

Cable Solutions

# **LÜTZE CABLEFIX®**Cable Gland Systems



## **Efficiency in Automation**

Cable • Connectivity • Cabinet • Control

## Welcome to LÜTZE

#### **Cable Solutions**



#### **Connectivity Solutions**



#### **Cabinet Solutions**



#### **Control Solutions**



#### **Transportation Solutions**



#### **LÜTZE - Efficiency in Automation**

A tradition in automation for over 60 years, with countless pioneering achievements and patents, the LÜTZE International Group is today one of the leading companies in the automation industry. LÜTZE supplies very efficient electronic and electrotechnical components, system solutions for automation and high tech for rail engineering.

The LÜTZE Group has sales companies throughout Europe, Asia and the USA and numerous sales partners across the world to provide global product availability and service to our customers in all markets.

Our intelligent range of cables offers a large selection of Ethernet and bus cables, single cable solutions, motor, servo and feedback cables, and also control cables and electronic cables.

Our industrial cables are specifically designed for continuous flexing applications in C-tracks and suited for automated production as they are very durable and can withstand harsh industrial environments.









# Business Management: Sustainable and forward-looking

"The competitiveness of our industry and of its suppliers depends quite substantially on how we succeed in developing practical results. The results that we produce together today, are our competitive advantages in the future."

Udo LÜTZE.

Member of the Executive Committee of the Green Carbody Innovation Alliance



#### The future is blue

Sustainable enterprise means thinking and planning ahead, understanding and embedding the belief that long lasting success is more important than short-term profit maximisation.

This is an attitude that has existed within LÜTZE for quite some time. Economic and environmental responsibilities complement each

other well and are reflected in the sustainable management and product policy - and from now in the *Sky***BLUE** campaign.

We manufacture our products in a resourceful and energy-conscious manner. We use long lasting, environmentally-friendly materials. And our products, in turn, help our customers save energy and

esources.

Good for everyone: for us, for the environment, for our customers a win-win-win situation.

#### Goods with real value

The value of a product or a solution from LÜTZE is determined by its sustainable qualities as well. Every innovation is only as successful in the future if it has a long-term positive effect. Therefore, we provide long lasting as well as highly efficient components.

We are incorporating the necessary knowledge and manufacturing competence in numerous joint

projects with the objective of improving energy efficiency and sustainable technologies and industries. Thus, LÜTZE provides answers and demonstrates how to handle resources responsibly, with our environment and our future in mind.







**RoHS** 

## **LÜTZE CABLEFIX® X Cable Glands**



#### **Fast installation**

LÜTZE CABLEFIX® X allows cable to be fed into the control cabinet with a high packing density. Depending on the frame, 12 or 23 cables can be inserted at the same time. The self-sealing membrane allows fast and easy insertion of non-terminated cables.

Thanks to the uncomplicated locking function, it can be fitted into control cabinets with a sheet metal thickness of 1.5 mm very quickly. Saves up to 80 % time compared to using individual cable glands.

#### Less space required

LÜTZE CABLEFIX® cable gland systems allow a high cable density and reduce the space required for the gland system in the control cabinet by 50%. This means more space for other components and can, in some cases, allow the use of a smaller control cabinet, which in turn saves costs.

#### **Excellent sealing**

To ensure that the components in the control cabinet are protected as well as possible, LÜTZE CABLEFIX® X offers very good sealing resistance to jet water, dust and oils. It meets the specifications of IP65 and of UL Type 12 and 13.

UL Type 4X is also easily reached from a cable diameter of 5 mm. This allows them to be used in North America.



