P3	–	E 150p9	09	10	12	6.5–9.5	6.0	49.5
	NVNZ-P110S/P1	NVNZ-P110R/P	E 151p7	11	10	12	4.0–6.5	6.0	52.0
	NVNZ-P110S/P3	–	E 151p9	11	10	12	6.5–9.5	6.0	52.0
	NVNZ-P112S/P1	NVNZ-P112R/P	E 151p7	11	12	16	4.0–6.5	6.0	53.5
	NVNZ-P112S/P3	–	E 151p9	11	12	16	6.5–9.5	6.0	53.5
	NVNZ-P112S/P4	–	E 151p11	11	12	16	7.0–10.5	6.0	53.5
	NVNZ-P160S/P1	NVNZ-P160R/P	E 152p11	16	10	12	4.0–6.5	6.5	52.5
	NVNZ-P167S/P3	NVNZ-P167R/P	E 153p9	16	17	20	6.5–9.5	6.5	61.0
	NVNZ-P167S/P4	–	E 153p11	16	17	20	7.0–10.5	6.5	61.0
	NVNZ-P167S/P5	–	E 153p13	16	17	20	9.0–13.0	6.5	61.0
	NVNZ-P167S/P6	–	E 153p16	16	17	20	11.5–15.5	6.5	61.0
	NVNZ-P213S/P1	NVNZ-P213R/P	E 154p11	21	23	25	7.0–10.5	7.0	72.0
	NVNZ-P213S/P4	–	E 154p18	21	23	25	14.0–18.0	7.0	72.0
	NVNZ-P213S/P5	NVNZ-P213R1/P	E 154p20	21	23	25	17.0–20.5	7.0	72.0
	NVNZ-P299S/P3	NVNZ-P299R/P	E 155p20	29	29	32	17.0–20.5	8.0	73.5
	NVNZ-P299S/P4	–	E 155p25	29	29	32	20.0–25.0	8.0	73.5
	NVNZ-P299S/P5	–	E 155p28	29	29	32	24.0–28.0	8.0	73.5
	NVNZ-P366S/P1	NVNZ-P366R/P	E 156p32	36	36	40	27.0–32.0	9.0	88.0
	NVNZ-P366S/P2	–	E 156p34	36	36	40	29.0–34.0	9.0	88.0
NVNZ-P366S/P3	–	E 156p36	36	36	40	32.0–36.0	9.0	88.0	
NVNZ-P488S/P1	NVNZ-P488R/P	E 158pm 1x35	48	48	50	32.0–35.0	10.0	90.5	
NVNZ-P488S/P2	–	E 158p44	48	48	50	39.0–44.0	10.0	90.5	

\*without insert

For applications in railway vehicles and heavy machine construction

For the separation of damp and dry areas

Sealing inserts are made from TPE-V

With integrated strain relief and optimal ingress protection at the cable (up to IP68/10 bar)

High thread and system connection strength

Temperature range sealing insert Pflitsch: –40°C to +135°C

**Note:** For several conductors multiple sealing inserts MDE are available


R/P version of fitting has to be used in combination with multiple sealing inserts



## Connectors PG, metal thread

### Type VAV & VBV

#### Type VAV - Connector 45° elbow, PG metal thread


	Order no. IP68, black ②	Order no. IP68, grey ②	Thread			Thread length (mm)	External dimensions (mm)
			PG	NW	Metric		
	NVAV-P090	MVAV-P090	09	10	12	12.0	50.5 x 37.0
	NVAV-P112	MVAV-P112	11	12	16	12.0	55.0 x 40.5
	NVAV-P137	MVAV-P137	13.5	17	20	13.0	63.5 x 50.0
	NVAV-P167	MVAV-P167	16	17	20	13.0	63.5 x 50.0
	NVAV-P213	MVAV-P213	21	23	25	14.0	73.0 x 60.5
	NVAV-P299	MVAV-P299	29	29	32	14.0	78.0 x 68.0
	NVAV-P366	MVAV-P366	36	36	40	17.0	98.0 x 87.5
	NVAV-P488	MVAV-P488	48	48	50	17.0	105.0 x 101.0

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength

#### Type VBV - Connector 90° curved elbow, PG metal thread

	Order no. IP68, black ②	Order no. IP68, grey ②	Thread			Thread length (mm)	External dimensions (mm)
			PG	NW	Metric		
	NVBV-P167	MVBV-P167	16	17	20	13.0	54.0 x 73.0
	NVBV-P213	MVBV-P213	21	23	25	14.0	65.5 x 85.0
	NVBV-P299	MVBV-P299	29	29	32	14.0	75.0 x 96.0
	NVBV-P366	MVBV-P366	36	36	40	17.0	90.5 x 123.0
	NVBV-P488	MVBV-P488	48	48	50	17.0	103.5 x 135.0

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength  
Smooth elbow allows easy threading of wires and cables


**Note:** For smaller conduit sizes NW 10 to NW 12 appropriate standard elbows of type VW are also available

② IP68GT available. Please add  
"GT" after the order no.

## Connectors PG, metal thread

### Type VWV

#### Type VWV - Connector 90° elbow, PG metal thread

	Order no. IP68, black ②	Order no. IP68, grey ②	Thread			Thread length (mm)	External dimensions (mm)
			PG	NW	Metric		
	NVWV-P090	MVWV-P090	09	10	12	12.0	39.5 x 39.5
	NVWV-P112	MVWV-P112	11	12	16	12.0	45.5 x 45.0
	NVWV-P137	MVWV-P137	13.5	17	20	13.0	50.0 x 58.5
	NVWV-P167	MVWV-P167	16	17	20	13.0	50.0 x 58.5
	NVWV-P213	MVWV-P213	21	23	25	14.0	62.0 x 67.0
	NVWV-P299	MVWV-P299	29	29	32	14.0	69.0 x 74.5
	NVWV-P366	MVWV-P366	36	36	40	17.0	83.5 x 98.0
	NVWV-P488	MVWV-P488	48	48	50	17.0	96.5 x 111.0

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength


**Note:** Curved elbows of type VB are also available for sizes NW 17 to NW 48

② IP68GT available. Please add  
"GT" after the order no.

## Connectors GAS, polyamide thread


### Type VN & VW

#### Type VN - Connector straight, GAS thread

	Order no. IP66	Order no. IP68	Thread GAS	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BVND-G00MGT	BVNV-G00M	¼"	07	10	11.0	34.5
	BVND-G000GT	BVNV-G000	¼"	10	12	11.0	36.5
	BVND-G010GT	BVNV-G010	⅜"	10	12	11.0	36.5
	BVND-G012GT	BVNV-G012	⅜"	12	16	11.0	39.0
	BVND-G022GT	BVNV-G022	½"	12	16	13.0	41.0
	BVND-G027GT	BVNV-G027	½"	17	20	13.0	49.5
	BVND-G043GT	BVNV-G043	¾"	23	25	14.0	54.0
	BVND-G069GT	BVNV-G069	1"	29	32	15.0	56.0
	BVND-G076GT	BVNV-G076	1¼"	36	40	18.0	71.0
	BVND-G088GT	BVNV-G088	1½"	48	50	18.0	71.5
	BVND-G098GT	BVNV-G098	2"	48	50	18.0	71.5

For cable protection systems in a wide range of applications

#### Type VW - Connector 90° elbow, GAS thread


	Order no. IP66	Thread GAS	Fits to conduit size		Thread length (mm)	External dimensions (mm)
			NW	Metric		
	BVWD-G00MGT	¼"	07	10	11.0	32.0 x 36.5
	BVWD-G000GT	¼"	10	12	11.0	34.0 x 39.5
	BVWD-G010GT	⅜"	10	12	11.0	34.0 x 40.5
	BVWD-G012GT	⅜"	12	16	11.0	38.5 x 46.0
	BVWD-G022GT	½"	12	16	13.0	40.5 x 47.5
	BVWD-G027GT	½"	17	20	13.0	45.5 x 58.5
	BVWD-G043GT	¾"	23	25	14.0	56.0 x 66.5
	BVWD-G069GT	1"	29	32	15.0	64.5 x 73.5
	BVWD-G076GT	1¼"	36	40	18.0	77.0 x 96.0
	BVWD-G088GT	1½"	48	50	18.0	90.5 x 106.0
	BVWD-G098GT	2"	48	50	18.0	90.5 x 111.0

For cable protection systems in a wide range of applications

## Connectors NPT, polyamide thread

### Type VN & VA

#### Type VN - Connector straight, NPT thread


	Order no. IP66 ①	Order no. IP68 ① ②	Thread NPT	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BVND-N022GT	BVNV-N022	½"	12	16	13.0	41.5
	BVND-N027GT	BVNV-N027	½"	17	20	13.0	49.5
	BVND-N043GT	BVNV-N043	¾"	23	25	14.0	54.0
	BVND-N069GT	BVNV-N069	1"	29	32	15.0	56.0
	BVND-N076GT	BVNV-N076	1¼"	36	40	18.0	71.0
	BVND-N088GT	BVNV-N088	1½"	48	50	18.0	71.5
	BVND-N098GT	BVNV-N098	2"	48	50	18.0	71.5

#### Approvals



For cable protection systems in a wide range of applications

#### Type VA - Connector 45° elbow, NPT thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread NPT	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	BVAD-N022GT	BVAV-N022	½"	12	16	13.0	50.0 x 41.5
	BVAD-N027GT	BVAV-N027	½"	17	20	13.0	57.5 x 51.5
	BVAD-N043GT	BVAV-N043	¾"	23	25	14.0	67.0 x 60.0
	BVAD-N069GT	BVAV-N069	1"	29	32	15.0	73.5 x 67.0
	BVAD-N076GT	BVAV-N076	1¼"	36	40	18.0	91.5 x 85.5
	BVAD-N088GT	BVAV-N088	1½"	48	50	18.0	99.0 x 96.0
	-	BVAV-N098	2"	48	50	18.0	99.0 x 101.0

#### Approvals



For cable protection systems in a wide range of applications


- ① Please replace "B" for black with "S" for grey in front of the order no.  
 ② IP68GT available. Please add "GT" after the order no.



## Connectors NPT, polyamide thread

### Type VW

#### Type VW - Connector 90° elbow, NPT thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread NPT	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	BVWD-N022GT	BVWV-N022	½"	12	16	13.0	40.5 x 47.5
	BVWD-N027GT	BVWV-N027	½"	17	20	13.0	45.5 x 58.5
	BVWD-N043GT	BVWV-N043	¾"	23	25	14.0	56.0 x 66.5
	BVWD-N069GT	BVWV-N069	1"	29	32	15.0	64.5 x 73.5
	BVWD-N076GT	BVWV-N076	1¼"	36	40	18.0	77.0 x 96.0
	BVWD-N088GT	BVWV-N088	1½"	48	50	18.0	90.5 x 106.0
	BVWD-N098GT	BVWV-N098	2"	48	50	18.0	90.5 x 111.0

#### Approvals



For applications in railway vehicles and heavy machine construction  
High thread and system connection strength


**Note:** Curved elbows of type VB are also available for sizes NW 17 to NW 48


- ① Please replace "B" for black with "S" for grey in front of the order no.
- ② IP68GT available. Please add "GT" after the order no.

## Swivel connectors, metric/PG/NPT metal thread

### Type SBV & SWV/SBV


#### Type SBV - Swivel connector 90° curved elbow, metric/PG metal thread

	Order no. IP68, black <sup>4</sup>	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
			NW	Metric		
	NSBV-M207-10	M20 x 1.5	17	20	10.0	62.5 x 74.5
	NSBV-M253-11	M25 x 1.5	23	25	11.0	73.0 x 87.5
	NSBV-M329-13	M32 x 1.5	29	32	13.0	86.5 x 98.0
	NSBV-M406-13	M40 x 1.5	36	40	13.0	98.5 x 127.5
	NSBV-M409-13	M40 x 1.5	29	32	13.0	86.5 x 98.0
	NSBV-M508-14	M50 x 1.5	48	50	14.0	113.5 x 139.0
	NSBV-M638-14	M63 x 1.5	48	50	14.0	110.0 x 139.0

	Order no. IP68, black <sup>4</sup>	Thread PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
			NW	Metric		
<b>Approvals</b>  	NSBV-P167-6.5	16	17	20	6.5	58.0 x 74.5
	NSBV-P213-7	21	23	25	7.0	69.0 x 87.5
	NSBV-P299-8	29	29	32	8.0	80.0 x 98.0
	NSBV-P366-9	36	36	40	9.0	91.5 x 127.5
	NSBV-P488-10	48	48	50	10.0	106.0 x 139.0

For applications with high technical requirements mainly in machine building  
 Suitable for occasional rotation  
 Thread and integrated swivel adapter made from nickel-plated brass  
 High thread and system connection strength  
 Smooth elbow allows easy threading of wires and cables

#### Type SWV/SBV - Swivel connector 90° curved elbow, NPT metal thread

	Order no. IP68, black <sup>4</sup>	Thread NPT	Fits to conduit size		Thread length (mm)	External dimensions (mm)
			NW	Metric		
	NSWV-N022/01	½"	12	16	15.4	57.0 x 48.5
	NSBV-N027/01	½"	17	20	15.4	66.5 x 74.5
	NSBV-N043/01	¾"	23	25	15.7	77.5 x 87.5
	NSBV-N069/01	1"	29	32	19.6	92.0 x 98.0
	NSBV-N076/01	1¼"	36	40	20.2	104.5 x 125.5
	NSBV-N088/01	1½"	48	50	20.6	118.5 x 138.5
	NSBV-N098/01	2"	48	50	21.4	119.5 x 138.5

#### Approvals




For applications with high technical requirements mainly in heavy machine building and rail applications  
 Suitable for occasional rotation  
 Thread and integrated swivel adapter made from colourless anodized aluminium  
 High thread and system connection strength  
 Smooth elbow allows easy threading of wires and cables

<sup>4</sup> IP68GT available. Please add  
 "GT" prior to the thread length  
 (for example NSBV-M329GT-13)

## Swivel connectors, metric/NPT metal thread

### Type SNV

#### Type SNV - Swivel connector, straight, IP68 metric metal thread


	Order no. IP68, black <sup>4</sup>	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NSNV-M120-10	M12 x 1.5	10	12	10.0	50.5
	NSNV-M162-10	M16 x 1.5	12	16	10.0	53.5
	NSNV-M207-10	M20 x 1.5	17	20	10.0	62.5
	NSNV-M253-11	M25 x 1.5	23	25	11.0	67.5
	NSNV-M329-13	M32 x 1.5	29	32	13.0	72.0
	NSNV-M329-7	M32 x 1.5	29	32	7.0	66.0
	NSNV-M406-13	M40 x 1.5	36	40	13.0	85.5
	NSNV-M406-7	M40 x 1.5	36	40	7.0	79.5
	NSNV-M409-13	M40 x 1.5	29	32	13.0	72.0
	NSNV-M508-14	M50 x 1.5	48	50	14.0	87.5
NSNV-M638-14	M63 x 1.5	48	50	14.0	84.0	

#### Approvals



For applications in railway vehicles and heavy machine construction  
 Specially formulated polyamide 6  
 Thread and integrated swivel adapter made from nickel-plated brass  
 Very high impact resistance. High thread and system connection strength. Suitable for occasional rotation  
 Easy introduction of wires and cables  
 Vibration-proof connection to PMAFLEX conduits  
 Very good chemical properties  
 Free from halogens and cadmium  
 Fits both conduit profiles – fine (T) and coarse (G)  
 IP68, IP69

#### Type SNV - Swivel connector, straight, NPT metal thread

	Order no. IP68, black <sup>4</sup>	Thread NPT	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NSNV-N022/01	½"	12	16	15.4	58.0
	NSNV-N027/01	½"	17	20	15.4	66.5
	NSNV-N043/01	¾"	23	25	15.7	72.0
	NSNV-N069/01	1"	29	32	19.6	77.5
	NSNV-N076/01	1¼"	36	40	20.2	91.5
	NSNV-N088/01	1½"	48	50	20.6	92.0
	NSNV-N098/01	2"	48	50	21.4	93.0

#### Approvals




For applications with high technical requirements mainly in machine building  
 Specially formulated polyamide 6  
 Thread and integrated swivel adapter made from colourless anodized aluminium  
 Very high impact resistance. High thread and system connection strength. Suitable for occasional rotation  
 Easy introduction of wires and cables  
 Vibration-proof connection to PMAFLEX conduits  
 Very good chemical properties  
 Free from halogens and cadmium  
 Fits both conduit profiles – fine (T) and coarse (G)  
 IP68, IP69

<sup>4</sup> IP68GT available. Please add  
 "GT" prior to the thread length  
 (for example NSBV-M329GT-13)

## Swivel connectors with female NPT metal thread

### Type SNIV & SBIV

#### Type SNIV - Swivel connector straight, female NPT metal thread, IP68


	Order no. black <sup>4</sup>	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NSNIV-N022/01	½"	12	16	13.6	59.0
	NSNIV-N027/01	½"	17	20	13.6	67.0
	NSNIV-N043/01	¾"	23	25	14.1	72.5
	NSNIV-N069/01	1"	29	32	16.8	76.5
	NSNIV-N076/01	1¼"	36	40	17.3	91.5
	NSNIV-N088/01	1½"	48	50	17.3	93.5
	NSNIV-N098/01	2"	48	50	17.8	93.0

#### Approvals



For applications with high technical requirements mainly in machine building

#### Type SBIV - 360° Swivel connector, 90° curved elbow, IP68, female NPT metal thread

	Order no. IP68, black <sup>4</sup>	Thread NPT	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NSBIV-N022/01	½"	12	16	13.6	48.5 x 46.5
	NSBIV-N027/01	½"	17	20	13.6	67.0 x 74.5
	NSBIV-N043/01	¾"	23	25	14.1	78.0 x 87.5
	NSBIV-N069/01	1"	29	32	16.8	91.0 x 98.0
	NSBIV-N076/01	1¼"	36	40	17.3	104.5 x 125.5
	NSBIV-N088/01	1½"	48	50	17.3	119.5 x 138.5
	NSBIV-N098/01	2"	48	50	17.8	119.0 x 138.5

#### Approvals




Technical requirements mainly in heavy machine building and rail applications  
 Suitable for occasional rotation  
 Specially formulated polyamide 6  
 Thread and integrated swivel adapter made from colourless anodized aluminium  
 Very high impact resistance  
 High thread and system connection strength  
 Suitable for occasional rotation  
 Easy introduction of wires and cables  
 Vibration-proof connection to PMAFLEX conduits  
 Very good chemical properties  
 Free from halogens and cadmium  
 Fits both conduit profiles – fine (T) and coarse (G)  
 IP68, IP69

<sup>4</sup> IP68GT available. Please add  
 "GT" prior to the thread length  
 (for example NSBV-M329GT-13)

# Flanges, connectors with female, metric thread


## Type VO & VI

### Type VO - Flange 90°

	Order no. IP66 ①	Order no. IP68 ① ②	Fits to conduit size		Width x Length x Depth (mm)	Screw sizes
			NW	Metric		
	BVOD-P167GT	BVOV-P167	17	20	46.0 x 65.5 x 35.8	2 x M5
	BVOD-P213GT	BVOV-P213	23	25	65.5 x 70.5 x 43.2	2 x M6
	BVOD-P299GT	BVOV-P299	29	32	67.0 x 78.0 x 49.5	4 x M6
	BVOD-P366GT	BVOV-P366	36	40	85.0 x 102.0 x 65.5	4 x M6
	BVOD-P488GT	BVOV-P488	48	50	86.0 x 119.0 x 77.5	4 x M6

For cable protection systems in a wide range of applications  
 Flange seal FGO4 made from EPDM, flange seal FGO4/01 made from NBR  
 Temperature range with FGO4: -40°C to +105°C  
 Temperature range with FGO4/01: -25°C to +70°C

### Type VI - Connector straight, female metric thread

	Order no. IP66, black	Order no. IP68, black ②	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BVID-M12MGT	-	M12 x 1.5	07	10	8.0	32.0
	BVID-M160GT	BVIR-M160	M16 x 1.5	10	12	8.0	33.5
	BVID-M162GT	BVIR-M162	M16 x 1.5	12	16	8.0	36.5
	-	BVIR-M202	M20 x 1.5	12	16	8.0	36.5
	BVID-M207GT	BVIR-M207	M20 x 1.5	17	20	8.0	44.5
	BVID-M253GT	BVIR-M253	M25 x 1.5	23	25	8.0	48.5
	-	BVIR-M257	M25 x 1.5	17	20	8.0	44.5
	BVID-M329GT	BVIR-M329	M32 x 1.5	29	32	10.0	51.5
	BVID-M406GT	BVIR-M406	M40 x 1.5	36	40	10.0	65.5
	BVID-M508GT	BVIR-M508	M50 x 1.5	48	50	10.0	65.5
	BVID-M638GT	BVIR-M638	M63 x 1.5	48	50	10.0	65.5

#### Approvals



For cable protection systems in a wide range of applications  
 VID: IP66 static/IP54 dynamic, conduit side  
 VIR: IP68 static/IP67 dynamic, conduit side  
 No seal on female thread side


① Please replace "B" for black with "S" for grey in front of the order no.  
 ② IP68GT available. Please add "GT" after the order no.



## Connectors with female, metric metal thread

### Type VIR

#### Type VIR - Connector straight, female metric metal thread

	Order no. IP68, black ②	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NVIR-M120	M12 x 1.5	10	12	7.5	35.0
	NVIR-M160	M16 x 1.5	10	12	9.0	40.5
	NVIR-M162	M16 x 1.5	12	16	9.0	42.0
	NVIR-M207	M20 x 1.5	17	20	10.0	50.0
	NVIR-M253	M25 x 1.5	23	25	10.0	56.0
	NVIR-M329	M32 x 1.5	29	32	11.0	55.5
	NVIR-M406	M40 x 1.5	36	40	13.0	71.0
	NVIR-M508	M50 x 1.5	48	50	15.0	75.0
	NVIR-M638	M63 x 1.5	48	50	17.5	76.0

#### Approvals



For applications in railway vehicles and heavy machine construction  
 High thread and system connection strengths  
 VIR: IP68 static/IP67 dynamic, conduit side  
 No seal on female thread side


① Please replace "B" for black with "S" for grey in front of the order no.

② IP68GT available. Please add "GT" after the order no.

