

AGRO EMC solutions.

For safe and reliable installation
and operation.

Your trusted EMC partner





EMC.

A topic of increasing importance.

Electromagnetic compatibility (EMC) is a feature of the modern world that everybody encounters daily. For example, an annoying sound on the radio that accompanies the ringing of a mobile phone is a typical case of electromagnetic interference between two devices.

But annoying sounds are the least harmful consequence of such unwanted interactions. If an expensive, high-tech car stalls due to electromagnetic incompatibility in its onboard computer, it is frustrating and costly. And the issue takes on far greater significance when entire industrial facilities or medical devices are affected or even completely shut down due to EMC problems. Production downtime can easily result in financial damage in the five- to seven-figure euro range – not to mention potential data loss or reputational damage from delayed deliveries.

With the increasing use of technology in our everyday life and work, the topic of electromagnetic compatibility is becoming ever more critical. More and more electronic devices are finding their way into our homes, industrial plants are becoming more complex, and modern wireless technologies such as GPS, Bluetooth and Wi-Fi have become indispensable. As the electronics industry grows, so too does the challenge of electromagnetic interference – because every electrical device is susceptible to EMC disturbances and can even generate them itself. Therefore, 100% electromagnetic compatibility must be the ultimate goal. It is essential – early in the planning and development phase of machines, systems and devices, and taking all relevant components into account – to consider EMC and take appropriate steps to reduce interference emissions as well as susceptibility to interference. This prevents costly remediation work. Inadequate EMC measures can cause electronic defects and malfunctions, resulting in expensive repairs.

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Industry / Mechanical engineering

Industrial plants and modern manufacturing systems are heavily reliant on power electronics, frequency converters and sensitive control systems. EMC cable glands ensure reliable shield contact and prevent electromagnetic interference between machine components and control technology.



Energy generation / Energy technology

High electrical power levels and strong electromagnetic fields occur in power plants, wind turbines and photovoltaic systems. EMC cable glands ensure the safe dissipation of interference currents and protect measurement, control and protection systems against malfunctions.



Railway technology / Transport infrastructure

Railway systems and signalling equipment operate with complex electronics in safety-critical applications. EMC cable glands provide continuous shielding and help prevent interference in communication, control and signalling systems.



Automotive industry

Modern vehicles, especially electric and hybrid vehicles, have numerous electronic control units and high-voltage systems. EMC cable glands protect the vehicle's electronics from electromagnetic interference and help ensure the proper functioning of sensitive systems such as ADAS and battery management features.



Telecommunications / Network technology

Interference-free data transmission is crucial in data centres, mobile telecommunications and network infrastructures. EMC cable glands ensure consistent shielding of data and supply lines, minimising electromagnetic interference.

Aerospace

In aerospace and military applications, a high degree of reliability is demanded with respect to electromagnetic compatibility. EMC cable glands ensure the protection of highly sensitive avionics and communication systems, even under extreme environmental conditions.



Medical technology

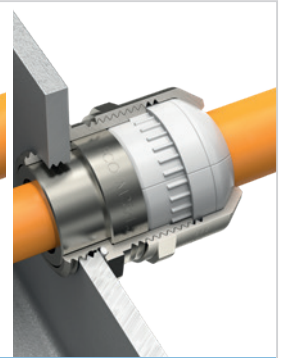
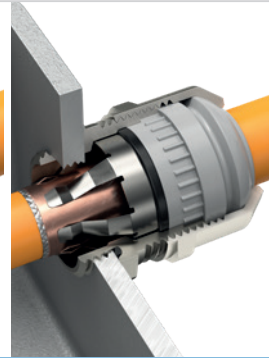
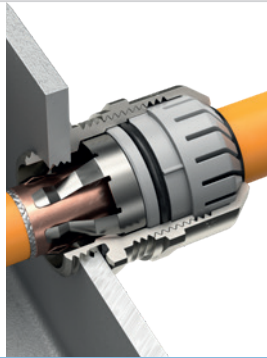
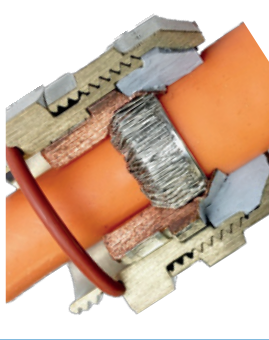
Medical devices such as MRI, CT and laboratory systems rely on precise electronic signals. EMC cable glands prevent electromagnetic interference and thus contribute to the reliable and accurate operation of diagnostic and therapeutic systems.

Building automation / Infrastructure technology

Modern building and security systems make use of numerous electronic components for applications such as fire-alarm, entry and control networks. EMC cable glands ensure interference-free signal transmission and increase the operational reliability of complex building systems.



Model	Rapid	easyCONNECT	Progress® EMC	powerCONNECT	
Thread	M12 - M32	M12 - M63	M8 - M95	M16 - M85	M16 - M32
Clamping range	4.5 - 25.0 mm	3.5 - 53.0 mm	2.5 - 75.0 mm	6.0 - 70.0 mm	6.0 - 25.5 mm
	Pg 7 - Pg 29		Pg 7 - Pg 48		
	4.5 - 25.5 mm		4.5 - 46.5 mm		
Temperature	-40 °C to +100 °C	-60 °C to +100 °C	-40 °C to +100 °C	-60 °C to +100 °C	-40 °C to +200 °C
Protection class	IP 68 / IP 69	IP 68 / IP 69	IP 68 / IP 69	IP 68 / IP 69	IP 68 / IP 69
Current carrying capacity and temperature rise at 100 °C					
EMC Kontakt	Contact disc	Contact spring	Contact sleeve	Compression sleeve	Compression sleeve
Material	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Seal	TPE	TPE	TPE	TPE	FPM
Strain relief	Type A according to EN 62444	Type A according to EN 62444	Type A according to EN 62444	Type A according to EN 62444	Type A according to EN 62444
Shielding connection	360° possible		360° complete	360° complete	360° complete
EMC shielding effectiveness Requirement LV215 30 to 300 MHz > 50 dB				≥ 101 dB at 30 MHz ≥ 86 dB at 300 MHz	≥ 101 dB at 30 MHz ≥ 86 dB at 300 MHz
Transfer impedance					
Link to technical data					



Series 85	EVolution EMC	ECO HL1	ECO HL3	ECO HV
M16 - M63 4.5 - 52.0 mm Pg 11 - Pg 29 6.0 - 33.0 mm	M20 - M25 - M32 9.8 - 23.1 mm	M16 - M40 4.5 - 26 mm	M16 - M40 4.5 - 25.5 mm	M20 - M40 5.0 - 25.5 mm
-40 °C to +100 °C	-40 °C to +140 °C	-40 °C to +100 °C	-50 °C to +105 °C	-50 °C to +140 °C
IP 68 / IP 69	IP 68 / IP 6K9K	IP 68 / IP 69	IP 68 / IP 69	IP 68 / IP 69
M16: 307 A, M20: 485 A, M25: 650 A, M32: 690 A, M40: 805 A, M50: 920 A, M63: 1010 A				
Collet-grip piece	Crimp	Basket spring	Basket spring	Supporting ring / Contact sleeve
Nickel-plated brass	Lead-free brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
TPE	Silicone HCR	TPE	TPE with railway certification	Silicone HCR
Type A according to EN 62444	Type A according to EN 62444	Type A according to EN 62444	Type A according to EN 62444	Type A according to EN 62444
360° complete	360° complete	360° complete	360° complete	360° complete
≥ 93 dB at 30 MHz ≥ 86 dB at 300 MHz	≥ 90 dB at 30 MHz ≥ 60 dB at 300 MHz			
	≤ 2.5 mΩ/m at 2 MHz ≤ 5.0 mΩ/m at 30 MHz			
				



The EMC Directive.

EMC fundamentals, regulations and standards.

But what exactly does EMC mean?

Every electrical device generates an electromagnetic field around itself, which in turn can induce voltages and currents in other electrical devices. Depending on the intensity of this mutual interference, this can result in malfunctions, reduced functionality or even complete device failure.

In the EN 61000 series of standards, EMC is defined as follows:

"Electromagnetic compatibility is the ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment." The active and passive components of this definition can be clearly illustrated using the example of a heart pacemaker: A pacemaker should not be affected by environmental influences at all, so as not to endanger the patient's life. On the other hand, the patient must not be harmed simply by the operation of the device.

Electromagnetic interference is generally categorised as either low-frequency or high-frequency.

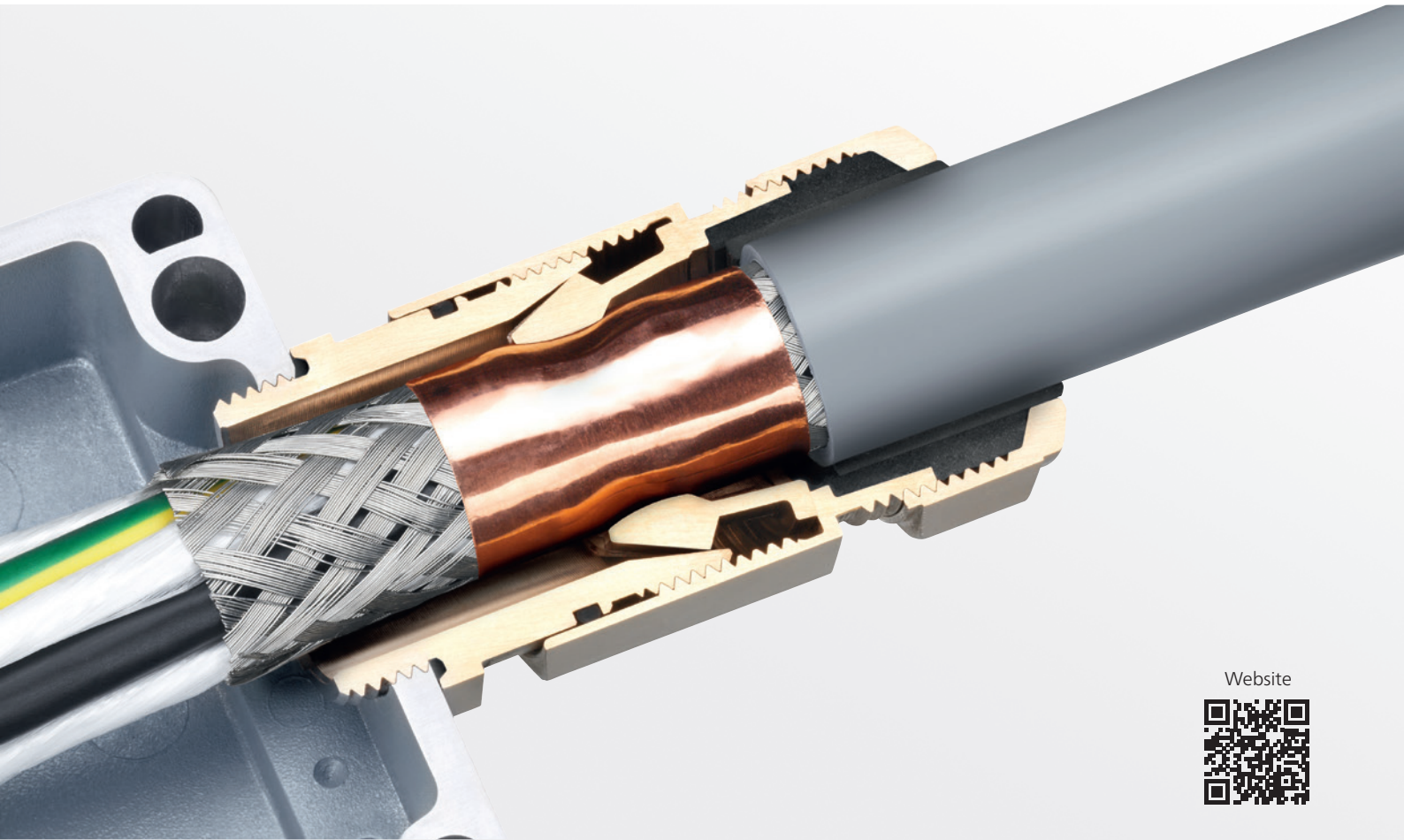
In the low-frequency range, interference arises from various forms of coupling (galvanic, inductive, capacitive) between two circuits.

At higher frequencies, starting at approximately 1 MHz, additional field-induced interference occurs, affecting the susceptible device. This includes receivers, electrotechnical equipment and electrical

installations. Furthermore, a distinction can be made between natural sources of interference, such as lightning, and artificial sources, such as transmitters, frequency converters and switching operations.

With regard to electromagnetic compatibility, attention should be paid to legal aspects as well as technical ones.

Generally, electrical products, machines and systems are subject to numerous directives, laws, regulations and specifications. The legislation governing EMC at European level is intended not only to ensure the free movement of goods within the single market, but also to safeguard public health and safety as well as protecting the environment, radio communications and consumers. As a result, only products that comply with the protection requirements stipulated in the EMC Directive (2014/30/EU) may be placed on the market within the EU. Accordingly, manufacturers must design their products in such a way that no unacceptable electromagnetic interference occurs between two devices or systems, and this must be proven by appropriate testing procedures.



Website



Shielding and contact.

For trouble-free operation.

In industrial environments, electromagnetic compatibility is of particular importance because complex machines and systems are extremely susceptible to electromagnetic interference. However, these unwanted EMC effects can be counteracted by means of effective shielding of all components. Good shielding reduces the emission of interference from electrical equipment while also decreasing its susceptibility to electromagnetic interference.

However, not only the cables themselves, but also all other applicable components must have shielding properties. Cable glands thus become active components that must ensure that the quality of the shielding is maintained at the sensitive connection points and that there are no shielding losses. Therefore, it is necessary to use not only an optimally shielded cable but also EMC-compliant cable glands. Although there is no separate EMC standard for these components, they contribute significantly to ensuring that the manufacturers' prescribed EMC requirements can be met.

