
PRODUCT CATALOGUE

PMA® Flexible cable protection systems

For applications with high requirements



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.

Table of contents

001–007	Introduction
008–033	PMA® conduits
034–045	PMAFIX Pro
046–087	PMAFIX IP66, IP68 (IP69)
088–091	Special connectors
092–111	Accessories
112–119	PMA JUMBO sizes
120–125	PMA® Divisible System
126–133	PMA® Smart Line IP66
134–143	PMAJACK Plastic and metal braids
144–154	Technical annex
155–172	Index
173	Important information
174	Further information

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.

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.

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.





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 continues 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 is. 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.

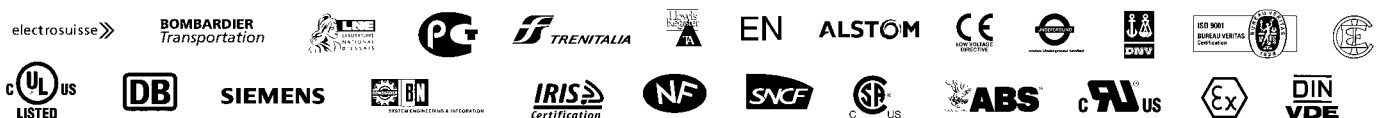
Rail vehicles/Rail infrastructure

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	PLU	POH	PSX	CYL	ESD	PCL	PCS	
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	PLU	POH	PSX	CYL	ESD	PCL	PCS	
Material properties	Ductility									
	Reversed bending resistance									
	Compression resistance									
	Low temperature performance									
	High temperature performance									
	Resistance to weathering									
	Approvals	<p>Bi-National Recognition File UL1696 & CSA C22.2 No. 227.3-05 Bi-National Listing File UL1660 & CSA C22.2 No. 227.2.1</p>								
	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)	Min. (-)	-50	-25	-25	-100	-40	-40	-50	-50
		Max. (+)	135	95	95	170	105	90	105	95
	Short term max. operating temperature 168h (acc. to DO 9.21-4360)	(+)	180	120	120	200	160	150	160	150
Sizes	Nominal width min.		07	10	10	10	07	07	07	07
	Nominal width max.		48	48	48	48	125	95	125	95
	Metric size min.		10	12	12	12	10	10	10	10
	Metric size max.		50	50	50	50	146	106	146	106

PMA[®] conduits

Overview

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

—
01 **CXR90** Conduit
Three layer corrugated
conduit, very flexible,
medium-duty
(Multilayer)

—
02 **PHT** Conduit
Highly flexible, medium /
heavy-duty

The product groups:

- PMAFLEX Pro
- PMAFLEX
- PMAFLEX PLus
- PMAFLEX Multilayer
- PMA Divisible System
- PMA Smart Line

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

Offering many different conduit types for diverse applications with various technical requirements to protect humans and cables. 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.



—
01

—
02

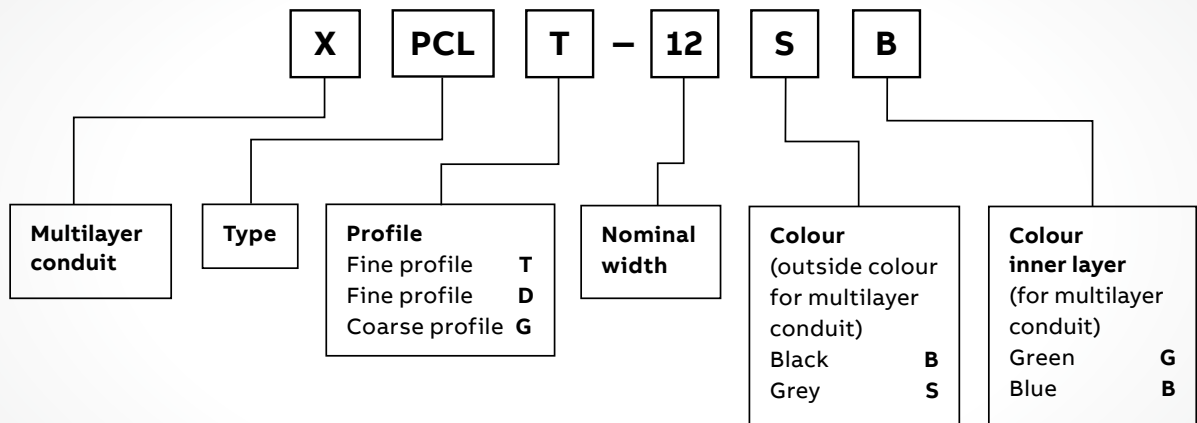
PMA CONDUITS

Offering many different conduit types for diverse applications with various technical requirements to protect humans and cables.

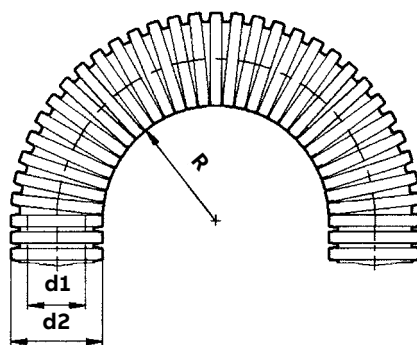


PMA® conduits

Part number codes



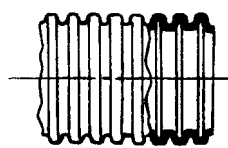
Radius



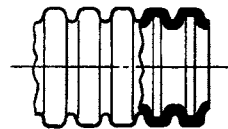
Stat. radius = Lowest recommended bending radius for static (fixed) installation.

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 & PLU 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	6.2	10.0	15/40	50
	PHTT-10B	10	12	9.6	13.0	20/55	50
	PHTT-12B	12	16	12.0	15.8	30/65	50
	PHTT-17B	17	20	16.2	21.2	40/70	50
	PHTT-23B	23	25	22.6	28.5	45/95	50
	PHTG-17B	17	20	15.2	21.2	40/75	50
	PHTG-23B	23	25	22.0	28.5	45/100	50
	PHTG-29B	29	32	27.7	34.5	55/120	50
	PHTG-36B	36	40	35.8	42.5	60/180	30
	PHTG-48B	48	50	46.8	54.5	70/200	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 PLU - Flexible, medium-duty

	Order no. (black)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
		NW	Metric				
	PLUT-10B	10	12	9.5	13.0	20	50
	PLUT-12B	12	16	11.8	15.8	30	50
	PLUG-17B	17	20	15.3	21.2	40	50
	PLUG-23B	23	25	22.4	28.5	45	50
	PLUG-29B	29	32	28.7	34.5	55	50
	PLUG-36B	36	40	36.3	42.5	65	30
	PLUG-48B	48	50	47.3	54.5	70	30

PLU 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) and LUL Engineering Standard,
approved by Metronet and Tube Line
For static interior applications
Good ductility

Materials	Temperature range	Colour
Specially modified polypropylene	-25°C to +95°C	Black
Certification	Short-term to: +120°C	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Impact resistance	-
	Good impact resistance	

PMAFLEX Pro

Type POH & PSX conduit

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	9.2	13.0	13.0	50
	POHT-12B	POHT-12S	12	16	11.8	15.8	15.8	50
	POHG-17B	POHG-17S	17	20	15.7	21.2	21.2	50
	POHG-23B	POHG-23S	23	25	22.0	28.5	28.5	50
	POHG-29B	POHG-29S	29	32	27.4	34.4	34.4	50
	POHG-36B	POHG-36S	36	40	35.8	42.4	42.4	30
	POHG-48B	POHG-48S	48	50	46.8	54.4	54.5	30


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

POH Index

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

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)
		-

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	13.0	20	50
	PSXT-12B	12	16	12.2	15.8	30	50
	PSXT-17B	17	20	16.2	21.2	35	50
	PSXG-23B	23	25	22.3	28.5	45	50
	PSXG-29B	29	32	28.0	34.5	55	50
	PSXG-36B	36	40	36.5	42.5	60	30
	PSXG-48B	48	50	47.5	54.5	70	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	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Fire performance	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	6.2	10.0	15	50
	CYLT-10B	CYLT-10S	10	12	9.6	13.0	20	50
	CYLT-12B	CYLT-12S	12	16	12.0	15.8	30	50
	CYLT-17B	CYLT-17S	17	20	16.2	21.2	40	50
	CYLT-23B	CYLT-23S	23	25	22.6	28.5	45	50
	CYLT-29B	CYLT-29S	29	32	29.0	34.5	55	50
	CYLT-36B	CYLT-36S	36	40	36.5	42.5	60	30
	CYLT-48B	CYLT-48S	48	50	47.5	54.5	70	30
	CYLG-23B	CYLG-23S	23	25	21.9	28.5	45	50
	CYLG-29B	CYLG-29S	29	32	27.6	34.5	55	50
	CYLG-36B	CYLG-36S	36	40	36.0	42.5	60	30
	CYLG-48B	CYLG-48S	48	50	47.0	54.5	70	30
	CYLG-56B	CYLG-56S	56	68	56.3	67.2	120	30
	CYLG-70B	CYLG-70S	70	80	68.0	80.0	160	10
	CYLG-95B	CYLG-95S	95	106	91.9	106.0	210	10
	CYLG-125B	CYLG-125S	125	146	126.5	146.5	450	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	6.2	10.0	15/40	50
	ESDT-10B	10	12	9.6	13.0	20/50	50
	ESDT-12B	12	16	12.0	15.8	30/70	50
	ESDT-17B	17	20	16.4	21.1	40/75	50
	ESDT-23B	23	25	22.6	28.4	45/90	50
	ESDT-29B	29	32	29.0	34.3	55/110	50
	ESDT-36B	36	40	36.5	42.5	60/160	30
	ESDT-48B	48	50	47.5	54.5	70/200	30
	ESDG-56B	56	68	56.5	67.0	110/250	30
	ESDG-70B	70	80	67.5	80.0	150/330	10
	ESDG-95B	95	106	91.5	106.0	170/440	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	6.2	10.0	15	50
	PCLT-10B	PCLT-10S	10	12	9.6	13.0	20	50
	PCLT-12B	PCLT-12S	12	16	12.0	15.8	30	50
	PCLT-17B	PCLT-17S	17	20	16.2	21.2	40	50
	PCLT-23B	PCLT-23S	23	25	22.6	28.5	45	50
	PCLT-29B	PCLT-29S	29	32	29.0	34.5	55	50
	PCLT-36B	PCLT-36S	36	40	36.5	42.5	60	30
	PCLT-48B	PCLT-48S	48	50	47.5	54.5	70	30
	PCLG-17B	PCLG-17S	17	20	15.3	21.2	40	50
	PCLG-23B	PCLG-23S	23	25	21.9	28.5	45	50
	PCLG-29B	PCLG-29S	29	32	27.6	34.5	55	50
	PCLG-36B	PCLG-36S	36	40	36.0	42.5	60	30
	PCLG-48B	PCLG-48S	48	50	47.0	54.5	70	30
	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	

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 PCS & PCSL conduit

Type PCS - Very flexible, heavy-duty conduit

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./Dyn. radius (mm)	PU (m)
			NW	Metric				
	PCST-07B	PCST-07S	07	10	6.0	10.0	15/40	50
	PCST-10B	PCST-10S	10	12	9.2	13.0	20/50	50
	PCST-12B	PCST-12S	12	16	11.8	15.8	25/70	50
	PCST-17B	PCST-17S	17	20	16.0	21.2	35/80	50
	PCSG-17B	PCSG-17S	17	20	15.2	21.2	35/85	50
	PCSG-23B	PCSG-23S	23	25	21.5	28.5	40/110	50
	PCSG-29B	PCSG-29S	29	32	27.7	34.4	50/130	50
	PCSG-36B	PCSG-36S	36	40	35.8	42.4	60/180	30
	PCSG-48B	PCSG-48S	48	50	46.8	54.4	70/220	30
	PCSG-56B	PCSG-56S	56	68	56.1	67.2	130/280	30
	PCSG-70B	PCSG-70S	70	80	66.5	80.0	170/360	10
	PCSG-95B	PCSG-95S	95	106	91.0	106.0	250/470	10


For dynamic outside applications in railway vehicles / outdoor applications with highest requirements to UV and weathering resistance
 Extensive railway approvals. Very good ductility and good reversed bending characteristics
 Very good mechanical characteristics even under extreme conditions, such as low temperatures and low humidity
 Highest reversed bending resistance
 Excellent resistance to ultra violet rays and weathering

PCS 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	
Free from halogens, REACH compliant and RoHS compliant	Fatigue resistance	UV Resistance
	Excellent fatigue resistance	Excellent

Type PCSL - Highly flexible, medium-duty conduit

	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./Dyn. radius (mm)	PU (m)
			NW	Metric				
	PCSLT-07B	PCSLT-07S	07	10	6.2	10.0	15/40	50
	PCSLT-10B	PCSLT-10S	10	12	9.6	13.0	20/50	50
	PCSLT-12B	PCSLT-12S	12	16	11.9	15.8	25/65	50
	PCSLT-17B	PCSLT-17S	17	20	16.4	21.1	30/65	50
	PCSLG-17B	PCSLG-17S	17	20	15.2	21.1	30/80	50
	PCSLG-23B	PCSLG-23S	23	25	21.7	28.4	40/100	50
	PCSLG-29B	PCSLG-29S	29	32	27.4	34.3	50/120	50
	PCSLG-36B	PCSLG-36S	36	40	35.8	42.3	60/180	30
	PCSLG-48B	PCSLG-48S	48	50	46.7	54.2	70/200	30

For dynamic outside applications in railway vehicles / 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
 Excellent reversed bending resistance
 Excellent resistance to ultra violet rays and weathering

PCSL 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
Certification	Short-term to: +150°C	
Free from halogens, REACH compliant and RoHS compliant	Fatigue resistance	UV Resistance
	Excellent fatigue resistance	Excellent

PMAFLEX

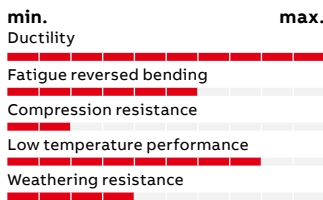
Type PEL & PIS/PIH conduit

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	9.7	12.7	20	50
	PELT-12S	PELT-12SL	12	16	11.5	15.5	30	50
	PELT-17S	PELT-17SL	17	20	16.0	20.9	35	50
	PELT-23S	PELT-23SL	23	25	22.5	27.5	40	50
	PELT-29S	PELT-29SL	29	32	28.5	33.8	50	30
	PELT-36S	PELT-36SL	36	40	34.0	41.6	60	30
	PELT-48S	PELT-48SL	48	50	47.0	53.2	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



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

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

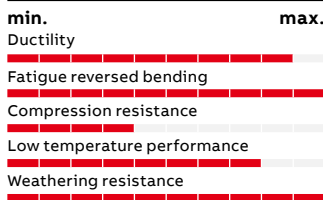
	Order no. (black)	Order no. (grey)	Conduit size		Inside Ø (mm)	Outside Ø (mm)	Stat./dyn. radius (mm)	PU (m)
			NW	Metric				
	PIST-07B	PIST-07S	07	10	6.2	10.0	15/40	50
	PIST-10B	PIST-10S	10	12	9.6	13.0	20/50	50
	PIST-12B	PIST-12S	12	16	11.9	15.8	25/65	50
	PIST-17B	PIST-17S	17	20	16.4	21.1	30/65	50
	PIST-23B	PIST-23S	23	25	22.6	28.4	35/90	50
	PIST-29B	PIST-29S	29	32	29.0	34.3	45/110	50
	PIST-36B	PIST-36S	36	40	36.5	42.5	60/165	30
	PIST-48B	PIST-48S	48	50	47.5	54.5	70/180	30
	PISG-17B	PISG-17S	17	20	15.2	21.1	30/80	50
	PISG-23B	PISG-23S	23	25	21.7	28.4	40/100	50
	PISG-29B	PISG-29S	29	32	27.9	34.7	50/120	50
	PISG-36B	PISG-36S	36	40	35.8	42.3	60/180	30
	PISG-48B	PISG-48S	48	50	46.7	54.2	70/200	30
	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

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

Approvals



PIS/PIH Index




Materials	Temperature range	Colour
Specially modified polyamide 12	-50°C to +95°C	Black/Grey
Certification	Weathering characteristics	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Short-term to: +150°C 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	9.6	13	20/50	50
	POST-12B	12	16	11.9	15.8	30/70	50
	POST-17B	17	20	16.2	21.2	35/75	50
	POST-23B	23	25	22.6	28.5	40/100	50
	POST-29B	29	32	29	34.5	50/120	50
	POST-36B	36	40	36.5	42.5	60/180	30
	POST-48B	48	50	47.5	54.5	70/195	30
	POSG-29B	29	32	27.6	34.5	50/120	50
	POSG-36B	36	40	36	42.5	60/180	30
	POSG-48B	48	50	47	54.5	70/195	30
	POSG-70B	70	80	67.2	79.6	150/350	30
	POSG-95B	95	106	91.3	106	170/450	30

POS Index

min.
Ductility


max.

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	22.4	28.5	35/70	50
	PUET-29B	29	32	28.8	34.5	40/90	30
	PUET-36B	36	40	35.8	42.4	50/120	30
	PUET-48B	48	50	48.6	54.5	60/130	21
	PUEG-56B	56	68	56.3	67.2	90/170	30
	PUEG-70B	70	80	68.2	80.5	100/220	30

PUE Index

min.
Ductility

max.

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	9.5	12.6	20	50
	PVDT-12P	12	16	11.8	15.5	30	50
	PVDT-17P	17	20	16.0	20.8	40	50
	PVDT-23P	23	25	22.6	28.0	45	50
	PVDT-29P	29	32	29.0	34.1	50	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	9.2	13.0	25	50
	VAMT-12B	VAMT-12S	12	16	11.8	15.8	30	50
	VAMG-17B	VAMG-17S	17	20	15.2	21.2	40	50
	VAMG-23B	VAMG-23S	23	25	22.0	28.5	50	50
	VAMG-29B	VAMG-29S	29	32	27.7	34.4	60	50
	VAMG-36B	VAMG-36S	36	40	35.8	42.4	70	30
	VAMG-48B	VAMG-48S	48	50	46.8	54.4	80	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	9.6	13.0	20	50
	VAMLT-12B	VAMLT-12S	12	16	12.0	15.8	30	50
	VAMLG-17B	VAMLG-17S	17	20	15.3	21.2	40	50
	VAMLG-23B	VAMLG-23S	23	25	22.6	28.5	45	50
	VAMLG-29B	VAMLG-29S	29	32	27.6	34.5	55	50
	VAMLG-36B	VAMLG-36S	36	40	36.0	42.5	65	30
	VAMLG-48B	VAMLG-48S	48	50	47.0	54.5	75	30
	VAMLG-56B	VAMLG-56S	56	68	56.3	67.2	140	30
	VAMLG-70B	VAMLG-70S	70	80	67.5	80.0	160	10
	VAMLG-95B	VAMLG-95S	95	106	91.5	106.0	210	10
	VAMLG-125B	VAMLG-125S	125	146	126.0	146.5	450	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	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Fire performance	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	6.0	10.0	20	100
	VCST-10B	VCST-10S	10	12	9.2	13.0	25	50
	VCST-12B	VCST-12S	12	16	11.8	15.8	30	50
	VCST-17B	VCST-17S	17	20	16.0	21.2	40	50
	VCSG-17B	VCSG-17S	17	20	15.2	21.2	40	50
	VCSG-23B	VCSG-23S	23	25	22.0	28.5	50	50
	VCSG-29B	VCSG-29S	29	32	27.7	34.4	60	50
	VCSG-36B	VCSG-36S	36	40	35.8	42.4	70	30
	VCSG-48B	VCSG-48S	48	50	46.8	54.4	80	30
	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

VCS Index

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


For static external installations, especially in railway vehicles
 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	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Fatigue 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				
	VOHD-07B	VOHD-07S	07	10	5.8	10.0	30	50
	VOHD-10B	VOHD-10S	10	12	9.0	13.0	35	50
	VOHD-12B	VOHD-12S	12	16	11.6	15.8	40	50
	VOHG-17B	VOHG-17S	17	20	14.5	21.0	60	50
	VOHG-23B	VOHG-23S	23	25	21.1	28.5	70	50
	VOHG-29B	VOHG-29S	29	32	26.6	34.5	80	50
	VOHG-36B	VOHG-36S	36	40	35.0	42.5	90	30
	VOHG-48B	VOHG-48S	48	50	46.5	54.5	100	30
	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

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	6.2	10.0	15	50
	PLRT-10B	PLRT-10S	10	12	T	9.6	13.0	20	50
	PLRT-12B	PLRT-12S	12	16	T	12.0	15.8	30	50
	PLRG-17B	PLRG-17S	17	20	G	15.8	21.2	40	50
	PLRG-23B	PLRG-23S	23	25	G	21.9	28.5	45	50
	PLRG-29B	PLRG-29S	29	32	G	27.6	34.5	55	50
	PLRG-36B	PLRG-36S	36	40	G	36.0	42.5	60	30
	PLRG-48B	PLRG-48S	48	50	G	47.0	54.5	70	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	13.0	20	50
	XPCLT-12BB	XPCLT-12SB	12	16	11.8	15.6	30	50
	XPCLT-17BB	XPCLT-17SB	17	20	16.6	21.0	40	50
	XPCLG-17BB	XPCLG-17SB	17	20	15.6	20.9	40	50
	XPCLG-23BB	XPCLG-23SB	23	25	21.9	28.5	45	50
	XPCLG-29BB	XPCLG-29SB	29	32	27.6	34.5	55	50
	XPCLG-36BB	XPCLG-36SB	36	40	36.0	42.5	60	30
	XPCLG-48BB	XPCLG-48SB	48	50	47.0	54.5	70	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	9.6	13.0	25	50
	XSOLT-12BG	12	16	11.8	15.6	30	50
	XSOLG-17BG	17	20	15.2	21.0	40	50
	XSOLG-23BG	23	25	22.0	28.5	50	50
	XSOLG-29BG	29	32	27.5	34.4	60	50
	XSOLG-36BG	36	40	35.8	42.4	70	30
	XSOLG-48BG	48	50	46.8	54.4	80	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


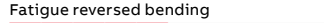


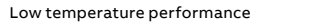
Type XVCS1H & XVCS2H conduit

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	9.2	13.0	25	50
	XVCS1H-12BG	12	16	11.7	15.5	30	50
	XVCS1H-17BG	17	20	15.2	21.0	40	50
	XVCS1H-23BG	23	25	21.7	28.4	50	50
	XVCS1H-29BG	29	32	27.5	34.3	60	50
	XVCS1H-36BG	36	40	35.8	42.2	70	30
	XVCS1H-48BG	48	50	46.8	54.3	80	30

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

XVCS1H Index


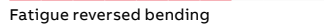



min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 6	-50°C to +90°C	Black/Green
Fatigue reversed bending		Intermediate layer: Specially bonding compound	Short-term to: +120°C	
Compression resistance		Inner layer: Specially modified polyolefin		
Low temperature 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	13.0	20	50
	XVCS2H-12BG	12	16	11.7	15.5	25	50
	XVCS2H-17BG	17	20	15.2	21.0	35	50
	XVCS2H-23BG	23	25	22.0	28.4	40	50
	XVCS2H-29BG	29	32	27.7	34.3	50	50
	XVCS2H-36BG	36	40	35.8	42.2	60	30
	XVCS2H-48BG	48	50	46.8	54.3	70	30

For track side applications and other exterior static applications with high UV exposure
 Easy laying 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



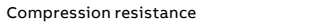


Type XPCS & XPCSF conduit

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-10BG	10	12	9.2	13.0	20	50	50
	XPCST-12BG	12	16	11.8	15.8	25	70	50
	XPCSG-17BG	17	20	15.2	21.2	35	85	50
	XPCSG-23BG	23	25	21.5	28.5	40	110	50
	XPCSG-29BG	29	32	27.7	34.4	50	130	50
	XPCSG-36BG	36	40	35.8	42.4	60	180	30
	XPCSG-48BG	48	50	46.8	54.4	70	220	30

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



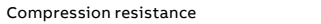

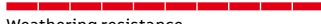
min.	max.	Materials	Temperature range	Colour
Ductility		Outer layer: Specially formulated polyamide 12	-40°C to +95°C	Black/Green
Fatigue reversed bending		Inner layer: Specially formulated polyamide 6	Short-term to: +150°C	
Compression resistance				
Low temperature performance				
Weathering resistance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

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	06	10	15	40	100
	XPCSFT-10BO	10	12	9.2	13.0	20	50	50
	XPCSFT-12BO	12	16	11.8	15.8	25	70	50
	XPCSFG-17BO	17	20	15.2	21.2	35	85	50
	XPCSFG-23BO	23	25	21.5	28.5	40	110	50
	XPCSFG-29BO	29	32	27.5	34.4	50	130	50
	XPCSFG-36BO	36	40	35.8	42.4	60	180	30
XPCSFG-48BO	48	50	46.8	54.4	70	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

PMA OXC Overextruded

Type JFBD 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					
	JFBDT-12C01	12	16	11.8	16.0	70	100	50
	JFBDG-17C01	17	20	15.6	21.6	85	125	50
	JFBDG-23C01	23	25	21.7	28.8	110	160	50
	JFBDG-29C01	29	32	27.4	34.7	140	200	50
	JFBDG-36C01	32	40	35.8	42.7	200	260	30
	JFBDG-48C01	48	50	46.7	54.6	230	300	30

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

Approvals




JFBD Index

min.	max.	Materials	Colour
Ductility		Conduit: made from high-grade, specially formulated polyamide 12	Corrugated conduit: blue
Fatigue reversed bending		Overextrusion: made from modified polyamide elastomer	Overextrusion: blue, translucent
Compression resistance			
Low temperature performance			
Weathering resistance			
		Certification	UV Resistance
		FDA 21 CFR / EU 10/2011 compliant outer layer material; ECOLAB certificate	-

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	15.2	21.2	40	31/100
	CUSG-23B	CUSG-23S	¾	23	25	21.9	28.5	45	31/100
	CUSG-29B	CUSG-29S	1	29	32	27.6	34.5	55	31/100
	CUSG-36B	CUSG-36S	1 ¼	36	40	36.0	42.5	60	31/100
	CUSG-48B	CUSG-48S	1 ½	48	50	47.0	54.5	70	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
Free from halogens, REACH compliant and RoHS compliant	UV Resistance	Self-extinguishing, acc. to UL 94 V2
		-

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	15.2	21.2	35/85	31/100
	PUSG-23B	PUSG-23S	¾	23	25	22.0	28.5	40/110	31/100
	PUSG-29B	PUSG-29S	1	29	32	27.7	34.4	50/130	31/100
	PUSG-36B	PUSG-36S	1 ¼	36	40	35.8	42.4	60/180	31/100
	PUSG-48B	PUSG-48S	1 ½	48	50	46.8	54.4	70/220	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
Free from halogens, REACH compliant and RoHS compliant	UV Resistance	Self-extinguishing, acc. to UL 94 V2
		Excellent

PMAFLEX Plus

Type VUS conduit

Type VUS - Flexible, heavy-duty

	Order no. (black)	Order no. (grey)	Conduit size			Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m/ft)
			Inch	NW	Metric				
VUS	VUSG-17B	VUSG-17S	½	17	20	15.2	21.2	40	31/100
	VUSG-23B	VUSG-23S	¾	23	25	22.0	28.5	50	31/100
	VUSG-29B	VUSG-29S	1	29	32	27.7	34.4	60	31/100
	VUSG-36B	VUSG-36S	1 ¼	36	40	35.8	42.4	70	31/100
	VUSG-48B	VUSG-48S	1 ½	48	50	46.8	54.4	80	31/100



For static exterior installations with approval acc. to UL 1660 (UL Listing)
 For applications requiring high compression resistance
 Good ductility
 High mechanical strength even under extreme conditions, such as low temperatures and low humidity
 Very good resistance to ultra violet rays and weathering

Approvals



VUS Index


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

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

PMA® Divisible System

Type PACOF conduit & stainless steel overbraiding for conduits

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	Fire performance	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Short-term to: +160°C	-

Type LLPO - Very flexible, light-duty

	Order no. (black)	Order no. (grey)	Conduit size			Inside Ø (mm)	Outside Ø (mm)	Stat. radius (mm)	PU (m)
			NW	Metric	Profile				
	LLPO-07A	LLPO-07S	07	10	T	6.2	10.0	15	50
	LLPO-10A	LLPO-10S	10	12	T	9.6	13.0	20	50
	LLPO-12A	LLPO-12S	12	16	T	12.0	15.8	30	50
	LLPO-17A	LLPO-17S	17	20	T	16.2	21.2	40	50
	LLPO-23A	LLPO-23S	23	25	T	22.6	28.5	45	50
	LLPO-29A	LLPO-29S	29	32	T	29.0	34.5	55	50
	LLPO-36A	LLPO-36S	36	40	T	36.5	42.5	60	30
	LLPO-48A	LLPO-48S	48	50	T	47.5	54.5	70	30