An overview of the LÜTZE CABLEFIX® products by LÜTZE: https://bit.ly/3185cre

### **LÜTZE CABLEFIX® X Cable Glands**

#### Comprehensive protection. Extensive time savings.











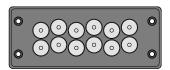
#### **Characteristics**

- $\bullet$  Up to 80 % time savings compared to using individual cable glands
- · Compact design with a high packing density
- Variable clamping range for different cable diameters
- Simple and quick to install: cables are inserted by pushing the end through the seal from the front
- Snap-in design for enclosures with a 1.5 mm wall thickness
- As standard, the membrane is sealed so that no blind plug is required if an input point is not in use
- No tool is required for feeding through the membrane
- Very good sealing up to UL Type 4X, 12 and 13
- Protection class IP 65
- · Standard cut-out 112 x 36 mm
- · Silicone free

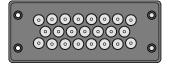
Item	Designation	Number of	Clamping range	Dimensions	Cut-out	Protection class
		openings	Ø mm	WxHxD mm	mm	
606561	LÜTZE CABLEFIX® X 12	12	12 x 5,0 - 13,0	148,0 x 60,0 x 13,5	112 x 36	UL Type 4X, 12, 13, IP65
	Snap-In					UL CCN NITW2 NITW8
606562	LÜTZE CABLEFIX® X 23	23	23 x 4,0 - 8,5*	148,0 x 60,0 x 13,5	112 x 36	UL Type 4X, 12, 13, IP65
	Snap-In					UL CCN NITW2 NITW8

<sup>\*</sup>UL Type 4X for all diameters  $\geq$  5.0 mm

#### LÜTZE CABLEFIX® X 12



#### LÜTZE CABLEFIX® X 23





## LÜTZE CABLEFIX® ONE cable gland set



#### Easy to use

Order an item number and receive a ready-to-install set comprising a frame and matching sealing elements. In the case of LUTZE CABLEFIX® ONE, sets with 4, 7 and 10 openings are available.

Thanks to the adjustable sealing elements, each set covers a wide clamping range. The pre-configured sets means that there is no need for a large number of sealing elements.

The configuration and order process is simplified and the number of item numbers in drawings, part lists and inventory lists is minimized.

#### **UL Type 4X, 12 and 13**

LÜTZE CABLEFIX® ONE are designed for the UL types 4X, 12 and 13, and protect the control cabinet, the components and cables for both indoor and outdoor applications. The types 4X and 12 seal against dust and fluids, whilst type 13 offers additional protection against oil and cooling medium splashes.

#### Wide clamping range

The innovative onion ring design means that a single sealing element can cover a wide clamping range. There are several large and small sealing elements in each set to cover every diameter from 3.5 mm to 29.5 mm.

The sealing elements can be used for both non-terminated and also ready-made cables.

#### Save time

LÜTZE CABLEFIX® systems can reduce the installation time by up to 80% compared to the installation of other cable glands.

The cable gland is mounted in the standard mounting cut-out that can be penetrated with rectangular standard punches. The entire process from the preparation of the control cabinet through to the final assembly is therefore very quick and easy.



Openings in the online catalogue: https://bit.ly/31hNyBi

## LÜTZE CABLEFIX® ONE cable gland set

#### One set. One item number. Simple order.









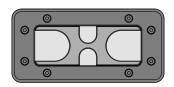


#### **Characteristics**

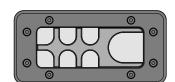
- Suitable for cables with or without pre-installed connectors
- The sets include frames and the associated sealing elements that cover a wide clamping range thanks to many multi-layers
- · Simple order and specification process, thanks to one item number per set
- Unused seals are closed as standard; additional blind plugs are not necessary
- Very good sealing up to UL Type 4X, 12 and 13
  Protection class IP 66
- · Good strain relief acc. to EN 62444
- Standard cut-out 112 x 46 mm
- · Silicone free

Item	Designation	Number of openings	Clamping range Ø mm	Dimensions WxHxD mm	Cut-out mm	Protection class
606500	LÜTZE CABLEFIX®	2 x small	2 x 3,5 - 15,5	156,5 x 75,5 x 27,5	112 x 46	UL Type 4X, 12, 13, IP66
	ONE 4	2 x large	2 x 15,5 – 29,5			UL CCN NITW2 NITW8
606501	LÜTZE CABLEFIX®	6 x small	6 x 3,5 - 15,5	156,5 x 75,5 x 27,5	112 x 46	UL Type 4X, 12, 13, IP66
	ONE 7	1 x large	1 x 15,5 – 29,5			UL CCN NITW2 NITW8
606502	LÜTZE CABLEFIX®	10 x small	10 x 3,5 – 15,5	156,5 x 75,5 x 27,5	112 x 46	UL Type 4X, 12, 13, IP66
	ONE 10					UL CCN NITW2 NITW8