## Connector straight, PG female thread

### Type FIL/VIR & VIZR

#### Type FIL/VIR - Connector straight, female PG thread

	Order no. IP67, black	Order no. IP68, black <sup>②</sup>	Thread PG	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BFIL-P07M	–	07	07	10	8.0	29.0
	BFIL-P070	–	07	10	12	8.0	34.5
	–	BVIR-P070	07	10	12	8.0	33.5
	BFIL-P090	–	09	10	12	8.0	32.5
	–	BVIR-P090	09	10	12	8.0	33.5
	BFIL-P112	–	11	12	16	8.0	32.5
	–	BVIR-P112	11	12	16	8.0	36.5
	BFIL-P117	–	11	17	20	8.0	35.0
	BFIL-P132	–	13.5	12	16	8.0	32.5
	BFIL-P137	–	13.5	17	20	8.0	33.5
	BFIL-P160	–	16	10	12	7.0	37.0
	BFIL-P167	–	16	17	20	8.0	33.5
	–	BVIR-P167	16	17	20	8.0	44.5
	BFIL-P217	–	21	17	20	10.5	35.5
	BFIL-P213	–	21	23	25	8.0	39.0
	BFIL-P293	–	29	23	25	9.0	42.0
	BFIL-P299	–	29	29	32	9.0	43.0
	BFIL-P369	–	36	29	32	16.0	52.0
	BFIL-P366	–	36	36	25	13.0	64.0
	BFIL-P488	–	48	48	50	13.0	65.0


For cable protection systems in a wide range of applications

VIR: IP68 static/IP67 dynamic, conduit side

FIL: IP67 static/IP65 dynamic, conduit side

No seal on female thread side

#### Type VIZR - Connector straight, female PG metal thread

	Order no. IP68, black <sup>②</sup>	Thread PG	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NVIZR-P07M	07	07	10	6.0	35.0
	NVIZR-P090	09	10	12	9.0	38.5
	NVIZR-P110	11	10	12	9.0	41.0
	NVIZR-P112	11	12	16	9.0	42.0
	NVIZR-P137	13.5	17	20	8.0	46.5
	NVIZR-P167	16	17	20	9.5	48.0
	NVIZR-P213	21	23	25	10.0	58.0
	NVIZR-P299	29	29	32	12.5	57.0
	NVIZR-P366	36	36	40	13.0	76.0
	NVIZR-P488	48	48	50	14.0	75.0

For applications in railway vehicles and heavy machine construction

High thread and system connection strengths

VIZR: IP68 static/IP67 dynamic, conduit side


No seal on female thread side

<sup>②</sup> IP68GT available. Please add  
"GT" after the order no.

## Connectors with female UNEF thread

### Type VI

#### Type VI - Connector straight, UNEF female thread for AMP connectors

	Order no. IP66, black	Order no. IP68, black ②	Thread UNEF	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BVIDA-U15MGT	BVIRA-U15M	5/8"-24	07	10	8.0	31.5
	BVIDA-U150GT	BVIRA-U150	5/8"-24	10	12	8.0	33.5
	BVIDA-U152GT	BVIRA-U152	5/8"-24	12	16	8.0	36.5
	BVIDA-U180GT	BVIRA-U180	3/4"-20	10	12	8.0	33.5
	BVIDA-U182GT	BVIRA-U182	3/4"-20	12	16	8.0	36.5
	BVIDA-U187GT	BVIRA-U187	3/4"-20	17	20	8.0	44.5
	BVIDA-U232GT	BVIRA-U232	1 5/16"-20	12	16	8.0	38.5
	BVIDA-U237GT	BVIRA-U237	1 5/16"-20	17	20	8.0	46.5
	BVIDA-U233GT	BVIRA-U233	1 5/16"-20	23	25	8.0	48.5
	BVIDA-U347GT	BVIRA-U347	1 3/8"-18	17	20	8.0	46.5
	BVIDA-U343GT	BVIRA-U343	1 3/8"-18	23	25	8.0	48.5
	BVIDA-U402GT	BVIRA-U402	1 5/8"-18	12	16	7.0	55.5
	BVIDA-U407GT	BVIRA-U407	1 5/8"-18	17	20	7.0	61.5
	BVIDA-U403GT	BVIRA-U403	1 5/8"-18	23	25	7.0	60.5

For cable protection systems in a wide range of applications  
 Suitable for the AMP connector serie CPC  
 VIDA: IP66 static/IP54 dynamic, conduit side. VIRA: IP68 static/IP67 dynamic, conduit side  
 No seal on female thread side

#### Type VI - Connector straight, UNEF female thread for Souriau connectors

	Order no. IP66, black	Order no. IP68, black ②	Thread UNEF	Fits to NW	Shell size UTG-6	Thread length (mm)	Overall length (mm)
BVIDB-U202GT	BVIRB-U202	1 3/16"-20	12	14-12	4.5	44.0	
BVIDB-U232GT	BVIRB-U232	1 5/16"-20	12	16-19	4.5	49.0	
BVIDB-U237GT	BVIRB-U237	1 5/16"-20	17	16-19	4.5	52.0	
BVIDB-U267GT	BVIRB-U267	1 1/2"-18	17	18-23	4.5	52.0	
BVIDB-U297GT	BVIRB-U297	1 3/16"-18	17	20-28	6.5	55.5	
BVIDB-U293GT	BVIRB-U293	1 3/16"-18	23	20-28	6.5	52.0	
BVIDB-U323GT	BVIRB-U323	1 5/16"-18	23	22-35	6.5	52.0	
BVIDB-U357GT	BVIRB-U357	1 7/16"-18	17	24-48	6.5	58.5	
BVIDB-U353GT	BVIRB-U353	1 7/16"-18	23	24-48	6.5	54.0	
BVIDB-U359GT	BVIRB-U359	1 7/16"-18	29	24-48	6.5	50.5	

For cable protection systems in a wide range of applications  
 Suitable for the Souriau connector series UTG-6/ITT Cannon Trident  
 VIDB: IP66 static/IP54 dynamic, conduit side. VIRB: IP68 static/IP67 dynamic, conduit side  
 No seal on female thread side

	Order no. IP68, black ②	Thread UNEF	Fits to NW	Shell size UTG-6	Thread length (mm)	Overall length (mm)
	BVIRS-U162	1 1/16"-24	12	12	9.4	47.5
	BVIRS-U202	1 3/16"-20	12	14	9.4	47.5
	BVIRS-U237	1 5/16"-20	17	16	10.0	56.0
	BVIRS-U267	1 1/2"-18	17	18	9.2	55.5
	BVIRS-U293	1 3/16"-18	23	20	9.8	56.0
	BVIRS-U323	1 5/16"-18	23	22	9.8	56.0
	BVIRS-U359	1 7/16"-18	29	24	9.7	55.5


② IP68GT available. Please add "GT" after the order no.

For cable protection systems in a wide range of applications  
 Suitable for the Souriau connector series UTO and UTS  
 VIRS: IP68 static/IP67 dynamic, conduit side. No seal on female thread side

## Connectors with female UN thread

### Type VI

Type VI - Connector straight, UN female thread for MIL-C5015

	Order no. IP66, black	Order no. IP68, black <sup>②</sup>	Thread UN	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	-	BVIVG-U152*	5/8" -24 UNEF	12	16	8.0	36.5
	-	BVIVG-U187*	3/4" -20 UNEF	17	20	9.0	46.5
	-	BVIVG-U210*	7/8" -20 UNEF	10	07	9.0	37.0
	BVIDG-U212GT	BVIVG-U212*	7/8" -20 UNEF	12	16	9.0	38.5
	BVIDG-U217GT	BVIVG-U217*	7/8" -20 UNEF	17	20	9.0	46.5
	BVIDG-U242GT	BVIVG-U242*	1" -20 UNEF	12	16	9.0	40.5
	-	BVIVG-U243*	1" -20 UNEF	23	25	9.0	55.0
	BVIDG-U247GT	BVIVG-U247*	1" -20 UNEF	17	20	9.0	47.5
	-	BVIVG-U292*	1 3/16" -18 UNEF	12	16	9.0	40.5
	BVIDG-U293GT	BVIVG-U293*	1 3/16" -18 UNEF	23	25	9.0	55.0
	BVIDG-U297GT	BVIVG-U297*	1 3/16" -18 UNEF	17	20	9.0	47.5
	-	BVIVG-U299*	1 3/16" -18 UNEF	29	32	9.0	47.0
	-	BVIVG-U349*	1 3/8" -18 UNEF	29	32	9.0	52.0
	-	BVIVG-U352*	1 7/16" -18 UNEF	12	16	9.0	39.0
	BVIDG-U353GT	BVIVG-U353*	1 7/16" -18 UNEF	23	25	9.0	52.0
	-	BVIVG-U356*	1 7/16" -18 UNEF	36	40	9.0	63.0
	BVIDG-U357GT	BVIVG-U357*	1 7/16" -18 UNEF	17	20	9.0	46.5
	BVIDG-U359GT	BVIVG-U359*	1 7/16" -18 UNEF	29	29	9.0	52.0
	BVIDG-U433GT	BVIVG-U433*	1 3/4" -18 UNS	23	25	10.0	52.0
	BVIDG-U436GT	BVIVG-U436*	1 3/4" -18 UNS	36	40	10.0	62.5
	-	BVIVG-U437*	1 3/4" -18 UNS	17	20	10.0	46.5
	BVIDG-U439GT	BVIVG-U439*	1 3/4" -18 UNS	29	32	10.0	51.5
	-	BVIVG-U503*	2" -18 UNS	23	25	10.0	51.5
	BVIDG-U506GT	BVIVG-U506*	2" -18 UNS	36	40	10.0	62.5
	-	BVIVG-U508*	2" -18 UNS	48	50	10.0	64.5
	BVIDG-U509GT	BVIVG-U509*	2" -18 UNS	29	32	10.0	55.0
	-	BVIVG-U563*	2 1/4" -16 UN	23	25	10.0	51.0
	BVIDG-U566GT	BVIVG-U566*	2 1/4" -16 UN	36	40	10.0	62.0
	-	BVIVG-U568*	2 1/4" -16 UN	48	50	10.0	64.0
	BVIDG-U569GT	BVIVG-U569*	2 1/4" -16 UN	29	32	10.0	51.0
-	BVIVG-U628*	2 1/2" -16 UN	48	50	10.0	64.0	

#### Approvals



For applications in machine, vehicle and traction building industries

Suitable for MIL connector series C5015

VIDG: IP66 static/IP54 dynamic, conduit- and thread side

VIVG: IP68 static/IP67 dynamic, conduit- and thread side

No seal on female thread side


\* UL Recognition according to UL 1619

<sup>②</sup> IP68GT available. Please add  
"GT" after the order no.

## Y, T pieces, conduit adapters

### Type VY & VT

#### Type VY - Y piece


	Order no. IP66 ①	Order no. IP68 ① ②	1 x conduit size		2 x conduit size	
			NW	Metric	NW	Metric
	BVYD-100707GT	BVYR-100707	10	12	07	10
	BVYD-121010GT	BVYR-121010	12	16	10	12
	BVYD-171212GT	BVYR-171212	17	20	12	16
	BVYD-231717GT	BVYR-231717	23	25	17	20
	BVYD-292323GT	BVYR-292323	29	32	23	25
	BVYD-362929GT	BVYR-362929	36	40	29	32
	BVYD-483636GT	BVYR-483636	48	50	36	40

#### Approvals



Sizes can be adapted with AV conduit adapters to fit smaller conduit dimensions

#### Type VT - T piece

	Order no. IP66 ①	Order no. IP68 ① ②	3 x conduit size	
			NW	Metric
	BVTD-101010GT	BVTR-101010	10	12
	BVTD-121212GT	BVTR-121212	12	16
	BVTD-171717GT	BVTR-171717	17	20
	BVTD-232323GT	BVTR-232323	23	25
	BVTD-292929GT	BVTR-292929	29	32
	BVTD-363636GT	BVTR-363636	36	40
	BVTD-484848GT	BVTR-484848	48	50

#### Approvals



Sizes can be adapted with AV conduit adapters to fit smaller conduit dimensions


① Please replace "B" for black with "S" for grey in front of the order no.  
 ② IP68GT available. Please add "GT" after the order no.



## Y, T pieces, conduit adapters

### Type AV

#### Type AV - Conduit adapter

	Order no. IP66, black	Order no. IP68, black	Fits to fitting for		Fits to fitting size		Overall length (mm)
			NW	Metric	NW	Metric	
AV 	-	BAVR-10/07	10	12	07	10	43.0
	BAVD-12/10GT	BAVR-12/10	12	16	10	12	46.0
	BAVD-17/10GT	BAVR-17/10	17	20	10	12	53.0
	BAVD-17/12GT	BAVR-17/12	17	20	12	16	54.0
	BAVD-23/10GT	BAVR-23/10	23	25	10	12	54.0
	BAVD-23/12GT	BAVR-23/12	23	25	12	16	53.0
	BAVD-23/17GT	BAVR-23/17	23	25	17	20	62.0
	BAVD-29/10GT	BAVR-29/10	29	32	10	12	56.5
	BAVD-29/12GT	BAVR-29/12	29	32	12	16	55.0
	BAVD-29/17GT	BAVR-29/17	29	32	17	20	61.0
	BAVD-29/23GT	BAVR-29/23	29	32	23	25	64.0
	BAVD-36/29GT	BAVR-36/29	36	40	29	32	81.0
	BAVD-48/36GT	BAVR-48/36	48	50	36	40	88.5

#### Approvals




Allows conduit size reduction of PMA connectors, particularly of T and Y pieces

## Connections, connection splices, metric, PG

### Type VNR-REM & VSG

#### Type VNR-REM - Connection to solid metal tube, metric/PG

	Order no. IP66 without clamp ① ②	Order no. IP68 with clamp ① ②	Fits to conduit size		Steel tube metric	Inside Ø (mm)	Overall length (mm)
			NW	Metric			
	BVNR-REM162	BVNR-REM162-24	12	16	M16	16.0	54.0
	BVNR-REM187	BVNR-REM187-28	17	20	M18	18.5	65.0
	BVNR-REM207	BVNR-REM207-28	17	20	M20	20.0	65.0
	BVNR-REM253	BVNR-REM253-32	23	25	M25	26.0	71.0
	BVNR-REM329	BVNR-REM329-44	29	32	M32	32.0	71.0
	BVNR-REM406	BVNR-REM406-50	36	40	M40	40.0	90.0
	BVNR-REM508	BVNR-REM508-65	48	50	M50	50.0	90.0

	Order no. IP66 without clamp ① ②	Order no. IP68 with clamp ① ②	Fits to conduit size		Steel tube PG	Inside Ø (mm)	Overall length (mm)
			NW	Metric			
	BVNR-RE12	BVNR-RE12-24	12	16	PG11	18.5	56.0
	BVNR-RE1317	BVNR-RE1317-28	17	20	PG13	20.4	65.0
	BVNR-RE17	BVNR-RE17-28	17	20	PG16	22.5	65.0
	BVNR-RE23	BVNR-RE23-32	23	25	PG21	28.5	71.0
	BVNR-RE29	BVNR-RE29-44	29	32	PG29	37.0	71.0
	BVNR-RE36	BVNR-RE36-50	36	40	PG36	47.0	84.0
	BVNR-RE48	BVNR-RE48-65	48	50	PG48	59.3	90.0


Quick connection of solid metal tubes with flexible PMA conduits

Jubilee clip made of galvanised bright steel

Available with or without jubilee clip

IP68 on corrugated conduit side, on tube side up to IP68 with sealant

#### Type VSG - Connection splice for flexible conduits

	Order no. IP66 ①	Order no. IP68 ①	Fits to conduit size		Inside Ø (mm)	Overall length (mm)
			NW	Metric		
	BVSGD-1212GT	BVSGR-1212	12	16	23.5	66.0
	BVSGD-1717GT	BVSGR-1717	17	20	29.5	87.0
	BVSGD-2323GT	BVSGR-2323	23	25	37.0	103.0
	BVSGD-2929GT	BVSGR-2929	29	32	44.0	100.0
	BVSGD-3636GT	BVSGR-3636	36	40	53.5	130.0
	BVSGD-4848GT	BVSGR-4848	48	50	66.0	133.0

#### Approvals



Designed for optimal connection of PMA conduits


① Please replace "B" for black with "S" for grey in front of the order no.

② IP68GT available. Please add "GT" to order no. or insert before clamp size (e.g. BVNR-REM162GT, BVNR-REM162GT-24)

## PMA FIXPlus fittings with metric threads

### Type UNV-M-UL & UAV-M-UL

#### Type UNV-M-UL - Connector straight, metric thread


	Order no. black	Order no. grey	Thread metric	Fits to conduit size NW	Thread length (mm)	Outside Ø (mm)	Overall length (mm)
	BUNV-M207-UL	SUNV-M207-UL	M20 x 1.5	17	11.0	29.5	47.5
	BUNV-M257-UL	SUNV-M257-UL	M25 x 1.5	17	12.0	32.0	48.5
	BUNV-M253-UL	SUNV-M253-UL	M25 x 1.5	23	12.0	37.0	52.0
	BUNV-M323-UL	SUNV-M323-UL	M32 x 1.5	23	15.0	43.0	55.5
	BUNV-M329-UL	SUNV-M329-UL	M32 x 1.5	29	15.0	44.0	56.0
	BUNV-M409-UL	SUNV-M409-UL	M40 x 1.5	29	19.0	49.0	60.0
	BUNV-M406-UL	SUNV-M406-UL	M40 x 1.5	36	19.0	55.0	72.5
	BUNV-M506-UL	SUNV-M506-UL	M50 x 1.5	36	19.0	59.0	72.0
	BUNV-M508-UL	SUNV-M508-UL	M50 x 1.5	48	19.0	69.0	72.5
	BUNV-M638-UL	SUNV-M638-UL	M63 x 1.5	48	19.0	75.0	72.0

#### Approvals



Extremely high impact resistance  
 Vibration-resistant connection to PMA FLEXPlus conduits  
 Easy installation  
 High conduit pull-out strength  
 Very good chemical properties  
 Free from halogens and cadmium  
 Fits conduit profile coarse (G)  
 Lock nut delivered with the fitting

#### Type UAV-M-UL - Connector 45° elbow, metric thread

	Order no. black	Order no. grey	Thread metric	Fits to conduit size NW	Thread length (mm)	Outside Ø (mm)	Overall length (mm)	Overall height (mm)
	BUAV-M207-UL	SUAV-M207-UL	M20 x 1.5	17	11.0	29.5	55.5	51.5
	BUAV-M253-UL	SUAV-M253-UL	M25 x 1.5	23	12.0	37.0	65.0	58.5
	BUAV-M329-UL	SUAV-M329-UL	M32 x 1.5	29	15.0	44.0	73.5	66.5
	BUAV-M406-UL	SUAV-M406-UL	M40 x 1.5	36	19.0	53.5	92.5	85.5
	BUAV-M506-UL	SUAV-M506-UL	M50 x 1.5	36	19.0	53.5	92.5	89.5
	BUAV-M508-UL	SUAV-M508-UL	M50 x 1.5	48	19.0	66.0	100.0	96.0
	BUAV-M638-UL	SUAV-M638-UL	M63 x 1.5	48	19.0	66.0	100.0	104.0

#### Approvals



Extremely high impact resistance  
 Vibration-resistant connection to PMA FLEXPlus conduits  
 Easy installation  
 High conduit pull-out strength  
 Very good chemical properties  
 Free from halogens and cadmium  
 Fits conduit profile coarse (G)  
 Lock nut delivered with the fitting

## PMA FIXPlus fittings with metric threads

### Type UWV-M-UL

#### Type UWV-M-UL - Connector 90° elbow, metric thread

	Order no. black	Order no. grey	Thread metric	Fits to conduit size NW	Thread length (mm)	Outside Ø (mm)	Overall length (mm)	Overall height (mm)
UNV-M-UL	BUWV-M207-UL	SUWV-M207-UL	M20 x 1.5	17	11.0	29.5	58.5	43.5
	BUWV-M253-UL	SUWV-M253-UL	M25 x 1.5	23	12.0	37.0	65.0	54.0
	BUWV-M329-UL	SUWV-M329-UL	M32 x 1.5	29	15.0	44.0	73.0	64.5
	BUWV-M406-UL	SUWV-M406-UL	M40 x 1.5	36	19.0	53.5	69.0	78.0
	BUWV-M508-UL	SUWV-M508-UL	M50 x 1.5	48	19.0	66.0	106.0	91.5



#### Approvals




- Extremely high impact resistance
- Vibration-resistant connection to PMA FLEXPlus conduits
- Easy installation
- High conduit pull-out strength
- Very good chemical properties
- Free from halogens and cadmium
- Fits conduit profile coarse (G)
- Lock nut delivered with the fitting

## PMA FIXPlus fittings with NPT threads

### Type UNV-N-UL & UAV-N-UL

#### Type UNV-N-UL - Connector straight, NPT thread


	Order no. black	Order no. grey	Thread size NPT	Fits to conduit size NW	Thread length (mm)	Outside Ø (mm)	Overall length (mm)
	BUNV-N027-UL	SUNV-N027-UL	½"	17	13.0	29.5	49.5
	BUNV-N043-UL	SUNV-N043-UL	¾"	23	14.0	37.0	54.0
	BUNV-N069-UL	SUNV-N069-UL	1"	29	15.0	44.0	56.0
	BUNV-N076-UL	SUNV-N076-UL	1¼"	36	18.0	55.0	71.0
	BUNV-N088-UL	SUNV-N088-UL	1½"	48	18.0	69.0	71.5
	BUNV-N098-UL	SUNV-N098-UL	2"	48	18.0	69.0	71.5

#### Approvals



Extremely high impact resistance  
 Vibration-resistant connection to PMA FLEXPlus conduits  
 Easy installation  
 High conduit pull-out strength  
 Very good chemical properties  
 Free from halogens and cadmium  
 Fits conduit profile coarse (G)  
 Lock nuts available on request

#### Type UAV-N-UL - Connector 45° elbow, metric thread

	Order no. black	Order no. grey	Thread size NPT	Fits to conduit size NW	Thread length (mm)	Outside Ø (mm)	Overall length (mm)	Overall height (mm)
	BUAV-N027-UL	SUAV-N027-UL	½"	17	13.0	29.5	57.5	51.5
	BUAV-N043-UL	SUAV-N043-UL	¾"	23	14.0	37.0	67.0	60.0
	BUAV-N069-UL	SUAV-N069-UL	1"	29	15.0	44.0	73.5	67.0
	BUAV-N076-UL	SUAV-N076-UL	1¼"	36	18.0	53.5	91.5	85.5
	BUAV-N088-UL	SUAV-N088-UL	1½"	36	18.0	66.0	99.0	96.0
	BUAV-N098-UL	SUAV-N097-UL	2"	48	18.0	66.0	99.0	101.0

#### Approvals




Extremely high impact resistance  
 Vibration-resistant connection to PMA FLEXPlus conduits  
 Easy installation  
 High conduit pull-out strength  
 Very good chemical properties  
 Free from halogens and cadmium  
 Fits conduit profile coarse (G)  
 Lock nuts available on request



## PMA FIXPLus fittings with NPT threads

### Type UWV-M-UL

#### Type UWV-M-UL - Connector 90° elbow, NPT thread

	Order no. black	Order no. grey	Thread size NPT	Fits to conduit size NW	Thread length (mm)	Outside Ø (mm)	Overall length (mm)	Overall height (mm)
UNV-N-UL	BUWV-N027-UL	SUWV-N027-UL	½"	17	13.0	29.5	58.5	45.5
	BUWV-N043-UL	SUWV-N043-UL	¾"	23	14.0	37.0	66.5	56.0
	BUWV-N069-UL	SUWV-N069-UL	1"	29	15.0	44.0	73.5	64.5
	BUWV-N076-UL	SUWV-N076-UL	1¼"	36	18.0	53.5	96.0	77.0
	BUWV-N088-UL	SUWV-N088-UL	1½"	48	18.0	66.0	106.0	90.5
	BUWV-N098-UL	SUWV-N098-UL	2"	48	18.0	66.0	111.0	90.5

#### Approvals



Extremely high impact resistance  
 Vibration-resistant connection to PMA FLEXPLus conduits  
 Easy installation  
 High conduit pull-out strength  
 Very good chemical properties  
 Free from halogens and cadmium  
 Fits conduit profile coarse (G)  
 Lock nuts available on request







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# Special connectors

## Introduction

Meeting the demands of our customers. We are always looking for ways to offer our best services.

