INSULATORS



1969 ZAJEČAR FMT

MINEL FEPO 1956

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SUPPORT INSULATORS

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SUPPORT INSULATORS

INTRODUCTION

APPLICATION

Support insulators are used as supporting elements for busbars in various types of substations, especially in distribution cabinets. They can also be used as supporting elements for terminals, transformer winding leads, and electric motors.

Due to the characteristics of epoxy resin, they can operate in all exploitation conditions, including tropical ones. They find a particular application in locations requiring resistance to moisture, chemical influences, impulse overvoltages, and breaking forces. Because of these properties, besides the aforementioned applications, they are suitable for use in the mining and chemical industries, as well as for installation in marine plants.

DESCRIPTION

The post insulators are manufactured with main insulation made of epoxy resin of thermal class B (maximum temperature 125°C).

According to the cantilever failing load, post insulators are divided into class A (3.75 kN), class B (7.5 kN), and class C (12.5 kN).

Detailed technical characteristics for each type of insulator are provided in tabular form next to each model.

MOUNTING

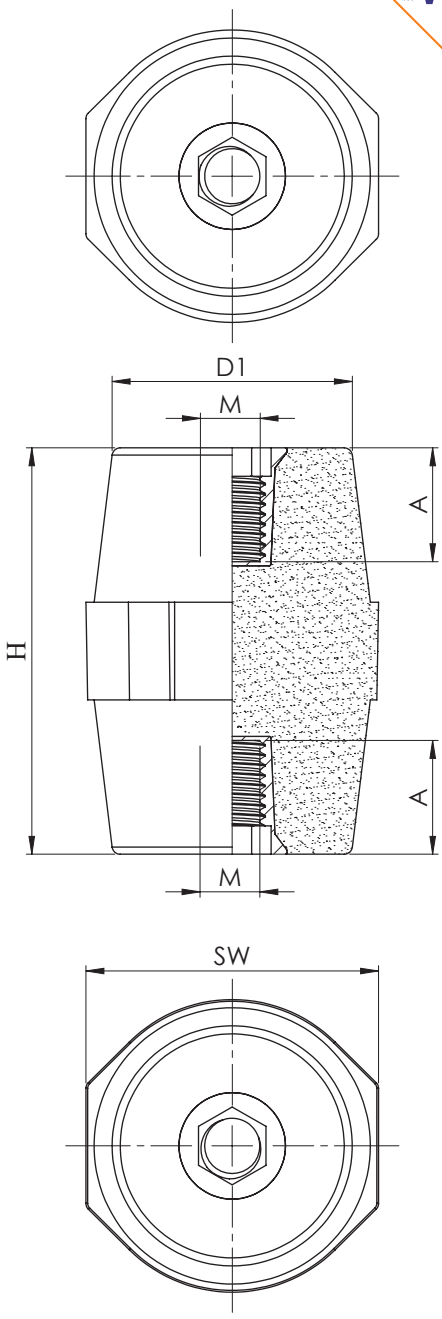
The installation of the insulators is performed via cast-in inserts or bolts, depending on the insulator type. During installation, pay close attention to the tightening torque of the bolts; tightening beyond the permissible limit can cause insert extraction, bolt breakage, or insulator damage

MAINTENANCE

Almost no maintenance is required during exploitation. It is only necessary during regular annual overhauls to clean them of dirt and to tighten the mounting bolts and connection interfaces, especially for insulators installed in machinery whose operation is accompanied by high vibrations.

