

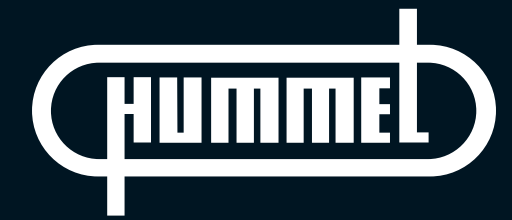


*Setting Standards*

## Cable Glands for „Hazardous Areas“



**EXIOS**



# Cable Glands for „Hazardous Areas“



# EXIOS

## HUMMEL AG



For over 60 years HUMMEL AG has provided outstanding solutions for all forms of cable management applications in the form of cable glands, metal circular connectors and box enclosures. Our NEW innovative EXIOS range of Ex-d cable glands now offers the highest quality, reliability, ease of installation and above all safety for all hazardous area applications by meeting the very latest ATEX / IECEx Standards.

HUMMEL AG continues to invest in its ongoing programme of Ex product development to provide its customers with the best product and safety features – We aim to meet our Company motto:

### Setting Standards

HUMMEL AG has a worldwide reputation as a leading manufacturer of electro-mechanical devices and offers the latest construction, tool making, plating, and assembly within our automated factory processes. Our staffs are trained to the highest standards.

### EXIOS should be the new choice of specification

Used primarily on Offshore / Onshore Oil & Gas Exploration the EXIOS is gaining rapid global recognition as the leading Ex Gland for Dual Seal and Barrier applications. Together with the existing high specification of our premier brand – HSK – HUMMEL can offer cable glands for Exd / Exe / Exi areas in VO rated plastic, brass, nickel plated, stainless steel. Linked to these items are our approved range of cable gland accessories.

HUMMEL AG offers its customer base the Global Coverage demanded with point of contact in most continents. See the HUMMEL website for our locations and network of sales agents and distributors. Quality Management is fundamental to our approach and EXIOS is produced to ISO 9001: 2008 and the very latest flameproof standards globally.

### EXIOS IS THE NUMBER ONE CHOICE FOR ALL EXD CABLE GLANDS



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## General:

The quality of our products has been certified by many different certification bodies and authorities. HUMMEL AG is a certified manufacturer and supplier of electro-mechanical devices.

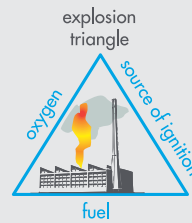


### What is an explosion?

So that an explosion can occur, three conditions must be fulfilled; see the explosion triangle diagramm.

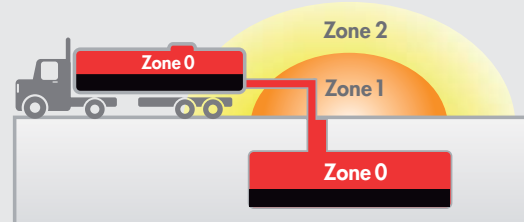
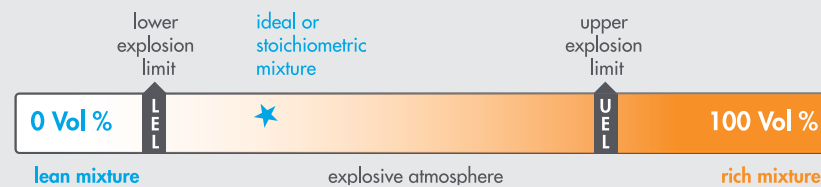
1. Fuel
2. Oxygen
3. Source of ignition

If one removes one of these three conditions, an explosion cannot occur.



### Potentially Explosive Atmosphere

A potentially explosive atmosphere is understood to be a mixture of a combustible material and oxygen. Oxygen is generally present as a component of air. Combustible materials can be e.g.: gases, fluids, vapours, mist or dusts. If the proportion of oxygen falls below a certain value dependent on the material, known as the oxygen limit concentration, then this mixture cannot be ignited.