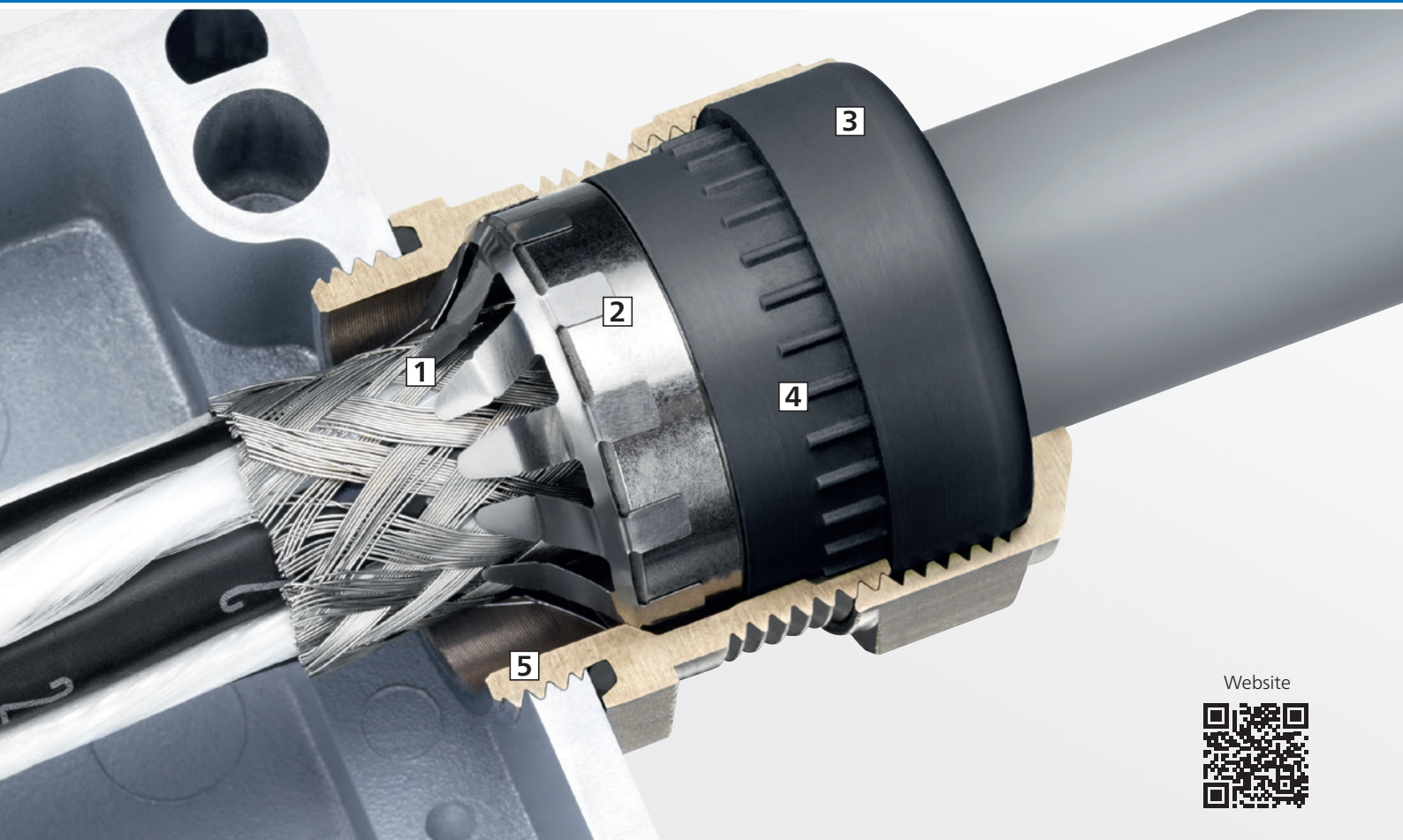
The effectiveness of cable shielding depends on the shielding material, the shielding type and the connection to electrical ground. For optimal performance, the shield should be connected to ground as directly as possible on both sides, with low resistance, low inductance and a large contact area.

The contact must be good enough to avoid elevated contact resistance levels, even under vibration.

With a broad range of EMC-compliant products, AGRO offers the right solution and contact option for numerous applications. In the case of the new Progress® EMC powerCONNECT cable gland (p. 18), the contact occurs directly at the gland's lower part. The range also includes the following well-proven product lines:

- Progress® EMC (p. 13)
- Progress® EMC powerCONNECT (p. 17)
- Progress® EMC Serie 85 (p. 19)
- Progress® EMC easyCONNECT (p. 22)
- Progress® EMC easyCONNECT Multi (p. 25)
- EVolution EMC (p. 27)
- ECO (p. 31)

All product lines are characterised by easy installation. The Swiss EMC laboratory MONTENA EMC SA certifies selected AGRO cable glands as having low transfer impedances and, depending on the model, high current-carrying capacity. Both are common quality criteria for shielding. To achieve high technical performance, AGRO involves the EMC specialist in the development of new products from the very beginning.



Website



Progress® EMC Rapid.

For time-saving installation.

The cable gland with two contact options, facilitating quick and easy shield contact by means of an integrated contact element with flexible protruding strips. This enables good contact to be achieved with partially stripped shielded cables or with fully exposed cable shields, which may also be extended.

1 Low contact resistance

The contact element's large, flexible protruding strips maximise the gripping area on the shield braiding, facilitating time-saving installation.

2 Flexibility in creating the contact

For a superior 360°-contact, the contact element can be removed and the trimmed shield can be placed directly against the contact surface on the cable gland's lower part, via the contact sleeve.

3 High sealing performance

Internal contours precisely matched to the sealing insert ensure that the sealing insert will deform as intended, thus ensuring its sealing performance in compliance with protection class IP 68 / IP 69 / NEMA 4X.

4 Good anti-rotation protection

The longitudinal knurling (surface texture) applied to the cable gland's lower part provides a high degree of protection against rotation via the sealing insert.

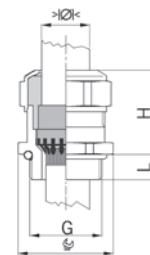
5 Metric or Pg connection thread

Progress® EMC Rapid cable glands with metric or Pg connection threads can be screwed into existing threaded openings or used with an EMC locknut.



Short entry thread metric

Material:	Nickel-plated brass
Contact sleeve:	Nickel-plated brass
Contact disc:	Stainless steel A2
Seal:	TPE
O-ring:	NBR
Strain relief:	Version A acc. to EN 62444
Protection class:	IP 68 (up to 10 bar) / IP 69
NEMA Type rating:	4X
Properties:	For a quick installation of partially dismantled cables as well as thoroughly shielded cables
Operation temperature:	-40 °C to +100 °C



One-piece sealing insert
not overall length insulated

G	>10< min mm	>10< max mm	 mm	H mm	L mm	Art.-No.	
M12x1.5	4.5	6.0	15	20	5	1081.12.060	50
M12x1.5	6.0	7.5	15	20	5	1081.12.075	50
M16x1.5	6.0	8.0	18	23	5	1081.17.080	50
M16x1.5	8.0	10.0	18	25	5	1081.17.100	50
M20x1.5	8.0	11.0	24	25	6	1081.20.110	50
M20x1.5	11.0	14.0	24	27	6	1081.20.140	50
M25x1.5	13.0	16.0	30	30	7	1081.25.160	25
M25x1.5	16.0	19.0	30	33	7	1081.25.190	25
M32x1.5	18.0	21.0	36	32	8	1081.32.210	25
M32x1.5	21.0	25.0	36	32	8	1081.32.250	25



Progress
MS EMV Rapid



Long entry thread metric

One-piece sealing insert
not overall length insulated

G	>10< min mm	>10< max mm	 mm	H mm	L mm	Art.-No.	
M12x1.5	4.5	6.0	15	20	10	1181.12.060	50
M12x1.5	6.0	7.5	15	20	10	1181.12.075	50
M16x1.5	6.0	8.0	18	23	10	1181.17.080	50
M16x1.5	8.0	10.0	18	25	10	1181.17.100	50
M20x1.5	8.0	11.0	24	25	10	1181.20.110	50
M20x1.5	11.0	14.0	24	27	10	1181.20.140	50
M25x1.5	13.0	16.0	30	30	11	1181.25.160	25
M25x1.5	16.0	19.0	30	33	11	1181.25.190	25
M32x1.5	18.0	21.0	36	32	13	1181.32.210	25
M32x1.5	21.0	25.0	36	32	13	1181.32.250	25

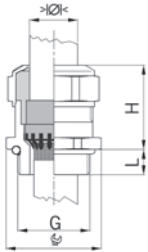


Progress
MS EMV Rapid



Cable glands Progress® EMC Rapid nickel-plated brass with contact disc

Short entry thread Pg



Material:	Nickel-plated brass
Contact sleeve:	Nickel-plated brass
Contact disc:	Stainless steel A2
Seal:	TPE
O-ring:	NBR
Protection class:	IP 68 (up to 10 bar) / IP 69
NEMA Type rating:	4X
Properties:	For a quick installation of partially dismantled cables as well as thoroughly shielded cables
Operation temperature:	-40 °C to +100 °C



Progress
MS EMV Rapid



One-piece sealing insert
not overall length insulated

G	>10< min mm	>10< max mm	mm	H mm	L mm	Art.-No.	
Pg 7	4.5	6.0	15	20	6	1081.07.060	50
Pg 7	6.0	7.5	15	20	6	1081.07.075	50
Pg 9	6.0	8.0	18	23	6	1081.09.080	50
Pg 9	8.0	10.0	18	25	6	1081.09.100	50
Pg 11	5.5	8.5	21	25	6	1081.11.085	50
Pg 11	8.5	12.0	21	25	6	1081.11.120	50
Pg 13	8.0	11.0	24	25	6	1081.13.110	50
Pg 13	11.0	14.0	24	27	6	1081.13.140	50
Pg 16	8.0	11.0	24	24	6	1081.16.110	50
Pg 16	11.0	14.0	24	27	6	1081.16.140	50
Pg 21	13.0	16.0	30	30	7	1081.21.160	25
Pg 21	16.0	19.0	30	33	7	1081.21.190	25
Pg 29	19.0	23.0	38	33	8	1081.29.230	25
Pg 29	23.0	25.5	38	32	8	1081.29.255	25

Long entry thread Pg

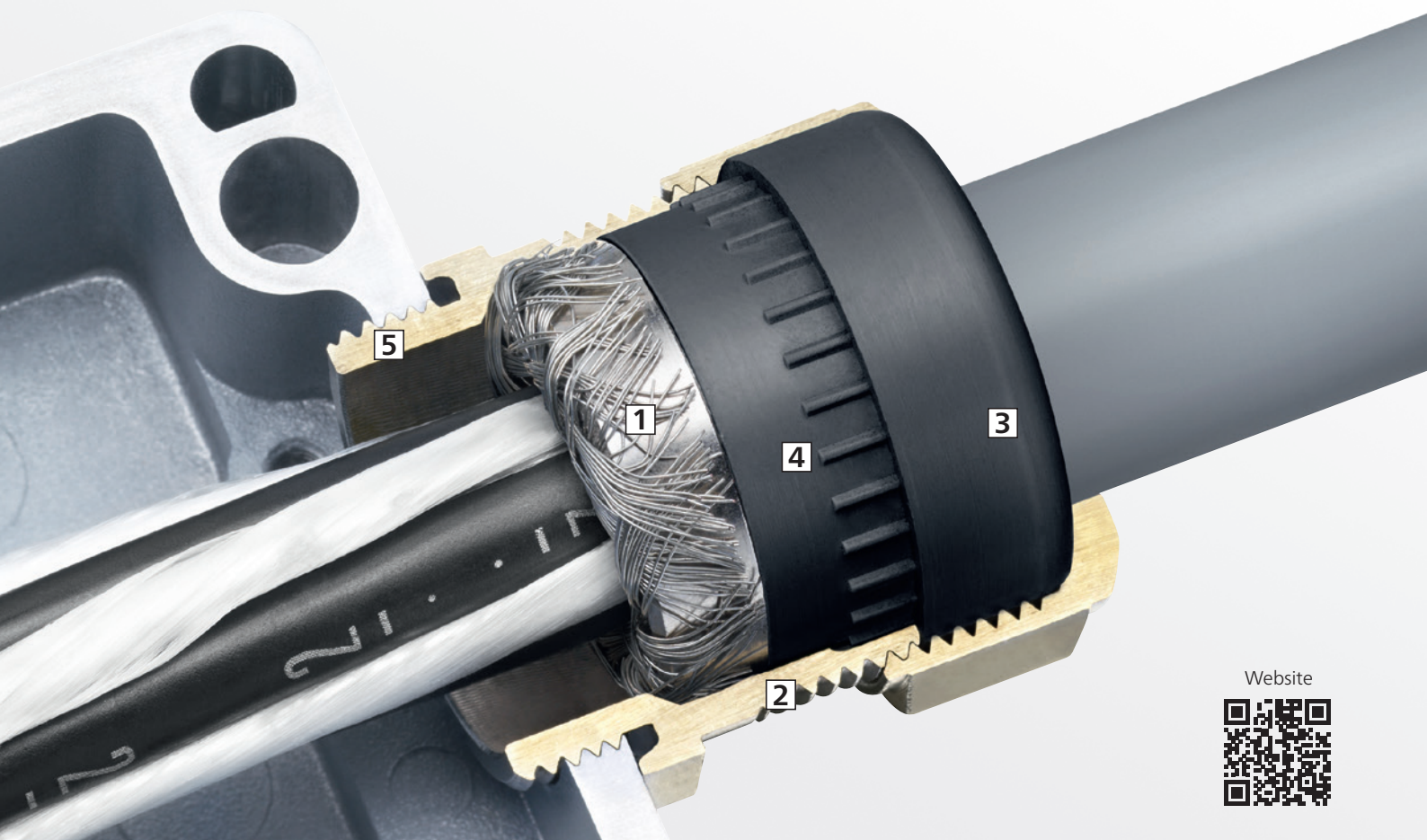


Progress
MS EMV Rapid



One-piece sealing insert
not overall length insulated

G	>10< min mm	>10< max mm	mm	H mm	L mm	Art.-No.	
Pg 7	4.5	6.0	15	20	10	1181.07.060	50
Pg 7	6.0	7.5	15	20	10	1181.07.075	50
Pg 9	6.0	8.0	18	23	10	1181.09.080	50
Pg 9	8.0	10.0	18	25	10	1181.09.100	50
Pg 11	5.5	8.5	21	25	10	1181.11.085	50
Pg 11	8.5	12.0	21	25	10	1181.11.120	50
Pg 13	8.0	11.0	24	25	10	1181.13.110	50
Pg 13	11.0	14.0	24	27	10	1181.13.140	50
Pg 16	8.0	11.0	24	24	10	1181.16.110	50
Pg 16	11.0	14.0	24	27	10	1181.16.140	50
Pg 21	13.0	16.0	30	30	12	1181.21.160	25
Pg 21	16.0	19.0	30	33	12	1181.21.190	25
Pg 29	19.0	23.0	38	33	12	1181.29.230	25
Pg 29	23.0	25.5	38	32	12	1181.29.255	25



Website



Progress® EMC.

