C.E.® ENCLOSURES CATALOGUE

EJB series - Instrument Enclosures - Terminal Boxes - Control Stations - GUB series

rev_250226_B

www.ce2k.com

INDEX

Ex db IIB+H2 ALUMINIUM AND STAINLESS STEEL ENCLOSURES - EJB... SERIES

ALUMINIUM ENCLOSURES

SS316L ENCLOSURES

EJB... series enclosures have Ex db IIB, IIB + H2 and IIIC mode of protection.

These enclosures are suitable to be used in hazardous areas for different applications, such as push button stations, instrument housing, lighting distribution panels, power distribution panels, heat tracing panels, motor control panels, etc.

CE2K S.r.l. EJB Ex db enclosures are ATEX, IECEx, Tr Cu and INMETRO certified.

EJB SERIES
TECHNICAL SPECIFICATION

MATERIAL

Enclosure material:	Copper free aluminium or stainless steel AISI 316L

Ex CODE

Ex marking:	Ex II 2 GD Ex db IIB T6/T5/T4 Gb Ex db IIB+H2 T6/T5/T4 Gb Ex tb IIIC T85°C / T100°C / T135°C Db

MECHANICAL FEATURES

Degree of protection:	IP66
Temperature:	-20°C to +60°C (with window) -50°C to +60°C (without window)
Threaded Holes:	ISO Metric / ANSI B1.20.1 NPT

Ex FEATURES

Standards:	EN 60079-0 / EN 60079-1 / EN 60079-11 / EN 60079-31 IEC 60079-0 / IEC 60079-1 / IEC 60079-11 / IEC 60079-31
Suitable for:	Zone 1 / Zone 2 / Zone 21 / Zone 22

CERTIFICATES

Certificates Number:	Ex 14 ATEX 0002X IECEx INE 14.0017X EAC certificate available INMETRO certificate available

NOTE

Enclosures can be internally equipped with intrinsically safe equipment.
Enclosures can be equipped with windows on the cover.
Certificate for Group I M2 available.
For power dissipated values, refer to the Ex certificate.

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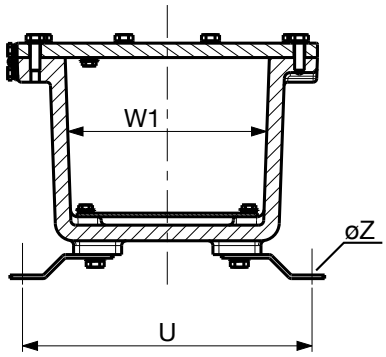
EJB SERIES - ALUMINIUM
DIMENSIONS

TYPE	External Dimensions			Internal Dimensions			Internal Plate		Fixing Holes		Weight	Feet Fixing Bolts
	Height (H)	Width (W)	Depth (D)	Height (H1)	Width (W1)	Depth (D1)	A	B	T	U	kg	ØZ
EJB-A	315	250	175	230	165	130	215	150	180	241	11	M8
EJB-B	425	245	230	345	170	185	321	150	290	249	16	M8
EJB-C	490	415	260	385	310	200	335	275	336	414	36	M8
EJB-D	530	495	260	425	390	200	394	358	360	480	44	M8
EJB-E	595	540	315	480	430	235	446	391	400	559	80	M10
EJB-F	835	445	315	720	340	235	670	294	630	449	93	M10
EJB-G	835	610	315	720	500	235	670	450	630	604	123	M10
EJB-H	835	610	410	720	500	330	670	450	630	604	134	M10

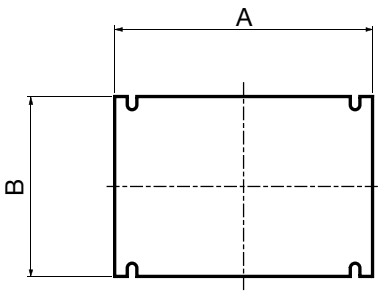
- All dimensions are in mm.
- Dimensions and weights are approximate and subject to change without notice.

EJB SERIES - ALUMINIUM DRAWINGS

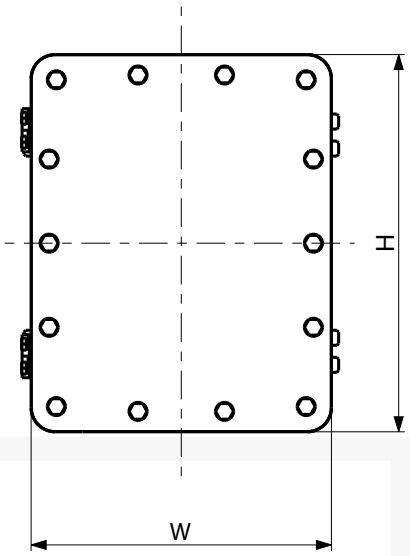
BOTTOM VIEW



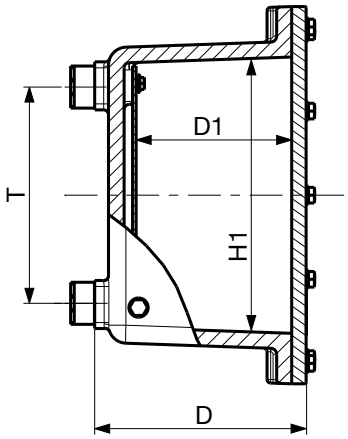
INTERNAL PLATE



FRONT VIEW



SIDE VIEW



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EJB SERIES - STAINLESS STEEL
DIMENSIONS

	External Dimensions			Internal Dimensions			Internal Plate		Fixing Holes		Weight	Feet Fixing Bolts
TYPE *	Height (H)	Width (W)	Depth (D)	Height (H1)	Width (W1)	Depth (D1)	A	B	T	U	kg	ØZ
EJBS-A	320	255	182	235	170	140	225	160	175	258	32	M10
EJBS-B	430	255	240	345	170	195	335	160	285	258	42	M10
EJBS-C	490	415	260	390	315	215	380	305	330	403	80	M10
EJBS-D	535	495	260	430	390	215	420	380	370	478	99	M10
EJBS-E	600	545	275	485	430	220	475	420	405	538	144	M16
EJBS-F	845	460	320	725	340	265	715	330	605	450	180	M16
EJBS-G	835	615	315	725	505	263	715	495	605	616	281	M16
EJBS-H	835	615	410	725	505	358	715	495	605	616	309	M16

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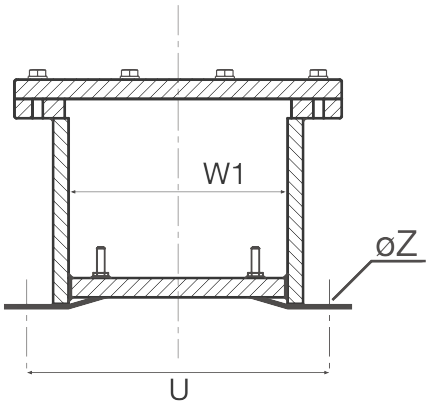
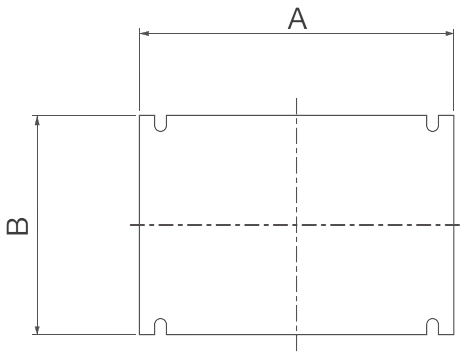
EJB SERIES - STAINLESS STEEL
DRAWINGS

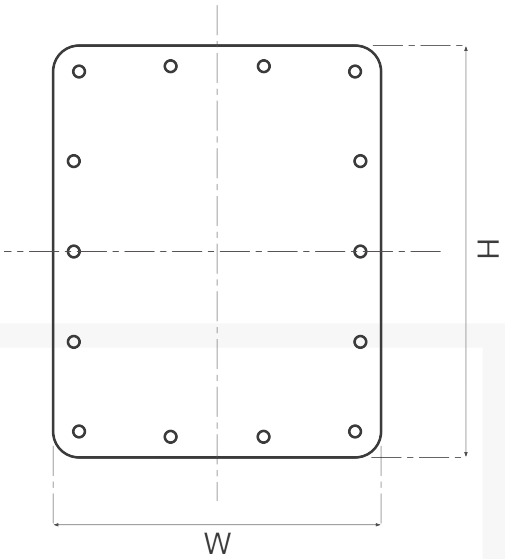
BOTTOM VIEW



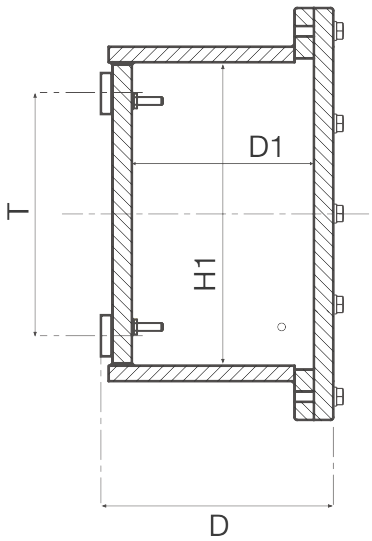
INTERNAL PLATE



FRONT VIEW



SIDE VIEW



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EJB SERIES - WINDOWS
DIMENSIONS AND DRAWINGS

APPLICABLE WINDOWS AND ENTRIES M32X1.5 ON EJB LIDS

Window type	Glass dimensions	EJB-A EJBS-A	EJB-B EJBS-B	EJB-C EJBS-C	EJB-D EJBS-D	EJB-E EJBS-E	EJB-F EJBS-F	EJB-G EJBS-G	EJB-H EJBS-H
P = 80x80	120x120	-	X	X	X	X	X	X	X
Q = 120x120	160x160	-	-	X	X	X	X	X	X
R = 160x160	200x200	-	-	-	X	X	X	X	X
S = 40x70	80x110	-	X	X	X	X	X	X	X
T = 40x200	80x240	-	-	X	X	X	X	X	X
U = 100x270	140x310	-	-	-	-	X	X	X	X

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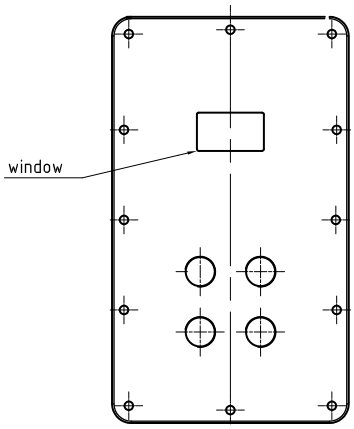

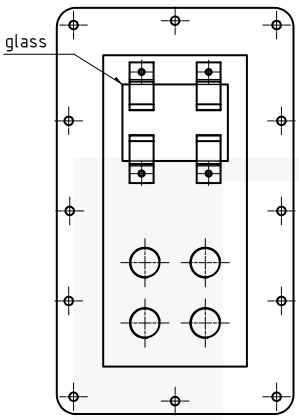

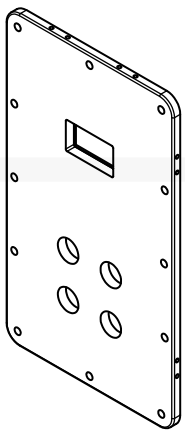

EJB SERIES - WINDOWS
DIMENSIONS AND DRAWINGS

APPLICABLE WINDOWS AND ENTRIES M32X1.5 ON EJB LIDS

Window type	Glass dimensions	EJB-A EJBS-A	EJB-B EJBS-B	EJB-C EJBS-C	EJB-D EJBS-D	EJB-E EJBS-E	EJB-F EJBS-F	EJB-G EJBS-G	EJB-H EJBS-H
V = Ø 120	Ø 160	-	-	X	X	X	X	X	X
W = Ø 160	Ø 200	-	-	-	X	X	X	X	X
X = Ø 180	Ø 220	-	-	-	-	X	X	X	X

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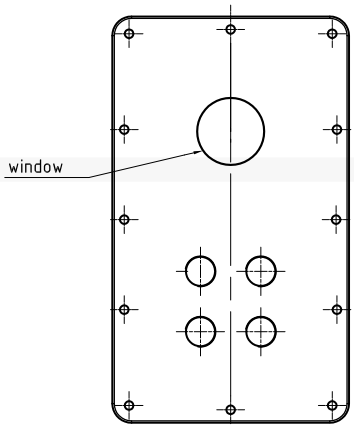

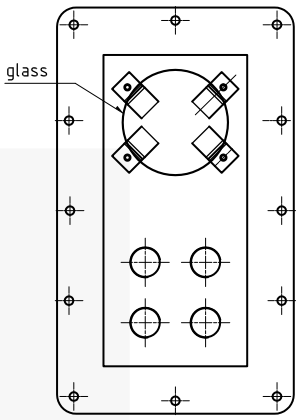

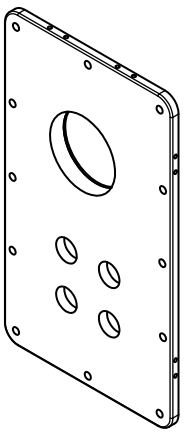

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EJB... SERIES - FEATURES

NUMBER OF THREADED HOLES AND OPERATORS ON FRONT

EJB Type		A	B	C	D	E	F	G	H
Nr. of threaded holes and operators (M32 and M25) - with windows	min	-	4	8	12	18	35	56	56
	max	-	6	12	18	24	40	64	64
Nr. of threaded holes and operators (M32 and M25) - without windows		6	10	24	36	42	55	88	88

NUMBER OF CABLE ENTRIES ON LONG/SHORT SIDE FOR EACH EJB ALUMINIUM

L = Long Side S = Short Side	EJB-A		EJB-B		EJB-C		EJB-D		EJB-E		EJB-F		EJB-G		EJB-H	
	L	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S
M20 / ½"	8	6	12	6	20	16	24	22	30	24	55	26	55	32	60	38
M25 / ¾"	8	4	8	4	12	9	22	16	25	20	38	18	40	22	44	24
M32 / 1"	3	3	3	2	10	8	11	9	13	11	30	15	34	18	36	20
M40 - 1"1/4	2	1	2	1	4	3	8	8	8	8	14	6	16	12	17	13
M50 - 1"1/2	2	1	2	1	4	3	8	8	8	8	14	6	16	12	17	13
M63 - 2"	1	1	2	1	3	2	3	3	4	4	10	4	11	5	12	6
M75					2	2	2	2	3	2	4	2	6	4	6	4
2"1/2									3	2	4	2	6	4	6	4
M80							1	1	2	2	3	1	5	3	5	3
3"									2	2	3	1	5	3	5	3

NUMBER OF CABLE ENTRIES ON LONG/SHORT SIDE FOR EACH EJB STAINLESS STEEL

L = Long Side S = Short Side	EJB-A		EJB-B		EJB-C		EJB-D		EJB-E		EJB-F		EJB-G		EJB-H	
	L	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S
M20 / ½"	8	6	12	6	20	16	24	22	30	24	55	26	55	32	60	38
M25 / ¾"	8	4	8	4	12	9	22	16	25	20	38	18	40	22	44	24
M32 / 1"	3	3	3	2	10	8	11	9	13	11	30	15	34	18	36	20
M40 - 1"1/4	2	1	2	1	4	3	8	8	8	8	14	6	16	12	17	13
M50 - 1"1/2	2	1	2	1	4	3	8	8	8	8	14	6	16	12	17	13
M63 - 2"	1	1	2	1	3	2	3	3	4	4	10	4	11	5	12	6
M75					2	2	2	2	3	2	4	2	6	4	6	4
2"1/2					2	2	2	2	3	2	4	2	6	4	6	4
M80							1	1	2	2	3	1	5	3	5	3
3"							1	1	2	2	3	1	5	3	5	3

Yellow background = wall thickness 12 and 15 mm
Red background = wall thickness 20 mm

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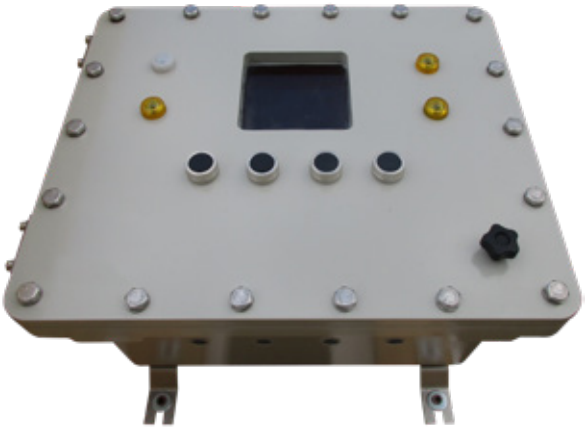
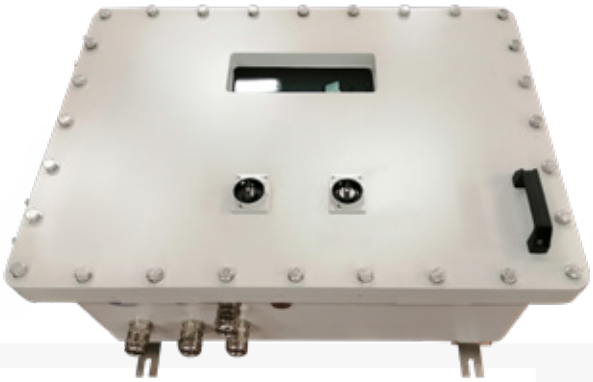
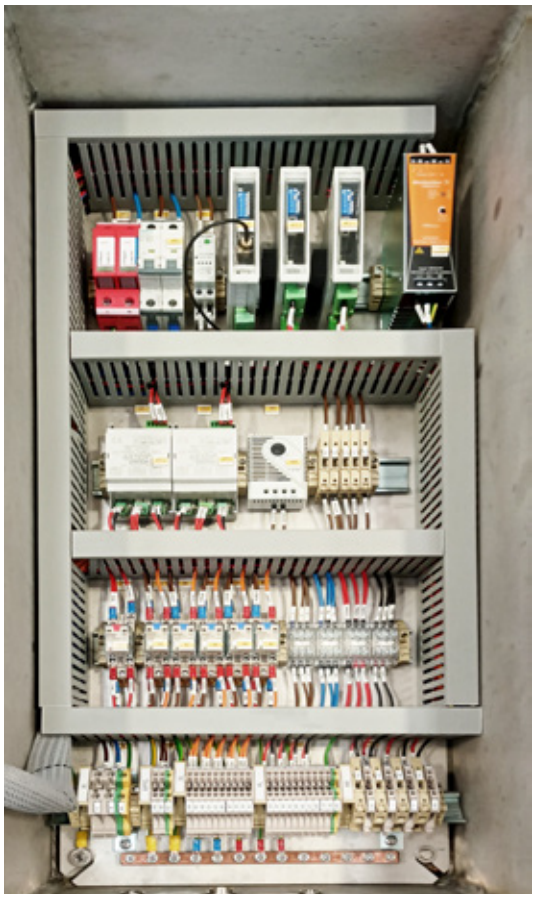
EJB... SERIES - EXAMPLE OF EJB WITH WINDOW AND OPERATORS







Ex db IIB+H2 ALUMINIUM AND STAINLESS STEEL ENCLOSURES EJB... SERIES FOR USA and CANADA APPLICATIONS

ALUMINIUM

SS316L

Certified for
Class 1, Zone 1
Zone 21

EJB... series of empty enclosures offer Ex db IIB +H2 mode of protection.

