

Operating Instruction (english)

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1 General

1.1 Manufacturer

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1.2 Details of the operating instruction

- Identification / Part no. MONTAN07
- Issued 2024-10

1.3 Additional documents

- Catalogue and product data sheets www.jacob-gmbh.de
- EU Declaration of conformity see page 32
- EU Type Examination Certificate www.jacob-gmbh.de
- IECEx Certificate of Conformity www.jacob-gmbh.de

1.4 Designation, description and classification of product

- General designation: Ex Equipment cable gland
- Manufacturer designation:
• PERFECT plus Ex-cable gland, series K100-1xxx-zz-EX and K400-1xxx-zz-EX, consisting of dome nut, lamellar insert, sealing ring, gland body with connecting thread and o-ring-sealing
• PERFECT plus EMC-Ex-cable gland, series K102-1xxx-zz-EX and K402-1xxx-zz-EX, consisting of the individual components of the PERFECT plus Ex cable gland and additional contact spring
- Classification: Ex Equipment cable gland with clamping by the sealing ring for entry of non-armoured and braided cables.
- Optional accessories: Hexagonal locknuts series 50.2xx M, 50.2xx Y, 50.2xx YPOT

1.5 Conformity with directives, standards and regulations

- Development, production and testing as per DIN EN ISO 9001 and EN ISO IEC 80079-34.
- EU Declaration of conformity, see page 32
- IECEx Certificate of Conformity

2 Safety Instructions

2.1 Target group

Specialist electricians and personnel trained in electrical engineering, with specialist knowledge and skills required to perform work on equipment for use in potentially explosive areas.

2.2 Safe use

- Carefully read the operating instruction and observe them
- Store the operating instruction at the installation location
- Ex Equipment cable gland is only approved and is only to be used for the following purposes:
 - for entry of fixed installed cables
 - in enclosures and equipment with Type of Protection "eb" (Increased safety) and "tb" (Protection by enclosure)
 - in areas with explosive gas atmosphere, Zones 1 and 2, equipment group II, categories 2G and 3G, group IIC, Equipment Protection Level (EPL) Gb
 - in areas with explosive dust atmosphere, Zones 21 and 22, equipment group II, categories 2D and 3D, group IIIC, Equipment Protection Level (EPL) Db
- Work on the Ex Equipment cable gland, including installation, commissioning, servicing, maintenance and repair, may only be performed by specialist electricians or personnel trained in electrical engineering with the appropriate specialist knowledge and skills.
- Before installation and commissioning, ensure that the Ex Equipment cable gland is undamaged.
- Before installation, remove the dust cap
- Only suitable for use in a normal industrial atmosphere
- The operator is solely responsible for proper and safe use, with reference to these operating instructions.

2.3 Restrictions on use

- Additional reliable strain relief/anchorage must be guaranteed for the inserted and fixed installed cables.
- The Ex Equipment cable glands with connecting thread M12x1,5, types K100-1012-zz-EX and K102-1012-zz-EX are only suitable for low risk mechanical hazards. Install with protection against mechanical impact energy.

2.4 Prohibited use

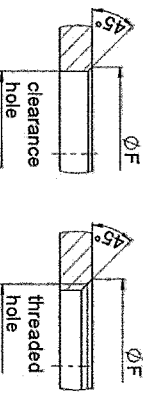
- Contrary to the manufacturer's specification (see "3. Technical data")
- Operation with dust cap
- Use in Zone 0 and 20
- Use on flameproof enclosures in potentially explosive areas
- PERFECT plus EMC-Ex-cable gland for equipotential bonding

2.5 Modification and alteration

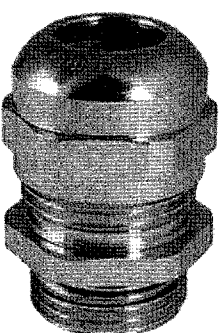
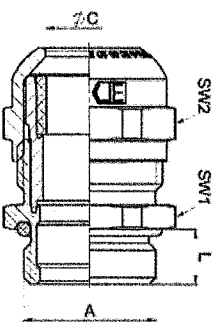
WARNING

Hazard due to modification or alteration! Explosion protection at risk!
The PERFECT plus Ex-cable gland and PERFECT plus EMC-Ex-cable gland may not be modified or altered.