In addition to the broad ranges of connectors offered within the PMAFIX Pro, PMAFIX and Smartline product lines, PMA offers further application specific connector solutions such as the MPNK-M series for high temperatures applications, JENQ-M series for Food and Beverage applications and the MONK-M to terminate an overbraided conduit.






## Metal connectors, metric


### Type MPNK & MONK

#### Type MPNK - Metal connector for PMA conduits, metric thread

	Order no. metal	Thread metric	Fits to conduit size NW	Fits to conduit size profile	Inside Ø min. (mm)	Thread length (mm)
	MPNK-M160	M16 x 1.5	10	T	12.0	12.0
	MPNK-M162	M16 x 1.5	12	T	12.0	12.0
	MPNK-M207	M20 x 1.5	17	T	15.8	14.0
	MPNK-M253	M25 x 1.5	23	G	19.0	15.0
	MPNK-M329	M32 x 1.5	29	G	26.5	18.0

For high temperature applications  
 Suitable for high mechanical loads  
 Nickel-plated brass  
 Seals made from silicon  
 Easy introduction of wires and cables  
 Vibration-proof connection to PMAFLEX conduits  
 Very good chemical properties  
 IP68

#### Type MONK - Metal connector for overbraided conduits, metric thread

	Order no. metal	Thread metric	Fits to conduit size NW	Fits to conduit profile	Inside Ø min. (mm)	Thread length (mm)
	MONK-M162	M16 x 1.5	12	T	12.0	12.0
	MONK-M207	M20 x 1.5	17	T	16.0	14.0
	MONK-M253	M25 x 1.5	23	G	19.0	15.0
	MONK-M329	M32 x 1.5	29	G	26.5	18.0
	MONK-M406	M40 x 1.5	36	G	35.0	15.0
	MONK-M508	M50 x 1.5	48	G	45.0	16.0

For termination of overbraided conduits  
 For high temperature applications and applications in areas with hot metal shavings and flying sparks  
 Nickel-plated brass  
 Seals made from silicon



## Stainless steel liquid tight fitting

### Type JENQ

Type JENQ - for overextruded conduit, IP69

	Order no.	Thread size metric	Fits to conduit size NW	Thread length (mm)	Inside Ø min. (mm)	Ø D (mm)	Wrench size (mm)	sw
JENQ	JENQ-M162-10	M16 x 1.5	12	10.0	9.2	31.9	35.9	30.0
	JENQ-M207-10	M20 x 1.5	17	10.0	13.0	35.0	36.9	32.0
	JENQ-M253-11	M25 x 1.5	23	11.0	18.3	44.5	41.6	40.0
	JENQ-M329-13	M32 x 1.5	29	13.0	24.0	55.5	48.7	50.0
	JENQ-M406-13	M40 x 1.5	36	13.0	32.4	61.5	51.2	57.0
	JENQ-M506-14	M50 x 1.5	48	14.0	42.3	78.0	57.4	74.0



#### Approvals



IP 69 rating  
 For termination of overextruded conduits  
 For high hygienic requirements  
 Suitable for food & beverage industry  
 Unique single piece design Stainless Steel 316L material  
 Seals made from FDA compliant material  
 Easy cleaning  
 High thread and system connection strengths  
 High resistance to chemicals and cleaning agents  
 Easy assembly

# Accessories

## Introduction

For flexible and application friendly solutions. PMA offers a vast array of practical accessories in order to complete the PMA cable protection system.

We offer lock nuts produced from polyamide or metal, thread reducers and enlargers, conduit adapters, swivel adapters as well as different mounting clips for conduits. All these practical products will help to create the PMA line for our customers even more flexible and application friendly.









## Flat gaskets, metric, PG, NPT, GAS

### Type SVN4

#### Type SVN4 - Flat thread gasket, metric/NPT/PG/GAS

Order no.	Fits to thread metric	Inside Ø (mm)	Outside Ø (mm)	Thickness (mm)
SVN4				
SVN4-M12	M12 x 1.5	12.0	20.0	1.5
SVN4-M12/02	M12 x 1.5	12.0	23.0	1.5
SVN4-M16	M16 x 1.5	16.0	22.0	1.5
SVN4-M16/02	M16 x 1.5	16.0	25.0	1.5
SVN4-M20	M20 x 1.5	20.0	27.0	1.5
SVN4-M20/02	M20 x 1.5	20.0	33.0	1.5
SVN4-M25	M25 x 1.5	25.0	35.0	1.5
SVN4-M25/01	M25 x 1.5	25.0	31.0	1.5
SVN4-M25/02	M25 x 1.5	25.0	39.0	1.5
SVN4-M32	M32 x 1.5	32.0	43.0	1.5
SVN4-M32/02	M32 x 1.5	32.0	49.0	1.5
SVN4-M40	M40 x 1.5	40.0	55.0	1.5
SVN4-M40/01	M40 x 1.5	40.0	51.0	1.5
SVN4-M40/02	M40 x 1.5	40.0	64.0	1.5
SVN4-M50	M50 x 1.5	50.0	69.0	1.5
SVN4-M50/01	M50 x 1.5	50.0	59.0	1.5
SVN4-M50/02	M50 x 1.5	50.0	74.0	1.5
SVN4-M63	M63 x 1.5	63.0	75.0	1.5

Order no.	Fits to thread PG	Inside Ø (mm)	Outside Ø (mm)	Thickness (mm)
SVN4-07	07	12.5	16.5	1.5
SVN4-09	07	15.2	20.0	1.5
SVN4-11	11	18.6	24.0	1.5
SVN4-13	13.5	20.4	31.0	1.5
SVN4-16	16	22.5	31.0	1.5
SVN4-21	21	28.3	37.0	1.5
SVN4-29	29	37.0	48.0	1.5
SVN4-36	36	47.0	57.0	1.5
SVN4-42	42	54.0	60.0	1.5
SVN4-48	48	59.3	69.0	1.5

Order no.	Fits to thread PG	Inside Ø (mm)	Outside Ø (mm)	Thickness (mm)
SVN4-N02/01	½"	28.0	21.6	1.5
SVN4-N04/01	¾"	36.0	27.0	1.5
SVN4-N06/01	1"	46.0	33.7	1.5
SVN4-N07/01	1¼"	55.0	42.5	1.5
SVN4-N08/01	1½"	70.0	48.6	1.5
SVN4-N09/01	2"	70.0	60.7	1.5

Order no.	Fits to thread GAS	Inside Ø (mm)	Outside Ø (mm)	Thickness (mm)
SVN4-G00	¼"	13.2	20.0	1.5
SVN4-G01	⅜"	16.7	22.0	1.5
SVN4-G02	½"	21.0	28.0	1.5
SVN4-G04	¾"	26.5	34.0	1.5
SVN4-G06	1"	33.3	42.0	1.5
SVN4-G07	1¼"	41.9	53.0	1.5
SVN4-G08	1½"	47.8	62.0	1.5
SVN4-G09	2"	59.6	69.0	1.5

For sealing of polyamide or metal threads of PMA fittings. For ingress protection at the thread up to IP68

For solid sealing of uneven rough contact areas around the thread hole or when no constructive measures for O-Rings are provided


NBR reinforced with aramide fibres (asbestos-free). Temperature range: -50°C to +200°C, short-term to +350°C

**Note:** Depending on flange sizes flat thread gaskets can have different widths. Please indicate fitting for which gasket is needed for replacement orders

## Locking clips, water impact protection


### Type AFN2, OVN2 & WPS

#### Type AFN2 - Universal safety clip

	Order no. dark grey	Fits to conduit size		Width (mm)	Length (mm)	Thickness (mm)
		NW	Profile			
	AFN2-07GT	07	G + T	14.0	14.0	7.0
	AFN2-10GT	10	G + T	17.5	17.0	8.0
	AFN2-12GT	12	G + T	20.5	20.0	7.3
	AFN2-17GT	17	G + T	26.5	22.0	8.0
	AFN2-23GT	23	G + T	34.0	27.5	11.8
	AFN2-29GT	29	G + T	40.5	32.0	11.8
	AFN2-36GT	36	G + T	50.0	39.0	9.5
	AFN2-48GT	48	G + T	62.0	47.0	9.5


Pre-installed in PMA connectors IP66 and IP68GT  
Allows simple push-in assembly of PMA conduits

#### Type OVN2 - Oval clip

	Order no. dark grey	Fits to conduit size		Width (mm)	Length (mm)	Thickness (mm)
		NW	Profile			
	OVN2-07	07	G + T	14.0	14.0	6.0
	OVN2-10	10	G + T	17.5	17.0	7.0
	OVN2-12	12	G + T	21.0	19.0	6.0
	OVN2-17	17	G + T	26.5	22.5	7.0
	OVN2-23	23	G + T	34.0	27.5	10.5
	OVN2-29	29	G + T	40.5	32.0	10.5
	OVN2-36	36	G + T	49.5	39.0	8.5
	OVN2-48	48	G + T	62.0	47.0	8.5

Provides reliable fixation of PMA conduits within PMA IP68 fittings

#### Type WPS - Water impact protection

	Order no. black	Fits to conduit size		Outside Ø (mm)	Thickness (mm)
		NW	Profile		
	WPS-NW10	10	G + T	22.0	8.0
	WPS-NW12	12	G + T	26.0	8.0
	WPS-NW17	17	G + T	33.0	8.0
	WPS-NW23	23	G + T	40.0	9.0
	WPS-NW29	29	G + T	47.0	9.5
	WPS-NW36	36	G + T	59.0	10.0
	WPS-NW48	48	G + T	71.0	10.0

Increased protection of PMAFIX fittings against water jet impact – increased protection up to IP69

For increased ingress protection requirements regarding high pressure/steam jet cleaning

Based on PMAFIX IP68 system

Two-piece water impact protection with click cap


Retrofit installation possible



## Sealing caps


### Type NVN3, NFN3 & NR

#### Type NVN3 - Sealing cap, reinforced

	Order no.	Fits to conduit size		Length (mm)
		NW	Metric	
	NVN3-07	07	10	9.0
	NVN3-09	10	12	9.0
	NVN3-11	12	16	12.0
	NVN3-16	17	23	16.5
	NVN3-21	23	25	13.0
	NVN3-29	29	32	14.0
	NVN3-36	36	40	17.5
	NVN3-48	48	50	17.5


In connection with PMAFIX connectors ("V" series) and PMA corrugated conduits  
 For ingress protection IP68 static/IP67 dynamic  
 Specially modified polyesterelastomer  
 Free from halogens and cadmium  
 Fits both conduit profiles: fine (T) and coarse (G)  
 Temperature range: -40°C to +105°C

#### Type NFN3 - Sealing cap

	Order no.	Fits to conduit size		Length (mm)
		NW	Profile	
	NFN3-07	07	10	9.0
	NFN3-09	10	12	9.0
	NFN3-11	12	16	9.0
	NFN3-16	17	23	9.0
	NFN3-21	23	25	9.0
	NFN3-29	29	32	9.0
	NFN3-36	36	40	11.0
	NFN3-48	48	50	11.0

In connection with PMAFIX connectors ("F" series) and PMA corrugated conduits  
 For ingress protection IP67 static/IP65 dynamic  
 Specially modified polyesterelastomer  
 Free from halogens and cadmium  
 Fits conduit profiles: fine (T) and coarse (G)  
 Temperature range: -40°C to +105°C

#### Type KNH2 - PMAFIX Pro sealing and locking element


	Order no.	Fits to conduit size		Outside Ø (mm)	Overall length (mm)
		NW	Metric		
	KNH2-NW10	10	12	22.0	28.0
	KNH2-NW12	12	16	25.5	33.5
	KNH2-NW17	17	20	31.5	38.5
	KNH2-NW23	23	25	38.5	41.0
	KNH2-NW29	29	32	46.5	46.5
	KNH2-NW36	36	40	55.5	50.5
	KNH2-NW48	48	50	68.0	56.5

For use in connection with PMAFIX PRO connectors PMA corrugated conduits for ingress protection IP68 and IP69 static and dynamic  
 Specially modified PA6/Polyester-elastomer  
 Free from halogens and cadmium  
 Fits conduit profiles: fine (T) and coarse (G)  
 Temperature range: -40°C to +105°C

## Enlargers, reducers, metric and PG


### Type ME, MR & NR

#### Type ME - Enlarger, brass, metric thread

	Order no.	Thread outside		Thread inside		Wrench size (mm)	Inside Ø (mm)	Overall length (mm)
		Metric	Length (mm)	Metric	Length (mm)			
	M12M16M	M12 x 1.5	5.0	M16 x 1.5	7.0	18	8.0	16.0
	M16M20M	M16 x 1.5	5.0	M20 x 1.5	7.5	22	12.0	16.5
	M20M25M	M20 x 1.5	6.0	M25 x 1.5	8.0	27	15.0	18.5
	M25M32M	M25 x 1.5	7.0	M32 x 1.5	9.0	34	21.0	20.5
	M32M40M	M32 x 1.5	8.0	M40 x 1.5	10	42	26.0	23.5
	M40M50M	M40 x 1.5	8.0	M50 x 1.5	13	52	34.0	30.0
	M50M63M	M50 x 1.5	9.0	M63 x 1.5	16	65	44.0	32.5


For enlargement of an existing thread  
 Nickel-plated brass  
 Hexagonal form  
 Temperature range: -60°C to +200°C

#### Type MR - Reducer, brass, metric thread

	Order no. standard	Order no. hexagonal	Thread outside metric	Thread inside metric
	M16M12M	M16M12M/6	M16 x 1.5	M12 x 1.5
	M20M12M	M20M12M/6	M20 x 1.5	M12 x 1.5
	M20M16M	M20M16M/6	M20 x 1.5	M16 x 1.5
	M25M16M	M25M16M/6	M25 x 1.5	M16 x 1.5
	M25M20M	M25M20M/6	M25 x 1.5	M20 x 1.5
	M32M20M	M32M20M/6	M32 x 1.5	M20 x 1.5
	M32M25M	M32M25M/6	M32 x 1.5	M25 x 1.5
	M40M25M	M40M25M/6	M40 x 1.5	M25 x 1.5
	M40M32M	M40M32M/6	M40 x 1.5	M32 x 1.5
	M50M32M	M50M32M/6	M50 x 1.5	M32 x 1.5
	M50M40M	M50M40M/6	M50 x 1.5	M40 x 1.5
	M63M40M	M63M40M/6	M63 x 1.5	M40 x 1.5
	M63M50M	M63M50M/6	M63 x 1.5	M50 x 1.5

Reduction of threaded or clearance holes to smaller thread sizes  
 Nickel-plated brass  
 Temperature range: -60°C to +200°C  
 Round form without O-ring, XXXX/6 hexagonal form with O-ring

#### Type NR - Reducer, PG

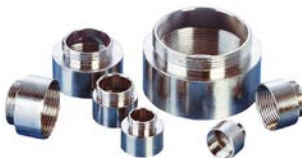
	Order no.	Thread outside PG	Thread inside PG	Length (mm)	Inside Ø (mm)	Outside Ø (mm)
	1109N	11	09	22.5	10.5	24.5
	1309N	13.5	09	15.0	10.0	26.0
	1311N	13.5	11	24.0	11.5	26.0
	1609N	16	09	16.0	10.0	29.0
	1611N	16	11	16.0	11.5	29.0
	1613N	16	13.5	27.0	13.5	29.0
	2113N	21	13.5	16.0	13.5	35.5
	2116N	21	16	16.0	15.5	35.5
	2921N	29	21	17.0	22.0	43.0
	3629N	36	29	24.0	30.5	54.0

Reduction of threaded or clearance holes to smaller PG thread sizes  
 High-grade, glass fibre reinforced Polyamid 6  
 Temperature range: -30°C to +100°C

## Enlargers, reducers, PG


### Type ME & MR

#### Type ME - Enlarger, brass, PG thread

	Order no. metal, standard	Thread outside		Thread inside		Outside Ø (mm)	Overall length (mm)
		PG	Length (mm)	PG	Length (mm)		
	0709M	07	5.0	09	07	17.0	15.0
	0911M	09	6.0	11	07	20.0	16.5
	0913M	09	6.0	13	7.5	22.0	17.5
	1113M	11	6.0	13	08	22.0	17.5
	1116M	11	6.5	16	8.5	24.0	19.0
	1121M	11	6.5	21	10	30.0	21.0
	1316M	13.5	6.5	16	7.5	24.0	19.0
	1321M	13.5	6.5	21	8.5	30.0	21.0
	1621M	16	6.5	21	8.5	30.0	21.0
	1629M	16	6.5	29	11	39.0	22.5
	2129M	21	7.0	29	11.5	39.0	23.0
	2936M	29	8.0	36	12	50.0	27.5
	4248M	42	10.0	48	17	64.0	33.0

For enlargement of an existing thread  
 Nickel-plated brass  
 Temperature range: -60°C to +200°C

#### Type MR - Reducer, brass, PG thread


	Order no. metal, standard	Thread outside		Thread inside PG	Outside Ø (mm)	Overall length (mm)
		PG	Length (mm)			
	0907M	09	6.0	07	17.0	8.5
	1107M	11	6.0	07	20.0	8.5
	1109M	11	6.0	09	20.0	8.5
	1307M	13.5	6.5	07	22.0	9.0
	1309M	13.5	6.5	09	22.0	9.0
	1311M	13.5	6.5	11	22.0	9.0
	1607M	16	6.5	07	24.0	9.5
	1609M	16	6.5	09	24.0	9.5
	1611M	16	6.5	11	24.0	9.5
	1613M	16	6.5	13.5	24.0	9.5
	2111M	21	7.0	11	30.0	10.0
	2113M	21	7.0	13.5	30.0	10.0
	2116M	21	7.0	16	30.0	10.0
	2916M	29	8.0	16	39.0	11.5
	2921M	29	8.0	21	39.0	11.5
	3621M	36	9.0	21	50.0	12.5
	3629M	36	9.0	29	50.0	12.5
	4229M	42	10	29	57.0	14.0
	4236M	42	10	36	57.0	14.0
	4836M	48	10	36	64.0	14.0
4842M	48	10	42	64.0	14.0	

Reduction of threaded or clearance holes to smaller thread sizes  
 Nickel-plated brass  
 Temperature range: -60°C to +200°C

## Plug screws, metric, PG

### Type 514

#### Type 514 - Plug screw, metric/PG thread

	Order no. grey	Fits to thread metric	Outside Ø (mm)	Height (mm)	Thread length (mm)
	514-M12	M12 x 1.5	15.0	10.0	6.0
	514-M16	M16 x 1.5	20.0	10.5	6.0
	514-M20	M20 x 1.5	24.0	10.5	6.0
	514-M25	M25 x 1.5	30.0	13.0	8.0
	514-M32	M32 x 1.5	37.0	13.5	8.0
	514-M40	M40 x 1.5	46.0	14.0	8.0
	514-M50	M50 x 1.5	56.0	16.5	10.0
	514-M63	M63 x 1.5	70.0	17.0	12.0
	Order no. grey	Fits to thread PG	Outside Ø (mm)	Height (mm)	Thread length (mm)
	514-07	07	15.0	10.0	6.0
	514-09	09	19.0	10.0	6.0
	514-11	11	22.0	10.0	6.0
	514-13	13.5	25.0	10.0	6.0
	514-16	16	27.0	10.0	6.0
	514-21	21	33.0	12.5	8.0
	514-29	29	44.5	13.0	8.0
	514-36	36	55.5	15.0	10.0
	514-48	48	69.5	17.0	12.0


For closing off unused threaded holes  
 Polyamide 6 glass fibre reinforced  
 Free from halogens and cadmium  
 IP54  
 Temperature range: -30°C to +100°C



## Lock nuts, metric, PG

### Type MN

Type MN - Hexagonal lock nut, polyamide, metric/PG thread


	Order no. black	Order no. grey	Fits to thread metric	Wrench size (mm)	Height (mm)
	BMN-M12	GMN-M12	M12 x 1.5	17	5.0
	BMN-M16	GMN-M16	M16 x 1.5	22	5.0
	BMN-M20	GMN-M20	M20 x 1.5	26	5.6
	BMN-M25	GMN-M25	M25 x 1.5	32	6.0
	BMN-M32	GMN-M32	M32 x 1.5	41	7.0
	BMN-M40	GMN-M40	M40 x 1.5	50	7.0
	BMN-M50	GMN-M50	M50 x 1.5	60	8.0
	BMN-M63	GMN-M63	M63 x 1.5	75	8.0
	Order no. black	Order no. grey	Fits to thread PG	Wrench size (mm)	Height (mm)
	BMN-07	GMN-07	07	19	5.0
	BMN-09	GMN-09	09	22	5.0
	BMN-11	GMN-11	11	24	5.0
	BMN-13	GMN-13	13.5	27	6.0
	BMN-16	GMN-16	16	30	6.0
	BMN-21	GMN-21	21	36	7.0
	BMN-29	GMN-29	29	46	7.0
	BMN-36	GMN-36	36	60	8.0
	BMN-48	GMN-48	48	70	8.0

Glass fibre reinforced Polyamid 6  
High tightening torques

## Lock nuts, metric, PG

### Type MM

#### Type MM - Hexagonal lock nut, brass, metric/PG thread

	Order no.	Fits to thread metric	Wrench size (mm)	Height (mm)
	GMM-M12	M12 x 1.5	15	2.8
	GMM-M16	M16 x 1.5	19	2.8
	GMM-M20	M20 x 1.5	24	3.0
	GMM-M25	M25 x 1.5	30	3.5
	GMM-M32	M32 x 1.5	36	4.0
	GMM-M40	M40 x 1.5	46	4.5
	GMM-M50	M50 x 1.5	60	5.0
	GMM-M63	M63 x 1.5	70	5.5
	Order no.	Fits to thread PG	Wrench size (mm)	Height (mm)
	GMM-07	07	15	2.8
	GMM-09	09	18	2.8
	GMM-11	11	21	3.0
	GMM-13	13.5	23	3.0
	GMM-16	16	26	3.0
	GMM-21	21	32	3.5
	GMM-29	29	41	4.0
	GMM-36	36	51	5.0
	GMM-42	42	60	5.0
	GMM-48	48	64	5.5

Nickel-plated brass

Maximum possible torque

Safe system connection

# PMA TRUST™


## Modular support system

For use in rolling stock applications.  
The most versatile, compact and lightest design of its kind on the market.