Are suitable to be used in hazardous areas for different applications, and can be used as push button stations, instrument housing, lighting distribution panels, power distribution panels, heat tracing panels, motor control panels, etc.

CE2K S.r.l. Ex db IIB+H2 enclosures are certified according UL 60079-0, UL 60079-1, UL 60079-31, CSA C22.2 No.60079-0, CSA C22.2 No.60079-1, CSA C22.2 No.60079-31 standards.

EJB SERIES
TECHNICAL SPECIFICATION

MATERIAL

Enclosure material:	Copper free aluminium or stainless steel AISI 316L

Ex CODE

Ex marking Canada:	Ex db IIB+H2 T6/T5/T4 Gb Ex tb IIIC T85°C / T100°C / T135°C Db
Ex marking USA:	Class I, Zone 1, AEx db IIB+H2 T6/T5/T4 Gb Zone 21, AEx tb IIIC T85°C/T100°C/T135°C Db

MECHANICAL FEATURES

Degree of protection:	IP66
Temperature:	-50°C to +60°C
Threaded Holes:	ISO Metric / ANSI B1.20.1 NPT

Ex FEATURES

Standards:	UL 60079-0 / UL 60079-1 / UL 60079-31 CSA C22.2 No.60079-0 / CSA C22.2 No.60079-1, / CSA C22.2 No.60079-31
Suitable for:	Zone 1 / Zone 21

CERTIFICATES

Certificates Number:	c LC us LC 15427-1

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EJB SERIES - ALUMINIUM
DIMENSIONS

TYPE	External Dimensions			Internal Dimensions			Internal Plate		Fixing Holes		Weight	Feet Fixing Bolts
	Height (H)	Width (W)	Depth (D)	Height (H1)	Width (W1)	Depth (D1)	A	B	T	U	kg	ØZ
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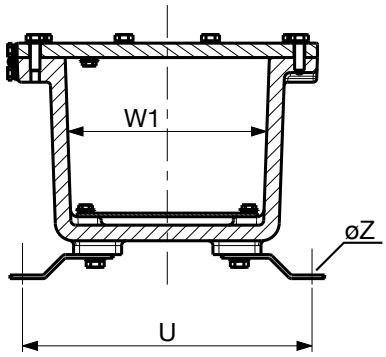
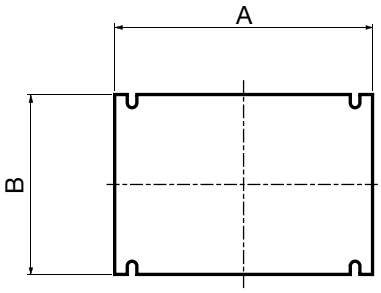
EJB SERIES - ALUMINIUM
DRAWINGS

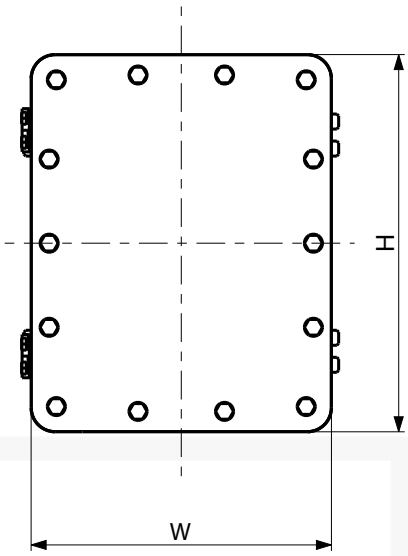
BOTTOM VIEW



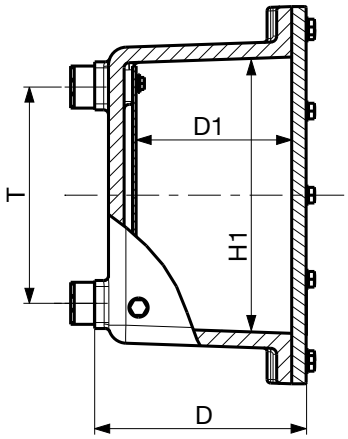
INTERNAL PLATE



FRONT VIEW



SIDE VIEW



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EJB SERIES - STAINLESS STEEL
DIMENSIONS

	External Dimensions			Internal Dimensions			Internal Plate		Fixing Holes		Weight	Feet Fixing Bolts
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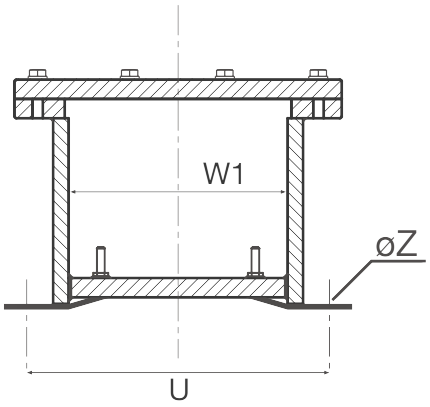
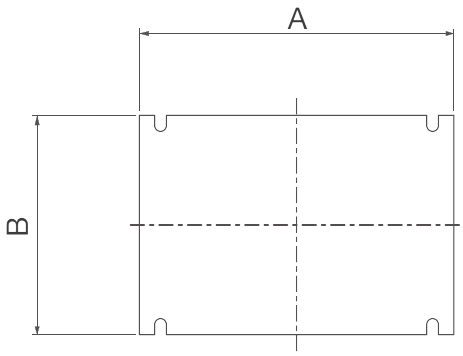
EJB SERIES - STAINLESS STEEL
DRAWINGS

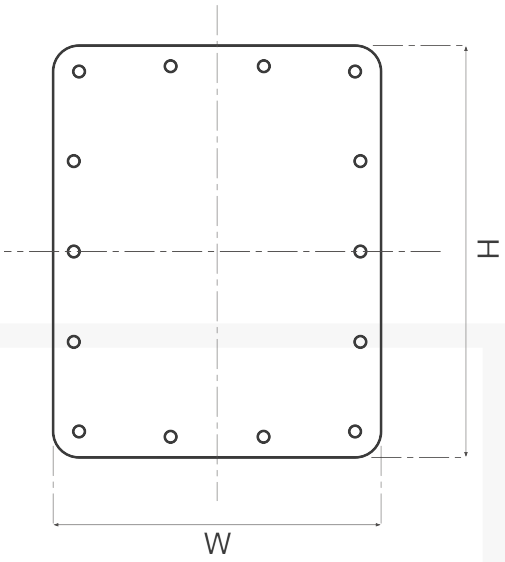
BOTTOM VIEW



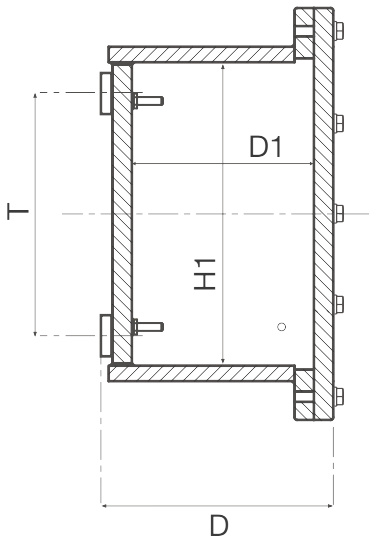
INTERNAL PLATE



FRONT VIEW



SIDE VIEW



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EJB... SERIES - FEATURES

TYPES OF ENCLOSURES	TEMPERATURE CLASS		MAXIMUM POWER DISSIPATED		
	GAS	DUST	40°C	50°C	60°C
EJB-A	T6	T85°C	90W	60W	25W
	T5	T100°C	120W	95W	75W
	T4	T135°C	205W	180W	155W
EJB-B	T6	T85°C	125W	90W	55W
	T5	T100°C	180W	145W	110W
	T4	T135°C	305W	270W	235W
EJB-C	T6	T85°C	210W	150W	95W
	T5	T100°C	295W	235W	180W
	T4	T135°C	500W	440W	380W
EJB-D	T6	T85°C	255W	185W	115W
	T5	T100°C	360W	290W	220W
	T4	T135°C	610W	535W	465W
EJB-E	T6	T85°C	265W	200W	125W
	T5	T100°C	390W	315W	240W
	T4	T135°C	655W	580W	505W
EJB-F	T6	T85°C	350W	265W	165W
	T5	T100°C	515W	415W	315W
	T4	T135°C	850W	755W	660W
EJB-G	T6	T85°C	410W	315W	195W
	T5	T100°C	610W	495W	375W
	T4	T135°C	1020W	905W	790W

EJB... SERIES - FEATURES

NUMBER OF THREADED HOLES AND OPERATORS ON FRONT

EJB Type	A	B	C	D	E	F	G	H
Nr. of threaded holes and operators (M32 and M25) - without windows	4	10	24	36	42	55	88	88

NUMBER OF CABLE ENTRIES ON LONG/SHORT SIDE FOR EACH EJB

ENTRY	BOX TYPE							
	A	B	C	D	E	F	G	H
M20 / ½"	8/6	12/6	20/16	24/22	30/24	55/26	55/32	60/38
M25 / ¾"	8/4	8/4	12/9	22/16	25/20	38/18	40/22	44/24
M32 / 1"	3/3	3/2	10/8	11/9	13/11	30/15	34/18	36/20
M50 / 1.1/2"	2/1	2/1	4/3	8/8	8/8	14/6	16/12	17/13
M63 / 2"	1/1	2/1	3/2	3/3	4/4	10/4	11/5	12/6
M75 / 2.1/2"			2/2	2/2	3/2	4/2	6/4	6/4

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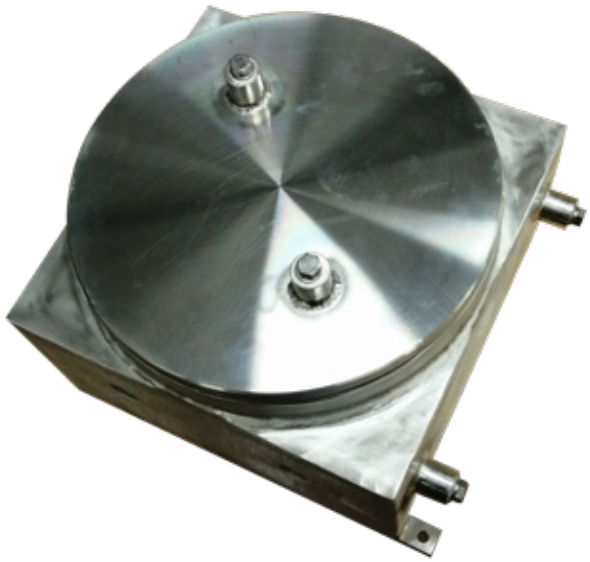
Ex db and Ex tb IIC ALUMINIUM AND STAINLESS STEEL ENCLOSURES - GUB SERIES



GUB... series enclosures are suitable for use in industrial plants, chemical and petrochemical industries, offshore plaftorms, etc. where a potentially explosive atmosphere due to the presence of gases and/or dusts may be present.

CE2K S.r.l. GUB... series enclosures are available in copper free aluminium or stainless steel. They can be in stationary or portable versions, and for stationary versions they can be equipped with windows.

GUB SERIES
TECHNICAL SPECIFICATION

MATERIAL

Enclosure material:	Copper free aluminium or stainless steel AISI316L
Windows (option):	Borosilicate tempered glass

Ex CODE

Ex marking:

II 2G
Ex db IIC T6...T4 Gb
or
II 2GD
Ex db IIC T6...T4 Gb
Ex tb IIIC T85°C...T135°C Db

MECHANICAL FEATURES

Degree of protection:	IP66
Temperature:	-50°C to +80°C (without window, EPL Gb)
	-40°C to +80°C (without window, EPL Gb and Db)
	-40°C to +80°C (with window, EPL Gb and Db)
Threaded Holes:	ISO Metric / ANSI B1.20.1 NPT

Ex FEATURES

Standards:	EN 60079-0 / EN 60079-1 / EN 60079-11 / EN 60079-31
	IEC 60079-0 / IEC 60079-1 / IEC 60079-11 / IEC 60079-31
Suitable for:	Zone 1 / Zone 2 / Zone 21 / Zone 22

CERTIFICATES

Certificates Number:

EPT 17ATEX2760X Issue 1
IECEx EUT 17.0029X Issue 2
TR Cu certificates available upon request
INMETRO certificates available upon request

PART NUMBER

Part number:
GUB . / . / .
GUB . / P / . / .
GUB . / W / . / .

NOTE

Enclosures can be internally equipped with intrinsically safe equipment (ambient temperature max. +60°C).
Enclosures can be equipped with operators on side.
Enclosures can be equipped with batteries.

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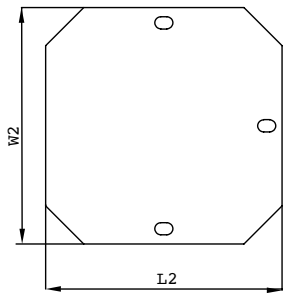
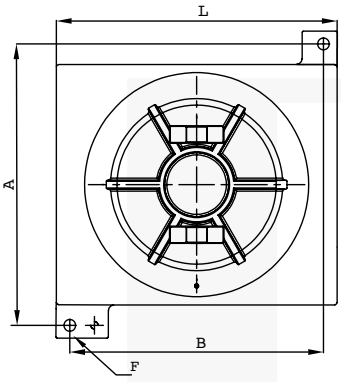
GUB SERIES STATIONARY ALUMINIUM DIMENSIONS

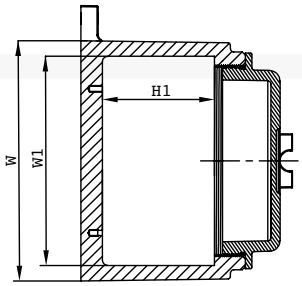
ALUMINIUM

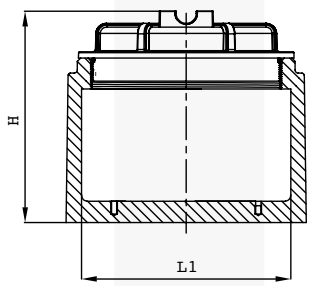
TYPE	External dimensions (mm)			Internal dimensions (mm)			Plates dimensions (mm)*		Fixing holes (mm)		Fixing bolts dim.	Weight (kg)
	Len-gth (L)	Width (W)	Height (H)	Lenght (L1)	Width (W1)	Height (H1)	Length (L2)	Width W(2)	A	B	(F)	
GUB1	174	174	166	145	145	76	130	60	198	148	M10	5
GUB2	208	208	195	180	180	106	155	155	230	178	M10	6,5
GUB3	263	225	198	234	192	111	190	150	260	230	M10	8,5
GUB4	325	291	277	278	246	144	250	216	316	300	M10	22
GUB5	430	430	300	392	392	175	340	340	470	390	M12	41
GUB6	573	570	380	507	507	208	440	440	650	523	M12	113

Dimensions and weights are subject to change without notice.







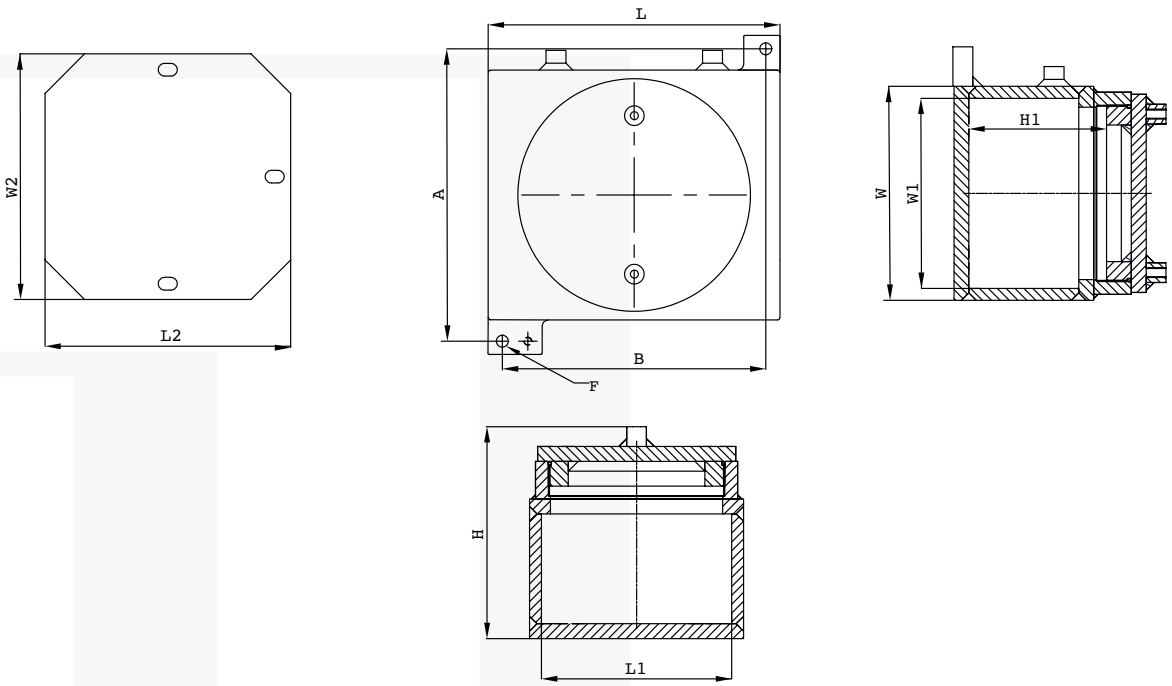


GUB SERIES STATIONARY AISI316L DIMENSIONS

STAINLESS STEEL (only for GUB././.)

TYPE	External dimensions (mm)			Internal dimensions (mm)			Plates dimensions (mm)*		Fixing holes (mm)		Fixing bolts dim.	Weight (kg)
	Len-gth (L)	Width (W)	Height (H)	Lenght (L1)	Width (W1)	Height (H1)	Len-gth L2	Width W2	A	B	(F)	
GUBS1	170	170	160	146	146	110	130	60	198	144	M10	16
GUBS2	204	204	190	180	180	134	155	155	230	178	M10	23
GUBS3	258	216	195	234	192	139	190	150	260	230	M10	30
GUBS4	308	276	243	278	246	185	250	216	316	284	M10	52
GUBS5	432	432	276	402	402	173	340	340	480	390	M11	118
GUBS6	537	537	370	507	507	230	440	440	650	493	M12	172

Dimensions and weights are subject to change without notice.