3 Technical data

Types / Series	K100-1xxx-zz-EX, K102-1xxx-zz-EX K400-1xxx-zz-EX, K402-1xxx-zz-EX			
Marking	Ⓢ II 2G Ex eb IIC Gb Ⓢ II 2D Ex tb IIIC Db			
Registered trademark of the manufacturer	E			
EU Type Examination Certificate	BVS 17 ATEX E 118 X			
IECEx Certificate of Conformity	IECEx BVS 17.0101X			
Identification number notified body (QAR)	0158			
Connecting thread size	metric: M12x1,5 to M63x1,5 as per EN IEC 60423			
Connecting thread length	Standard length: 6,5 mm to 10 mm Long: > 10 mm Connecting threads longer than the standard length or the long version are also approved.			
Wall thickness of enclosure	≥ 4 mm - Threaded hole < 4 mm - Threaded hole with hexagonal locknut - Clearance hole with hexagonal locknut			
Suited for cable diameter	Subject to nominal size, 3 mm to 48 mm			
Suited for equipment with the mechanical risk level	Subject to nominal size and type, 4 J: M12x1,5 types K100-1012-zz-EX, K102-1012-zz-EX 7 J: M12x1,5 types K400-1012-zz-EX, K402-1012-zz-EX 7 J: M16x1,5 to M63x1,5 all types			
Service temperature range	-40 °C to +85 °C -40 °C to +85 °C			
Storage temperature in original packaging				
Degree of protection / Protection grade after installation	IP66 / IP68 (10 bar, 30 min.) as per EN IEC 60529			
Chamfer on the enclosure	Size	ØF [mm]	Size	ØF [mm]
	M12x1,5	13 ±0,2	M32x1,5	33 ±0,2
	M16x1,5	17 ±0,2	M40x1,5	41 ±0,2
	M20x1,5	21 ±0,2	M50x1,5	51 ±0,2
	M25x1,5	26 ±0,2	M63x1,5	64 ±0,2

- Connecting thread as per EN IEC 60423 with tolerance class 6g.
- Threaded holes must comply with EN IEC 60423 with tolerance class 7H.
- Surface roughness in the area of the contact surface of the Ex equipment cable gland max. 2 µm Ra as per ISO 1302.



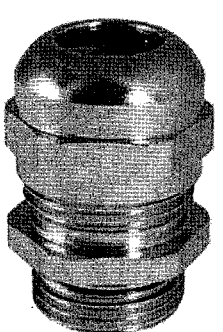
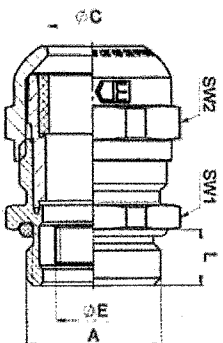
Part No.	A	ØC	L	SW1	SW2	Installation torque M		Ø clearance hole enclosure
						Gland body	Dome nut	
		[mm]	[mm]	[mm]	[mm]	[Nm]	[Nm]	[mm]
K100-1012-00-EX	M12x1,5	3 - 7	6,5	16	16	3	3	12 ^{+0,2}
K100-1016-00-EX	M16x1,5	6 - 10	7	20	20	3	3	16 ^{+0,2}
K100-1020-00-EX	M20x1,5	8 - 13	8	24	24	3	3	20 ^{+0,2}
K100-1025-00-EX	M25x1,5	10 - 17	8	29	29	6	6	25 ^{+0,2}
K100-1032-00-EX	M32x1,5	11 - 21	9	36	36	12	12	32 ^{+0,2}
K100-1040-00-EX	M40x1,5	16 - 28	9	45	45	14	14	40 ^{+0,2}
K100-1050-00-EX	M50x1,5	21 - 35	10	55	55	20	20	50 ^{+0,2}
K100-1063-00-EX	M63x1,5	34 - 48	10	68	68	25	25	63 ^{+0,2}
K400-1012-00-EX	M12x1,5	3 - 7	6,5	16	16	3	3	12 ^{+0,2}
K400-1016-00-EX	M16x1,5	6 - 10	7	20	20	3	3	16 ^{+0,2}
K400-1020-00-EX	M20x1,5	8 - 13	8	24	24	3	3	20 ^{+0,2}
K400-1025-00-EX	M25x1,5	10 - 17	8	29	29	6	6	25 ^{+0,2}
K400-1032-00-EX	M32x1,5	11 - 21	9	36	36	12	12	32 ^{+0,2}
K400-1040-00-EX	M40x1,5	16 - 28	9	45	45	14	14	40 ^{+0,2}
K400-1050-00-EX	M50x1,5	21 - 35	10	55	55	20	20	50 ^{+0,2}
K400-1063-00-EX	M63x1,5	34 - 48	10	68	68	25	25	63 ^{+0,2}