For machine building and installation

Excellent reversed bending characteristics

Very good resistance against acids and hydrolysis

LLPO Index


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

Materials	Temperature range	Colour
Specially modified polyolefine	-20°C to +90°C	Black/Grey
Certification	Fire protection	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Short-term to: +130°C	-
	Good flammability	-

PMA® Smart Line

Type PPCOF & LLPA conduit

Type PPCOF - Flexible, divisible

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

Type LLPA - 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				
	LLPA-07A	LLPA-07S	07	10	T	6.2	10.0	15	50
	LLPA-10A	LLPA-10S	10	12	T	9.6	13.0	20	50
	LLPA-12A	LLPA-12S	12	16	T	12.0	15.8	30	50
	LLPA-17A	LLPA-17S	17	20	T	16.2	21.2	40	50
	LLPA-23A	LLPA-23S	23	25	T	22.6	28.5	45	50
	LLPA-29A	LLPA-29S	29	32	T	29.0	34.5	55	50
	LLPA-36A	LLPA-36S	36	40	T	36.5	42.5	60	30
	LLPA-48A	LLPA-48S	48	50	T	47.5	54.5	70	30

Approvals



	LLPAG-17A	LLPAG-17S	17	20	G	15.8	21.2	40	50
	LLPAG-23A	LLPAG-23S	23	25	G	21.9	28.5	45	50
	LLPAG-29A	LLPAG-29S	29	32	G	27.6	34.5	55	50
	LLPAG-36A	LLPAG-36S	36	40	G	36.0	42.5	60	30
	LLPAG-48A	LLPAG-48S	48	50	G	47.0	54.5	70	30
	LLPAG-56A	LLPAG-56S	56	68	G	56.3	67.2	120	30
	LLPAG-70A	LLPAG-70S	70	80	G	68.0	80.0	160	10
	LLPAG-95A	LLPAG-95S	95	106	G	91.9	106.0	210	10
	LLPAG-125A	LLPAG-125S	125	146	G	126.5	146.5	450	06

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
	Short-term to: +160°C	
Certification	Self extinguishing	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	acc. to UL 94 V2	-

PMA® Smart Line

Type LLPF & LLPO conduit

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	6.2	10.0	15	50
	LLPF-10A	LLPF-10S	10	12	T	9.6	13.0	20	50
	LLPF-12A	LLPF-12S	12	16	T	12.0	15.8	30	50
	LLPF-17A	LLPF-17S	17	20	T	16.2	21.2	40	50
	LLPF-23A	LLPF-23S	23	25	T	22.6	28.5	45	50
	LLPF-29A	LLPF-29S	29	32	T	29.0	34.5	55	50
	LLPFG-17A	LLPFG-17S	17	20	G	15.8	21.2	40	50
	LLPFG-23A	LLPFG-23S	23	25	G	21.9	28.5	45	50
	LLPFG-29A	LLPFG-29S	29	32	G	27.6	34.5	55	50
	LLPFG-36A	LLPFG-36S	36	40	G	36.0	42.5	60	30
LLPFG-48A	LLPFG-48S	48	50	G	47.0	54.5	70	30	

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

LLPF 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	UV Resistance
Free from halogens, REACH compliant and RoHS compliant	Fire protection	-
	Self-extinguishing	

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	-	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



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01



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02

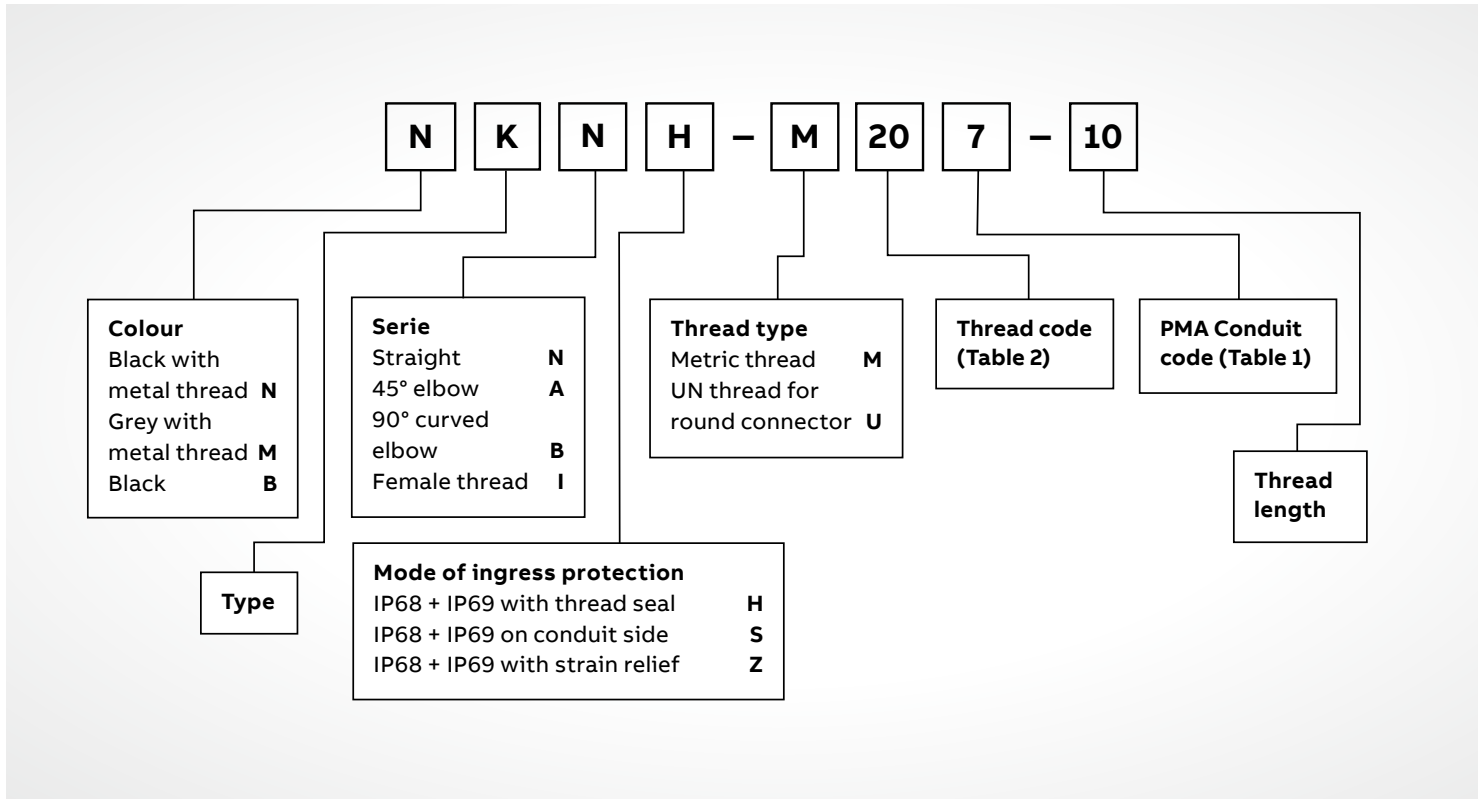
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IP68 + IP69

Static + dynamic

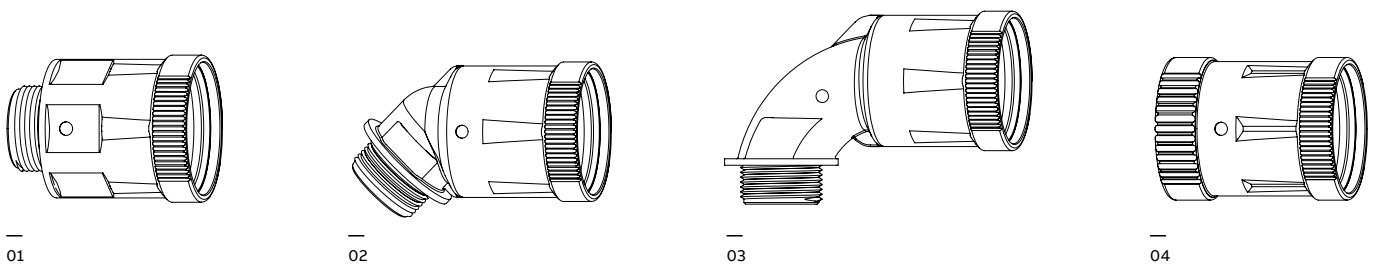
- Highest sealing through fully closed system also in highest dynamic applications
- Extra long ribbed sealing areas (cross linked material)
- 360° locking and sealing element shields against high pressure water jets (up to 100 bar)
- Content of delivery: Locking and sealing element and thread seal for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

PMAFIX Pro

Part number codes



Connector series IP68 + IP69



- 01 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

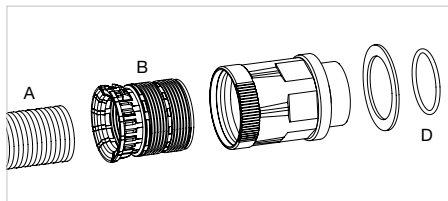
Thread Metric	PMA code
M12x1.5	M12
M16x1.5	M16
M20x1.5	M20
M25x1.5	M25
M32x1.5	M32
M40x1.5	M40
M50x1.5	M50
M63x1.5	M63

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

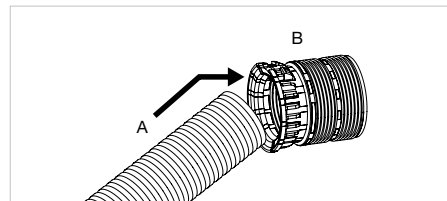
Type	PMA code
With O-ring groove (MIL C 5015)	G

Installation IP68 + IP69



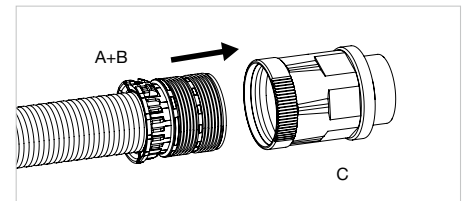
01

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



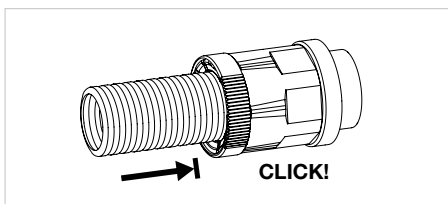
02

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



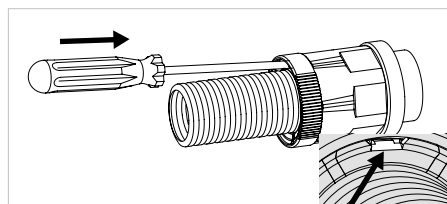
03

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.



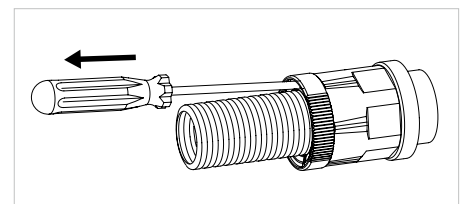
04

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.

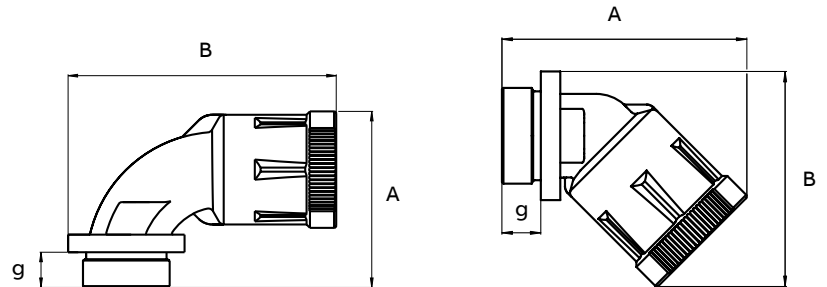


06

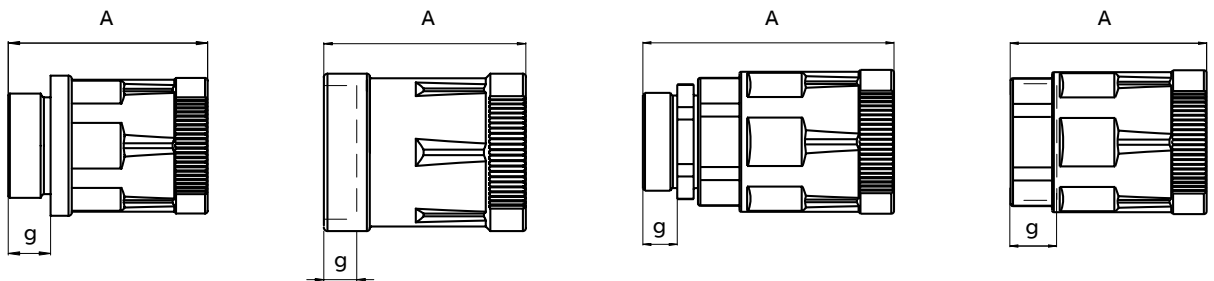
Pull the conduit and screwdriver out of the fitting together keeping the screwdriver parallel to the conduit.

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 150/p7	M12 x 1.5	10	12	4.0–6.5	5.0	53.5
	NKNZ-M120/P2		EK 150/p8	M12 x 1.5	10	12	5.0–8.0	5.0	53.5
	NKNZ-M120/P3		EK 150/p9	M12 x 1.5	10	12	6.5–9.5	5.0	53.5
	NKNZ-M160/P1	NKNZ-M160R/P	E 150/p7	M16 x 1.5	10	12	4.0–6.5	6.0	54.5
	NKNZ-M160/P2		E 150/p8	M16 x 1.5	10	12	5.0–8.0	6.0	54.5
	NKNZ-M160/P3		E 150/p9	M16 x 1.5	10	12	6.5–9.5	6.0	54.5
	NKNZ-M202/P1	NKNZ-M202R/P	E 152/p7	M20 x 1.5	12	16	4.0–6.5	6.5	60.5
	NKNZ-M202/P3		E 152/p9	M20 x 1.5	12	16	6.5–9.5	6.5	60.5
	NKNZ-M202/P4		E 152/p11	M20 x 1.5	12	16	7.0–10.5	6.5	60.5
	NKNZ-M207/P3	NKNZ-M207R/P	E 152/p9	M20 x 1.5	17	20	6.5–9.5	6.5	66.5
	NKNZ-M207/P4		E 152/p11	M20 x 1.5	17	20	7.0–10.5	6.5	66.5
	NKNZ-M207/P5		E 152/p13	M20 x 1.5	17	20	9.0–13.0	6.5	66.5
	NKNZ-M257/P4	NKNZ-M257R/P	E 153/p11	M25 x 1.5	17	20	7.0–10.5	7.5	67.5
	NKNZ-M257/P5		E 153/p13	M25 x 1.5	17	20	9.0–13.0	7.5	67.5
	NKNZ-M257/P6		E 153/p16	M25 x 1.5	17	20	11.5–15.5	7.5	67.5
	NKNZ-M253/P5	NKNZ-M253R/P	EK 154/p13	M25 x 1.5	23	25	9.0–13.0	7.5	75.0
	NKNZ-M253/P6	NKNZ-M253R1/P	EK 154/p16	M25 x 1.5	23	25	11.5–15.5	7.5	75.0
	NKNZ-M323/P2	NKNZ-M323R/P	E 154/p13	M32 x 1.5	23	25	9.0–13.0	8.0	76.0
	NKNZ-M323/P4		E 154/p18	M32 x 1.5	23	25	14.0–18.0	8.0	76.0
	NKNZ-M323/P5	NKNZ-M323R1/P	E 154/p20	M32 x 1.5	23	25	17.0–20.5	8.0	76.0
	NKNZ-M329/P2	NKNZ-M329R/P	EK 155/p18	M32 x 1.5	29	32	14.0–18.0	8.0	83.0
	NKNZ-M329/P3		EK 155/p20	M32 x 1.5	29	32	17.0–20.5	8.0	83.0
	NKNZ-M329/P4		EK 155/p25	M32 x 1.5	29	32	20.0–25.0	8.0	83.0
	NKNZ-M409/P1	NKNZ-M409R/P	E 155/p16	M40 x 1.5	29	32	11.5–15.5	8.0	83.0
	NKNZ-M409/P2		E 155/p18	M40 x 1.5	29	32	14.0–18.0	8.0	83.0
	NKNZ-M409/P3		E 155/p20	M40 x 1.5	29	32	17.0–20.5	8.0	83.0
	NKNZ-M409/P4		E 155/p25	M40 x 1.5	29	32	20.0–25.0	8.0	83.0
	NKNZ-M409/P5		E 155/p28	M40 x 1.5	29	32	24.0–28.0	8.0	83.0
	NKNZ-M406/P1	NKNZ-M406R/P	E 156/p25HF	M40 x 1.5	36	40	20.0–25.0	9.0	87.5
	NKNZ-M406/P2		EK 156/p28	M40 x 1.5	36	40	24.0–28.0	9.0	87.5
	NKNZ-M506/P1	NKNZ-M506R/P	E 156/p32	M50 x 1.5	36	40	27.0–32.0	10.0	90.0
	NKNZ-M506/P3		E 156/p36	M50 x 1.5	36	40	32.0–36.0	10.0	90.0
NKNZ-M508/P2	NKNZ-M508R/P	E 157/p36HF	M50 x 1.5	48	50	32.0–36.0	10.0	100.0	
NKNZ-M508/P3		E 157/p40HF	M50 x 1.5	48	50	36.0–40.0	10.0	100.0	
NKNZ-M638/P1	NKNZ-M638R/P	E 158/pm1x35	M63 x 1.5	48	50	32.0–35.0	10.0	100.0	
NKNZ-M638/P2		E 158/p44	M63 x 1.5	48	50	39.0–44.0	10.0	100.0	

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				
	KNZ, patent	NKNZ-M160/P1-L	NKNZ-M160R/P-L	E 150/p7	M16 x 1.5	10	16	4.0–6.5	15.0	63.5
		NKNZ-M160/P2-L		E 150/p8	M16 x 1.5	10	16	5.0–8.0	15.0	63.5
		NKNZ-M160/P3-L		E 150/p9	M16 x 1.5	10	16	6.5–9.5	15.0	63.5
		NKNZ-M202/P1-L	NKNZ-M202R/P-L	E 152/p7	M20 x 1.5	12	20	4.0–6.5	15.0	69.0
		NKNZ-M202/P3-L		E 152/p9	M20 x 1.5	12	20	6.5–9.5	15.0	69.0
		NKNZ-M202/P4-L		E 152/p11	M20 x 1.5	12	20	7.0–10.5	15.0	69.0
		NKNZ-M207/P3-L	NKNZ-M207R/P-L	E 152/p9	M20 x 1.5	17	20	6.5–9.5	15.0	75.0
		NKNZ-M207/P4-L		E 152/p11	M20 x 1.5	17	20	7.0–10.5	15.0	75.0
		NKNZ-M207/P5-L		E 152/p13	M20 x 1.5	17	20	9.0–13.0	15.0	75.0
		NKNZ-M257/P5-L	NKNZ-M257R/P-L	E 153/p13	M25 x 1.5	17	25	9.0–13.0	15.0	75.0
		NKNZ-M257/P6-L		E 153/p16	M25 x 1.5	17	25	11.5–15.5	15.0	75.0
		NKNZ-M323/P2-L	NKNZ-M323R/P-L	E 154/p13	M32 x 1.5	23	32	9.0–13.0	15.0	83.0
		NKNZ-M323/P4-L		E 154/p18	M32 x 1.5	23	32	14.0–18.0	15.0	83.0
		NKNZ-M323/P5-L	NKNZ-M323R1/P-L	E 154/p20	M32 x 1.5	23	32	17.0–20.5	15.0	83.0
		NKNZ-M329/P2-L	NKNZ-M329R/P-L	EK 155/p18	M32 x 1.5	29	32	14.0–18.0	15.0	90.0
		NKNZ-M329/P3-L		EK 155/p20	M32 x 1.5	29	40	17.0–20.5	15.0	90.0
		NKNZ-M409/P3-L	NKNZ-M409R/P-L	E 155/p20	M40 x 1.5	29	40	17.0–20.5	15.0	90.0
		NKNZ-M409/P4-L		E 155/p25	M40 x 1.5	29	40	20.0–25.0	15.0	90.0
		NKNZ-M409/P5-L		E 155/p28	M40 x 1.5	29	50	24.0–28.0	15.0	90.0
		NKNZ-M506/P1-L	NKNZ-M506R/P-L	E 156/p32	M50 x 1.5	36	50	27.0–32.0	15.0	95.0
	NKNZ-M506/P3-L		E 156/p36	M50 x 1.5	36	50	32.0–36.0	15.0	95.0	
	NKNZ-M508/P2-L	NKNZ-M508R/P-L	E 157/p36HF	M50 x 1.5	48	50	32.0–36.0	15.0	105.0	
	NKNZ-M508/P3-L		E 157/p40HF	M50 x 1.5	48	50	36.0–40.0	15.0	105.0	
	NKNZ-M638/P1-L	NKNZ-M638R/P-L	E 158/pm1x35	M63 x 1.5	48	63	32.0–35.0	15.0	105.0	
	NKNZ-M638/P2-L		E 158/p44	M63 x 1.5	48	63	39.0–44.0	15.0	105.0	

* 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


Approvals



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
	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	

Approvals




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

Connectors metric, female metal thread (sealing elements)

Type KIS & KNH2

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


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

Connectors nylon straight fitting

Type JKNH

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

	Order no. black	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	M40x1.5	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



ECOLAB

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 ingress protection IP66 and IP68. 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 $+105^{\circ}\text{C}$, short-term to $+160^{\circ}\text{C}$

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



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Patent



—
Patent



—
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

IP68GT

IP68 static

IP67 dynamic

IP69 according to IEC 60529

- 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)

IP68

IP68 static

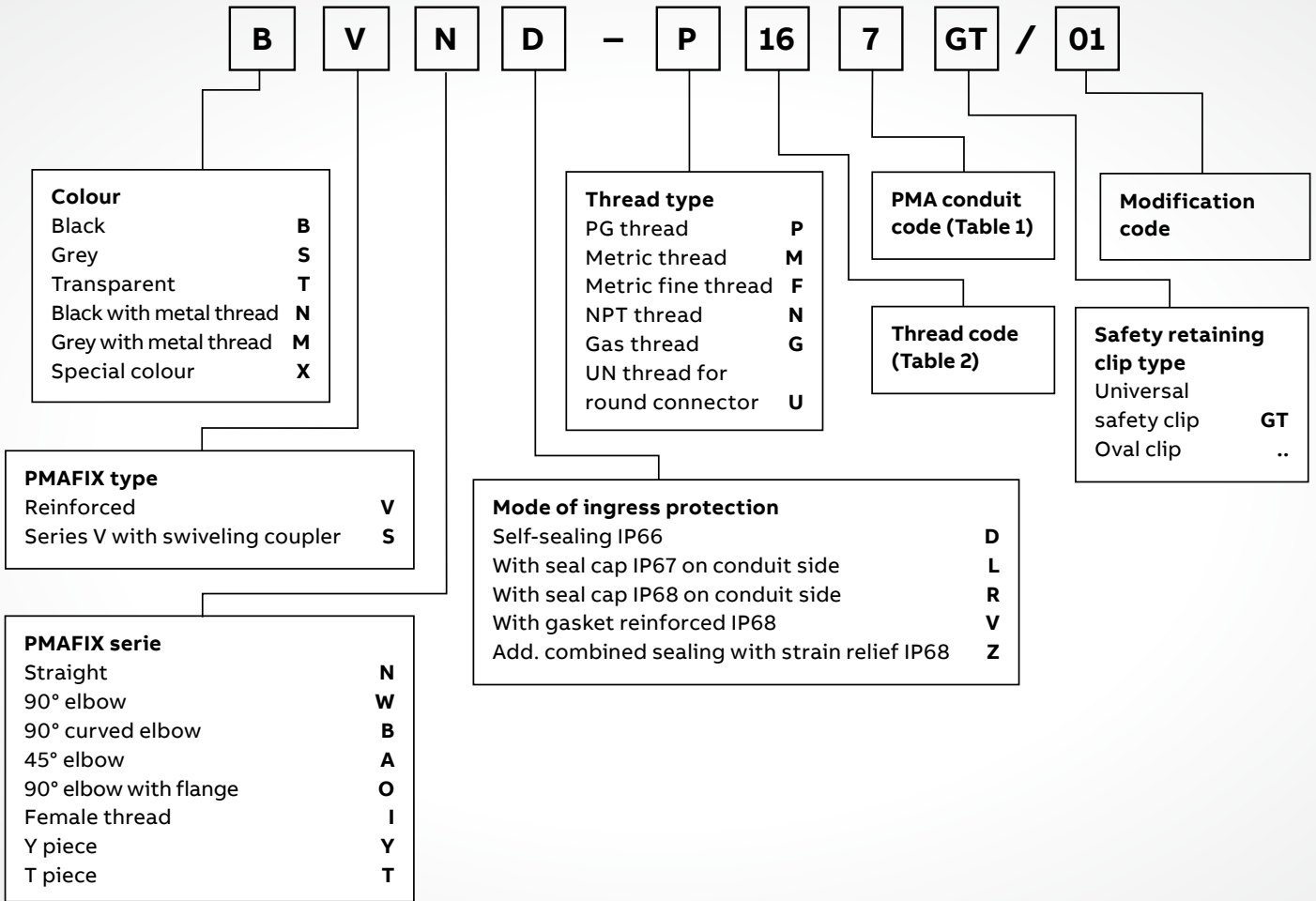
IP67 dynamic

IP69 according to IEC 60529

- 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)

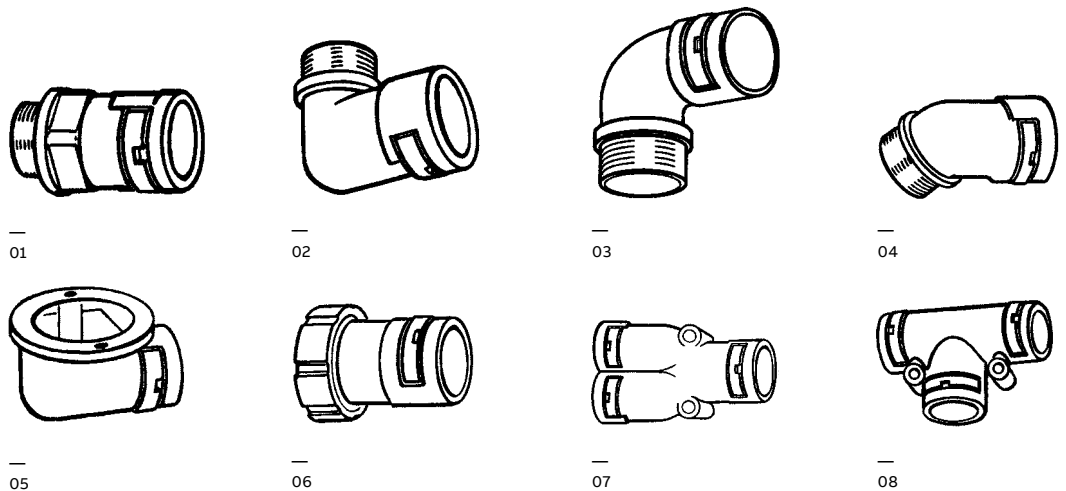
PMAFIX

Part number codes



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

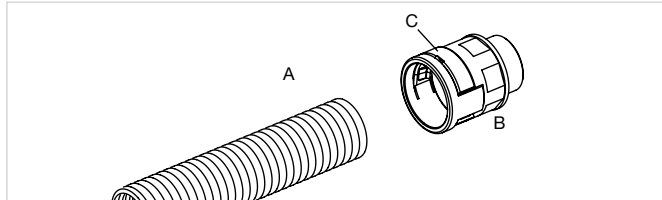
Type	PMA code
AMP	A
Souriau (ex Burndy) UTG 6	B
With O-ring groove (MIL C 5015)	G
Souriau UTO/UTS	S

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							13/16-18 UNEF	U29
M12 x 1.0	F12							1¼-18 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

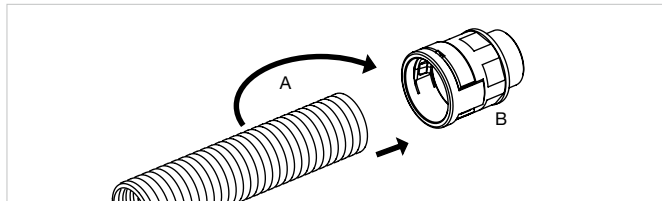
PMAFIX
Installation

Installation IP66



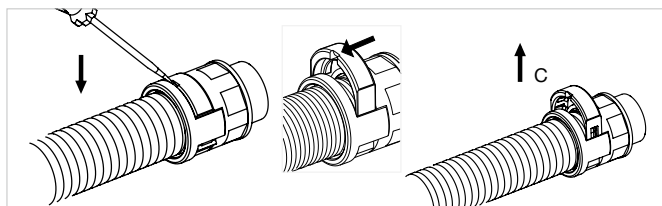
01

A = Conduit
B = Fitting
C = Universal safety clip



02

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

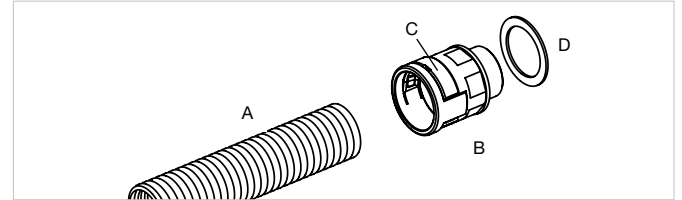


03

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

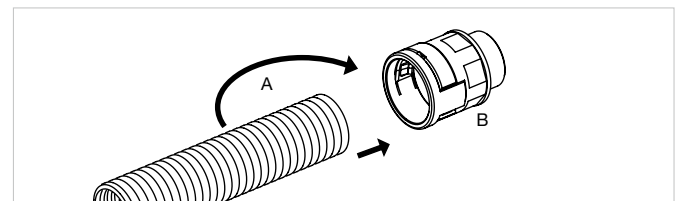
Locking clip pre-installed in all IP66 connectors.