### Zones IEC/CENELEC/ATEX

Category	Zone	Description
GAS	Zone 0	relates to areas in which a potentially explosive atmosphere consisting of a mixture of air and gases, vapours or mist exists continuously, for long periods or frequently
	Zone 1	relates to areas in which it can be considered that a potentially explosive atmosphere of gases, vapours or mist occurs occasionally
	Zone 2	relates to areas in which it is unlikely that a potentially explosive atmosphere of gases, vapours or mist might occur, but if it does occur then in all probability only seldom and for a short period
DUST	Zone 20	relates to areas in which a potentially explosive atmosphere consisting of a mixture of dust and air exists continuously, for long periods or frequently
	Zone 21	relates to areas in which it can be considered that a potentially explosive atmosphere of a mixture of dust and air occurs occasionally
	Zone 22	(note the difference between conductive and non-conductive dust!) relates to areas in which it is unlikely that a potentially explosive atmosphere of suspended dust might occur, but if it does occur then in all probability only seldom and for a short period

### Appartous Group and Device Category EPL

#### Group I Mining

- M1 high degree of safety EPL Ma
- M2 high degree of safety EPL Mb

#### Group II Non-Mining

- 1 very high degree of safety
  - Gas (Zone 0, 1, 2) EPL Ga
  - Dust (Zone 20, 21, 22) EPL Da
- 2 high degree of safety
  - Gas (Zone 1, 2) EPL Gb
  - Dust (Zone 21, 22) EPL Db
- 3 normal degree of safety
  - Gas (Zone 2) EPL Gc
  - Dust (Zone 22) EPL Gc

### Gases and Dust

Gas	Dust
IIA Propane	IIIA combustible dust
IIB Ethylene	IIIB non-conductive dust
IIC Hydrogene	IIIC conductive dust

### Temperature Classes

Temperature class	Highest permissible surface temperature of the operating facility	Ignition temperature of combustible materials
T1	450 °C	> 450 °C
T2	300 °C	> 300 °C < 450 °C
T3	200 °C	> 200 °C < 300 °C
T4	135 °C	> 135 °C < 200 °C
T5	100 °C	> 100 °C < 200 °C
T6	85 °C	> 85 °C < 100 °C

### Protection Concepts

#### Electrical

Intrinsic safety	Ex-ia	IEC 60079-11/EN 60079-11	Zone 0,1,2	Limit the energy	
Intrinsic safety	Ex-ib	IEC 60079-11/EN 60079-11	Zone 1,2		
Intrinsic safety	Ex-ic	IEC 60079-11/EN 60079-11	Zone 2		
Increased safety	Ex-e	IEC 60079-7/EN 60079-7	Zone 1,2	No arcs, sparks or hot surfaces, IP54 or better.	
Flameproof enclosure	Ex-d	IEC 60079-1/EN 60079-1	Zone 1,2	Contain the explosion Use a flamepath.	

#### Dust Protection

Enclosure	Ex-t	IEC 60079-31/EN 60079-31	Zone 20,21,22	Dust tight enclosure IP6X	
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### International Protection, EN 60529

1. Code		2. Code		Penetration of water							
Protection against human access to hazardous parts	Protection of equipment against penetration of solid foreign objects	IP 0x	IP 00	IP x1	IP x2	IP x3	IP x4	IP x5	IP x6	IP x7	IP x8
Non-protected	Non-protected	IP 0x	IP 00								
Protected against access to hazardous parts with the back of the hand	Protected against solid foreign objects larger in diameter than 50 mm	IP 1x	IP 10	IP 11	IP 12						
Protected against access to hazardous parts with a finger	Protected against solid foreign object larger in diameter than 12,5 mm	IP 2x	IP 20	IP 21	IP 22	IP 23					
Protected against access to hazardous parts with a tool larger in diameter than 25 mm	Protected against solid foreign objects larger in diameter than 2,5 mm	IP 3x	IP 30	IP 31	IP 32	IP 33	IP 34				
Protected against access to hazardous parts with a wire larger in diameter than 1,0 mm	Protected against solid foreign objects larger in diameter than 1 mm	IP 4x	IP 40	IP 41	IP 42	IP 43	IP 44				
Protected against access to hazardous parts with a wire larger in diameter than 1,0 mm	Prevents penetration of dust sufficient to cause damage inside the equipment.	IP 5x	IP 50				IP 54	IP 55			
Protected against access to hazardous parts with a wire larger in diameter than 1,0 mm	Dust proof	IP 6x	IP 60					IP 65	IP 66	IP 67	IP 68