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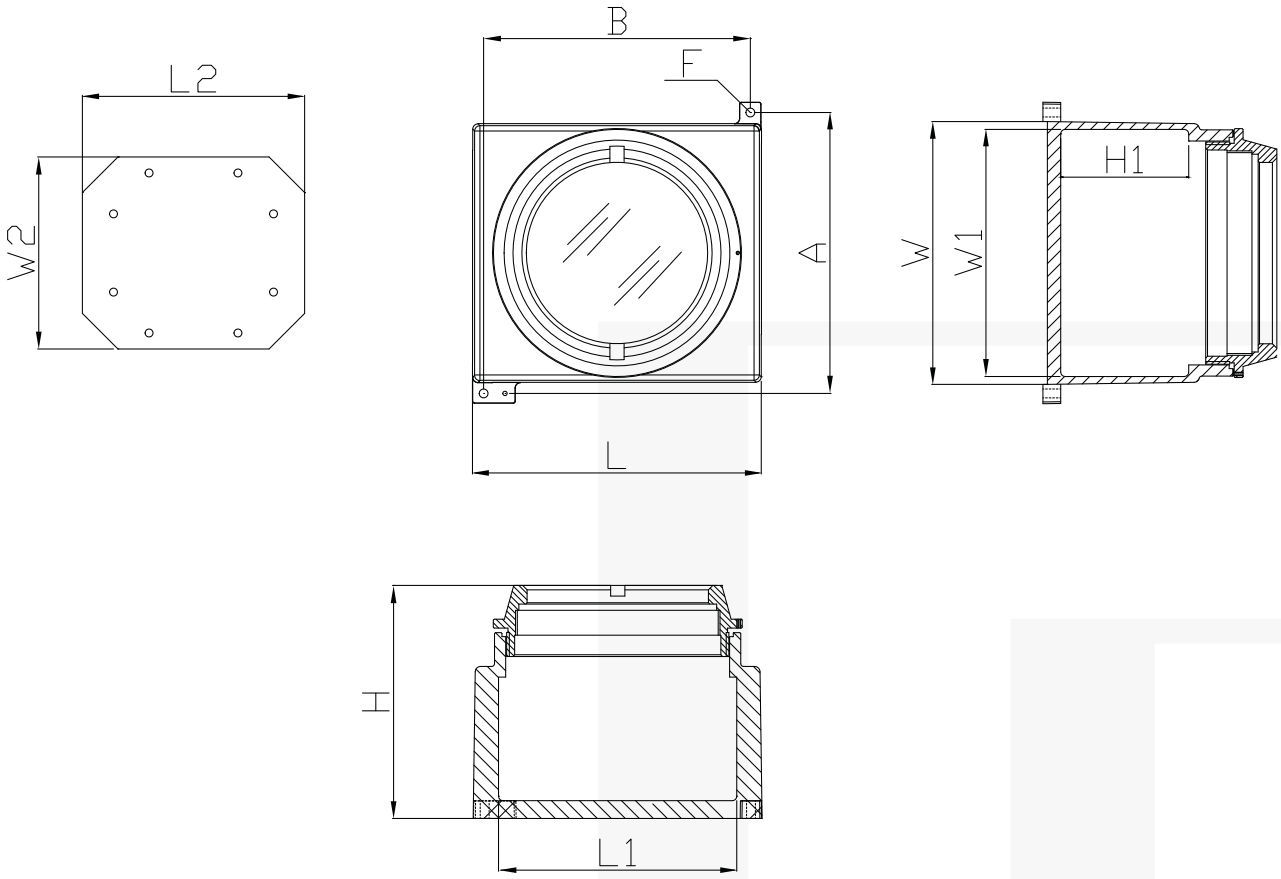
GUB SERIES WITH WINDOW ALUMINIUM
DIMENSIONS AND DRAWINGS

TYPE	External dimensions (mm)			Internal dimensions (mm)			Plates dimensions (mm)*		Fixing holes (mm)		Fixing bolts dim.	Weight (kg)	Glass Windows (mm) (option)
	Length (L)	Width (W)	Height (H)	Lenght (L1)	Width (W1)	Height (H1)	Length L2	Width W2	A	B	(F)		
GUB-2/W	208	208	185	180	180	106	155	155	230	178	M10	7	136
GUB-3/W	263	225	190	234	192	111	190	150	260	230	M10	9	136
GUB-4/W	325	291	262	278	246	144	250	216	316	300	M10	23	204

Dimensions and weights are subject to change without notice.



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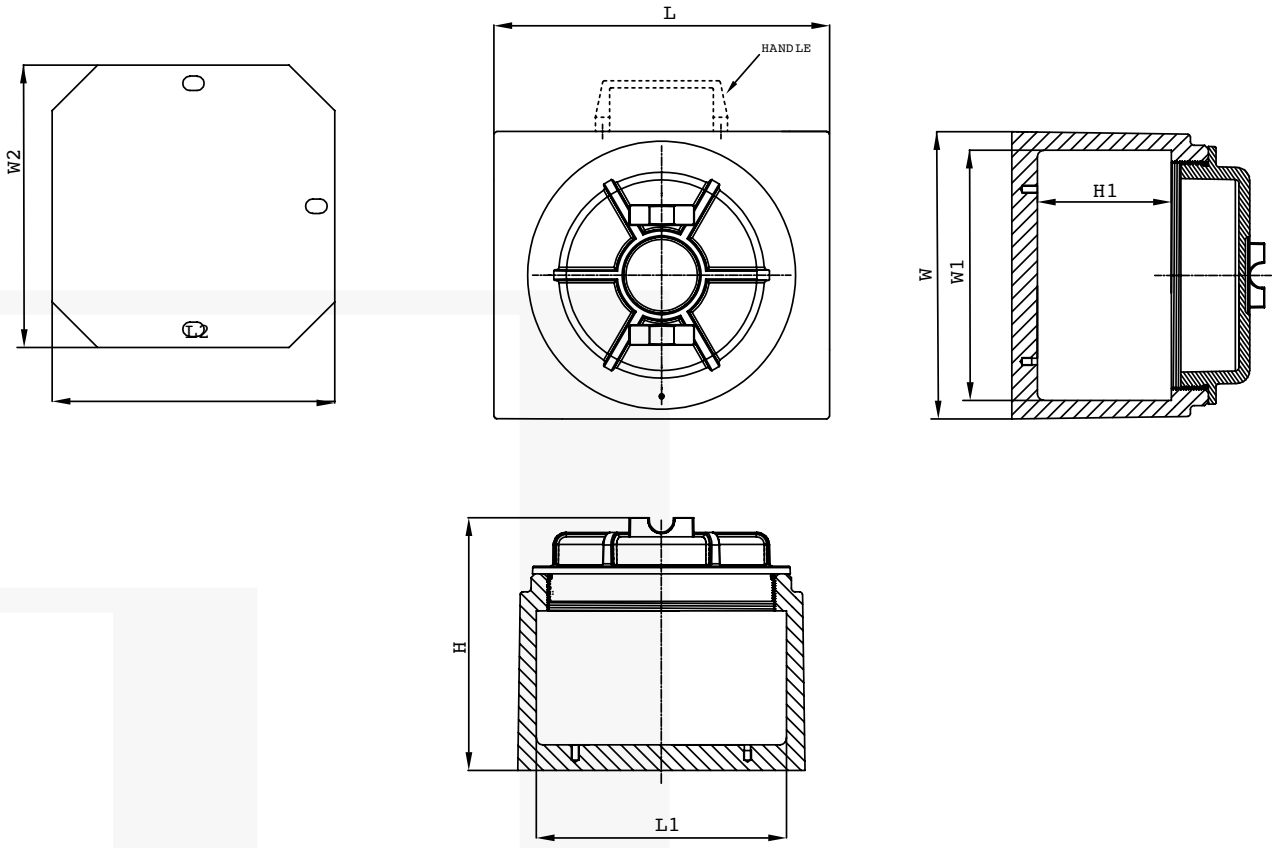
250226_A

GUB SERIES PORTABLE ALUMINIUM DIMENSIONS AND DRAWINGS

TYPE	External dimensions (mm)			Internal dimensions (mm)			Plates dimensions (mm)*		Weight (kg)
	Length (L)	Width (W)	Height (H)	Lenght (L1)	Width (W1)	Height (H1)	Length (L2)	Width W(2)	
GUB2/P	208	208	195	180	180	160	155	155	6,5
GUB3/P	225	263	198	192	234	164	190	150	8,5

Dimensions and weights are subject to change without notice.



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MAXIMUM DISSIPATED POWER LIMITS (W / VA) RELATED TO THE ALUMINUM MATERIAL VERSION

Maximum dissipated power for versions Ex db and or Ex tb - Frame mounting installation 6 sides involved in thermal dissipation + warning entry point > 70°C															
Type (AL)	Tamb up to 40°C			Tamb up to 50°C			Tamb up to 60°C			Tamb up to 70°C			Tamb up to 80°C		
	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C
	Tcable 78°C	Tcable 92°C	Tcable 120°C	Tcable 78°C	Tcable 92°C	Tcable 120°C	Tcable 78°C	Tcable 92°C	Tcable 120°C	Tcable 78°C	Tcable 92°C	Tcable 120°C	Tcable 78°C	Tcable 92°C	Tcable 120°C
GUB1	39	61	106	26	46	94	16	32	79	8	20	68	0	12	55
GUB2	45	68	120	28	51	106	18	35	90	9	23	74	0	14	58
GUB3	63	92	169	39	71	150	25	48	129	12	32	100	0	19	81
GUB4	94	144	281	71	105	250	47	82	201	23	59	157	0	35	120
GUB5	119	169	337	89	134	277	59	104	242	29	74	186	0	44	149
GUB6	282	449	752	176	318	661	111	216	578	55	141	490	0	83	367

GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db and or Ex tb - Wall mounting installation 5 sides involved in thermal dissipation + warning entry point > 70°C

Type (AL)	Tamb up to 40°C			Tamb up to 50°C			Tamb up to 60°C			Tamb up to 70°C			Tamb up to 80°C		
	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C
	Tcable 78°C	Tcable 92°C	Tcable 120°C	Tcable 78°C	Tcable 92°C	Tcable 120°C	Tcable 78°C	Tcable 92°C	Tcable 120°C	Tcable 78°C	Tcable 92°C	Tcable 120°C	Tcable 78°C	Tcable 92°C	Tcable 120°C
GUB1	36	53	99	22	40	88	14	27	75	7	18	57	0	10	46
GUB2	36	57	111	24	45	96	16	29	77	8	20	65	0	12	51
GUB3	50	80	155	34	64	134	22	41	108	11	28	90	0	17	71
GUB4	86	120	256	65	96	210	43	75	171	21	54	143	0	32	107
GUB5	109	155	290	81	122	253	54	95	207	27	68	169	0	40	136
GUB6	216	347	648	149	255	576	97	181	499	48	121	392	0	73	307

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GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db [i.] with or without Ex tb type of protection - Frame mounting installation 6 sides involved in thermal dissipation + warning entry point > 70°C			
Type (AL)	Tamb up to 40°C	Tamb up to 50°C	Tamb up to 60°C
	T6 / T85°C		
	Tcable 78°C		
GUB1	39	26	16
GUB2	45	28	18
GUB3	63	39	25
GUB4	94	71	47
GUB5	119	89	59
GUB6	282	176	111

Maximum dissipated power for versions Ex db [i.] with or without Ex tb type of protection - Wall mounting installation 5 sides involved in thermal dissipation + warning entry point > 70°C			
Type (AL)	Tamb up to 40°C	Tamb up to 50°C	Tamb up to 60°C
	T6 / T85°C		
	Tcable 78°C		
GUB1	36	22	14
GUB2	36	24	16
GUB3	50	34	22
GUB4	86	65	43
GUB5	109	81	54
GUB6	216	149	97

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GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db and or Ex tb - Frame mounting installation 6 sides involved in thermal dissipation without warning entry point

Type (AL)	Tamb up to 40°C			Tamb up to 50°C			Tamb up to 60°C			Tamb up to 70°C			Tamb up to 80°C		
	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C
	No T. Cable marked														
GUB1	39	39	39	22	22	22	10	10	10	0	0	0	0	0	0
GUB2	44	44	44	25	25	25	12	12	12	0	0	0	0	0	0
GUB3	63	67	67	38	38	38	18	18	18	0	0	0	0	0	0
GUB4	90	90	90	59	59	59	29	29	29	0	0	0	0	0	0
GUB5	118	118	118	77	77	77	38	38	38	0	0	0	0	0	0
GUB6	275	275	275	173	173	173	85	85	85	0	0	0	0	0	0

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GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db and or Ex tb - Wall mounting installation 5 sides involved in thermal dissipation without warning entry point

Type (AL)	No T. Cable marked	Tamb up to 40°C			Tamb up to 50°C			Tamb up to 60°C			Tamb up to 70°C			Tamb up to 80°C		
		T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C
GUB1	35	35	35	35	20	20	20	10	10	10	0	0	0	0	0	0
GUB2	36	39	39	39	23	23	23	11	11	11	0	0	0	0	0	0
GUB3	50	56	56	56	33	33	33	16	16	16	0	0	0	0	0	0
GUB4	82	82	82	82	54	54	54	27	27	27	0	0	0	0	0	0
GUB5	108	108	108	108	71	71	71	35	35	35	0	0	0	0	0	0
GUB6	216	235	235	235	149	150	150	74	74	74	0	0	0	0	0	0

GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db [i.] with or without Ex tb type of protection - Frame mounting installation 6 sides involved in thermal dissipation without warning entry point			
Type (AL)	Tamb up to 40°C	Tamb up to 50°C	Tamb up to 60°C
	T6 / T85°C		
	No T. Cable marked		
GUB1	39	22	10
GUB2	44	25	12
GUB3	63	38	18
GUB4	90	59	29
GUB5	118	77	38
GUB6	275	173	85

Maximum dissipated power for versions Ex db [i.] with or without Ex tb type of protection - Wall mounting installation 5 sides involved in thermal dissipation without warning entry point			
Type (AL)	Tamb up to 40°C	Tamb up to 50°C	Tamb up to 60°C
	T6 / T85°C		
	No T. Cable marked		
GUB1	35	20	10
GUB2	36	23	11
GUB3	50	33	16
GUB4	82	54	27
GUB5	108	71	35
GUB6	216	149	74

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MAXIMUM DISSIPATED POWER LIMITS (W / VA) RELATED TO THE STAINLESS STEEL MATERIAL VERSION

Maximum dissipated power for versions Ex db and or Ex tb - Frame mounting installation 6 sides involved in thermal dissipation + warning entry point > 70°C

Type (SS)	Tamb up to 40°C						Tamb up to 50°C						Tamb up to 60°C					
	T6 / T85°C		T5 / T100°C		T4 / T135°C		T6 / T85°C		T5 / T100°C		T4 / T135°C		T6 / T85°C		T5 / T100°C		T4 / T135°C	
	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C
GUB1	15	38	21	58	39	82	11	25	17	45	31	74	7	16	13	31	25	65
GUB2	17	44	24	66	44	93	13	28	19	49	35	82	8	18	15	34	29	74
GUB3	26	62	37	90	67	143	19	38	29	70	54	132	12	25	22	47	44	113
GUB4	60	79	81	108	128	236	44	60	66	89	107	193	28	40	51	69	93	154
GUB5	77	100	104	138	157	261	57	75	85	113	138	218	36	50	65	87	120	180
GUB6	158	204	225	329	386	624	115	142	177	241	320	550	74	93	132	172	265	480

GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db and or Ex tb - Frame mounting installation 6 sides involved in thermal dissipation + warning entry point > 70°C

Type (SS)	Tamb up to 70°C						Tamb up to 80°C					
	T6 / T85°C		T5 / T100°C		T4 / T135°C		T6 / T85°C		T5 / T100°C		T4 / T135°C	
	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C
GUB1	3	8	9	20	20	58	0	0	4	12	16	51
GUB2	3	9	10	23	23	66	0	0	5	13	18	56
GUB3	5	12	15	31	35	98	0	0	8	19	28	79
GUB4	12	20	35	50	78	121	0	0	19	30	63	98
GUB5	16	25	44	62	101	150	0	0	24	37	81	125
GUB6	32	46	90	117	215	371	0	0	49	70	168	296

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GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db and or Ex tb - Wall mounting installation 5 sides involved in thermal dissipation + warning entry point > 70°C

Type (SS)	Tamb up to 40°C						Tamb up to 50°C						Tamb up to 60°C					
	T6 / T85°C		T5 / T100°C		T4 / T135°C		T6 / T85°C		T5 / T100°C		T4 / T135°C		T6 / T85°C		T5 / T100°C		T4 / T135°C	
	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C
GUB1	13	28	17	45	30	64	9	19	14	36	25	57	6	13	11	23	20	52
GUB2	14	30	20	50	33	70	10	22	16	36	27	64	7	14	12	25	23	58
GUB3	21	43	28	70	46	100	15	30	23	50	39	91	9	20	17	36	33	82
GUB4	56	77	76	106	115	213	41	58	62	87	100	189	26	39	47	68	87	151
GUB5	72	98	98	135	147	256	53	73	80	110	130	211	34	49	60	85	112	177
GUB6	140	187	198	304	328	583	103	131	156	219	278	513	66	87	118	158	233	448

GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db and or Ex tb - Wall mounting installation 5 sides involved in thermal dissipation + warning entry point > 70°C												
Type (SS)	Tamb up to 70°C						Tamb up to 80°C					
	T6 / T85°C		T5 / T100°C		T4 / T135°C		T6 / T85°C		T5 / T100°C		T4 / T135°C	
	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C	Tcable 78°C	Tcable 125°C	Tcable 92°C	Tcable 150°C	Tcable 120°C	Tcable 180°C
GUB1	2	6	7	16	17	47	0	0	4	9	13	40
GUB2	3	7	8	18	19	52	0	0	4	11	15	45
GUB3	4	10	12	25	27	74	0	0	6	15	22	64
GUB4	11	19	32	48	73	117	0	0	17	29	59	96
GUB5	15	24	41	61	94	147	0	0	22	36	76	122
GUB6	29	43	81	109	189	338	0	0	44	65	148	255

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GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db [i.] with or without Ex tb type of protection - Frame mounting installation
6 sides involved in thermal dissipation + warning entry point > 70°C