Examples of connecting thread lengths for the types

K100-1xxx-zz-EX generally all thread lengths

K100-1xxx-00-EX Connecting thread standard length

K100-1xxx-50-EX Connecting thread long



Part No.	A	ØC	ØE	L	SW1	SW2	Installation torque M		Ø clearance hole enclosure
							Gland body	Dome nut	
		[mm]	[mm]	[mm]	[mm]	[mm]	[Nm]	[Nm]	[mm]
K102-1012-00-EX	M12x1,5	3 - 7	2,5 - 5	6,5	16	16	3	3	12 ^{+0,2}
K102-1016-00-EX	M16x1,5	6 - 10	4 - 7	7	20	20	3	3	16 ^{+0,2}
K102-1020-00-EX	M20x1,5	8 - 13	5 - 10	8	24	24	3	3	20 ^{+0,2}
K102-1025-00-EX	M25x1,5	10 - 17	7 - 14	8	29	29	6	6	25 ^{+0,2}
K102-1032-00-EX	M32x1,5	11 - 21	9 - 17	9	36	36	12	12	32 ^{+0,2}
K102-1040-00-EX	M40x1,5	16 - 28	14 - 24	9	45	45	14	14	40 ^{+0,2}
K102-1050-00-EX	M50x1,5	21 - 35	17 - 31	10	55	55	20	20	50 ^{+0,2}
K102-1063-00-EX	M63x1,5	34 - 48	25 - 43	10	68	68	25	25	63 ^{+0,2}
K402-1012-00-EX	M12x1,5	3 - 7	2,5 - 5	6,5	16	16	3	3	12 ^{+0,2}
K402-1016-00-EX	M16x1,5	6 - 10	4 - 7	7	20	20	3	3	16 ^{+0,2}
K402-1020-00-EX	M20x1,5	8 - 13	5 - 10	8	24	24	3	3	20 ^{+0,2}
K402-1025-00-EX	M25x1,5	10 - 17	7 - 14	8	29	29	6	6	25 ^{+0,2}
K402-1032-00-EX	M32x1,5	11 - 21	9 - 17	9	36	36	12	12	32 ^{+0,2}
K402-1040-00-EX	M40x1,5	16 - 28	14 - 24	9	45	45	14	14	40 ^{+0,2}
K402-1050-00-EX	M50x1,5	21 - 35	17 - 31	10	55	55	20	20	50 ^{+0,2}
K402-1063-00-EX	M63x1,5	34 - 48	25 - 43	10	68	68	25	25	63 ^{+0,2}

Examples of connecting thread lengths for the types

K102-1xxx-zz-EX generally all thread lengths

K102-1xxx-00-EX Connecting thread standard length

K102-1xxx-50-EX Connecting thread long

4 Installation and commissioning

WARNING

Hazard due to incorrect installation! Explosion protection at risk!