Installation IP68GT



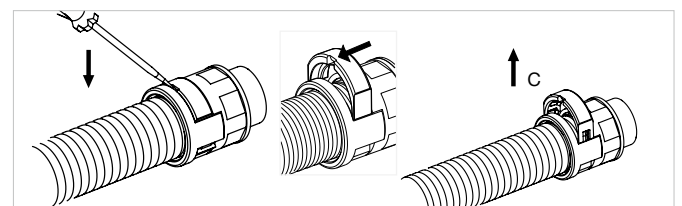
01

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.

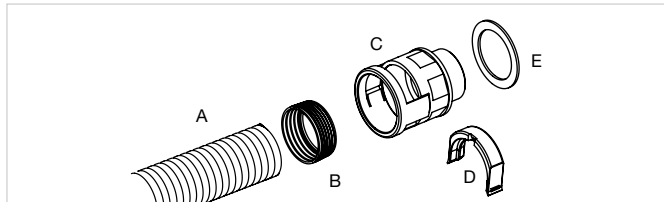
Pre-installed sealing cap and locking clip in all IP68GT connectors.

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

PMAFIX

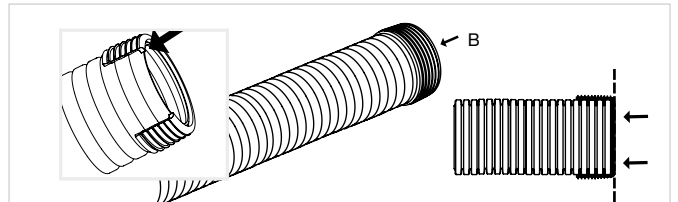
Installation

Installation IP68 (IP69)



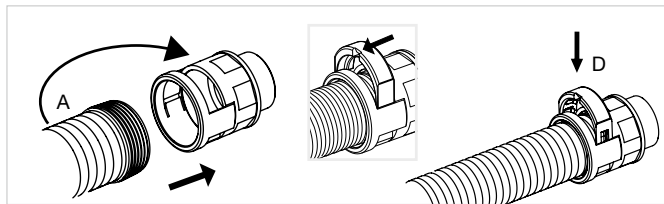
01

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



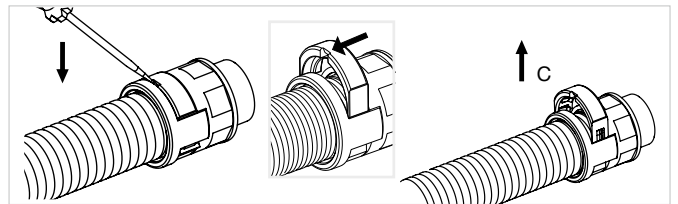
02

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



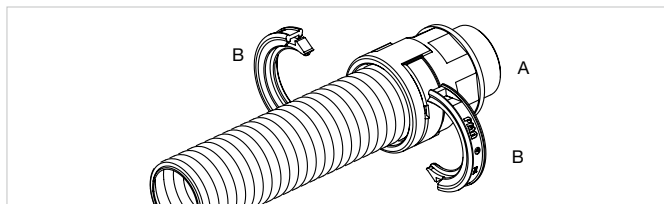
03

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.



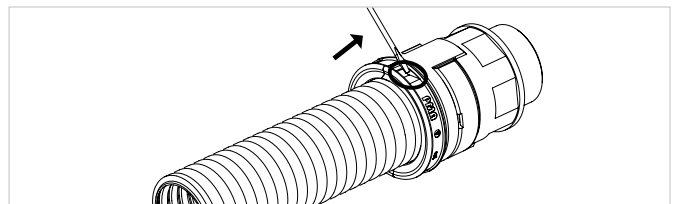
04

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.

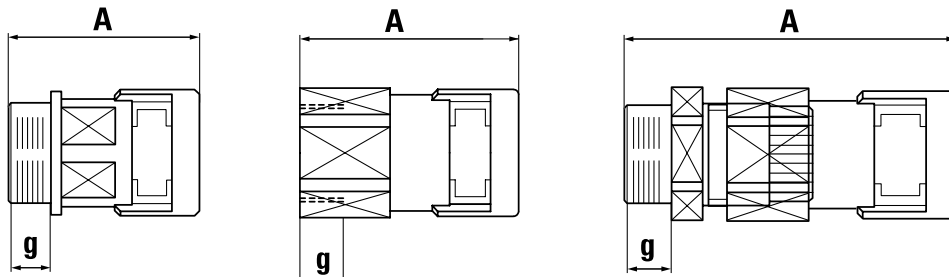
* For safety reasons, oval clip will not fit if seal cap is not fully installed.

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

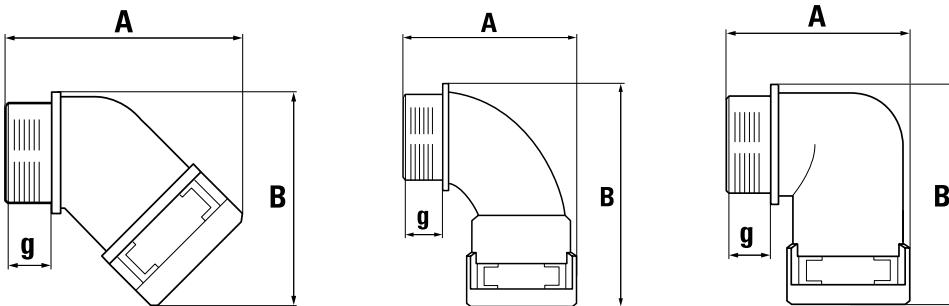
PMAFIX

Connectors metric, polyamide thread

Installation IP66




g = Thread length
A = Overall length



g = Thread length
A x B = External dimensions

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

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 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 ⁴	Order no. IP68, grey ⁴	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

⁴ 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 ⁴	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


⁴ 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 ⁵	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


⁵ 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 15p36	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 ⁴	Order no. IP68, grey ⁴	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-M257-11	MVAV-M257-11	M25 x 1.5	17	20	11.0	61.5 x 54.5
	NVAV-M323-13	MVAV-M323-13	M32 x 1.5	23	25	13.0	72.0 x 64.5
	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-M409-13	MVAV-M409-13	M40 x 1.5	29	32	13.0	77.0 x 73.0
	NVAV-M506-14	MVAV-M506-14	M50 x 1.5	36	40	14.0	95.0 x 92.5
	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

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

Connectors metric, metal thread

Type VBV

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

	Order no. IP68, black ⑤	Order no. IP68, grey ⑤	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

⑤ 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 ^④	Order no. IP68, grey ^④	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

^④ 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 150 p7	M16 x 1.5	10	12	4.0–6.5	8.0	65.0
	NVWZ-M160S/P2	–	E 150 p8	M16 x 1.5	10	12	5.0–8.0	8.0	65.0
	NVWZ-M160S/P3	–	E 150 p9	M16 x 1.5	10	12	6.5–9.5	8.0	65.0
	NVWZ-M202S/P1	NVWZ-M202R/P	E 127 p7	M20 x 1.5	12	16	4.0–6.5	8.0	74.5
	NVWZ-M202S/P3	–	E 152 p9	M20 x 1.5	12	16	6.5–9.5	8.0	74.5
	NVWZ-M202S/P4	–	E 152 p11	M20 x 1.5	12	16	7.0–10.5	8.0	74.5
	NVWZ-M207S/P1	NVWZ-M207R/P	E 152 p7	M20 x 1.5	17	20	4.0–6.5	8.0	81.0
	NVWZ-M207S/P3	–	E 152 p9	M20 x 1.5	17	20	6.5–9.5	8.0	81.0
	NVWZ-M207S/P4	–	E 152 p11	M20 x 1.5	17	20	7.0–10.5	8.0	81.0
	NVWZ-M207S/P5	–	E 152 p13	M20 x 1.5	17	20	9.0–13.0	8.0	81.0
	NVWZ-M257S/P5	NVWZ-M257R/P	E 153 p13	M25 x 1.5	17	20	9.0–13.0	8.0	84.0
	NVWZ-M257S/P6	–	E 153 p16	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	

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. IP68 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 ②	Order no. IP68, grey ②	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

② 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 150 p7	09	10	12	4.0–6.5	6.0	49.5
	NVNZ-P090S/P3	–	E 150 p9	09	10	12	6.5–9.5	6.0	49.5
	NVNZ-P110S/P1	NVNZ-P110R/P	E 151 p7	11	10	12	4.0–6.5	6.0	52.0
	NVNZ-P110S/P3	–	E 151 p9	11	10	12	6.5–9.5	6.0	52.0
	NVNZ-P112S/P1	NVNZ-P112R/P	E 151 p7	11	12	16	4.0–6.5	6.0	53.5
	NVNZ-P112S/P3	–	E 151 p9	11	12	16	6.5–9.5	6.0	53.5
	NVNZ-P112S/P4	–	E 151 p11	11	12	16	7.0–10.5	6.0	53.5
	NVNZ-P160S/P1	NVNZ-P160R/P	E 152 p11	16	10	12	4.0–6.5	6.5	52.5
	NVNZ-P167S/P3	NVNZ-P167R/P	E 153 p9	16	17	20	6.5–9.5	6.5	61.0
	NVNZ-P167S/P4	–	E 153 p11	16	17	20	7.0–10.5	6.5	61.0
	NVNZ-P167S/P5	–	E 153 p13	16	17	20	9.0–13.0	6.5	61.0
	NVNZ-P167S/P6	–	E 153 p16	16	17	20	11.5–15.5	6.5	61.0
	NVNZ-P213S/P1	NVNZ-P213R/P	E 154 p11	21	23	25	7.0–10.5	7.0	72.0
	NVNZ-P213S/P4	–	E 154 p18	21	23	25	14.0–18.0	7.0	72.0
	NVNZ-P213S/P5	NVNZ-P213R1/P	E 154 p20	21	23	25	17.0–20.5	7.0	72.0
	NVNZ-P299S/P3	NVNZ-P299R/P	E 155 p20	29	29	32	17.0–20.5	8.0	73.5
	NVNZ-P299S/P4	–	E 155 p25	29	29	32	20.0–25.0	8.0	73.5
	NVNZ-P299S/P5	–	E 155 p28	29	29	32	24.0–28.0	8.0	73.5
	NVNZ-P366S/P1	NVNZ-P366R/P	E 156 p32	36	36	40	27.0–32.0	9.0	88.0
	NVNZ-P366S/P2	–	E 156 p34	36	36	40	29.0–34.0	9.0	88.0
NVNZ-P366S/P3	–	E 156 p36	36	36	40	32.0–36.0	9.0	88.0	
NVNZ-P488S/P1	NVNZ-P488R/P	E 158 pm 1x35	48	48	50	32.0–35.0	10.0	90.5	
NVNZ-P488S/P2	–	E 158 p44	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

⑤ IP68GT available. Please
replace “S” or “R” with “GT”
(e.g. NVNZ-P112GT/P1)

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 PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				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 PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				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 PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
				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 & VA

Type VN - Connector straight, GAS thread

	Order no. IP66 ①	Order no. IP68 ① ②	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 VA - Connector 45° elbow, GAS thread

	Order no. IP66 ①	Order no. IP68 ① ②	Thread GAS	Fits to conduit size		Thread length (mm)	Overall length (mm)
				NW	Metric		
	BVAD-G000GT	BVAV-G000	¼"	10	12	11.0	43.5 x 37.0
	BVAD-G012GT	BVAV-G012	⅜"	12	16	11.0	48.0 x 40.0
	BVAD-G027GT	BVAV-G027	½"	17	20	13.0	57.5 x 51.5
	BVAD-G043GT	BVAV-G043	¾"	23	25	14.0	67.0 x 60.0
	BVAD-G069GT	BVAV-G069	1"	29	32	15.0	73.5 x 67.0
	BVAD-G076GT	BVAV-G076	1¼"	36	40	18.0	91.5 x 85.5
	BVAD-G088GT	–	1½"	48	50	18.0	99.0 x 96.0
	BVAD-G098GT	BVAV-G098	2"	48	50	18.0	99.0 x 101.0

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 GAS, polyamide thread

Type VW

Type VW - Connector 90° elbow, GAS thread

	Order no.	Order no.	Thread GAS	Fits to conduit size		Thread length (mm)	External dimensions (mm)
	IP66 ^①	IP68 ^{① ②}		NW	Metric		
	BVWD-G00MGT	BVWV-G00M	¼"	07	10	11.0	32.0 x 36.5
	BVWD-G000GT	BVWV-G000	¼"	10	12	11.0	34.0 x 39.5
	BVWD-G010GT	BVWV-G010	⅜"	10	12	11.0	34.0 x 40.5
	BVWD-G012GT	BVWV-G012	⅜"	12	16	11.0	38.5 x 46.0
	BVWD-G022GT	BVWV-G022	½"	12	16	13.0	40.5 x 47.5
	BVWD-G027GT	BVWV-G027	½"	17	20	13.0	45.5 x 58.5
	BVWD-G043GT	BVWV-G043	¾"	23	25	14.0	56.0 x 66.5
	BVWD-G069GT	BVWV-G069	1"	29	32	15.0	64.5 x 73.5
	BVWD-G076GT	BVWV-G076	1¼"	36	40	18.0	77.0 x 96.0
	BVWD-G088GT	BVWV-G088	1½"	48	50	18.0	90.5 x 106.0
	BVWD-G098GT	BVWV-G098	2"	48	50	18.0	90.5 x 111.0

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 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. IP68 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
	BVAD-N098GT	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. IP68 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 ⁴	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

Approvals	Order no. IP68, black ⁴	Thread PG	Fits to conduit size		Thread length (mm)	External dimensions (mm)
			NW	Metric		
	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 ⁴	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

⁴ 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 ⁴	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 ⁴	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

⁴ 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 ⁴	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 ⁴	Thread NPT	Fits to conduit size		Thread length (mm)	Overall length (mm)
			NW	Metric		
	NSWIV-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

⁴ 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 66.0 x 35.5	2 x M5
	BVOD-P213GT	BVOV-P213	23	25	65.5 x 70.0 x 43.0	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

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

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 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 ②	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-P363	–	36	23	25	12.0	51.0
	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 ②	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

② 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 1/16"-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 1/16"-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

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

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

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 ②	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

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. IP68 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. IP68 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)

Special connectors

Introduction

Meet 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 this 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-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 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, reducers

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 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, metric


Type ME & MR

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

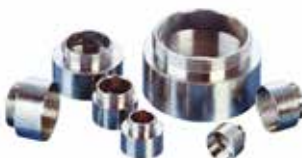
	Order no. standard	Order no. hexagonal	Thread outside metric	Thread inside metric
		M16M12M	M16M12M/6	M16 x 1.5
M20M12M		M20M12M/6	M20 x 1.5	M12 x 1.5
M20M16M		M20M16M/6	M20 x 1.5	M16 x 1.5
M25M16M		M25M16M/6	M25 x 1.5	M16 x 1.5
M25M20M		M25M20M/6	M25 x 1.5	M20 x 1.5
M32M20M		M32M20M/6	M32 x 1.5	M20 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, hexagonal form with O-ring

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)
MN	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

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)
	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.

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, PCS) (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.

* All conduits are REACH and RoHS compliant





Conduits, large sizes

Type PMAFLEX JUMBO conduits

Type PMAFLEX JUMBO conduits

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				
	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
	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-56B	LLPAG-56S	56	68	56.3	67.2	120/-	30
	LLPAG-70B	LLPAG-70S	70	80	68.0	80.0	160/-	10
	LLPAG-95B	LLPAG-95S	95	106	91.9	106.0	210/-	10
	LLPAG-125B	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
	PCSG-56B	PCSG-56S	56	68	56.1	67.2	130/280	30
	PCSG-70B	PCSG-70S	70	80	66.5	80.0	170/360	10
	PCSG-95B	PCSG-95S	95	106	91.0	106	250/470	10
	PUEG-56B	-	56	68	56.3	67.2	90/170	30
	PUEG-70B	-	70	80	68.2	80.5	100/220	30

Approvals



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			
GG	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			
GO	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 FG04: -40°C to +105°C
 Temperature range with FG04/01: -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 FG04: -40°C to +105°C
 Temperature range with FG04/01: -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		
GH	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 6/14
 PA 6

Type SGS - Tube clamp

	Order no.	Fits to conduit size		Width x Height x Depth (mm)	Fixing screw
		NW	Metric		
SGS	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 	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 $+160^{\circ}\text{C}$
Connectors: -40°C to min. $+105^{\circ}\text{C}$

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	Can be opened and closed again in longitudinal direction any time Good ductility
Fatigue reversed bending	Good compression resistance
Compression resistance	Free from halogens, REACH + RoHS compliant
Low temperature performance	Temperature range: -40°C to +105°C, short-term to +160°C
Weathering resistance	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	For machine building and plant construction For trouble-free retrofitting and applicable for repairs
Fatigue reversed bending	Specially modified polypropylene PP Can be opened and closed again in longitudinal direction any time Good reversed bending resistance
Compression resistance	Temperature range: -20°C to +105°C, short-term to +150°C
Low temperature performance	IP50
Weathering resistance	

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)
LSGO	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 at an 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



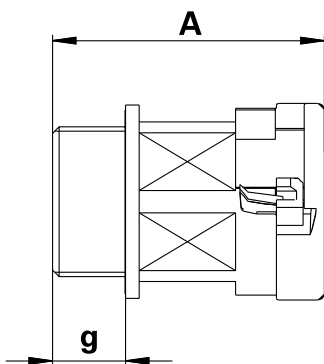
— Patent

— IP66

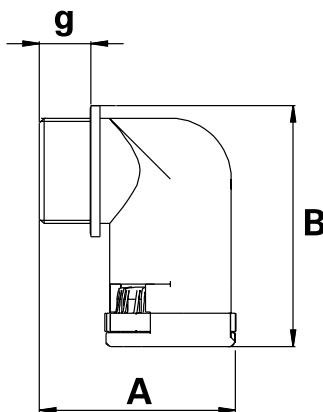
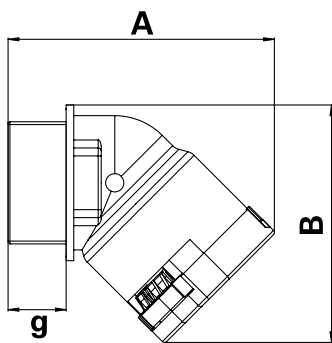
IP66 static

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)



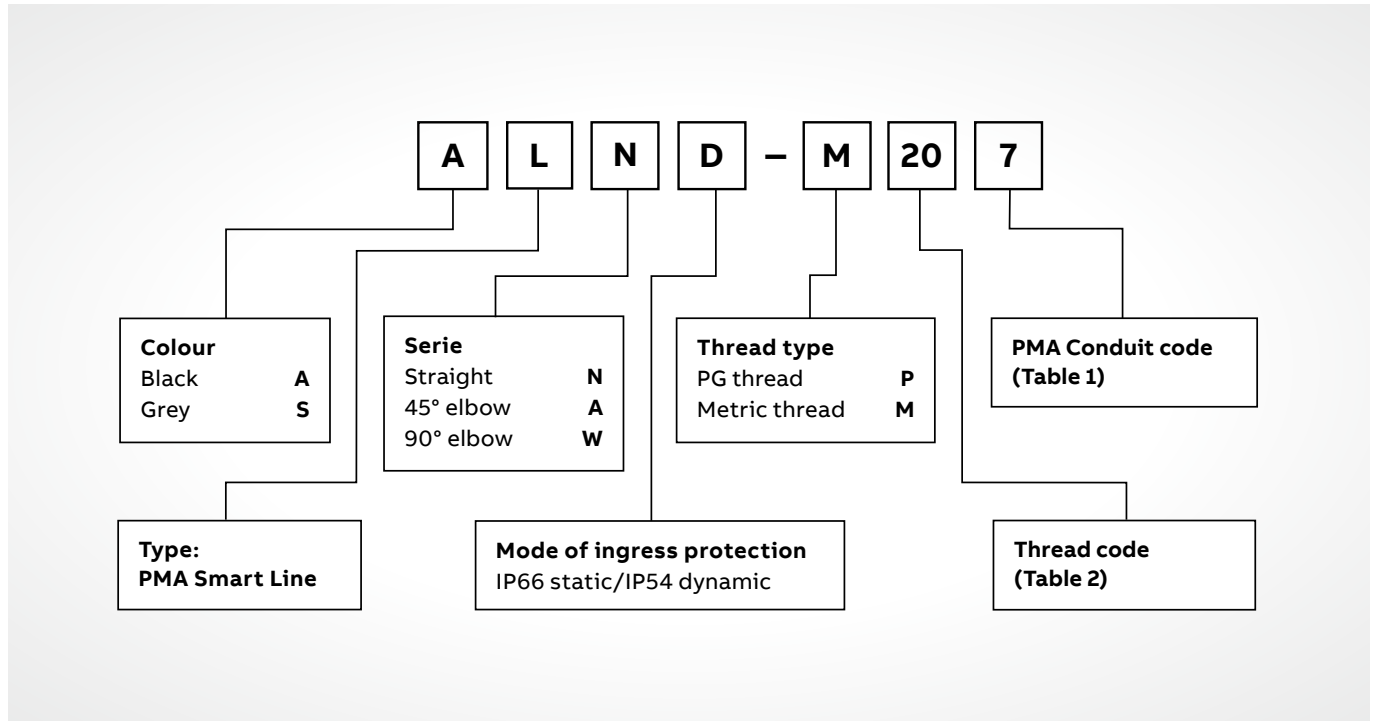
g = Thread length A = Overall length



g = Thread length A x B = External dimensions

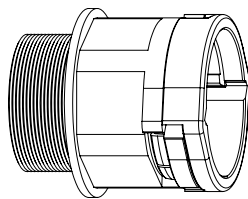
PMA® Smart Line

Part number codes

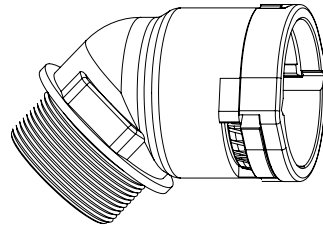


Connector series

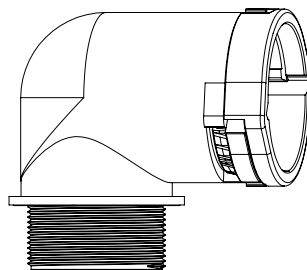
- 01 Straight (N)
- 02 45° elbow (A)
- 03 90° elbow (W)



01



02



03

PMA® Smart Line

Size codes, installation

Table 1: Conduit codes

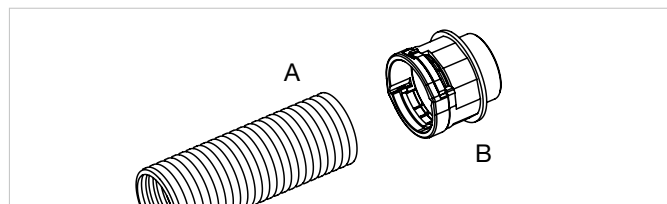
Nominal width	Metric size	PMA code
07	10	M
10	12	0
12	16	2
17	20	7
23	25	3
29	32	9
36	40	6
48	50	8

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

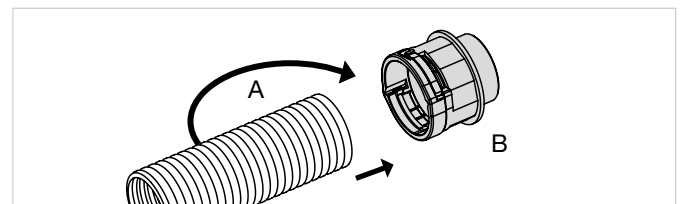
Thread PG	PMA code
PG07	P07
PG09	P09
PG11	P11
PG13.5	P13
PG16	P16
PG21	P21
PG29	P29
PG36	P36
PG48	P48

Installation IP66



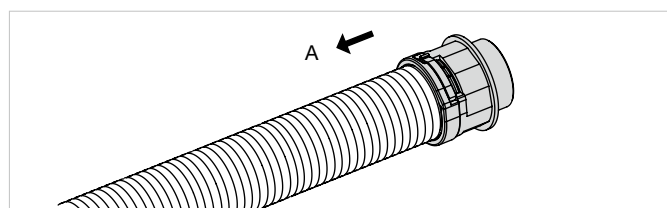
01

A = Conduit
B = Fitting



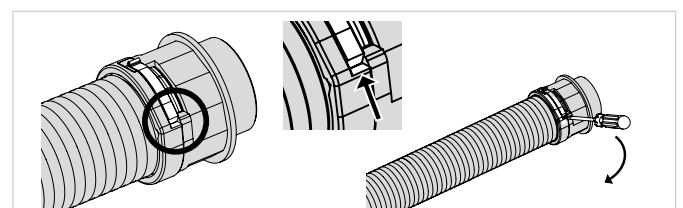
02

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	SLND-M120	M12 x 1.5	10	12	11.0	34.0
	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	SLAD-M120	M12 x 1.5	10	12	11.0	42.5 x 33.0
	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		
LWD, patent 	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		
LND, patent 	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 & F.PX

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

Type F.PX - Braided hose

	Order no. grey	NW	Fits to termination	Weight nom. per 100 m (kg)	Operative range min. Ø (mm)	Operative range max. Ø (mm)
F.PX	F.PX.04GR	04	–	0.3	3.0	7.0
	F.PX.06GR	06	SRER-06	0.5	5.0	8.0
	F.PX.08GR	08	SRER-06	0.7	7.0	10.0
	F.PX.10GR	10	SRER-06	0.8	9.0	13.0
	F.PX.12GR	12	SRER-06	1.1	11.0	16.0
	F.PX.16GR	16	SRER-16	1.3	15.0	21.0
	F.PX.20GR	20	SRER-16/SRER-21	1.5	20.0	26.0
	F.PX.25GR	25	SRER-16/SRER-21	2.0	24.0	31.0
	F.PX.30GR	30	SRER-21/SRER-29	2.9	28.0	38.0
	F.PX.40GR	40	SREV-40	3.1	38.0	49.0

Monofile Ø: 0.28mm for increased abrasion properties

Coverage: > 90%

Polyester


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

Temperature range: -50°C to +120°C, short-term to +150°C

Plastic braided hoses

Type L.PX & G.PX

Type L.PX - Braided hose

	Order no. black	Order no. grey	NW	Fits to termination	Weight nom. per 100m (kg)	Operative range min. Ø (mm)	Operative range max. Ø (mm)
L.PX	L.PX.04SW	L.PX.04GR	04	–	0.4	3.0	8.0
	L.PX.08SW	L.PX.08GR	08	SRER-06	0.5	5.0	10.0
	L.PX.10SW	L.PX.10GR	10	SRER-06	0.7	7.0	14.0
	L.PX.16SW	L.PX.16GR	16	SRER-16	0.8	11.0	20.0
	L.PX.20SW	L.PX.20GR	20	SRER-16	1.2	19.0	28.0
	L.PX.25SW	L.PX.25GR	25	SRER-21/SRER-29	1.4	21.0	34.0
	L.PX.30SW	L.PX.30GR	30	SRER-21/SRER-29	1.7	25.0	40.0
	L.PX.40SW	L.PX.40GR	40	SRER-29	1.7	31.0	55.0
	L.PX.50SW	L.PX.50GR	50	SREV-40/SRER-50	2.7	40.0	68.0

Monofile Ø: 0.22mm


Coverage: > 65%

Polyester

Specifications: DIN 5510 (S4/SR2/ST2), NF F 16-101/102 (I1/F2), EN45545-2 HL3

Temperature range: -50°C to +120°C, short-term to +150°C

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	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

Braid terminations, connectors

Type RER/REV

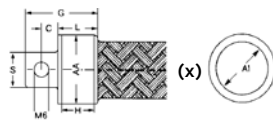
Type RER/REV - Braid termination

RER/REV	Order no.	NW	AI (mm)	AA (mm)	BI (mm)	BA (mm)	H (mm)	L (mm)	G (mm)	S (mm)	C (mm)
	grey										
	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

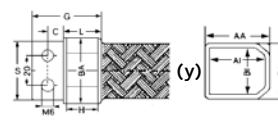


For termination and fixation of plastic braided hoses
 Suitable for: F.66, C.66, L.66, F.PX, L.PX braids
 Polyamide 6
 For exact braid and termination fitting configuration please refer to PMAJACK data sheets

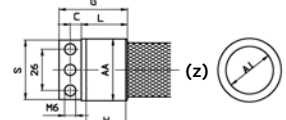
RER
 x = with one mounting hole



REV
 y = with two mounting holes



RER
 z = with three mounting holes



Braid terminations, connectors

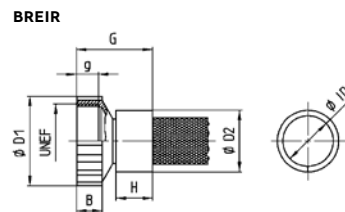
Type BREIR & MREIR



Type BREIR - Connector for plastic braids, female thread

Order no. black	NW	Thread size UNEF	Fits to PMAJACK			Ø ID (mm)	Ø D1 (mm)	B (mm)	G (mm)	g (mm)	H (mm)	Ø D2 (mm)
			F.66	C.66 F.PX	L.66 L.PX							
BREIR-U2916	16	1 ³ / ₁₆ -18	12-20	12-25	16-25	36.2	20.5	10.5	36.5	9	15	25
BREIR-U3516	16	1 ⁷ / ₁₆ -18	12-20	12-25	16-25	42.5	20.5	11.5	37.5	9	15	25

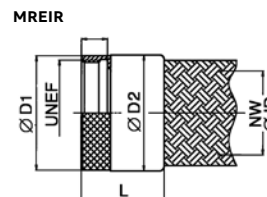
For round connectors
Suitable for: F.66, C.66, L.66, F.PX, L.PX braids
Polyamide 6



Type MREIR - Connector for plastic braids, female thread

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


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



Stainless steel braids, tools


Type F.304, PMA-Tie-tool & 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 PMA-Tie-tool - Clamping tool for metal cable ties

	Order no.	For PMA-Tie-tool width (mm)
	PMA-Tie-tool	6.35

Handtool, self locking for speedy application
Allows easy strapping of metal cable ties "Band-It"
For long lasting fixation without deformation
Stainless steel
Colour: Black

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

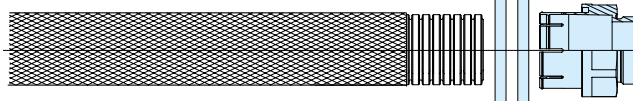
Type VEMD - Connector for overbraided conduits, metric/PG metal thread

	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

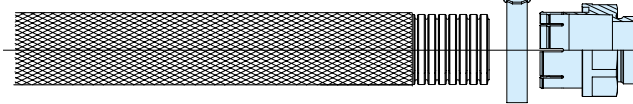
	Order no. with jubilee clip	Thread PG	Fits to conduit size		Outside Ø x Length (mm)
			NW	Metric	
	MVEMD-P4856/01	48	56	68	80.0 x 72.0

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

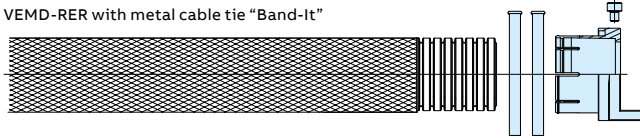
Type VEMD-RER - Adapter for overbraided conduits

	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

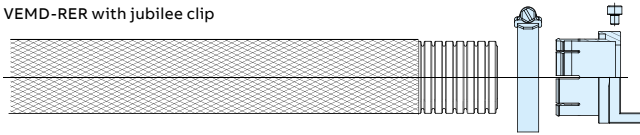


*Metal cable tie
Nickel-plated aluminium
IP66 on conduit side

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

Technical annex

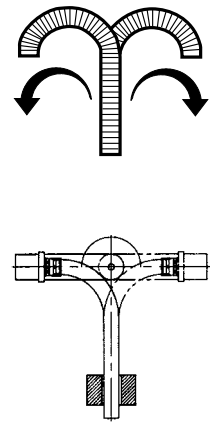
Testing methods IEC EN 61386

PMA DO is a PMA in-house test.