Type (SS)	Tamb up to 40°C		Tamb up to 50°C		Tamb up to 60°C	
	T6 / T85°C					
	Tcable 78°C	Tcable 125°C	Tcable 78°C	Tcable 125°C	Tcable 78°C	Tcable 125°C
GUB1	15	38	11	25	7	16
GUB2	17	44	13	28	8	18
GUB3	26	62	19	38	12	25
GUB4	60	79	44	60	28	40
GUB5	77	100	57	75	36	50
GUB6	158	204	115	142	74	93

rev_
250226_A

GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db [i.] with or without Ex tb type of protection – Wall mounting installation 5 sides involved in thermal dissipation + warning entry point > 70°C						
Type (SS)	Tamb up to 40°C		Tamb up to 50°C		Tamb up to 60°C	
	T6 / T85°C					
	Tcable 78°C	Tcable 125°C	Tcable 78°C	Tcable 125°C	Tcable 78°C	Tcable 125°C
GUB1	13	28	9	19	6	13
GUB2	14	30	10	22	7	14
GUB3	21	43	15	30	9	20
GUB4	56	77	41	58	26	39
GUB5	72	98	53	73	34	49
GUB6	140	187	103	131	66	87

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GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db and or Ex tb - Frame mounting installation 6 sides involved in thermal dissipation without warning entry point

Type (SS)	Tamb up to 40°C			Tamb up to 50°C			Tamb up to 60°C			Tamb up to 70°C			Tamb up to 80°C		
	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C
	No Tcable marked														
GUB1	12			8			4			0					
GUB2	14			9			4			0					
GUB3	21			14			7			0					
GUB4	47			31			15			0					
GUB5	61			40			20			0					
GUB6	123			82			41			0					

GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db and or Ex tb – Wall mounting installation 5 sides involved in thermal dissipation without warning entry point

Type (SS)	Tamb up to 40°C			Tamb up to 50°C			Tamb up to 60°C			Tamb up to 70°C			Tamb up to 80°C		
	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C	T6 / T85°C	T5 / T100°C	T4 / T135°C
	No Tcable marked														
GUB1	10			6			3			0					
GUB2	11			7			3			0					
GUB3	16			11			5			0					
GUB4	44			29			14			0					
GUB5	57			38			19			0					
GUB6	110			73			36			0					

GUB SERIES - FEATURES

Maximum dissipated power for versions Ex db [i.] with or without Ex tb type of protection - Frame mounting installation 6 sides involved in thermal dissipation without warning entry point			
Type (SS)	Tamb up to 40°C	Tamb up to 50°C	Tamb up to 60°C
	T6 / T85°C		
	No Tcable marked		
GUB1	12	8	4
GUB2	14	9	4
GUB3	21	14	7
GUB4	47	31	15
GUB5	61	40	20
GUB6	123	82	41

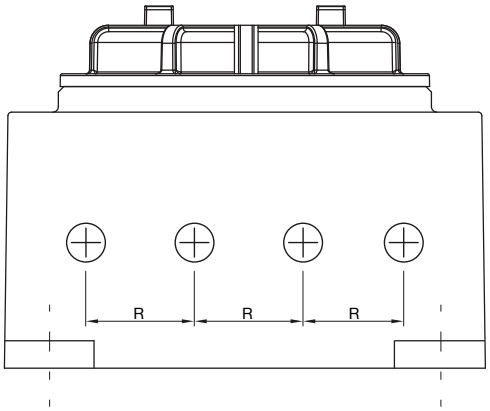
Maximum dissipated power for versions Ex db [i.] with or without Ex tb type of protection - Wall mounting installation 5 sides involved in thermal dissipation without warning entry point			
Type (SS)	Tamb up to 40°C	Tamb up to 50°C	Tamb up to 60°C
	T6 / T85°C		
	No Tcable marked		
GUB1	10	6	3
GUB2	11	7	3
GUB3	16	11	5
GUB4	44	29	14
GUB5	57	38	19
GUB6	110	73	36

rev_ 250226_A

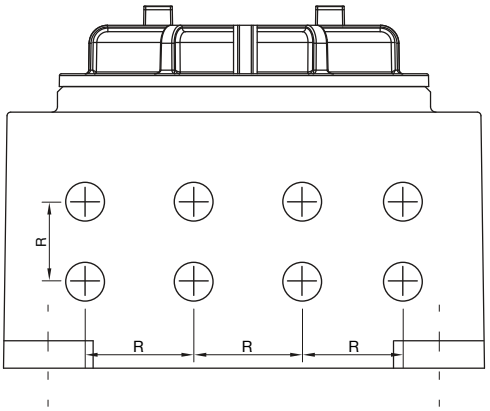
GUB SERIES - FEATURES

MAXIMUM NUMBER OF CABLE ENTRIES

LAYOUT A



LAYOUT B



ENCLOSURES	SIDE	¼" ÷ ½" ❶ M12÷ M20x1.5			¾" ❶ M25x1.5			1" ❶ M32x1.5			1" ¼ ❶ M40x1.5			1" ½ ❶ M50x1.5			2" ❶ M63x1.5			2" ½ ❶ M75x1.5 or 2			3" ❶ M80x1.5 or 2		
		R	Layout		R	Layout		R	Layout		R	Layout		R	Layout		R	Layout		R	Layout		R	Layout	
			A	B		A	B		A	B		A	B		A	B		A	B		A	B		A	B
GUB 1	S	44	3	-	55	2	-	65	-	-	75	-	-	80	-	-	90	-	-	120	-	-	130	-	-
	L		3	-		2	-		-	-		-	-		-	-		-	-		-	-		-	-
GUB 2	S	44	4	8	55	3	-	65	2	-	75	2	-	80	2	-	90	1	-	120	-	-	130	-	-
	L		4	8		3	-		2	-		2	-		2	-		1	-		-	-		-	-
GUB 3	S	44	4	8	55	3	-	65	2	-	75	2	-	80	2	-	90	2	-	120	-	-	130	-	-
	L		5	10		4	-		3	-		3	-		2	-		2	-		-	-		-	-
GUB 4	S	44	5	15 ❷	55	4	8	65	3	6	75	3	-	80	2	-	90	2	-	120	1	-	130	1	-
	L		6	18 ❷		4	8		4	8		3	-		3	-		3	-		2	-		2	-
GUB 5	S	70	6	18 ❷	70	5	10	70	5	6	75	4	-	80	4	-	90	4	-	120	3	-	130	2	-
	L		6	18 ❷		5	10		5	8		4	-		4	-		4	-		3	-		2	-
GUB 6	S	44	10	30 ❷	55	8	24 ❷	65	7	6	75	6	12	80	5	10	90	5	-	120	3	-	130	3	-
	L		10	30 ❷		8	24 ❷		7	8		6	12		5	10		5	-		3	-		3	-

❶ = ANSI/ASME B1.20.1 NPT
❷ = Arranged on 3 rows
L = Long Side
S = Short Side

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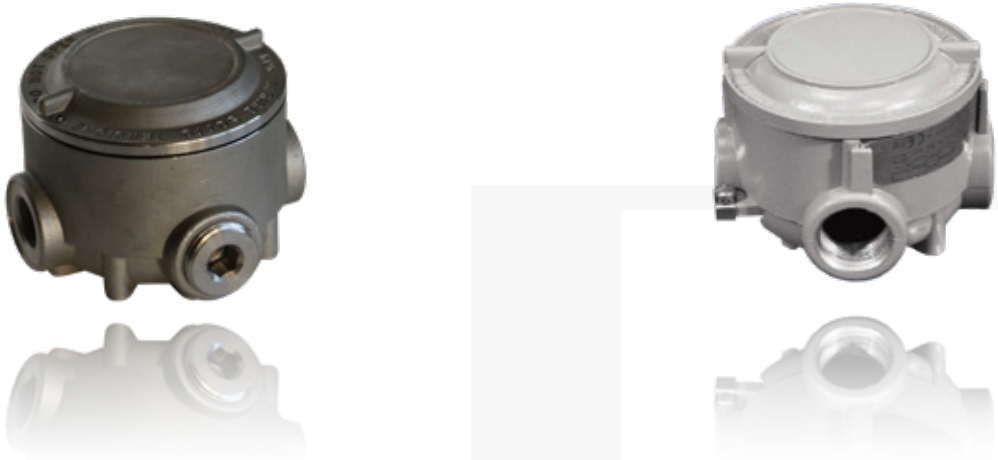
Ex db IIC INSTRUMENT ENCLOSURES AND TERMINAL BOXES

INSTRUMENT ENCLOSURES



TERMINAL BOXES

Instrument and terminal boxes are used to contain instruments, measurement devices and terminals. Suitable to be used in potentially explosive areas zone 1,21 and zone 2,22 these products are available both in copper-free aluminium or SS316L material.

CE2K S.r.l. Ex db IIC enclosures are ATEX, IECEx, Tr Cu and INMETRO certified.

INSTRUMENT ENCLOSURES
TECHNICAL SPECIFICATIONS

MATERIAL

Enclosure material:	Copper free aluminium or stainless steel AISI 316L

Ex CODE

Ex marking:	Ex II 2 GD Ex db IIC T6 ... T4 Gb Ex tb IIIC T85°C ... T135°C Db

MECHANICAL FEATURES

Degree of protection:	IP66
Temperature:	-50°C to +85°C
Threaded holes:	ISO Metric / ANSI B1.20.1 NPT

ELECTRICAL FEATURES

Max. rated voltage:	690 VAC / VDC
Max. rated impulse voltage:	8 kV (max. 10 sec.)
Frequency:	50 / 60 Hz
Maximum rated current:	109 A
Max. rated cross section:	35 sqmm

Ex FEATURES

Standards:	EN 60079-0 / EN 60079-1 / EN 60079-31 IEC 60079-0 / IEC 60079-1 / IEC 60079-31
Suitable for:	Zone 1 / Zone 2 / Zone 21 / Zone 22

CERTIFICATES

Certificates Number:

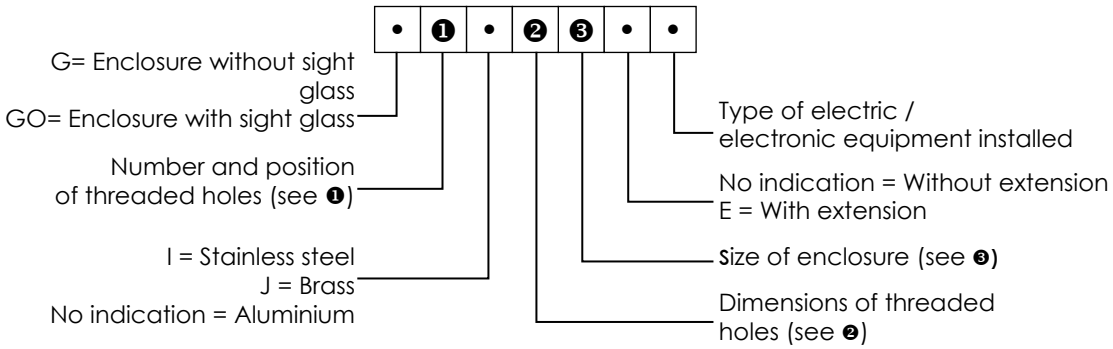
- Ex FTZÚ 15 ATEX 0182X
- IECEx FTZÚ 15.0035X
- EAC TR Cu certificate available upon request
- INMETRO certificate available upon request

NOTE

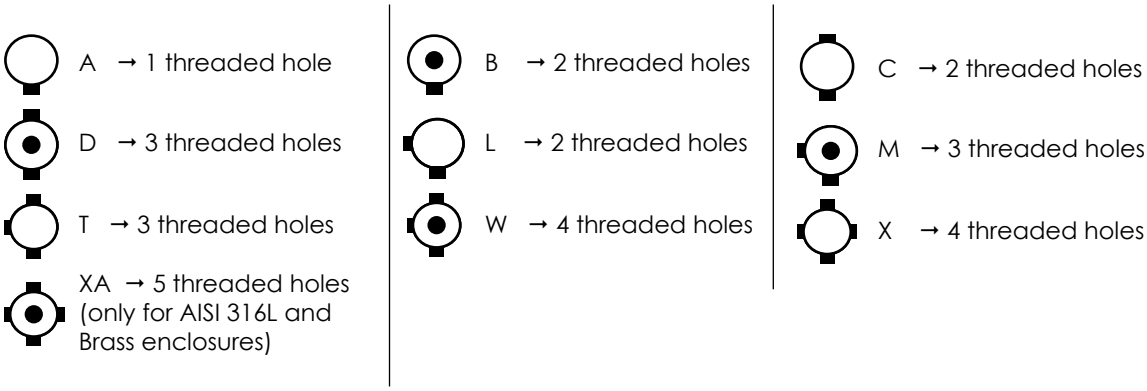
Certificate for Group I available.

INSTRUMENT ENCLOSURES
TECHNICAL SPECIFICATIONS

TYPE DESIGNATION OF INSTRUMENT ENCLOSURES



❶ Number and position of threaded holes (for Stainless steel and brass instument enclosures):



❷ Dimensions of threaded holes:

1= 1/2" NPT	20= M20x1.5
2= 3/4" NPT	25= M25x1.5
3= 1" NPT	32= M32x1.5
4= 1.1/4" NPT	40= M40x1.5
5= 1.1/2" NPT	50= M50x1.5
6= 2" NPT	63= M63x1.5

K = Mixed
In case of entries having different threading and/ or dimensions on the same enclosure, the marking will include the letter "K" and the layout of the threaded holes will be attached to the operating and maintenance manual.

❸ Size of the enclosures (all dimensions ± 3 mm):

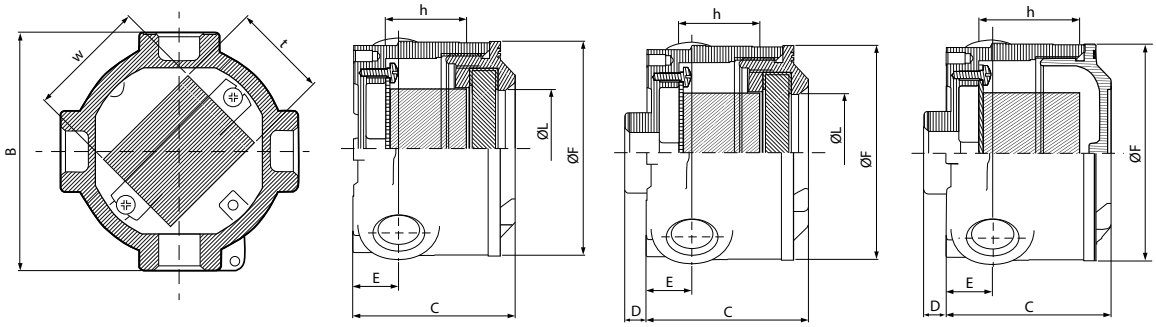
AISI 316L and Brass Enclosures

4 = Ø 71 mm;
6 = Ø 90 mm;
6A = Ø 90 mm;
7 = Ø 112 mm;
8 = Ø 131 mm ;
9 = Ø 146 mm

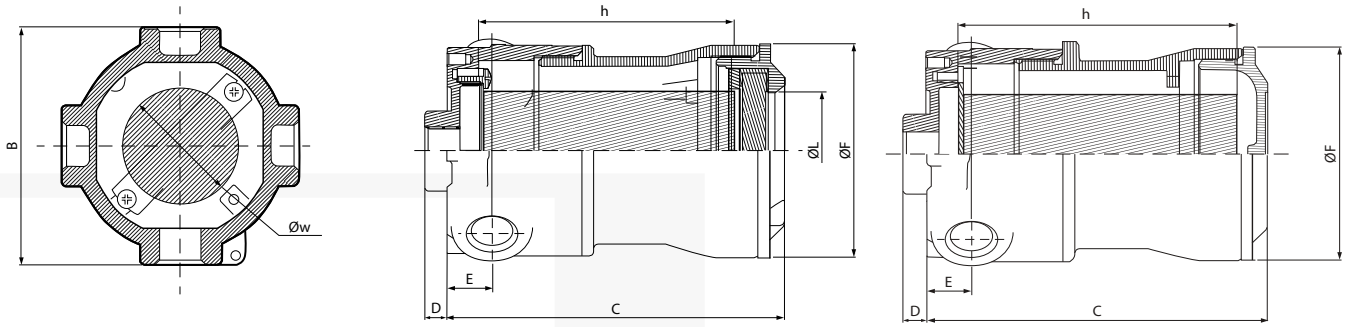
Aluminium Enclosures

4 = Ø 71mm;
6 = Ø 90 mm;
6A = Ø 90 mm;
8 = Ø 130 mm;
9 = Ø 145 mm ;

AISI 316L INSTRUMENT ENCLOSURES
DRAWINGS AND DIMENSIONS



WITH / WITHOUT WINDOW AND WITHOUT EXTENSION										
❸ Size	External dimensions (mm)						Max. dimensions apparatus (mm)			
	B	C	D	E	ØF	ØL	h	h (no window)	w	t
4	80	69	9	20	71	30	30	40	30	28
6	100	68	9,5	22,5	90	50	30	40	50	35
6A	100	73	9,5	22,5	90	50	35	45	50	35
7	126	82	11	24	112	65	40	50	65	45
8	145	99	9,5	27	131	70	55	65	70	60
9	161	115	9,5	27	146	85	65	80	85	65



WITH / WITHOUT WINDOW AND WITH EXTENSION									
❸ Size	External dimensions (mm)						Max. dimensions apparatus (mm)		
	B	C	D	E	ØF	ØL	h	h (no window)	Øw
4	80	129	9	20	71	30	75	90	30
6	100	118 ÷ 143	9,5	22,5	90	50	70 ÷ 95	80 ÷ 105	50
6A	100	123 ÷ 148	9,5	22,5	90	50	75 ÷ 100	85 ÷ 110	50
7	126	132 ÷ 172	11	24	112	65	80 ÷ 120	90 ÷ 130	65
8	145	149 ÷ 189	9,5	27	131	70	90 ÷ 130	65	70
9	161	165 ÷ 215	9,5	27	146	85	100 ÷ 150	80	85

Dimensions and weights are approximate and subject to change without notice.