- Work is only to be performed by specialist electricians or personnel trained in electrical engineering with appropriate specialist knowledge and skills.
- Installation as described in these operating instructions
- Compliance with national safety and accident prevention regulations
- Observe technical data (see "3. Technical data")

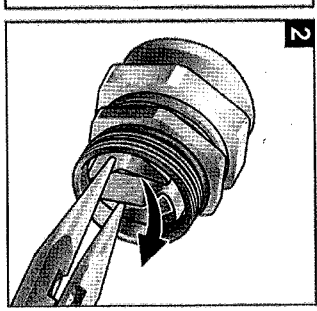
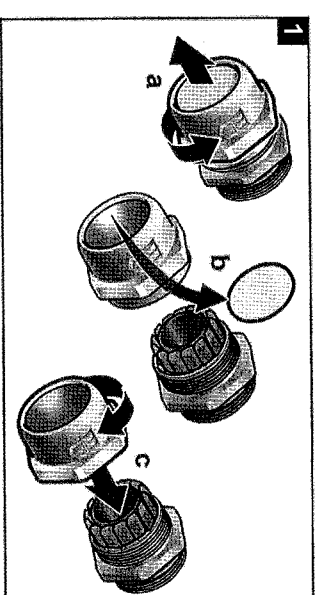
4.1 Basic information

- Additional reliable strain relief/anchorage must be guaranteed for the inserted and fixed installed cables.
- The Ex Equipment cable glands with connecting thread M12x1,5, types K100-1012-zz-EX and K102-1012-zz-EX are only suitable for low risk mechanical hazards. Install with protection against mechanical impact energy.
- Sealing rings and o-ring-sealings are fitted to prevent loss.
- Plugging sealing rings of different sizes into one another is not permitted.
- Threaded and clearance holes must be made perpendicular to the wall of the enclosure.
- Avoid excessive chamfers or sharp edges on threaded or clearance holes
- Observe the specified service temperature range (see "3. Technical data")
- The specified installation torques must be used. If a specified installation torque cannot be used, we will conduct a type-specific test on request.
- Use suitable tools
 - Torque wrench
 - Cable stripper to expose the braided screen of a shielded cable
 - Pliers for removing the contact spring

4.2 Before installation and commissioning

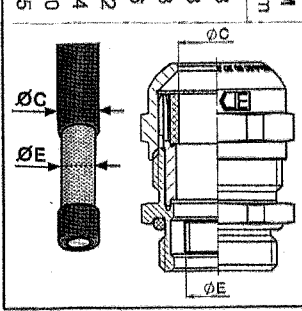
- Check for integrity of
 - Ex Equipment cable gland
 - Thread
 - Sealing rings and o-ring-sealings
 - Threaded or clearance hole in enclosure
- Remove dust cap
- Choose the connecting thread size based on the sealing and clamping range ØC
- Ensure that the connecting thread and the threaded or clearance hole in the enclosure match.
- Observe the wall thicknesses (see "3. Technical data")
- Check whether the length of the connecting thread is sufficient. If required, select a version with long connecting thread.
- When installing the Ex Equipment cable gland with long connecting thread and when installing with a hexagonal locknut in the enclosure, ensure compliance with the required clearance and creepage distances.