Consistent contact quality with low transfer impedance.

The Progress® EMC cable gland of brass with its well-proven contact sleeve facilitates 360°-contact with shield braiding that ends in the cable gland. The appropriate edge geometry of the contact sleeve prevents any shearing off of the shield braiding.

1 Low contact resistance

The concentric 360° shield grip ensures low contact resistance.

2 Constant contact pressure

The interlocking "sealing insert/contact sleeve" combination ensures constant and enduring contact pressure between the shield braiding and the cable gland's lower part.

3 Optimal sealing and high temperature resistance

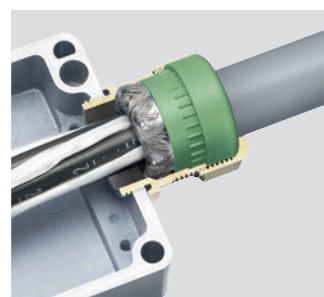
Internal contours precisely matched to the sealing insert ensure that the sealing insert will deform as intended, thus ensuring its sealing performance in compliance with protection class IP 68 / IP 69 / NEMA 4X. Standard FPM sealing inserts are available for temperatures from -40 °C to +200 °C.

4 Good anti-rotation protection

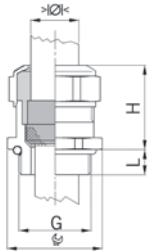
The longitudinal knurling (surface texture) applied to the cable gland's lower part provides a high degree of protection against rotation via the sealing insert.

5 Short or long connection thread

Short or long connection threads in metric or Pg design allow for secure fastening of the cable gland with or without an EMC locknut.



Short entry thread metric



Material:	Nickel-plated brass
Contact sleeve:	Nickel-plated brass
Seal:	TPE
O-ring:	NBR
Strain relief:	Version A acc. to EN 62444
Protection class:	IP 68 (up to 10 bar) / IP 69
NEMA Type rating:	4X
Properties:	Excellent shield contact through the contact sleeve with the braided shield terminating in the screwed cable gland
Operation temperature:	-40 °C to +100 °C



Progress MS EMV



One-piece sealing insert
not overall length insulated

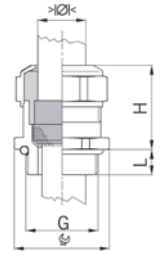
G	>I< min mm	>I< max mm	mm	H mm	L mm	i info	Art.-No.	
M8x1.25	2.5	3.5	11	15	5	1	1080.08.035	50
M8x1.25	3.0	4.0	11	15	5	1	1080.08.040	50
M10x1.5	3.0	4.0	13	16	5	1	1080.10.040	50
M10x1.5	4.0	6.0	13	16	5	1	1080.10.060	50
M12x1.5	4.5	6.0	15	20	5	-	1080.12.060	50
M12x1.5	6.0	7.5	15	20	5	-	1080.12.075	50
M16x1.5	6.0	8.0	18	23	5	-	1080.17.080	50
M16x1.5	8.0	10.0	18	25	5	-	1080.17.100	50
M20x1.5	8.0	11.0	24	25	6	-	1080.20.110	50
M20x1.5	11.0	14.0	24	27	6	-	1080.20.140	50
M25x1.5	13.0	16.0	30	30	7	-	1080.25.160	25
M25x1.5	16.0	19.0	30	33	7	-	1080.25.190	25
M32x1.5	18.0	21.0	36	32	8	-	1080.32.210	25
M32x1.5	21.0	25.0	36	32	8	-	1080.32.250	25
M40x1.5	24.0	28.5	46	34	8	-	1080.40.285	10
M40x1.5	28.5	32.0	46	34	8	-	1080.40.320	10
M50x1.5	33.0	37.0	55	36	9	-	1080.50.370	10
M50x1.5	37.0	41.0	55	36	9	-	1080.50.410	10
M63x1.5	40.0	46.0	70	39	10	-	1080.63.460	5
M63x1.5	46.0	50.0	70	39	10	-	1080.63.500	5
M75x1.5	50.0	56.0	80	40	11	-	1080.75.560	1
M80x2.0	56.0	65.0	95	45	18	-	1080.80.650	1
M85x2.0	63.0	70.0	95	45	18	-	1080.85.700	1
M95x2.0	68.0	75.0	110	52	20	-	1080.95.750	1

1 = Metric coarse-pitch thread (with VDE test report)

Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.

Long entry thread metric

Material:	Nickel-plated brass
Contact sleeve:	Nickel-plated brass
Seal:	TPE
O-ring:	NBR
Strain relief:	Version A acc. to EN 62444
Protection class:	IP 68 (up to 10 bar) / IP 69
NEMA Type rating:	4X
Properties:	Excellent shield contact through the contact sleeve with the braided shield terminating in the screwed cable gland
Operation temperature:	-40 °C to +100 °C



One-piece sealing insert
not overall length insulated

G	>10< min mm	>10< max mm	mm	H mm	L mm	i info	Art.-No.	
M8x1.25	2.5	3.5	11	15	10	1	1180.08.035	50
M8x1.25	3.0	4.0	11	15	10	1	1180.08.040	50
M10x1.5	3.0	4.0	13	16	10	1	1180.10.040	50
M10x1.5	4.0	6.0	13	16	10	1	1180.10.060	50
M12x1.5	4.5	6.0	15	20	10	-	1180.12.060	50
M12x1.5	6.0	7.5	15	20	10	-	1180.12.075	50
M16x1.5	6.0	8.0	18	23	10	-	1180.17.080	50
M16x1.5	8.0	10.0	18	25	10	-	1180.17.100	50
M20x1.5	8.0	11.0	24	25	10	-	1180.20.110	50
M20x1.5	11.0	14.0	24	27	10	-	1180.20.140	50
M25x1.5	13.0	16.0	30	30	11	-	1180.25.160	25
M25x1.5	16.0	19.0	30	33	11	-	1180.25.190	25
M32x1.5	18.0	21.0	36	32	13	-	1180.32.210	25
M32x1.5	21.0	25.0	36	32	13	-	1180.32.250	25
M40x1.5	24.0	28.5	46	34	13	-	1180.40.285	10
M40x1.5	28.5	32.0	46	34	13	-	1180.40.320	10
M50x1.5	33.0	37.0	55	36	14	-	1180.50.370	10
M50x1.5	37.0	41.0	55	36	14	-	1180.50.410	10
M63x1.5	40.0	46.0	70	39	14	-	1180.63.460	5
M63x1.5	46.0	50.0	70	39	14	-	1180.63.500	5

1 = Metric coarse-pitch thread (with VDE test report)

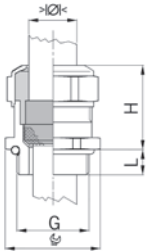
Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.



Progress MS EMV



Short entry thread Pg



Material / Contact sleeve: Nickel-plated brass

Seal: TPE

O-ring: NBR

Protection class: IP 68 (up to 10 bar) / IP 69

NEMA Type rating: 4X

Properties: Excellent shield contact through the contact sleeve with the braided shield terminating in the screwed cable gland

Operation temperature: -40 °C to +100 °C



Progress MS EMV



One-piece sealing insert. Not overall length insulated

G	>Ø< min mm	>Ø< max mm	 mm	H mm	L mm	Art.-No.	
Pg 7	4.5	6.0	15	20	6	1080.07.060	50
Pg 7	6.0	7.5	15	20	6	1080.07.075	50
Pg 9	6.0	8.0	18	23	6	1080.09.080	50
Pg 9	8.0	10.0	18	25	6	1080.09.100	50
Pg 11	5.5	8.5	21	23	6	1080.11.085	50
Pg 11	8.5	12.0	21	23	6	1080.11.120	50
Pg 13	8.0	11.0	24	25	6	1080.13.110	50
Pg 13	11.0	14.0	24	27	6	1080.13.140	50
Pg 16	8.0	11.0	24	24	6	1080.16.110	50
Pg 16	11.0	14.0	24	27	6	1080.16.140	50
Pg 21	13.0	16.0	30	30	7.5	1080.21.160	25
Pg 21	16.0	19.0	30	33	7.5	1080.21.190	25
Pg 29	19.0	23.0	38	33	8	1080.29.230	25
Pg 29	23.0	25.5	38	32	8	1080.29.255	25
Pg 36	25.0	30.5	50	36	8	1080.36.305	10
Pg 36	30.5	35.0	50	34	8	1080.36.350	10
Pg 42	33.0	37.0	55	37	10	1080.42.370	10
Pg 42	37.0	41.0	55	36	10	1080.42.410	10
Pg 48	39.0	43.0	65	42	11	1080.48.430	10
Pg 48	43.0	46.5	65	40	11	1080.48.465	10

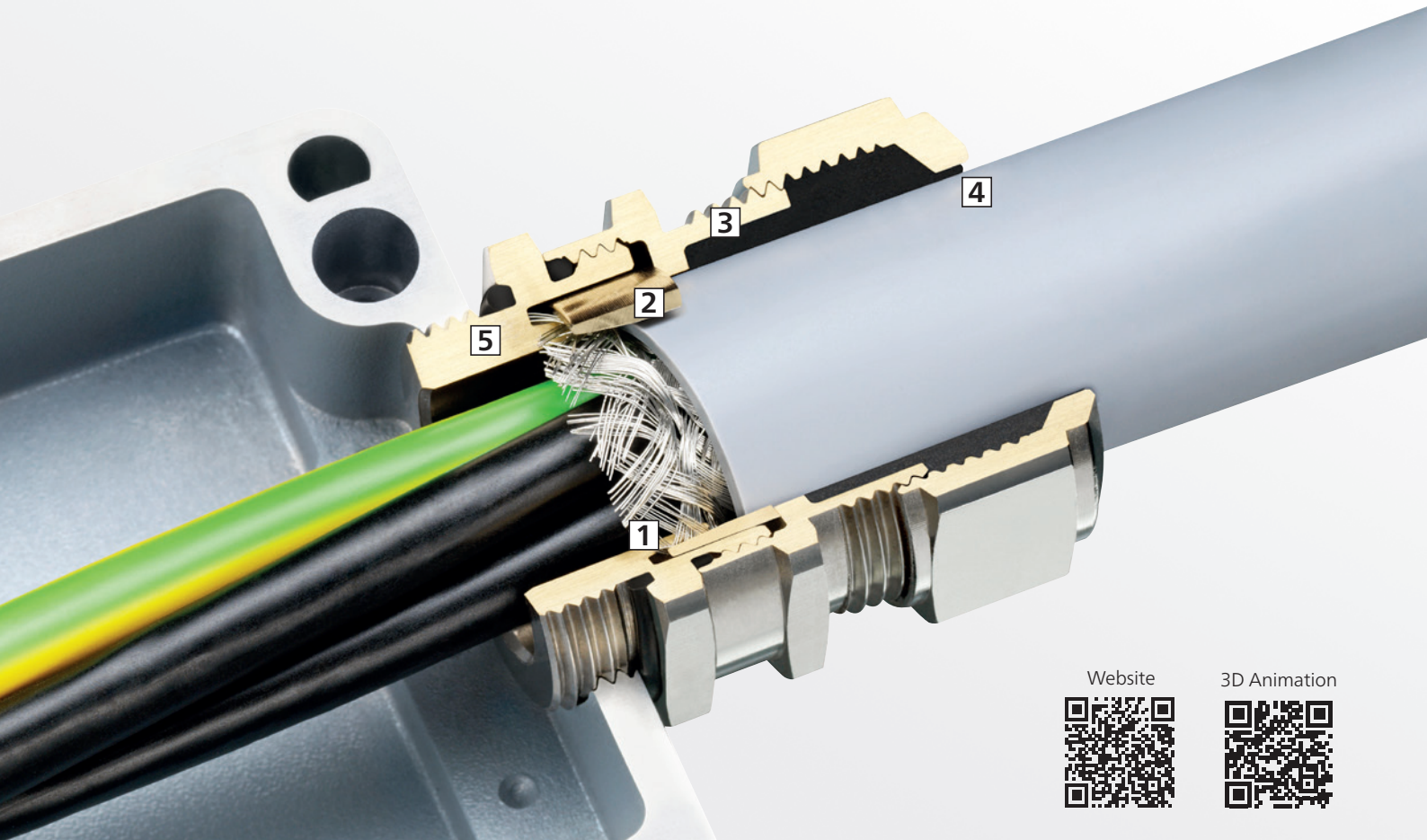
Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.

Long entry thread Pg

One-piece sealing insert. Not overall length insulated

G	>Ø< min mm	>Ø< max mm	 mm	H mm	L mm	Art.-No.	
Pg 7	4.5	6.0	15	20	10	1180.07.060	50
Pg 7	6.0	7.5	15	20	10	1180.07.075	50
Pg 9	6.0	8.0	18	23	10	1180.09.080	50
Pg 9	8.0	10.0	18	25	10	1180.09.100	50
Pg 11	5.5	8.5	21	23	10	1180.11.085	50
Pg 11	8.5	12.0	21	23	10	1180.11.120	50
Pg 13	8.0	11.0	24	25	10	1180.13.110	50
Pg 13	11.0	14.0	24	27	10	1180.13.140	50
Pg 16	8.0	11.0	24	24	10	1180.16.110	50
Pg 16	11.0	14.0	24	27	10	1180.16.140	50
Pg 21	13.0	16.0	30	30	12	1180.21.160	25
Pg 21	16.0	19.0	30	33	12	1180.21.190	25
Pg 29	19.0	23.0	38	33	12	1180.29.230	25
Pg 29	23.0	25.5	38	32	12	1180.29.255	25
Pg 36	25.0	30.5	50	36	15	1180.36.305	10
Pg 36	30.5	35.0	50	34	15	1180.36.350	10
Pg 42	33.0	-	55	37	15	1180.42.370	10
Pg 42	37.0	41.0	55	36	15	1180.42.410	10
Pg 48	39.0	43.0	65	42	15	1180.48.430	10
Pg 48	43.0	46.5	65	40	15	1180.48.465	10

Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.



Website



3D Animation



Progress® EMC powerCONNECT.

Direct connection technology for high discharge currents with minimal space requirements.



The Progress® EMC powerCONNECT cable gland, with its innovative, highly advanced compression ring design, ensures reliable 360° shield contact with minimal space requirements. This type of shield contact has been used in telecommunications for many years and is now also available for industrial applications. The direct transition from the braiding to the cable gland's lower part ensures very low contact resistance.