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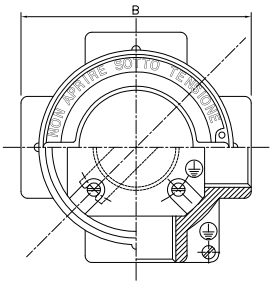
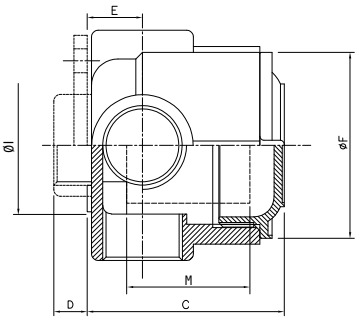
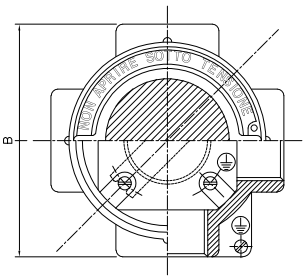
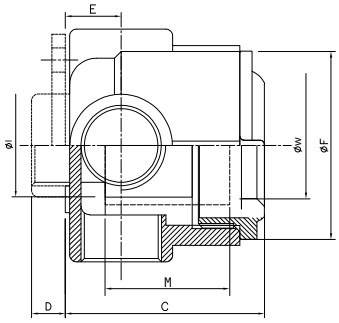
ALUMINIUM INSTRUMENT ENCLOSURES
DRAWINGS AND DIMENSIONS

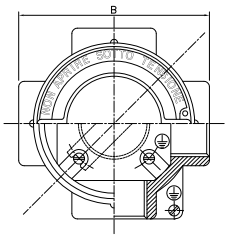


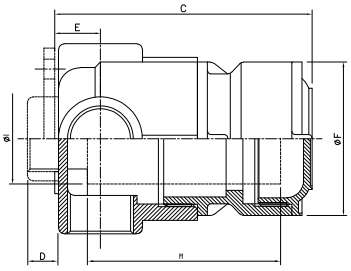


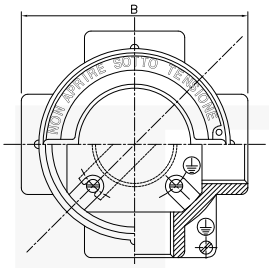


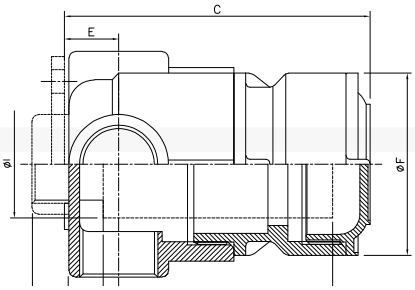


WITH / WITHOUT WINDOW AND WITHOUT EXTENSION									
❸ Size	External dimensions (mm)						Max. dimensions apparatus		
	B	C	D	E	ØF	Øw	M (mm)	M (mm) (no window)	ØI
4	80	77	9	20	70	38	22	49	44
6	100	78	8	20	90	50	23	49	64
6A	100	86	8	23	90	50	30	57	64
8	138	113	14	32	130	82	46	80	96
9	150	126	14	36	145	96	52	90	106









WITH / WITHOUT WINDOW AND WITH EXTENSION									
❸ Size	External dimensions (mm)						Max. dimensions apparatus		
	B	C	D	E	ØF	Øw	M (mm)	M (mm) (no window)	ØI
4	80	121	9	20	70	38	82	103	44
6	100	141	8	20	90	50	98	123	64
6A	100	148	8	23	90	50	105	131	64
8	138	185	14	32	130	82	138	168	96
9	150	205	14	36	145	96	153	188	106

Dimensions and weights are approximate and subject to change without notice.

TERMINAL BOXES
TECHNICAL SPECIFICATIONS

MATERIAL

Enclosure material:	Copper free Aluminium or stainless steel SS316L

Ex CODE

Ex marking:	Ex II 2 GD Ex db IIC T6 ... T4 Gb Ex tb IIIC T85°C ... T135°C Db

MECHANICAL FEATURES

Degree of protection:	IP66
Temperature:	-50°C to +85°C
Threaded holes:	ISO Metric / ANSI B1.20.1 NPT

ELECTRICAL FEATURES

Max. rated voltage:	690 VAC / VDC
Max. rated impulse voltage:	8 kV (max. 10 sec.)
Frequency:	50 / 60 Hz
Maximum rated current:	109 A
Max. rated cross section:	35 sqmm

Ex FEATURES

Standards:	EN 60079-0 / EN 60079-1 / EN 60079-31 IEC 60079-0 / IEC 60079-1 / IEC 60079-31
Suitable for:	Zone 1 / Zone 2 / Zone 21 / Zone 22

CERTIFICATES

Certificates Number:

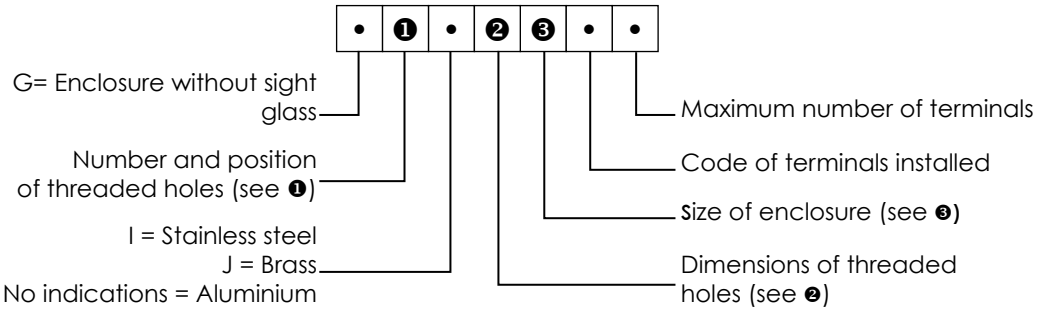
- Ex FTZÚ 15 ATEX 0182X
- IECEx FTZÚ 15.0035X
- EAC TR Cu certificate available upon request
- INMETRO certificate available upon request

NOTE

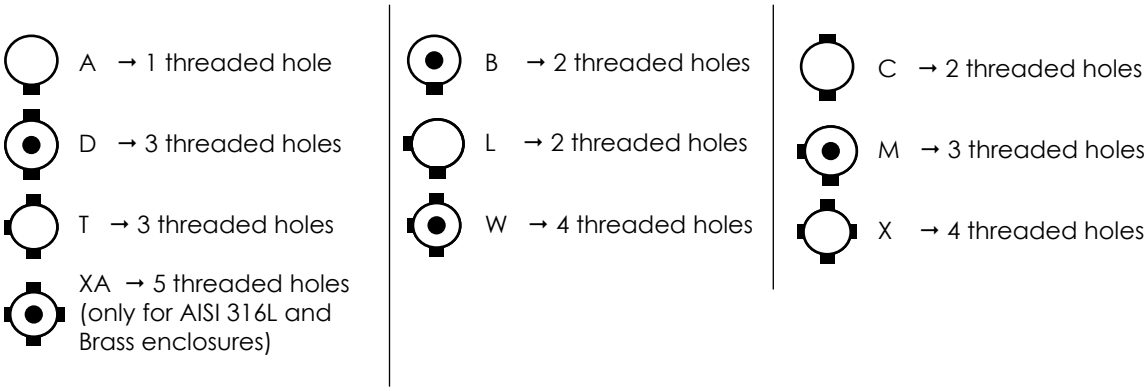
Certificate for Group I available.

TERMINAL BOXES
TECHNICAL SPECIFICATIONS

TYPE DESIGNATION OF INSTRUMENT ENCLOSURES



❶ Number and position of threaded holes (for Stainless steel and brass instument enclosures):



❷ Dimensions of threaded holes:

1= 1/2" NPT	20= M20x1.5
2= 3/4" NPT	25= M25x1.5
3= 1" NPT	32= M32x1.5
4= 1.1/4" NPT	40= M40x1.5
5= 1.1/2" NPT	50= M50x1.5
6= 2" NPT	63= M63x1.5

K = Mixed
In case of entries having different threading and/or dimensions on the same enclosure, the marking will include the letter "K" and the layout of the threaded holes will be attached to the operating and maintenance manual.

❸ Size of the enclosures (all dimensions ± 3 mm):

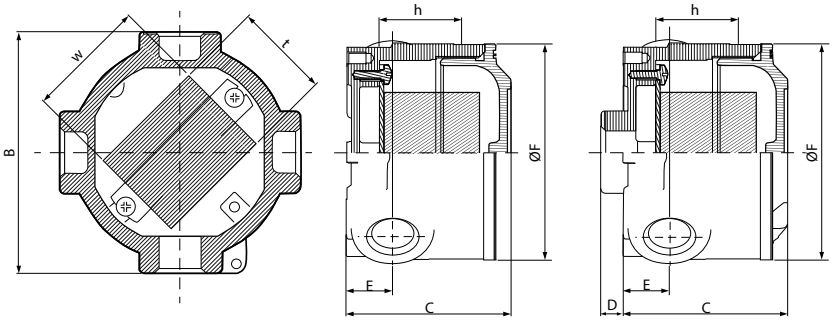
AISI 316L and Brass Enclosures

4 = Ø 71 mm;
6 = Ø 90 mm;
6A = Ø 90 mm;
7 = Ø 112 mm;
8 = Ø 131 mm ;
9 = Ø 146 mm

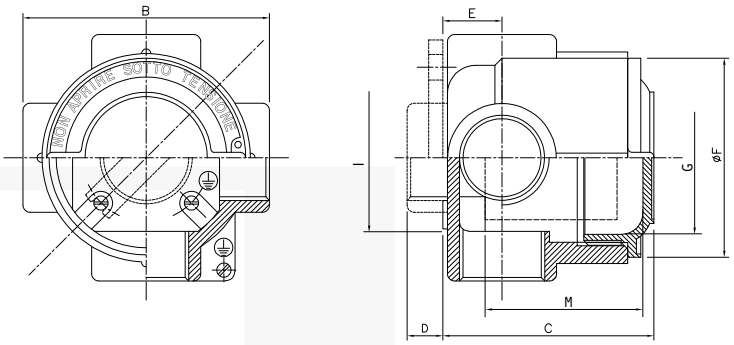
Aluminium Enclosures

4 = Ø 71mm;
6 = Ø 90 mm;
6A = Ø 90 mm;
8 = Ø 130 mm;
9 = Ø 145 mm ;

AISI 316L AND ALUMINIUM TERMINAL BOXES
DRAWINGS AND DIMENSIONS



AISI 316L TERMINAL BOXES - WITHOUT WINDOW AND WITHOUT EXTENSION									
❸ Size	External dimensions (mm)					Max. dimensions terminal strip (mm)			Max. volume terminals strip (dm³)
	B	C	D	E	ØF	h	w	t	
4	80	69	9	20	71	40	30	28	0,033
6	100	68	9,5	22,5	90	40	50	35	0,070
6A	100	73	9,5	22,5	90	45	50	35	0,078
7	126	82	11	24	112	50	65	45	0,146
8	145	99	9,5	27	131	65	70	60	0,273
9	161	115	9,5	27	146	75	85	65	0,414



ALUMINIUM TERMINAL BOXES - WITHOUT WINDOW AND WITHOUT EXTENSION								
❸ Size	External dimensions (mm)					Max. dimensions apparatus (mm)		
	B	C	D	E	ØF	M	I	G
4	80	77	9	20	70	49	51	51
6	100	78	8	20	90	49	70	70
6A	100	86	8	23	90	57	70	70
8	138	113	14	32	130	80	98	103
9	150	126	14	36	145	90	112	118

Dimensions and weights are approximate and subject to change without notice.

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Ex db eb IIC CONTROL STATIONS AND Ex eb IIC TERMINAL BOXES AISI 316L

CONTROL STATIONS

TERMINAL BOXES

CE2K-.. .. ..-JB/CS-X-… are enclosures in stainless steel SS316L material, with mode of protection 'eb'/'tb'. They are used as general-purpose boxes, containing increased safety certified terminals, intrinsic safety terminals, or other elements; and they can also be used as control and signalling units.

Enclosures CE2K-.. .. ..-JB/CS-X-… are available with ATEX, IECEx and ECASEx certificates.

AISI 316L CONTROL STATIONS
TECHNICAL SPECIFICATION

DESCRIPTION

CE2K-.. .. ..-CS-X-… enclosures are able to operate in an ambient temperature from -52°C to +85°C and have degree of protection IP65/IP66, according to the accessories installed.
The control and signalling units series CE2K-.. .. ..-CS-X-… can be fitted with different type of certified terminals and additional certified instruments.
These enclosures can be provided with or without removable gland plate.

MATERIAL

Enclosure material:	stainless steel AISI 316L

Ex CODE

Ex marking:	II 2GD Ex db eb ia/ib mb [ia Ga] IIC T6...T4 Gb (*) Ex tb IIIC T85°C...T135°C Db or Ex tb [ia Da] IIIC T85°C...T135°C Db

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AISI 316L CONTROL STATIONS
TECHNICAL SPECIFICATION

MECHANICAL FEATURES

Degree of protection:	IP66 or IP65 (*)
External earth:	bolt M10
Material gasket:	silicone
Mounting plate:	SS included
Cover:	solid
Cover fixing:	by screws or by hinges
Removable gland plate:	Upon request

ELECTRICAL FEATURES

Max. rated voltage (Ex e):	In accordance with the installed components/equipment
Max. rated voltage (Ex i):	In accordance with the installed I.S. components/equipment
Frequency:	50 / 60 Hz
Maximum rated current:	In accordance with the installed components/equipment
Maximum rated cross section:	300 sqmm

Ex FEATURE

Standards:	EN IEC 60079-0	IEC 60079-0
	EN 60079-1	IEC 60079-1
	EN IEC 60079-7	IEC 60079-7
	EN 60079-11	IEC 60079-11
	EN 60079-18	IEC 60079-18
	EN 60079-31	IEC 60079-31

Suitable for: Zone 1 / Zone 2 / Zone 21 / Zone 22

CERTIFICATES

Certificates Number:

FIDI 25 ATEX 0033X

IECEx FIDI 25.0014X

AVAIBLE UPON REQUEST

(*) According to accessories installed such as operators, selectors and removable gland plate.

AISI 316L CONTROL STATIONS
DIMENSIONS

MODEL	EXTERNAL DIMENSIONS			Kg	REAR FIXING CENTER DISTANCE		MOUNTING PLATE DIMENSIONS		REAR FIXING POINT	DOOL DRILL SIZE		WORKING DEPT
	W	H			W-50	H-50	W-35	H35		W-40	H-40	d
	mm	mm	mm		mm	mm	mm	mm		mm	mm	mm
CE2K-09 09 09 -SSX-W	90	90	90	0,4	/	40	/	/	2	50	50	85
CE2K-09 14 09 -SSX-W	90	140	90	0,7						50	100	75
CE2K-09 15 09 -SSX-W	90	150	90	0,7	/	100	/	/	2	50	110	85
CE2K-09 20 09 -SSX-W	90	200	90	0,8	/	150	/	/	2	50	160	85
CE2K-09 28 09 -SSX-W	90	280	90	1,15	/	230	/	/	2	50	240	75
CE2K-09 30 09 -SSX-W	90	300	90	1,3	/	250	/	/	2	50	260	85
CE2K-10 10 10 -SSX-W	100	100	100	0,74	/	50	70	85	2	60	60	85
CE2K-10 16 10 -SSX-W	100	160	100	1,03	/	110	70	145	2	60	120	85
CE2K-10 20 10 -SSX-W	100	200	100	1,23	/	150	70	185	2	60	160	85
CE2K-15 15 12 -SSX-W	150	150	120	1,5	/	100	115	115	2	110	110	115
CE2K-15 20 12 -SSX-W	150	200	120	1,9	/	150	115	165	2	110	160	115
CE2K-15 30 12 -SSX-W	150	300	120	2,8	/	250	115	265	2	110	260	115
CE2K-16 16 10 -SSX-W	160	160	100	1,48	110	110	130	130	4	120	120	85
CE2K-16 25 10 -SSX-W	160	250	100	2,1	110	200	130	220	4	120	210	85
CE2K-20 20 10 -SSX-W	200	200	100	2,12	150	150	170	170	4	160	160	85
CE2K-20 25 12 -SSX-W	200	250	120	2,82	150	200	170	220	4	160	210	105
CE2K-20 30 12 -SSX-W	200	300	120	3,24	150	250	170	270	4	160	260	105
CE2K-20 40 12 -SSX-W	200	400	120	4,2	150	350	170	370	4	160	360	105
CE2K-30 30 12 -SSX-W	300	300	120	4,7	250	250	270	270	4	260	260	105
CE2K-30 40 12 -SSX-W	300	400	120	6,03	250	350	270	370	4	260	360	105
CE2K-30 40 15 -SSX-W	300	400	150	7	250	350	265	365	4	260	360	138

Dimensions and weights are approximate and subject to change without any notice.
The above table refers to the Control Station version having cover with screws. Control Station version is also available with hinged cover and other dimensions are available upon request.
Contact **info@ce2k.com** for further details.

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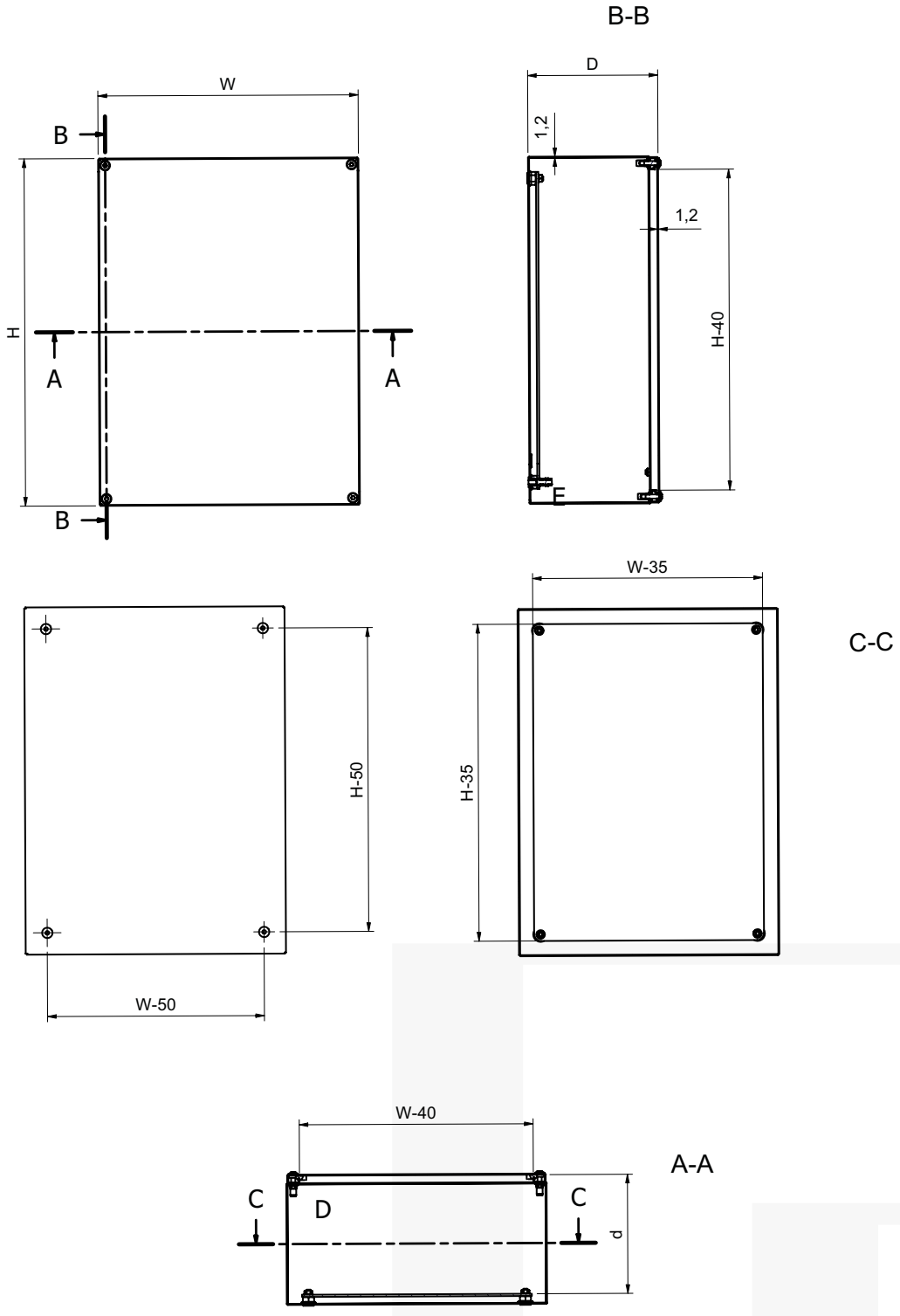
AISI 316L CONTROL STATIONS DRAWINGS



Drawings above refer to Control Station with bolted cover. For the drawings of hinges of Control Stations ask to info@ce2k.com.