PMA® TRUST™ modular support system is a lightweight, compact solution with high impact resistance. Thanks to the new design, external dimensions are reduced to the very minimum and internal spacing between adjoining conduits is very small. The system is specifically designed for use in railway vehicle construction and other applications where fixation of parallel running conduits and cables is required.



Type BGPMK - PMA TRUST™ cable clamping adapter


	Order no. black	Clamping range		Fits to multiple holder BGPM & reduction BGPMR (NW)	Nom. dimensions A (mm)	Weight kg/100 pcs	Packing unit/pcs
		1 fold BGPM & BGMPR	2, 3 & 4 fold BGPM & BGMPR*				
	BGPMK-10/7-3	7-3	6-4	10	30.0	0.3	5
	BGPMK-12/9-5	9-5	8-6	12	30.0	0.3	5
	BGPMK-17/15-11	15-11	14-12	17	30.0	0.5	5
	BGPMK-17/12-8	12-8	11-9	17	30.0	0.6	5
	BGPMK-23/20-16	20-16	19-17	23	30.0	0.9	5
	BGPMK-23/18-14	18-14	17-15	23	30.0	1.0	5
	BGPMK-29/25-21	25-21	24-22	29	30.0	1.3	5
	BGPMK-29/22-18	22-18	21-19	29	30.0	1.4	5
	BGPMK-36/34-30	34-30	33-31	36	30.0	1.5	5
	BGPMK-36/31-27	31-27	30-28	36	30.0	1.7	5
	BGPMK-36/28-24	28-24	27-25	36	30.0	1.9	5
	BGPMK-48/46-42	46-42	45-43	48	30.0	2.1	5
	BGPMK-48/43-39	43-39	42-40	48	30.0	2.4	5
	BGPMK-48/40-36	40-36	39-37	48	30.0	2.7	5
	BGPMK-48/37-33	37-33	36-34	48	30.0	2.9	5

\*We recommend to use cable with the slight reduced clamping range to ensure both optimum cable clamping as well as pre-assembly  
Cable clamping adapters for BGPM Multiple Holders and BGPMR reduction half-shells for supporting and holding cables  
Provides axial strain relief for cables  
Flexible configuration in multiple holders & reductions possible  
Easy installation

## PMA TRUST™ modular support system

### Type BGPM, BGPMR & BGPMK

#### Type BGPM - PMA TRUST™ modular support system

	Order no. black	Conduit profile T/G	Conduit size NW	No. of conduits	Nom. dimensions (mm)			Weight kg/100 pcs	Packing unit/pcs
					Length	Depth	Height		
	BGPM-1x10	T	10	1	39.5	30.0	24.5	1.7	10
	BGPM-1x12	T	12	1	42.5	30.0	28.0	2.0	10
	BGPM-2x12	T	12	2	61.0	30.0	28.0	2.7	10
	BGPM-3x12	T	12	3	79.5	30.0	28.0	3.3	5
	BGPM-4x12	T	12	4	98.0	30.0	28.0	4.0	5
	BGPM-1x17	T/G	17	1	48.0	30.0	33.0	2.7	10
	BGPM-2x17	T/G	17	2	72.5	30.0	33.0	3.6	10
	BGPM-3x17	T/G	17	3	97.0	30.0	33.0	4.5	5
	BGPM-4x17	T/G	17	4	121.5	30.0	33.0	5.7	5
	BGPM-1x23	T/G	23	1	55.0	30.0	40.0	3.3	10
	BGPM-2x23	T/G	23	2	87.0	30.0	40.0	4.6	10
	BGPM-3x23	T/G	23	3	119.0	30.0	40.0	5.7	5
	BGPM-4x23	T/G	23	4	151.0	30.0	40.0	7.2	5
	BGPM-1x29	T/G	29	1	61.0	30.0	46.0	4.0	10
	BGPM-2x29	T/G	29	2	99.5	30.0	46.0	5.5	10
	BGPM-3x29	T/G	29	3	137.5	30.0	46.0	7.0	5
	BGPM-4x29	T/G	29	4	176.0	30.0	46.0	9.0	5
	BGPM-1x36	T/G	36	1	70.0	30.0	55.0	5.4	10
	BGPM-2x36	T/G	36	2	116.5	30.0	55.0	7.6	10
	BGPM-3x36	T/G	36	3	163.0	30.0	55.0	9.9	5
	BGPM-4x36	T/G	36	4	209.5	30.0	55.0	12.4	5
	BGPM-1x48	T/G	48	1	82.0	30.0	66.0	6.9	10
	BGPM-2x48	T/G	48	1	141.0	30.0	66.0	10.5	10
	BGPM-3x48	T/G	48	3	199.5	30.0	66.0	13.4	5
BGPM-4x48	T/G	48	4	258.5	30.0	66.0	17.1	5	

For applications in rail vehicle construction and other applications where fixation of parallel running conduits and cables is required

Light weight and compact design

Conduit rotation possible preventing torsion

Axial fixation of conduit and/or cables

Quick installation, possible with one hand

#### Type BGPMR - PMA TRUST™ reducers

	Order no. black	Conduit profile T/G	Conduit size NW	Fits to multiple holder BGPM (NW)	Fits to reduction BGPMR	Nom. dimensions A (mm)	Weight kg/100 pcs	Packing unit/pcs
	BGPMR-12T/17	T	12	17	17	30.0	0.4	5
	BGPMR-17GT/23	T/G	17	23	23	30.0	0.7	5
	BGPMR-23GT/29	T/G	23	29	29	30.0	0.7	5
	BGPMR-29GT/36	T/G	29	36	36	30.0	1.2	5
	BGPMR-36GT/48	T/G	36	48	-	30.0	2.0	5

Reducers for BGPM modular system support for downsizing corrugated conduits

Provides axial strain relief for conduits, but allows rotation


Combination of multiple reductions possible

Easy installation

## System supports, half-shells


### Type VH & GN

#### Type VH - System support

	Order no. support ①	Order no. clip ①	Order no. complete ①	Fits to conduit size		Width x Height x Depth (mm)	Fixing screws
				NW	Metric		
	BVH-17-010	BVH-17-020	BVH-17-000	17	20	35 x 36 x 36	6 x M5
	BVH-23-010	BVH-23-020	BVH-23-000	23	25	35 x 44 x 36	6 x M5
	BVH-29-010	BVH-29-020	BVH-29-000	29	32	46 x 52 x 40	6 x M5
	BVH-36-010	BVH-36-020	BVH-36-000	36	40	53 x 58 x 60	6 x M5
	BVH-48-010	BVH-48-020	BVH-48-000	48	50	66 x 72 x 60	6 x M5

For applications in machine building and installation  
 Optimal axial strain relief due to integrated rib  
 Variable fixation possible due to six holes, safe against turning  
 With safety lid suitable for overhead installation  
 High retention forces  
 PA 6

#### Type GN - Half shell

	Order no. fine profile, black	Order no. coarse profile, black	Fits to conduit size		Outside Ø (mm)	Width (mm)
			NW	Metric		
	BGN-S12T	–	12	16	26.5	34.0
	BGN-S17T	BGN-S17G	17	20	32.0	34.0
	BGN-S23T	BGN-S23G	23	25	39.5	34.0
	BGN-S29T	BGN-S29G	29	32	47.0	34.0
	BGN-S36T	–	36	40	55.0	36.5
	–	BGN-S36G	36	40	55.0	34.0
	BGN-S48T	–	48	50	66.5	36.5
	–	BGN-S48G	48	50	66.5	34.0
	–	BGN-S70G	70	80	93.5	38.0

For conduit fixation in conjunction with beam systems, particularly in traction and machine applications  
 Fixes conduit against axial movements  
 Allows radial turning of conduit  
 Especially suitable for dynamic applications due to rounded edges  
 PA 6


① Please replace “B” for black with “S”  
 for grey in front of the order no.



## System supports, rails for system supports

### Type FH-0 & FHS

#### Type FH-0 - System support, one-piece

	Order no. black	Order no. grey	Fits to conduit size		Width x Height x Depth (mm)	Fixing screws
			NW	Metric		
	BFH-07-0	SFH-07-0	07	10	17.0 x 21.5 x 20.0	1 x M4
	BFH-10-0	SFH-10-0	10	12	20.5 x 24.5 x 20.0	1 x M5
	BFH-12-0	SFH-12-0	12	16	24.0 x 27.0 x 20.0	1 x M5
	BFH-17-0	SFH-17-0	17	20	30.0 x 34.0 x 20.0	1 x M6
	BFH-23-0	SFH-23-0	23	25	38.5 x 42.0 x 20.0	1 x M6
	BFH-29-0	SFH-29-0	29	32	45.5 x 48.0 x 20.0	1 x M6
	BFH-36-0	SFH-36-0	36	40	55.5 x 56.0 x 20.0	1 x M6
	BFH-48-0	SFH-48-0	48	50	67.5 x 68.0 x 20.0	1 x M6

For applications in machine building and installation  
 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  
 Fits to rail for system support FHS  
 PA 6

#### Type FHS - Rail for system support

	Order no. black	Order no. grey	Fits to system supports	Length x Height x Depth (mm)
FHS	BFHS-00	SFHS-00	FH-NW-0	275.0 x 15.5 x 25.0
	Additional position supports or distance spacers			
	BFHS-PH	SFHS-PH	Position support with screws	
	BFHS-PH1	SFHS-PH1	Distance spacers	




For flexible assembly of one-piece system supports and/or fixation of various conduit sizes  
 Glass fibre reinforced polyamide 6  
 Extremely robust construction  
 High stiffness  
 Positioning and distance spacers available  
 Glass fibre reinforced PA6

## Tube clamps


### Type GL & GH

#### Type GL - Tube clamp, one-piece

	Order no. black	Order no. grey	Fits to conduit size		Width (mm)	Fixing screws
			NW	Metric		
	BGL-07	SGL-07	07	10	25.0	1 x M4
	BGL-10	SGL-10	10	12	27.0	1 x M4
	BGL-12	SGL-12	12	16	31.0	1 x M4
	BGL-17	SGL-17	17	20	39.5	1 x M5
	BGL-23	SGL-23	23	25	49.0	1 x M5
	BGL-29	SGL-29	29	32	57.0	1 x M6

Used in general machine and installation applications  
 Integrated rib provides axial strain relief  
 Allows turning of the conduit, thus avoiding torsion stresses  
 Pre-fixation on the conduit possible  
 PA 6

#### Type GH - Tube clamp, one-piece


	Order no. black	Order no. grey	Thread outside		Width (mm)	Fixing screws
			NW	Metric		
	BGH-23	SGH-23	23	25	16.0	2 x M5
	BGH-29	SGH-29	29	32	19.0	2 x M6
	BGH-36	SGH-36	36	40	24.0	2 x M6
	BGH-48	SGH-48	48	50	24.0	2 x M6
	BGH-56	SGH-56	56	68	26.0	2 x M8
	BGH-70	SGH-70	70	80	30.0	2 x M8
	BGH-95	SGH-95	95	106	30.0	2 x M8

Used in general machine and installation applications  
 Integrated rib provides axial strain relief  
 Allows turning of the conduit, thus avoiding torsion stresses  
 Pre-fixation on the conduit possible  
 Allows solid fixation with 2 screws  
 PA 6

## Tube clamps


### Type SGB & SGS

#### Type SGB - Tube clamp

	Order no. black	Fits to conduit size		Width (mm)	Fixing screws
		NW	Metric		
	SGB-07	07	10	13.0	1 x M4
	SGB-09	10	12	13.0	1 x M4
	SGB-11	12	16	13.0	1 x M4
	SGB-16	17	20	16.0	1 x M5
	SGB-21	23	25	16.0	1 x M5
	SGB-29	29	32	19.0	1 x M6
	SGB-36	36	40	19.0	1 x M6
	SGB-48	48	50	19.0	1 x M6

For fixation of static conduits  
Galvanized steel  
Elastomer profile (EPDM) free from halogens  
Smooth connection to PMA conduits  
Good resistance to ozone and ageing  
Temperature range: -40°C to +120°C

#### Type SGS - Tube clamp


	Order no. black	Fits to conduit size		Width x Height x Depth (mm)	Fixing screws
		NW	Metric		
	SGS-36	36	40	80.0 x 48.0 x 19.0	2 x M6
	SGS-48	48	50	94.0 x 58.0 x 19.0	2 x M6
	SGS-56	56	68	118.0 x 72.0 x 24.0	2 x M8
	SGS-70	70	80	130.0 x 85.0 x 24.0	2 x M8
	SGS-95	95	106	156.0 x 110.0 x 24.0	2 x M8
	SGS-125	125	146	200.0 x 152.0 x 24.0	2 x M8

For fixation of static conduits  
Galvanized steel  
Elastomer profile (EPDM) free from halogens  
Smooth connection to PMA conduits  
Good resistance to ozone and ageing  
Temperature range: -40°C to +120°C  
Galvanized steel/EPDM

## System supports

### Type GPS, GP & BGP-3x48

#### Type GPS - System support, one-piece, stackable

	Order no.	Fits to conduit size			Width (mm)	Height (mm)	Depth (mm)
		NW	Metric	DIN-NW			
	BGPS-12/01*	12	16	2	70.0	51.0	30.0
	BGPS-17	17	20	2	70.0	51.0	30.0
	BGPS-23	23	25	2	70.0	51.0	30.0
	BGPS-29	29	32	3	85.0	65.0	30.0
	BGPS-36	36	40	3	85.0	65.0	30.0
	BGPS-48	48	50	4	115.0	92.5	30.0
	BGPS-56	56	68	4	115.0	92.5	30.0

\*This size will be delivered with a half-shell insert

In railway vehicle construction, heavy machine building industry and other applications with increased mechanical requirements

Heavy design, high retention forces. Applicable with standard metal C rails

Clasp for easy pre-mounting and final assembly. Especially suitable for dyn. applic. due to rounded edges


The following nominal widths can be combined for stacking: NW 12 with NW 17 + 23, NW 17 with NW 23,

NW 29 with NW 36, NW 48 with NW 56

Content of delivery: System support and 2 screws for securing of the lid (optional); without mounting accessories

PA 6

#### Type GP - System support, stackable

	Order no. ①	Thread outside		Width (mm)	Height (mm)	Depth (mm)
		NW	Metric			
	BGP-12/01*	12	16	48.0	66.0	36.0
	BGP-17	17	20	48.0	66.0	36.0
	BGP-23	23	25	48.0	66.0	36.0
	BGP-29	29	32	62.0	66.0	36.0
	BGP-36	36	40	62.0	66.0	36.0
	BGP-48	48	50	76.0	66.0	36.0
	BGP-56G	56	68	87.0	78.0	36.0

\*This size will be delivered with a half-shell insert

In railway vehicle construction, heavy machine building industry and other applications with increased mechanical requirements

Variable stacking possibilities, due to the "Block"-system a high rigidity is guaranteed


Fixes conduit against axial movements. Allows radial turning of conduit

Especially suitable for dyn. applic. due to rounded edges. Variety of support possibilities

Content of delivery: System support with assembling screws; without mounting accessories

PA 6

#### Type BGP-3x48- Multiple system support

	Order no.	Thread outside			Width (mm)	Height (mm)	Length (mm)
		NW	Metric	Profile			
	BGP-3x48	48	50	G and T	30.0	84.0	214.0

In railway vehicle construction, heavy machine building industry and other applications with increased mechanical requirements

Multiple system support for 3 x NW48 max. conduits

Axial fixation of conduit. Conduit rotation possible (avoids torsion)

Especially suitable for dynamic applications due to rounded edges


PA 6

① Please replace "B" for black with "S" for grey in front of the order no.

## Conduit terminations


### Type RKS & CT

#### Type RKS - Conduit terminal sleeve

	Order no. black	Fits to conduit size		Inside Ø (mm)	Outside Ø (mm)	Length (mm)
		NW	Metric			
	RKS-07	07	10	4.5	12.5	16.0
	RKS-10	10	12	8.0	15.5	16.0
	RKS-12	12	16	10.0	19.0	20.0
	RKS-17	17	20	13.0	24.0	21.0
	RKS-23	23	25	20.0	32.0	22.0
	RKS-29	29	32	25.0	38.0	22.0
	RKS-36	36	40	33.0	46.0	25.0
	RKS-48	48	50	45.0	58.0	25.0
	RKS-56	56	68	54.0	71.0	28.0

For clean conduit end termination where no fitting is required  
PA 6

#### Type CT - Conduit termination

	Order no. black	Fits to conduit size		Clamping range (mm)	Length (mm)	Height (mm)
		NW	Metric			
	BCT-10	10	12	4-8	28.0	13.0
	BCT-12	12	16	5-9	35.0	16.0
	BCT-17	17	20	7-14	42.0	21.0
	BCT-23	23	25	14-22	51.0	28.0
	BCT-29	29	32	16-22	53.0	34.0
	BCT-36	36	40	16-29	55.0	42.0


For sealing of cables and wires at the exit from PMA corrugated conduits  
Avoids ingress of dirt and liquids  
Can be fixed additionally with cable ties  
Neoprene rubber  
Temperature range: -30°C to +120°C



## Abrasion protection sleeves, tools

### Type SS/SV & EWZ

#### Type SS/SV - Abrasion protection sleeve

	Order no.	Fits to conduit size		Outside Ø (mm)	Length (mm)
		NW	Metric		
	BSS-17	17	20	42.0	22.0
	BSS-23	23	25	49.0	26.0
	BSS-29	29	32	55.0	26.0
	BSS-36	36	40	63.0	30.0
	BSS-48	48	50	75.0	30.0
	BSS-56G	56	68	90.0	33.0
	BSV-70G	70	80	108.0	60.0

Abrasion protection for corrugated conduits in positions exposed to chafing  
Increases the life time of moving conduits  
PA 6

#### Type EWZ - Draw-in tool

	Order no. black with hole	Order no. black with handle	Fits to conduit size NW	Width x Length x Depth (mm)
EWZ	EWZ-02	EWZ-03	7.5–34	117.7 x 45.2 x 71.9



Suitable for drawing in cables or wires into PMA Divisible System conduits or other slit conduits  
Designed in a handy shape and equipped with a practical hand grip for wedging or with hole for direct holding of the wires  
Polyamide 6.6  
Colour: black

## Tools

### Type PMACUT

#### Type PMACUT - Cutting tool for conduits, NW 07–48

	Order no. Cutting tool	Order no. Spare blade	Cutting range	For conduit size NW
PMACUT	PMACUT-38	FP-38	0–38	07–29
	PMACUT-52	FP-52	0–52	23–48



Can be used to cut all PMA conduits  
Enables a precise and straight cut around the corrugation  
Metal  
Colour: Red

#### Type PMACUT - Cutting tool for conduits, NW 56–125

PMACUT	Order no. black	Fits to conduit size		Length x Width x Depth (mm)
		NW	Metric	
	PMACUT-NW56	56	68	337 x 101 x 15
	PMACUT-NW70	70	80	350 x 110 x 15
	PMACUT-NW95	95	106	400 x 142 x 20
	PMACUT-NW125	125	146	443 x 182 x 20

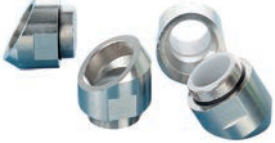


Can be used to cut all PMA conduits with large nominal widths  
Enables a precise and straight cut at the top of the corrugation  
High level of safety through retractable blade  
Aluminium

## Elbow adapters, metric

### Type MAVI & MAVIK

#### Type MAVI - Special 45° elbow adapter, metric thread

	Order no.	Thread metric		Thread length outside (mm)	Outside Ø (mm)	Overall length (mm)
		Inside	Outside			
	MAVI-M20/01	M20 x 1.5	M20 x 1.5	10.0	35.0	45.0
	MAVI-M25/01	M25 x 1.5	M25 x 1.5	11.0	39.0	51.0
	MAVI-M32/01	M32 x 1.5	M32 x 1.5	13.0	46.0	54.0
	MAVI-M40/01	M40 x 1.5	M40 x 1.5	13.0	55.0	62.0
	MAVI-M50/01	M50 x 1.5	M50 x 1.5	14.0	65.0	75.0
	MAVI-M63/01	M63 x 1.5	M63 x 1.5	14.0	80.0	84.0