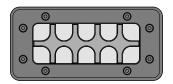
#### **LÜTZE CABLEFIX® ONE 4**



#### **LÜTZE CABLEFIX® ONE 7**



#### **LÜTZE CABLEFIX® ONE 10**





## **LÜTZE CABLEFIX® VARIO cable gland systems**



#### **Durable design**

Thanks to the use of high-quality solid material, such as aluminium or glass fiber-reinforced polyamide, the frames can withstand even the toughest of environments. They are highly resistant to oils, solvents, UV and weather. Achieved tightness requirements pursuant to IP65 completely prevents any dust penetration and protects against jet water from any direction.

#### **Maximum flexibility**

The frames are available in various sizes, and also in plastic or aluminium. With a large number of pre-configured sealing elements, each frame can be equipped individually.

Everything is possible, from blind plugs and sealing elements with a clamping range of up to 34.5 mm. Thanks to the tongue and groove principle, the combination of the sealing elements with cable assemblies is possible at any time. Even retrofitting is easy.

#### Low quantity

Deliveries of 1 unit are possible; regardless of whether only replacement goods are ordered or whether a whole range is ordered for complete configuration.

The modular Cablefix® Vario system allows simple replacement of the components. The following pages contain all relevant data for selection of the suitable frame and sealing modules.



Plastic frame in the online catalogue: https://bit.ly/2DzdAHW



Blind plug in the online catalogue: https://bit.ly/39V1V2C



Aluminium frame in the online catalogue: https://bit.ly/3gqKvgr



Seal elements in the online catalogue: https://bit.ly/318TVXE

## LÜTZE CABLEFIX® VARIO cable gland systems

#### One frame. Multiple of possibilities.





#### **Characteristics**

- Great flexibility in the application
- The frames can be equipped individually with a large number of different modules
- · Subsequent assembly to existing installations easily possible
- Boreholes in the modules that are not required can be simply closed with blind plugs
- · Compact design i.e. space-saving

- 2 module sizes with a tongue and groove principle
- Very good weather resistance
- · Good strain relief and sealing
- Protection class IP65 in combination with respective modules
- · Silicone free

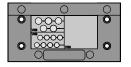
Item	Designation	Dimensions WxHxD mm	Number of modules	Frame material
606052	LÜTZE CABLEFIX® VARIO KKLR1	136 x 71 x 30	VK: 4, VG: 2	PA66 GF50
606053	LÜTZE CABLEFIX® VARIO KKLR2	164 x 71 x 30	VK: 6, VG: 3	PA66 GF50
606038	LÜTZE CABLEFIX® VARIO AKLR0	68 x 68 x 30	VK: 2, VG: 1	Aluminium
606001	LÜTZE CABLEFIX® VARIO AKLR1	108 x 68 x 30	VK: 4, VG: 2	Aluminium
606002	LÜTZE CABLEFIX® VARIO AKLR2	148 x 68 x 30	VK: 6, VG: 3	Aluminium
606005	LÜTZE CABLEFIX® VARIOAKLR5	188 x 78 x 30	VK: 8, VG: 4	Aluminium
606007	LÜTZE CABLEFIX® VARIOAKLR7	188 x 118 x 30	VK: 16. VG: 8	Aluminium

VK = Module small

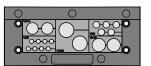
VG = Module large

NOTE: The composition of the modules is shown as an example. Matching modules must be ordered separately and are listed from page 12 onwards.