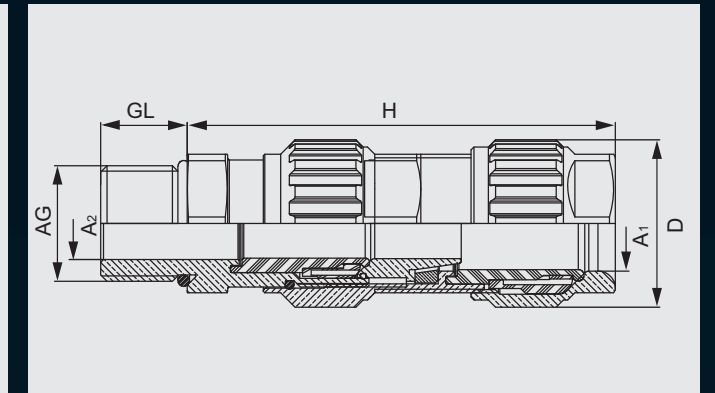
### EXIOS Standards

IEC 60079-0:2007-10	IEC 60079-1:2007-4	IEC 60079-7:2006-7	IEC 60079-31:2008
EN 60079-0:2009	EN 60079-1:2007	EN 60079-7:2007	EN 60079-31:2009
EN 60529			

- Dual seal on the inner and outer sheath of the cable
  - Time-proven HUMMEL clamping system
  - Armour acceptance range from 0 – 2,5 mm
  - Exceptional clamping range
  - Innovative „Interlocking Armour Cone“
  - Zero torsion on cable cores and armour
  - Fast and easy pre-assembly by hand by the use of profile material with maximum grip
- 
- According to the latest IECEx and ATEX standards
  - Ex-e / Ex-d / Ex-ta
  - Zones 1, 2, 20, 21, 22
  - II 2G Ex d/e IIC Gb / II 1D Ex ta IIIC Da
  - Equipment Protection Level GbDa
- 
- IP 66, 67 and 68 (5 bar)
  - Halogen- and phosphorous-free
  - Silicone Seals and O-Ring are standard

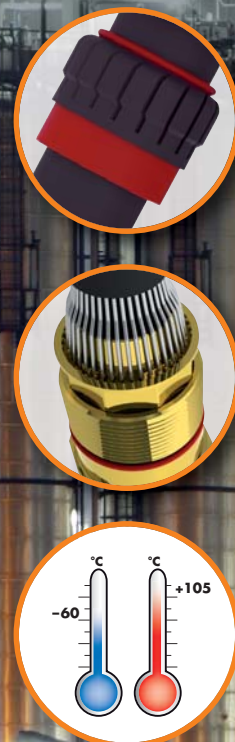
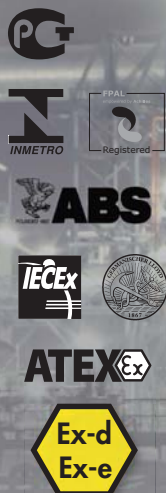


Mechanical Data	Materials and Technical Data
Material	brass, nickel-plated brass, stainless steel
Seals / O-Rings	silicone, VMQ
Clamping insert	PA 6
Armour	Metallic Armour or Screen
Temperature Range	-60°C – 105°C (-76°F – 221°F)
Protection	IP 66, 67 and 68 (5 bar)
Certificate	IECEx BVS 10.0078 X BVS 10 ATEX E 062 X