Where a certain cable outlet angle is required

In connection with PMA connectors, especially connectors with strain relief VNZ

Enables different mounting positions: With a lock nut behind a clearance hole / In threaded holes (lock nut on MAVI side for positioning) / With SCA spin-coupler


Nickel-plated aluminium (other materials e.g. stainless steel or nickel-plated brass available on request)

High thread and system connection strength

IP68 static/IP67 dynamic

Temperature range: -60°C to +105°C

#### Type MAVIK - Positioning 45° elbow adapter, metric thread

	Order no.	Thread metric		Thread length outside (mm)	Outside Ø (mm)	Overall length (mm)
		Inside	Outside			
	MAVIK-M20/01	M20 x 1.5	M20 x 1.5	10.0	35.0	52.0
	MAVIK-M25/01	M25 x 1.5	M25 x 1.5	11.0	39.0	58.0
	MAVIK-M32/01	M32 x 1.5	M32 x 1.5	13.0	46.0	61.0
	MAVIK-M40/01	M40 x 1.5	M40 x 1.5	13.0	55.0	69.5
	MAVIK-M50/01	M50 x 1.5	M50 x 1.5	14.0	65.0	83.0
	MAVIK-M63/01	M63 x 1.5	M63 x 1.5	14.0	80.0	92.0

Where a certain cable outlet angle is required

In connection with PMA connectors, especially connectors with strain relief VNZ

The counter nut allows accurate positioning of the outlet direction in threaded holes

Adapter made from nickel-plated aluminium (other materials e.g. stainless steel or nickel-plated brass available on request), counter nut made from nickel-plated brass

High thread and system connection strength


IP68 static/IP67 dynamic

Temperature range: -60°C to +105°C

## Swivel and positioning adapters, metric, PG

### Type SWA & SCA

#### Type SWA - Swivel adapter with special sealing, metric/PG metal thread

	Order no.	Thread metric	Thread length (mm)	Outside Ø (mm)	Overall length (mm)
	SWA-M16-10	M16 x 1.5	10.0	23.0	37.5
	SWA-M20-10	M20 x 1.5	10.0	27.0	38.5
	SWA-M25-11	M25 x 1.5	11.0	32.0	41.0
	SWA-M32-13	M32 x 1.5	13.0	45.0	46.5
	SWA-M40-13	M40 x 1.5	13.0	55.0	47.5
	SWA-M50-14	M50 x 1.5	14.0	59.0	49.5
	SWA-M63-14	M63 x 1.5	14.0	75.0	52.0

	Order no.	Thread PG	Thread length (mm)	Outside Ø (mm)	Overall length (mm)
	SWA-P09	09	15.0	23.0	44.5
	SWA-P11	11	15.0	27.0	45.5
	SWA-P16	16	15.0	32.0	48.0
	SWA-P21	21	15.0	40.0	51.0
	SWA-P29	29	15.0	50.0	52.0
	SWA-P36	36	15.0	59.0	55.0
	SWA-P48	48	15.0	70.0	55.0

Allow PMA connectors to swivel freely in applications where such movement is occasionally necessary


In connection with PMA connectors with metal thread

Nickel-plated brass with thread edge protection

IP68 and IP69

Temperature range: -40°C to +105°C

#### Type SCA - Positioning adapter, metric/PG metal thread

	Order no.	Thread metric	Thread length (mm)	Outside Ø (mm)	Overall length (mm)
	SCA-M16-10	M16 x 1.5	10.0	22.0	32.0
	SCA-M20-10	M20 x 1.5	10.0	26.0	33.0
	SCA-M25-11	M25 x 1.5	11.0	32.0	35.0
	SCA-M32-13	M32 x 1.5	13.0	39.0	39.5
	SCA-M40-13	M40 x 1.5	13.0	50.0	41.0
	SCA-M50-14	M50 x 1.5	14.0	59.0	43.5
	SCA-M63-14	M63 x 1.5	14.0	75.0	45.5

	Order no.	Thread PG	Thread length (mm)	Outside Ø (mm)	Overall length (mm)
	SCA-P09	09	12.0	22.0	35.0
	SCA-P11	11	12.0	26.0	36.0
	SCA-P16	16	13.0	29.0	38.0
	SCA-P21	21	14.0	39.0	41.0
	SCA-P29	29	14.0	44.0	42.5
	SCA-P36	36	17.0	59.0	49.0
	SCA-P48	48	17.0	69.0	50.5

Allows easy positioning of elbow connectors with metal thread

In connection with PMA connectors with metal thread (Metric: Metal long thread)

Nickel-plated brass

High fastening torque with thread edge protection

P68 and IP69

Temperature range: -40°C to +105°C

# PMA JUMBO sizes

## General technical details

Larger sizes for big solutions. When you need conduits with larger sizes for your cable protection, we provide you with a comprehensive selection of large size conduits including connectors and flanges.

—  
\* All conduits are REACH and RoHS compliant

The PMA JUMBO product line includes a range of large size cable protection products. Seven different conduit types using a variety of raw materials, to provide optimal performance in various applications and compatible fittings.

- PMA JUMBO conduits polyamide and polyurethane conduits in the large nominal width sizes NW56, 70, 95, 125 (PA6 conduits – PCL, CYL, VCS, VOH) (PA12 conduits – PIS) (PU conduits – PUE)
- PMAGRIP flange and threaded fittings plus accessories BGG (straight), BGO (90°) flange fittings achieve a sealing rating of IP50 and IP65 with a conduit sealing ring BGGV (straight), BGOV (90°) flange fittings achieve a sealing rating of IP68

### Material

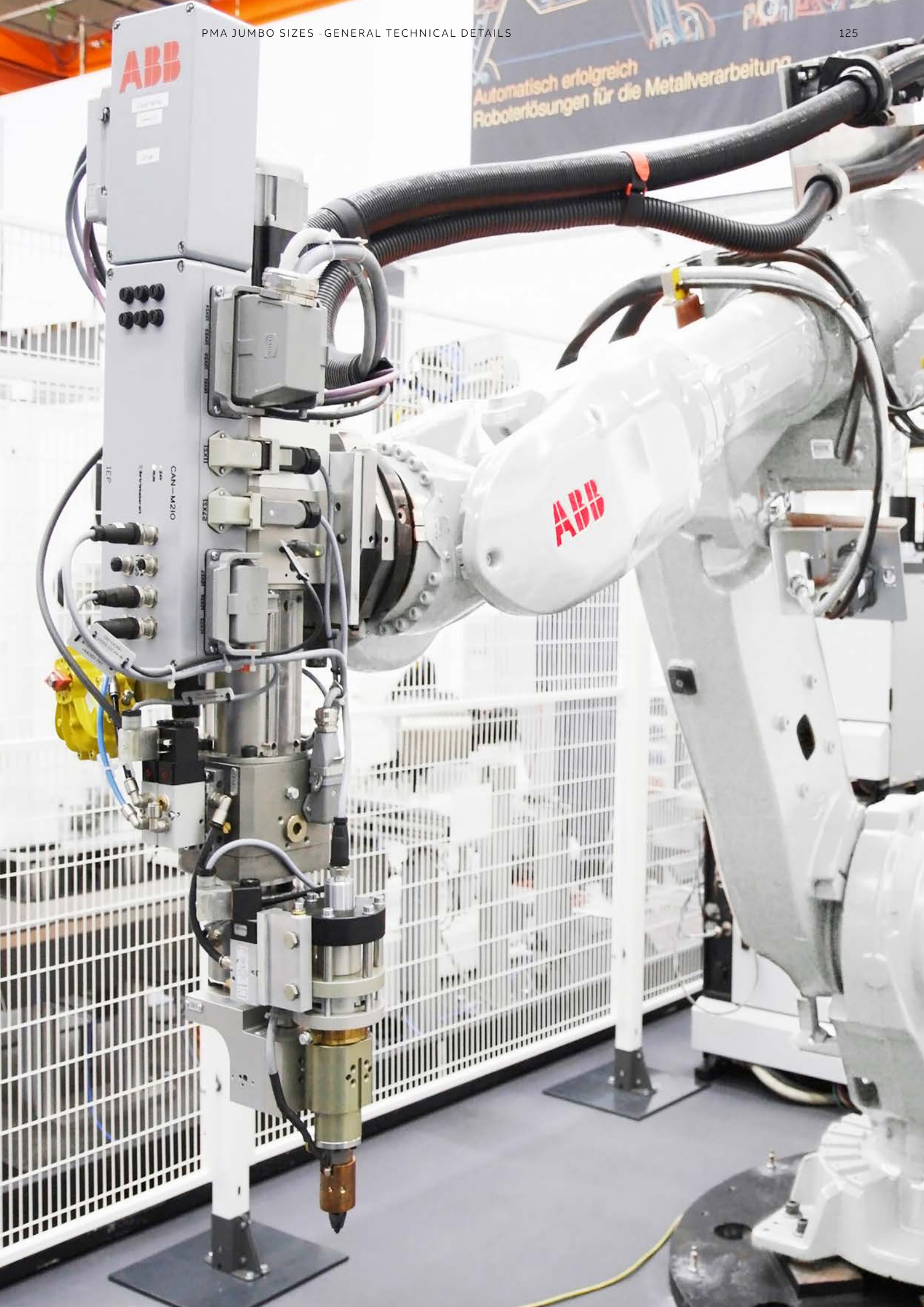
- Conduits made from specially formulated PA6, PA12 and PU
- Fittings made from specially formulated polyamide 6
- Self-extinguishing
- Free from halogens, REACH + RoHS compliant\*
- Very good chemical properties
- Temperature range:  
PA6 –40°C to +105°C, short-term to +160°C  
PA12 –40°C to +95°C, short-term to +150°C  
PU –60°C to +50°C

### Characteristics

- Excellent conduit pull-out strength
- High impact resistance
- All PMA Jumbo conduits have a coarse (G) profile
- The conduit types PIS and VCS are UL recognized in jumbo sizes for use with the flange type fittings.









## Conduits, large sizes

### Type PMAFLEX JUMBO conduits

#### Type PMAFLEX JUMBO conduits


	Order no. black	Order no. grey	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./Dyn. radius (mm)	PU meter
			NW	Metric				
PMAFLEX JUMBO conduits	PCLG-56B	PCLG-56S	56	68	56.3	67.2	130/-	30
	PCLG-70B	PCLG-70S	70	80	67.5	80.0	160/-	10
	PCLG-95B	PCLG-95S	95	106	91.5	106.0	210/-	10
	PCLG-125B	PCLG-125S	125	146	126.5	146.5	450/-	6
	PIHG-56B	PIHG-56S	56	68	56.3	67.2	110/270	30
	PIHG-70B	PIHG-70S	70	80	67.2	79.6	150/350	30
	PIHG-95B	PIHG-95S	95	106	91.3	106.0	170/450	30
	PIHG-125B	PIHG-125S	125	146	126.5	146.5	350/480	20
c R US	VCSG-56B	VCSG-56S	56	68	56.1	67.2	150/-	30
	VCSG-70B	VCSG-70S	70	80	66.5	80.0	200/-	10
	VCSG-95B	VCSG-95S	95	106	91.0	106.0	300/-	10
	LLPAG-56A	LLPAG-56S	56	68	56.3	67.2	120/-	30
	LLPAG-70A	LLPAG-70S	70	80	68.0	80.0	160/-	10
	LLPAG-95A	LLPAG-95S	95	106	91.9	106.0	210/-	10
	LLPAG-125A	LLPAG-125S	125	146	126.5	146.5	450/-	6
	VOHG-56B	VOHG-56S	56	68	55.5	67.2	135/-	10
	VOHG-70B	VOHG-70S	70	80	67.0	80.0	200/-	10
	VOHG-95B	VOHG-95S	95	106	90.5	106.0	300/-	10
	VOHG-125B	VOHG-125S	125	146	126.0	146.5	480/-	6
Approvals	PUEG-56B	-	56	68	56.3	67.2	90/170	30
	PUEG-70B	-	70	80	68.2	80.5	100/220	30

For further conduits and other sizes see conduit guide

## PMAGRIP flange connectors

### Type GG & GO

#### Type GG - Flange straight


	Order no. black	Order no. grey	Fits to conduit size		Width (mm)	Height (mm)	Depth (mm)
			NW	Metric			
	BGG-56	SGG-56	56	68	82.0	97.0	42.0
	BGG-70	SGG-70	70	80	97.0	114.0	48.0
	BGG-95	SGG-95	95	106	126.0	146.0	53.0
	BGG-125	SGG-125	125	146	-	194.0	79.0

#### Approvals



Ingress protection: IP50 without conduit seal ring (IP65 with conduit seal ring)  
 Flange seal FGO4 made from EPDM, standard for indoor and outdoor applications  
 Flange seal FGO4/01 made from NBR, optional for indoor applications with special chemical requirements  
 Temperature range with FGO4: -40°C to +105°C  
 Temperature range with FGO4/01: -25°C to +70°C  
 Content of delivery: Flange part, fixation clamps (incl. 2 screws), flange seal (FGO4 or FGO4/01), conduit seal ring (optional for IP65)

#### Type GO - Flange 90° elbow

	Order no. black	Order no. grey	Fits to conduit size		Width (mm)	Height (mm)	Depth (mm)
			NW	Metric			
	BGO-56	SGO-56	56	68	82.0	97.0	101.0
	BGO-70	SGO-70	70	80	97.0	114.0	115.0
	BGO-95	SGO-95	95	106	126.0	146.0	149.0

#### Approvals



Ingress protection: IP50 without conduit seal ring (IP65 with conduit seal ring)  
 Flange seal FGO4 made from EPDM, standard for indoor and outdoor applications  
 Flange seal FGO4/01 made from NBR, optional for indoor applications with special chemical requirements  
 Temperature range with FGO4: -40°C to +105°C  
 Temperature range with FGO4/01: -25°C to +70°C  
 Content of delivery: Flange part, fixation clamps (incl. 2 screws), flange seal (FGO4 or FGO4/01), conduit seal ring (optional for IP65)

## PMAGRIP flange connectors

### Type GGV & GOV

#### Type GGV - Flange straight

	Order no. black, IP68	Fits to conduit size		Width (mm)	Height (mm)	Depth (mm)
		NW	Metric			
GGV	BGGV-56	56	68	82.0	97.0	42.0
	BGGV-70	70	80	97.0	114.0	48.0
	BGGV-95	95	106	126.0	146.0	53.0



#### Approvals



In railway vehicle construction as well as in a wide range of industrial applications with high sealing and safety requirements  
 Flange seal FGO4 made from EPDM, standard for indoor and outdoor applications  
 Flange seal FGO4/01 made from NBR on request, optional for indoor applications with special chemical requirements  
 Ingress protection: IP68, IP69 with conduit sealing NVN3  
 Temperature range with FGO4: -40°C to +105°C  
 Temperature range with FGO4/01: -25°C to +70°C  
 If the application temperature is above 70°C we recommend to use an additional internal conduit support sleeve (BES)  
 Content of delivery: Flange part, fixation clamps (incl. 2 screws), conduit seal (NVN3), flange seal (FGO4 or FGO4/01)

#### Type GOV - Flange 90° elbow

	Order no. black, IP68	Fits to conduit size		Width (mm)	Height (mm)	Depth (mm)
		NW	Metric			
GOV	BGOV-56	56	68	82.0	97.0	101.0
	BGOV-70	70	80	97.0	114.0	115.0
	BGOV-95	95	106	126.0	146.0	149.0



#### Approvals



In railway vehicle construction as well as in a wide range of industrial applications with high sealing and safety requirements  
 Flange seal FGO4 made from EPDM, standard for indoor and outdoor applications  
 Flange seal FGO4/01 made from NBR on request, optional for indoor applications with special chemical requirements  
 Ingress protection: IP68, IP69 with conduit sealing NVN3  
 Temperature range with FGO4: -40°C to +105°C  
 Temperature range with FGO4/01: -25°C to +70°C  
 If the application temperature is above 70°C we rec. to use an additional internal conduit support sleeve (BES)  
 Content of delivery: Flange part, fixation clamps (incl. 2 screws), conduit seal (NVN3), flange seal (FGO4 or FGO4/01)



## PMAGRIP threaded connectors

### Type GG & GI

#### Type GG - Connector straight with locking clamps, metric/PG thread

	Order no. black	Order no. grey	Thread	Fits to conduit size		Thread length (mm)	Outside Ø (mm)	Overall length (mm)
				NW	Metric			
GG	BGG-M6356	SGG-M6356	M63 x 1.5	56	68	18.0	98.0	57.5
	BGG-P3656	SGG-P3656	PG 36	56	68	18.0	98.0	57.3



Ingress protection: IP50 without conduit seal ring (IP65 with conduit seal ring)

Content of delivery: Threaded part, fixation clamps (incl. 2 screws), conduit seal ring (optional for IP65)

#### Type GI - Connector straight with locking clamps, metric female thread

	Order no. black	Order no. grey	Thread	Fits to conduit size		Thread length (mm)	Outside Ø (mm)	Overall length (mm)
				NW	Metric			
GI	BGI-M7556	SBI-M7556	M75 x 1.5	56	68	15.0	98.0	53.3



Ingress protection: IP50 without conduit seal ring (IP65 with conduit seal ring)


Content of delivery: Threaded part, fixation clamps (incl. 2 screws), conduit seal ring (optional for IP65)



## Tube clamps, conduit seal rings, large size accessories


### Type GH & SGS

#### Type GH - Tube clamp, one-piece

	Order no. black	Order no. grey	Fits to conduit size		Width (mm)	Fixing screw
			NW	Metric		
	BGH-56	SGH-56	56	68	26.0	2 x M8
	BGH-70	SGH-70	70	80	30.0	2 x M8
	BGH-95	SGH-95	95	106	30.0	2 x M8

For general machine and installation applications  
 Integrated rib provides axial strain relief  
 Allows turning of the conduit thus avoiding torsion stresses  
 Pre-fixation on the conduit possible  
 Allows solid fixation with 2 screws  
 For other sizes of BGH tube clamps please see page 112  
 PA 6

#### Type SGS - Tube clamp


	Order no.	Fits to conduit size		Width x Height x Depth (mm)	Fixing screw
		NW	Metric		
	SGS-36	36	40	80.0 x 48.0 x 19.0	2 x M6
	SGS-48	48	50	94.0 x 58.0 x 19.0	2 x M6
	SGS-56	56	68	118.0 x 72.0 x 24.0	2 x M8
	SGS-70	70	80	130.0 x 85.0 x 24.0	2 x M8
	SGS-95	95	106	156.0 x 110.0 x 24.0	2 x M8
	SGS-125	125	146	200.0 x 152.0 x 24.0	2 x M8

For fixation of static conduits  
 Galvanized steel  
 Elastomer profile (EPDM) free from halogens  
 Smooth connection to PMA conduits  
 Good resistance to ozone and ageing  
 Temperature range: -40°C to +120°C

## Tube clamps, conduit seal rings, large size accessories

### Type SGO3

#### Type SGO3 - Conduit seal ring

	Order no.	Fits to conduit size		Inside Ø (mm)	Outside Ø (mm)	Thickness (mm)
		NW	Metric			
	SGO3-56	56	68	49.5	61.0	1.5
	SGO3-70	70	80	61.5	74.0	1.5
	SGO3-95	95	106	86.0	102.0	1.5
	SGO3-125	125	146	122.0	142.0	2.0

Used at the conduit end for sealing between the PMAGRIP flanges GG/GO/GI and PMA JUMBO conduits

Nitrile rubber NBR

Temperature range: -40°C to +105°C

# PMA Divisible System

## General technical details

One-piece Divisible System. The ideal solution for repairs, retrofit and pre-loomed applications. Equally all PMA conduits are compatible.

PMA offers a divisible system based upon PMA standard nominal widths.

This allows free combination of the PACOF and PPCOF divisible conduits with PMAFIX Pro, PMAFIX and PMA Smart Line fittings. Using the PMA Divisible System Fittings repairs can be easily made to existing installations without disconnecting cables. Equally all PMA conduits – also slit – are compatible with the fittings of the divisible system.