PMA DO 9.21-4425
IEC EN 61386

Reversed bending test with swinging movements

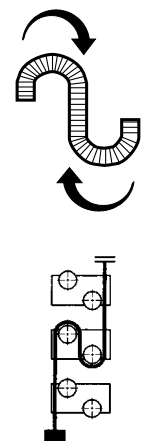
This standard is based on a cyclic reversed bending test (pivoting) of conduits under various conditions (temperature). The conduits are dynamically loaded and evaluated at the upper and lower application temperature limits. The test is performed based on IEC EN 61386. The minimum requirement corresponds to the specifications of IEC EN 61386. For PMA, the test is not considered completed for final evaluation until cracking or fracture. The number of cycles to fracture determines the fatigue strength of the conduit.



PMA DO 9.21-4420

Reversed bending test

This standard describes a cyclic reversed bending test with additional tensile loading (lifting) on flexible conduits under standard ambient conditions (23°C/50% relative humidity). The conduit is loaded until fracture. The number of cycles to fracture determines the fatigue strength of the conduit.



Technical annex

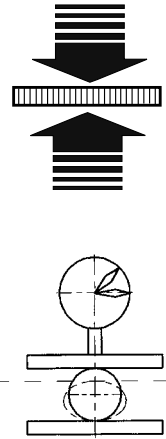
Testing methods IEC EN 61386

PMA DO is a PMA in-house test.

PMA DO 9.21-4320 IEC EN 61386

Peak load test

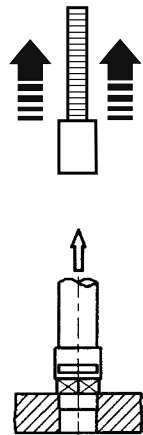
This standard describes the peak load test on conduits under standard ambient conditions (23°C/50% relative humidity). The conduit is deformed by a defined amount between two plates. The restoring force established over a specific time (by relaxation of the conduit) describes the crushing pressure or compressive strength.



PMA DO 9.21-4610 IEC EN 61386

Pull out test

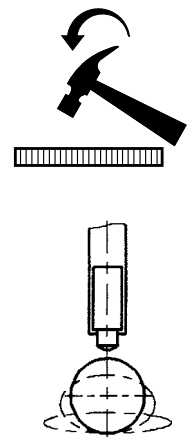
This standard defines the system pull-out test on conduits and connectors under standard ambient conditions (23°C/50% relative humidity). The conduits are mounted with the appropriate system connectors. The pull-out strength of the system is determined in a tensile test.



PMA DO 9.21-4330 IEC EN 61386

Impact test

This standard describes the impact strength test on conduits at various temperatures. The specimen is placed on a steel plate, centred under an impact head with a defined profile. The impact head impacts the centre of the specimen surface. In contrast to international specifications, deformation behaviour (buckling) is determining rather than fracture behaviour. The impact test is considered to be passed if no fracture or cracking can be detected after the impact, as well as no excessive permanent deformation of the conduit in accordance with PMA specifications.



Technical annex

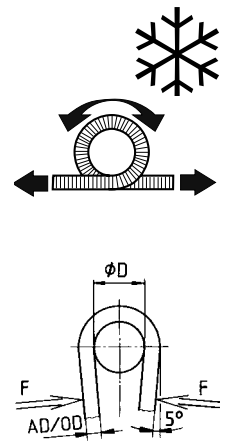
Testing methods IEC EN 61386

PMA DO is a PMA in-house test.

PMA DO 9.21-4380

Cold bending test

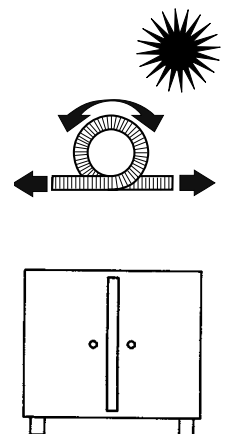
This standard describes a bending test on conduits at low temperatures. The specimens are stored in a controlled-climate cabinet at the specified test temperature. Loading is achieved by winding the specimen around a test mandrel with a defined diameter. The various products are classified based on the mandrel diameter which can be achieved.



PMA DO 9.21-4360

Thermal ageing test

This standard describes a bending test on thermally aged specimens. The test conduits are stored in a controlled-climate oven at the specified test temperature. After removal from the oven, they are cooled to room temperature. Loading is achieved by winding the specimen around a test mandrel with a defined diameter. The various products are classified based on the mandrel diameter which can be achieved.

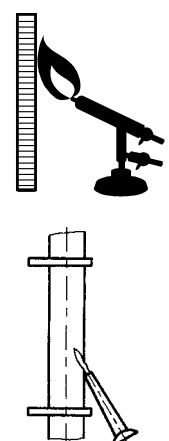


PMA DO 9.21-4430

IEC EN 61386

Self-extinguishing

This standard describes a flame test on conduits based on international specifications. The conduit is exposed to a defined flame from a standard burner. The time of ignition, flame propagation behaviour as well as time of extinguishing after removal of the flame source are significant parameters for evaluating the flame behaviour of the products.



Technical annex

Ingress protections IEC 60529

Ingress protection (IP) according to IEC 60529

Ingress protection (IP)




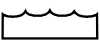


A standard to classify product performance regarding ingress protection.

Different number – different protection!

For example, products classified as IPx8 are not automatically protected against jet water! Immersion tests for classifications IPx7 and IPx8 differ from the tests for protection against jet water for IPx6, IPx5, or IPx4.

Therefore PMA cable protection systems are tested regarding different sealing requirements.

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



PMA products offer complete protection!








Tested to 100 bar

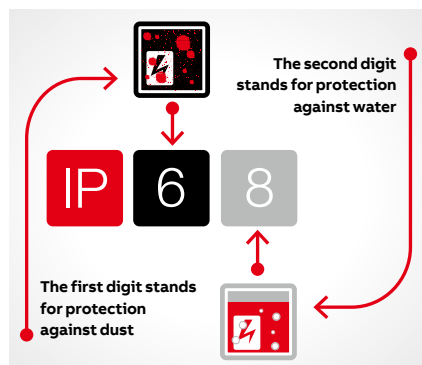
Technical annex

Ingress protections IEC 60529

Dust


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

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



Water

Protection against fluids
Degree of protection (water)

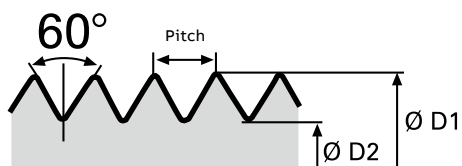
	0	No protection
	1	Protected against vertically falling drops of water
	2	Protected against direct sprays of water 15° from vertical
	3	Protected against sprays of water to 60° from vertical
	4	Protected against water sprayed from all directions - limited ingress permitted
	5	Protected against low pressure jets of water from all directions - limited ingress permitted
	6	Protected against strong pressure jets of water, heavy seas - limited ingress permitted
	7	Protection against the effects of immersion between 15cm - 1m
	8	Protection against long periods of immersion under a quoted pressure, e.g. 2 bar at 24 hours
	9	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

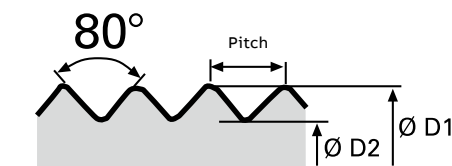
Metric fine thread - EN 60423

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



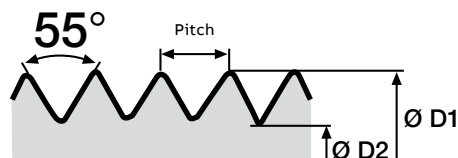
PG thread - DIN 40430

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



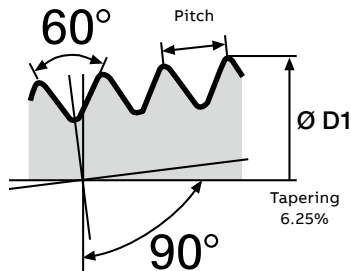
GAS pipe thread - DIN 259 Bl. 3, ISO 228/1

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		Inside Ø nom. (mm)
Standard	Metric	
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

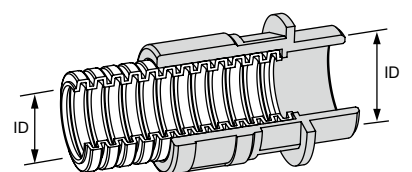
Thread size	Inside diameter mm (nom.) ID	
	Metal thread	Polyamide thread
M12	–	8.0
M12	5.7	8.0
M16	9.6	11.0
M16	9.7	11.0
M20	13.5	13.0
M20	13.5	14.6
M25	18.3	19.0
M25	18.4	19.0
M32	24.2	24.0
M32	25.4	26.0
M40	31.4	32.0
M40	32.6	32.0
M50	39.5	39.0
M50	41.5	42.0
M63	51.4	53.0

Conduit

Nominal width NW		Inside Ø nom. (mm)
Standard	Metric	
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

Thread size	Inside diameter mm (nom.) ID	
	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

Torques

Recommended 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

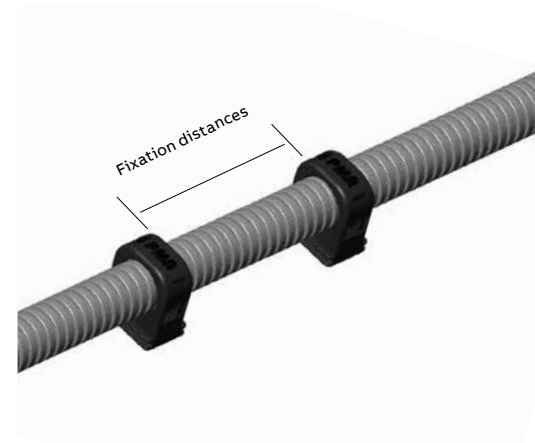
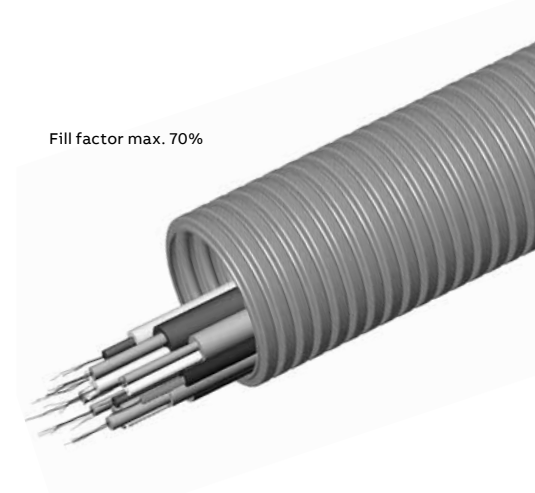
PMA AG recommends that cable protection systems be fastened with a spacing of **300mm to 500mm** between supports. This spacing can be varied depending on the application and location. This recommendation applies for all available dimensions. For larger diameters, the increased load due to the cables 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
Benzene	–	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
Trichloroethylene	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.

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
0709M	7TAA292550R0000	98	514-36	7TAA292690R0007	99	ALND-M406	7TAA292000R0033	131
0907M	7TAA292550R0001	98	514-48	7TAA292690R0008	99	ALND-M409	7TAA292000R0034	131
0911M	7TAA292550R0002	98	514-M12	7TAA292690R0009	99	ALND-M506	7TAA292000R0035	131
0913M	7TAA292550R0003	98	514-M16	7TAA292690R0010	99	ALND-M508	7TAA292000R0036	131
1107M	7TAA292550R0004	98	514-M20	7TAA292690R0011	99	ALND-M638	7TAA292000R0037	131
1109M	7TAA292550R0005	98	514-M25	7TAA292690R0012	99	ALND-P070	7TAA292000R0038	132
1109N	7TAA292550R0006	96	514-M32	7TAA292690R0013	99	ALND-P090	7TAA292000R0039	132
1113M	7TAA292550R0007	98	514-M40	7TAA292690R0014	99	ALND-P092	7TAA292000R0040	132
1116M	7TAA292550R0008	98	514-M50	7TAA292690R0015	99	ALND-P110	7TAA292000R0041	132
1121M	7TAA292550R0009	98	514-M63	7TAA292690R0016	99	ALND-P112	7TAA292000R0042	132
1307M	7TAA292550R0010	98	AFN2-07GT	7TAA292700R0000	95	ALND-P132	7TAA292000R0043	132
1309M	7TAA292550R0011	98	AFN2-10GT	7TAA292700R0001	95	ALND-P137	7TAA292000R0044	132
1309N	7TAA292550R0012	96	AFN2-12GT	7TAA292700R0002	95	ALND-P167	7TAA292000R0045	132
1311M	7TAA292550R0013	98	AFN2-17GT	7TAA292700R0003	95	ALND-P213	7TAA292000R0046	132
1311N	7TAA292550R0014	96	AFN2-23GT	7TAA292700R0004	95	ALND-P299	7TAA292000R0047	132
1316M	7TAA292550R0015	98	AFN2-29GT	7TAA292700R0005	95	ALND-P366	7TAA292000R0048	132
1321M	7TAA292550R0016	98	AFN2-36GT	7TAA292700R0006	95	ALND-P488	7TAA292000R0049	132
1607M	7TAA292550R0017	98	AFN2-48GT	7TAA292700R0007	95	ALWD-M120	7TAA292000R0050	132
1609M	7TAA292550R0018	98	ALAD-M120	7TAA292000R0000	131	ALWD-M160	7TAA292000R0051	132
1609N	7TAA292550R0019	96	ALAD-M160	7TAA292000R0001	131	ALWD-M162	7TAA292000R0052	132
1611M	7TAA292550R0020	98	ALAD-M162	7TAA292000R0002	131	ALWD-M202	7TAA292000R0053	132
1611N	7TAA292550R0021	96	ALAD-M202	7TAA292000R0003	131	ALWD-M207	7TAA292000R0054	132
1613M	7TAA292550R0022	98	ALAD-M207	7TAA292000R0004	131	ALWD-M253	7TAA292000R0055	132
1613N	7TAA292550R0023	96	ALAD-M253	7TAA292000R0005	131	ALWD-M257	7TAA292000R0056	132
1621M	7TAA292550R0024	98	ALAD-M257	7TAA292000R0006	131	ALWD-M323	7TAA292000R0057	132
1629M	7TAA292550R0025	98	ALAD-M323	7TAA292000R0007	131	ALWD-M329	7TAA292000R0058	132
2111M	7TAA292550R0026	98	ALAD-M329	7TAA292000R0008	131	ALWD-M406	7TAA292000R0059	132
2113M	7TAA292550R0027	98	ALAD-M406	7TAA292000R0009	131	ALWD-M409	7TAA292000R0060	132
2113N	7TAA292550R0028	96	ALAD-M409	7TAA292000R0010	131	ALWD-M506	7TAA292000R0061	132
2116M	7TAA292550R0029	98	ALAD-M506	7TAA292000R0011	131	ALWD-M508	7TAA292000R0062	132
2116N	7TAA292550R0030	96	ALAD-M508	7TAA292000R0012	131	ALWD-M638	7TAA292000R0063	132
2129M	7TAA292550R0031	98	ALAD-M638	7TAA292000R0013	131	ALWD-P070	7TAA292000R0064	133
2916M	7TAA292550R0032	98	ALAD-P090	7TAA292000R0014	133	ALWD-P090	7TAA292000R0065	133
2921M	7TAA292550R0033	98	ALAD-P112	7TAA292000R0015	133	ALWD-P092	7TAA292000R0066	133
2921N	7TAA292550R0034	96	ALAD-P132	7TAA292000R0016	133	ALWD-P110	7TAA292000R0067	133
2936M	7TAA292550R0035	98	ALAD-P137	7TAA292000R0017	133	ALWD-P112	7TAA292000R0068	133
3621M	7TAA292550R0036	98	ALAD-P167	7TAA292000R0018	133	ALWD-P130	7TAA292000R0069	133
3629M	7TAA292550R0037	98	ALAD-P213	7TAA292000R0019	133	ALWD-P132	7TAA292000R0070	133
3629N	7TAA292550R0038	96	ALAD-P299	7TAA292000R0020	133	ALWD-P137	7TAA292000R0071	133
4229M	7TAA292550R0039	98	ALAD-P366	7TAA292000R0021	133	ALWD-P167	7TAA292000R0072	133
4236M	7TAA292550R0040	98	ALAD-P488	7TAA292000R0022	133	ALWD-P213	7TAA292000R0073	133
4248M	7TAA292550R0041	98	ALND-M120	7TAA292000R0023	131	ALWD-P299	7TAA292000R0074	133
4836M	7TAA292550R0042	98	ALND-M160	7TAA292000R0024	131	ALWD-P366	7TAA292000R0075	133
4842M	7TAA292550R0043	98	ALND-M162	7TAA292000R0025	131	ALWD-P488	7TAA292000R0076	133
514-07	7TAA292690R0000	99	ALND-M200	7TAA292000R0026	131	BAVD-12/10GT	7TAA292580R0000	86
514-09	7TAA292690R0001	99	ALND-M202	7TAA292000R0027	131	BAVD-17/10GT	7TAA292580R0001	86
514-11	7TAA292690R0002	99	ALND-M207	7TAA292000R0028	131	BAVD-17/12GT	7TAA292580R0002	86
514-13	7TAA292690R0003	99	ALND-M253	7TAA292000R0029	131	BAVD-23/10GT	7TAA292580R0003	86
514-16	7TAA292690R0004	99	ALND-M257	7TAA292000R0030	131	BAVD-23/12GT	7TAA292580R0004	86
514-21	7TAA292690R0005	99	ALND-M323	7TAA292000R0031	131	BAVD-23/17GT	7TAA292580R0005	86
514-29	7TAA292690R0006	99	ALND-M329	7TAA292000R0032	131	BAVD-29/10GT	7TAA292580R0006	86

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
BAVD-29/12GT	7TAA292580R0007	86	BFIL-P488	7TAA292610R0015	82	BGPS-17	7TAA292860R0027	106
BAVD-29/17GT	7TAA292580R0008	86	BGG-125	7TAA292860R0000	115	BGPS-23	7TAA292860R0028	106
BAVD-29/23GT	7TAA292580R0009	86	BGG-56	7TAA292860R0001	115	BGPS-29	7TAA292860R0029	106
BAVD-36/29GT	7TAA292580R0010	86	BGG-70	7TAA292860R0002	115	BGPS-36	7TAA292860R0030	106
BAVD-48/36GT	7TAA292580R0011	86	BGG-95	7TAA292860R0003	115	BGPS-48	7TAA292860R0031	106
BAVR-10/07		86	BGG-M6356	7TAA292860R0004	117	BGPS-56	7TAA292860R0032	106
BAVR-12/10	7TAA292580R0014	86	BGG-P3656	7TAA292860R0005	117	BKIHG-U212	7TAA292400R0028	43
BAVR-17/10	7TAA292580R0015	86	BGGV-56	7TAA292860R0006	116	BKIHG-U217	7TAA292400R0029	43
BAVR-17/12	7TAA292580R0016	86	BGGV-70	7TAA292860R0007	116	BKIHG-U242	7TAA292400R0030	43
BAVR-23/10	7TAA292580R0017	86	BGGV-95	7TAA292860R0008	116	BKIHG-U243	7TAA292400R0031	43
BAVR-23/12	7TAA292580R0018	86	BGH-23	7TAA292720R0014	104	BKIHG-U247	7TAA292400R0032	43
BAVR-23/17	7TAA292580R0019	86	BGH-29	7TAA292720R0015	104	BKIHG-U292	7TAA292400R0033	43
BAVR-29/10	7TAA292580R0020	86	BGH-36	7TAA292720R0016	104	BKIHG-U293	7TAA292400R0034	43
BAVR-29/12	7TAA292580R0021	86	BGH-48	7TAA292720R0017	104	BKIHG-U297	7TAA292400R0035	43
BAVR-29/17	7TAA292580R0022	86	BGH-56	7TAA292720R0018	104,118	BKIHG-U299	7TAA292400R0036	43
BAVR-29/23	7TAA292580R0023	86	BGH-70	7TAA292720R0019	104,118	BKIHG-U353	7TAA292400R0037	43
BAVR-36/29	7TAA292580R0024	86	BGH-95	7TAA292720R0020	104,118	BKIHG-U357	7TAA292400R0038	43
BAVR-48/36	7TAA292580R0025	86	BGI-M7556	7TAA292860R0009	117	BKIHG-U359	7TAA292400R0039	43
BCT-10	7TAA292860R0045	107	BGL-07	7TAA292720R0021	104	BKIHG-U433	7TAA292400R0040	43
BCT-12	7TAA292860R0046	107	BGL-10	7TAA292720R0022	104	BKIHG-U439	7TAA292400R0041	43
BCT-17	7TAA292860R0047	107	BGL-12	7TAA292720R0023	104	BKIHG-U503	7TAA292400R0042	43
BCT-23	7TAA292860R0048	107	BGL-17	7TAA292720R0024	104	BKIHG-U506	7TAA292400R0043	43
BCT-29	7TAA292860R0049	107	BGL-23	7TAA292720R0025	104	BKIHG-U508	7TAA292400R0044	43
BCT-36	7TAA292860R0050	107	BGL-29	7TAA292720R0026	104	BKIHG-U509	7TAA292400R0045	43
BFH-07-0	7TAA292700R0009	103	BGN-S12T	7TAA292680R0000	102	BKIHG-U566	7TAA292400R0046	43
BFH-10-0	7TAA292700R0011	103	BGN-S17G	7TAA292680R0001	102	BKIHG-U568	7TAA292400R0047	43
BFH-12-0	7TAA292700R0012	103	BGN-S17T	7TAA292680R0002	102	BLN-M16	7TAA292740R0000	123
BFH-17-0	7TAA292700R0013	103	BGN-S23G	7TAA292680R0003	102	BLN-M20	7TAA292740R0001	123
BFH-23-0	7TAA292700R0015	103	BGN-S23T	7TAA292680R0004	102	BLN-M25	7TAA292740R0002	123
BFH-29-0	7TAA292700R0017	103	BGN-S29G	7TAA292680R0005	102	BLN-M32	7TAA292740R0003	123
BFH-36-0	7TAA292700R0018	103	BGN-S29T	7TAA292680R0006	102	BLN-M40	7TAA292740R0004	123
BFH-48-0	7TAA292700R0020	103	BGN-S36G	7TAA292680R0007	102	BLN-M50	7TAA292740R0005	123
BFHS-00	7TAA292700R0022	103	BGN-S36T	7TAA292680R0008	102	BLNO-M160	7TAA292740R0006	123
BFHS-PH	7TAA292700R0024	103	BGN-S48G	7TAA292680R0009	102	BLNO-M162	7TAA292740R0007	123
BFHS-PH1	7TAA292700R0025	103	BGN-S48T	7TAA292680R0010	102	BLNO-M202	7TAA292740R0008	123
BFIL-P070	7TAA292610R0003	82	BGN-S70G	7TAA292680R0011	102	BLNO-M207	7TAA292740R0009	123
BFIL-P07M	7TAA292610R0004	82	BGO-56	7TAA292860R0010	115	BLNO-M253	7TAA292740R0010	123
BFIL-P090	7TAA292610R0005	82	BGO-70	7TAA292860R0011	115	BLNO-M257	7TAA292740R0011	123
BFIL-P112	7TAA292610R0006	82	BGO-95	7TAA292860R0012	115	BLNO-M323	7TAA292740R0012	123
BFIL-P117	7TAA292610R0007	82	BGOV-56	7TAA292860R0013	116	BLNO-M329	7TAA292740R0013	123
BFIL-P132	7TAA292610R0008	82	BGOV-70	7TAA292860R0014	116	BLNO-M406	7TAA292740R0014	123
BFIL-P137	7TAA292610R0009	82	BGOV-95	7TAA292860R0015	116	BLNO-M409	7TAA292740R0015	123
BFIL-P160	7TCA292000R0600	82	BGP-12/01	7TCA292000R6631	106	BLNO-M508	7TAA292740R0016	123
BFIL-P167	7TAA292610R0010	82	BGP-17	7TCA292000R6632	106	BLSGO-101010		125
BFIL-P213	7TAA292610R0011	82	BGP-23	7TCA292000R6633	106	BLSGO-121212		125
BFIL-P217	7TAA292610R0012	82	BGP-29	7TCA292000R6634	106	BLSGO-171717		125
BFIL-P293	7TCA292000R0601	82	BGP-3x48		106	BLSGO-232323		125
BFIL-P299	7TAA292610R0013	82	BGP-36	7TCA292000R6635	106	BLTO-070707	7TCA292000R4700	124
BFIL-P363		82	BGP-48	7TCA292000R6636	106	BLTO-101010	7TCA292000R4701	124
BFIL-P366	7TAA292610R0014	82	BGP-56G	7TAA292860R0026	106	BLTO-121212	7TCA292000R4702	124
BFIL-P369	7TCA292000R0602	82	BGPS-12/01	7TCA292000R5539	106	BLTO-171717	7TCA292000R4703	124