Metric Brass											
Number	Gland Size	AG	H mm	D mm	H max.	GL mm	Ø A1 mm	Ø A2 mm	Armour Ø mm		
									Clamping ring 1	Clamping ring 2	Ring 3 optional
1.605.1600.50	20-1	M 16x1,5	22	27	69,5	16	6-12	3-8,1	0-0,7	0,7-1,25	-
1.605.2000.50	20-2	M 20x1,5	24	29	74,3	16	9-16	6-12	0-0,7	0,7-1,25	-
1.605.2000.51	20-3	M 20x1,5	30	35	80,5	16	12,5-20,5	9-14	0-0,7	0,7-1,4	-
1.605.2000.52	20-3	M 20x1,5	30	35	80,5	16	12,5-20,5	9-14	0-0,7	0,7-1,4	-
1.605.2500.51	20-3	M 25 x 1,5	36	42	91	16	16,9-26	12,5-20,5	0-0,7	0,9-1,6	0,7-1,4
1.605.2500.50	25	M 25x1,5	36	42	91	16	16,9-26	12,5-20,5	0-0,7	0,9-1,6	0,7-1,4
1.605.3200.50	32	M 32x1,5	46	52	96	16	22-33	16,9-26	0-0,7	1,3-2,0	0,7-1,4
1.605.4000.50	40	M 40x1,5	55	64	107	16	28-41	22-33	0-0,7	1,3-2,0	0,7-1,4
1.605.5000.50	50	M 50x1,5	65	73	131,5	16	36-52,6	28,9-44,4	0-1,0	1,5-2,5	1,0-2,0
1.605.6300.50	63	M 63x1,5	80	90	144,5	16	46-65,3	39,9-56,3	0-1,0	1,5-2,5	1,0-2,0
1.605.7500.50	75	M 75x1,5	95	107	154	16	57-78	50,5-68,2	0-1,0	1,5-2,5	1,0-2,0

NPT brass											
Number	Gland Size	AG	H mm	D mm	H max.	GL mm	Ø A1 mm	Ø A2 mm	Armour Ø mm		
									Clamping ring 1	Clamping ring 2	Ring 3 optional
1.605.3800.70	20-1	NPT 3/8"	22	27	69,5	16	6-12	3-8,1	0-0,7	0,7-1,25	-
1.605.1200.70	20-2	NPT 1/2"	24	29	74,3	20	9-16	6-12	0-0,7	0,7-1,25	-
1.605.1200.71	20-3	NPT 1/2"	30	35	80,5	20	12,5-20,5	9-14	0-0,7	0,7-1,4	-
1.605.3400.70	25	NPT 3/4"	36	42	91	20,5	16,9-26	12,5-20,5	0-0,7	0,9-1,6	0,7-1,4
1.605.1000.70	32	NPT 1"	46	52	96	25	22-33	16,9-26	0-0,7	1,3-2,0	0,7-1,4
1.605.5400.70	40	NPT 1 1/4"	55	64	107	26	28-41	22-33	0-0,7	1,3-2,0	0,7-1,4
1.605.6400.70	40	NPT 1 1/2"	55	64	107	26,5	28-41	22-33	0-0,7	1,3-2,0	0,7-1,4
1.605.2000.70	50	NPT 2"	65	73	131,5	27	36-52,6	28,9-44,4	0-1,0	1,5-2,5	1,0-2,0
1.605.5200.70	63	NPT 2 1/2"	80	90	144,5	40	46-65,3	39,9-56,3	0-1,0	1,5-2,5	1,0-2,0
1.605.3000.70	75	NPT 3"	95	107	154	41	57-78	50,5-68,2	0-1,0	1,5-2,5	1,0-2,0



# EXIOS + BARRIER

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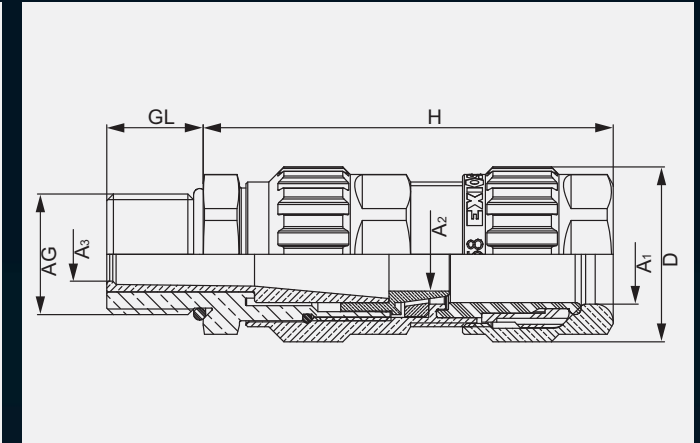
The innovative and advanced design of the EXIOS is available as a barrier version.