AISI 316L TERMINAL BOXES
TECHNICAL SPECIFICATIONS

DESCRIPTION

CE2K-.. .. ..-JB-X-… enclosures are able to operate in an ambient temperature from -52°C to +85°C and have degree of protection IP65/IP66, according to the accessories installed.

The terminal boxes series CE2K-.. .. ..-JB-X-… can be fitted with different type of certified terminals. These enclosures can be provided with or without removable gland plate.

MATERIAL

Enclosure material:	Stainless Steel AISI316L

Ex CODE

Ex marking:	II 2GD Ex eb ia/ib IIC T6...T4 Gb or Ex ia IIC T6 Ga (*) Ex tb IIIC T85°C...T135°C Db or

MECHANICAL FEATURES

Degree of protection:	IP66 or IP65 (*)
External earth:	bolt M10
Material gasket:	silicone
Mounting plate:	SS included
Cover:	solid
Cover fixing:	by screws or by hinges
Removable gland plate:	Upon request

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AISI 316L TERMINAL BOXES
TECHNICAL SPECIFICATIONS

ELECTRICAL FEATURES

Max. rated voltage (Ex e):	In accordance with the installed components/equipment
Max. rated voltage (Ex i):	In accordance with the installed I.S. components/equipment
Frequency:	50 / 60 Hz
Maximum rated current:	In accordance with the installed components/equipment
Maximum rated cross section:	300 sqmm

Ex FEATURES

Standards:	EN IEC 60079-0	IEC 60079-0
	EN IEC 60079-7	IEC 60079-7
	EN 60079-11	IEC 60079-11
	EN 60079-31	IEC 60079-31
Suitable for:	Zone 1 / Zone 2 / Zone 21 / Zone 22	

CERTIFICATES

Certificates Number:

FIDI 25 ATEX 0033X

IECEx FIDI 25.0014X

AVAIBLE UPON REQUEST

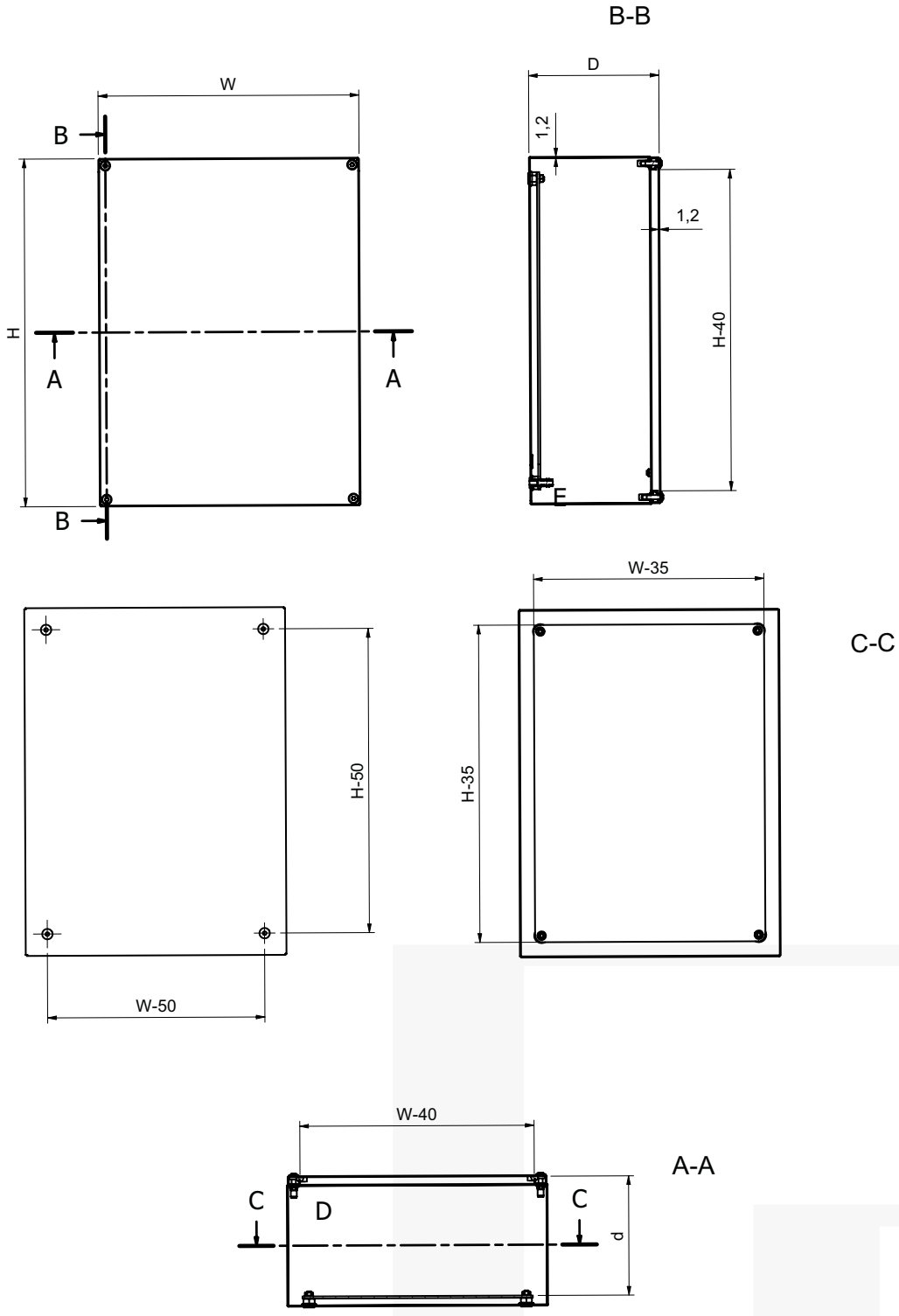
(*) According to the presence of the and removable gland plate.

AISI 316L TERMINAL BOXES
DIMENSIONS

MODEL	EXTERNAL DIMENSIONS			Kg	REAR FIXING CENTER DISTANCE		MOUNTING PLATE DIMENSIONS		REAR FIXING POINT	DOOL DRILL SIZE		WORKING DEPT
	W	H			W-50	H-50	W-35	H35		W-40	H-40	d
	mm	mm	mm		mm	mm	mm	mm		mm	mm	mm
CE2K-09 09 09 -SSX-W	90	90	90	0,4	/	40	/	/	2	50	50	85
CE2K-09 14 09 -SSX-W	90	140	90	0,7						50	100	75
CE2K-09 15 09 -SSX-W	90	150	90	0,7	/	100	/	/	2	50	110	85
CE2K-09 20 09 -SSX-W	90	200	90	0,8	/	150	/	/	2	50	160	85
CE2K-09 28 09 -SSX-W	90	280	90	1,15	/	230	/	/	2	50	240	75
CE2K-09 30 09 -SSX-W	90	300	90	1,3	/	250	/	/	2	50	260	85
CE2K-10 10 10 -SSX-W	100	100	100	0,74	/	50	70	85	2	60	60	85
CE2K-10 16 10 -SSX-W	100	160	100	1,03	/	110	70	145	2	60	120	85
CE2K-10 20 10 -SSX-W	100	200	100	1,23	/	150	70	185	2	60	160	85
CE2K-15 15 12 -SSX-W	150	150	120	1,5	/	100	115	115	2	110	110	115
CE2K-15 20 12 -SSX-W	150	200	120	1,9	/	150	115	165	2	110	160	115
CE2K-15 30 12 -SSX-W	150	300	120	2,8	/	250	115	265	2	110	260	115
CE2K-16 16 10 -SSX-W	160	160	100	1,48	110	110	130	130	4	120	120	85
CE2K-16 25 10 -SSX-W	160	250	100	2,1	110	200	130	220	4	120	210	85
CE2K-20 20 10 -SSX-W	200	200	100	2,12	150	150	170	170	4	160	160	85
CE2K-20 25 12 -SSX-W	200	250	120	2,82	150	200	170	220	4	160	210	105
CE2K-20 30 12 -SSX-W	200	300	120	3,24	150	250	170	270	4	160	260	105
CE2K-20 40 12 -SSX-W	200	400	120	4,2	150	350	170	370	4	160	360	105
CE2K-30 30 12 -SSX-W	300	300	120	4,7	250	250	270	270	4	260	260	105
CE2K-30 40 12 -SSX-W	300	400	120	6,03	250	350	270	370	4	260	360	105
CE2K-30 40 15 -SSX-W	300	400	150	7	250	350	265	365	4	260	360	138

Dimensions and weights are approximate and subject to change without any notice.
The above table refers to the Control Station version having cover with screws. Control Station version is also available with hinged cover and other dimensions are available upon request.
Contact **info@ce2k.com** for further details.

AISI 316L TERMINAL BOXES
DRAWINGS



Drawings above refer to Control Station with bolted cover. For the drawings of hinges of Control Stations ask to **info@ce2k.com.**

GRP CONTROL STATIONS
TECHNICAL SPECIFICATIONS

DESCRIPTION

The CE2K-.. .. ..-CS-GRP range includes 25 sizes of enclosures manufactured in GRP (glass reinforced polyester) with 4mm thickness, that can be threaded.

Polyester is a valid alternative to aluminum, stainless steel or cast iron; it has excellent mechanical strength and a long life expectancy.

The boxes series CE2K-.. .. ..-CS-GRP are able to operate in an ambient temperature from -60°C to +85°C and consist of enclosures having degree of protection IP66 (with red or white colour silicone gasket placed on internal part of the lid) or IP66/67 (as option).

The control and signalling units series CE2K-.. .. ..-CS-GRP can be equipped with certified components like:
- ammeter/voltmeter;
- switch module (for push-button, selector switch, control switch, etc.) and relevant actuator;
- safety switch;
- signalling lamp or Led; illuminated button;
- fuse;
- potentiometer.

Temperature class depends on the temperature class of the "hottest" component(s): if at least one component having temperature class T5 or T4 is mounted, the temperature class shall be T5 or T4.

The maximum permissible ambient temperature of the certified operators shall duly be considered.

For area of drilling on the lid must be considered the lid dimensions less 15%.

MATERIAL

Enclosure material:	Black glass fibre reinforced polyester resin graphite added (surface resistance <1GΩ)

Ex CODE

Ex marking:	Ⓔx II 2 GD Ex eb IIC T6/T5 Gb Ex tb IIIC T85°C / T100°C Db

GRP CONTROL STATIONS
TECHNICAL SPECIFICATIONS

MECHANICAL FEATURES

Thickness:	4mm
Degree of protection:	IP66 (IP66/67 as option)
Back fixing points Gasket:	silicone
Mounting plate:	as option
Mounting plate dimensions:	see technical details
Cover:	solid
Cover fixing:	by screws

ELECTRICAL FEATURES

Max. rated voltage (Ex e):	11k VAC or VDC
Max. rated voltage (Ex i):	30 VAC or VDC
Frequency:	50/60 Hz
Maximum rated current:	520A
Maximum rated cross section:	300sqmm

Ex FEATURES

Standards:	EN 60079-0 / EN 60079-1 / EN 60079-7 / EN 60079-11/ EN 60079-31
Suitable for:	Zone 1 / Zone 2 / Zone 21 / Zone 22

CERTIFICATES

Certificates Number:

CEC 15 ATEX 211

INMETRO certificate available upon request

GRP CONTROL STATIONS
DIMENSIONS

Model	External dimensions			Internal dimensions			Fixing		Screw
	H	W	D	h	w	d			
	mm	mm	mm	mm	mm	mm	H+	W+	
CE2K-12 12 09-CS-GRP	120	122	90	102	104	80	82	106	
CE2K-12 22 09-CS-GRP	120	220	90	102	190	80	82	204	
CE2K-16 16 09-CS-GRP	160	160	90	142	112	80	110	140	
CE2K-16 26 09-CS-GRP	160	260	90	142	212	80	110	240	
CE2K-16 36 09-CS-GRP	160	360	90	142	312	80	110	340	
CE2K- 16 56 09-CS-GRP	160	560	90	142	512	80	110	540	
CE2K-20 25 12-CS-GRP	200	250	120	180	230	110			
CE2K-25 25 12-CS-GRP	250	255	120	230	235	110	200	235	M6
CE2K-25 25 16-CS-GRP	250	255	160	230	235	140			
CE2K-25 40 12-CS-GRP	250	400	120	230	380	110	200	380	
CE2K-25 40 16-CS-GRP	250	400	160	230	380	160			
CE2K-25 60 12-CS-GRP	250	600	120	230	580	110			
CE2K-25 60 16-CS-GRP	250	600	160	230	580	140			
CE2K-40 40 12-CS-GRP	405	400	120	385	580	110			
CE2K-40 40 16-CS-GRP	405	400	165	385	380	154	355	380	

Dimensions and weights are approximate and subject to change without notice.
Table above refers to Control Station with bolted cover. For the dimensions of Control Stations with hinges ask to info@ce2k.com.

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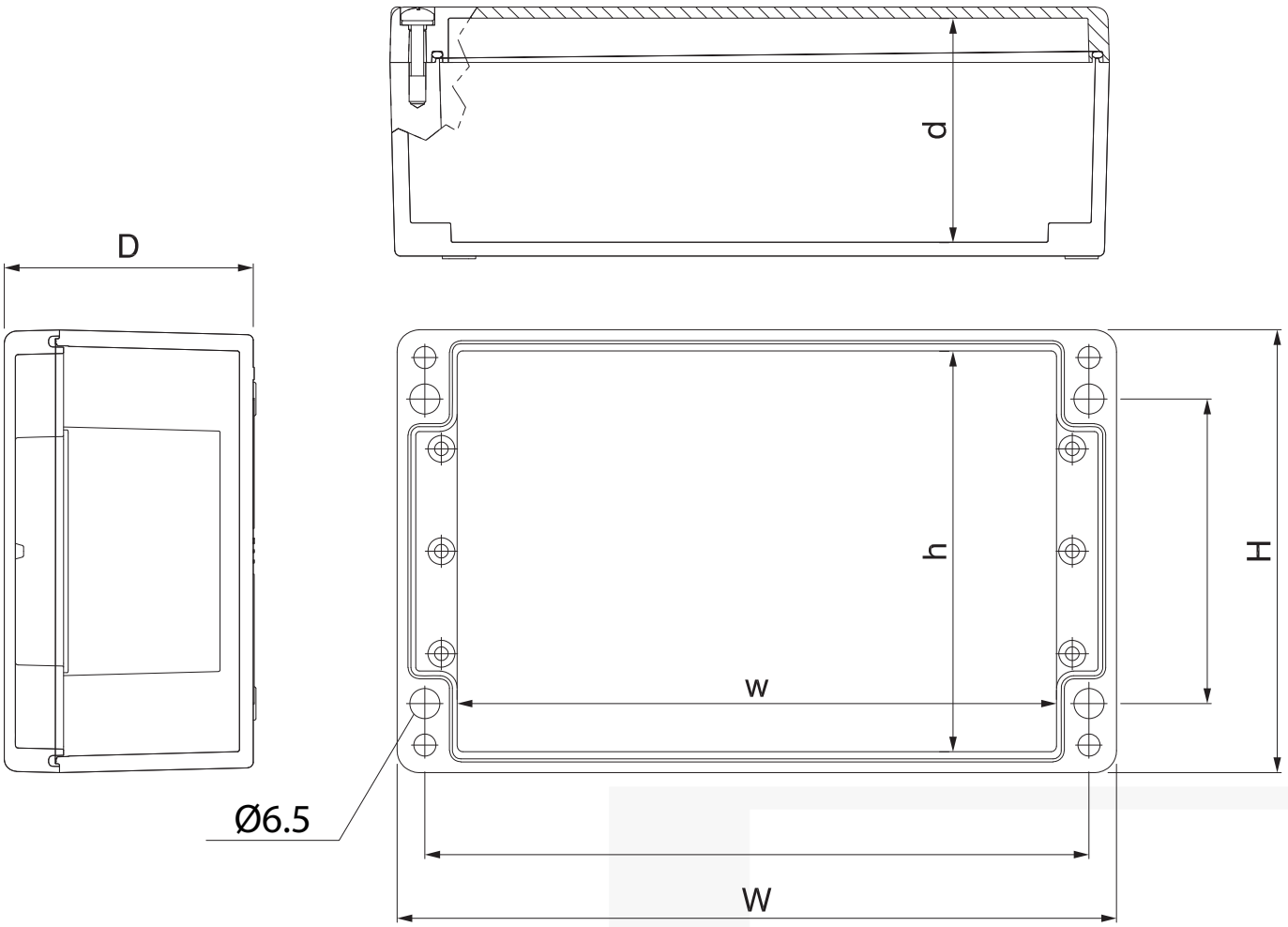
GRP CONTROL STATIONS
DRAWINGS



GRP TERMINAL BOXES
TECHNICAL SPECIFICATIONS

DESCRIPTION

The terminal boxes series CE2K-.. .. ..-GRP are able to operate in an ambient temperature from -60°C to +85°C and consist of enclosures having degree of protection IP66 (with red or white colour silicone gasket placed on internal part of the lid) or IP66/67 (as option).

The CE2K-.. .. ..-GRP range includes 25 sizes of enclosures manufactured in GRP glass reinforced polyester with 4 mm thickness, that can be threaded.

Polyester is a valid alternative to aluminum, stainless steel or cast iron; it has excellent mechanical strength and a long life expectancy.