OK/S*





Low-voltage support insulators **OK/S***

Type	Dimensions (mm)							Package (pcs.)
	H	SW	D1	Um (V)	M	A	F (kN)	
OK/S 3030 – M6	30	30	26	600	M6	8	1.25	80
OK/S 3030 – M8	30	30	26	600	M8	7	1.25	80
OK/S 3235 – M6	35	32	28	1000	M6	9	2.25	64
OK/S 3235 – M8	35	32	28	1000	M8	10	2.25	64
OK/S 3235 – M10	35	32	28	1000	M10	10	2.25	64
OK/S 4135 – M6	35	41	35	1000	M6	9	4	36
OK/S 4135 – M8	35	41	35	1000	M8	9	4	36
OK/S 4135 – M10	35	41	35	1000	M10	10	4	36
OK/S 4040 – M8	40	40	30	1000	M8	11	4	100
OK/S 4040 – M10	40	40	30	1000	M10	12	4	100
OK/S 4040 – M12	40	40	30	1000	M12	10	4	100
OK/S 4145 – M6	45	41	35	1500	M6	12	4	27
OK/S 4145 – M8	45	41	35	1500	M8	12	4	27
OK/S 4145 – M10	45	41	35	1500	M10	12	4	27
OK/S 4145 – M12	45	41	35	1500	M12	12	4	27
OK/S 3650 – M8	50	36	29	2000	M8	12	2.25	36
OK/S 3650 – M10	50	36	29	2000	M10	12	2.25	36
OK/S 3650 – M12	50	36	29	2000	M12	13	2.25	36
OK/S 5560 – M8	60	55	40	2000	M8	20	3.5	25
OK/S 5560 – M10	60	55	40	2000	M10	21	3.5	25
OK/S 5560 – M12	60	55	40	2000	M12	20	3.5	25
OK/S 4165 – M8	65	41	35	3000	M8	17	3.5	22
OK/S 4165 – M10	65	41	35	3000	M10	19	3.5	22
OK/S 4165 – M12	65	41	35	3000	M12	19	3.5	22
OK/S 5070 – M8	70	50	36	5000	M8	19	4.5	12
OK/S 5070 – M10	70	50	36	5000	M10	19	4.5	12
OK/S 5070 – M12	70	50	36	5000	M12	19	4.5	12
OK/S 6575 – M12	75	65	52	5000	M12	18	7.5	8
OK/S 6575 – M16	75	65	52	5000	M16	23	7.5	8

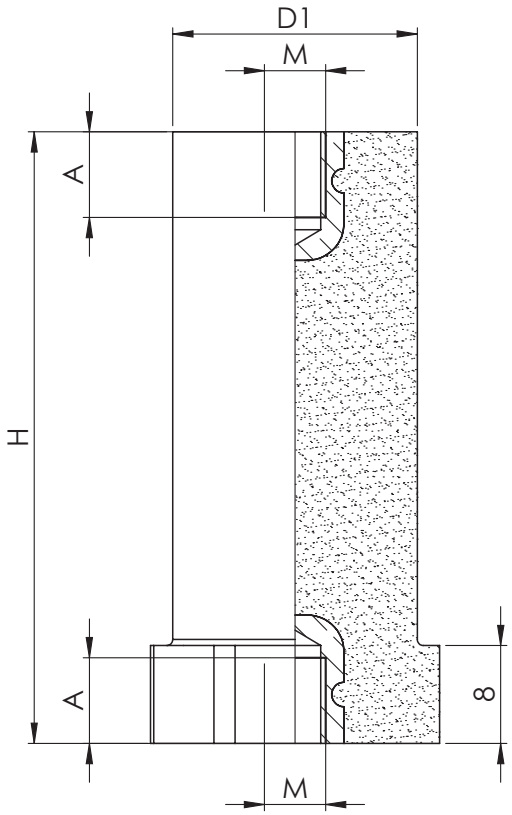
TECHNICAL DATA	OK/S*
Colour	Brown
Standard	IEC 60273:1990; IEC 60660:1999
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin

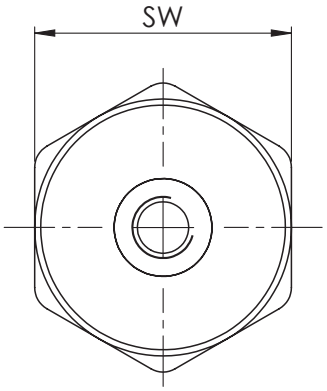
NOTE:
Insulators of type OK/S* exhibit excellent electrical and mechanical characteristics and can be used in extreme operating conditions such as high ambient temperatures, as well as when in contact with corrosive substances and vibrations. The hexagon in the middle is designed for a wrench to facilitate easy mounting and fixing of the insulator. Type OK/S* insulators are made of epoxy resin, which contributes to environmental protection and human health compared to similar materials such as polyglass-polyester with fiberglass.