### Material

- Conduits made from spec. formulated PA 6 and Polypropylene
- Fittings made from specially formulated polyamide 6
- Colour: Black
- Free from halogens, REACH + RoHS compliant
- Temperature range:  
Conduits: –40°C to +160°C  
Connectors: –40°C to min. +105°C

### Characteristics

- Fast installation
- Conduit can be installed in fitting prior to closing the fitting
- High impact resistance
- High conduit pull-out strength
- Fits conduit profiles – fine (T) and coarse (G)








## Conduits

### Type PACOF & PPCOF

#### Type PACOF - Flexible, divisible


	Order no. black	Fits to conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU meter
		NW	Metric				
	PACOF-07B	07	10	5.6	10.0	30	50
	PACOF-10B	10	12	8.5	12.8	33	50
	PACOF-12B	12	16	11.0	15.6	35	50
	PACOF-17B	17	20	15.5	21.1	45	50
	PACOF-23B	23	25	22.1	28.4	70	50
	PACOF-29B	29	32	27.2	34.5	120	50
	PACOF-36B	36	40	32.0	42.4	145	30
	PACOF-48B	48	50	43.9	54.1	150	30
	PACOF-70B	70	80	62.0	79.0	190	10

#### PACOF Index

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

For machine building and plant construction  
 For trouble-free retrofitting and applicable for repairs  
 Specially modified polyamide 6  
 Can be opened and closed again in longitudinal direction any time  
 Good ductility  
 Good compression resistance  
 Free from halogens, REACH + RoHS compliant  
 Temperature range: -40°C to +105°C, short-term to +160°C  
 IP50

#### Type PPCOF - Flexible, divisible

	Order no. black	Fits to conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU meter
		NW	Metric				
	PPCOF-07B	07	10	5.6	10.0	25	50
	PPCOF-10B	10	12	8.5	12.8	28	50
	PPCOF-12B	12	16	11.0	15.6	35	50
	PPCOF-17B	17	20	15.1	21.1	45	50
	PPCOF-23B	23	25	22.1	28.4	60	50
	PPCOF-29B	29	32	26.6	34.5	100	50
	PPCOF-36B	36	40	31.8	42.4	120	30
	PPCOF-48B	48	50	43.9	54.1	140	30
	PPCOF-70B	70	80	60.5	78.0	200	10

#### PPCOF Index

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


For machine building and plant construction  
 For trouble-free retrofitting and applicable for repairs  
 Specially modified polypropylene PP  
 Can be opened and closed again in longitudinal direction any time  
 Good reversed bending resistance  
 Temperature range: -20°C to +105°C, short-term to +150°C  
 IP50



## Connectors, lock nuts

### Type LNO & LN

#### Type LNO - Divisible connector straight, one-piece, metric thread

	Order no. black	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	BLNO-M160	M16 x 1.5	10	12	13.0	37.5
	BLNO-M162	M16 x 1.5	12	16	13.0	39.5
	BLNO-M202	M20 x 1.5	12	16	13.0	39.5
	BLNO-M207	M20 x 1.5	17	20	13.0	43.5
	BLNO-M257	M25 x 1.5	17	20	14.0	44.5
	BLNO-M253	M25 x 1.5	23	25	14.0	52.5
	BLNO-M323	M32 x 1.5	23	25	17.0	56.0
	BLNO-M329	M32 x 1.5	29	32	17.0	61.0
	BLNO-M409	M40 x 1.5	29	32	21.0	65.0
	BLNO-M406	M40 x 1.5	36	40	22.0	74.5
	BLNO-M508	M50 x 1.5	48	50	22.0	80.5

Divisible connector straight, one-piece, metric thread

Compatible with PMA standard, slit and divisible conduits with standard nominal widths


In industries, plant construction, machine building as well as in house and electrical installations

For retrofit installation or repair

IP54

Special: Push-in installation of conduit into pre-installed fitting also possible

#### Type LN - Divisible lock nut, metric thread

	Order no. black	Thread metric	Fits with divisible connector		Wrench size (mm)	Width (mm)
			BLNO-M160	BLNO-M162		
	BLN-M16	M16 x 1.5	BLNO-M160	BLNO-M162	22.0	8.0
	BLN-M20	M20 x 1.5	BLNO-M202	BLNO-M207	26.0	8.0
	BLN-M25	M25 x 1.5	BLNO-M257	BLNO-M253	32.0	9.0
	BLN-M32	M32 x 1.5	BLNO-M323	BLNO-M329	41.0	12.0
	BLN-M40	M40 x 1.5	BLNO-M409	BLNO-M406	50.0	15.0
	BLN-M50	M50 x 1.5	BLNO-M508		60.0	15.0

Compatible with divisible PMA connectors, type BLNO


For retrofit installation or repair

Temperature range: -40°C to +100°C, short-term: +130°C

## T, Y pieces, connection splice


### Type LTO & LYO

#### Type LTO - Divisible T piece, one-piece

	Order no. black, IP40	3x conduit sizes	
		NW	Metric
	BLTO-070707	07	10
	BLTO-101010	10	12
	BLTO-121212	12	16
	BLTO-171717	17	20
	BLTO-232323	23	25
	BLTO-292929	29	32

Compatible with PMA standard, slit and divisible conduits with standard nominal widths  
 In industries, plant construction, machine building as well as in house and electrical installations  
 For retrofit installation or repair  
 IP40  
 Conduit can be installed in fitting prior to closing the fitting

#### Type LYO - Divisible Y piece, one-piece


	Order no. black, IP40	1x conduit size		2x conduit sizes	
		NW	Metric	NW	Metric
	BLYO-100707	10	12	07	10
	BLYO-121010	12	16	10	12
	BLYO-171212	17	20	12	16
	BLYO-231717	23	25	17	20
	BLYO-292917	17	20	29	32

Compatible with PMA standard, slit and divisible conduits with standard nominal widths  
 In industries, plant construction, machine building as well as in house and electrical installations  
 For retrofit installation or repair  
 IP40  
 Conduit can be installed in fitting prior to closing the fitting

## T, Y pieces, connection splice

### Type LSGO

Type LSGO - One-piece, divisible

	Order no. black, IP40	Fits to conduit size NW	Overall length (mm)	Outer Ø (mm)
	BLSGO-101010	10	36	16
	BLSGO-121212	12	36	21
	BLSGO-171717	17	38	26
	BLSGO-232323	23	39	33

Compatible with PMA standard, slit and divisible conduits with standard nominal widths  
 In industries, plant construction, machine building as well as in house and electrical installations  
 For retrofit installation or repair  
 Polyamide (Nylon) 66  
 IP40 rated

# PMA Smart Line IP66

## General technical details

Modern, versatile and attractive. Functional and modern design, providing excellent value for money. Suitable for machine building, installation and construction industries.

One-piece design, IP66 protection and simple, fast installation are the outstanding features of the Smart Line. Other characteristics including a modern, functional design and an excellent price/performance ratio make this product line a very attractive solution.

### Material

- Fittings made from specially formulated polyamide 6
- Self-extinguishing
- Free from halogens, REACH + RoHS compliant
- Temperature range:  
–45°C to +105°C, short-term to +150°C

### Characteristics

- High impact resistance
- Good conduit pull-out strength
- Vibration-proof connection to PMA conduits
- Fits conduit profiles – fine (T) and coarse (G)
- To avoid accidental opening, disassembling only possible with a screwdriver









**PMA Smart Line**

General technical details



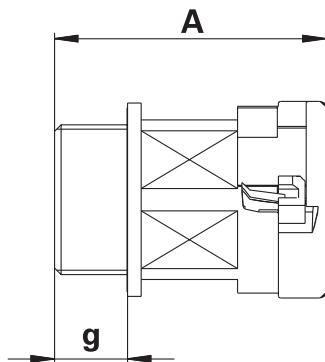
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Patent

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IP66

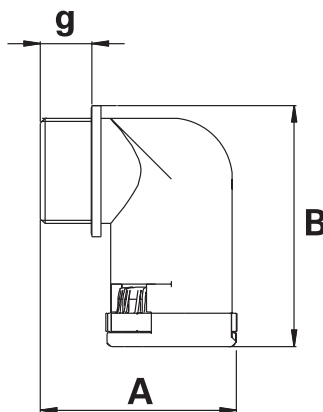
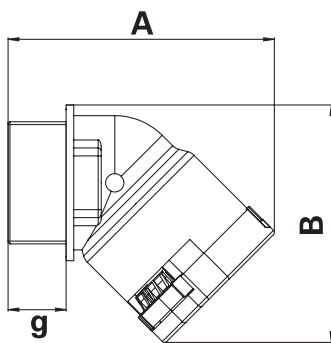
**IP66 static**

**IP54 dynamic**

- One piece fitting
- Conical sealing method
- Integrated sealing lip in thread flange
- Easy “push-in” installation
- Ready for installation (fitting gets delivered with engaged locking elements)



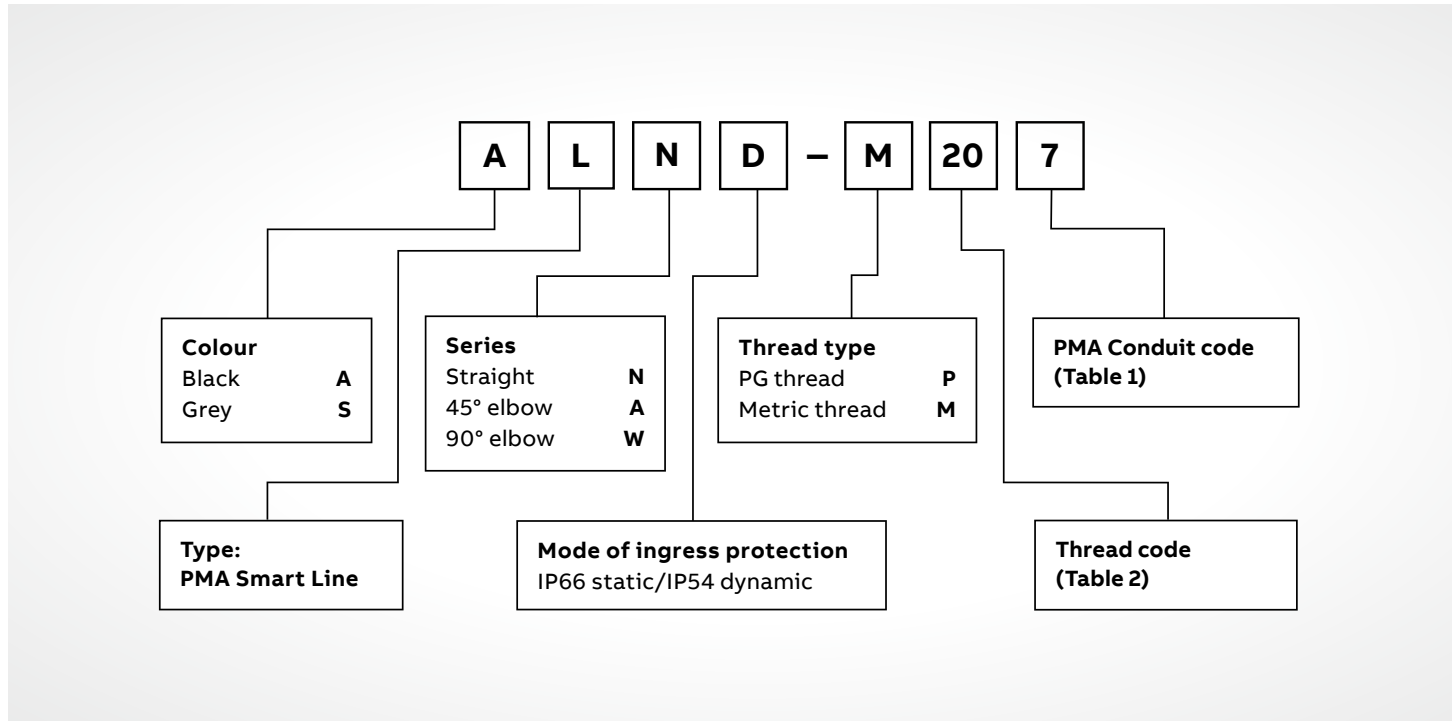
g = Thread length    A = Overall length



g = Thread length    A x B = External dimensions

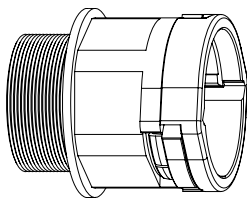
## PMA Smart Line

Part number codes

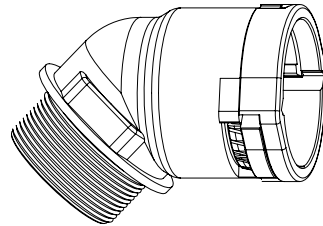


## Connector series

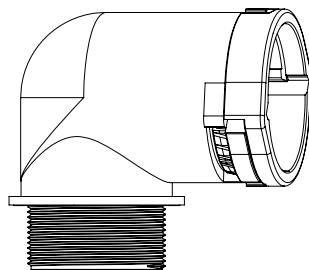
- 01 Straight (N)
- 02 45° elbow (A)
- 03 90° elbow (W)



01



02



03

## PMA Smart Line

### Size codes, installation

Table 1: Conduit codes

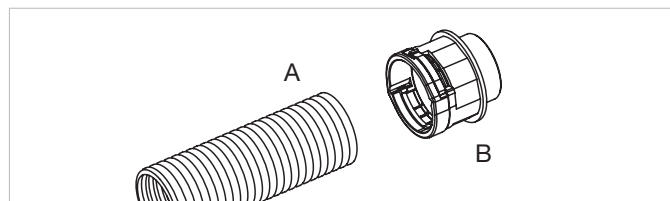
Nominal width	Metric size	PMA code
07	10	M
10	12	0
12	16	2
17	20	7
23	25	3
29	32	9
36	40	6
48	50	8

Table 2: Thread codes

Thread Metric	PMA code
M12 x 1.5	M12
M16 x 1.5	M16
M20 x 1.5	M20
M25 x 1.5	M25
M32 x 1.5	M32
M40 x 1.5	M40
M50 x 1.5	M50
M63 x 1.5	M63

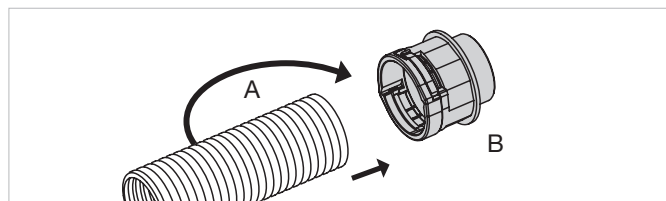
Thread PG	PMA code
PG07	P07
PG09	P09
PG11	P11
PG13.5	P13
PG16	P16
PG21	P21
PG29	P29
PG36	P36
PG48	P48

### Installation IP66



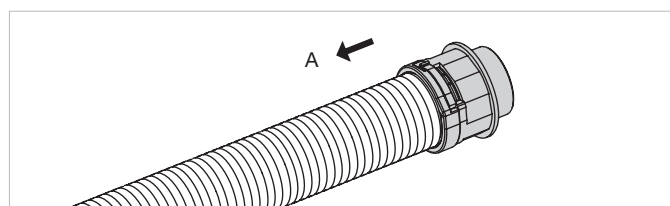
01

A = Conduit  
B = Fitting



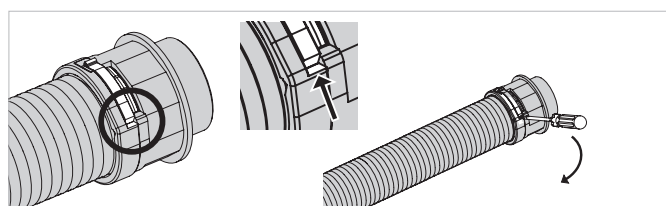
02

Push in the conduit (A) with a slight twist until the stop.



03

Pull back the conduit (A) slightly to ensure the locking mechanism is fully engaged.




04

To disengage the locking mechanism use a size 1 screwdriver.


## Connectors, metric, polyamide thread

### Type LND & LAD

#### Type LND - Connector straight, metric thread

	Order no. black, IP66	Order no. grey, IP66	Thread metric	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
				LND, patent	ALND-M120		
	ALND-M160	SLND-M160	M16 x 1.5	10	12	11.0	34.0
	ALND-M162	SLND-M162	M16 x 1.5	12	16	11.0	38.0
	ALND-M200	SLND-M200	M20 x 1.5	10	12	11.0	34.0
	ALND-M202	SLND-M202	M20 x 1.5	12	16	11.0	38.0
	ALND-M207	SLND-M207	M20 x 1.5	17	20	11.0	41.0
	ALND-M257	SLND-M257	M25 x 1.5	17	20	12.0	42.0
	ALND-M253	SLND-M253	M25 x 1.5	23	25	12.0	45.5
	ALND-M323	SLND-M323	M32 x 1.5	23	25	15.0	48.5
	ALND-M329	SLND-M329	M32 x 1.5	29	32	15.0	50.5
	ALND-M409	SLND-M409	M40 x 1.5	29	32	19.0	54.5
	ALND-M406	SLND-M406	M40 x 1.5	36	40	19.0	60.5
	ALND-M506	SLND-M506	M50 x 1.5	36	40	19.0	61.0
	ALND-M508	SLND-M508	M50 x 1.5	48	50	19.0	61.0
	ALND-M638	SLND-M638	M63 x 1.5	48	50	19.0	61.0


#### Type LAD - Connector 45° elbow, metric thread

	Order no. black, IP66	Order no. grey, IP66	Thread metric	Fits to conduit size		Thread length (mm)	External Dimensions (mm)
				NW	Metric		
				LAD, patent	ALAD-M120		
	ALAD-M160	SLAD-M160	M16 x 1.5	10	12	11.0	42.5 x 35.0
	ALAD-M162	SLAD-M162	M16 x 1.5	12	16	11.0	47.5 x 39.5
	ALAD-M202	SLAD-M202	M20 x 1.5	12	16	11.0	47.5 x 41.5
	ALAD-M207	SLAD-M207	M20 x 1.5	17	20	11.0	54.0 x 46.0
	ALAD-M257	SLAD-M257	M25 x 1.5	17	20	12.0	55.0 x 48.5
	ALAD-M253	SLAD-M253	M25 x 1.5	23	25	12.0	63.5 x 55.5
	ALAD-M323	SLAD-M323	M32 x 1.5	23	25	15.0	67.0 x 60.0
	ALAD-M329	SLAD-M329	M32 x 1.5	29	32	15.0	72.5 x 63.5
	ALAD-M409	SLAD-M409	M40 x 1.5	29	32	19.0	76.5 x 66.5
	ALAD-M406	SLAD-M406	M40 x 1.5	36	40	19.0	87.5 x 78.0
	ALAD-M506	SLAD-M506	M50 x 1.5	36	40	19.0	88.0 x 82.0
	ALAD-M508	SLAD-M508	M50 x 1.5	48	50	19.0	97.5 x 88.0
	ALAD-M638	SLAD-M638	M63 x 1.5	48	50	19.0	97.5 x 94.5


## Connectors, metric and PG, polyamide thread

### Type LWD & LND

#### Type LWD - Connector 90° elbow, metric thread

	Order no. black, IP66	Order no. grey, IP66	Thread metric	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
	ALWD-M120	SLWD-M120	M12 x 1.5	10	12	11.0	33.0 x 36.5
	ALWD-M160	SLWD-M160	M16 x 1.5	10	12	11.0	33.0 x 38.5
	ALWD-M162	SLWD-M162	M16 x 1.5	12	16	11.0	37.5 x 43.0
	ALWD-M202	SLWD-M202	M20 x 1.5	12	16	11.0	37.5 x 45.0
	ALWD-M207	SLWD-M207	M20 x 1.5	17	20	11.0	42.0 x 50.5
	ALWD-M257	SLWD-M257	M25 x 1.5	17	20	12.0	43.0 x 53.0
	ALWD-M253	SLWD-M253	M25 x 1.5	23	25	12.0	52.5 x 59.0
	ALWD-M323	SLWD-M323	M32 x 1.5	23	25	15.0	56.0 x 62.5
	ALWD-M329	SLWD-M329	M32 x 1.5	29	32	15.0	62.5 x 69.0
	ALWD-M409	SLWD-M409	M40 x 1.5	29	32	19.0	66.5 x 72.0
	ALWD-M406	SLWD-M406	M40 x 1.5	36	40	19.0	76.0 x 83.0
	ALWD-M506	SLWD-M506	M50 x 1.5	36	40	19.0	76.0 x 87.0
	ALWD-M508	SLWD-M508	M50 x 1.5	48	50	19.0	89.0 x 92.5
	ALWD-M638	SLWD-M638	M63 x 1.5	48	50	19.0	89.0 x 99.0

#### Type LND - Connector straight, PG thread

	Order no. black, IP66	Order no. grey, IP66	Thread PG	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	ALND-P070*	SLND-P070*	07	10	12	7.0	44.0
	ALND-P090	SLND-P090	09	10	12	11.0	34.0
	ALND-P092*	SLND-P092*	09	12	16	8.0	50.0
	ALND-P110	SLND-P110	11	10	12	8.0	45.5
	ALND-P112	SLND-P112	11	12	16	11.0	38.0
	ALND-P132	SLND-P132	13.5	12	16	11.0	38.0
	ALND-P137	SLND-P137	13.5	17	20	11.0	41.0
	ALND-P167	SLND-P167	16	17	20	11.0	41.0
	ALND-P213	SLND-P213	21	23	25	12.0	45.5
	ALND-P299	SLND-P299	29	29	32	12.0	47.5
	ALND-P366	SLND-P366	36	36	40	13.0	54.5
	ALND-P488	SLND-P488	48	48	50	13.0	55.0


\*These products will be delivered with a thread adapter




## Connectors, PG, polyamide thread

### Type LAD & LWD conduits

#### Type LAD - Connector 45° elbow, PG thread

	Order no. black, IP66	Order no. grey, IP66	Thread PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
LAD, patent 	ALAD-P090	SLAD-P090	09	10	12	11.0	42.5 x 34.0
	ALAD-P112	SLAD-P112	11	12	16	11.0	47.5 x 40.0
	ALAD-P132	SLAD-P132	13.5	12	16	11.0	47.5 x 41.5
	ALAD-P137	SLAD-P137	13.5	17	20	11.0	54.0 x 46.0
	ALAD-P167	SLAD-P167	16	17	20	11.0	54.0 x 47.0
	ALAD-P213	SLAD-P213	21	23	25	12.0	63.5 x 57.5
	ALAD-P299	SLAD-P299	29	29	32	12.0	69.5 x 65.0
	ALAD-P366	SLAD-P366	36	36	40	13.0	81.5 x 80.0
	ALAD-P488	SLAD-P488	48	48	50	13.0	91.5 x 93.0

#### Type LWD - Connector 90° elbow, PG thread

	Order no. black, IP66	Order no. grey, IP66	Thread PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				NW	Metric		
LWD, patent 	ALWD-P070*	SLWD-P070*	07	10	12	7.0	42.0 x 37.5
	ALWD-P090	SLWD-P090	09	10	12	11.0	32.5 x 37.5
	ALWD-P092*	SLWD-P092*	09	12	16	8.0	48.0 x 43.5
	ALWD-P110*	SLWD-P110*	11	10	12	8.0	44.0 x 40.0
	ALWD-P112	SLWD-P112	11	12	16	11.0	36.5 x 43.5
	ALWD-P130*	SLWD-P130*	13.5	10	12	9.0	37.5 x 40.0
	ALWD-P132	SLWD-P132	13.5	12	16	11.0	36.5 x 45.0
	ALWD-P137	SLWD-P137	13.5	17	20	11.0	41.0 x 50.5
	ALWD-P167	SLWD-P167	16	17	20	11.0	41.0 x 51.5
	ALWD-P213	SLWD-P213	21	23	25	12.0	52.0 x 61.0
	ALWD-P299	SLWD-P299	29	29	32	12.0	58.5 x 70.5
	ALWD-P366	SLWD-P366	36	36	40	13.0	70.0 x 85.0
	ALWD-P488	SLWD-P488	48	48	50	13.0	83.0 x 97.5

\*These products will be delivered with a thread adapter

# PMAJACK Plastic and metal braids

## General technical details

Bundling and abrasion protection. Polyamide, polyester and steel braids – an alternative way to bundle and protect electrical cables.

Plastic braids manufactured from polyester and polyamide filaments – the other alternative solution for protecting and bundling cables.

This PMA cable protection system provides simple bundling and abrasion protection for cables and wires.