#### LÜTZE CABLEFIX® VARIO KKLR1



#### **LÜTZE CABLEFIX® VARIO KKLR2**



**LÜTZE CABLEFIX® VARIO AKLR5** 

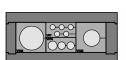
LÜTZE CABLEFIX® VARIO AKLR0



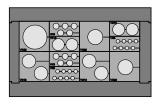
LÜTZE CABLEFIX® VARIO AKLR1



LÜTZE CABLEFIX® VARIO AKLR2



**LÜTZE CABLEFIX® VARIO AKLR7** 





## LÜTZE CABLEFIX® VARIO sealing modules

#### Modules for individual design



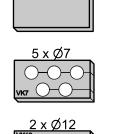


#### **Characteristics**

- Great flexibility in the application Subsequent assembly to existing installations easily possible
- Large selection of modules
  Individual and needs-based configuration options
- Boreholes in the modules that are not required can be closed with blind plugs
- Very good weather resistanceProtection class IP65
- · Silicone free

Item	Designation	Dimensions	Number of	Clamping range	Material
		WxH mm	holes	mm	
606150	LÜTZE CABLEFIX® VARIO VK0	40 x 20	0	0,0-0,0	TPE
606151	LÜTZE CABLEFIX® VARIO VK4	40 x 20	14	4,0-4,5	TPE
606152	LÜTZE CABLEFIX® VARIO VK5	40 x 20	8	4,5 – 5,5	TPE
606153	LÜTZE CABLEFIX® VARIO VK6	40 x 20	8	5,5-6,5	TPE
606154	LÜTZE CABLEFIX® VARIO VK7	40 x 20	5	6,5 – 7,5	TPE
606155	LÜTZE CABLEFIX® VARIO VK8	40 x 20	5	7,5-8,5	TPE
606156	LÜTZE CABLEFIX® VARIO VK9	40 x 20	3	8,5 – 9,5	TPE
606157	LÜTZE CABLEFIX® VARIO VK10	40 x 20	3	9,5-10,5	TPE
606158	LÜTZE CABLEFIX® VARIO VK12	40 x 20	2	10,5 – 12,5	TPE
606159	LÜTZE CABLEFIX® VARIO VK14	40 x 20	2	12,5 – 14,5	TPE
606160	LÜTZE CABLEFIX® VARIO VK16	40 x 20	2	14,5 – 16,5	TPE

#### VK = Sealing modules small





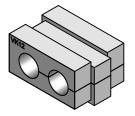
5 x Ø8













## LÜTZE CABLEFIX® VARIO sealing modules

#### Modules for individual design





#### **Characteristics**

- Great flexibility in the application Subsequent assembly to existing installations easily possible
- Large selection of modules
  Individual and needs-based configuration options
- Boreholes in the modules that are not required can be closed with blind plugs
- Very good weather resistanceProtection class IP65
- · Silicone free

Item	Designation	Dimensions WxH mm	******		Material
		WAITIIIII	lioles	mm	
606200	LÜTZE CABLEFIX® VARIO VG0	40 x 40	0	0.0 - 0.0	TPE
606201	LÜTZE CABLEFIX® VARIO VG18	40 x 40	2	16,5 – 18,5	TPE
606202	LÜTZE CABLEFIX® VARIO VG20	40 x 40	1	18,5 – 20,5	TPE
606203	LÜTZE CABLEFIX® VARIO VG22	40 x 40	1	20,5 – 22,5	TPE
606204	LÜTZE CABLEFIX® VARIO VG24	40 x 40	1	22,5 – 24,5	TPE
606205	LÜTZE CABLEFIX® VARIO VG26	40 x 40	1	24,5 – 26,5	TPE
606206	LÜTZE CABLEFIX® VARIO VG28	40 x 40	1	26,5 – 28,5	TPE
606207	LÜTZE CABLEFIX® VARIO VG30	40 x 40	1	28,5 – 30,5	TPE
606208	LÜTZE CABLEFIX® VARIO VG32	40 x 40	1	30,5 – 32,5	TPE
606209	LÜTZE CABLEFIX® VARIO VG34	40 x 40	1	32,5 - 34,5	TPE