The EXIOS Barrier has all the outstanding EXIOS features, but uses a compound barrier to make it flameproof. Whenever installation requires a barrier gland (IEC 60079-14 / 10.4.2), EXIOS Barrier is your solution.

- According to the latest IECEx and ATEX standards
- Ex-e / Ex-d / Ex-ta
- Zones 1, 2, 20, 21, 22
- I M2 Ex d/e I Mb IIC Gb / Ex ta IIIC Da
- Equipment Protection Level MbGbDa
- IP 66, 67 and 68 (5 bar)
- Halogen- and phosphorous-free
- Silicone Seals and O-Ring are standard



Mechanical Data	Materials and Technical Data
Material	brass, nickel-plated brass, stainless steel
Seals / O-Rings	silicone, VMQ
Compound	Epoxy-Putty
Clamping insert	PA 6
Armour	Metallic Armour or Screen
Temperature Range	-60°C – 85°C (-76°F – 185°F)
Protection	IP 66, 67 and 68 (5 bar)
Certificate	IECEX SIR 11.0044X Sira 11 ATEX 1110X



Metric brass										Armour Øk mm		
Number	Gland Size	AG	Ø mm	D mm	H max.	GL mm	Øk A1 mm	A2 Øk Max. Inner Sheath	A3 Øk Max. over cores	Max. No. cores	Clamping ring 1	Clamping ring 2
1.606.1600.50	20-1	M 16x1,5	22	27	69,5	16	6-12	8,2	7,9	8	0-0,7	0,7-1,25
1.606.2000.50		M 20x1,5										
1.606.2000.51	20-2	M 20x1,5	24	29	74,3	16	9-16	12	8,8	10	0-0,7	0,7-1,25
1.606.2000.52		M 20x1,5										
1.606.2500.51	20-3	M 25x1,5	30	35	80,5	16	12,5-20,5	14	11,5	15	0-0,7	0,7-1,4
1.606.2500.50		M 25x1,5										
1.606.3200.50	25	M 32x1,5	36	42	91	16	16,9-26	20	16,4	25	0-0,7	0,9-1,6
1.606.4000.50	32	M 40x1,5	46	52	96	16	22-33	26	21,4	45	0-0,7	1,3-2,0
1.606.5000.50	40	M 50x1,5	55	64	107	16	28-41	33,2	27,6	70	0-0,7	1,3-2,0
1.606.6300.50	50	M 63x1,5	65	73	131,5	16	36-52,6	44,2	37,5	85	0-1,0	1,5-2,5
1.606.6300.50	63	M 63x1,5	80	90	144,5	16	46-65,3	56,2	47,3	120	0-1,0	1,5-2,5
1.606.7500.50	75	M 75x1,5	95	107	154	16	57-78	68,2	58,0	150	0-1,0	1,5-2,5

NPT brass										Armour Øk mm		
Number	Gland Size	AG	Ø mm	D mm	H max.	GL mm	Øk A1 mm	A2 Øk Max. Inner Sheath	A3 Øk Max. over cores	Max. No. cores	Clamping ring 1	Clamping ring 2
1.606.3800.70	20-1	NPT 3/8"	22	27	64,0	16	6-12	8,2	7,9	8	0-0,7	0,7-1,25
1.606.1200.70	20-2	NPT 1/2"	24	29	68,0	16	9-16	12	8,8	10	0-0,7	0,7-1,25
1.606.1200.71	20-3	NPT 1/2"	30	35	73,0	16	12,5-20,5	14	11,5	15	0-0,7	0,7-1,4
1.606.3400.70	25	NPT 3/4"	36	42	81,3	16	16,9-26	20	16,4	25	0-0,7	0,9-1,6
1.606.1000.70	32	NPT 1"	46	52	85,5	16	22-33	26	21,4	45	0-0,7	1,3-2,0
1.606.5400.70	40	NPT 1 1/4"	55	64	94,4	16	28-41	33,2	27,6	70	0-0,7	1,3-2,0
1.606.6400.70		NPT 1 1/2"										
1.606.2000.70	50	NPT 2"	65	73	116,3	16	36-52,6	44,2	37,5	85	0-1,0	1,5-2,5
1.606.5200.70	63	NPT 2 1/2"	80	90	127,6	16	46-65,3	56,2	47,3	120	0-1,0	1,5-2,5
1.606.3000.70	75	NPT 3"	95	107	136,5	16	57-78	68,2	58,0	150	0-1,0	1,5-2,5