1 Minimal contact resistance

The direct contact between the cable's shielding and the cable gland's tapered element results in extremely low contact resistance and reduces the system's transfer impedance.

2 High discharge currents

Lasting high contact pressure, which results from the fixed compression ring and the complete tightening of the middle part, facilitates high discharge currents, the extent of which is limited only by the shield's cross-sectional area.

3 Special middle part

Tightening the middle part fully ensures the shield braiding is properly clamped without mechanically stressing the current-carrying conductors.

4 High flexibility

Excellent sealing performance with high flexibility. The two-part sealing insert facilitates a wide clamping range for protection class IP 68 / IP 69 / NEMA 4X.

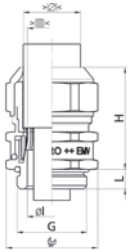
5 Various connection threads

Progress® EMC powerCONNECT cable glands are available with short and long connection threads. Metric threads allow for installation in threaded holes or with an EMC locknut.



M	min. L mm
M16	≥ 13
M20	≥ 14
M25	≥ 15
M32	≥ 17
M40	≥ 18
M50/63	≥ 20
M75/80/85	≥ 22

Short entry thread metric



Material:	Nickel-plated brass
Seal:	TPE
O-ring:	NBR
Strain relief:	Version A acc. to EN 62444
Protection class:	IP 68 (up to 10 bar) / IP 69
NEMA Type rating:	4X
Properties:	For high leakage currents, concentric 360° shield contact ensure extremely low transfer resistance and transfer impedance. Compact design
Operation temperature:	-60 °C to +100 °C



Two-piece sealing insert
not overall length insulated

G	>Ø< min mm	>Ø< max mm	>Ø< min mm	>Ø< max mm	>■< mm	Ø mm	mm	H mm	L mm	i info	Art.-No.	
M16x1.5	6.0	8.0	8.0	10.5	9.3	8.2	18	28	5	-	1084.17	25
M20x1.5	8.0	11.0	11.0	15.0	13.4	11.9	24	32	6	-	1084.20	25
M25x1.5	12.5	16.0	16.0	20.5	18.7	17.6	30	36.5	7	-	1084.25	25
M32x1.5	17.0	21.0	21.0	25.5	23.8	22.1	36	38.5	8	-	1084.32	25
M40x1.5	24.0	28.5	28.5	33.0	30.4	29.5	46	42	8	-	1084.40	10
M50x1.5	33.0	37.0	37.0	42.0	38.7	37.7	55	44.5	9	-	1084.50	10
M63x1.5	40.0	46.0	46.0	52.0	48.6	46.6	70	49	10	-	1084.63	5
M75x1.5	50.0	56.0	56.0	63.0	59.7	57.9	80	51	11	-	1084.75	1
M80x2.0	-	-	58.0	65.0	62.0	59.8	95	58	12	1	1084.80.650	1
M85x2.0	-	-	63.0	70.0	67.0	64.7	95	58	12	1	1084.85.700	1

1 = One-piece sealing insert

Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.

Available on request:

Stainless steel A2 or A4

Entry thread Pg and NPT

Long entry thread metric



Two-piece sealing insert
not overall length insulated

G	>Ø< min mm	>Ø< max mm	>Ø< min mm	>Ø< max mm	>■< mm	Ø mm	mm	H mm	L mm	i info	Art.-No.	
M16x1.5	6.0	8.0	8.0	10.5	9.3	8.2	18	28	10	-	1184.17	25
M20x1.5	8.0	11.0	11.0	15.0	13.4	11.9	24	32	10	-	1184.20	25
M25x1.5	12.5	16.0	16.0	20.5	18.7	17.6	30	36.5	11	-	1184.25	25
M32x1.5	17.0	21.0	21.0	25.5	23.8	22.1	36	38.5	13	-	1184.32	25
M40x1.5	24.0	28.5	28.5	33.0	30.4	29.5	46	42	13	-	1184.40	10
M50x1.5	33.0	37.0	37.0	42.0	38.7	37.7	55	44.5	14	-	1184.50	10
M63x1.5	40.0	46.0	46.0	52.0	48.6	46.6	70	49	14	-	1184.63	5
M75x1.5	50.0	56.0	56.0	63.0	59.7	57.9	80	51	15	-	1184.75	1
M80x2.0	-	-	58.0	65.0	62.0	59.8	95	58	18	1	1184.80.650	1
M85x2.0	-	-	63.0	70.0	67.0	64.7	95	58	18	1	1184.85.700	1

1 = One-piece sealing insert

Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.

Available on request:

Stainless steel A2 or A4

Entry thread Pg and NPT



Progress® EMV Serie 85.

Concentric shield grip for high discharge currents.



Progress® EMC Series 85 brass cable glands provide an especially low-impedance connection between shield braiding and metal cabinet while ensuring safe and reliable cable entry.

1 Optimal shield contact

The middle part with its large spanner flats facilitates flawless 360° contact with the shield braiding thanks to its clever collet-chuck design. The thin copper sheeting around the braided shield provides for an even distribution of force from the collet chuck.

2 High discharge currents

The compact collet-chuck element ensures a concentric, low-impedance shield grip and can handle continuous discharge currents of up to 1.6 kA – and short term of up to 3 kA.

3 High flexibility

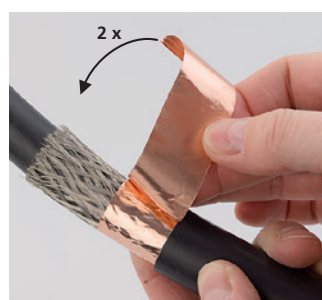
The two-part sealing inserts can be very quickly adjusted on-site to suit the existing cable diameter..

4 Optimal sealing performance

Internal contours precisely matched to the sealing insert ensure that the sealing insert will deform as intended, thus ensuring its sealing performance in compliance with protection class IP 68 / IP 69 / NEMA 4X.

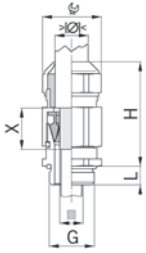
5 Metric or Pg connection thread

Progress® EMC Series 85 cable glands with metric or Pg connection threads can be screwed into existing threaded openings or used with an EMC locknut.



Cable glands Progress® EMC Series 85 nickel-plated brass with collet chuck

Entry thread metric



Material:	Nickel-plated brass
Seal:	TPE
O-ring:	NBR
Strain relief:	Version A acc. to EN 62444
Protection class:	IP 68 (up to 10 bar) / IP 69
Properties:	For high leakage currents, concentric shield contact with minimal transfer resistances and transfer impedances
Operation temperature:	-40 °C to +100 °C



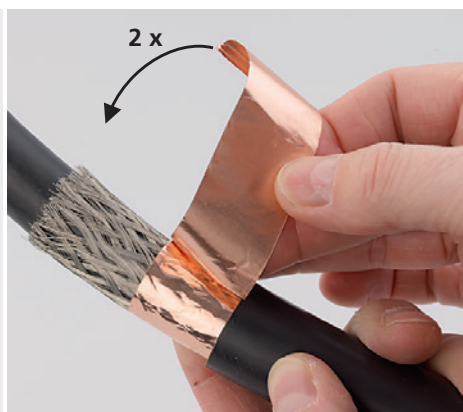
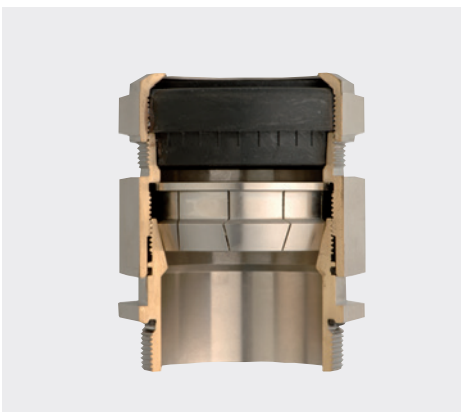
Two-piece sealing insert
not overall length insulated

G	> Ø < min mm	> Ø < max mm	> Ø < min mm	> Ø < max mm	> ■ < mm	 mm	H mm	L mm	X mm	Art.-No.	
M16x1.5	-	-	4.5	6.0	3.0-4.5	18	40	6	14	1000.17.85.045	25
M16x1.5	6.0	8.0	8.0	10.5	4.5-8.0	18	42	8	16	1000.17.85.080	25
M16x1.5	8.0	11.0	11.0	15.0	7.5-10.0	24	47	8	20	1000.17.85.100	25
M20x1.5	8.0	11.0	11.0	15.0	7.5-12.0	24	47	8	20	1000.20.85.120	25
M20x1.5	12.5	16.0	16.0	20.5	10.0-14.0	30	59	8	21	1000.20.85.140	20
M25x1.5	12.5	16.0	16.0	20.5	10.0-16.0	30	59	8	21	1000.25.85.160	20
M25x1.5	17.0	21.0	21.0	25.5	14.0-19.0	36	66	8	24	1000.25.85.190	25
M32x1.5	17.0	21.0	21.0	25.5	14.0-22.0	36	66	10	24	1000.32.85.220	25
M32x1.5	24.0	28.5	28.5	33.0	21.0-25.0	46	68	10	24	1000.32.85.250	5
M40x1.5	24.0	28.5	28.5	33.0	21.0-30.0	46	68	12	24	1000.40.85.300	5
M50x1.5	33.0	37.0	37.0	42.0	29.0-38.0	55	82	13	30	1000.50.85.380	5
M63x1.5	33.0	37.0	37.0	42.0	29.0-38.0	70/55	82	15	30	1000.63.85.380	5
M63x1.5	40.0	46.0	46.0	52.0	35.0-44.0	70	78	15	26	1000.63.85.440	1

Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.

Important: To provide the best possible protection for the cable shield and the cable, it is necessary to install a copper EMC tape.

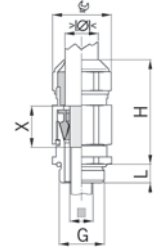
The copper tape must be fixed according to the illustration!
(Example: Tape Scotch 3M Typ 1181)



Cable glands Progress® EMC Series 85 nickel-plated brass with collet chuck

Entry thread Pg

Material: Nickel-plated brass
 Seal: TPE
 O-ring: NBR
 Protection class: IP 68 (up to 10 bar) / IP 69
 Properties: For high leakage currents, concentric shield contact with minimal transfer resistances and transfer impedances
 Operation temperature: -40 °C to +100 °C



Two-piece sealing insert
 not overall length insulated

G	> Ø < min mm	> Ø < max mm	> Ø < min mm	> Ø < max mm	> ■ < mm	 mm	H mm	L mm	X mm	Art.-No.	
Pg 11	6.0	8.0	8.0	10.5	4.5-8.0	21/18	42	8	16	1000.11.85.080	25
Pg 11	8.0	11.0	11.0	15.0	7.5-12.0	24	47	8	20	1000.11.85.120	25
Pg 16	8.0	11.0	11.0	15.0	7.5-12.0	24	47	8	20	1000.16.85.120	25
Pg 16	12.5	16.0	16.0	20.5	10.0-15.0	30	59	8	21	1000.16.85.150	25
Pg 21	12.5	16.0	16.0	20.5	10.0-16.0	30	59	8	21	1000.21.85.160	20
Pg 21	17.0	21.0	21.0	25.5	14.0-19.0	36	66	8	24	1000.21.85.190	25
Pg 29	17.0	21.0	21.0	25.5	14.0-22.0	38/36	66	10	24	1000.29.85.220	20
Pg 29	24.0	28.5	28.5	33.0	21.0-25.0	46	68	10	24	1000.29.85.250	5

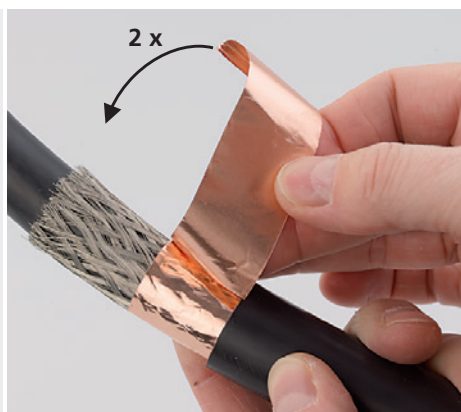
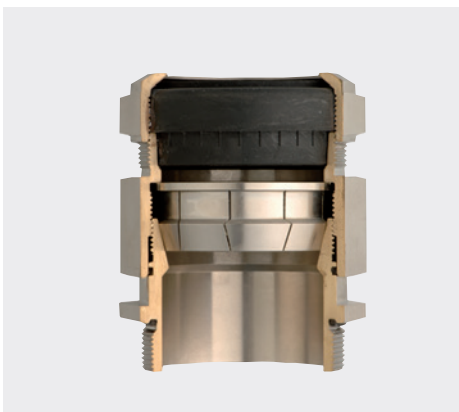
Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.