#### VG = Sealing modules large

























## LÜTZE CABLEFIX® VARIO sealing modules

#### Modules for individual design



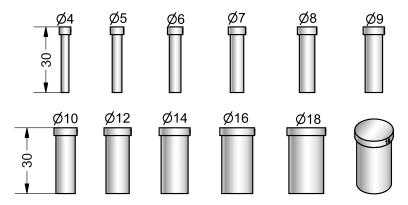


#### **Characteristics**

- · Great flexibility in the application
- Subsequent assembly to existing installations easily possible
  Large selection of modules
- · Individual and needs-based configuration options
- Boreholes in the modules that are not required can be closed with blind plugs
  • Very good weather resistance
- Protection class IP65
- · Silicone free

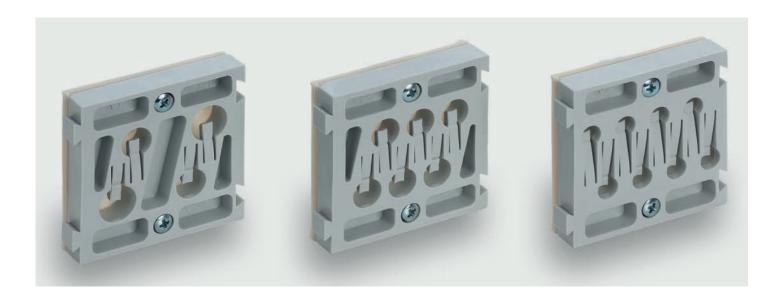
Item	Designation	Dimension	Diameter	Clamping range	Material
		L mm	mm	mm	
606250	LÜTZE CABLEFIX® VARIO BL4	30	4	PA6 GF15	606151
606251	LÜTZE CABLEFIX® VARIO BL5	30	5	PA6 GF15	606152
606252	LÜTZE CABLEFIX® VARIO BL6	30	6	PA6 GF15	606153
606253	LÜTZE CABLEFIX® VARIO BL7	30	7	PA6 GF15	606154
606254	LÜTZE CABLEFIX® VARIO BL8	30	8	PA6 GF15	606155
606255	LÜTZE CABLEFIX® VARIO BL9	30	9	PA6 GF15	606156
606256	LÜTZE CABLEFIX® VARIO BL10	30	10	PA6 GF15	606157
606257	LÜTZE CABLEFIX® VARIO BL12	30	12	PA6 GF15	606158
606258	LÜTZE CABLEFIX® VARIO BL14	30	14	PA6 GF15	606159
606259	LÜTZE CABLEFIX® VARIO BL16	30	16	PA6 GF15	606160
606260	LÜTZE CABLEFIX® VARIO BL18	30	18	PA6 GF15	606201

BL = Blind plug





## LÜTZE CABLEFIX® flange cable glands



#### **Compact installation**

The 50 x 50 mm flanges have an extremely space-saving design. Compared to the screwing method, only half of the surface is required. They are therefore excellently suited for the use of control, bus and AS-I cables.

Depending on the design, between 4 and 8 cables with varying diameters can be used. Boreholes that are not required can be closed with the blind plugs supplied. A rectangular cut-out is sufficient for installation.

#### **Problem-free retrofitting**

The dovetail guide allows uncomplicated retrofitting. Any type of combination is possible thanks to the linear arrangement of the flanges.

The flanges can be replaced by simply pushing them out of the connections. Individual cables can be released with a screwdriver and the spring clamp, and then replaced.

#### **Selected materials**

The materials used offer good resistance to oils, fuels, grease and alkalis.



Plastic frame in the online catalogue: https://bit.ly/3gvdRKY

## LÜTZE CABLEFIX® flange cable glands

#### Various combination options



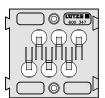
#### **Characteristics**

- The LÜTZE CABLEFIX® flanges can be lined up using the dovetail guide.
- This makes individual and different combinations possible as required
- The integrated strain relief closes automatically when the cables are pushed through
- An integrated rubber mould seals the cables with a sealing lip
- Individual cables can be released easily from the spring clamp by means of a screwdriver and replaced as required for troubleshooting, maintenance and retrofitting
- Inputs that are not required can be closed with the plugs supplied with the product
- · Resistant to fuels, mineral oils, greases, alkalis

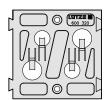
Item	Designation	Маßе	Klemmbereich	Material
		(BxHxT) mm	mm	
600347	LÜTZE CABLEFIX® ST	50 x 50 x 11,5	6 x 6,3 – 8,9	PA 6,6
600320	LÜTZE CABLEFIX® B/V	50 x 50 x 11,5	2 x 6,1 - 8,8	PA 6,6
		2 x 7,8 - 10,7		
600321	LÜTZE CABLEFIX® S/A	50 x 50 x 11,5	8 x 3,8 - 6,3	PA 6,6

NOTE: 50 mm must be calculated for all lined-up flanges. Cut out with standard sheet metal holepunch.