Various braid types to fulfill different requirements complimented by a range of braid terminations for simple and clean assembly.

### Material

- Braids made from polyamide 6.6 or polyester
- Terminations made from PA 6, aluminium or brass
- Free from halogens, REACH + RoHS compliant

### Characteristics

- Flammability of braids:
  - polyamide 6.6 UL 94 V2,
  - polyester UL 94 V0
- Braid design: Following DIN 65 164 part 1+2
- EN 45545-2 HL3










## Plastic braided hoses

### Type F.66 & C.66

#### Type F.66 - Braided hose


	Order no. black	Order no. grey	NW	Fits to termination	Weight nom. per 100 m (kg)	Operative range min. Ø (mm)	Operative range max. Ø (mm)
	F.66.04SW	F.66.04GR	4	–	0.4	3.0	7.0
	F.66.06SW	F.66.06GR	6	SRER-06	0.6	5.0	8.0
	F.66.08SW	F.66.08GR	8	SRER-06	0.8	7.0	10.0
	F.66.10SW	F.66.10GR	10	SRER-06	1.0	9.0	13.0
	F.66.12SW	F.66.12GR	12	SRER-06	1.4	11.0	16.0
	F.66.16SW	F.66.16GR	16	SRER-16	1.7	15.0	21.0
	F.66.20SW	F.66.20GR	20	SRER-16	2.0	20.0	26.0
	F.66.25SW	F.66.25GR	25	SRER-21/SRER-29	2.4	24.0	31.0
	F.66.30SW	F.66.30GR	30	SRER-21/SRER-29	3.5	28.0	38.0
	F.66.40SW	F.66.40GR	40	SRER-29	4.2	38.0	49.0
	F.66.50SW	F.66.50GR	50	SREV-40/SRER-50	5.1	48.0	65.0
	F.66.70SW	F.66.70GR	70	SREV-40/SRER-50	4.9	48.0	85.0

#### Approvals



Monofile Ø: 0.28mm for increased abrasion properties  
 Coverage: >90%  
 Polyamide 6.6  
 Specifications: DIN 5510 (S4/SR2/ST2), UL-File E 125 619, EN45545-2 HL3  
 Temperature range: –55°C to +135°C, short-term to +160°C

#### Type C.66 - Braided hose


	Order no. black	Order no. grey	NW	Fits to termination	Weight nom. per 100 m (kg)	Operative range min. Ø (mm)	Operative range max. Ø (mm)
	C.66.10SW	C.66.10GR	10	SRER-06	0.7	8.0	14.0
	C.66.12SW	C.66.12GR	12	SRER-06/SRER-16	0.9	9.0	18.0
	C.66.16SW	C.66.16GR	16	SRER-06/SRER-16	1.2	11.0	22.0
	C.66.20SW	C.66.20GR	20	SRER-16/SRER-21	1.4	14.0	26.0
	C.66.25SW	C.66.25GR	25	SRER-16/SRER-21	1.4	18.0	28.0
	C.66.30SW	C.66.30GR	30	SRER-21/SRER-29	2.5	25.0	43.0
	C.66.40SW	C.66.40GR	40	SRER-29	2.5	30.0	52.0
	C.66.45SW	–	45	SREV-40/SRER-50	4.0	40.0	73.0

Monofile Ø: 0.28mm for increased abrasion properties  
 Coverage: >75%  
 Polyamide 6.6  
 Specifications: DIN 5510 (S4/SR2/ST2), EN45545-2 HL3  
 Temperature range: –55°C to +135°C, short-term to +160°C

## Plastic braided hoses

### Type L.66

#### Type L.66 - Braided hose

	Order no. black	Order no. grey	NW	Fits to termination	Weight nom. per 100 m (kg)	Operative range min. Ø (mm)	Operative range max. Ø (mm)
L.66	L.66.04SW	L.66.04GR	04	–	0.4	4.0	5.0
	L.66.08SW	L.66.08GR	08	SRER-06	0.5	5.0	10.0
	L.66.10SW	L.66.10GR	10	SRER-06	0.8	7.0	13.0
	L.66.16SW	L.66.16GR	16	SRER-16	0.9	11.0	20.0
	L.66.20SW	L.66.20GR	20	SRER-16	1.4	17.0	33.0
	L.66.25SW	L.66.25GR	25	SRER-21/SRER-29	1.5	21.0	34.0
	L.66.30SW	L.66.30GR	30	SRER-21/SRER-29	1.8	25.0	45.0
	L.66.40SW	L.66.40GR	40	SRER-29	1.9	31.0	55.0
	L.66.50SW	L.66.50GR	50	SREV-40/SRER-50	3.2	58.0	70.0

Monofile Ø: 0.25mm

Coverage: > 65%

Polyamide 6.6

Specifications: DIN 5510 (S4/SR2/ST2), NF F 16-101/102 (I3/F2), EN45545-2 HL3


Temperature range: -55°C to +135°C, short-term to +160°C



## Plastic braided hoses


### Type G.PX & B.PX

#### Type G.PX - Braided hose

	Order no. black	NW	Packing unit PU/m	Weight nom. per 100m (kg)	Recommended range	
					min. Ø (mm)	max. Ø (mm)
	G.PX.05SW	05	25	1.6	4.5	5.5
	G.PX.08SW	08	25	2.0	7.0	9.0
	G.PX.10SW	10	25	2.3	9.0	11.0
	G.PX.13SW	13	25	2.5	11.5	13.0
	G.PX.16SW	16	25	3.4	14.5	17.5
	G.PX.19SW	19	25	3.8	17.0	21.0
	G.PX.25SW	25	25	4.8	22.5	27.5
	G.PX.29SW	29	25	5.3	26.0	32.0
	G.PX.32SW	32	25	6.1	29.0	35.0
	G.PX.38SW	38	25	8.3	34.0	42.0
	G.PX.50SW	50	25	8.7	45.0	55.0

Open, self winding construction. For retrofit installation. Overlapping: 90° (+40°/-25°). Polyester  
 Specifications: DIN 5510 (S4/SR2/ST2), NF F 16-101/102 (I3/F2), EN45545-2 HL3. Temperature range: -55°C to +150°C

#### Type B.PX - Braided hose

	Order no. black	NW	Construction numb. x Ø mm	Packing unit PU/m	Weight nom. per 100m (kg)	Recommended range	
						min. Ø (mm)	max. Ø (mm)
	B.PX.12SW	12	96 x 0.20	100	0.5	6.0	18.0
	B.PX.15SW	15	144 x 0.20	100	0.7	10.0	28.0
	B.PX.30SW	30	192 x 0.20	100	0.9	20.0	42.0

Coverage: > 50%. Excellent abrasion properties. Lightweight structure. High flexibility. Excellent flame-retardant properties. Polyester  
 Specifications: EN 45545-2 HL3 (R22 & R23). UL94 V0. Temperature range: -50°C to +120°C continuous, +150°C short-term

## Braid terminations, connectors

### Type RER/REV

#### Type RER/REV - Braid termination

	Order no. grey	NW	AI	AA	BI	BA	H	L	G	S	C
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
RER/REV	SRER-06 (x)	06	6.5	13	-	-	13	21	33	13	6
	SRER-16 (x)	16	16	24	-	-	15	25	39	15	7
	SRER-21 (x)	21	22	32	-	-	20	29	43	15	7
	SRER-29 (z)	29	30	40	-	-	18	29	43	39	7
	SRER-50 (z)	50	50	61	-	-	18	29	43	50	7
	SREV-40 (y)	40	47	58	34	44	20	24	44	38	10



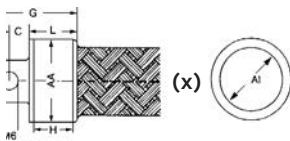
For termination and fixation of plastic braided hoses

Suitable for: F.66, C.66, L.66 braids

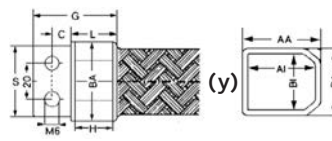
Polyamide 6

For exact braid and termination fitting configuration please refer to PMAJACK data sheets

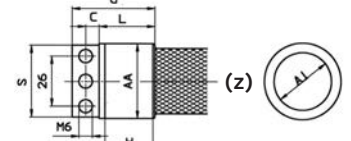
**RER**  
x = with one mounting hole



**REV**  
y = with two mounting holes



**RER**  
z = with three mounting holes



## Braid terminations, connectors

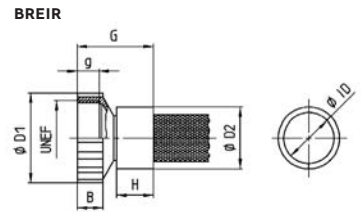
### Type BREIR & MREIR

#### Type BREIR - Connector for plastic braids, female thread

	Order no. black	NW	Thread size		Fits to PMAJACK		Ø	Ø	B	G	g	H	Ø
			UNEF	UNEF	F.66	ID	D1	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
BREIR	BREIR-U2916	16	1 3/16	-18	12-20		36.2	20.5	10.5	36.5	9	15	25
	BREIR-U3516	16	1 7/16	-18			42.5	20.5	11.5	37.5	9	15	25



For round connectors  
Suitable for: F.66, C.66, L.66 braids  
Polyamide 6

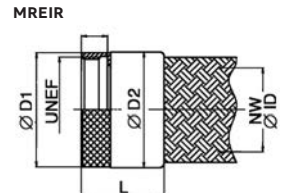


#### Type MREIR - Connector for plastic braids, female thread

	Order no. grey	NW	Thread size		Fits to PMAJACK		g	Ø	Ø	L	Ø
			UNEF	UNEF	F.PX	C.66	(mm)	D1	D2	(mm)	ID
MREIR	MREIR-U3529	29	1 7/16	-18	25-40	30+40	29	40.0	40.5	37.5	30.0




For round connectors  
Suitable for: F.66, C.66, L.66 braids  
Black anodized aluminium



## Stainless steel braids, tools

### Type F.304 & HSG


#### Type F.304 - Stainless steel braided hose

	Order no.	Braid specification	Fits to conduit size NW	Operative range min. Ø (mm)	Operative range max. Ø (mm)
	F.304.10	24 x 7 x 0.3	10	10.0	18.0
	F.304.12	24 x 8 x 0.3	12	10.0	24.0
	F.304.17	24 x 12 x 0.3	17	15.0	28.0
	F.304.23	36 x 9 x 0.3	23	21.0	34.0
	F.304.29	36 x 11 x 0.3	29	25.0	40.0
	F.304.36	36 x 9 x 0.4	36	32.0	47.0
	F.304.48	48 x 10 x 0.4	48	55.0	80.0

Surface coverage: >90%

Temperature range: -70°C to +1000°C

#### Type HSG - Hot cutting tool

	Order no.	Order no. Spare cutting tape
	HSG-00	HSG-00-SB

For quick and easy cutting of plastic braidings

Smallest hot cutting tool for permanent use

With fixed edge (working area 30mm)

Voltage: 230 V-50 Hz (115 V-60 Hz)


Performance: 40W

Length of the connecting lead: 2m

## Connectors, adapters

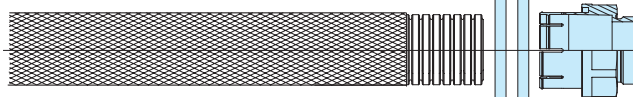
### Type VEMD

Type VEMD - Connector for overbraided conduits, metric/PG metal thread

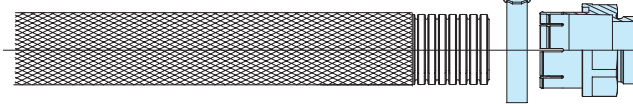
	Order no. with jubilee clip	Thread metric	Fits to conduit size		Outside Ø x Length (mm)
			NW	Metric	
	MVEMD-M406/01	40 x 1.5	36	40	55.0 x 59.0
	MVEMD-M508/01	40 x 1.5	48	50	65.0 x 62.0
	MVEMD-M6356/01	63 x 1.5	56	68	80.0 x 72.0
	Order no. with jubilee clip	Thread PG	Fits to conduit size		Outside Ø x Length (mm)
	MVEMD-P4856/01	48	56	68	80.0 x 72.0

Nickel-plated aluminium  
IP66 up to IP68 on request

VEMD with metal cable tie "Band-It"



VEMD with jubilee clip



Content of delivery includes blue marked products.



## Connectors, adapters

### Type VEMD-RER

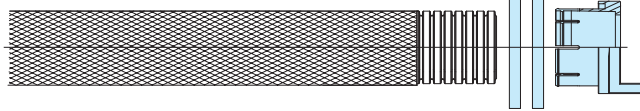
#### Type VEMD-RER - Adapter for overbraided conduits

	Order no. with Band-It*	Order no. with jubilee clip	Fits to conduit size		Width x Height x Length (mm)
			NW	Metric	
VEMD-RER	MVEMD-RER6	MVEMD-RER6/01	36	40	54.0 x 54.0 x 53.0
	MVEMD-RER8	-	48	50	66.0 x 66.0 x 53.0

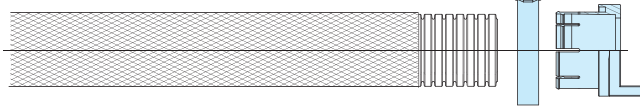


\*Metal cable tie  
Nickel-plated aluminium  
IP66 on conduit side

VEMD-RER with metal cable tie "Band-It"



VEMD-RER with jubilee clip



Content of delivery includes  
blue marked products.

# Technical annex

## Introduction

Conforms with standards. Intensive research and testing is the reason PMA continues to set new standards and trends in cable protection.

PMA products conform to worldwide standards and regulations.

As a pioneer in the field of cable protection, we have always given high priority to our own testing facilities, and we have consciously introduced stringent in-house standards. This approach has enabled PMA to exercise a significant influence on the development of international standards. Standards committees with responsibility for cable systems regularly ask our company to provide advice or participate as an active member.

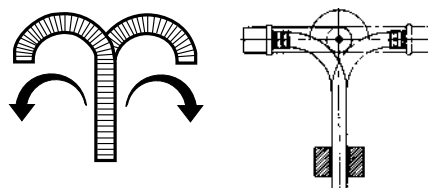
**High quality product from A-Z**  
From basic items to high-tech products, all of our products meet the most stringent quality requirements.

- Some of the outstanding are:
- Resistance to temperature, weathering, UV radiation and chemical agents
  - High system pull-out resistance
  - Excellent fire protection characteristics (flammability, smoke density and toxicity)
  - Excellent system ingress protection up to IP68 and IP69
  - Extremely long service life
  - Conformance to all major international product standards



### Resistance to fatigue when exposed to Continuous Bending Test

**According to EC EN 61386 and PMA DO 9.21-4425 test procedures.** Both procedures describe tests designed to evaluate conduit resistance to fatigue when exposed to continuous cycles of repetitive bending. The test procedure involves bending back and forth around a central pivotal point. Although the test procedure is the same for both standards there are differences in the test parameters and the classification of results.



**Technical annex**

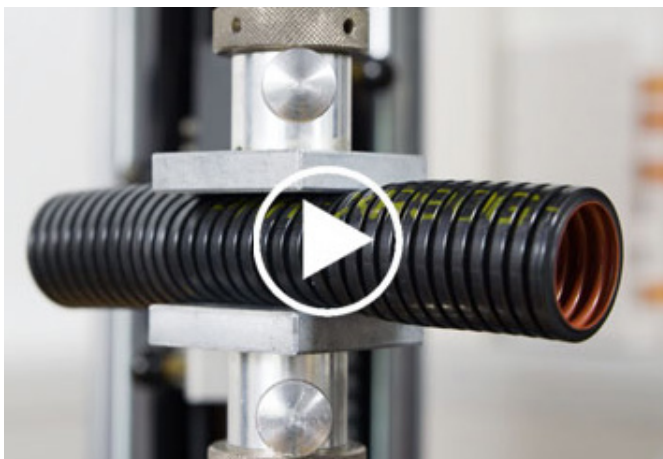
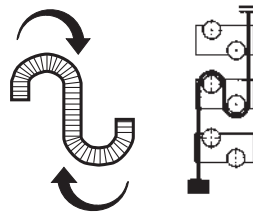
Testing methods according to IEC EN01386 and PMA internal procedures



**Resistance to fatigue** when exposed to Continuous Bending Test 2

**According to PMA DO 9.21-4420 test procedures.**

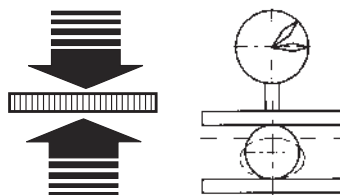
The PMA DO 9.21-4420 test procedures describes a demanding test for conduit fatigue when exposed to continuous repetitive bending. The conduit is fixed at the top of the apparatus, it passes over and under two pulley wheels. A weight is suspended at the bottom end simulating the weight of cables within the conduit. The pulley wheels move up and down continuously bending the conduit twice through 180° over its entire length.



**Compression Strength Test**

**According to IEC EN 61386 standard and PMA DO 9.21-4320 test procedures.** Both, procedures describe a test designed to evaluate conduit resistance to compression forces.

Excessive deformation of a conduit under compression could potentially cause damage to cables being protected within it. The force required to compress the conduit between two square plates to a specific % of its original diameter is measured. Relaxation over time and recovery after removal of the force are evaluated.



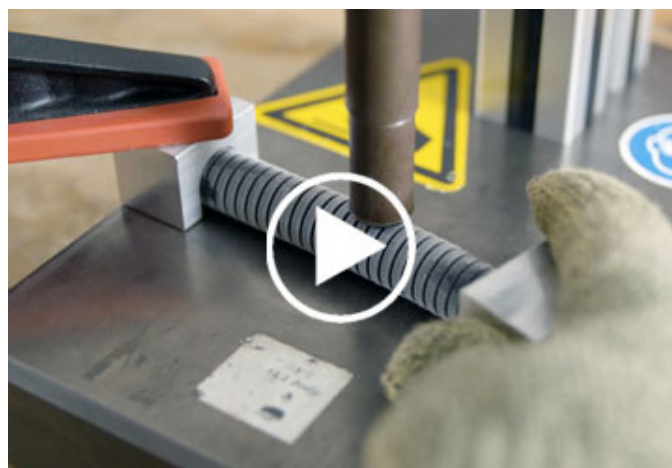
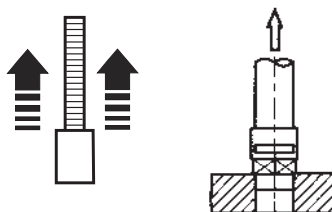
## Technical annex

Testing methods according to IEC EN01386 and PMA internal procedures



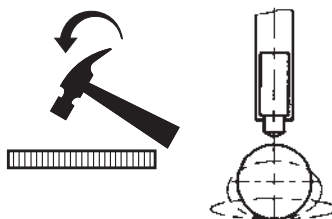
### System Security - Pull-Out Strength Test

According to IEC EN 61386 and PMA DO 9.21-4610 test procedures. IEC EN 61386 and PMA DO 9.21-4610 are designed to test the security of the connection between conduit and fitting. Two fittings with a piece of conduit between them are pulled apart with steadily increasing force. Extension of the conduit is recorded graphically against the force applied. The force required to pull the conduit out of the fitting is determined. The tests are performed at 23°C and 50% r.h.



### Resistance to Impact Test

According to IEC EN 61386 standard and PMA DO 9.21-4330 test procedures. IEC EN 61386 and PMA DO 9.21-4330 describe tests to evaluate the resistance of conduits to high energy impacts. They can be performed on conduits at various temperatures. Weights of different mass are dropped from an adjustable height directly onto a conduit sample which has been conditioned at the specified temperature.



**Technical annex**

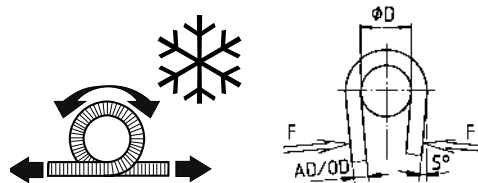
Testing methods according to IEC EN01386 and PMA internal procedures



**Flexibility at Low Temperature Test**

**According to PMA DO 9.21-4380 test procedures.**

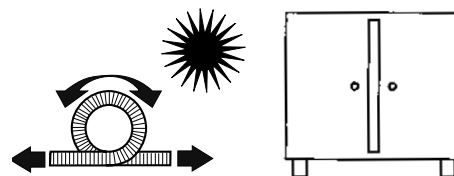
This standard describes a test procedure to evaluate the flexibility of conduits at low temperatures. The conduit under test is placed in a climatic chamber at the lowest specified operating temperature for four hours. It is then removed and immediately bent around a mandrel of diameter related to the outside diameter (OD) of the conduit.



**Resistance to thermal ageing test**

**According to PMA DO 9.21-4360 test procedures.**

This standard describes a procedure designed to evaluate the thermal stability of a conduit and its resistance to thermal ageing. The conduit is exposed to a temperature significantly above the maximum recommended continuous operating temperature for 168 hours, 160°C (PA6) or 150°C (PA12). The Flexibility at Low Temperature procedure DO 9.21-4380 is performed both before and after the thermal ageing procedure. The results are compared to detect any change in material characteristics.





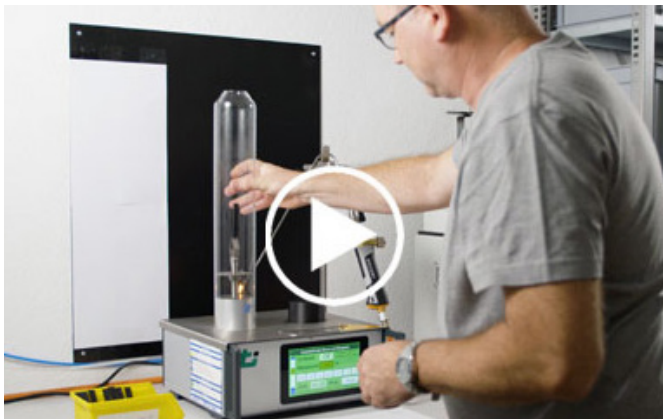
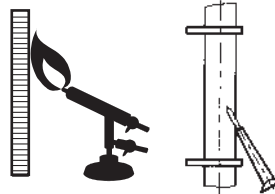
## Technical annex

Testing methods according to IEC EN01386 and PMA internal procedures



## Flammability tests

According to IEC EN 61386 and PMA DO 9.21-4430 test procedures. DO 9.21-4430 evaluates flammability characteristics using a defined flame from a standard burner. The time before ignition, fire propagation behaviour and extinguishing time after removal of the heat source are all factors in evaluating the flammability of conduits for a Self-Extinguishing Classification IEC 61386 uses the IEC 60695-2-11 glow wire test procedure for fittings and the IEC 60695-11-2 1 kW flame test for conduits to evaluate the flame Propagation behavior of the cable protection system allocating the classifications. Non-flame propagating or Flame Propagating.