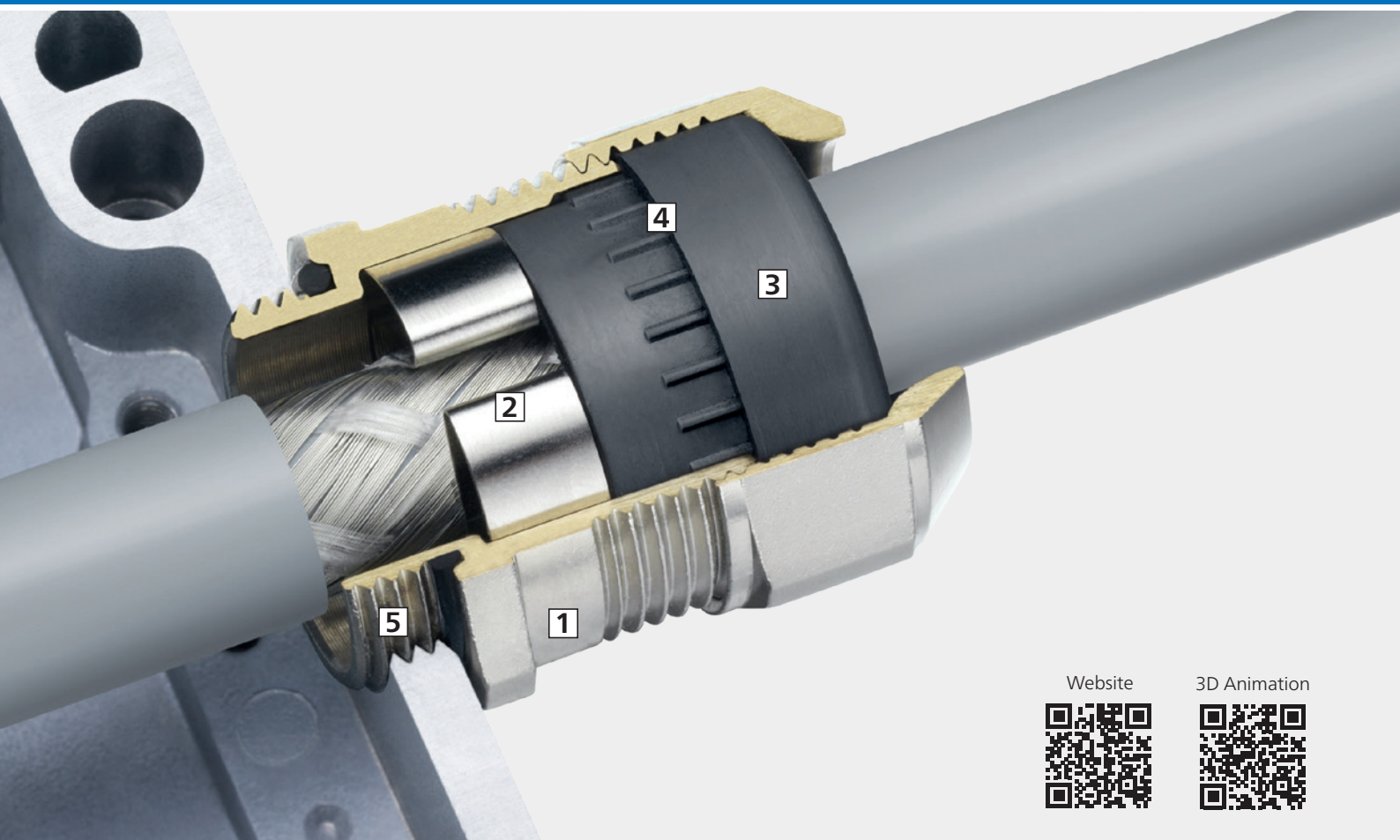
Important: To provide the best possible protection for the cable shield and the cable, it is necessary to install a copper EMC tape.

Further dimensions upon request



The copper tape must be fixed according to the illustration!
 (Example: Tape Scotch 3M Typ 1181)





Progress® EMV easyCONNECT.

Fast, easy and reliable installation via innovative contact spring.



The Progress® EMC easyCONNECT cable gland ensures full control during installation and compensates for tolerances in shield thickness to ensure a reliable shield grip. The spring system facilitates good, reliable shield contact for either partially or fully stripped shielded cables.

1 Easily identifiable

Progress® EMC easyCONNECT cable glands can be immediately identified by their EMC roller-embossed markings.

2 Optimal shield contact

The strong, cable-friendly clamping of the cable shield ensures excellent shield contact and extremely low transfer impedance. The shape of the contact spring facilitates not only a wide shield clamping range but also easy removal of the cable gland without damaging the cable braiding.

3 Best possible sealing performance

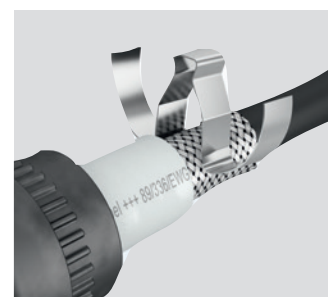
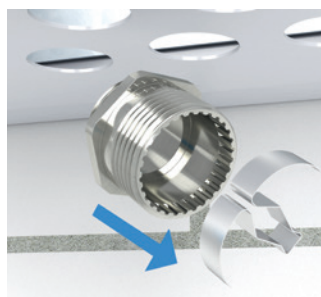
The two-part sealing insert can be adjusted on-site in seconds to suit the existing cable diameter, and ensures flawless sealing in compliance with protection class IP 68 / IP 69 / NEMA 4X.

4 Good anti-rotation protection

The longitudinal knurling (surface texture) applied to the cable gland's lower part provides a high degree of protection against rotation via the sealing insert.

5 Short or long connection thread

Short or long connection threads in metric design allow for secure fastening of the cable gland with or without an EMC locknut.



Short entry thread metric

Material:	Nickel-plated brass
Contact spring:	Spring steel 1.4310
Seal:	TPE
O-ring:	NBR
Strain relief:	Version A acc. to EN 62444
Protection class:	IP 68 (up to 10 bar) / IP 69
NEMA Type rating:	4X
Properties:	For a quick and safe installation of partially dismantled cables as well as thoroughly shielded cables
Operation temperature:	-60 °C to +100 °C



Two-piece sealing insert
not overall length insulated

G							H	L	i	Art.-No.	
	min mm	max mm	min mm	max mm	mm	mm	mm	mm	info		
M12x1.5	-	-	3.5	5.0	2.5-5.5	15	22	5	1	1083.12.050	50
M12x1.5	-	-	5.0	6.5	2.5-5.5	15	22	5	1	1083.12.065	50
M16x1.5	6.0	8.0	8.0	10.5	4.5-8.5	18	25	5	-	1083.17	50
M20x1.5	8.0	11.0	11.0	15.0	6.0-12.0	24	27	6	-	1083.20	50
M25x1.5	12.5	16.0	16.0	20.5	9.5-17.0	30	33	7	-	1083.25	25
M32x1.5	17.0	21.0	21.0	25.5	14.0-21.0	36	33	8	-	1083.32	25
M40x1.5	24.0	28.5	28.5	33.0	20.5-29.0	46	38	8	-	1083.40	10
M50x1.5	33.0	37.0	37.0	42.0	28.0-36.0	55	42	9	-	1083.50	10
M63x1.5	40.0	46.0	46.0	52.0	35.0-46.0	70	42	10	-	1083.63	5

1 = One-piece sealing insert

Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.

Available on request:

Entry thread Pg and NPT



Long entry thread metric

Two-piece sealing insert
not overall length insulated

G							H	L	i	Art.-No.	
	min mm	max mm	min mm	max mm	mm	mm	mm	mm	info		
M12x1.5	-	-	3.5	5.0	2.5-5.5	15	22	10	1	1183.12.050	50
M12x1.5	-	-	5.0	6.5	2.5-5.5	15	22	10	1	1183.12.065	50
M16x1.5	6.0	8.0	8.0	10.5	4.5-8.5	18	25	10	-	1183.17	50
M20x1.5	8.0	11.0	11.0	15.0	6.0-12.0	24	27	10	-	1183.20	50
M25x1.5	12.5	16.0	16.0	20.5	9.5-17.0	30	33	11	-	1183.25	25
M32x1.5	17.0	21.0	21.0	25.5	14.0-21.0	36	33	13	-	1183.32	25
M40x1.5	24.0	28.5	28.5	33.0	20.5-29.0	46	38	13	-	1183.40	10
M50x1.5	33.0	37.0	37.0	42.0	28.0-36.0	55	42	14	-	1183.50	10
M63x1.5	40.0	46.0	46.0	52.0	35.0-46.0	70	42	14	-	1183.63	5

1 = One-piece sealing insert

Available with sealing inserts conformity with EN 45545 / NFPA 130. When placing an inquiry, prefix the article number by the capital F.

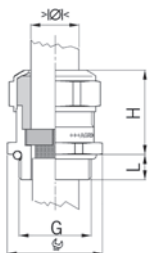
Available on request:

Entry thread Pg and NPT

Executions in steel A2 and A4



Short entry thread metric



Material:	CrNi stainless steel A2 (DIN EN 1.4305 / AISI 303)
Identification:	1 groove
Contact spring:	Spring steel 1.4310
Seal:	FPM
O-ring:	FPM
Strain relief:	Version A acc. to EN 62444
Protection class:	IP 68 (up to 10 bar) / IP 69
Properties:	For a quick and safe installation of partially dismantled cables as well as thoroughly shielded cables
Operation temperature:	-40 °C to +200 °C



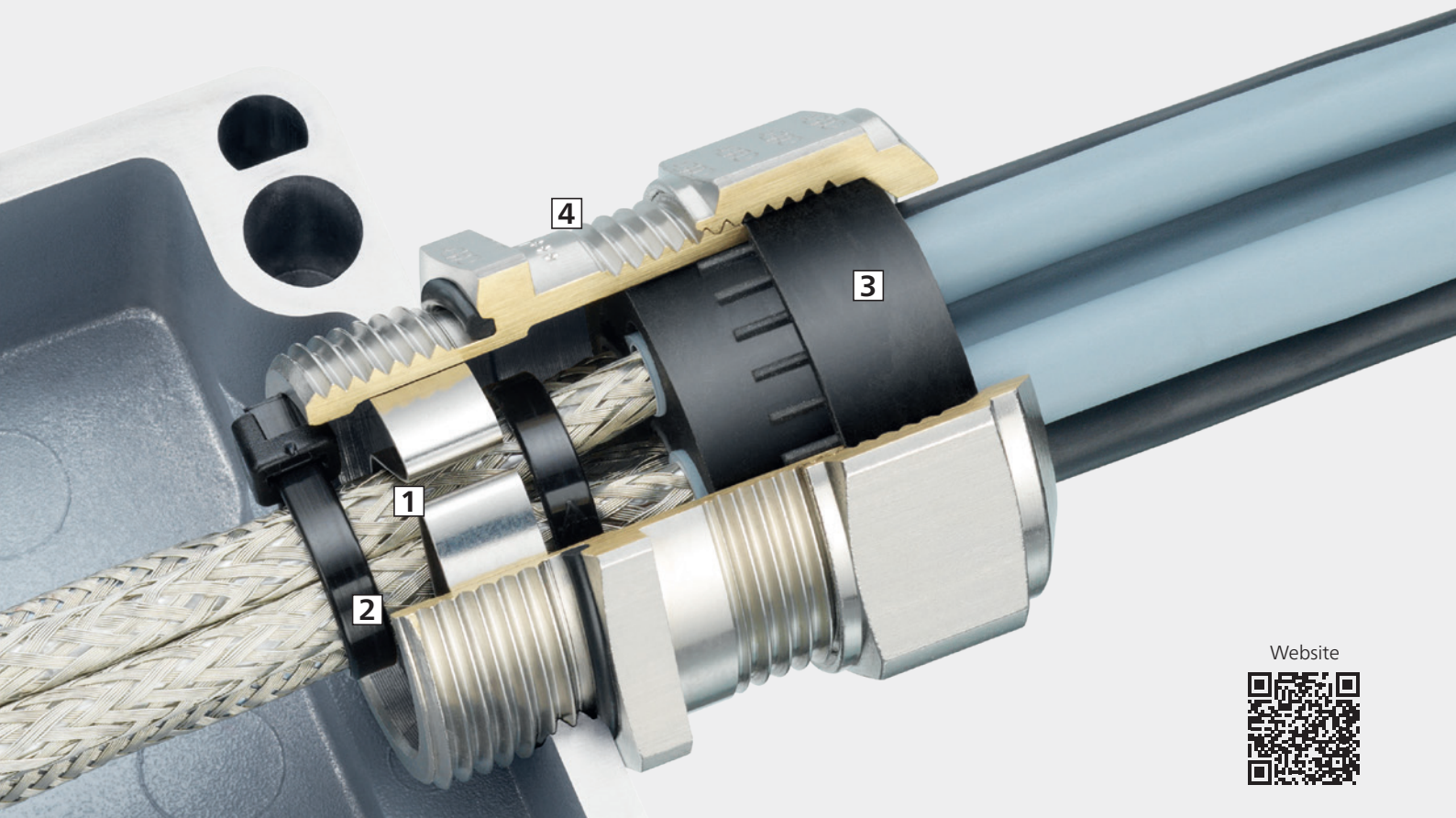
Two-piece sealing insert
not overall length insulated
For high temperature applications

G	>10< min mm	>10< max mm	>10< min mm	>10< max mm	mm	H mm	L mm	i info	Art.-No.	
M12x1.5	-	-	3.5	5.0	17	22	7	1	1083.12.96.050	50
M12x1.5	-	-	5.0	6.5	17	22	7	1	1083.12.96.065	50
M16x1.5	6.0	8.0	8.0	10.5	19	25	7	-	1083.17.96	50
M20x1.5	8.0	11.0	11.0	15.0	24	27	8	-	1083.20.96	50
M25x1.5	12.5	16.0	16.0	20.5	30	33	8	-	1083.25.96	25
M32x1.5	17.0	21.0	21.0	25.5	36	33	9	-	1083.32.96	25
M40x1.5	24.0	28.5	28.5	33.0	46	38	9	-	1083.40.96	10
M50x1.5	33.0	37.0	37.0	42.0	55	42	10	-	1083.50.96	10
M63x1.5	40.0	46.0	46.0	52.0	70	42	10	-	1083.63.96	5

1 = One-piece sealing insert

Available on request:

Long entry thread metric



Website



Progress® EMV easyCONNECT Multi.

Secure multi-contact connection via innovative contact spring.

Progress® EMC easyCONNECT Multi is the first cable gland that allows for the entry of multiple shielded cables into a housing or cabinet while ensuring a strong, reliable shield grip.

1 Gentle clamping

The contact spring can be easily, quickly and reliably installed without damaging the shield braiding. Suitable for continuous, non-continuous or partially exposed shielding.

2 Low contact resistance

Excellent discharge values are ensured by additionally holding the individual shield braids together using cable ties.

3 Multi sealing inserts

Multi sealing inserts can be provided for cables of the same or different diameters and ensure a flawless seal while maintaining IP 68 / IP 69 protection.

4 Easily identifiable

Progress® EMC easyCONNECT Multi cable glands can be immediately identified by their EMC roller-embossed markings.