CONTENTS

OK/D 21*







Low-voltage support insulators **OK/D 21***

Type	Dimensions (mm)							Package (pcs.)
	H	SW	D1	Um (V)	M	A	F (kN)	
OK/D 2116 – M4	16	21	20	220	M4	4	3	200
OK/D 2116 – M5	16	21	20	220	M5	4	3	200
OK/D 2116 – M6	16	21	20	220	M6	4	3	100
OK/D 2116 – M8	16	21	20	220	M8	4	3	150
OK/D 2120 – M5	20	21	20	400	M5	5	2.5	200
OK/D 2120 – M6	20	21	20	400	M6	5	2.5	100
OK/D 2120 – M8	20	21	20	400	M8	5	2.5	200
OK/D 2125 – M5	25	21	20	500	M5	6	2	150
OK/D 2125 – M6	25	21	20	500	M6	6	2	150
OK/D 2125 – M8	25	21	20	500	M8	6	2	150
OK/D 2130 – M5	30	21	20	600	M5	7	2	140
OK/D 2130 – M6	30	21	20	600	M6	7	2	140
OK/D 2130 – M8	30	21	20	600	M8	7	2	140
OK/D 2135 – M6	35	21	20	600	M6	7	1.5	120
OK/D 2140 – M6	40	21	20	600	M6	9	1.5	110
OK/D 2140 – M8	40	21	20	600	M8	10	1.5	110
OK/D 2145 – M6	45	21	20	750	M6	9	1	100
OK/D 2145 – M8	45	21	20	750	M8	10	1	100
OK/D 2150 – M6	50	21	20	750	M6	10	1	80
OK/D 2150 – M8	50	21	20	750	M8	10	1	80
OK/D 2160 – M6	60	21	20	750	M6	9	1	70
OK/D 2160 – M8	60	21	20	750	M8	9	1	70

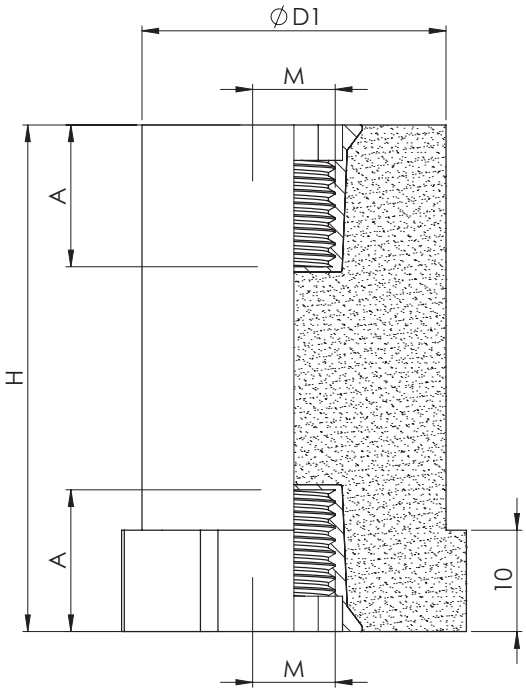
TECHNICAL DATA	OK/D 21*
Colour	Brown
Standard	IEC 60273:1990; IEC 60660:1999
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin

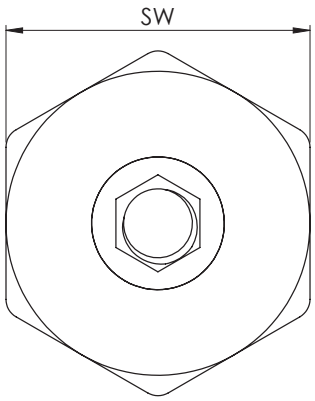
NOTE:

Insulators of type OK/D 21* exhibit excellent electrical and mechanical characteristics and can be used in extreme operating conditions such as high ambient temperatures, as well as when in contact with corrosive substances and vibrations. The hexagon in the middle is designed for a wrench to facilitate easy mounting and fixing of the insulator. Type OK/D 21* insulators are made of epoxy resin, which contributes to environmental protection and human health compared to similar materials such as polyglass-polyester with fiberglass.