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
BLTO-232323	7TCA292000R4704	124	BVAD-M638GT	7TAA292150R0042	54	BVBD-M253GT	7TAA292150R0092	55
BLTO-292929	7TCA292000R4705	124	BVAD-N022GT	7TAA292150R0043	75	BVBD-M257GT	7TAA292150R0093	55
BLYO-100707	7TCA292000R4706	124	BVAD-N027GT	7TAA292150R0044	75	BVBD-M323GT	7TAA292150R0094	55
BLYO-121010	7TCA292000R4707	124	BVAD-N043GT	7TAA292150R0045	75	BVBD-M329GT	7TAA292150R0095	55
BLYO-171212	7TCA292000R4708	124	BVAD-N069GT	7TAA292150R0046	75	BVBD-M406GT	7TAA292150R0096	55
BLYO-231717	7TCA292000R4709	124	BVAD-N076GT	7TAA292150R0047	75	BVBD-M409GT	7TAA292150R0097	55
BLYO-292917	7TCA292000R4710	124	BVAD-N088GT	7TAA292150R0048	75	BVBD-M506GT	7TAA292150R0098	55
BMN-07	7TAA292670R0008	100	BVAD-N098GT		75	BVBD-M508GT	7TAA292150R0099	55
BMN-09	7TAA292670R0009	100	BVAD-P090GT	7TAA292150R0049	66	BVBD-M638GT	7TAA292150R0100	55
BMN-11	7TAA292670R0010	100	BVAD-P112GT	7TAA292150R0050	66	BVBD-P167GT	7TAA292150R0101	67
BMN-13	7TAA292670R0011	100	BVAD-P132GT	7TAA292150R0051	66	BVBD-P213GT	7TAA292150R0102	67
BMN-16	7TAA292670R0012	100	BVAD-P137GT	7TAA292150R0052	66	BVBD-P299GT	7TAA292150R0103	67
BMN-21	7TAA292670R0013	100	BVAD-P167GT	7TAA292150R0053	66	BVBD-P366GT	7TAA292150R0104	67
BMN-29	7TAA292670R0014	100	BVAD-P213GT	7TAA292150R0054	66	BVBD-P488GT	7TAA292150R0105	67
BMN-36	7TAA292670R0015	100	BVAD-P299GT	7TAA292150R0055	66	BVBV-M207	7TAA292150R0106	55
BMN-48	7TAA292670R0016	100	BVAD-P366GT	7TAA292150R0056	66	BVBV-M253	7TAA292150R0107	55
BMN-M12	7TAA292670R0020	100	BVAD-P488GT	7TAA292150R0057	66	BVBV-M257	7TAA292150R0108	55
BMN-M16	7TAA292670R0021	100	BVAV-G000	7TAA292150R0058	73	BVBV-M323	7TAA292150R0109	55
BMN-M20	7TAA292670R0022	100	BVAV-G012	7TAA292150R0059	73	BVBV-M329	7TAA292150R0110	55
BMN-M25	7TAA292670R0023	100	BVAV-G027	7TAA292150R0060	73	BVBV-M406	7TAA292150R0111	55
BMN-M32	7TAA292670R0024	100	BVAV-G043	7TAA292150R0061	73	BVBV-M409	7TAA292150R0112	55
BMN-M40	7TAA292670R0025	100	BVAV-G069	7TAA292150R0062	73	BVBV-M506	7TAA292150R0113	55
BMN-M50	7TAA292670R0026	100	BVAV-G076	7TAA292150R0063	73	BVBV-M508	7TAA292150R0114	55
BMN-M63	7TAA292670R0027	100	BVAV-G098	7TAA292150R0064	73	BVBV-M638	7TAA292150R0115	55
BREIR-U2916	7TAA292920R0007	140	BVAV-M160	7TAA292150R0065	54	BVBV-P167	7TAA292150R0116	67
BREIR-U3516	7TCA292000R0853	140	BVAV-M162	7TAA292150R0066	54	BVBV-P213	7TAA292150R0117	67
BSS-17	7TAA292850R0013	108	BVAV-M202	7TAA292150R0067	54	BVBV-P299	7TAA292150R0118	67
BSS-23	7TAA292850R0014	108	BVAV-M207	7TAA292150R0068	54	BVBV-P366	7TAA292150R0119	67
BSS-29	7TAA292850R0015	108	BVAV-M253	7TAA292150R0069	54	BVBV-P488	7TAA292150R0120	67
BSS-36	7TAA292850R0016	108	BVAV-M329	7TAA292150R0070	54	BVH-17-000	7TAA292700R0027	102
BSS-48	7TAA292850R0017	108	BVAV-M406	7TAA292150R0071	54	BVH-17-010	7TAA292700R0028	102
BSS-56G	7TAA292850R0018	108	BVAV-M506	7TAA292150R0072	54	BVH-17-020	7TAA292700R0029	102
BSV-70G	7TAA292850R0019	108	BVAV-M508	7TAA292150R0073	54	BVH-23-000	7TAA292700R0030	102
BVAD-G000GT	7TAA292150R0024	73	BVAV-M638	7TAA292150R0074	54	BVH-23-010	7TAA292700R0031	102
BVAD-G012GT	7TAA292150R0025	73	BVAV-N022	7TAA292150R0075	75	BVH-23-020	7TAA292700R0032	102
BVAD-G027GT	7TAA292150R0026	73	BVAV-N027	7TAA292150R0076	75	BVH-29-000	7TAA292700R0033	102
BVAD-G043GT	7TAA292150R0027	73	BVAV-N043	7TAA292150R0077	75	BVH-29-010	7TAA292700R0034	102
BVAD-G069GT	7TAA292150R0028	73	BVAV-N069	7TAA292150R0078	75	BVH-29-020	7TAA292700R0035	102
BVAD-G076GT	7TAA292150R0029	73	BVAV-N076	7TAA292150R0079	75	BVH-36-000	7TAA292700R0036	102
BVAD-G088GT	7TAA292150R0030	73	BVAV-N088	7TAA292150R0080	75	BVH-36-010	7TAA292700R0037	102
BVAD-G098GT	7TAA292150R0031	73	BVAV-N098	7TAA292150R0081	75	BVH-36-020	7TAA292700R0038	102
BVAD-M120GT	7TAA292150R0032	54	BVAV-P090	7TAA292150R0082	66	BVH-48-000	7TAA292700R0039	102
BVAD-M160GT	7TAA292150R0033	54	BVAV-P112	7TAA292150R0083	66	BVH-48-010	7TAA292700R0040	102
BVAD-M162GT	7TAA292150R0034	54	BVAV-P132	7TAA292150R0084	66	BVH-48-020	7TAA292700R0041	102
BVAD-M202GT	7TAA292150R0035	54	BVAV-P137	7TAA292150R0085	66	BVID-M12MGT	7TAA292610R0016	80
BVAD-M207GT	7TAA292150R0036	54	BVAV-P167	7TAA292150R0086	66	BVID-M160GT	7TAA292610R0017	80
BVAD-M253GT	7TAA292150R0037	54	BVAV-P213	7TAA292150R0087	66	BVID-M162GT	7TAA292610R0018	80
BVAD-M329GT	7TAA292150R0038	54	BVAV-P299	7TAA292150R0088	66	BVID-M207GT	7TAA292610R0019	80
BVAD-M406GT	7TAA292150R0039	54	BVAV-P366	7TAA292150R0089	66	BVID-M253GT	7TAA292610R0020	80
BVAD-M506GT	7TAA292150R0040	54	BVAV-P488	7TAA292150R0090	66	BVID-M329GT	7TAA292610R0021	80
BVAD-M508GT	7TAA292150R0041	54	BVBD-M207GT	7TAA292150R0091	55	BVID-M406GT	7TAA292610R0022	80

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
BVID-M508GT	7TAA292610R0023	80	BVIR-M508	7TAA292610R0074	80	BVIVG-U352	7TAA292610R0169	84
BVID-M638GT	7TAA292610R0024	80	BVIR-M638	7TAA292610R0075	80	BVIVG-U353	7TAA292610R0117	84
BVIDA-U150GT	7TAA292610R0025	83	BVIR-P070	7TAA292610R0076	80	BVIVG-U356	7TAA292610R0118	84
BVIDA-U152GT	7TAA292610R0026	83	BVIR-P090	7TAA292610R0077	80	BVIVG-U357	7TAA292610R0119	84
BVIDA-U15MGT	7TAA292610R0027	83	BVIR-P112	7TAA292610R0078	80	BVIVG-U359	7TAA292610R0120	84
BVIDA-U180GT	7TAA292610R0028	83	BVIR-P167	7TAA292610R0079	80	BVIVG-U433	7TAA292610R0121	84
BVIDA-U182GT	7TAA292610R0029	83	BVIRA-U150	7TAA292610R0080	83	BVIVG-U436	7TAA292610R0122	84
BVIDA-U187GT	7TAA292610R0030	83	BVIRA-U152	7TAA292610R0081	83	BVIVG-U437	7TAA292610R0123	84
BVIDA-U232GT	7TAA292610R0031	83	BVIRA-U15M	7TAA292610R0082	83	BVIVG-U439	7TAA292610R0124	84
BVIDA-U233GT	7TAA292610R0032	83	BVIRA-U180	7TAA292610R0083	83	BVIVG-U503	7TAA292610R0125	84
BVIDA-U237GT	7TAA292610R0033	83	BVIRA-U182	7TAA292610R0084	83	BVIVG-U506	7TAA292610R0126	84
BVIDA-U343GT	7TAA292610R0034	83	BVIRA-U187	7TAA292610R0085	83	BVIVG-U508	7TAA292610R0127	84
BVIDA-U347GT	7TAA292610R0035	83	BVIRA-U232	7TAA292610R0086	83	BVIVG-U509	7TAA292610R0128	84
BVIDA-U402GT	7TAA292610R0036	83	BVIRA-U233	7TAA292610R0087	83	BVIVG-U563	7TAA292610R0129	84
BVIDA-U403GT	7TAA292610R0037	83	BVIRA-U237	7TAA292610R0088	83	BVIVG-U566	7TAA292610R0130	84
BVIDA-U407GT	7TAA292610R0038	83	BVIRA-U343	7TAA292610R0089	83	BVIVG-U568	7TAA292610R0131	84
BVIDB-U162GT	7TAA292610R0039	83	BVIRA-U347	7TAA292610R0090	83	BVIVG-U569	7TAA292610R0132	84
BVIDB-U202GT	7TAA292610R0040	83	BVIRA-U402	7TAA292610R0091	83	BVIVG-U628	7TCA292000R1039	84
BVIDB-U232GT	7TAA292610R0041	83	BVIRA-U403	7TAA292610R0092	83	BVND-G000GT	7TAA292150R0127	73
BVIDB-U237GT	7TAA292610R0042	83	BVIRA-U407	7TAA292610R0093	83	BVND-G00MGT	7TAA292150R0128	73
BVIDB-U267GT	7TAA292610R0043	83	BVIRB-U162	7TAA292610R0094	83	BVND-G010GT	7TAA292150R0129	73
BVIDB-U293GT	7TAA292610R0044	83	BVIRB-U202	7TAA292610R0095	83	BVND-G012GT	7TAA292150R0130	73
BVIDB-U297GT	7TAA292610R0045	83	BVIRB-U232	7TAA292610R0096	83	BVND-G022GT	7TAA292150R0131	73
BVIDB-U323GT	7TAA292610R0046	83	BVIRB-U237	7TAA292610R0097	83	BVND-G027GT	7TAA292150R0132	73
BVIDB-U353GT	7TAA292610R0047	83	BVIRB-U267	7TAA292610R0098	83	BVND-G043GT	7TAA292150R0133	73
BVIDB-U357GT	7TAA292610R0048	83	BVIRB-U293	7TAA292610R0099	83	BVND-G069GT	7TAA292150R0134	73
BVIDB-U359GT	7TAA292610R0049	83	BVIRB-U297	7TAA292610R0100	83	BVND-G076GT	7TAA292150R0135	73
BVIDG-U212GT	7TAA292610R0050	84	BVIRB-U323	7TAA292610R0101	83	BVND-G088GT	7TAA292150R0136	73
BVIDG-U217GT	7TAA292610R0051	84	BVIRB-U353	7TAA292610R0102	83	BVND-G098GT	7TAA292150R0137	73
BVIDG-U242GT	7TAA292610R0052	84	BVIRB-U357	7TAA292610R0103	83	BVND-M120GT	7TAA292150R0138	53
BVIDG-U247GT	7TAA292610R0053	84	BVIRB-U359	7TAA292610R0104	83	BVND-M12MGT	7TAA292150R0139	53
BVIDG-U293GT	7TAA292610R0054	84	BVIRS-U162	7TCA292000R0041	83	BVND-M160GT	7TAA292150R0140	53
BVIDG-U297GT	7TAA292610R0055	84	BVIRS-U202	7TCA292000R0042	83	BVND-M162GT	7TAA292150R0141	53
BVIDG-U353GT	7TAA292610R0056	84	BVIRS-U237	7TCA292000R0043	83	BVND-M200GT	7TAA292150R0142	53
BVIDG-U357GT	7TAA292610R0057	84	BVIRS-U267	7TCA292000R0044	83	BVND-M202GT	7TAA292150R0144	53
BVIDG-U359GT	7TAA292610R0058	84	BVIRS-U293	7TCA292000R0045	83	BVND-M203GT	7TAA292150R0146	53
BVIDG-U433GT	7TAA292610R0059	84	BVIRS-U323	7TCA292000R0046	83	BVND-M207GT	7TAA292150R0147	53
BVIDG-U436GT	7TAA292610R0060	84	BVIRS-U359	7TCA292000R0047	83	BVND-M253GT	7TAA292150R0149	53
BVIDG-U439GT	7TAA292610R0061	84	BVIVG-U152	7TAA292610R0105	84	BVND-M257GT	7TAA292150R0150	53
BVIDG-U506GT	7TAA292610R0062	84	BVIVG-U187	7TAA292610R0106	84	BVND-M323GT	7TAA292150R0152	53
BVIDG-U509GT	7TAA292610R0063	84	BVIVG-U210	7TAA292610R0107	84	BVND-M329GT	7TAA292150R0154	53
BVIDG-U566GT	7TAA292610R0064	84	BVIVG-U212	7TAA292610R0108	84	BVND-M406GT	7TAA292150R0156	53
BVIDG-U569GT	7TAA292610R0065	84	BVIVG-U217	7TAA292610R0109	84	BVND-M409GT	7TAA292150R0157	53
BVIR-M160	7TAA292610R0066	80	BVIVG-U242	7TAA292610R0110	84	BVND-M506GT	7TAA292150R0159	53
BVIR-M162	7TAA292610R0067	80	BVIVG-U243	7TAA292610R0111	84	BVND-M508GT	7TAA292150R0160	53
BVIR-M202	7TAA292610R0068	80	BVIVG-U247	7TAA292610R0112	84	BVND-M638GT	7TAA292150R0161	53
BVIR-M207	7TAA292610R0069	80	BVIVG-U292	7TAA292610R0113	84	BVND-N022GT	7TAA292150R0162	75
BVIR-M253	7TAA292610R0070	80	BVIVG-U293	7TAA292610R0114	84	BVND-N027GT	7TAA292150R0163	75
BVIR-M257	7TAA292610R0071	80	BVIVG-U297	7TAA292610R0115	84	BVND-N043GT	7TAA292150R0164	75
BVIR-M329	7TAA292610R0072	80	BVIVG-U299	7TAA292610R0116	84	BVND-N069GT	7TAA292150R0165	75
BVIR-M406	7TAA292610R0073	80	BVIVG-U349	7TCA292000R1035	84	BVND-N076GT	7TAA292150R0166	75

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
BVND-N088GT	7TAA292150R0167	75	BVNDZ-M406GT	7TAA292150R0209	54	BVNV-G098	7TAA292150R0266	73
BVND-N098GT	7TAA292150R0168	75	BVNDZ-M508GT	7TAA292150R0210	54	BVNV-M120	7TAA292150R0267	53
BVND-P070GT-11	7TAA292150R0169	65	BVNDZ-M638GT	7TAA292150R0211	54	BVNV-M12M	7TAA292150R0268	53
BVND-P070GT-8	7TAA292150R0170	65	BVNDZ-P090GT	7TAA292150R0212	66	BVNV-M160	7TAA292150R0269	53
BVND-P072GT-11	7TAA292150R0171	65	BVNDZ-P112GT	7TAA292150R0213	66	BVNV-M162	7TAA292150R0270	53
BVND-P072GT-8	7TAA292150R0172	65	BVNDZ-P132GT	7TAA292150R0214	66	BVNV-M200	7TAA292150R0272	53
BVND-P07MGT-11	7TAA292150R0173	65	BVNDZ-P137GT	7TAA292150R0215	66	BVNV-M202	7TAA292150R0273	53
BVND-P07MGT-8	7TAA292150R0174	65	BVNDZ-P163GT	7TAA292150R0216	66	BVNV-M203	7TAA292150R0274	53
BVND-P090GT-11	7TAA292150R0176	65	BVNDZ-P167GT	7TAA292150R0217	66	BVNV-M207	7TAA292150R0275	53
BVND-P090GT-8	7TAA292150R0177	65	BVNDZ-P213GT	7TAA292150R0218	66	BVNV-M253	7TAA292150R0277	53
BVND-P092GT-11	7TAA292150R0178	65	BVNDZ-P299GT	7TAA292150R0219	66	BVNV-M257	7TAA292150R0279	53
BVND-P092GT-8	7TCA292000R1057	65	BVNDZ-P366GT	7TAA292150R0220	66	BVNV-M323	7TAA292150R0281	53
BVND-P097GT-11	7TAA292150R0179	65	BVNDZ-P488GT	7TAA292150R0221	66	BVNV-M329	7TAA292150R0282	53
BVND-P097GT-8	7TCA292000R5693	65	BVNR-RE12	7TAA292150R0222	87	BVNV-M406	7TAA292150R0283	53
BVND-P09MGT-11	7TAA292150R0180	65	BVNR-RE12-24	7TAA292150R0223	87	BVNV-M409	7TAA292150R0284	53
BVND-P09MGT-8	7TCA292000R1058	65	BVNR-RE1317	7TAA292150R0224	87	BVNV-M506	7TAA292150R0285	53
BVND-P110GT-11	7TAA292150R0181	65	BVNR-RE1317-28	7TAA292150R0225	87	BVNV-M508	7TAA292150R0286	53
BVND-P110GT-8	7TAA292150R0182	65	BVNR-RE17	7TAA292150R0226	87	BVNV-M638	7TAA292150R0287	53
BVND-P112GT-11	7TAA292150R0183	65	BVNR-RE17-28	7TAA292150R0227	87	BVNV-N022	7TAA292150R0289	75
BVND-P112GT-8	7TAA292150R0184	65	BVNR-RE23	7TAA292150R0229	87	BVNV-N027	7TAA292150R0290	75
BVND-P117GT-11	7TAA292150R0185	65	BVNR-RE23-32	7TAA292150R0230	87	BVNV-N043	7TAA292150R0291	75
BVND-P117GT-8	7TCA292000R1060	65	BVNR-RE29	7TAA292150R0232	87	BVNV-N069	7TAA292150R0292	75
BVND-P11MGT-11	7TAA292150R0186	65	BVNR-RE29-44	7TAA292150R0233	87	BVNV-N076	7TAA292150R0293	75
BVND-P11MGT-8	7TCA292000R5694	65	BVNR-RE36	7TAA292150R0235	87	BVNV-N088	7TAA292150R0294	75
BVND-P130GT-11	7TAA292150R0187	65	BVNR-RE36-50	7TAA292150R0236	87	BVNV-N098	7TAA292150R0295	75
BVND-P130GT-8	7TCA292000R1061	65	BVNR-RE48	7TAA292150R0238	87	BVNV-P070	7TAA292150R0296	65
BVND-P132GT-11	7TAA292150R0188	65	BVNR-RE48-65	7TAA292150R0239	87	BVNV-P072	7TCA292000R1118	65
BVND-P132GT-8	7TCA292000R1062	65	BVNR-REM162	7TAA292150R0240	87	BVNV-P07M	7TAA292150R0297	65
BVND-P137GT-11	7TAA292150R0189	65	BVNR-REM162-24	7TAA292150R0241	87	BVNV-P090	7TAA292150R0298	65
BVND-P137GT-8	7TCA292000R1064	65	BVNR-REM187	7TAA292150R0242	87	BVNV-P092	7TAA292150R0299	65
BVND-P13MGT-11	7TAA292150R0190	65	BVNR-REM187-28	7TAA292150R0243	87	BVNV-P097	7TAA292150R1288	65
BVND-P13MGT-8	7TCA292000R1065	65	BVNR-REM207	7TAA292150R0244	87	BVNV-P09M	7TAA292150R0300	65
BVND-P160GT-11	7TAA292150R0191	65	BVNR-REM207-28	7TAA292150R0245	87	BVNV-P110	7TAA292150R0301	65
BVND-P160GT-8	7TCA292000R5695	65	BVNR-REM253	7TAA292150R0246	87	BVNV-P112	7TAA292150R0302	65
BVND-P162GT-11	7TAA292150R0192	65	BVNR-REM253-32	7TAA292150R0247	87	BVNV-P117	7TAA292150R0303	65
BVND-P163GT-11	7TAA292150R0193	65	BVNR-REM329	7TAA292150R0248	87	BVNV-P11M	7TAA292150R0304	65
BVND-P163GT-8	7TCA292000R1066	65	BVNR-REM329-44	7TAA292150R0249	87	BVNV-P130	7TAA292150R0305	65
BVND-P167GT-11	7TAA292150R0194	65	BVNR-REM406	7TAA292150R0250	87	BVNV-P132	7TAA292150R0306	65
BVND-P167GT-8	7TAA292150R0195	65	BVNR-REM406-50	7TAA292150R0251	87	BVNV-P137	7TAA292150R0307	65
BVND-P213GT	7TAA292150R0196	65	BVNR-REM508	7TAA292150R0252	87	BVNV-P13M	7TAA292150R0308	65
BVND-P296GT	7TAA292150R0197	65	BVNR-REM508-65	7TAA292150R0253	87	BVNV-P162	7TAA292150R0309	65
BVND-P299GT	7TAA292150R0198	65	BVNV-G000	7TAA292150R0256	73	BVNV-P163	7TCA292000R1137	65
BVND-P366GT	7TAA292150R0199	65	BVNV-G00M	7TAA292150R0257	73	BVNV-P167	7TAA292150R0310	65
BVND-P368GT	7TAA292150R0200	65	BVNV-G010	7TAA292150R0258	73	BVNV-P213	7TAA292150R0311	65
BVND-P428GT	7TAA292150R0201	65	BVNV-G012	7TAA292150R0259	73	BVNV-P296	7TAA292150R0312	65
BVND-P488GT	7TAA292150R0202	65	BVNV-G022	7TAA292150R0260	73	BVNV-P299	7TAA292150R0313	65
BVNDZ-M160GT	7TAA292150R0204	54	BVNV-G027	7TAA292150R0261	73	BVNV-P366	7TAA292150R0314	65
BVNDZ-M162GT	7TAA292150R0205	54	BVNV-G043	7TAA292150R0262	73	BVNV-P368	7TCA292000R1147	65
BVNDZ-M207GT	7TAA292150R0206	54	BVNV-G069	7TAA292150R0263	73	BVNV-P428	7TAA292150R0315	65
BVNDZ-M253GT	7TAA292150R0207	54	BVNV-G076	7TAA292150R0264	73	BVNV-P488	7TAA292150R0316	65
BVNDZ-M329GT	7TAA292150R0208	54	BVNV-G088	7TAA292150R0265	73	BVNZ-M162S	7TAA292150R0317	54

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
BVNZ-M207S	7TAA292150R0318	54	BVTR-484848	7TAA292150R0363	85	BVWD-P132GT-8	7TCA292000R1240	68
BVNZ-M253S	7TAA292150R0319	54	BVWD-G000GT	7TAA292150R0364	74	BVWD-P137GT-11	7TAA292150R0405	68
BVNZ-M329S	7TAA292150R0320	54	BVWD-G00MGT	7TAA292150R0365	74	BVWD-P137GT-8	7TAA292150R0406	68
BVNZ-M406S	7TAA292150R0321	54	BVWD-G010GT	7TAA292150R0366	74	BVWD-P13MGT-11	7TAA292150R0407	68
BVNZ-M508S	7TAA292150R0322	54	BVWD-G012GT	7TAA292150R0367	74	BVWD-P13MGT-8	7TCA292000R5707	68
BVNZ-M638S	7TAA292150R0323	54	BVWD-G022GT	7TAA292150R0368	74	BVWD-P167GT-11	7TAA292150R0408	68
BVNZ-P090S	7TAA292150R0327	66	BVWD-G027GT	7TAA292150R0369	74	BVWD-P167GT-8	7TAA292150R0409	68
BVNZ-P112S	7TAA292150R0328	66	BVWD-G043GT	7TAA292150R0370	74	BVWD-P213GT	7TAA292150R0410	68
BVNZ-P132S	7TAA292150R0329	66	BVWD-G069GT	7TAA292150R0371	74	BVWD-P299GT	7TAA292150R0411	68
BVNZ-P137S	7TAA292150R0330	66	BVWD-G076GT	7TAA292150R0372	74	BVWD-P366GT	7TAA292150R0412	68
BVNZ-P163S	7TAA292150R0331	66	BVWD-G088GT	7TAA292150R0373	74	BVWD-P488GT	7TAA292150R0413	68
BVNZ-P167S	7TAA292150R0332	66	BVWD-G098GT	7TAA292150R0374	74	BVWV-G000	7TAA292150R0414	74
BVNZ-P213S	7TAA292150R0333	66	BVWD-M120GT	7TAA292150R0375	55	BVWV-G00M	7TAA292150R0415	74
BVNZ-P299S	7TAA292150R0334	66	BVWD-M12MGT	7TAA292150R0376	55	BVWV-G010	7TAA292150R0416	74
BVNZ-P366S	7TAA292150R0335	66	BVWD-M160GT	7TAA292150R0377	55	BVWV-G012	7TAA292150R0417	74
BVNZ-P488S	7TAA292150R0336	66	BVWD-M162GT	7TAA292150R0378	55	BVWV-G022	7TAA292150R0418	74
BVOD-P167GT	7TAA292150R0337	80	BVWD-M200GT	7TAA292150R0379	55	BVWV-G027	7TAA292150R0419	74
BVOD-P213GT	7TAA292150R0338	80	BVWD-M202GT	7TAA292150R0380	55	BVWV-G043	7TAA292150R0420	74
BVOD-P299GT	7TAA292150R0339	80	BVWD-M207GT	7TAA292150R0381	55	BVWV-G069	7TAA292150R0421	74
BVOD-P366GT	7TAA292150R0340	80	BVWD-M253GT	7TAA292150R0382	55	BVWV-G076	7TAA292150R0422	74
BVOD-P488GT	7TAA292150R0341	80	BVWD-M329GT	7TAA292150R0383	55	BVWV-G088	7TAA292150R0423	74
BVOV-P167	7TAA292150R0342	80	BVWD-M406GT	7TAA292150R0384	55	BVWV-G098	7TAA292150R0424	74
BVOV-P213	7TAA292150R0343	80	BVWD-M508GT	7TAA292150R0385	55	BVWV-M120	7TAA292150R0425	55
BVOV-P299	7TAA292150R0344	80	BVWD-N022GT	7TAA292150R0386	76	BVWV-M12M	7TAA292150R0426	55
BVOV-P366	7TAA292150R0345	80	BVWD-N027GT	7TAA292150R0387	76	BVWV-M160	7TAA292150R0427	55
BVOV-P488	7TAA292150R0346	80	BVWD-N043GT	7TAA292150R0388	76	BVWV-M162	7TAA292150R0428	55
BVSGD-1212GT	7TAA292300R0000	87	BVWD-N069GT	7TAA292150R0389	76	BVWV-M202	7TAA292150R0429	55
BVSGD-1717GT	7TAA292300R0001	87	BVWD-N076GT	7TAA292150R0390	76	BVWV-M207	7TAA292150R0430	55
BVSGD-2323GT	7TAA292300R0002	87	BVWD-N088GT	7TAA292150R0391	76	BVWV-M253	7TAA292150R0431	55
BVSGD-2929GT	7TAA292300R0003	87	BVWD-N098GT	7TAA292150R0392	76	BVWV-M329	7TAA292150R0432	55
BVSGD-3636GT	7TAA292300R0004	87	BVWD-P070GT-11	7TAA292150R0393	68	BVWV-M406	7TAA292150R0433	55
BVSGD-4848GT	7TAA292300R0005	87	BVWD-P070GT-8	7TCA292000R1233	68	BVWV-M508	7TAA292150R0434	55
BVSGR-1212	7TAA292300R0006	87	BVWD-P072GT-11	7TAA292150R0394	68	BVWV-N022	7TAA292150R0435	76
BVSGR-1717	7TAA292300R0007	87	BVWD-P072GT-8	7TCA292000R5702	68	BVWV-N027	7TAA292150R0436	76
BVSGR-2323	7TAA292300R0008	87	BVWD-P07MGT-11	7TAA292150R0395	68	BVWV-N043	7TAA292150R0437	76
BVSGR-2929	7TAA292300R0009	87	BVWD-P07MGT-8	7TCA292000R5703	68	BVWV-N069	7TAA292150R0438	76
BVSGR-3636	7TAA292300R0010	87	BVWD-P090GT-11	7TAA292150R0396	68	BVWV-N076	7TAA292150R0439	76
BVSGR-4848	7TAA292300R0011	87	BVWD-P090GT-8	7TCA292000R1236	68	BVWV-N088	7TAA292150R0440	76
BVTD-101010GT	7TAA292150R1292	85	BVWD-P092GT-11	7TAA292150R0397	68	BVWV-N098	7TAA292150R0441	76
BVTD-121212GT	7TAA292150R1293	85	BVWD-P092GT-8	7TCA292000R5704	68	BVWV-P070	7TAA292150R0442	68
BVTD-171717GT	7TAA292150R1294	85	BVWD-P09MGT-11	7TAA292150R0398	68	BVWV-P072	7TCA292000R5709	68
BVTD-232323GT	7TAA292150R0347	85	BVWD-P09MGT-8	7TCA292000R5705	68	BVWV-P07M	7TAA292150R0443	68
BVTD-292929GT	7TAA292150R0348	85	BVWD-P110GT-11	7TAA292150R0399	68	BVWV-P090	7TAA292150R0444	68
BVTD-363636GT	7TAA292150R0349	85	BVWD-P110GT-8	7TCA292000R1238	68	BVWV-P092	7TAA292150R0445	68
BVTD-484848GT	7TAA292150R0350	85	BVWD-P112GT-11	7TAA292150R0400	68	BVWV-P09M	7TAA292150R0446	68
BVTR-101010	7TAA292150R0351	85	BVWD-P112GT-8	7TAA292150R0401	68	BVWV-P110	7TAA292150R0447	68
BVTR-121212	7TAA292150R0353	85	BVWD-P11MGT-11	7TAA292150R0402	68	BVWV-P112	7TAA292150R0448	68
BVTR-171717	7TAA292150R0355	85	BVWD-P11MGT-8	7TCA292000R5706	68	BVWV-P11M	7TCA292000R1259	68
BVTR-232323	7TAA292150R0358	85	BVWD-P130GT-11	7TAA292150R0403	68	BVWV-P130	7TAA292150R0449	68
BVTR-292929	7TAA292150R0359	85	BVWD-P130GT-8	7TCA292000R1239	68	BVWV-P132	7TAA292150R0450	68
BVTR-363636	7TAA292150R0361	85	BVWD-P132GT-11	7TAA292150R0404	68	BVWV-P137	7TAA292150R0451	68