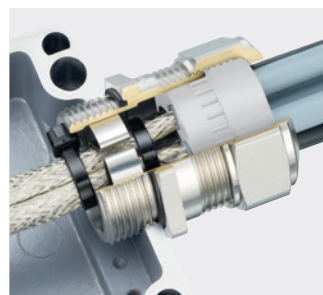
Available on request:

A2 or A4 steel

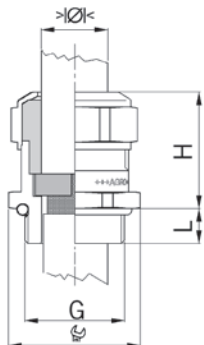
Pg or NPT connection thread

With FPM sealing inserts

With F sealing inserts according to EN 45545 / NFPA 130



Progress® EMV easyCONNECT Multi



Material:	Nickel-plated brass
Contact spring:	Spring steel 1.4310
Seal:	TPE
O-ring:	NBR
Strain relief:	Version A acc. to EN 62444
Temperature range:	-40°C to +100°C
Protection class:	IP 68 (up to 10 bar) / IP 69
Applications:	For quick and reliable installation of partially stripped cables or continuously shielded cables



One-piece sealing insert
Not continuously isolating

For shielded cables in limited space conditions, Progress® EMC easyConnect Multi is the perfect solution. Whether for cables of the same or different diameters, or for preassembled, non-preassembled or hybrid cables: The innovative contact spring facilitates problem-free earthing. The presented pictures show only a small selection of the many possibilities.

You specify the number of cable entries and the relevant diameters, and we will supply the EMC Multi cable gland to meet your needs.

Available on request:

Versions in A2 or A4 steel

Entry thread Pg or NPT

With FPM sealing inserts for high temperatures

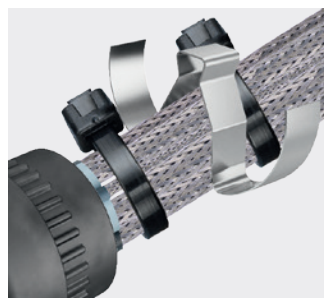
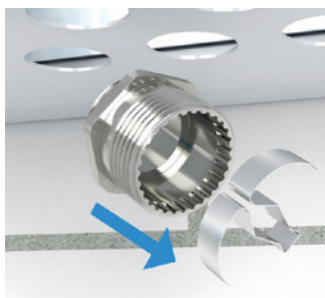
With sealing inserts of type F in accordance with EN 45545

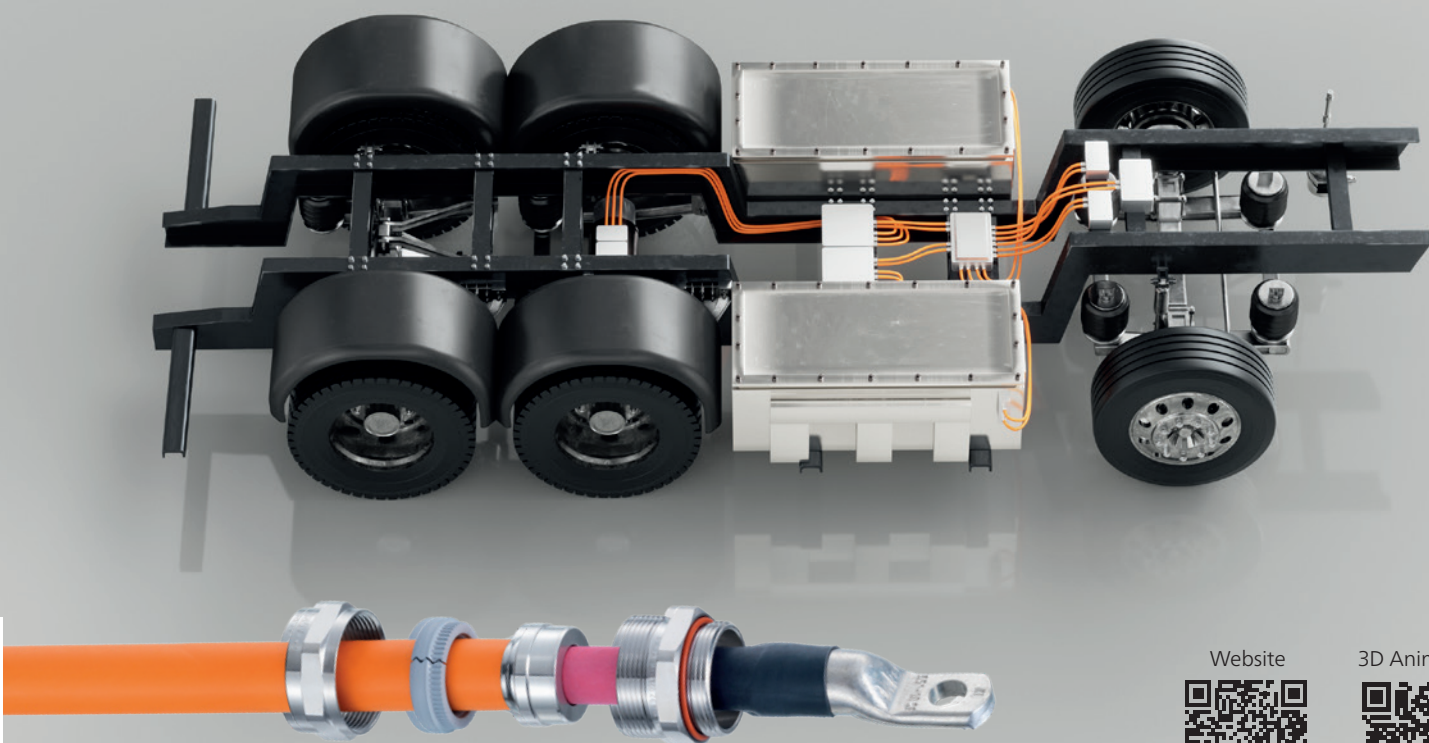


With standard hole layouts



With customized hole layouts





Website



3D Animation



EVolution EMC.

The EMC innovation for e-mobility.

All around the world, manufacturers from a wide range of industries rely on AGRO's expertise. The Swiss company AGRO AG has been developing and producing high-quality solutions for the insertion and laying of cables since 1953 and, with numerous innovations and patents, is a pioneer in the field of cable glands. Special vehicles such as construction, mining or railway vehicles must function reliably under extreme conditions. **AGRO offers the optimal solution** with its innovative EMC cable gland.

The best in class!

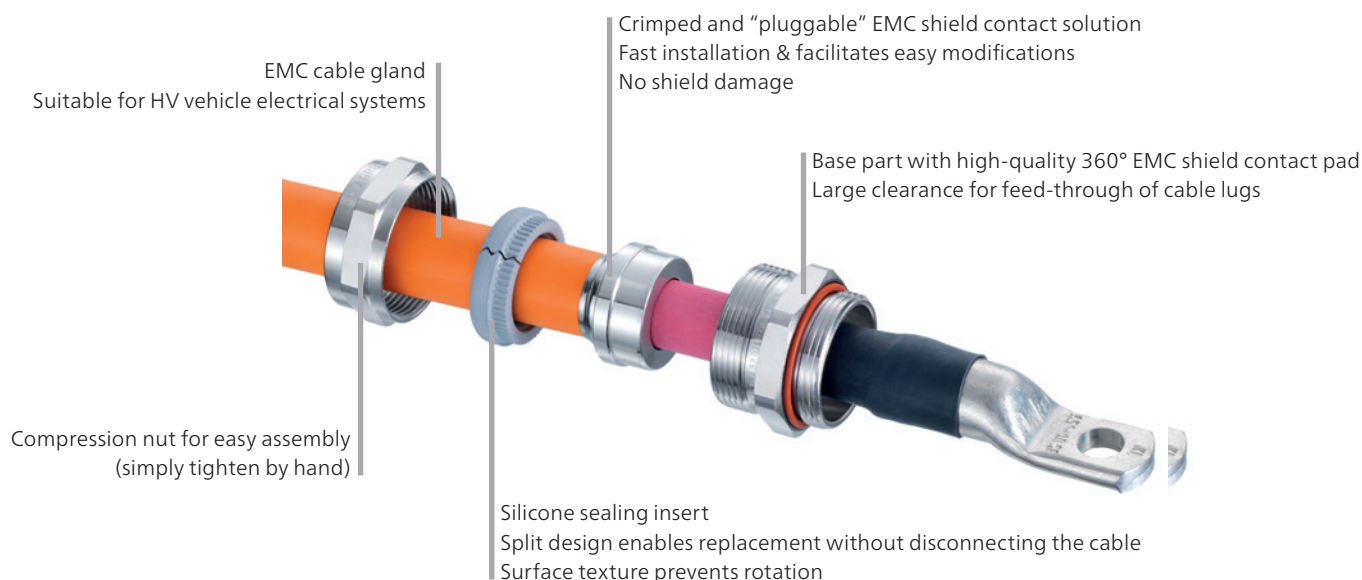
The **shock-tested EVolution EMC** cable gland is a high-quality solution that offers outstanding functionality, efficiency and reliability. It is characterised by **exceptionally high performance**, far exceeding the capabilities of conventional cable glands. At the same time, pre-assembly and final installation can be carried out reliably and easily.

Connector meets cable gland.

Amazingly simple and robust: the **'pluggable' 360° EMC contact solution** makes the **EVolution EMC** the best cable gland in its class. Its innovative design ensures process reliability, excellent current-carrying capacity, high temperature resistance and a long service life. No more EMC problems!

For simple and reliable cable assembly. EVolution EMC.

Whether on the road, rail, in the field or at sea:
the **EVolution EMC cable gland** offers maximum performance in terms of EMC protection, tightness and durability.



Benefits offered by the EVolution EMC cable gland

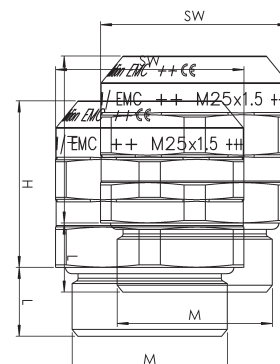
- Exceptional EMC shielding attenuation, even at high frequencies (≥ 86 dB)
- Excellent shield current carrying capacity
- Shock-tested in accordance with DIN EN 60068-2-27
- Free choice of cable manufacturer and cable assembly company
- Reduces the total cost of ownership (TCO) thanks to its high reliability (less downtime, fewer recalls and lower maintenance costs)
- High process reliability (LV214 and LV215)
- Short installation time on the vehicle (pre-assembled)
- Environmentally friendly thanks to lead-free brass (RoHS)



AGRO AXI-PRESS Crimp-Tool

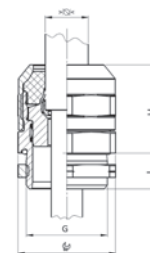
Connection thread size				
M	M20x1.5	M25x1.5	M32x1.5	M40x1.5
L (mm) short long	6 10	7 11	8 13	8 13
H (mm)	25.5	26.6	23.8	25.3
SW (mm)	24	30	36	46
Base part clearance (mm)	16.0	21.0	27.3	35.3
Cable cross-section (mm ²)	16 - 35	35 - 70	70 - 120	150
Clamping range min. - max. (mm)	8.1 - 14.85	12.4 - 18.55	16.6 - 23.25	24.5 - 25.5
Temperature range	-40°C to +140°C			
Protection class	IP 68 / IP 6K9K			

Further sizes on request



complete SET lower part short

Material:	Brass CuZn21Si3P lead-free
Contact spring:	beryllium copper
Seal:	Silicone HCR
O-ring:	Silicone
Protection class:	IP 68 / IP 6K9K
Strain relief:	Version A acc. to EN 62444
Vibration strength:	Vibration profile sharpness grade 3 / temperature profile sharpness grade 4 to LV214 in accordance with EN 60068-2-14/-27
Operation temperature:	-40 °C to +140 °C



Complet set
Electromobility
Reliable processing

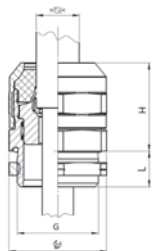
G	 min mm	 max mm	 mm	H mm	L mm	Art.-No.	
M20x1.5	8.1	9.1	24	25.5	6	1089.20.090.SETAR1	25
M20x1.5	8.9	10.0	24	25.5	6	1089.20.098.SETAR1	25
M20x1.5	9.5	10.5	24	25.5	6	1089.20.103.SETAR1	25
M20x1.5	10.8	11.9	24	25.5	6	1089.20.114.SETAR1	25
M20x1.5	11.5	12.55	24	25.5	6	1089.20.124.SETAR1	25
M20x1.5	12.4	13.4	24	25.5	6	1089.20.132.SETAR1	25
M20x1.5	13.1	14.15	24	25.5	6	1089.20.139.SETAR1	25
M20x1.5	13.8	14.85	24	25.5	6	1089.20.146.SETAR1	25
M25x1.5	12.4	13.4	30	26.6	7	1089.25.132.SETAR1	25
M25x1.5	13.1	14.15	30	26.6	7	1089.25.139.SETAR1	25
M25x1.5	13.8	14.85	30	26.6	7	1089.25.146.SETAR1	25
M25x1.5	14.5	15.55	30	26.6	7	1089.25.154.SETAR1	25
M25x1.5	15.1	16.15	30	26.6	7	1089.25.160.SETAR1	25
M25x1.5	16.0	17.0	30	26.6	7	1089.25.168.SETAR1	25
M25x1.5	16.6	17.65	30	26.6	7	1089.25.175.SETAR1	25
M25x1.5	17.5	18.55	30	26.6	7	1089.25.184.SETAR1	25
M32x1.5	16.6	17.65	36	23.8	8	1089.32.175.SETAR1	25
M32x1.5	17.5	18.55	36	23.8	8	1089.32.184.SETAR1	25
M32x1.5	19.0	20.1	36	23.8	8	1089.32.200.SETAR1	25
M32x1.5	20.1	21.15	36	23.8	8	1089.32.210.SETAR1	25
M32x1.5	21.5	22.65	36	23.8	8	1089.32.227.SETAR1	25
M32x1.5	22.2	23.25	36	23.8	8	1089.32.231.SETAR1	25

Available on request:

Other cable types / cross sections



complete SET lower part long



Material:	Brass CuZn21Si3P lead-free
Contact spring:	beryllium copper
Seal:	Silicone HCR
O-ring:	Silicone
Protection class:	IP 68 / IP 6K9K
Strain relief:	Version A acc. to EN 62444
Vibration strength:	Vibration profile sharpness grade 3 / temperature profile sharpness grade 4 to LV214 in accordance with EN 60068-2-14/-27/-27
Operation temperature:	-40 °C to +140 °C



Complet set
Electromobility
Reliable processing

G	$\begin{matrix} > \text{Ø} < \\ \text{min mm} \end{matrix}$	$\begin{matrix} > \text{Ø} < \\ \text{max mm} \end{matrix}$	$\begin{matrix} \text{mm} \\ \text{mm} \end{matrix}$	H mm	L mm	Art.-No.	
M20x1.5	8.1	9.1	24	25.5	10	1189.20.090.SETAR1	25
M20x1.5	8.9	10.0	24	25.5	10	1189.20.098.SETAR1	25
M20x1.5	9.5	10.5	24	25.5	10	1189.20.103.SETAR1	25
M20x1.5	10.8	11.9	24	25.5	10	1189.20.114.SETAR1	25
M20x1.5	11.5	12.55	24	25.5	10	1189.20.124.SETAR1	25
M20x1.5	12.4	13.4	24	25.5	10	1189.20.132.SETAR1	25
M20x1.5	13.1	14.15	24	25.5	10	1189.20.139.SETAR1	25
M20x1.5	13.8	14.85	24	25.5	10	1189.20.146.SETAR1	25
M25x1.5	12.4	13.4	30	26.6	11	1189.25.132.SETAR1	25
M25x1.5	13.1	14.15	30	26.6	11	1189.25.139.SETAR1	25
M25x1.5	13.8	14.85	30	26.6	11	1189.25.146.SETAR1	25
M25x1.5	14.5	15.55	30	26.6	11	1189.25.154.SETAR1	25
M25x1.5	15.1	16.15	30	26.6	11	1189.25.160.SETAR1	25
M25x1.5	16.0	17.0	30	26.6	11	1189.25.168.SETAR1	25
M25x1.5	16.6	17.65	30	26.6	11	1189.25.175.SETAR1	25
M25x1.5	17.5	18.55	30	26.6	11	1189.25.184.SETAR1	25
M32x1.5	16.6	17.65	36	23.8	13	1189.32.175.SETAR1	25
M32x1.5	17.5	18.55	36	23.8	13	1189.32.184.SETAR1	25
M32x1.5	19.0	20.1	36	23.8	13	1189.32.200.SETAR1	25
M32x1.5	20.1	21.15	36	23.8	13	1189.32.210.SETAR1	25
M32x1.5	21.5	22.65	36	23.8	13	1189.32.227.SETAR1	25
M32x1.5	22.2	23.25	36	23.8	13	1189.32.231.SETAR1	25

Available on request:

Other cable types / cross sections

Electrical Contact Overlays

Electrical Contact Overlays, or ECO for short, is the modular AGRO system for achieving reliable 360° shield contact.