MATERIAL

Enclosure material:	Black glass fibre reinforced polyester resin graphite addes (surface resistance <1GΩ)

Ex CODE

Ex marking:	Ex II 2 GD Ex eb IIC T6/T5 Gb Ex tb IIIC T85°C / T100°C Db

MECHANICAL FEATURES

Thickness:	4mm
Degree of protection:	IP66 (IP66/67 as option)
Back fixing points	
Gasket:	silicone
Mounting plate	as option
Mounting plate dimensions:	see technical details
Cover:	solid
Cover fixing:	by screws

GRP TERMINAL BOXES TECHNICAL SPECIFICATIONS

ELECTRICAL FEATURES

Max. rated voltage (Ex e):	11k VAC or VDC
Max. rated voltage (Ex i):	30 VAC or VDC
Frequency:	50/60 Hz
Maximum rated current:	520A
Maximum rated cross section:	300sqmm

Ex FEATURES

Standards:	EN 60079-0 / EN 60079-1 / EN 60079-7 / EN 60079-11/ EN 60079-31
Suitable for:	Zone 1 / Zone 2 / Zone 21 / Zone 22

CERTIFICATES

Certificates Number: CEC 15 ATEX 211

INMETRO certificate available upon request

GRP TERMINAL BOXES
DIMENSIONS

Model	External dimensions			Internal dimensions			Fixing		Screw
	H	W	D	h	w	d			
	mm	mm	mm	mm	mm	mm	H+	W+	
CE2K-75 08 55-GRP	75	80	55	58	48	46	45	68	M4
CE2K-75 08 75-GRP	75	80	75	58	48	66	45	68	
CE2K-75 11 55-GRP	75	110	55	58	78	46	45	98	
CE2K-75 11 75-GRP	75	110	75	58	78	66	45	98	
CE2K-75 16 55-GRP	75	160	55	58	128	46	45	148	
CE2K-75 16 75-GRP	75	160	75	58	128	66	45	148	
CE2K-75 19 55-GRP	75	190	55	58	158	46	45	178	
CE2K-75 19 75-GRP	75	190	75	58	158	66	45	178	
CE2K-75 23 55-GRP	75	230	55	58	198	46	39	218	
CE2K-75 23 75-GRP	75	230	75	58	198	66	39	218	
CE2K-12 12 09-GRP	120	122	90	102	104	80	82	106	M6
CE2K-12 22 09-GRP	120	220	90	102	190	80	82	204	
CE2K-16 16 09-GRP	160	160	90	142	112	80	110	140	
CE2K-16 26 09-GRP	160	260	90	142	212	80	110	240	
CE2K-16 36 09-GRP	160	360	90	142	312	80	110	340	
CE2K- 16 56 09-GRP	160	560	90	142	512	80	110	540	
CE2K-20 25 12-GRP	200	250	120	180	230	110			
CE2K-25 25 12-GRP	250	255	120	230	235	110	200	235	
CE2K-25 25 16-GRP	250	255	160	230	235	140			
CE2K-25 40 12-GRP	250	400	120	230	380	110	200	380	
CE2K-25 40 16-GRP	250	400	160	230	380	160			
CE2K-25 60 12-GRP	250	600	120	230	580	110			
CE2K-25 60 16-GRP	250	600	160	230	580	140			
CE2K-40 40 12-GRP	405	400	120	385	580	110			
CE2K-40 40 16-GRP	405	400	165	385	380	154	355	380	

Dimensions and weights are approximate and subject to change without notice.
Table above refers to Control Station with bolted cover. For the dimensions of Control Stations with hinges ask to info@ce2k.com.

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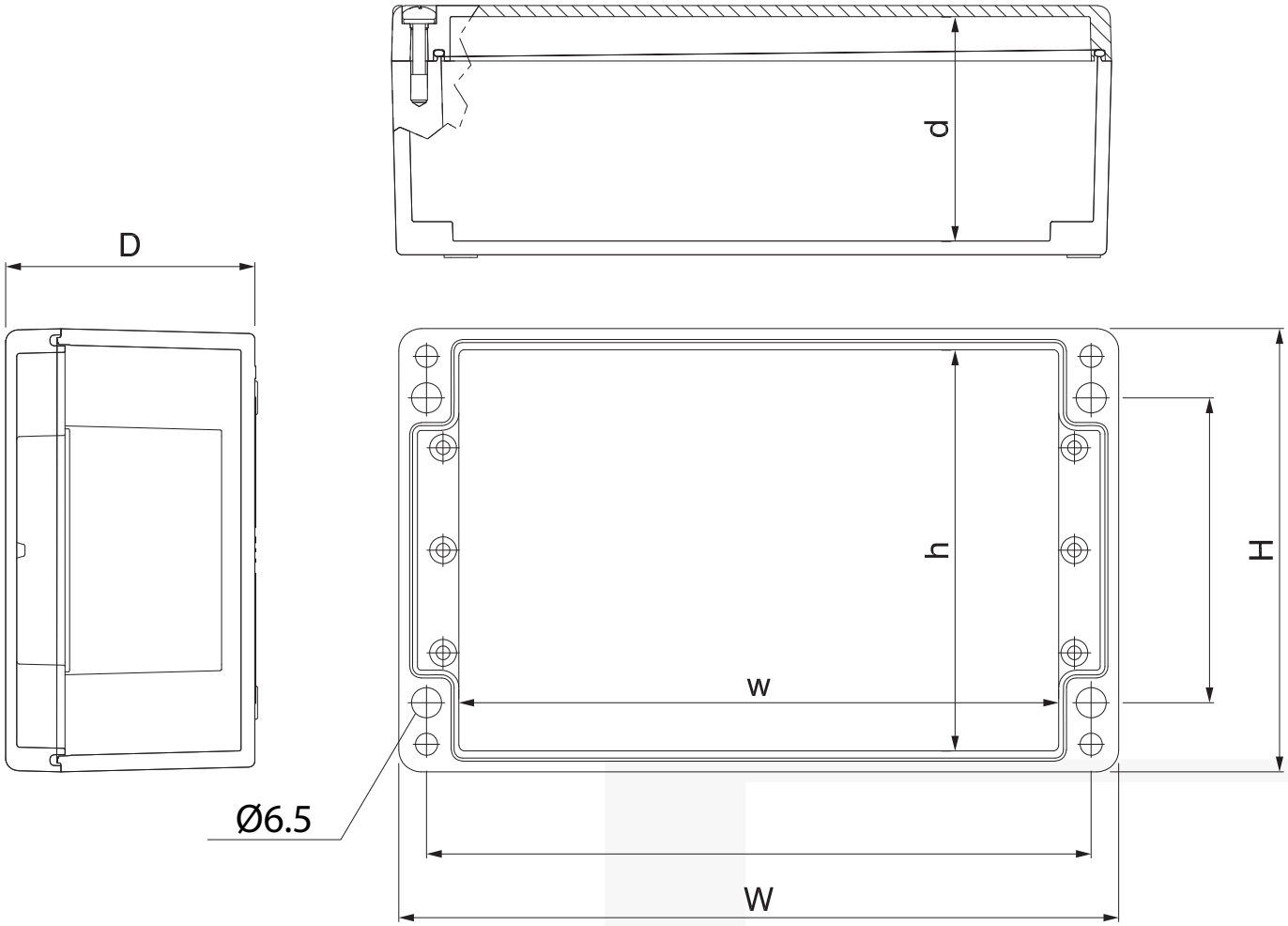
GRP TERMINAL BOXES
DRAWINGS



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EXPLOSIVE ATMOSPHERE

The Directive defines 'explosive atmosphere' as mixture with air, under atmospheric conditions of flammable substances in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

Explosive atmospheres can be caused by flammable gases, mists or vapours or by combustible dusts. If there is enough of the substance, mixed with air, then all it needs is a source of ignition to cause an explosion.

ATEX (ATmosphères EXplosibles) is the name commonly given to the two European Directives for controlling explosive atmospheres:

1. Directive 99/92/EC: deals with the precautions to be taken in workplaces where explosive atmospheres might be present due to flammable dusts vapours or gases (or mixtures of these);
2. Directive 2014/34/EU: is concerned with products that may be supplied for use in potentially explosive atmospheres.

Directive 99/92/EC

Directive 99/92/EC requires employers to protect workers from the risk of explosive atmospheres.
The Directive provides workers with a minimum level of protection in hazardous areas throughout the member states.

The directive is based on 3 straightforward principles:

1. Where possible, to prevent the formation of explosive atmosphere;
2. Where such atmosphere are unavoidable, to prevent ignition and
3. To ensure the heath and safety of workers by mitigating the effects of any explosions that does occur.

Where the workers from different organizations are present on site, it is the employer who has responsibility for the workplace that must coordinate and implement the safety measures for all workers.

Directive 2014/34/EU

Directive 2014/34/EU "Equipment and Protective Systems for use in potentially explosive atmospheres". Covers electrical and non-electrical products intended for use in hazardous areas.
Potentially explosive atmosphere are classified with respect to the possibility of the presence of an explosive mixture due to:

- Gas;
- Dust;
- Vapours;
- Mists.

CONDITIONS TO CREATE AN EXPLOSION

An explosion can only take place if the following three factors coincide:

- Combustible substance - Gas, liquid or solid substance:
  - Gas: A gas is a sample of matter that conforms to the shape of a container in which it is held and acquires a uniform density inside the container, even in the presence of gravity and regardless of the amount of substance in the container. If not confined to a container, gaseous matter, also known as vapour, will disperse into space. The term gas is also used in reference to the state, or condition, of matter having this property;
  - Vapour: The term vapour is used to describe the state of a substance when it's gaseous phase is in equilibrium with it's liquid or solid phases, below it's boiling point;
  - Fog: Droplet of liquid dispersed in a gas (ex. Air) following strong accelerations (Ex. Vibrations or by condensation);
  - Dust: Is made by small solid particles which are present in the atmosphere, deposit themselves for the effect of their weight, but that can remain suspended for a certain period. A set of solid dust particles, smaller than 500µm, is considered "dust". (Only dust smaller than 200µm can provoke explosions).
- Oxygen (in the air).
- Source of ignition (e.g. electrical spark).

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Combustible substances form a potentially explosive atmosphere when they are present within a certain range of concentration.

If the concentration is too low (lean mixture) and if the concentration is too high (rich mixture) an explosion does not take place. Slow burning takes place instead, or no burning at all. Only in the area between the upper and the lower explosion limits does the mixture react explosively if ignited.
The explosion limits depend on the surrounding pressure and the proportion of oxygen in the air.

Flammability limit (LEL e UEL): Minimum or maximum concentration levels of vapour of a flammable or combustible material (expressed as per cent by volume in air) at which an explosion will occur in a confined area if an ignition source is present. No explosion can occur in the presence of very low or very high concentrations.

LEL (lower explosive limit): Lowest concentration (percentage) of a gas or vapour in air capable of producing a flash of fire in presence of an ignition source (arc, flame, heat). Concentrations lower than LEL are 'too lean' to burn. Also called lower flammable limit (LFL).

UEL (upper explosive limit): Highest concentration (percentage) of a gas or vapour in air capable of producing a flash of fire in presence of an ignition source (arch, flame, heat). Concentrations higher than UEL are 'too rich' to burn. Also called upper flammable limit (UFL).

IECEx

IEC (International Electro-technical Commission) promote international co-operation on all questions of standardization and related matters in the fields of electro-technology, including Conformity Assessment.

IECEx is the International Standard way of doing Ex Certification.
The IEC's System with Schemes covering Certification to Standards that relate to Equipment, Services and Persons in areas relating to Explosive Atmospheres, to provide an Internationally accepted means of demonstrating claimed compliance with International Standards.

The objective of the IECEx System is to facilitate international trade in equipment and services for use in explosive atmospheres, while maintaining the required level of safety:

- Reduced testing and certification costs to manufacturer;
- Reduced time to market;
- International confidence in the product assessment process;
- One international database listing;
- Maintaining International Confidence in equipment and services covered by IECEx Certification.

Ex EQUIPMENT

Ex equipment in such areas include:

- Automotive refuelling stations or petrol stations;
- Oil refineries, rigs and processing plants;
- Chemical processing plants;
- Printing industries, paper and textiles;
- Hospital operating theatres;
- Aircraft refuelling and hangars;
- Surface coating industries;
- Underground coalmines;
- Sewerage treatment plants;
- Gas pipelines and distribution centres;
- Grain handling and storage;
- Woodworking areas;
- Sugar refineries:
- Metal surface grinding, especially aluminium dusts and particles;

HAZARDOUS AREA ZONES AND EQUIPMENT CATEGORIES

GASES, VAPOURS AND MISTS

ZONE 0 = A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mists is present continuously or for long periods or frequently.

ZONE 1 = A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mists is likely to occur in normal operation.

ZONE 2 = A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mists is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

DUSTS

ZONE 20 = A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, or for long periods or frequently.

ZONE 21 = A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation occasionally.

ZONE 22 = A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

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EQUIPMENT CATEGORIES AND ZONES

The hazardous area zone classification and corresponding equipment categories are:
ZONE 0 or ZONE 20 -> Category 1 equipment
ZONE 1 or ZONE 21 -> Category 2 equipment
ZONE 2 or ZONE 22 -> Category 3 equipment

Note: Category 1 equipment can also be used in Zones 1 and 21 and Category 1 and 2 equipment can be used in Zones 2 and 22.

Zone of use	ATEX category	IECEx ELP
Zone 0	1G	Ga
Zone 20	1D	Da
Zone 1	2G	Gb
Zone 21	2D	Db
Zone 2	3G	Gc
Zone 22	3D	Dc

GAS AND VAPOURUS – Classifications

Mining	Surface Industy		
Group I	Group II		
Methane (Grisoul)	IIA	IIB	IIC
	Propane	Ethylene	Acetylene
	Acetone	Methyl Ethyl Ketone	Hydrogen
	Toluene	Coal Gas	Carbon Disulphide

Group IIC is the most severe group. Hazards in this group can be ignited very easily indeed.
Equipment marked as suitable for Group IIC is also suitable for Group IIB and Group IIA.
Equipment marked as suitable for IIB is also suitable for Group IIA but NOT for IIC.

Ex EQUIPMENT

Group	Surface Industry
IIIA	Combustible flyings
IIIB	Non-conductive dust
IIIC	Conductive dust

The presence of dust layers does not automatically lead to the dust zone. The likelihood of the dust layer being disturbed to create a cloud needs to be considered. Dust layers also need careful consideration in terms of ignition temperature. Because the dust layer can make the equipment under it hotter then normal, a factor of safety is applied to the layer ignition temperature.

EQUIPMENT CATEGORIES AND ZONES

As well as considering the protection against electrical arcs and sparks igniting a flammable atmosphere, consideration needs to be given to the surface temperature of equipment. Flammable materials are categorized according to their ignition temperature. Again, rather than work with an infinite range, six temperature classes are defined as follows:

Temperature Class	Max. Surface Temperature	Ignition Temperature
T1	450°C	>450°C
T2	300°C	>300°C
T3	200°C	>200°C
T4	135°C	>135°C
T5	100°C	>100°C
T6	85°C	>85°C

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Apparatus Groups and Temperature Classes for common flammable gases and vapours:

Gas Group	Temperature Class					
	T1	T2	T3	T4	T5	T6
I	Methane	-	-	-	-	-
IIA	Propane	Ethanol	Heptane	Benzaldehy-de	-	-
IIB	Hydrogen	Ethylene	Acryl Aldehy-de	Dibutyl Ether	-	-
IIC	Hydrogen	Acetyle-ne	-	-	-	Carbon Disulphide

The bigger the "T" number the lower is the temperature.

The Temperature classification will be marked on items of equipment. If the hazardous area in which you are installing equipment has gases or vapours with a low auto ignition temperature then you will need equipment with a bigger "T" Number so as to ensure that any hot surfaces on the equipment will not ignite the hazard.

For example, if a hazard has an auto ignition temperature of 180°C, then it would be safe to use equipment which is marked T6 or T5 or T4. It would not be safe to use equipment marked T3 or T2 or T1 as this equipment could exhibit surface temperatures, which are hot enough to ignite the hazardous atmosphere.

TEMPERATURE CLASSES FOR COMMON FLAMMABLE DUSTS AND FIBERS

When considering installations that are risk of a potential explosion due to dust ignition, the equipment used is classified in much the same way as with gases. No equipment should be installed where the surface temperature of the equipment is greater than the ignition temperature of the given hazard. Below there are some common dust hazardous and their minimum ignition temperature:

Ignition Temperatures for Common Flammable Dusts and Fibres		
Substance	Ignition Temperature	
	Cloud	Layer
Sugar	490°C	460°C
Aluminium	590°C	>450°C
Flour	490°C	340°C
Coal dust	380°C	225°C
Methyl Cellulose	420°C	320°C
Grain dust	510°C	300°C
Starch	460°C	435°C
Phenolic Resin	530°C	>450°C
Soot	810°C	570°C

IGNITION SOURCES - Identification and Control

- Flames and hot gases;
- Electric arcs and spark;
- Cutting and welding flames;
- Electrostatic sparks;
- Electromagnetic waves;
- Mechanical friction;
- Mechanical sparks produced by grinding;
- Adiabatic compression and shock waves;
- Optical radiation;
- Electromagnetic radiation;
- Chemical reactions;
- Ultrasonic;
- Direct fired space and process heating;
- Use of cigarettes/matches etc;
- Hot surfaces;
- Heated process vessels such as dryers and furnaces;
- Hot process vessels;
- Space heating equipment;
- Mechanical machinery;
- Electrical equipment and lights;
- Spontaneous heating;
- Friction heating or sparks;

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- Impact sparks;
- Sparks from electrical equipment;
- Stray currents from electrical equipment
- Electrostatic discharge sparks:
- Lightning strikes;
- Electromagnetic radiation of different wavelengths
- Vehicles, unless specially designed or modified are likely to contain a range of potential ignition sources;

Sources of ignition should be effectively controlled in all hazardous areas by a combination of design measures, and systems of work:

- Using electrical equipment and instrumentation classified for the zone in which it is located. New mechanical equipment will need to be selected in the same way;
- Earthing of all plant / equipment;
- Elimination of surfaces above auto-ignition temperatures of flammable materials being handled/stored;
- Provision of lightning protection;
- Correct selection of vehicles/internal combustion engines that have to work in the zoned areas;
- Correct selection of equipment to avoid high intensity electromagnetic radiation sources, e.g. limitations on the power input to fibre optic systems, avoidance of high intensity lasers or sources of infrared radiation;
- Prohibition of smoking/use of matches/lighters;
- Controls over the use of normal vehicles;
- Controls over activities that create intermittent hazardous areas, e.g. tanker loading/unloading;
- Control of maintenance activities that may cause sparks/hot surfaces/naked flames through a Permit to Work System;
- Precautions to control the risk from pyrophoric scale usually associated with formation of ferrous sulphide inside process equipment.