## Flammability test - Limited oxygen supply

According to EN ISO 4589-2 standard. The limited oxygen index test is a commonly used method for assessing the flammability of materials. Samples of material are exposed to a flame within a chamber. The oxygen content within the controlled environment within the chamber can be varied to within 0.1%. Through an iterative method the maximum percentage of oxygen in the air at which the sample of material extinguishes is determined. This percentage of oxygen can be used as an indication of how easily a material burns. The higher the Limited Oxygen Index % value the less flammable a material is.

## Resistance to chemicals test

According to ISO 175:210 standard. In many real application cable protection systems are exposed to chemicals. Extensive data is available for the compatibility of various plastic materials with many different chemicals. This data can be used for assessment of compatibility for specific applications. PMA publishes a compatibility list for the most commonly occurring combinations of plastic and chemical. If chemicals are mixed or if no data is available for an assessment PMA recommends a compatibility test. Changes to appearance, dimensions and mechanical characteristics are assessed after long term exposure to the chemical to confirm compatibility.



## PMA® (DO) test procedures

PMA® has more than 15 test procedures (PMA DO) that enables us to perform cable protection-related, application-specific material and product tests.

Customers' application-specific needs are a top priority at PMA. That's why the company, as a leading manufacturer of cable protection products, voluntarily defined various supplementary in-house test procedures, which are consistently used to test PMA products to uniform criteria. This helps us safeguard the high quality and safety of PMA cable protection solutions and supply our customers with the best, most reliable products. It gives our customer the confidence that our products perform without failure or problems and meet their expectations.

The PMA test procedures apply not only to the general product properties usual for overarching standards but also to specific applications,

such as impact resistance in low-temperature rail applications, ingress protection in dynamic outdoor applications or abrasion resistance in automation applications. PMA test procedures are primarily used in areas where the market has yet to define overarching binding standards for specific applications. Many of our bespoke test procedures are geared to existing overarching standards wherever possible, and often correspond to other international standards in terms of structure, procedure and results assessment.

### Scope of a PMA test procedures:

- Detailed description of the content of testing
- Definition of samples in terms of material and quantity, distinction from other products
- Definition of the test environment, e.g. climate conditions and temperature
- Definition of devices and apparatus used in testing
- Precise definition of each relevant test parameter, such as mass, temperature, time or drop height
- Exact step-by-step definition of the test procedure
- Parameters for assessing the test result, such as the onset of mechanical losses, changes in the material, number of cycles, etc.
- List of contiguous overarching standards such as UL or IEC

—  
**For more information on the PMA test procedures (DO), please contact your PMA supplier**

## Technical annex

### Ingress protections according to IEC 60529



### Ingress Protection Test for Static Applications

According to IEC EN 60529 standard and PMA DO 7.3-1160-00 test procedures. IEC EN 60529 describes various levels of system ingress protection against both water and dust. IP\*7 and IP\*8 are sealing ratings for a system fully immersed under water. IP\*7 is precisely defined as immersion to a depth of 1 meter for 30 minutes. An IP\*8 rating indicates that the system remains dry after immersion to a depth > 1m and/or duration >30minutes. It is the intention of the standard that the time and depth of the test should be agree between customer and supplier according to the requirements of the application.



### Ingress Protection Test for Dynamic Applications

According to PMA DO 9.21-4440 test procedures. This PMA internal procedure allows the sealing performance of a cable protection system which is in continuous motion to be tested. It is significantly more difficult to achieve an efficient and long-lasting seal against ingress of water for a dynamic system than for a static system. The test equipment simulates typical movement of a cable protection system while it is submerged under water.



PMA Products

			PMAFIX Pro	PMAFIX IP68+ WPS	PMAFIX IP68/ IP68GT	PMAFIX IP66	PMA Smart Line
	IPx4	Splash water from all directions	●	●	●	●	●
	IPx5	Jet water at any angle	●	●	●	●	●
	IPx6	Powerful jet water from any angle	●	●	●	●	●
	IPx7	Submersion (1m, 30 min.)	●	●	●	-	-
	IPx8	Submersion at time and pressure >IPx7	●	●	●	-	-
	IPx9	High pressure (up to 100 bar, 80°C) water from any angle	●	●*	●*	●*	●*








\*IEC 60529 can be fulfilled without WPS (Water impact protection ring). PMA recommends the use of the WPS ring for trouble free practical applications

## Technical annex

### Ingress protections according to IEC 60529

#### Dust

**Protection against contact and penetration of foreign objects**  
Degree of protection (contact/foreign bodies)

	<b>0</b>	No protection
	<b>1</b>	Objects greater than 50mm Ø, accidental touch by hands
	<b>2</b>	Objects greater than 12.5mm Ø, accidental touch by fingers
	<b>3</b>	Objects greater than 2.5mm Ø, e.g. tools/wires
	<b>4</b>	Objects greater than 1mm Ø, e.g. tools/wires
	<b>5</b>	Protected against dust - limited ingress (no harmful deposits)
	<b>6</b>	Totally protected against dust (dust-tight)

#### Water

**Protection against fluids**  
Degree of protection (water)

	<b>0</b>	No protection
	<b>1</b>	Protected against vertically falling drops of water
	<b>2</b>	Protected against direct sprays of water 15° from vertical
	<b>3</b>	Protected against sprays of water to 60° from vertical
	<b>4</b>	Protected against water sprayed from all directions - limited ingress permitted
	<b>5</b>	Protected against low pressure jets of water from all directions - limited ingress permitted
	<b>6</b>	Protected against strong pressure jets of water, heavy seas - limited ingress permitted
	<b>7</b>	Protection against the effects of immersion between 15cm - 1m
	<b>8</b>	Protection against long periods of immersion under a quoted pressure, e.g. 2 bar at 24 hours
	<b>9</b>	IP69 Automotive standard DIN40050 and signifies resistance to high pressure jets of water (up to 80 bar) from any angle



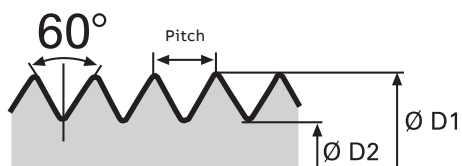


## Technical annex

### Table of thread dimensions

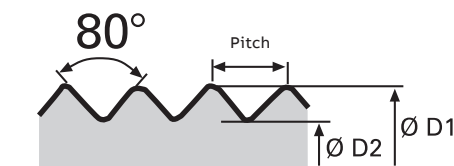
Metric fine thread - EN 60423

Metric	Pitch (mm)	Ø D1 (mm)	Ø D2 (mm)	Hole -0/+0.3 (mm)
12	1.5	12	10.16	12.0
16	1.5	16	14.16	16.0
20	1.5	20	18.16	20.0
25	1.5	25	23.16	25.0
32	1.5	32	30.16	32.0
40	1.5	40	38.16	40.0
50	1.5	50	48.16	50.0
63	1.5	63	61.16	63.0



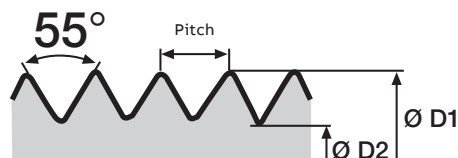
PG thread - DIN 40430

PG	Pitch (mm)	Ø D1 (mm)	Ø D2 (mm)	Hole (mm)
07	1.270	12.5	11.28	12.7
09	1.411	15.2	13.86	15.4
11	1.411	18.6	17.26	18.8
13	1.411	20.4	19.06	20.7
16	1.411	22.5	21.16	22.8
21	1.588	28.3	26.78	28.6
29	1.588	37.0	35.48	37.4
36	1.588	47.0	45.48	47.5
48	1.588	59.3	57.78	59.8



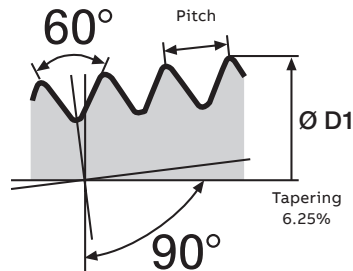
GAS pipe thread - DIN 259 Bl. 3, ISO 228/1

GAS	Pitch (mm)	Ø D1 (mm)	Ø D2 (mm)	Hole (mm)
¼"	1.337	13.157	11.445	13.4
⅜"	1.337	16.662	14.950	17.0
½"	1.814	20.955	18.631	21.3
¾"	1.814	26.441	24.117	26.8
1"	2.309	33.249	30.291	33.7
1¼"	2.309	41.910	38.952	42.4
1½"	2.309	47.803	44.845	48.3
2"	2.309	59.614	56.656	60.2



American standard taper pipe thread - ANSI/ASME B 1.20

NPT	Pitch (mm)	Ø D1 (mm)	Hole D2 (mm)
¼"	1.411	13.716	13.9
⅜"	1.411	17.145	17.4
½"	1.814	21.336	21.6
¾"	1.814	26.670	26.9
1"	2.209	33.401	33.7
1¼"	2.209	42.164	42.4
1½"	2.209	48.260	48.5
2"	2.209	60.325	60.6





## Technical annex

### Comparison table

#### Conduit

Nominal width NW		
Standard	Metric	Inside Ø nom. (mm)
07	10	6.2
10	12	9.6
10	12	9.6
12	16	12.0
12	16	12.0
17	20	16.2
17	20	16.2
23	25	22.6
23	25	22.6
29	32	29.0
29	32	29.0
36	40	36.5
36	40	36.5
48	50	47.5
48	50	47.5

#### Connector metric

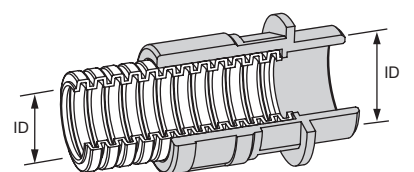
Inside diameter mm (nom.) ID		
Thread size	Metal thread	Polyamide thread
M12	-	8.0
M12	5.7	8.0
M16	9.6	11.0
M16	9.7	11.0
M20	13.5	13.0
M20	13.5	14.6
M25	18.3	19.0
M25	18.4	19.0
M32	24.2	24.0
M32	25.4	26.0
M40	31.4	32.0
M40	32.6	32.0
M50	39.5	39.0
M50	41.5	42.0
M63	51.4	53.0

#### Conduit

Nominal width NW		
Standard	Metric	Inside Ø nom. (mm)
07	10	6.2
10	12	9.6
12	16	12.0
-	-	-
17	20	16.2
23	25	22.6
29	32	29.0
36	40	36.5
-	-	-
48	50	47.5

#### Connector PG

Inside diameter mm (nom.) ID		
Thread size	Metal thread	Polyamide thread
PG07	-	8.0
PG09	9.5	10.0
PG11	12.5	13.0
PG13.5	14.5	14.5
PG16	16.5	17.5
PG21	22.0	22.5
PG29	30.0	30.5
PG36	40.0	37.5
PG42	-	46.0
PG48	49.5	50.0



Inside diameter threads to inside diameter conduits.

## Technical annex

### Tightening torques

#### Recommended tightening torques for PMA fittings - For threaded bore holes and with lock nuts

Thread	Metal* [Nm]	Polyamide** [Nm]
M12	4.0	1.5
M16	4.0	3.0
M20	6.0	4.0
M25	8.0	6.0
M32	10.0	8.0
M40	15.0	9.0
M50	15.0	10.0
M63	15.0	10.0

\* Thread combination: Metal + metal

\*\* Thread combination: Metal + polyamide or polyamide + polyamide

Thread	Metal* [Nm]	Polyamide [Nm]
PG07	3.5	1.5
PG09	4.0	1.5
PG11	6.0	2.0
PG13.5	6.0	2.5
PG16	7.0	4.0
PG21	8.0	5.0
PG29	10.0	9.0
PG36	15.0	15.0
PG48	15.0	15.0

#### Strain relief fittings - According to EN 50262

Thread	Metal NVNZ-Mxxxx NKNZ-Mxxxx	Metal NVNZ-Mxxxx/P NKNZ-Mxxxx/P	Polyamide S/BVNZ-Mxxxx
	[Nm] EN	[Nm]	[Nm] EN
M12	5.0	6.0	0.9
M16	5.0	8.0	3.0
M20	7.5	10.0	4.0
M25	10.0	10.0	7.5
M32	15.0	15.0	10.0
M40	20.0	20.0	10.0
M50	20.0	20.0	10.0
M63	20.0	20.0	10.0

**Note:** These values were gauged at standard climate (23°C/50% relative humidity)

#### According to DIN VDE 0619

Thread	Metal NVNZ-Pxxxx	Metal NVNZ-Pxxxx/P	Polyamide S/BVNZ-Pxxxx
	[Nm]	[Nm]	[Nm]
PG07	6.25	6.0	2.5
PG09	6.25	8.0	3.75
PG11	6.25	10.0	3.75
PG13.5	6.25	10.0	3.75
PG16	7.5	10.0	5.0
PG21	10.0	15.0	7.5
PG29	10.0	20.0	7.5
PG36	10.0	30.0	7.5
PG48	10.0	40.0	7.5

## Technical annex

### Applications engineering information

#### Fill factor, relevant guidelines

The question of conduit capacity or fill factor arises in the use of cable protection systems. This describes the extent to which a conduit can or should be filled with cables and/or conductors based on the available cross-sectional area.

In all cases, PMA recommends that a conduit **capacity of 70%** not be exceeded. (Application-specific procedures and standards must also be considered.)

This ensures that operation is not unnecessarily impaired by increased friction between the individual conductors in dynamically moving systems. In addition, subsequent installation of additional conductors and/or cables is also possible if necessary.

#### Wiring installation: fixation

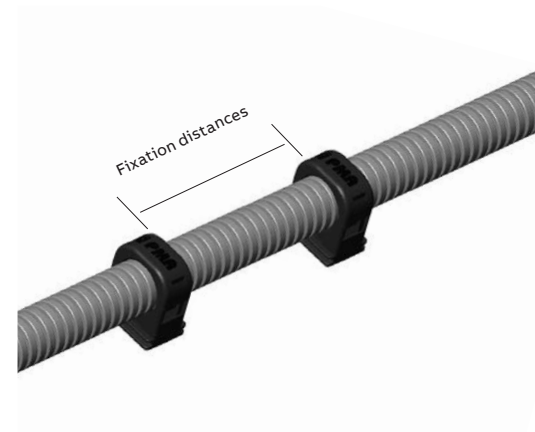
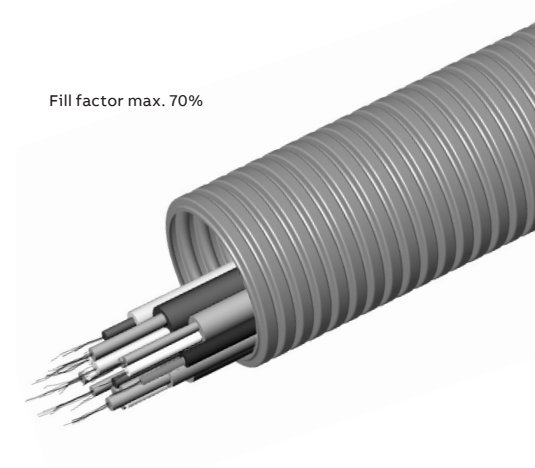
PMA AG recommends that cable protection systems be fastened with a spacing of **300mm to 500mm** between supports. This spacing can be varied depending on the application and location. This recommendation applies for all available dimensions. For larger diameters, the increased load due to the cables and conductors in the conduit is accounted for by adherence to the support spacing. PMA supplies suitable system supports for various strength requirements and applications.

European standard **EN 50343:2003-5.15** "Railway applications – Rolling stock – Rules for installation of cabling" specifies the following spacing between supports for fastening conductors:

**Horizontal wiring: 300mm**

**Vertical wiring: 500mm**

(Application specific guidelines and standards should also be considered.)



## Technical annex

### Chemical resistance

Chemical resistance comparison table

Resistance against	Chemical formula	PA6, Polyamide 6 PA6.6, Polyamide 6.6	PA12, Polyamide 12 PA11, Polyamide 11	PP, Polypropylene PE, Polyethylene	TPU	PFA PVDF
Acetic acid (10%)	C2H4O2	1	2	3	0	3
Acetone	C3H6O	3	3	3	0	3
Ammonia (30%)	NH3	3	3	3	0	3
Benzine	–	3	3	2	1	3
Brake fluid	–	3	3	3	0	3
Caustic soda	NaOH	3	3	3	1	3
Ethyl alcohol (40%)	C2H6O	3	3	3	1	3
Glycol	C2H6O2	3	3	3	0	3
Hydrochloric acid (10%)	HCL	0	1	3	0	3
Methanol	CH4O	2	3	3	1	3
Methyl ethyl ketone	C4H8O	3	3	3	0	3
Nitric acid (10%)	HNO3	0	0	2	0	3
Ozone	O3	2	2	2	1	3
Paint thinner	–	3	3	1	0	3
Perchloroethylene	C2Cl4	2	2	2	0	3
Paraffin	–	3	3	1	0	3
Phosphoric acid (10%)	H3O4P	1	2	3	0	3
Sea water	–	3	3	3	2	3
Soap solution	–	3	3	3	2	3
Sodium chloride	NaCl	3	3	3	3	3
Sulphuric acid (10%)	H2SO4	1	2	3	0	3
Toluene	C7H8	3	3	1	0	3
Trichlorethylene	C2HCl3	1	2	0	0	3
Turpentine	–	3	3	0	0	3
Urine	–	3	3	3	3	3

Resistance against oils and greases	Chemical formula	PA6, Polyamide 6 PA6.6, Polyamide 6.6	PA12, Polyamide 12 PA11, Polyamide 11	PP, Polypropylene PE, Polyethylene	TPU	PFA PVDF
Cutting oils*	–	3	3	2	1	3
Diesel oil	–	3	3	2	2	3
ASTM Oil Nr. 3	–	3	3	2	1	3
Fuel oil	–	3	3	2	1	3
Hydraulic oils*	–	3	3	2	1	3
Mineral oils	–	3	3	2	3	3
Spark-erosion liquids	–	3	3	2	1	3
Skydrol	–	1	2	2	0	3
Transformer oils*	–	3	3	2	1	3

\*Synthetic additives can affect the oil resistance of plastics. Please contact PMA for further information

**Key:**

3 = Excellent resistance/suitable for permanent contact

2 = Resistant/suitable for occasional contact

1 = Relatively resistant/suitable for short-term contact

0 = Not recommended

**Important**

The chemical resistance of plastic products is also dependant on factors such as temperature, amount of time exposed to chemicals (e.g. occasional contact or immersed) as well as the concentration of the specific chemicals. The stated chemical resistances are valid for a temperature of 20°C. The chemical resistance table above serves only as a guide for the use of polyamide products in conjunction with the listed chemicals. Each specific application should be controlled for suitability by the end-user.

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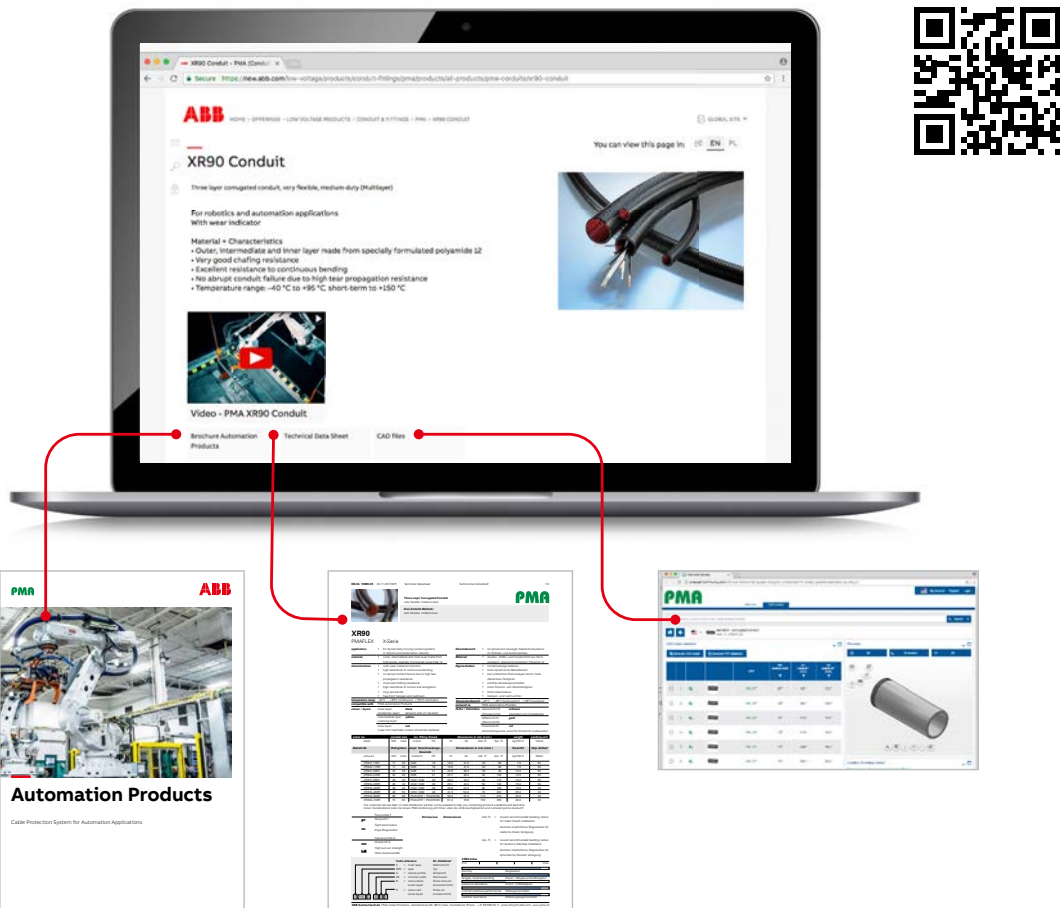
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