OK/D 30*







Low-voltage support insulators **OK/D 30***

Type	Dimensions (mm)							Package (pcs.)
	H	SW	D1	Um (V)	M	A	F (kN)	
OK/D 3030 – M6	30	30	30	750	M6	9	4.5	80
OK/D 3030 – M8	30	30	30	750	M8	9	4.5	80
OK/D 3030 – M10	30	30	30	750	M10	9	4.5	80
OK/D 3035 – M6	35	30	30	1000	M6	9	4.5	64
OK/D 3035 – M8	35	30	30	1000	M8	9	4.5	64
OK/D 3035 – M10	35	30	30	1000	M10	9	4.5	64
OK/D 3040 – M6	40	30	30	1000	M6	12	3	60
OK/D 3040 – M8	40	30	30	1000	M8	12	3	60
OK/D 3040 – M10	40	30	30	1000	M10	12	3	60
OK/D 3045 – M6	45	30	30	1000	M6	12	2.5	48
OK/D 3045 – M8	45	30	30	1000	M8	12	2.5	48
OK/D 3045 – M10	45	30	30	1000	M10	13	2.5	48
OK/D 3050 – M6	50	30	30	1500	M6	12	2	48
OK/D 3050 – M8	50	30	30	1500	M8	13	2	48
OK/D 3050 – M10	50	30	30	1500	M10	12	2	48
OK/D 3055 – M6	55	30	30	1500	M6	12	1.5	40
OK/D 3055 – M8	55	30	30	1500	M8	11	1.5	40
OK/D 3060 – M6	60	30	30	1500	M6	12	1.5	40
OK/D 3060 – M8	60	30	30	1500	M8	16	1.5	40
OK/D 3060 – M10	60	30	30	1500	M10	20	1.5	40
OK/D 3065 – M8	65	30	30	1500	M8	18	1	32
OK/D 3070 – M6	70	30	30	1500	M6	14	1	32
OK/D 3070 – M8	70	30	30	1500	M8	18	1	32
OK/D 3070 – M10	70	30	30	1500	M10	18	1	32

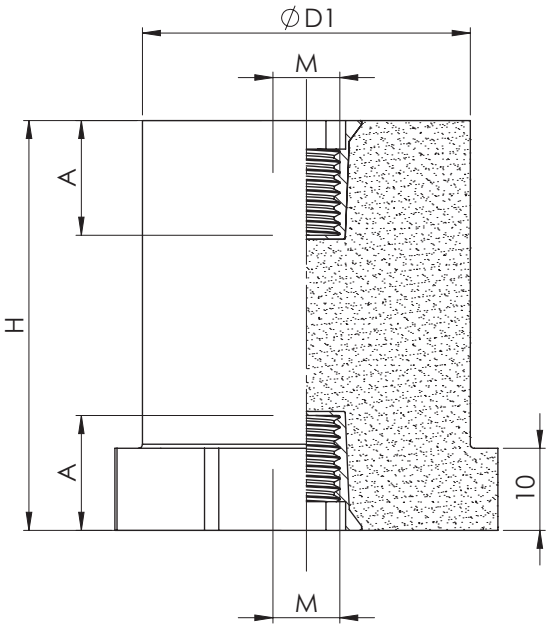
TECHNICAL DATA	OK/D 30*
Colour	Brown
Standard	IEC 60273:1990; IEC 60660:1999
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin