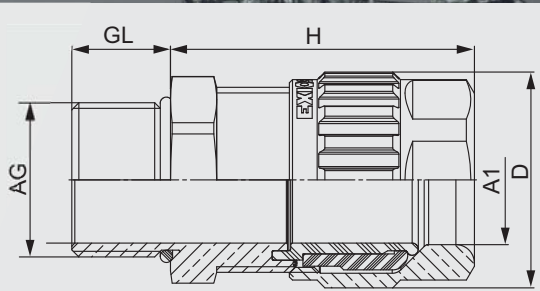
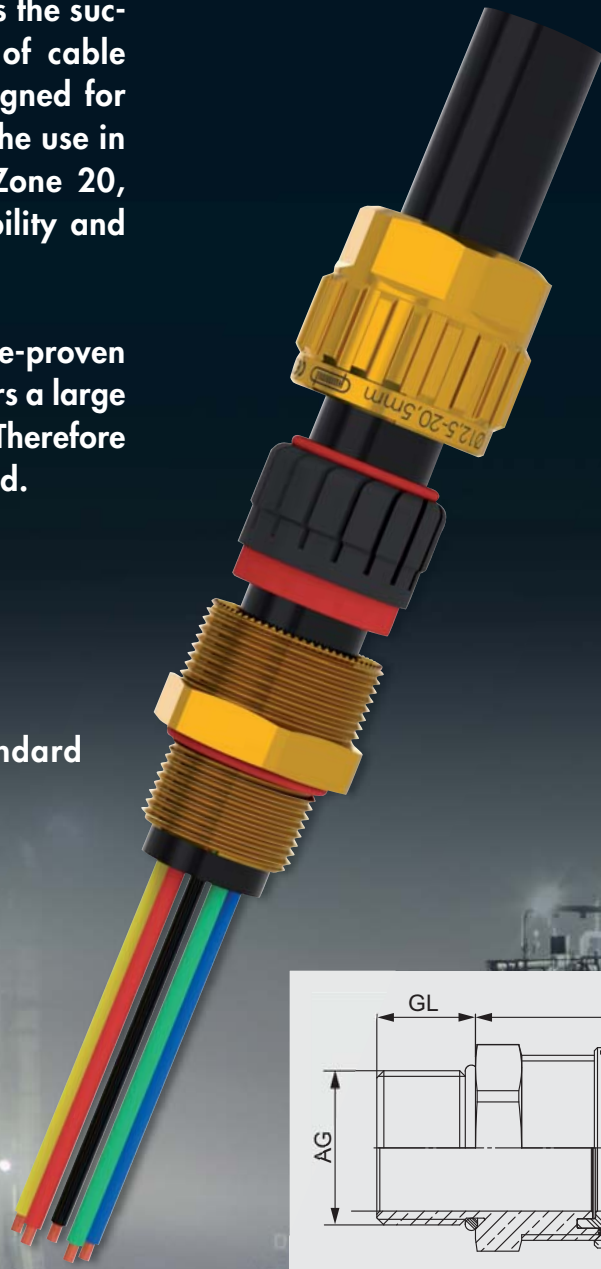
# EXIOS<sup>+</sup>A2F

coming soon

With the EXIOS A2F, HUMMEL follows the successful design of the EXIOS range of cable glands. This model is especially designed for unarmoured and braided cables for the use in hazardous areas Zone 1, Zone 2, Zone 20, Zone 21 and Zone 22, where durability and quality is a must.

The EXIOS A2F incorporates the time-proven HUMMEL clamping system, which offers a large clamping range in a small gland size. Therefore a smaller gland size can often be used.