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
BVWV-P13M	7TCA292000R1265	68	CYLG-36B	7TAA292240R0012	17	E 152/p9		40,41
BVWV-P167	7TAA292150R0452	68	CYLG-36S	7TAA292240R0013	17	E 152p11		60,70
BVWV-P213	7TAA292150R0453	68	CYLG-48B	7TAA292240R0014	17	E 152p11		60
BVWV-P299	7TAA292150R0454	68	CYLG-48S	7TAA292240R0015	17	E 152p13		60
BVWV-P366	7TAA292150R0455	68	CYLG-56B	7TAA292360R0002	17	E 152p7		60
BVWV-P488	7TAA292150R0456	68	CYLG-56S	7TAA292360R0003	17	E 152p9		60
BVYD-100707GT	7TAA292150R0457	85	CYLG-70B	7TAA292360R0004	17	E 152p9		60,70
BVYD-121010GT	7TAA292150R0458	85	CYLG-70S	7TAA292360R0006	17	E 152p9		64,70
BVYD-171212GT	7TAA292150R0459	85	CYLG-95B	7TAA292360R0008	17	E 153 p11		70
BVYD-231717GT	7TAA292150R0460	85	CYLG-95S	7TAA292360R0010	17	E 153 p13		64,70
BVYD-292323GT	7TAA292150R0461	85	CYLT-07B	7TAA292240R0018	17	E 153 p16		64,70
BVYD-362929GT	7TAA292150R0462	85	CYLT-07S	7TAA292240R0019	17	E 153/p11		40
BVYD-483636GT	7TAA292150R0463	85	CYLT-10B	7TAA292240R0020	17	E 153/p13		40,41
BVYR-100707	7TAA292150R0464	85	CYLT-10S	7TAA292240R0021	17	E 153/p16		40,41
BVYR-121010	7TAA292150R0465	85	CYLT-12B	7TAA292240R0022	17	E 153p13		60
BVYR-171212	7TAA292150R0466	85	CYLT-12S	7TAA292240R0023	17	E 153p16		60
BVYR-231717	7TAA292150R0467	85	CYLT-17B	7TAA292240R0024	17	E 154 p11		70
BVYR-292323	7TAA292150R0468	85	CYLT-17S	7TAA292240R0025	17	E 154/p13		40
BVYR-362929	7TAA292150R0469	85	CYLT-23B	7TAA292240R0026	17	E 154/p18		40,41
BVYR-483636	7TAA292150R0470	85	CYLT-23S	7TAA292240R0027	17	E 154/p20		40,41
C.66.10GR	7TAA292910R0000	136	CYLT-29B	7TAA292240R0028	17	E 154p18		60,70
C.66.10SW	7TAA292910R0001	136	CYLT-29S	7TAA292240R0029	17	E 154p20		60,70
C.66.12GR	7TAA292910R0002	136	CYLT-36B	7TAA292240R0030	17	E 155/p16		40
C.66.12SW	7TAA292910R0003	136	CYLT-36S	7TAA292240R0031	17	E 155/p18		40,41
C.66.16GR	7TAA292910R0004	136	CYLT-48B	7TAA292240R0032	17	E 155/p20		40,41
C.66.16SW	7TAA292910R0005	136	CYLT-48S	7TAA292240R0033	17	E 155/p25		40,41
C.66.20GR	7TAA292910R0006	136	E 127 p7		64,70	E 155/p28		40,41
C.66.20SW	7TAA292910R0007	136	E 150 p7		64,70	E 155p18		60
C.66.25GR	7TAA292910R0008	136	E 150 p8		64	E 155p20		60,70
C.66.25SW	7TAA292910R0009	136	E 150 p9		64,70	E 155p20		60
C.66.30GR	7TAA292910R0010	136	E 150/p7		40,41	E 155p25		60,70
C.66.30SW	7TAA292910R0011	136	E 150/p8		40,41	E 155p28		60,70
C.66.40GR	7TAA292910R0012	136	E 150/p9		40,41	E 156 p34		70
C.66.40SW	7TAA292910R0013	136	E 150p7		60	E 156 p36		70
C.66.45SW	7TAA292910R0014	136	E 150p8		60	E 156/p25HF		40
CUSG-17B	7TAA292490R0000	29	E 150p9		60	E 156/p32		40,41
CUSG-17S	7TCA292000R1523	29	E 151 p11		70	E 156/p36		40,41
CUSG-23B	7TAA292490R0001	29	E 151 p7		70	E 156p32		60,70
CUSG-23S	7TAA292490R0002	29	E 151 p7		70	E 157/p36HF		40,41
CUSG-29B	7TAA292490R0003	29	E 151 p9		70	E 157/p40HF		40,41
CUSG-29S		29	E 151 p9		70	E 157p36HF		60
CUSG-36B	7TAA292490R0004	29	E 152 p11		64,70	E 157p40HF		60
CUSG-36S		29	E 152 p11		64	E 158/p44		40,41
CUSG-48B	7TAA292490R0005	29	E 152 p13		64	E 158/pm1x35		40,41
CUSG-48S		29	E 152 p7		64	E 158p44		60,70
CYLG-125B	7TAA292360R0000	17	E 152 p9		64	E 158pm1X35		60,70
CYLG-125S	7TAA292360R0001	17	E 152/p11		40,41	E 15p36		60
CYLG-23B	7TAA292240R0008	17	E 152/p11		40,41	EK 150/p7		40
CYLG-23S	7TAA292240R0009	17	E 152/p13		40,41	EK 150/p8		40
CYLG-29B	7TAA292240R0010	17	E 152/p7		40,41	EK 150/p9		40
CYLG-29S	7TAA292240R0011	17	E 152/p9		40,41	EK 150p7		60

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
EK 154/p13		40,41	F.PX.06GR	7TAA292910R0066	137	GMN-M20	7TAA292670R0065	100
EK 154/p16		40	F.PX.08GR	7TAA292910R0067	137	GMN-M25	7TAA292670R0066	100
EK 155/p18		40,41	F.PX.10GR	7TAA292910R0068	137	GMN-M32	7TAA292670R0067	100
EK 155/p20		40,41	F.PX.12GR	7TAA292910R0069	137	GMN-M40	7TAA292670R0068	100
EK 155/p25		40	F.PX.16GR	7TAA292910R0070	137	GMN-M50	7TAA292670R0069	100
EK 156/p28		40	F.PX.20GR	7TAA292910R0071	137	GMN-M63	7TAA292670R0070	100
ESDG-56B	7TCA292000R7720	17	F.PX.25GR	7TAA292910R0072	137	HSG-00	7TAA292880R0004	141
ESDG-70B	7TCA292000R7722	17	F.PX.30GR	7TAA292910R0073	137	HSG-00-SB	7TAA292880R0005	141
ESDG-95B	7TCA292000R1850	17	F.PX.40GR	7TAA292910R0074	137	JENQ-M162-10		91
ESDT-07B	7TAA292240R0049	17	FP-38	7TAA292880R0002	109	JENQ-M207-10		91
ESDT-10B	7TAA292240R0050	17	FP-52	7TAA292880R0003	109	JENQ-M253-11		91
ESDT-12B	7TAA292240R0051	17	G.PX.05SW	7TAA292910R0075	138	JENQ-M329-13		91
ESDT-17B	7TAA292240R0052	17	G.PX.08SW	7TAA292910R0076	138	JENQ-M406-13		91
ESDT-23B	7TAA292240R0053	17	G.PX.10SW	7TAA292910R0077	138	JENQ-M506-14		91
ESDT-29B	7TAA292240R0054	17	G.PX.13SW	7TAA292910R0078	138	JFBDG-17C01		28
ESDT-36B	7TAA292240R0055	17	G.PX.16SW	7TAA292910R0079	138	JFBDG-23C01		28
ESDT-48B	7TAA292240R0056	17	G.PX.19SW	7TAA292910R0080	138	JFBDG-29C01		28
EWZ-02	7TAA292880R0000	108	G.PX.25SW	7TAA292910R0081	138	JFBDG-36C01		28
EWZ-03	7TAA292880R0001	108	G.PX.29SW	7TAA292910R0082	138	JFBDG-48C01		28
F.304.10	7TAA292910R0015	141	G.PX.32SW	7TAA292910R0083	138	JFBDT-12C01		28
F.304.12	7TAA292910R0016	141	G.PX.38SW	7TAA292910R0084	138	JKNH-M162		45
F.304.17	7TAA292910R0017	141	G.PX.50SW	7TAA292910R0085	138	JKNH-M202		45
F.304.23	7TAA292910R0018	141	GMM-07	7TAA292670R0028	101	JKNH-M207		45
F.304.29	7TAA292910R0019	141	GMM-09	7TAA292670R0029	101	JKNH-M253		45
F.304.36	7TAA292910R0020	141	GMM-11	7TAA292670R0030	101	JKNH-M257		45
F.304.48	7TAA292910R0021	141	GMM-13	7TAA292670R0032	101	JKNH-M323		45
F.66.04GR	7TAA292910R0024	136	GMM-16	7TAA292670R0034	101	JKNH-M329		45
F.66.04SW	7TAA292910R0025	136	GMM-21	7TAA292670R0035	101	JKNH-M406		45
F.66.06GR	7TAA292910R0026	136	GMM-29	7TAA292670R0037	101	JKNH-M409		45
F.66.06SW	7TAA292910R0027	136	GMM-36	7TAA292670R0038	101	JKNH-M506		45
F.66.08GR	7TAA292910R0028	136	GMM-42	7TAA292670R0039	101	JKNH-M508		45
F.66.08SW	7TAA292910R0029	136	GMM-48	7TAA292670R0040	101	JKNH-M638		45
F.66.10GR	7TAA292910R0030	136	GMM-M12	7TAA292670R0041	101	KNH2-NW10	7TAA292560R0000	44
F.66.10SW	7TAA292910R0031	136	GMM-M16	7TAA292670R0043	101	KNH2-NW12	7TAA292560R0001	44
F.66.12GR	7TAA292910R0032	136	GMM-M20	7TAA292670R0045	101	KNH2-NW17	7TAA292560R0002	44
F.66.12SW	7TAA292910R0033	136	GMM-M25	7TAA292670R0047	101	KNH2-NW23	7TAA292560R0003	44
F.66.16GR	7TAA292910R0034	136	GMM-M32	7TAA292670R0049	101	KNH2-NW29	7TAA292560R0004	44
F.66.16SW	7TAA292910R0035	136	GMM-M40	7TAA292670R0051	101	KNH2-NW36	7TAA292560R0005	44
F.66.20GR	7TAA292910R0036	136	GMM-M50	7TAA292670R0052	101	KNH2-NW48	7TAA292560R0006	44
F.66.20SW	7TAA292910R0037	136	GMM-M63	7TAA292670R0053	101	L.66.04GR	7TAA292910R0175	137
F.66.25GR	7TAA292910R0038	136	GMN-07	7TAA292670R0054	100	L.66.04SW	7TAA292910R0176	137
F.66.25SW	7TAA292910R0039	136	GMN-09	7TAA292670R0055	100	L.66.08GR	7TAA292910R0177	137
F.66.30GR	7TAA292910R0040	136	GMN-11	7TAA292670R0056	100	L.66.08SW	7TAA292910R0178	137
F.66.30SW	7TAA292910R0041	136	GMN-13	7TAA292670R0057	100	L.66.10GR	7TAA292910R0179	137
F.66.40GR	7TAA292910R0042	136	GMN-16	7TAA292670R0058	100	L.66.10SW	7TAA292910R0180	137
F.66.40SW	7TAA292910R0043	136	GMN-21	7TAA292670R0059	100	L.66.16GR	7TAA292910R0181	137
F.66.50GR	7TAA292910R0044	136	GMN-29	7TAA292670R0060	100	L.66.16SW	7TAA292910R0182	137
F.66.50SW	7TAA292910R0045	136	GMN-36	7TAA292670R0061	100	L.66.20GR	7TAA292910R0183	137
F.66.70GR	7TAA292910R0046	136	GMN-48	7TAA292670R0062	100	L.66.20SW	7TAA292910R0184	137
F.66.70SW	7TAA292910R0047	136	GMN-M12	7TAA292670R0063	100	L.66.25GR	7TAA292910R0185	137
F.PX.04GR	7TAA292910R0065	137	GMN-M16	7TAA292670R0064	100	L.66.25SW	7TAA292910R0186	137

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
L.66.30GR	7TAA292910R0187	137	LLPAG-36S	7TAA292030R0026	32	LLPO-48A	7TAA292030R0089	31
L.66.30SW	7TAA292910R0188	137	LLPAG-48A	7TAA292030R0027	32	LLPO-48S	7TAA292030R0090	31
L.66.40GR	7TAA292910R0189	137	LLPAG-48S	7TAA292030R0028	32	M12M16M	7TAA292550R0044	97
L.66.40SW	7TAA292910R0190	137	LLPAG-56A	7TAA292030R0029	32	M16M12M	7TAA292550R0045	97
L.66.50GR	7TAA292910R0191	137	LLPAG-56B		114	M16M12M/6	7TAA292550R0046	97
L.66.50SW	7TAA292910R0192	137	LLPAG-56S	7TAA292030R0030	32	M16M20M	7TAA292550R0047	97
L.PX.04GR	7TAA292910R0193	138	LLPAG-56S		114	M20M12M	7TAA292550R0048	97
L.PX.04SW	7TAA292910R0194	138	LLPAG-70A	7TAA292030R0031	32	M20M12M/6	7TAA292550R0049	97
L.PX.08GR	7TAA292910R0195	138	LLPAG-70B		114	M20M16M	7TAA292550R0050	97
L.PX.08SW	7TAA292910R0196	138	LLPAG-70S	7TAA292030R0032	32	M20M16M/6	7TAA292550R0051	97
L.PX.10GR	7TAA292910R0197	138	LLPAG-70S		114	M20M25M	7TAA292550R0052	97
L.PX.10SW	7TAA292910R0198	138	LLPAG-95A	7TAA292030R0033	32	M25M16M	7TAA292550R0053	97
L.PX.16GR	7TAA292910R0199	138	LLPAG-95B		114	M25M16M/6	7TAA292550R0054	97
L.PX.16SW	7TAA292910R0200	138	LLPAG-95S	7TAA292030R0034	32	M25M20M	7TAA292550R0055	97
L.PX.20GR	7TAA292910R0201	138	LLPAG-95S		114	M25M20M/6	7TAA292550R0056	97
L.PX.20SW	7TAA292910R0202	138	LLPF-07A	7TAA292030R0035	33	M25M32M	7TAA292550R0057	97
L.PX.25GR	7TAA292910R0203	138	LLPF-07S	7TAA292030R0036	33	M32M20M	7TAA292550R0058	97
L.PX.25SW	7TAA292910R0204	138	LLPF-10A	7TAA292030R0037	33	M32M20M/6	7TAA292550R0059	97
L.PX.30GR	7TAA292910R0205	138	LLPF-10S	7TAA292030R0038	33	M32M25M	7TAA292550R0060	97
L.PX.30SW	7TAA292910R0206	138	LLPF-12A	7TAA292030R0039	33	M32M25M/6	7TAA292550R0061	97
L.PX.40GR	7TAA292910R0207	138	LLPF-12S	7TAA292030R0040	33	M32M40M	7TAA292550R0062	97
L.PX.40SW	7TAA292910R0208	138	LLPF-17A	7TAA292030R0041	33	M40M25M	7TAA292550R0063	97
L.PX.50GR	7TAA292910R0209	138	LLPF-17S	7TAA292030R0042	33	M40M25M/6	7TAA292550R0064	97
L.PX.50SW	7TAA292910R0210	138	LLPF-23A	7TAA292030R0043	33	M40M32M	7TAA292550R0065	97
LLPA-07A	7TAA292030R0000	32	LLPF-23S	7TAA292030R0044	33	M40M32M/6	7TAA292550R0066	97
LLPA-07S	7TAA292030R0001	32	LLPF-29A	7TAA292030R0045	33	M40M50M	7TAA292550R0067	97
LLPA-10A	7TAA292030R0002	32	LLPF-29S	7TAA292030R0046	33	M50M32M	7TAA292550R0069	97
LLPA-10S	7TAA292030R0003	32	LLPFG-17A	7TAA292030R0048	33	M50M32M/6	7TAA292550R0070	97
LLPA-12A	7TAA292030R0005	32	LLPFG-17S	7TAA292030R0049	33	M50M40M	7TAA292550R0071	97
LLPA-12S	7TAA292030R0006	32	LLPFG-23A	7TAA292030R0050	33	M50M40M/6	7TAA292550R0072	97
LLPA-17A	7TAA292030R0007	32	LLPFG-23S	7TAA292030R0051	33	M50M63M	7TAA292550R0073	97
LLPA-17S	7TAA292030R0008	32	LLPFG-29A	7TAA292030R0052	33	M63M40M	7TCA292000R2520	97
LLPA-23A	7TAA292030R0009	32	LLPFG-29S	7TAA292030R0053	33	M63M40M/6	7TCA292000R0162	97
LLPA-23S	7TAA292030R0010	32	LLPFG-36A	7TAA292030R0054	33	M63M50M	7TAA292550R0074	97
LLPA-29A	7TAA292030R0011	32	LLPFG-36S	7TAA292030R0055	33	M63M50M/6	7TAA292550R0075	97
LLPA-29S	7TAA292030R0012	32	LLPFG-48A	7TAA292030R0056	33	MAVI-M20/01	7TAA292660R0000	110
LLPA-36A	7TAA292030R0013	32	LLPFG-48S	7TAA292030R0057	33	MAVI-M25/01	7TAA292660R0001	110
LLPA-36S	7TAA292030R0014	32	LLPO-07A	7TAA292030R0075	33	MAVI-M32/01	7TAA292660R0002	110
LLPA-48A	7TAA292030R0015	32	LLPO-07S	7TAA292030R0076	31	MAVI-M40/01	7TAA292660R0003	110
LLPA-48S	7TAA292030R0016	32	LLPO-10A	7TAA292030R0077	31	MAVI-M50/01	7TAA292660R0004	110
LLPAG-125A	7TAA292030R0017	32	LLPO-10S	7TAA292030R0078	31	MAVI-M63/01	7TAA292660R0005	110
LLPAG-125B		114	LLPO-12A	7TAA292030R0079	31	MAVIK-M20/01	7TAA292660R0006	110
LLPAG-125S	7TAA292030R0018	32	LLPO-12S	7TAA292030R0080	31	MAVIK-M25/01	7TAA292660R0007	110
LLPAG-125S		114	LLPO-17A	7TAA292030R0081	31	MAVIK-M32/01	7TAA292660R0008	110
LLPAG-17A	7TAA292030R0019	32	LLPO-17S	7TAA292030R0082	31	MAVIK-M40/01	7TAA292660R0009	110
LLPAG-17S	7TAA292030R0020	32	LLPO-23A	7TAA292030R0083	31	MAVIK-M50/01	7TAA292660R0010	110
LLPAG-23A	7TAA292030R0021	32	LLPO-23S	7TAA292030R0084	31	MAVIK-M63/01	7TAA292660R0011	110
LLPAG-23S	7TAA292030R0022	32	LLPO-29A	7TAA292030R0085	31	MKAH-M120-10	7TAA292400R0062	42
LLPAG-29A	7TAA292030R0023	32	LLPO-29S	7TAA292030R0086	31	MKAH-M160-10	7TAA292400R0063	42
LLPAG-29S	7TAA292030R0024	32	LLPO-36A	7TAA292030R0087	31	MKAH-M162-10	7TAA292400R0064	42
LLPAG-36A	7TAA292030R0025	32	LLPO-36S	7TAA292030R0088	31	MKAH-M202-10	7TAA292400R0065	42

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
MKAH-M207-10	7TAA292400R0066	42	MVAV-M120-5	7TAA292150R0472	61	MVBV-P488	7TAA292150R0519	71
MKAH-M253-11	7TAA292400R0067	42	MVAV-M162-10	7TAA292150R0473	61	MVEMD-M406/01	7TCA292000R2747	142
MKAH-M257-11	7TAA292400R0068	42	MVAV-M162-5	7TAA292150R0474	61	MVEMD-M508/01	7TCA292000R2748	142
MKAH-M323-13	7TAA292400R0069	42	MVAV-M207-10	7TAA292150R0475	61	MVEMD-M6356/01	7TCA292000R2749	142
MKAH-M329-13	7TAA292400R0070	42	MVAV-M207-6	7TAA292150R0476	61	MVEMD-P4856/01	7TCA292000R2750	142
MKAH-M406-13	7TAA292400R0071	42	MVAV-M253-11	7TAA292150R0477	61	MVEMD-RER6	7TCA292000R2751	143
MKAH-M409-13	7TAA292400R0072	42	MVAV-M253-7	7TAA292150R0478	61	MVEMD-RER6/01	7TCA292000R2752	143
MKAH-M506-14	7TAA292400R0073	42	MVAV-M257-11		61	MVEMD-RER8	7TCA292000R2753	143
MKAH-M508-14	7TAA292400R0074	42	MVAV-M323-13		61	MVNV-M120-10	7TAA292150R0520	56
MKAH-M638-14	7TAA292400R0075	42	MVAV-M329-13	7TAA292150R0479	61	MVNV-M120-5	7TAA292150R0521	56
MKBH-M120-10	7TAA292400R0076	42	MVAV-M329-8	7TAA292150R0480	61	MVNV-M160-10	7TAA292150R0522	56
MKBH-M160-10	7TAA292400R0077	42	MVAV-M406-13	7TAA292150R0481	61	MVNV-M160-5	7TAA292150R0523	56
MKBH-M162-10	7TAA292400R0078	42	MVAV-M406-8	7TAA292150R0482	61	MVNV-M162-10	7TAA292150R0524	56
MKBH-M202-10	7TAA292400R0079	42	MVAV-M409-13		61	MVNV-M162-5	7TAA292150R0525	56
MKBH-M207-10	7TAA292400R0080	42	MVAV-M506-14		61	MVNV-M202-10	7TAA292150R0526	56
MKBH-M253-11	7TAA292400R0081	42	MVAV-M508-14	7TAA292150R0483	61	MVNV-M202-6	7TAA292150R0527	56
MKBH-M257-11	7TAA292400R0082	42	MVAV-M508-9	7TAA292150R0484	61	MVNV-M207-10	7TAA292150R0528	56
MKBH-M323-13	7TAA292400R0083	42	MVAV-M638-10	7TAA292150R0485	61	MVNV-M207-6	7TAA292150R0529	56
MKBH-M329-13	7TAA292400R0084	42	MVAV-M638-14	7TAA292150R0486	61	MVNV-M253-11	7TAA292150R0530	56
MKBH-M406-13	7TAA292400R0085	42	MVAV-P090	7TAA292150R0487	71	MVNV-M253-7	7TAA292150R0531	56
MKBH-M409-13	7TAA292400R0086	42	MVAV-P112	7TAA292150R0488	71	MVNV-M257-11	7TAA292150R0532	56
MKBH-M506-14	7TAA292400R0087	42	MVAV-P137	7TAA292150R0489	71	MVNV-M257-7	7TAA292150R0533	56
MKBH-M508-14	7TAA292400R0088	42	MVAV-P167	7TAA292150R0490	71	MVNV-M323-13	7TAA292150R0534	56
MKBH-M638-14	7TAA292400R0089	42	MVAV-P213	7TAA292150R0491	71	MVNV-M323-8	7TAA292150R0535	56
MKNH-M120-10	7TAA292400R0090	39	MVAV-P299	7TAA292150R0492	71	MVNV-M329-13	7TAA292150R0536	56
MKNH-M160-10	7TAA292400R0091	39	MVAV-P366	7TAA292150R0493	71	MVNV-M329-8	7TAA292150R0537	56
MKNH-M162-10	7TAA292400R0092	39	MVAV-P488	7TAA292150R0494	71	MVNV-M406-13	7TAA292150R0538	56
MKNH-M202-10	7TAA292400R0093	39	MVBV-M207-10	7TAA292150R0495	62	MVNV-M406-8	7TAA292150R0539	56
MKNH-M207-10	7TAA292400R0094	39	MVBV-M207-6	7TAA292150R0496	62	MVNV-M409-13	7TAA292150R0540	56
MKNH-M253-11	7TAA292400R0095	39	MVBV-M253-11	7TAA292150R0497	62	MVNV-M409-8	7TAA292150R0541	56
MKNH-M257-11	7TAA292400R0096	39	MVBV-M253-7	7TAA292150R0498	62	MVNV-M506-14	7TAA292150R0542	56
MKNH-M323-13	7TAA292400R0097	39	MVBV-M257-11	7TAA292150R0499	62	MVNV-M506-9	7TAA292150R0543	56
MKNH-M329-13	7TAA292400R0098	39	MVBV-M257-7	7TAA292150R0500	62	MVNV-M508-14	7TAA292150R0544	56
MKNH-M406-13	7TAA292400R0099	39	MVBV-M323-13	7TAA292150R0501	62	MVNV-M508-9	7TAA292150R0545	56
MKNH-M409-13	7TAA292400R0100	39	MVBV-M323-8	7TAA292150R0502	62	MVNV-M638-10	7TAA292150R0546	56
MKNH-M506-14	7TAA292400R0101	39	MVBV-M329-13	7TAA292150R0503	62	MVNV-M638-14	7TAA292150R0547	56
MKNH-M508-14	7TAA292400R0102	39	MVBV-M329-8	7TAA292150R0504	62	MVNV-P090	7TAA292150R0548	69
MKNH-M638-14	7TAA292400R0103	39	MVBV-M406-13	7TAA292150R0505	62	MVNV-P112	7TAA292150R0549	69
MONK-M162	7TCA292000R4711	90	MVBV-M406-8	7TAA292150R0506	62	MVNV-P137	7TAA292150R0550	69
MONK-M207	7TCA292000R4712	90	MVBV-M409-13	7TAA292150R0507	62	MVNV-P167	7TAA292150R0551	69
MONK-M253	7TCA292000R4713	90	MVBV-M409-8	7TAA292150R0508	62	MVNV-P213	7TAA292150R0552	69
MONK-M329	7TCA292000R4714	90	MVBV-M506-14	7TAA292150R0509	62	MVNV-P293	7TAA292150R0553	69
MONK-M406	7TCA292000R4715	90	MVBV-M506-9	7TAA292150R0510	62	MVNV-P299	7TAA292150R0554	69
MONK-M508	7TCA292000R4716	90	MVBV-M508-14	7TAA292150R0511	62	MVNV-P366	7TAA292150R0555	69
MPNK-M160	7TCA292000R4717	90	MVBV-M508-9	7TAA292150R0512	62	MVNV-P488	7TAA292150R0556	69
MPNK-M162	7TCA292000R4718	90	MVBV-M638-10	7TAA292150R0513	62	MVWV-M120-10	7TAA292150R0557	63
MPNK-M207	7TCA292000R4719	90	MVBV-M638-14	7TAA292150R0514	62	MVWV-M120-5	7TAA292150R0558	63
MPNK-M253	7TCA292000R4720	90	MVBV-P167	7TAA292150R0515	71	MVWV-M160-10	7TAA292150R0559	63
MPNK-M329	7TCA292000R4721	90	MVBV-P213	7TAA292150R0516	71	MVWV-M160-5	7TAA292150R0560	63
MREIR-U3529	7TCA292000R2699	140	MVBV-P299	7TAA292150R0517	71	MVWV-M162-10	7TAA292150R0561	63
MVAV-M120-10	7TAA292150R0471	61	MVBV-P366	7TAA292150R0518	71	MVWV-M162-5	7TAA292150R0562	63