With HL1, HL3 and HV, the right solution is available for industrial, railway and e-mobility applications. Shared components simplify selection, reduce the number of alternative designs and help to optimise procurement, stock-holding and installation.

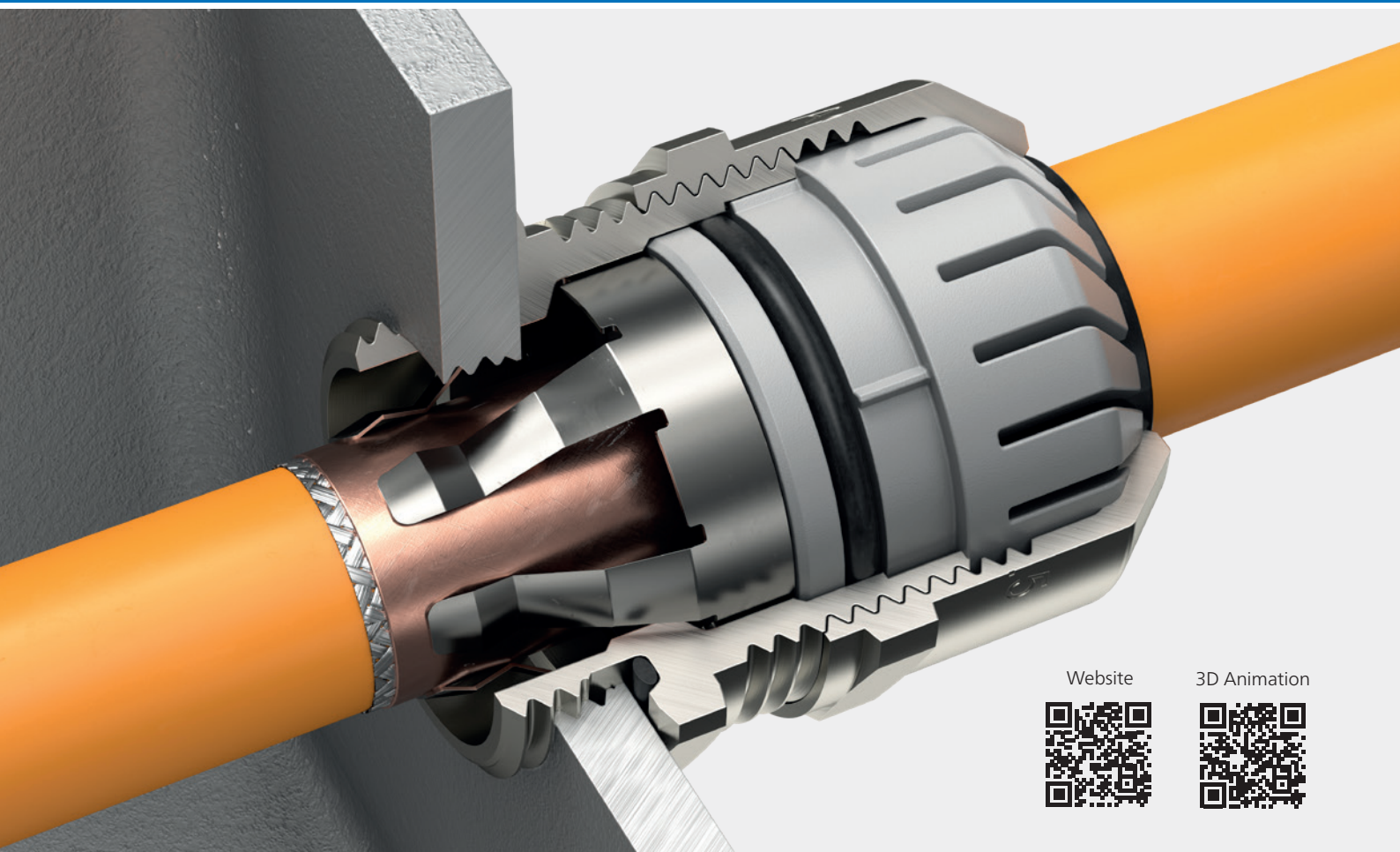


One platform for three application areas

ECO combines different shield contacts and sealing types within a modular system. HL1, HL3 and HV are specifically tailored to the requirements of industry, railway and e-mobility.

Allowing feedthrough of pre-assembled cables

The large internal opening in the compression nut and lower part of all three ECO types allows for the feedthrough of pre-assembled cable lugs and connectors. This reduces the number of installation steps on site and protects existing cable assemblies.



Website



3D Animation



Quickly installed. Securely connected.

ECO HL1: the solution for industrial applications

ECO HL1 was developed for industrial applications where ease of handling and short installation times are crucial. The segmental-ring sealing technology ensures reliable sealing and good strain relief. The dynamic contact spring establishes a uniform 360° contact with the cable shield. And its compact design is particularly suitable for control cabinets, machines, sensors and lighting.

Quick installation for improved efficiency

The user-friendly design reduces the number of required steps and facilitates reliable installation. No special tools are needed. This saves time in series assembly and reduces the effort required for installation and maintenance.

- Segmental ring technology for flexible shield contact
- Tool-free assembly
- Compact design for confined spaces
- High IP protection rating
- Ideal for series production and standard applications

Dynamic 360° shield contact

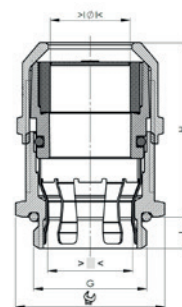
The dynamic contact spring ensures a continuous and enduringly secure connection to the cable shield. This reliably dissipates electromagnetic interference.

Compact and versatile

The compact design is also helpful where installation space is limited. Different clamping ranges facilitate flexible product selection for numerous industrial applications.

Short metric connection thread

Material:	Nickel-plated brass
Seal:	TPE
O-Ring:	NBR
Segmental sealing element:	Polyamid PA6
Contact spring:	Stainless spring steel 1.4310
Strain relief:	Type A according to EN 62444
Water jet protection:	IP 66
Water immersion protection:	IP 68, 5 bar / 30 min.
Water pressure protection:	IP 69, IP 69K
Dust protection:	IP 6X
Operating temperature:	-40 °C to +100 °C

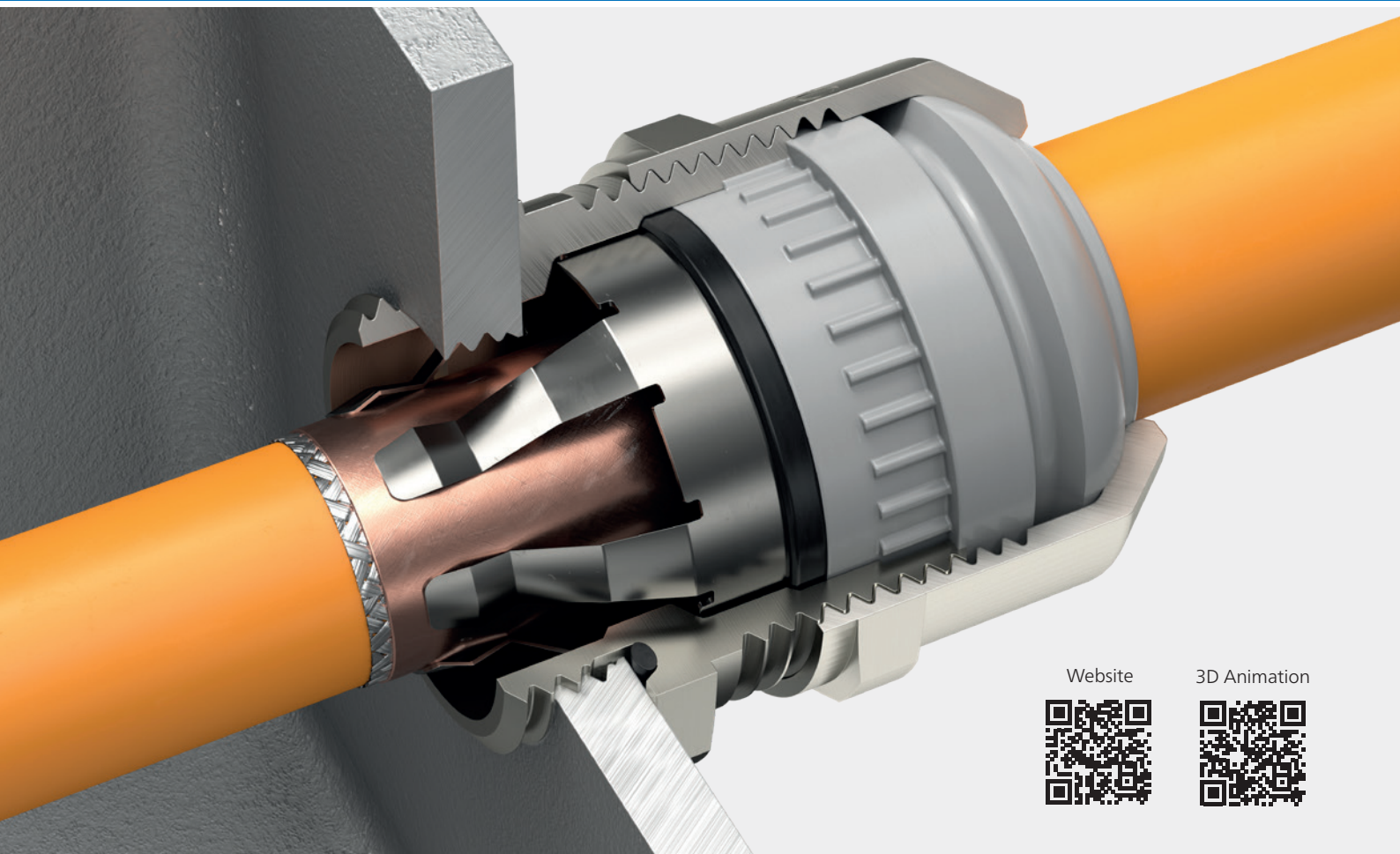


G	 min mm	 max mm	 mm	 mm	H mm	L mm	Art.-No.	
M16x1.5	5.0	9.5	4.5-8.0	19	31.5	5	1087.17.095	50
M20x1.5	7.0	13.0	5.0-11.0	24	36.0	6	1087.20.130	50
M25x1.5	10.0	17.5	8.0-15.5	30	35.8	7	1087.25.175	25
M32x1.5	13.0	21.0	11.0-19.0	36	40.5	8	1087.32.210	25
M40x1.5	20.0	29.0	17.0-26.0	46	49.5	9	1087.40.285	10



Long metric connection thread

G	 min mm	 max mm	 mm	 mm	H mm	L mm	Art.-No.	
M16x1.5	5.0	9.5	4.5-8.0	19	31.5	10	1187.17.095	50
M20x1.5	7.0	13.0	5.0-11.0	24	36.0	10	1187.20.130	50
M25x1.5	10.0	17.5	8.0-15.5	30	35.8	11	1187.25.175	25
M32x1.5	13.0	21.0	11.0-19.0	36	40.5	13	1187.32.210	25
M40x1.5	20.0	29.0	17.0-26.0	46	49.5	13	1187.40.285	10



Website



3D Animation



Safe against vibrations. Reliable in operation.

ECO HL3: the solution for railway applications

ECO HL3 combines a robust compression seal with a dynamic 360° shield contact. Its design is optimised for applications that are subject to vibrations, sudden loading and changing environmental conditions. This makes ECO HL3 particularly suitable for demanding applications in the railway sector.

Safe and reliable under demanding conditions

The compression technology ensures a uniform seal and reliable strain relief. The cable remains securely positioned even under mechanical stress.

- Compression technology for reliable contact
- Resistant to vibrations, jolts and corrosion
- Tested according to EN 45545-2/-3 and NFPA 130
- Ideal for rail vehicles, robotics and medical technology

Designed to withstand vibrations and jolts

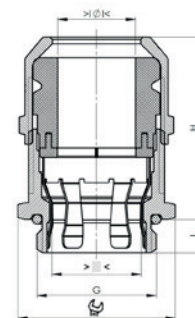
The robust design helps ensure a lasting reliable connection under dynamic conditions. This reduces the risk of contact interruptions and the need for unplanned rectification of faults.

Easy and reliable installation

The clever design helps ensure safe and reliable assembly, reducing errors during cable installation, maintenance and repair work.