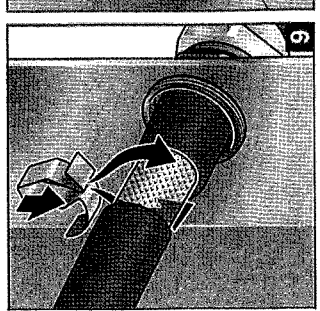
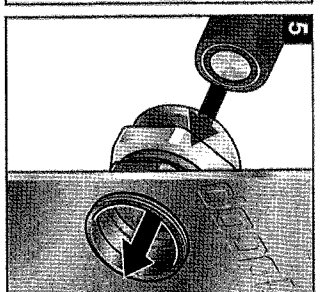
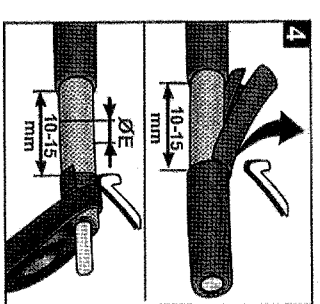
4.3 Installation of PERFECT plus EMC-Ex-cable gland
Only use the PERFECT plus EMC-Ex-cable gland for function for shielding and not for equipotential bonding.

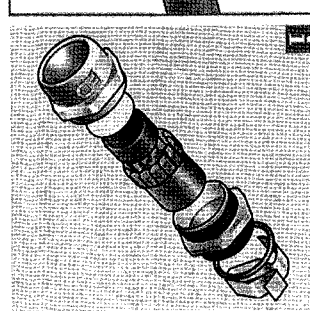
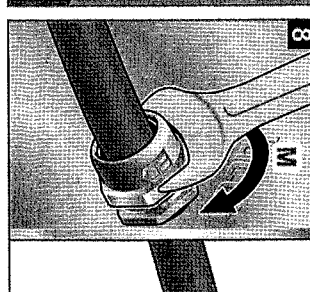
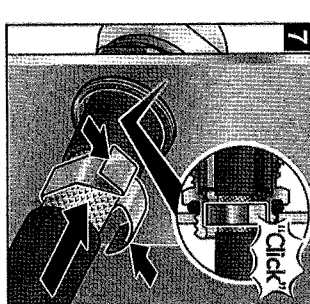




TI	ØC mm	ØE mm	M Nm
M12x1,5	3-7	2,5-5	3
M16x1,5	6-10	4-7	3
M20x1,5	8-13	5-10	3
M25x1,5	10-17	7-14	6
M32x1,5	11-21	9-17	12
M40x1,5	16-28	14-24	14
M50x1,5	21-35	17-31	20
M63x1,5	34-48	25-43	25







4.4 During installation

- During installation, make sure that the Ex Equipment cable gland is fully screwed into the connecting thread.
- Ensure proper seating of the sealing rings and o-ring-sealings
- Ensure that the specified protection grades are upheld.
- To prevent loosening, if necessary use an additional hexagonal locknut or suitable thread locking fluid.

5 Operation

- Observe the specified service temperature range (see "3. Technical data")
- Excess dust deposits are to be prevented. The user must comply with the requirements of EN IEC 60079-0 and EN IEC 60079-31.
- Perform regular servicing work (see "6. Service, maintenance, repair")

6 Service, maintenance, repair

WARNING

Hazard due to incorrect servicing, maintenance and repair! Explosion protection at risk!

- Work is only to be performed by specialist electricians or personnel trained in electrical engineering with appropriate specialist knowledge and skills.
- The nature and scope of servicing, maintenance and testing are based on national regulations.
- Adapt maintenance and testing intervals to operating conditions
- Minimum checks:
 - Integrity of sealing rings and o-ring-sealings
 - No cracking or damage to the Ex Equipment cable gland
 - Tightness of the Ex Equipment cable gland. If required, re-tighten to the specified installation torque.
 - Compliance with permitted temperatures
- Only repair with genuine spare parts

7 Accessories and spare parts

- Optional accessories: Hexagonal locknuts series 50.2xx M, 50.2xx Y, 50.2xx YPOT
- Only use genuine spare parts and accessories from Jacob GmbH.

8 Disposal

- Observe national and local directives and regulations for disposal
- Ensure environmentally sound disposal of all components
- Separate materials for recycling
- Material information:
 - Dome nut, Gland body: Brass, nickel plated surface
 - Polymer parts: Brass lead-free, nickel plated surface
Polyamide, CR/NBR, NBR, Polyethylene
 - Contact spring: Stainless steel