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
MVWV-M202-10	7TAA292150R0563	63	NKBH-M323-13	7TAA292400R0125	42	NKNZ-M207/P4-L		41
MVWV-M202-6	7TAA292150R0564	63	NKBH-M329-13	7TAA292400R0126	42	NKNZ-M207/P5	7TAA292400R0167	40
MVWV-M207-10	7TAA292150R0565	63	NKBH-M406-13	7TAA292400R0127	42	NKNZ-M207/P5-L		41
MVWV-M207-6	7TAA292150R0566	63	NKBH-M409-13	7TAA292400R0128	42	NKNZ-M207R/P	7TCA292000R6163	40
MVWV-M253-11	7TAA292150R0567	63	NKBH-M506-14	7TAA292400R0129	42	NKNZ-M207R/P-L	7TCA292000R0187	41
MVWV-M253-7	7TAA292150R0568	63	NKBH-M508-14	7TAA292400R0130	42	NKNZ-M253/P5	7TCA292000R0188	40
MVWV-M329-13	7TAA292150R0569	63	NKBH-M638-14	7TAA292400R0131	42	NKNZ-M253/P6	7TCA292000R0189	40
MVWV-M329-8	7TAA292150R0570	63	NKIS-M162	7TAA292400R0132	44	NKNZ-M253R/P	7TCA292000R6152	40
MVWV-M406-13	7TAA292150R0571	63	NKIS-M207	7TAA292400R0133	44	NKNZ-M253R1/P		40
MVWV-M406-8	7TAA292150R0572	63	NKIS-M253	7TAA292400R0134	44	NKNZ-M257/P4		40
MVWV-M508-14	7TAA292150R0573	63	NKIS-M329	7TAA292400R0135	44	NKNZ-M257/P5	7TAA292400R0172	40
MVWV-M508-9	7TAA292150R0574	63	NKIS-M406	7TAA292400R0136	44	NKNZ-M257/P5-L	7TAA292400R0173	41
MVWV-M638-10	7TAA292150R0575	63	NKIS-M508	7TAA292400R0137	44	NKNZ-M257/P6	7TAA292400R0174	40
MVWV-M638-14	7TAA292150R0576	63	NKIS-M638	7TAA292400R0138	44	NKNZ-M257/P6-L	7TCA292000R0190	41
MVWV-P090	7TAA292150R0577	72	NKNH-M120-10	7TAA292400R0139	39	NKNZ-M257R/P	7TCA292000R0191	40
MVWV-P112	7TAA292150R0578	72	NKNH-M160-10	7TAA292400R0140	39	NKNZ-M257R/P-L		41
MVWV-P137	7TAA292150R0579	72	NKNH-M162-10	7TAA292400R0141	39	NKNZ-M323/P2	7TCA292000R0192	40
MVWV-P167	7TAA292150R0580	72	NKNH-M202-10	7TAA292400R0142	39	NKNZ-M323/P2-L	7TCA292000R0193	41
MVWV-P213	7TAA292150R0581	72	NKNH-M207-10	7TAA292400R0143	39	NKNZ-M323/P4	7TAA292400R0177	40
MVWV-P299	7TAA292150R0582	72	NKNH-M253-11	7TAA292400R0144	39	NKNZ-M323/P4-L	7TCA292000R0194	41
MVWV-P366	7TAA292150R0583	72	NKNH-M257-11	7TAA292400R0145	39	NKNZ-M323/P5	7TAA292400R0178	40
MVWV-P488	7TAA292150R0584	72	NKNH-M323-13	7TAA292400R0146	39	NKNZ-M323/P5-L		41
NFN3-07	7TAA292800R0000	96	NKNH-M329-13	7TAA292400R0147	39	NKNZ-M323R/P	7TAA292400R0179	40
NFN3-09	7TAA292800R0001	96	NKNH-M406-13	7TAA292400R0148	39	NKNZ-M323R/P-L		41
NFN3-11	7TAA292800R0002	96	NKNH-M409-13	7TAA292400R0149	39	NKNZ-M323R1/P	7TAA292400R0180	40
NFN3-16	7TAA292800R0003	96	NKNH-M506-14	7TAA292400R0150	39	NKNZ-M323R1/P-L		41
NFN3-21	7TAA292800R0004	96	NKNH-M508-14	7TAA292400R0151	39	NKNZ-M329/P2	7TCA292000R0195	40
NFN3-29	7TAA292800R0005	96	NKNH-M638-14	7TAA292400R0152	39	NKNZ-M329/P2-L		41
NFN3-36	7TAA292800R0006	96	NKNZ-M120/P1	7TAA292400R0153	40	NKNZ-M329/P3	7TCA292000R6029	40
NFN3-48	7TAA292800R0007	96	NKNZ-M120/P2	7TAA292400R0154	40	NKNZ-M329/P3-L		41
NKAH-M120-10	7TAA292400R0104	42	NKNZ-M120/P3	7TAA292400R0155	40	NKNZ-M329/P4	7TCA292000R0196	40
NKAH-M160-10	7TAA292400R0105	42	NKNZ-M120R/P		40	NKNZ-M329R/P		40
NKAH-M162-10	7TAA292400R0106	42	NKNZ-M160/P1	7TAA292400R0156	40	NKNZ-M329R/P-L		41
NKAH-M202-10	7TAA292400R0107	42	NKNZ-M160/P1-L		41	NKNZ-M406/P1	7TCA292000R5867	40
NKAH-M207-10	7TAA292400R0108	42	NKNZ-M160/P2	7TAA292400R0157	40	NKNZ-M406/P2	7TCA292000R0197	40
NKAH-M253-11	7TAA292400R0109	42	NKNZ-M160/P2-L		41	NKNZ-M406R/P	7TCA292000R6071	40
NKAH-M257-11	7TAA292400R0110	42	NKNZ-M160/P3	7TAA292400R0158	40	NKNZ-M409/P1		40
NKAH-M323-13	7TAA292400R0111	42	NKNZ-M160/P3-L	7TCA292000R5581	41	NKNZ-M409/P2		40
NKAH-M329-13	7TAA292400R0112	42	NKNZ-M160R/P	7TCA292000R0183	40	NKNZ-M409/P3	7TCA292000R6028	40
NKAH-M406-13	7TAA292400R0113	42	NKNZ-M160R/P-L		41	NKNZ-M409/P3-L		41
NKAH-M409-13	7TAA292400R0114	42	NKNZ-M202/P1	7TAA292400R0161	40	NKNZ-M409/P4	7TAA292400R0187	40
NKAH-M506-14	7TAA292400R0115	42	NKNZ-M202/P1-L	7TCA292000R0184	41	NKNZ-M409/P4-L	7TCA292000R0198	41
NKAH-M508-14	7TAA292400R0116	42	NKNZ-M202/P3	7TAA292400R0162	40	NKNZ-M409/P5	7TAA292400R0188	40
NKAH-M638-14	7TAA292400R0117	42	NKNZ-M202/P3-L		41	NKNZ-M409/P5-L		41
NKBH-M120-10	7TAA292400R0118	42	NKNZ-M202/P4	7TAA292400R0163	40	NKNZ-M409R/P	7TAA292400R0189	40
NKBH-M160-10	7TAA292400R0119	42	NKNZ-M202/P4-L		41	NKNZ-M409R/P-L	7TCA292000R0199	41
NKBH-M162-10	7TAA292400R0120	42	NKNZ-M202R/P	7TCA292000R0185	40	NKNZ-M506/P1	7TAA292400R0192	40
NKBH-M202-10	7TAA292400R0121	42	NKNZ-M202R/P-L	???	41	NKNZ-M506/P1-L		41
NKBH-M207-10	7TAA292400R0122	42	NKNZ-M207/P3	7TAA292400R0165	40	NKNZ-M506/P3	7TAA292400R0193	40
NKBH-M253-11	7TAA292400R0123	42	NKNZ-M207/P3-L	7TCA292000R0186	41	NKNZ-M506/P3-L		41
NKBH-M257-11	7TAA292400R0124	42	NKNZ-M207/P4	7TAA292400R0166	40	NKNZ-M506R/P	7TCA292000R0200	40

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
NKNZ-M506R/P-L	7TCA292000R0201	41	NSNV-M406-7	7TCA292000R5961	78	NVBV-M406-13	7TAA292150R0634	62
NKNZ-M508/P2	7TAA292400R0196	40	NSNV-M409-13	7TCA292000R5962	78	NVBV-M406-8	7TAA292150R0635	62
NKNZ-M508/P2-L		41	NSNV-M508-14	7TCA292000R5963	78	NVBV-M409-13	7TAA292150R0636	62
NKNZ-M508/P3	7TAA292400R0197	40	NSNV-M638-14	7TCA292000R5964	78	NVBV-M409-8	7TAA292150R0637	62
NKNZ-M508/P3-L		41	NSNV-N022/01		78	NVBV-M506-14	7TAA292150R0638	62
NKNZ-M508R/P	7TCA292000R0202	40	NSNV-N027/01		78	NVBV-M506-9	7TAA292150R0639	62
NKNZ-M508R/P-L		41	NSNV-N043/01		78	NVBV-M508-14	7TAA292150R0640	62
NKNZ-M638/P1	7TAA292400R0200	40	NSNV-N069/01		78	NVBV-M508-9	7TAA292150R0641	62
NKNZ-M638/P1-L		41	NSNV-N076/01		78	NVBV-M638-10	7TAA292150R0642	62
NKNZ-M638/P2	7TAA292400R0201	40	NSNV-N088/01		78	NVBV-M638-14	7TAA292150R0643	62
NKNZ-M638/P2-L		41	NSNV-N098/01		78	NVBV-P167	7TAA292150R0644	71
NKNZ-M638R/P		40	NSWIV-N022/01		79	NVBV-P213	7TAA292150R0645	71
NKNZ-M638R/P-L		41	NSWV-N022/01		77	NVBV-P299	7TAA292150R0646	71
NSBIV-N027/01		79	NVAV-M120-10	7TAA292150R0596	61	NVBV-P366	7TAA292150R0647	71
NSBIV-N043/01		79	NVAV-M120-5	7TAA292150R0597	61	NVBV-P488	7TAA292150R0648	71
NSBIV-N069/01		79	NVAV-M162-10	7TAA292150R0598	61	NVIR-M120	7TAA292610R0133	81
NSBIV-N076/01		79	NVAV-M162-5	7TAA292150R0599	61	NVIR-M160	7TCA292000R0215	81
NSBIV-N088/01		79	NVAV-M207-10	7TAA292150R0600	61	NVIR-M162	7TAA292610R0134	81
NSBIV-N098/01		79	NVAV-M207-6	7TAA292150R0601	61	NVIR-M207	7TAA292610R0135	81
NSBV-M207-10	7TAA292150R0585	77	NVAV-M253-11	7TAA292150R0602	61	NVIR-M253	7TAA292610R0136	81
NSBV-M253-11	7TAA292150R0586	77	NVAV-M253-7	7TAA292150R0603	61	NVIR-M329	7TAA292610R0137	81
NSBV-M329-13	7TAA292150R0587	77	NVAV-M257-11	7TAA292150R0604	61	NVIR-M406	7TAA292610R0138	81
NSBV-M406-13	7TAA292150R0588	77	NVAV-M323-13	7TAA292150R0605	61	NVIR-M508	7TAA292610R0139	81
NSBV-M409-13	7TCA292000R2945	77	NVAV-M329-13	7TAA292150R0606	61	NVIR-M638	7TAA292610R0140	81
NSBV-M508-14	7TAA292150R0589	77	NVAV-M329-8	7TAA292150R0607	61	NVIZR-P07M	7TAA292610R0141	82
NSBV-M638-14	7TAA292150R0590	77	NVAV-M406-13	7TAA292150R0608	61	NVIZR-P090	7TAA292610R0142	82
NSBV-N027/01		77	NVAV-M406-8	7TAA292150R0609	61	NVIZR-P110	7TAA292610R0143	82
NSBV-N043/01		77	NVAV-M409-13	7TAA292150R0610	61	NVIZR-P112	7TAA292610R0144	82
NSBV-N069/01		77	NVAV-M506-14	7TAA292150R0611	61	NVIZR-P137	7TCA292000R0216	82
NSBV-N076/01		77	NVAV-M508-14	7TAA292150R0612	61	NVIZR-P167	7TAA292610R0145	82
NSBV-N088/01		77	NVAV-M508-9	7TAA292150R0613	61	NVIZR-P213	7TAA292610R0146	82
NSBV-N098/01		77	NVAV-M638-10	7TAA292150R0614	61	NVIZR-P299	7TAA292610R0147	82
NSBV-P167-6.5	7TAA292150R0591	77	NVAV-M638-14	7TAA292150R0615	61	NVIZR-P366	7TAA292610R0148	82
NSBV-P213-7	7TAA292150R0592	77	NVAV-P090	7TAA292150R0616	71	NVIZR-P488	7TAA292610R0149	82
NSBV-P299-8	7TAA292150R0593	77	NVAV-P112	7TAA292150R0617	71	NVN3-07	7TAA292800R0008	96
NSBV-P366-9	7TAA292150R0594	77	NVAV-P137	7TAA292150R0618	71	NVN3-09	7TAA292800R0009	96
NSBV-P488-10	7TAA292150R0595	77	NVAV-P167	7TAA292150R0619	71	NVN3-11	7TAA292800R0010	96
NSNIV-N022/01		79	NVAV-P213	7TAA292150R0620	71	NVN3-16	7TAA292800R0011	96
NSNIV-N027/01		79	NVAV-P299	7TAA292150R0621	71	NVN3-21	7TAA292800R0012	96
NSNIV-N043/01		79	NVAV-P366	7TAA292150R0622	71	NVN3-29	7TAA292800R0013	96
NSNIV-N069/01		79	NVAV-P488	7TAA292150R0623	71	NVN3-36	7TAA292800R0014	96
NSNIV-N076/01		79	NVBV-M207-10	7TAA292150R0624	62	NVN3-48	7TAA292800R0015	96
NSNIV-N088/01		79	NVBV-M207-6	7TAA292150R0625	62	NVNV-M120-10	7TAA292150R0649	56
NSNIV-N098/01		79	NVBV-M253-11	7TAA292150R0626	62	NVNV-M120-5	7TAA292150R0650	56
NSNV-M120-10	7TCA292000R5954	78	NVBV-M253-7	7TAA292150R0627	62	NVNV-M160-10	7TAA292150R0651	56
NSNV-M162-10	7TCA292000R5955	78	NVBV-M257-11	7TAA292150R0628	62	NVNV-M160-5	7TAA292150R0652	56
NSNV-M207-10	7TCA292000R5956	78	NVBV-M257-7	7TAA292150R0629	62	NVNV-M162-10	7TAA292150R0653	56
NSNV-M253-11	7TCA292000R5957	78	NVBV-M323-13	7TAA292150R0630	62	NVNV-M162-5	7TAA292150R0654	56
NSNV-M329-13	7TCA292000R5958	78	NVBV-M323-8	7TAA292150R0631	62	NVNV-M202-10	7TAA292150R0655	56
NSNV-M329-7	7TCA292000R5959	78	NVBV-M329-13	7TAA292150R0632	62	NVNV-M202-6	7TAA292150R0656	56
NSNV-M406-13	7TCA292000R5960	78	NVBV-M329-8	7TAA292150R0633	62	NVNV-M207-10	7TAA292150R0657	56

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
NVNV-M207-6	7TAA292150R0658	56	NVNZ-M160S/P1-L	7TAA292150R0697	60	NVNZ-M323S/P4-L	7TAA292150R0746	60
NVNV-M253-11	7TAA292150R0659	56	NVNZ-M160S/P2	7TAA292150R0698	58	NVNZ-M323S/P5	7TAA292150R0747	58
NVNV-M253-7	7TAA292150R0660	56	NVNZ-M160S/P2-L	7TAA292150R0699	60	NVNZ-M323S/P5-L	7TAA292150R0748	60
NVNV-M257-11	7TAA292150R0661	56	NVNZ-M160S/P3	7TAA292150R0700	58	NVNZ-M329R/P	7TCA292000R0278	58
NVNV-M257-7	7TAA292150R0662	56	NVNZ-M160S/P3-L	7TAA292150R0701	60	NVNZ-M329R/P-L	7TAA292150R0749	60
NVNV-M323-13	7TAA292150R0663	56	NVNZ-M202R/P	7TAA292150R0704	58	NVNZ-M329S/B2		59
NVNV-M323-8	7TAA292150R0664	56	NVNZ-M202R/P-L	7TAA292150R0705	60	NVNZ-M329S/B3		59
NVNV-M329-13	7TAA292150R0665	56	NVNZ-M202S/B1		59	NVNZ-M329S/B4		59
NVNV-M329-8	7TAA292150R0666	56	NVNZ-M202S/B3		59	NVNZ-M329S/P2	7TAA292150R0752	58
NVNV-M406-13	7TAA292150R0667	56	NVNZ-M202S/B4		59	NVNZ-M329S/P2-L	7TAA292150R0753	60
NVNV-M406-8	7TAA292150R0668	56	NVNZ-M202S/P1	7TAA292150R0708	58	NVNZ-M329S/P3	7TAA292150R0754	58
NVNV-M409-13	7TAA292150R0669	56	NVNZ-M202S/P1-L	7TAA292150R0709	60	NVNZ-M329S/P3-L	7TAA292150R0755	60
NVNV-M409-8	7TAA292150R0670	56	NVNZ-M202S/P3	7TAA292150R0710	58	NVNZ-M329S/P4	7TAA292150R0756	58
NVNV-M506-14	7TAA292150R0671	56	NVNZ-M202S/P3-L	7TAA292150R0711	60	NVNZ-M406R/P	7TAA292150R0757	58
NVNV-M506-9	7TAA292150R0672	56	NVNZ-M202S/P4	7TAA292150R0712	58	NVNZ-M406S/B1		59
NVNV-M508-14	7TAA292150R0673	56	NVNZ-M202S/P4-L	7TAA292150R0713	60	NVNZ-M406S/B2		59
NVNV-M508-9	7TAA292150R0674	56	NVNZ-M207R/P	7TAA292150R0714	58	NVNZ-M406S/P1	7TAA292150R0760	58
NVNV-M638-10	7TAA292150R0675	56	NVNZ-M207R/P-L	7TAA292150R0715	60	NVNZ-M406S/P2	7TAA292150R0761	58
NVNV-M638-14	7TAA292150R0676	56	NVNZ-M207S/B1		59	NVNZ-M409R/P	7TAA292150R0762	58
NVNV-N022		57	NVNZ-M207S/B2		59	NVNZ-M409R/P-L	7TAA292150R0763	60
NVNV-N027		57	NVNZ-M207S/B3		59	NVNZ-M409S/B1		59
NVNV-N043		57	NVNZ-M207S/B4		59	NVNZ-M409S/B2		59
NVNV-N069		57	NVNZ-M207S/B5		59	NVNZ-M409S/B3		59
NVNV-N076		57	NVNZ-M207S/P3	7TAA292150R0718	58	NVNZ-M409S/B4		59
NVNV-N088		57	NVNZ-M207S/P3-L	7TAA292150R0719	60	NVNZ-M409S/B5		59
NVNV-N098		57	NVNZ-M207S/P4	7TAA292150R0720	58	NVNZ-M409S/P1	7TAA292150R0766	58
NVNV-P090	7TAA292150R0677	69	NVNZ-M207S/P4-L	7TAA292150R0721	60	NVNZ-M409S/P2	7TAA292150R0767	58
NVNV-P112	7TAA292150R0678	69	NVNZ-M207S/P5	7TAA292150R0722	58	NVNZ-M409S/P3	7TCA292000R0288	58
NVNV-P137	7TAA292150R0679	69	NVNZ-M207S/P5-L	7TAA292150R0723	60	NVNZ-M409S/P3-L	7TAA292150R0768	60
NVNV-P167	7TAA292150R0680	69	NVNZ-M253R/P	7TAA292150R0724	58	NVNZ-M409S/P4	7TAA292150R0769	58
NVNV-P213	7TAA292150R0681	69	NVNZ-M253S/B5		59	NVNZ-M409S/P4-L	7TAA292150R0770	60
NVNV-P293	7TAA292150R0682	69	NVNZ-M253S/B6		59	NVNZ-M409S/P5	7TAA292150R0771	58
NVNV-P299	7TAA292150R0683	69	NVNZ-M253S/P5	7TAA292150R0728	58	NVNZ-M409S/P5-L	7TAA292150R0772	60
NVNV-P366	7TAA292150R0684	69	NVNZ-M253S/P6	7TAA292150R0729	58	NVNZ-M506R/P	7TAA292150R0773	58
NVNV-P488	7TAA292150R0685	69	NVNZ-M257R/P	7TAA292150R0730	58	NVNZ-M506R/P-L	7TAA292150R0774	60
NVNZ-M120R/P	7TAA292150R0686	58	NVNZ-M257R/P-L	7TAA292150R0731	60	NVNZ-M506S/B1		59
NVNZ-M120R/P-L		60	NVNZ-M257S/B4		59	NVNZ-M506S/B3		59
NVNZ-M120S/B1		59	NVNZ-M257S/B5		59	NVNZ-M506S/P1	7TAA292150R0777	58
NVNZ-M120S/B2		59	NVNZ-M257S/B6		59	NVNZ-M506S/P1-L	7TAA292150R0778	60
NVNZ-M120S/B3		59	NVNZ-M257S/P4	7TAA292150R0734	58	NVNZ-M506S/P3	7TAA292150R0779	58
NVNZ-M120S/P1	7TAA292150R0689	58	NVNZ-M257S/P5	7TAA292150R0735	58	NVNZ-M506S/P3-L	7TAA292150R0780	60
NVNZ-M120S/P1-L	7TCA292000R0254	60	NVNZ-M257S/P5-L	7TAA292150R0736	60	NVNZ-M508R/P	7TAA292150R0781	58
NVNZ-M120S/P2	7TAA292150R0690	58	NVNZ-M257S/P6	7TAA292150R0737	58	NVNZ-M508R/P-L	7TAA292150R0782	60
NVNZ-M120S/P3	7TAA292150R0691	58	NVNZ-M257S/P6-L	7TAA292150R0738	60	NVNZ-M508S/B2		59
NVNZ-M120S/P3-L	7TCA292000R0255	60	NVNZ-M323R/P	7TAA292150R0739	58	NVNZ-M508S/B3		59
NVNZ-M160R/P	7TAA292150R0692	58	NVNZ-M323R/P-L	7TAA292150R0740	60	NVNZ-M508S/P2	7TAA292150R0785	58
NVNZ-M160R/P-L	7TAA292150R0693	60	NVNZ-M323R1/P	7TAA292150R0741	58	NVNZ-M508S/P2-L	7TAA292150R0786	60
NVNZ-M160S/B1		59	NVNZ-M323R1/P-L	7TAA292150R0742	60	NVNZ-M508S/P3	7TAA292150R0787	58
NVNZ-M160S/B2		59	NVNZ-M323S/B4		59	NVNZ-M508S/P3-L	7TAA292150R0788	60
NVNZ-M160S/B3		59	NVNZ-M323S/B5		59	NVNZ-M638R/P	7TAA292150R0789	58
NVNZ-M160S/P1	7TAA292150R0696	58	NVNZ-M323S/P4	7TAA292150R0745	58	NVNZ-M638R/P-L	7TAA292150R0790	60

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
NVNZ-M638S/B1		59	NVWV-M329-13	7TAA292150R0876	63	PCLG-125S	7TAA292360R0012	18,114
NVNZ-M638S/B2		59	NVWV-M329-8	7TAA292150R0877	63	PCLG-17B	7TAA292240R0059	18
NVNZ-M638S/P1	7TAA292150R0793	58	NVWV-M406-13	7TAA292150R0878	63	PCLG-17S	7TAA292240R0060	18
NVNZ-M638S/P1-L	7TAA292150R0794	60	NVWV-M406-8	7TAA292150R0879	63	PCLG-23B	7TAA292240R0062	18
NVNZ-M638S/P2	7TAA292150R0795	58	NVWV-M508-14	7TAA292150R0880	63	PCLG-23S	7TAA292240R0063	18
NVNZ-M638S/P2-L	7TAA292150R0796	60	NVWV-M508-9	7TAA292150R0881	63	PCLG-29B	7TAA292240R0065	18
NVNZ-P090R/P	7TAA292150R0803	70	NVWV-M638-10	7TAA292150R0882	63	PCLG-29S	7TAA292240R0066	18
NVNZ-P090S/P1	7TCA292000R0296	70	NVWV-M638-14	7TAA292150R0883	63	PCLG-36B	7TAA292240R0069	18
NVNZ-P090S/P3	7TAA292150R0806	70	NVWV-P090	7TAA292150R0884	72	PCLG-36S	7TAA292240R0071	18
NVNZ-P110R/P	7TAA292150R0809	70	NVWV-P112	7TAA292150R0885	72	PCLG-48B	7TAA292240R0073	18
NVNZ-P110S/P1	7TAA292150R0812	70	NVWV-P137	7TAA292150R0886	72	PCLG-48S	7TAA292240R0075	18
NVNZ-P110S/P3	7TAA292150R0813	70	NVWV-P167	7TAA292150R0887	72	PCLG-56B	7TAA292360R0013	18,114
NVNZ-P112R/P	7TAA292150R0816	70	NVWV-P213	7TAA292150R0888	72	PCLG-56S	7TAA292360R0015	18,114
NVNZ-P112S/P1	7TAA292150R0819	70	NVWV-P299	7TAA292150R0889	72	PCLG-70B	7TAA292360R0017	18,114
NVNZ-P112S/P3	7TAA292150R0820	70	NVWV-P366	7TAA292150R0890	72	PCLG-70S	7TAA292360R0019	18,114
NVNZ-P112S/P4	7TAA292150R0821	70	NVWV-P488	7TAA292150R0891	72	PCLG-95B	7TAA292360R0021	18,114
NVNZ-P160R/P		70	NVWZ-M160R/P	7TAA292150R0892	64	PCLG-95S	7TAA292360R0023	18,114
NVNZ-P160S/P1	7TAA292150R0822	70	NVWZ-M160S/P1	7TAA292150R0893	64	PCLT-07B	7TAA292240R0076	18
NVNZ-P167R/P	7TAA292150R0825	70	NVWZ-M160S/P2	7TAA292150R0894	64	PCLT-07S	7TAA292240R0077	18
NVNZ-P167S/P3	7TAA292150R0828	70	NVWZ-M160S/P3	7TAA292150R0895	64	PCLT-10B	7TAA292240R0078	18
NVNZ-P167S/P4	7TAA292150R0829	70	NVWZ-M202R/P	7TAA292150R0896	64	PCLT-10S	7TAA292240R0079	18
NVNZ-P167S/P5	7TAA292150R0830	70	NVWZ-M202S/P1	7TAA292150R0897	64	PCLT-12B	7TAA292240R0080	18
NVNZ-P167S/P6	7TAA292150R0831	70	NVWZ-M202S/P3	7TAA292150R0898	64	PCLT-12S	7TAA292240R0081	18
NVNZ-P213R/P	7TAA292150R0834	70	NVWZ-M202S/P4	7TAA292150R0899	64	PCLT-17B	7TAA292240R0083	18
NVNZ-P213R1/P	7TAA292150R0836	70	NVWZ-M207R/P	7TAA292150R0900	64	PCLT-17S	7TAA292240R0085	18
NVNZ-P213S/P1	7TCA292000R0301	70	NVWZ-M207S/P1	7TCA292000R3285	64	PCLT-23B	7TAA292240R0086	18
NVNZ-P213S/P4	7TAA292150R0839	70	NVWZ-M207S/P3	7TAA292150R0901	64	PCLT-23S	7TAA292240R0088	18
NVNZ-P213S/P5	7TAA292150R0840	70	NVWZ-M207S/P4	7TAA292150R0902	64	PCLT-29B	7TAA292240R0089	18
NVNZ-P299R/P	7TAA292150R0843	70	NVWZ-M207S/P5	7TAA292150R0903	64	PCLT-29S	7TAA292240R0091	18
NVNZ-P299S/P3	7TAA292150R0846	70	NVWZ-M257R/P	7TAA292150R0904	64	PCLT-36B	7TAA292240R0092	18
NVNZ-P299S/P4	7TAA292150R0847	70	NVWZ-M257S/P5	7TAA292150R0905	64	PCLT-36S	7TCA292000R3533	18
NVNZ-P299S/P5	7TAA292150R0848	70	NVWZ-M257S/P6	7TAA292150R0906	64	PCLT-48B	7TCA292000R3535	18
NVNZ-P366R/P	7TAA292150R0851	70	NVWZ-M323S/P4	7TCA292000R3286	64	PCLT-48S	7TCA292000R3536	18
NVNZ-P366S/P1	7TAA292150R0854	70	OVN2-07	7TAA292700R0042	95	PCSG-17B	7TAA292240R0093	19
NVNZ-P366S/P2	7TAA292150R0855	70	OVN2-10	7TAA292700R0043	95	PCSG-17S	7TAA292240R0094	19
NVNZ-P366S/P3	7TAA292150R0856	70	OVN2-12	7TAA292700R0044	95	PCSG-23B	7TAA292240R0096	19
NVNZ-P488R/P	7TAA292150R0859	70	OVN2-17	7TAA292700R0045	95	PCSG-23S	7TAA292240R0098	19
NVNZ-P488S/P1	7TAA292150R0862	70	OVN2-23	7TAA292700R0046	95	PCSG-29B	7TAA292240R0099	19
NVNZ-P488S/P2	7TAA292150R0863	70	OVN2-29	7TAA292700R0047	95	PCSG-29S	7TAA292240R0100	19
NVWV-M120-10	7TAA292150R0864	63	OVN2-36	7TAA292700R0048	95	PCSG-36B	7TAA292240R0101	19
NVWV-M120-5	7TAA292150R0865	63	OVN2-48	7TAA292700R0049	95	PCSG-36S	7TAA292240R0102	19
NVWV-M160-10	7TAA292150R0866	63	PACOF-07B	7TAA292730R0000	31,122	PCSG-48B	7TAA292240R0103	19
NVWV-M160-5	7TAA292150R0867	63	PACOF-10B	7TAA292730R0001	31,122	PCSG-48S	7TAA292240R0104	19
NVWV-M162-10	7TAA292150R0868	63	PACOF-12B	7TAA292730R0002	31,122	PCSG-56B	7TAA292360R0025	19,114
NVWV-M162-5	7TAA292150R0869	63	PACOF-17B	7TAA292730R0004	31,122	PCSG-56S	7TAA292360R0026	19,114
NVWV-M202-10	7TAA292150R0870	63	PACOF-23B	7TAA292730R0006	31,122	PCSG-70B	7TAA292360R0027	19,114
NVWV-M202-6	7TAA292150R0871	63	PACOF-29B	7TAA292730R0008	31,122	PCSG-70S	7TCA292000R0303	19,114
NVWV-M207-10	7TAA292150R0872	63	PACOF-36B	7TAA292730R0009	31,122	PCSG-95B	7TAA292360R0029	19,114
NVWV-M207-6	7TAA292150R0873	63	PACOF-48B	7TAA292730R0010	31,122	PCSG-95S	7TAA292360R0030	19,114
NVWV-M253-11	7TAA292150R0874	63	PACOF-70B	7TAA292730R0011	31,122	PCSLG-17B	7TAA292240R0105	19
NVWV-M253-7	7TAA292150R0875	63	PCLG-125B	7TAA292360R0011	18,114	PCSLG-17S	7TCA292000R5792	19