Short metric connection thread

Material:	Nickel-plated brass
Seal:	TPE with railway certification
Supporting ring:	Polyamid PA6
O-Ring:	NBR
Contact spring:	Stainless spring steel 1.4310
Strain relief:	Type A according to EN 62444
Water jet protection:	IP 66
Water immersion protection:	IP 68, 10 bar / 30 min.
Water immersion protection:	IP 69, IP 69K
Water pressure protection:	IP X8 (10 bar / 30 min.)
Dust protection:	IP 6X
Operating temperature:	-50 °C to +105 °C

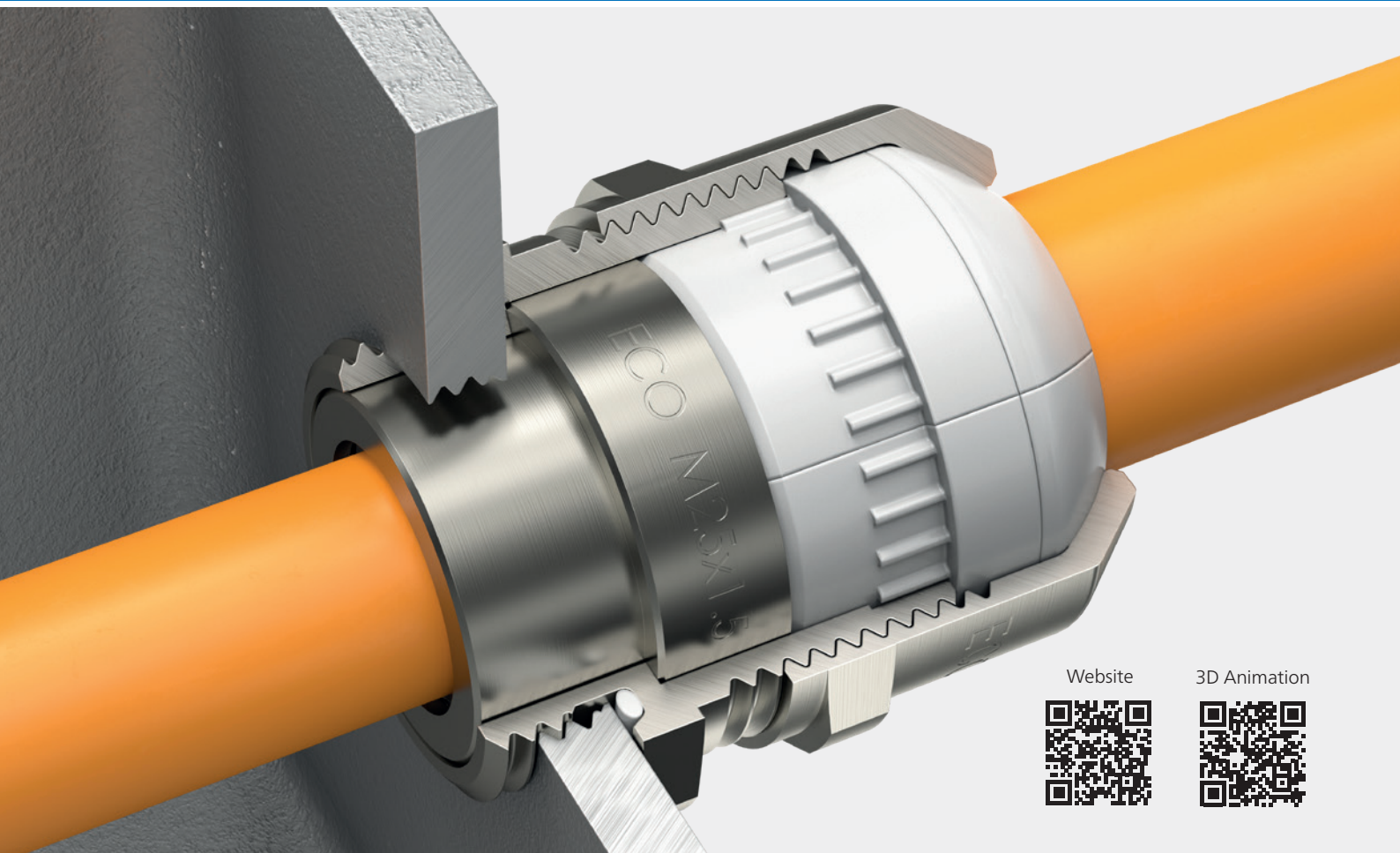


G	$\begin{array}{c} \text{> < <} \\ \text{min mm} \end{array}$	$\begin{array}{c} \text{> < <} \\ \text{max mm} \end{array}$	$\begin{array}{c} \text{> < <} \\ \text{mm} \end{array}$	$\begin{array}{c} \text{> < <} \\ \text{mm} \end{array}$	H mm	L mm	Art.-No.	
M16x1.5	5.0	8.0	4.5-8.0	19	31.5	5	F1088.17.080	50
M20x1.5	6.0	9.0	5.0-11.0	24	36.0	6	F1088.20.090	50
M20x1.5	8.0	11.0	6.0-9.0	24	36.0	6	F1088.20.110	50
M25x1.5	9.0	13.0	7.0-11.0	30	38.0	7	F1088.25.130	25
M25x1.5	11.5	16.0	9.5-14.0	30	38.0	7	F1088.25.160	25
M32x1.5	13.0	18.0	11.0-16.0	36	40.5	8	F1088.32.180	25
M32x1.5	16.0	21.0	14.0-19.0	36	40.5	8	F1088.32.210	25
M40x1.5	20.5	25.5	17.5-22.5	46	49.5	8	F1088.40.255	10
M40x1.5	23.5	28.5	20.5-25.5	46	49.5	8	F1088.40.285	10



Long metric connection thread

G	$\begin{array}{c} \text{> < <} \\ \text{min mm} \end{array}$	$\begin{array}{c} \text{> < <} \\ \text{max mm} \end{array}$	$\begin{array}{c} \text{> < <} \\ \text{mm} \end{array}$	$\begin{array}{c} \text{> < <} \\ \text{mm} \end{array}$	H mm	L mm	Art.-No.	
M16x1.5	5.0	8.0	4.5-8.0	19	31.5	10	F1188.17.080	50
M20x1.5	6.0	9.0	5.0-11.0	24	36.0	10	F1188.20.090	50
M20x1.5	8.0	11.0	6.0-9.0	24	36.0	10	F1188.20.110	50
M25x1.5	9.0	13.0	7.0-11.0	30	38.0	11	F1188.25.130	25
M25x1.5	11.5	16.0	9.5-14.0	30	38.0	11	F1188.25.160	25
M32x1.5	13.0	18.0	11.0-16.0	36	40.5	13	F1188.32.180	25
M32x1.5	16.0	21.0	14.0-19.0	36	40.5	13	F1188.32.210	25
M40x1.5	20.5	25.5	17.5-22.5	46	49.5	13	F1188.40.255	10
M40x1.5	23.5	28.5	20.5-25.5	46	49.5	13	F1188.40.285	10



With large contact area. Designed for demanding applications.

ECO HV: the solution for e-mobility & offshore applications

ECO HV was developed for electrically and thermally demanding applications. The supporting ring and contact sleeve facilitate a generous 360° contact with the exposed cable shield. The robust design and temperature-resistant silicone seals are particularly suitable for dynamic applications in e-mobility, generators and offshore systems.

Generous shield contact area

The exposed cable shield is guided over the supporting ring and then enclosed by the contact sleeve. This creates a stable and continuous electrical connection.

- Suitable for high currents of 120A
- Can be plugged and pre-assembled
- Resistant to vibrations, jolts and corrosion
- Shield contact via split sleeve
- IP 68 / IP 69K – ideal for electric vehicles, generators and offshore systems

Robust under dynamic loading

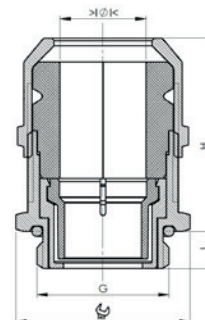
The contact and clamping sleeve ensures secure positioning of the cable shield. The design is intended for applications involving vibrations, sudden loads and mechanical stress.

For demanding temperature conditions

The silicone seal and silicone O-ring facilitate an operating temperature range of -50 °C to +140 °C. This makes the ECO HV suitable for demanding applications in the fields of e-mobility, generators and offshore systems.

Short connection thread, metric

Material:	Nickel-plated brass
Seal:	Silicone HCR
O-Ring:	Silicone HCR
Contact insert:	Messing vernickelt
Support sleeve:	PA GF18
Strain relief:	Ausführung A nach EN 62444
Water jet protection:	IP 66
Water immersion protection:	IP 68, 10 bar / 30 min.
Water pressure protection:	IP 69, IP 69K
Dust protection:	IP 6X, IP6 KX
Operating temperature:	-50 °C to +140 °C



G	$\begin{array}{c} \text{>}\varnothing\text{<} \\ \text{min mm} \end{array}$	$\begin{array}{c} \text{>}\varnothing\text{<} \\ \text{max mm} \end{array}$	$\begin{array}{c} \text{>}\blacksquare\text{<} \\ \text{mm} \end{array}$	$\begin{array}{c} \text{mm} \\ \text{mm} \end{array}$	H mm	L mm	$\begin{array}{c} \text{max. / Nm} \end{array}$	Art.-No.	
M20x1.5	6.0	9.0	5.0-8.0	24	38.0	6	10	1090.20.090	50
M20x1.5	8.0	11.0	7.0-10.0	24	38.0	6	10	1090.20.110	50
M25x1.5	10.0	13.0	8.0-11.5	30	43.5	7	10	1090.25.130	25
M25x1.5	12.0	16.0	11.0-14.5	30	43.5	7	10	1090.25.160	25
M32x1.5	13.0	18.0	11.0-16.0	36	47.0	8	15	1090.32.180	25
M32x1.5	16.0	21.0	14.0-19.0	36	47.0	8	15	1090.32.210	25
M40x1.5	20.5	25.5	17.5-22.5	46	55.0	8	20	1090.40.255	10
M40x1.5	23.0	28.0	20.5-25.5	46	55.0	8	20	1090.40.285	10



Long connection thread, metric

G	$\begin{array}{c} \text{>}\varnothing\text{<} \\ \text{min mm} \end{array}$	$\begin{array}{c} \text{>}\varnothing\text{<} \\ \text{max mm} \end{array}$	$\begin{array}{c} \text{>}\blacksquare\text{<} \\ \text{mm} \end{array}$	$\begin{array}{c} \text{mm} \\ \text{mm} \end{array}$	H mm	L mm	$\begin{array}{c} \text{max. / Nm} \end{array}$	Art.-No.	
M20x1.5	6.0	9.0	5.0-8.0	24	38.0	6	10	1190.20.090	50
M20x1.5	8.0	11.0	7.0-10.0	24	38.0	6	10	1190.20.110	50
M25x1.5	10.0	13.0	8.0-11.5	30	43.5	7	10	1190.25.130	25
M25x1.5	12.0	16.0	11.0-14.5	30	43.5	7	10	1190.25.160	25
M32x1.5	13.0	18.0	11.0-16.0	36	47.0	8	15	1190.32.180	25
M32x1.5	16.0	21.0	14.0-19.0	36	47.0	8	15	1190.32.210	25
M40x1.5	20.5	25.5	17.5-22.5	46	55.0	8	20	1190.40.255	10
M40x1.5	23.0	28.0	20.5-25.5	46	55.0	8	20	1190.40.285	10



Website



Braided sleeving.

In cooperation with our esteemed customers, we have clarified the product properties that are especially important for the user and have worked with our production engineers to translate these criteria into improved products.

The most notable change is the more pointed braid angle with which the individual strands are woven together. This new way of braiding, combined with a slightly thinner strand in the polyester version, results in extremely flexible sleeving and outstanding stretching qualities. The braiding can stretch to twice its nominal diameter.

The more pointed braid angle also permits smoother insertion of wires and cables, even over long distances. The individual strands run more parallel to the cables and do not obstruct or "catch" the cable.

Key properties:

- Extremely flexible
- Shortening/expansion ratio 1 : 2
- High resistance to acids and alkaline substances
- Tested according to EN 45545-2

In relation to certifications and approvals of cable protection sleeving products, please contact your AGRO sales representative.

Braided sleeving for electric vehicles

Material:	Polyester PET
Monofil:	Ø 0.25 mm
Properties:	Highly flexible, self-adapting, resistant to abrasion, free of cadmium, formaldehyde, halogen and graphite, self-extinguishing acc. to DIN 75200 (FMVSS 302), good resistance to fuel, mineral oil and chemicals
Expansion:	Expansion ratio 1 : 2
Operation temperature:	-55 °C to +150 °C

Orange					Art.-No.	
NW	Ø min mm	Ø max mm	OFB %			
5	4	10	89		6875.80.05	100
8	6	11	85		6875.80.08	100
10	8	14	84		6875.80.10	100
12	10	16	88		6875.80.12	100
16	14	24	86		6875.80.16	100
20	18	25	88		6875.80.20	100
25	18	33	87		6875.80.25	100
35	30	52	85		6875.80.35	100
45	38	60	85		6875.80.45	100

Colour orange for electric vehicles

OFB = Percentage of the surface covered by fabric



for additional installation

Material:	Monofil polyester PET with multifilament fibres
Monofil:	Ø 0.25 mm
Application:	Sinking of pre-connectorised cables without problems, for additional installation
Properties:	Highly flexible, self-adapting, resistant to abrasion, free of cadmium, formaldehyde, halogen and graphite, self-extinguishing acc. to DIN 75200 (FMVSS 302), good resistance to fuel, mineral oil and chemicals
Execution:	bundled winding strand
Operation temperature:	-55 °C to +150 °C

Orange					Art.-No.	
NW	Ø min mm	Ø max mm				
8	5	8			6879.80.08	50
13	10	13			6879.80.13	50
16	13	16			6879.80.16	50
19	16	19			6879.80.19	25
25	22	25			6879.80.25	25
29	26	29			6879.80.29	25
32	29	32			6879.80.32	25
38	35	44			6879.80.38	25
50	44	50			6879.80.50	25

Colour orange for electric vehicles

Nominal inner diameter with 25% / 90° overlap



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Products for applications in mechanical engineering, plant engineering, vehicle and rolling stock manufacturing, automation and energy technology.



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Our team of technical advisors will be happy to answer any questions you may have or provide further information, and looks forward to speaking with you: **+41 (0) 62 889 47 47 · info@agro.ch**

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