- Ex-e / Ex-d / Ex-ta
- IP 66, 67 and 68 (5bar)
- Halogen- and phosphorous-free
- Silicone Seal and O-Ring are standard



## Metric brass (NPT upon request)

Item No.	Gland Size	AG	⌀ mm	D mm	H max.	GL mm	A1 ⌀ mm
1.608.1600.50	20-1	M16x1,5	22	27	36,5	16	6-12
1.608.2000.50	20-2	M20x1,5	24	29	41	16	9-16
1.608.2001.51	20-3	M25x1,5	30	35	48	16	12,5-20,5
1.608.2500.50	25	M32x1,5	36	42	48,5	16	16,9-26
1.608.3200.50	32	M40x1,5	46	52	54	16	22-33
1.608.4000.50	40	M50x1,5	55	64	60	16	28-41
1.608.5000.50	50	M63x1,5	65	73	67	16	40-52,6
1.608.6300.50	63	M75x1,5	80	90	72	16	51-65,3

## Accessories

### Red Fibre Washer



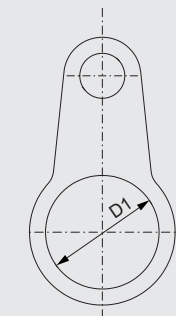
Metric	Item No.	NPT	Item No.
M16	1.326.1600.50	1/2"	1.326.1200.70
M20	1.326.2000.50	3/4"	1.326.3400.70
M25	1.326.2500.50	1"	1.326.1000.70
M32	1.326.3200.50	1 1/4"	1.326.5400.70
M40	1.326.4000.50	1 1/2"	1.326.6400.70
M50	1.326.5000.50	2"	1.326.2000.70
M63	1.326.6300.50	2 1/2"	1.326.5200.70
M75	1.326.7500.50	3"	1.326.3000.70

### PVC Shroud



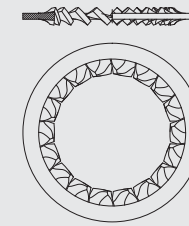
EXIOS Size	Item No.
20-1	1.802.2000.50
20-2	1.802.2000.51
20-3	1.802.2000.52
25	1.802.2500.50
32	1.802.3200.50
40	1.802.4000.50
50	1.802.5000.50
63	1.802.6300.50
75	1.802.7500.50

### Earth Tag Brass



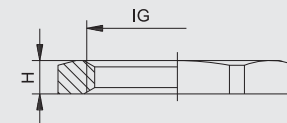
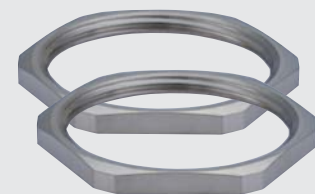
Metric	Item No.	NPT	Item No.
M16	1.022.1600.50	1/2"	1.022.1200.70
M20	1.022.2000.50	3/4"	1.022.3400.70
M25	1.022.2500.50	1"	1.022.1000.70
M32	1.022.3200.50	1 1/4"	1.022.5400.70
M40	1.022.4000.50	1 1/2"	1.022.6400.70
M50	1.022.5000.50	2"	1.022.2000.70
M63	1.022.6300.50	2 1/2"	1.022.5200.70
M75	1.022.7500.50	3"	1.022.3000.70

### Serrated Washer INOX



Metric	Item No.	NPT	Item No.
M16	1.329.1600.50	1/2"	1.329.1600.70
M20	1.329.2000.50	3/4"	1.329.3400.70
M25	1.329.2500.50	1"	1.329.1000.70
M32	1.329.3200.50	1 1/4"	1.329.5400.70
M40	1.329.4000.50	1 1/2"	1.329.6400.70
M50	1.329.5000.50	2"	1.329.2000.70
M63	1.329.6300.50	2 1/2"	1.329.5200.70
M75	1.329.7500.50	3"	1.329.3000.70

### Locknut Nickel Plated Brass (GM-Ms) (NPT upon request)



IG	H mm	⌀ mm	Item No.
M16 x 1,5	2,8	19	1.161.1600.50
M20 x 1,5	3,0	23	1.161.2000.50
M25 x 1,5	3,5	29	1.161.2500.50
M32 x 1,5	4,0	36	1.161.3200.50
M40 x 1,5	4,5	45	1.161.4000.50
M50 x 1,5	5,5	55	1.161.5000.50
M63 x 1,5	6,0	70	1.161.6300.50
M75 x 1,5	8,0	85	1.161.7500.50



## HUMMEL Worldwide

### HUMMEL Brazil

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