#### **LÜTZE CABLEFIX® ST**



#### **LÜTZE CABLEFIX® B/V**



#### LÜTZE CABLEFIX® S/A



## Design of the protection class designation according to EN 60529

The protection of electrical equipment through corresponding enclosure is specified with code letters and code numbers. This protection class designation consists of the letters "IP" and two code numbers from 0 to 8. The first code number stands for the protection against contact and foreign substances, the second number specifies the degree of protection against water. The higher the respective code number is, the higher is the offered protection. The valid protection class for each product is speci-

The higher the respective code number is, the higher is the offered protection. The valid protection class for each product is specified in the technical data.

For examp	le the designation:		
IP 65	Code letter IP	IP	
	First code number	6	corresponds to: Protection against entrance of dust
	Second code number	5	corresponds to: Protection against sprayed water

For protection against con	staat and faraign aubataness	
First code number	ntact and foreign substances	Evalenation
-	Protection scope designation	Explanation
0	No protection	No special protection of persons from accidental contact with standing or moving parts
		under voltage.
		No protection of the equipment against entry of solid foreign substances.
1	Protection against foreign substances	Protection against accidental contact of large area surfaces of standing and internally
	> 50 mm	moving parts under voltage, e.g. with the hand, but no protection against intentional
		access to these parts. Protection against entry of solid foreign substances with a
		diameter larger than 50 mm.
2	Protection against foreign substances	Protection against contact by the fingers of standing or internally moving parts under
	> 12 mm	voltage. Protection against entry of solid foreign substances with a diameter larger
		than 12 mm.
3	Protection against foreign substances	Protection against contact of standing or internally moving parts under voltage with
	> 2.5 mm	tools, wires or similar of a thickness larger than 2.5 mm. Protection against entry of
		solid foreign substances with a diameter larger than 2.5 mm.
4	Protection against foreign substances	Protection against contact of standing or internally moving parts under voltage with
	> 1 mm	tools, wires or similar of a thickness larger than 1 mm. Protection against entry of solid
		foreign substances with a diameter larger than 1 mm.
5	Protection against dust accumulation	Full protection against contact of standing or internally moving parts under voltage
		moving parts under voltage. Protection against dust accumulation. The entry of dust is
		not fully prevented but the dust may not enter in such quantities that the functioning is
		impaired.
6	Protection against dust accumulation	Full protection against contact of standing or internally moving parts under voltage
		moving parts under voltage. Protection against entry of dust.

For water protection		
Second code number	Protection scope designation	Explanation
0	No protection	No special protection
1	Protection from vertically falling	
	dripping water	Water drops that fall vertically may not have any damaging effect.
2	Protection from dripping water	Water drops that fall at an arbitrary angle of up to 15° to vertical may not have any
	falling at an angle	damaging effect.
3	Protection from sprayed water	Water that falls in an arbitrary angle up to 60° to vertical may not have a damaging
		effect.
4	Protection from splashed water	Water that is splashed from all directions against the equipment may not have a
		damaging effect.
5	Protection from water projected	Water projected from a nozzle that is aimed at the equipment from all directions may
	from a nozzle	not have any damaging effect.
6	Protection against flooding	Water may not enter into the equipment in damaging amounts during temporary
		flooding (e.g. by heavy seas)
7	Protection against immersion	Water may not enter in damaging amounts if the equipment is immersed in water for
		the defined pressure and time conditions.
8	Protection against submersion	Water may not enter in damaging amounts if the equipment is submerged in water for
		the defined pressure and indefinite amount of time.