TYPES OF PROTECTION FOR ELECTRICAL EQUIPMENT IN EXPLOSIVE GAS ATMOSPHERES

Types of protection for electrical equipment in explosive gas atmospheres

Type of protection	Symbol	Zone	Diagram	Main Application	Standard
Flameproof	d	1, 2		switchgears, control stations, indicating equipment, control systems, motors, transformers, heating equipment, light fittings	IEC 60079-1 EN 60079-1
Increased safety	e	1, 2		junction boxes, control stations for installing Ex-components (with a different type of protection), squirrel-cage motors, light fittings	IEC 60079-7 EN 60079-7
Pressurized	px py pz	1, 2 1, 2 2		switchgear and control cabinets, analyzers, large motors	IEC 60079-2 EN 60079-2
Encapsulation	ma mb mc	0, 1, 2 1, 2 2		switchgear with small capacity, control and signalling units, display units, sensors	IEC 60079-18 EN 60079-18
Powder filling	q	1, 2		sensors, display units, electronic ballasts, transmitters	IEC 60079-5 EN 60079-5
Oil immersion	o	1, 2		transformers, starting resistors	IEC 60079-6 EN 60079-6
Intrinsic safety	ia ib ic	0, 1, 2 1, 2 2		instrumentation technology, fieldbus technology, sensors, actuators [Ex ib] = associated electrical apparatus – installation in the safe area	IEC 60079-11 EN 60079-11
Type of protection 'n'	nA nC nR	2 2 2		all electrical equipment for Zone 2 nA = non-sparking device nC = sparking devices and components nR = restricted breathing enclosures	IEC 60079-15 EN 60079-15
Optical radiation	op is op pr op sh	0, 1, 2 1, 2 1, 2		op is = inherently safe optical radiation op pr = protected optical radiation op sh = optical radiation interlock	IEC 60079-28 EN 60079-28

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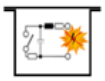
TYPES OF PROTECTION FOR ELECTRICAL EQUIPMENT IN EXPLOSIVE DUST ATMOSPHERES

Types of protection for electrical equipment in explosive dust atmospheres					
Protection by enclosure	ta tb tc	20, 21, 22 21, 22 22		switchgear, control stations, junction boxes, control boxes, motors, light fittings	IEC 60079-31 EN 60079-31
Pressurized	p	21,22		switchgear and control cabinets, motors	IEC 61241-4 EN 61241-4
Encapsulation	ma mb mc	20, 21, 22 21,22 22		switchgear with small capacity, control andsignalling units, display units, sensors	IEC 60079-18 EN 60079-18
Intrinsic safety	ia ib ic	20, 21, 22 21,22 22		instrumentation technology, fieldbus technology, sensors, actuators [Ex ib] = associated electrical apparatus – installation in the safe area	IEC 60079-11 EN 60079-11

Ex d "Flameproof Enclosures"
Parts that can ignite an explosive atmosphere are contained within an enclosure into which the explosive atmosphere can enter but which will contain any resultant explosion and prevent its transmission outside of the enclosure.

Ex p "Pressurized Equipment"
The ingress of an explosive atmosphere in a housing containing electrical equipment, is avoided by maintaining a protective gas (air or an inert gas) at a slight overpressure to the surrounding atmosphere. The overpressure may or may not be maintained by continuous flow.

Ex q "Powder Filling" / "Sand encapsulation"
All equipment that has the potential to arc or to spark is contained within an enclosure filled with quartz or glass powder particles. The powder filling prevents the possibility of an ignition.

Ex o "Oil Immersion"
Electrical equipment or parts of it are immersed in oil, thus avoiding ignition of the explosive atmosphere above the oil surface or outside the housing. This protection method is rarely applied now.

Ex e "Increased Safety"
This protection method refers to equipment that does not ordinarily produce sparks and for which special precautions must be taken during construction. Unacceptably

high temperatures must also be avoided, during both regular operation and certain irregular situations.

Ex i "Intrinsic Safety"
Intrinsic safety is intended for products in which the level of electrical energy circulating or stored in the product is insufficient to ignite a surrounding explosive atmosphere even under fault conditions. Because of the method by which intrinsic safety is achieved it is necessary to ensure that not only the electrical apparatus exposed to the potentially explosive atmosphere but also other electrical apparatus with which it is interconnected, is suitably constructed.

Ex m "Encapsulation"
With this protection method all parts that may ignite an explosive atmosphere, are encapsulated in a resin that is sufficiently resistant to ambient influences. The atmosphere must neither be ignited by sparks, nor by heating inside the encapsulation.

Ex n "Non-Sparking"
A type of protection where precautions are taken so that electrical equipment that has the potential to arc is not capable of igniting a surrounding explosive atmosphere. This can be further categorized as follows:
Ex nA - Where components used in construction are no sparking;
Ex nC - Where components used in construction are non-incendive;
Ex nR - Where components used are tightly enclosed to restrict the breathing and prevent ignition.

Ex op "Optical Radiation"
This is primarily concerned with the control of pulsed and continuous wave optical radiation through fiber optic cable with restrictions on the ratio of emitted optical power to the irradiated area. The protection concepts include Inherently Safe, which is analogous to Ex i and provides over-power/energy fault protection. Other methods include mechanical protection of the fiber and optical interlocks.

Ex t "Dust Protection by Enclosures"
This method is applicable to electrical equipment protected by enclosure and surface temperature limitation for use in explosive and dust atmospheres.

IP – Ingress Protection

What is IP code?
The IP code or Ingress Protection is used to define levels of sealing effectiveness of enclosures against intrusion from foreign matter and moisture. The IP number is composed of two numbers, the first referring to the protection against solid objects and the second against liquids. The higher the number - the better the protection. The IP code IPXX means that the type of protection is not defined because the electrical equipment has not been subjected to testing. If the IP code is not stated, then the electrical equipment is protected in accordance with IP20.

The IP codes refer only to:
- Solid foreign objects and dust;
- Water and moisture.

IP Codes = Ingress Protection - Protection of the equipment

First Number		Second Number	
0	No protection at all against solid objects (Sometimes X)	0	No protection against liquid object (Sometimes X)
1	Protected against solid objects up to 50mm^2	1	Protection against vertically falling drops of water
2	Protected against solid objects up to 12mm^2	2	Protection against direct sprays of water up to 15° from vertical
3	Protected against solid objects up to 2.5mm^2	3	Protection against direct sprays of water up to 60° from vertical
4	Protected against solid objects up to 1mm^2	4	Protection against water splashed from all directions - limited ingress permitted
5	Complete protection against contact and dust deposit (no harmful deposit)	5	Protected against low pressure jets of water from all directions- limited ingress permitted
6	Complete protection against contact and from infiltration of dust	6	Protected against powerful jets of water or heavy seas - limited ingress permitted
		7	Protected against the effect of immersion- between 15cm and 1m for 30 minutes
		8	Protected against long periods of immersion under pressure - user stated requirement

GENERAL COMPARISON BETWEEN IEC / CENELEC AND NEC PRACTICE

Classification of Zones and Divisions				
Dangerous explosive atmosphere		Continuously, long term or frequently	Occasionally	Not likely to occur and for short period only
Gas	IEC / CENELEC / NEC 505	Zone 0	Zone 1	Zone 2
	NEC 500 (Class I)	Division 1		Division 2
Dust	IEC / CENELEC / NEC 506	Zone 20	Zone 21	Zone 22
	NEC 500 (Class II, III)	Division 1		Division 2

NEC 500 SCOPE

Articles 500 through 504 cover the requirements for electrical and electronic equipment and wiring for all voltages in Class I, Divisions 1 and 2; Class II, Divisions 1 and 2; and Class III, Divisions 1 and 2 locations where fire or explosion hazards may exist due to flammable gases, flammable liquid–produced vapors, combustible liquid–produced vapors, combustible dusts, or ignitable fibers/flyings.

NEC 505 SCOPE

Article 505 is an alternative to the method of area classification for Class I locations as permitted in Article 500. The Zone Classification System is based on that of the International Electrotechnical Commission (IEC).

NEC 506 SCOPE

Article 506 is an alternative Classification System to Class II, and Class III that is based on the International Electrotechnical Commission System (IEC). Zones 20, 21 and 22 apply to combustible dusts or ignitable fibers/flyings. Combustible metallic dusts are not covered by Article 506.

GENERAL COMPARISON BETWEEN IEC / CENELEC AND NEC PRACTICE

Groups			
IEC / CENELEC / NEC 505		NEC 500	
Group I	Mines susceptible to firedamp		-
	Methane		
GROUP II Subdivisions	Explosive gas atmosphere Typical gas		Class I Subdivisions
IIA	Propane	Propane	Class I Group D
IIB	Ethylene	Ethylene	Class I Group C
IIC	Hydrogen	Hydrogen	Class I Group B
IIC	Acetylene	Acetylene	Class I Group A
GROUP III Subdivisions	Explosive dust atmosphere Typical dust		Class II / III Subdivisions
IIIA	Combustible flyings	fibers / flyings	Class III
IIIB	non-conductive dust	non-conductive dust	Class II Group G
IIIC	conductive dust	carbonaceous dust	Class II Group F
		combustible metal dust	Class II Group E

Temperature classification		
IEC / CENELEC / NEC 505	NEC 500	Maximum surface temperature
T1	T1	450°C
T2	T2	300°C
-	T2A	280°C
-	T2B	260°C
-	T2C	230°C
-	T2D	215°C
T3	T3	200°C
-	T3A	180°C
-	T3B	165°C
-	T3C	160°C
T4	T4	135°C
-	T4A	120°C
T5	T5	100°C
T6	T6	85°C
Dust: indication of the maximum surface temperature in °C (e.g. T135°C)		

EQUIPMENT MARKING

1 EU type-examination certificate

ID No.	Notified Body		Country
0477	Eurofins Product Testing Italy S.r.l.	EUT	IT

2 3 Conditions in potentially explosive areas ATEX 2014/34/EU

Explosive Atmosphere	Behavior flammable substances in the Ex area	Categorization of the potentially explosive areas	Required of the used items in accordance with CENELEC		EPL
			Equipment group	Equipment category	Equipment protection level
Coal mine atmosphere	Parts at coal mines endangered by firedamp and/or combustible dust		I	M1	Ma
			I	M2	Mb
Atmosphere from Gas / Liquid / Fog	Continuous, long periods, frequent	Zone 0	II	1G	Ga
	Occasional	Zone 1	II	2G	Gb
	Normally not, only for a short period	Zone 2	II	3G	Gc
Dust atmosphere	Continuous, long periods, frequent	Zone 20	II	1D	Da
	Occasional	Zone 21	II	2D	Db
	Normally not, only for a short period	Zone 22	II	3D	Dc

4 Ex identification acc. to standard (i.e.)

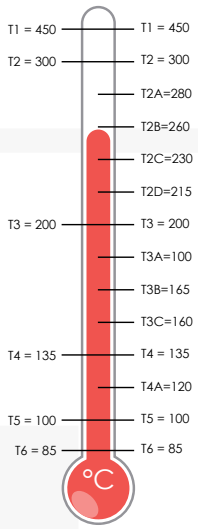
Ex db IIB+H_2	EN/IEC 60079-1	Installation in Ex area	Equipment

4 Protection Type (See the table page 53 / 54)

5 Gas and dust groups

Typical gas / dust	Identification
Methane	I
Propane	II A
Ethylene	II B
Hydrogen	II C or IIB+H_2
Combustible flyings	III A
Non-conducting dust	III B
Conducting dust	III C

6 Permissible surface temperature

Temperature class	Gas	Ignition temperature
	Ammonia	630°
	Methane	595°
	Hydrogen	560°
	Propane	470°
	Ethylene	425°
	Butane	365°
	Acetylene	305°
	Cyclohexane	259°
	Diethyl ether	170°
	Carbon disulfide	95°

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INSTALLATIONS OF CABLE GLANDS IN HAZARDOUS AREAS

(Extract from IEC/EN 60079-14 : 2014)

Clause 10.2 Selection of Cable Glands

The cable entry system shall comply with one of the following:

a) Cable glands sealed with setting compound (barrier cable glands) in compliance with IEC 60079-1 and certified as equipments;

b) Cables and glands meeting all of the following:
- cable glands comply with IEC 60079-1 and are certified as equipment
- cables used comply with 9.3.2(a) [sheathed with thermoplastic, thermosetting, or elestomeric material. They shall be circular and compact. Any bedding or sheath shall be sxtruded. Fillers, if any, shall be non-hygroscopic.]
- the connected cable is at least 3 m in length;

c) indirect cable entry using combination of flameproof enclosure with a bushing and increased safety terminal box (required glands sealed);

d) mineral-insulated metal-sheathed cable with or without plastic outer covering with appropriate flameproof cable gland complying with IEC 60079-1 (required glands sealed);

e) flameproof sealing device (for example a sealing chamber) specified in the equipment documentation or complying with IEC 60079-1 and employing a cable gland appropriate to the cables used. The sealing device shall incorporate compound or other appropriate seals which permit stopping around individual cores. The sealing device shall be fitted at the point of entry of cables to the equipment. (required glands sealed).

NOTE 1 The minimum length of cable is to minimize the potential for flame transmission through the cable (see also Annex E);

NOTE 2 If the cable gland and actual cable are certified as a part of the equipment (enclosures) then compliance to 10.6.2 is not necessary. (Source: IEC 60079-14:2013 Ed.5).

Annex E (informative)

Restricted breathing test forcables

E.1 Test procedure

A piece of cable with a length of 0,5 m should be type tested when installed into a sealed enclosure of 5 l (+/- 0.2 l), under constant temperature conditions. The cable is considered acceptable if the time interval required for an internal overpressure of at least 0,3 kPa (30 mm water gauge) to drop by 0,15 kPa (15 mm water gauge) is not less than 5 s. The enclosure must be completely tight to avoid pressure loss through the enclosure gaps.

To provide a better understanding of the older and new standard with regards to the use of barrier glands, a few examples are shown below. The following four situations involve a flameproof motor starter and a flameproof motor connected via an cable meeting the requirements of direct entry into a flameproof enclosure:

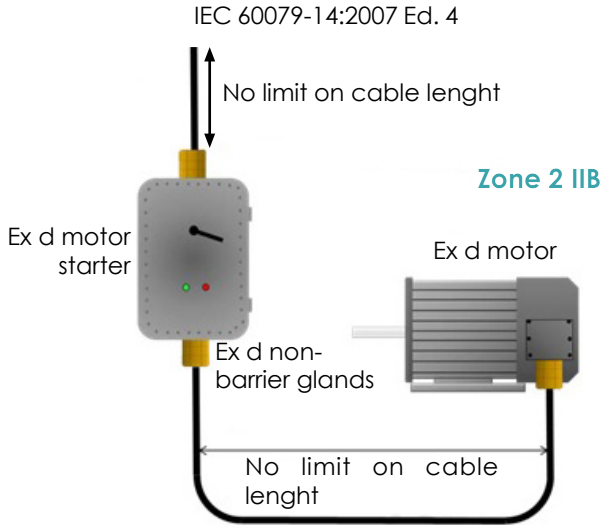

Figure 1: The use of non-barrier glands for direct entry into Ex d enclosures per IEC 60079-14:2007 4th Ed. Note that the use of non-barrier glands are acceptable even into Ex d arcing/sparking enclosures if the environment is Zone 2, IIB.

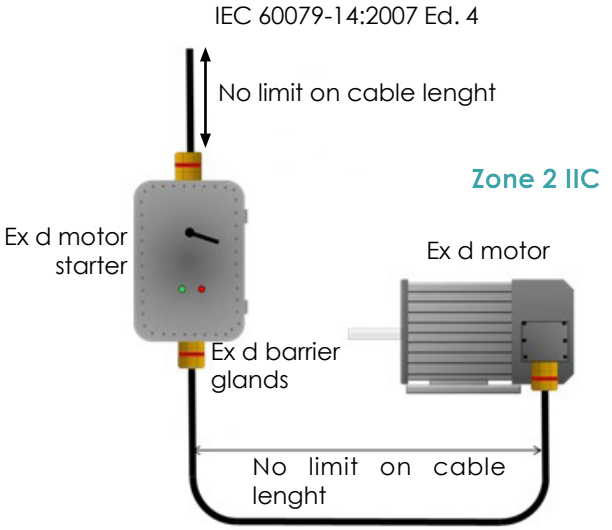

Figure 2: The use of barrier glands for direct entry into Ex d enclosures per IEC 60079-14:2007 4th Ed. Note that the use of barrier glands are required for all Ex d enclosures housing arcing/sparking components in a IIC environment (or also in a Zone 1 IIB if the enclosure volume is greater than 2 liters).

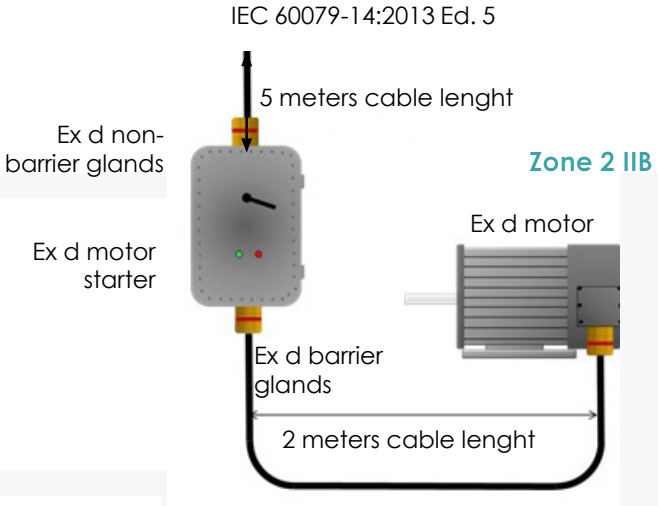

Figure 3: The use of barrier glands and non-barrier glands for direct entry into Ex d enclosures per IEC 60079-14:2013 5th Ed. Note the issue with cable length is now the critical factor of more or less than 3 meters, not the area classification or gas group.

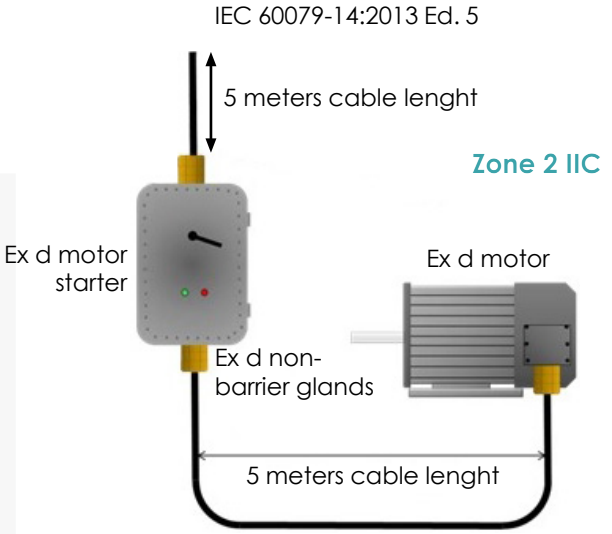

Figure 4: The use of non-barrier glands for direct entry into Ex d enclosures per IEC 60079-14:2013 5th Ed. Note the use of non-barrier glands even in a Zone 1 IIC environment with the connecting cable lengths exceed the 3 meter rule.

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