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
PCSLG-23B	7TAA292240R0106	19	PIHG-56S	7TAA292360R0034	20,114	PLUG-48B	7TAA292430R0014	15
PCSLG-23S	7TCA292000R5793	19	PIHG-70B	7TAA292360R0036	20,114	PLUT-10B	7TAA292430R0015	15
PCSLG-29B	7TAA292240R0107	19	PIHG-70S	7TAA292360R0038	20,114	PLUT-12B	7TAA292430R0016	15
PCSLG-29S	7TCA292000R5794	19	PIHG-95B	7TAA292360R0040	20,114	PMA-Tie-tool	7TCA292000R3742	141
PCSLG-36B	7TAA292240R0108	19	PIHG-95S	7TAA292360R0042	20,114	PMACUT-38	7TAA292880R0006	109
PCSLG-36S	7TCA292000R5795	19	PISG-17B	7TAA292240R0139	20	PMACUT-52	7TAA292880R0007	109
PCSLG-48B	7TAA292240R0109	19	PISG-17S	7TAA292240R0140	20	PMACUT-NW125	7TAA292880R0011	109
PCSLG-48S	7TCA292000R5796	19	PISG-23B	7TAA292240R0142	20	PMACUT-NW56	7TAA292880R0008	109
PCSLT-07B	7TAA292240R0110	19	PISG-23S	7TAA292240R0143	20	PMACUT-NW70	7TAA292880R0009	109
PCSLT-07S	7TCA292000R5797	19	PISG-29B	7TAA292240R0144	20	PMACUT-NW95	7TAA292880R0010	109
PCSLT-10B	7TAA292240R0111	19	PISG-29S	7TAA292240R0145	20	POHG-17B	7TAA292430R0017	16
PCSLT-10S	7TCA292000R5798	19	PISG-36B	7TAA292240R0147	20	POHG-17S	7TAA292430R0018	16
PCSLT-12B	7TAA292240R0112	19	PISG-36S	7TAA292240R0149	20	POHG-23B	7TAA292430R0019	16
PCSLT-12S	7TCA292000R5799	19	PISG-48B	7TAA292240R0151	20	POHG-23S	7TAA292430R0020	16
PCSLT-17B	7TAA292240R0113	19	PISG-48S	7TAA292240R0152	20	POHG-29B	7TAA292430R0021	16
PCSLT-17S	7TCA292000R5800	19	PIST-07B	7TAA292240R0153	20	POHG-29S	7TAA292430R0022	16
PCST-07B	7TAA292240R0115	19	PIST-07S	7TAA292240R0154	20	POHG-36B	7TAA292430R0023	16
PCST-07S	7TAA292240R0116	19	PIST-10B	7TAA292240R0155	20	POHG-36S	7TAA292430R0024	16
PCST-10B	7TAA292240R0117	19	PIST-10S	7TAA292240R0156	20	POHG-48B	7TAA292430R0025	16
PCST-10S	7TAA292240R0118	19	PIST-12B	7TAA292240R0157	20	POHG-48S	7TAA292430R0026	16
PCST-12B	7TAA292240R0119	19	PIST-12S	7TAA292240R0158	20	POHT-10B	7TAA292430R0027	16
PCST-12S	7TAA292240R0120	19	PIST-17B	7TAA292240R0160	20	POHT-10S	7TAA292430R0028	16
PCST-17B	7TAA292240R0121	19	PIST-17S	7TAA292240R0161	20	POHT-12B	7TAA292430R0029	16
PCST-17S	7TAA292240R0122	19	PIST-23B	7TAA292240R0163	20	POHT-12S	7TAA292430R0030	16
PELT-10S	7TAA292240R0123	20	PIST-23S	7TAA292240R0164	20	POSG-29B	7TCA292000R5823	21
PELT-10SL	7TAA292240R0124	20	PIST-29B	7TAA292240R0165	20	POSG-36B	7TCA292000R3749	21
PELT-12S	7TAA292240R0125	20	PIST-29S	7TAA292240R0166	20	POSG-48B	7TCA292000R3750	21
PELT-12SL	7TAA292240R0126	20	PIST-36B	7TAA292240R0167	20	POSG-70B	7TAA292900R0008	21
PELT-17S	7TAA292240R0127	20	PIST-36S	7TAA292240R0168	20	POSG-95B	7TCA292000R0304	21
PELT-17SL	7TAA292240R0128	20	PIST-48B	7TAA292240R0169	20	POST-10B	7TAA292240R0171	21
PELT-23S	7TAA292240R0131	20	PIST-48S	7TAA292240R0170	20	POST-12B	7TAA292240R0172	21
PELT-23SL	7TAA292240R0132	20	PLRG-17B	7TCA292000R6231	24	POST-17B	7TAA292240R0173	21
PELT-29S	7TAA292240R0133	20	PLRG-17S	7TCA292000R6259	24	POST-23B	7TAA292240R0174	21
PELT-29SL	7TAA292240R0134	20	PLRG-23B	7TCA292000R6232	24	POST-29B	7TAA292240R0175	21
PELT-36S	7TAA292240R0135	20	PLRG-23S	7TCA292000R6260	24	POST-36B	7TAA292240R0176	21
PELT-36SL	7TAA292240R0136	20	PLRG-29B	7TCA292000R6233	24	POST-48B	7TAA292240R0177	21
PELT-48S	7TAA292240R0137	20	PLRG-29S	7TCA292000R6261	24	PPCOF-07B	7TAA292730R0012	32,122
PELT-48SL	7TAA292240R0138	20	PLRG-36B	7TCA292000R6234	24	PPCOF-10B	7TAA292730R0013	32,122
PHTG-17B	7TAA292430R0000	15	PLRG-36S	7TCA292000R6262	24	PPCOF-12B	7TAA292730R0014	32,122
PHTG-23B	7TAA292430R0001	15	PLRG-48B	7TCA292000R6235	24	PPCOF-17B	7TAA292730R0016	32,122
PHTG-29B	7TAA292430R0002	15	PLRG-48S	7TCA292000R6263	24	PPCOF-23B	7TAA292730R0018	32,122
PHTG-36B	7TAA292430R0003	15	PLRT-07B	7TCA292000R6236	24	PPCOF-29B	7TAA292730R0020	32,122
PHTG-48B	7TAA292430R0004	15	PLRT-07S	7TCA292000R6264	24	PPCOF-36B	7TAA292730R0021	32,122
PHTT-07B	7TAA292430R0005	15	PLRT-10B	7TCA292000R6237	24	PPCOF-48B	7TAA292730R0022	32,122
PHTT-10B	7TAA292430R0006	15	PLRT-10S	7TCA292000R6265	24	PPCOF-70B	7TAA292730R0023	32,122
PHTT-12B	7TAA292430R0007	15	PLRT-12B	7TCA292000R6238	24	PSXG-23B	7TAA292430R0032	16
PHTT-17B	7TAA292430R0008	15	PLRT-12S	7TCA292000R6266	24	PSXG-29B	7TAA292430R0033	16
PHTT-23B	7TAA292430R0009	15	PLUG-17B	7TAA292430R0010	15	PSXG-36B	7TAA292430R0034	16
PIHG-125B	7TAA292360R0031	20,114	PLUG-23B	7TAA292430R0011	15	PSXG-48B	7TAA292430R0035	16
PIHG-125S	7TAA292360R0032	20,114	PLUG-29B	7TAA292430R0012	15	PSXT-10B	7TAA292430R0036	16
PIHG-56B	7TAA292360R0033	20,114	PLUG-36B	7TAA292430R0013	15	PSXT-12B	7TAA292430R0037	16

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
PSXT-17B	7TCA292000R0305	16	SFH-36-0	7TAA292700R0056	103	SLAD-M253	7TAA292000R0103	131
PUEG-56B	7TAA292360R0043	21,114	SFH-48-0	7TAA292700R0057	103	SLAD-M257	7TAA292000R0104	131
PUEG-70B	7TAA292360R0044	21,114	SFHS-00	7TAA292700R0058	103	SLAD-M323	7TAA292000R0105	131
PUET-23B	7TAA292900R0004	21	SFHS-PH	7TAA292700R0060	103	SLAD-M329	7TAA292000R0106	131
PUET-29B	7TAA292900R0005	21	SFHS-PH1	7TAA292700R0061	103	SLAD-M406	7TAA292000R0107	131
PUET-36B	7TAA292900R0006	21	SGB-07	7TAA292720R0027	105	SLAD-M409	7TAA292000R0108	131
PUET-48B	7TAA292900R0007	21	SGB-09	7TAA292720R0029	105	SLAD-M506	7TAA292000R0109	131
PUSG-17B	7TAA292490R0006	29	SGB-11	7TAA292720R0031	105	SLAD-M508	7TAA292000R0110	131
PUSG-17S		29	SGB-16	7TAA292720R0036	105	SLAD-M638	7TAA292000R0111	131
PUSG-23B	7TAA292490R0007	29	SGB-21	7TAA292720R0039	105	SLAD-P090	7TAA292000R0112	133
PUSG-23S		29	SGB-29	7TAA292720R0043	105	SLAD-P112	7TAA292000R0113	133
PUSG-29B	7TAA292490R0008	29	SGB-36	7TAA292720R0044	105	SLAD-P132	7TAA292000R0114	133
PUSG-29S		29	SGB-48	7TAA292720R0046	105	SLAD-P137	7TAA292000R0115	133
PUSG-36B	7TAA292490R0009	29	SGG-125	7TAA292860R0033	115	SLAD-P167	7TAA292000R0116	133
PUSG-36S		29	SGG-56	7TAA292860R0034	115	SLAD-P213	7TAA292000R0117	133
PUSG-48B	7TAA292490R0010	29	SGG-70	7TAA292860R0035	115	SLAD-P299	7TAA292000R0118	133
PUSG-48S		29	SGG-95	7TAA292860R0036	115	SLAD-P366	7TAA292000R0119	133
PVDT-10P	7TAA292240R0178	29	SGG-M6356	7TCA292000R4106	117	SLAD-P488	7TAA292000R0120	133
PVDT-12P	7TAA292240R0179	22	SGG-P3656	7TCA292000R4107	117	SLND-M120	7TAA292000R0121	131
PVDT-17P	7TAA292240R0180	22	SGH-23	7TAA292720R0047	104	SLND-M160	7TAA292000R0122	131
PVDT-23P	7TAA292240R0181	22	SGH-29	7TAA292720R0048	104	SLND-M162	7TAA292000R0123	131
PVDT-29P	7TCA292000R3817	22	SGH-36	7TAA292720R0049	104	SLND-M200	7TAA292000R0124	131
RKS-07	7TAA292150R0907	107	SGH-48	7TAA292720R0050	104	SLND-M202	7TAA292000R0125	131
RKS-10	7TAA292150R0908	107	SGH-56	7TAA292720R0051	104,118	SLND-M207	7TAA292000R0126	131
RKS-12	7TAA292150R0909	107	SGH-70	7TAA292720R0052	104,118	SLND-M253	7TAA292000R0127	131
RKS-17	7TAA292150R0910	107	SGH-95	7TAA292720R0053	104,118	SLND-M257	7TAA292000R0128	131
RKS-23	7TAA292150R0911	107	SGI-M7556	7TCA292000R4118	117	SLND-M323	7TAA292000R0129	131
RKS-29	7TAA292150R0912	107	SGL-07	7TAA292720R0054	104	SLND-M329	7TAA292000R0130	131
RKS-36	7TAA292150R0913	107	SGL-10	7TAA292720R0055	104	SLND-M406	7TAA292000R0131	131
RKS-48	7TAA292150R0914	107	SGL-12	7TAA292720R0056	104	SLND-M409	7TAA292000R0132	131
RKS-56	7TAA292150R0915	107	SGL-17	7TAA292720R0057	104	SLND-M506	7TAA292000R0133	131
SCA-M16-10	7TAA292630R0000	111	SGL-23	7TAA292720R0058	104	SLND-M508	7TAA292000R0134	131
SCA-M20-10	7TAA292630R0001	111	SGL-29	7TAA292720R0059	104	SLND-M638	7TAA292000R0135	131
SCA-M25-11	7TAA292630R0002	111	SGO-56	7TAA292860R0037	115	SLND-P070	7TAA292000R0136	132
SCA-M32-13	7TAA292630R0003	111	SGO-70	7TAA292860R0038	115	SLND-P090	7TAA292000R0137	132
SCA-M40-13	7TAA292630R0004	111	SGO-95	7TAA292860R0039	115	SLND-P092	7TAA292000R0138	132
SCA-M50-14	7TAA292630R0005	111	SGO3-125	7TAA292980R0000	119	SLND-P110	7TAA292000R0139	132
SCA-M63-14	7TAA292630R0006	111	SGO3-56	7TAA292980R0001	119	SLND-P112	7TAA292000R0140	132
SCA-P09	7TAA292630R0007	111	SGO3-70	7TAA292980R0002	119	SLND-P132	7TAA292000R0141	132
SCA-P11	7TAA292630R0008	111	SGO3-95	7TAA292980R0003	119	SLND-P137	7TAA292000R0142	132
SCA-P16	7TAA292630R0009	111	SGS-125	7TAA292720R0060	105,118	SLND-P167	7TAA292000R0143	132
SCA-P21	7TAA292630R0010	111	SGS-36	7TAA292720R0061	105,118	SLND-P213	7TAA292000R0144	132
SCA-P29	7TAA292630R0011	111	SGS-48	7TAA292720R0062	105,118	SLND-P299	7TAA292000R0145	132
SCA-P36	7TAA292630R0012	111	SGS-56	7TAA292720R0063	105,118	SLND-P366	7TAA292000R0146	132
SCA-P48	7TAA292630R0013	111	SGS-70	7TAA292720R0064	105,118	SLND-P488	7TAA292000R0147	132
SFH-07-0	7TAA292700R0050	103	SGS-95	7TAA292720R0065	105,118	SLWD-M120	7TAA292000R0148	132
SFH-10-0	7TAA292700R0051	103	SLAD-M120	7TAA292000R0098	131	SLWD-M160	7TAA292000R0149	132
SFH-12-0	7TAA292700R0052	103	SLAD-M160	7TAA292000R0099	131	SLWD-M162	7TAA292000R0150	132
SFH-17-0	7TAA292700R0053	103	SLAD-M162	7TAA292000R0100	131	SLWD-M202	7TAA292000R0151	132
SFH-23-0	7TAA292700R0054	103	SLAD-M202	7TAA292000R0101	131	SLWD-M207	7TAA292000R0152	132
SFH-29-0	7TAA292700R0055	103	SLAD-M207	7TAA292000R0102	131	SLWD-M253	7TAA292000R0153	132

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page	Part. no.	GID no.	Page
SLWD-M257	7TAA292000R0154	132	SVN4-M25	7TAA292640R0024	94	VAMLG-70S	7TAA292360R0051	23
SLWD-M323	7TAA292000R0155	132	SVN4-M25/01	7TCA292000R4288	94	VAMLG-95B	7TAA292360R0052	23
SLWD-M329	7TAA292000R0156	132	SVN4-M25/02	7TAA292640R0025	94	VAMLG-95S	7TAA292360R0053	23
SLWD-M406	7TAA292000R0157	132	SVN4-M32	7TAA292640R0026	94	VAMLT-10B	7TAA292240R0217	23
SLWD-M409	7TAA292000R0158	132	SVN4-M32/02	7TAA292640R0027	94	VAMLT-10S	7TAA292240R0218	23
SLWD-M506	7TAA292000R0159	132	SVN4-M40	7TAA292640R0028	94	VAMLT-12B	7TAA292240R0219	23
SLWD-M508	7TAA292000R0160	132	SVN4-M40/01	7TCA292000R4289	94	VAMLT-12S	7TAA292240R0220	23
SLWD-M638	7TAA292000R0161	132	SVN4-M40/02	7TAA292640R0029	94	VAMT-10B	7TAA292240R0223	22
SLWD-P070	7TAA292000R0162	133	SVN4-M50	7TAA292640R0030	94	VAMT-10S	7TAA292240R0224	22
SLWD-P090	7TAA292000R0163	133	SVN4-M50/01	7TCA292000R4290	94	VAMT-12B	7TAA292240R0225	22
SLWD-P092	7TAA292000R0164	133	SVN4-M50/02	7TAA292640R0031	94	VAMT-12S	7TAA292240R0226	22
SLWD-P110	7TAA292000R0165	133	SVN4-M63	7TAA292640R0032	94	VCSG-17B	7TAA292240R0230	23
SLWD-P112	7TAA292000R0166	133	SWA-M16-10	7TAA292590R0000	111	VCSG-17S	7TAA292240R0231	23
SLWD-P130	7TAA292000R0167	133	SWA-M20-10	7TAA292590R0001	111	VCSG-23B	7TAA292240R0232	23
SLWD-P132	7TAA292000R0168	133	SWA-M25-11	7TAA292590R0002	111	VCSG-23S	7TAA292240R0233	23
SLWD-P137	7TCA292000R4141	133	SWA-M32-13	7TAA292590R0003	111	VCSG-29B	7TAA292240R0234	23
SLWD-P167	7TAA292000R0169	133	SWA-M40-13	7TAA292590R0004	111	VCSG-29S	7TAA292240R0235	23
SLWD-P213	7TAA292000R0170	133	SWA-M50-14	7TAA292590R0005	111	VCSG-36B	7TAA292240R0236	23
SLWD-P299	7TAA292000R0171	133	SWA-M63-14	7TAA292590R0006	111	VCSG-36S	7TAA292240R0237	23
SLWD-P366	7TAA292000R0172	133	SWA-P09	7TAA292590R0007	111	VCSG-48B	7TAA292240R0238	23
SLWD-P488	7TAA292000R0173	133	SWA-P11	7TAA292590R0008	111	VCSG-48S	7TAA292240R0239	23
SRER-06	7TAA292920R0008	139	SWA-P16	7TAA292590R0009	111	VCSG-56B	7TAA292360R0054	23,114
SRER-16	7TAA292920R0009	139	SWA-P21	7TAA292590R0010	111	VCSG-56S	7TAA292360R0055	23,114
SRER-21	7TAA292920R0010	139	SWA-P29	7TAA292590R0011	111	VCSG-70B	7TAA292360R0056	23,114
SRER-29	7TAA292920R0011	139	SWA-P36	7TAA292590R0012	111	VCSG-70S	7TAA292360R0057	23,114
SRER-50	7TAA292920R0012	139	SWA-P48	7TAA292590R0013	111	VCSG-95B	7TAA292360R0058	23,114
SREV-40	7TAA292920R0013	139	VAMG-17B	7TAA292240R0195	22	VCSG-95S	7TAA292360R0059	23,114
SVN4-07	7TAA292640R0000	94	VAMG-17S	7TAA292240R0196	22	VCST-07B	7TAA292240R0240	23
SVN4-09	7TAA292640R0001	94	VAMG-23B	7TAA292240R0197	22	VCST-07S	7TAA292240R0241	23
SVN4-11	7TAA292640R0002	94	VAMG-23S	7TAA292240R0198	22	VCST-10B	7TAA292240R0242	23
SVN4-13	7TAA292640R0003	94	VAMG-29B	7TAA292240R0199	22	VCST-10S	7TAA292240R0243	23
SVN4-16	7TAA292640R0004	94	VAMG-29S	7TAA292240R0200	22	VCST-12B	7TAA292240R0244	23
SVN4-21	7TAA292640R0005	94	VAMG-36B	7TAA292240R0201	22	VCST-12S	7TAA292240R0245	23
SVN4-29	7TAA292640R0006	94	VAMG-36S	7TAA292240R0202	22	VCST-17B	7TAA292240R0246	23
SVN4-36	7TAA292640R0007	94	VAMG-48B	7TAA292240R0203	22	VCST-17S	7TAA292240R0247	23
SVN4-42	7TAA292640R0008	94	VAMG-48S	7TAA292240R0204	22	VOHD-07B	7TAA292240R0248	24
SVN4-48	7TAA292640R0009	94	VAMLG-125B	7TAA292360R0046	23	VOHD-07S	7TAA292240R0249	24
SVN4-G00	7TAA292640R0010	94	VAMLG-125S	7TAA292360R0047	23	VOHD-10B	7TAA292240R0250	24
SVN4-G01	7TAA292640R0011	94	VAMLG-17B	7TAA292240R0205	23	VOHD-10S	7TAA292240R0251	24
SVN4-G02	7TAA292640R0012	94	VAMLG-17S	7TAA292240R0206	23	VOHD-12B	7TAA292240R0252	24
SVN4-G04	7TAA292640R0013	94	VAMLG-23B	7TAA292240R0207	23	VOHD-12S	7TAA292240R0253	24
SVN4-G06	7TAA292640R0014	94	VAMLG-23S	7TAA292240R0208	23	VOHG-125B	7TAA292360R0060	24,114
SVN4-G07	7TAA292640R0015	94	VAMLG-29B	7TAA292240R0209	23	VOHG-125S	7TAA292360R0061	24,114
SVN4-G08	7TAA292640R0016	94	VAMLG-29S	7TAA292240R0210	23	VOHG-17B	7TAA292240R0255	24
SVN4-G09	7TAA292640R0017	94	VAMLG-36B	7TAA292240R0211	23	VOHG-17S	7TAA292240R0257	24
SVN4-M12	7TAA292640R0018	94	VAMLG-36S	7TAA292240R0212	23	VOHG-23B	7TAA292240R0259	24
SVN4-M12/02	7TAA292640R0019	94	VAMLG-48B	7TAA292240R0213	23	VOHG-23S	7TAA292240R0261	24
SVN4-M16	7TAA292640R0020	94	VAMLG-48S	7TAA292240R0214	23	VOHG-29B	7TAA292240R0263	24
SVN4-M16/02	7TAA292640R0021	94	VAMLG-56B	7TAA292360R0048	23	VOHG-29S	7TAA292240R0265	24
SVN4-M20	7TAA292640R0022	94	VAMLG-56S	7TAA292360R0049	23	VOHG-36B	7TAA292240R0266	24
SVN4-M20/02	7TAA292640R0023	94	VAMLG-70B	7TAA292360R0050	23	VOHG-36S	7TAA292240R0267	24

Index

Products in alphabetical order

Part. no.	GID no.	Page	Part. no.	GID no.	Page
VOHG-48B	7TAA292240R0269	24	XPCSG-29BG		27
VOHG-48S	7TAA292240R0271	24	XPCSG-36BG		27
VOHG-56B	7TAA292360R0062	24,114	XPCSG-48BG		27
VOHG-56S	7TAA292360R0063	24,114	XPCST-10BG		27
VOHG-70B	7TAA292360R0064	24,114	XPCST-12BG		27
VOHG-70S	7TAA292360R0065	24,114	XSOLG-17BG	7TAA292240R0303	25
VOHG-95B	7TAA292360R0066	24,114	XSOLG-23BG	7TAA292240R0304	25
VOHG-95S	7TAA292360R0067	24,114	XSOLG-29BG	7TAA292240R0305	25
VUSG-17B	7TAA292490R0011	30	XSOLG-36BG	7TAA292240R0306	25
VUSG-17S		30	XSOLG-48BG	7TAA292240R0307	25
VUSG-23B	7TAA292490R0012	30	XSOLT-10BG	7TCA292000R0335	25
VUSG-23S		30	XSOLT-12BG	7TAA292240R0314	25
VUSG-29B	7TAA292490R0013	30	XVCS1H-10BG		26
VUSG-29S		30	XVCS1H-12BG	7TAA292240R0315	26
VUSG-36B	7TAA292490R0014	30	XVCS1H-17BG	7TAA292240R0316	26
VUSG-36S		30	XVCS1H-23BG	7TAA292240R0317	26
VUSG-48B	7TAA292490R0015	30	XVCS1H-29BG	7TAA292240R0318	26
VUSG-48S		30	XVCS1H-36BG	7TAA292240R0319	26
WPS-NW10	7TAA292650R0000	95	XVCS1H-48BG	7TAA292240R0320	26
WPS-NW12	7TAA292650R0001	95	XVCS2H-10BG		26
WPS-NW17	7TAA292650R0002	95	XVCS2H-12BG	7TCA292000R4679	26
WPS-NW23	7TAA292650R0003	95	XVCS2H-17BG	7TCA292000R4681	26
WPS-NW29	7TAA292650R0004	95	XVCS2H-23BG	7TCA292000R4682	26
WPS-NW36	7TAA292650R0005	95	XVCS2H-29BG	7TCA292000R4683	26
WPS-NW48	7TAA292650R0006	95	XVCS2H-36BG	7TCA292000R4684	26
XPCLG-17BB	7TAA292240R0290	25	XVCS2H-48BG	7TCA292000R4685	26
XPCLG-17SB	7TAA292240R0291	25	xxxG-17x/S		33
XPCLG-23BB	7TAA292240R0292	25	xxxG-23x/S		33
XPCLG-23SB	7TAA292240R0293	25	xxxG-29x/S		33
XPCLG-29BB	7TAA292240R0294	25	xxxG-36x/S		33
XPCLG-29SB	7TAA292240R0295	25	xxxG-48x/S		33
XPCLG-36BB	7TAA292240R0296	25	xxxT-12x/S		33
XPCLG-36SB	7TAA292240R0297	25	xxxT-17x/S		33
XPCLG-48BB	7TAA292240R0298	25			
XPCLG-48SB	7TAA292240R0299	25			
XPCLT-10BB	7TCA292000R0334	25			
XPCLT-10SB		25			
XPCLT-12BB	7TAA292240R0300	25			
XPCLT-12SB	7TAA292240R0301	25			
XPCLT-17BB	7TAA292240R0302	25			
XPCLT-17SB		25			
XPCSFG-17BO		27			
XPCSFG-23BO		27			
XPCSFG-29BO		27			
XPCSFG-36BO		27			
XPCSFG-48BO		27			
XPCSFT-07BO		27			
XPCSFT-10BO		27			
XPCSFT-12BO		27			
XPCSG-17BG		27			
XPCSG-23BG		27			

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