You can find the valid protection class for the respective product in the technical data.

### Design of the protection type information acc. to NEMA

Table 1: Comparison overview of the specific protection classes for casings for non-dangerous **indoor areas** (see NEMA 250-2003).

#### Offers a certain amount of protection under the following conditions

	Dustas	.4! 4								
		tion type			_	_				
	1*	2*	4	4X	5	6	6P	12	12K	13
Access to dangerous parts of a system	•	•	•	•	•	•	•	•	•	•
Penetration of fixed foreign bodies (dirt that falls down)	•	•	•	•	•	•	•	•	•	•
Water penetration (drops of water and slight splashes)	-	•	•	•	•	•	•	•	•	•
Penetration of fixed foreign bodies (flying dirt, dust,	-	_	•	•	_	•	•	•	•	•
fluff and fibres)**										
Penetration of fixed foreign bodies (settling dust, fluff, fibres and	-	_	•	•	•	•	•	•	•	•
dust floating in the air)**										
Water penetration (splash water)	-	-	•	•	-	•	•	-	-	-
Oil and cooling medium leakage	-	_	_	_	-	_	_	•	•	•
Splashing and spraying oil and cooling medium	-	_	_	_	_	-	-	_	_	•
Caustic medium	_	_	_	•	_	_	•	_	_	_
Water penetration (occasional temporary submerging)	-	_	-	_	_	•	•	_	-	-
Water penetration (occasional longer submerging)	-	_	_	_	_	_	•	_	_	_

<sup>\*</sup>The casings can be vented

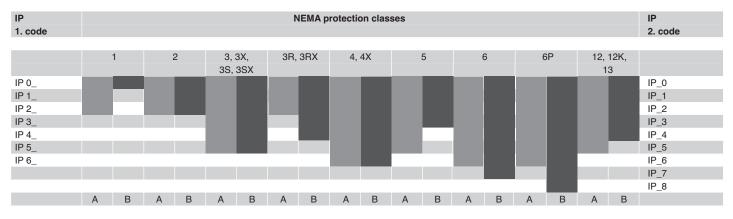
Table 2: Comparison overview of the specific protection classes for casings for non-dangerous **outdoor areas** (see NEMA 250-2003).

#### Offers a certain amount of protection under the following conditions

Protection type										
	3	3X	3R*	3RX	3S	3SX	4	4X	6	6P
Access to dangerous parts of a system	•	•	•	•	•	•	•	•	•	•
Water penetration (rain, hail, snow)**	•	•	•	•	•	•	•	•	•	•
Hail***	_	_	_	_	•	•	_	_	_	_
Penetration of fixed foreign bodies	•	•	-	_	•	•	•	•	•	•
(flying dirt, dust, fluff and fibres)										
Water penetration (fed through the hose)	_	-	_	_	-	-	•	•	•	•
Caustic medium	-	•	-	•	-	•	-	•	-	•
Water penetration (occasional temporary submerging)	_	_	_	_	_	_	_	_	•	•
Water penetration (occasional longer submerging)	-	-	-	-	-	-	-	-	-	•

<sup>\*</sup>The casings can be vented.

Table 3: Comparison overview of the NEMA protection classes and IP protection classes



A = A gray block in column 'A' shows that the NEMA casing type reaches the requirements for the respective IEC 60529 IP designation of the first code letter. The first code letter of the IP protection classes is protection against access to dangerous parts of a system and the penetration of foreign bodies.

<sup>\*\*</sup>These fibres and flue dust are not dangerous materials and are not deemed ignitable fibres or flammable dust material of Class III. See the National Electrical Code, Article 500, for ignitable fibres or flammable dust of Class III.

<sup>\*\*</sup>External operating mechanisms do not need to be functional, if the casing is covered with ice.

<sup>\*\*\*</sup>External operating mechanisms are functional, if the casing is covered with ice.

B = A black block in column 'B' shows that the NEMA casing type reaches the requirements for the respective IEC 60529 IP designation of the second code letter. jackets. The second code letter of the IP protection classes is protection against water penetration.

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