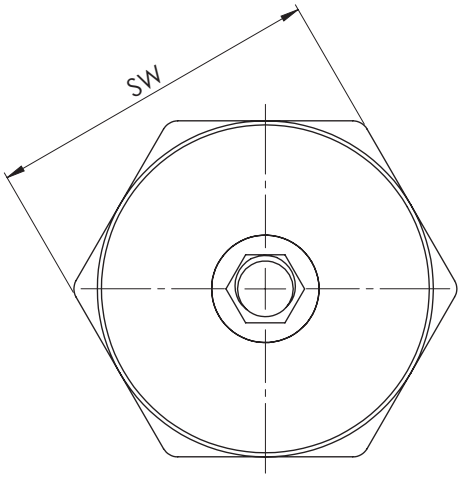
NOTE:
Insulators of type OK/D 30* exhibit excellent electrical and mechanical characteristics and can be used in extreme operating conditions such as high ambient temperatures, as well as when in contact with corrosive substances and vibrations. The hexagon in the middle is designed for a wrench to facilitate easy mounting and fixing of the insulator. Type OK/D 30* insulators are made of epoxy resin, which contributes to environmental protection and human health compared to similar materials such as polyglass-polyester with fiberglass.

CONTENTS

OK/D 41*







Low-voltage support insulators **OK/D 41***

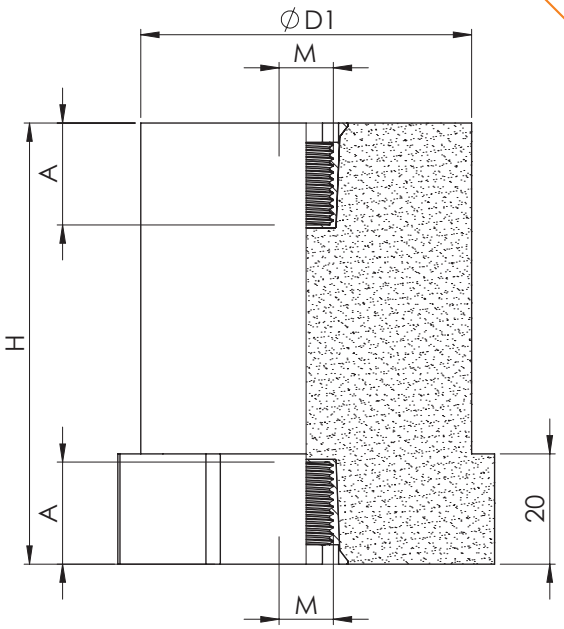
Type	Dimensions (mm)							Package (pcs.)
	H	SW	D1	Um (V)	M	A	F (kN)	
OK/D 4130 – M8	30	41	40	750	M8	8	7.5	45
OK/D 4130 – M10	30	41	40	750	M10	9	7.5	45
OK/D 4135 – M8	35	41	40	750	M8	9	7	36
OK/D 4135 – M10	35	41	40	750	M10	9	7	36
OK/D 4140 – M8	40	41	40	1000	M8	12	7	27
OK/D 4140 – M10	40	41	40	1000	M10	12	7	27
OK/D 4140 – M12	40	41	40	1000	M12	12	7	27
OK/D 4145 – M8	45	41	40	1000	M8	13	7	27
OK/D 4145 – M10	45	41	40	1000	M10	12	7	27
OK/D 4150 – M8	50	41	40	1500	M8	12	5	27
OK/D 4150 – M10	50	41	40	1500	M10	13	5	27
OK/D 4150 – M12	50	41	40	1500	M12	11	5	27
OK/D 4155 – M10	55	41	40	1500	M10	12	4	18
OK/D 4160 – M8	60	41	40	1500	M8	18	3.5	18
OK/D 4160 – M10	60	41	40	1500	M10	18	3.5	18
OK/D 4160 – M12	60	41	40	1500	M12	18	3.5	18
OK/D 4165 – M10	65	41	40	1500	M10	18	3.5	18
OK/D 4170 – M8	70	41	40	1500	M8	18	3	18
OK/D 4170 – M10	70	41	40	1500	M10	18	3	18

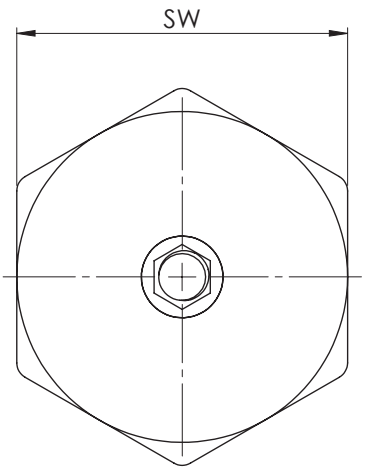
TECHNICAL DATA	OK/D 41*
Colour	Brown
Standard	IEC 60273:1990; IEC 60660:1999
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin

NOTE:
Insulators of type OK/D 41* exhibit excellent electrical and mechanical characteristics and can be used in extreme operating conditions such as high ambient temperatures, as well as when in contact with corrosive substances and vibrations. The hexagon in the middle is designed for a wrench to facilitate easy mounting and fixing of the insulator. Type OK/D 41* insulators are made of epoxy resin, which contributes to environmental protection and human health compared to similar materials such as polyglass-polyester with fiberglass.

OK/D 60*







Low-voltage support insulators **OK/D 60***

Type	Dimensions (mm)					Um (V)	F (kN)	Package (pcs.)
	H	SW	D1	A	M			
OK/D 6040 – M10	40	60	60	11	M10	1500	7	12
OK/D 6040 – M12	40	60	60	11	M12	1500	7	12
OK/D 6040 – M16	40	60	60	12	M16	1500	7	12
OK/D 6060 – M10	60	60	60	18	M10	3000	5	10
OK/D 6060 – M12	60	60	60	18	M12	3000	5	10
OK/D 6060 – M16	60	60	60	19	M16	3000	5	10
OK/D 6080 – M10	80	60	60	19	M10	5000	9	8
OK/D 6080 – M12	80	60	60	19	M12	5000	9	8
OK/D 6080 – M16	80	60	60	23	M16	5000	9	8
OK/D 60100 – M10	100	60	60	19	M10	8000	15	5
OK/D 60100 – M12	100	60	60	19	M12	8000	15	5
OK/D 60100 – M16	100	60	60	23	M16	8000	15	5

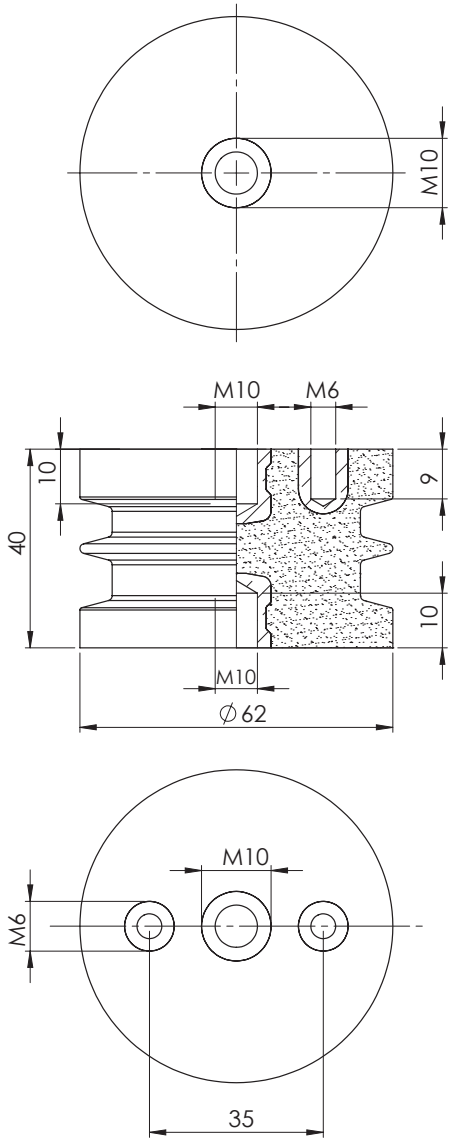
TECHNICAL DATA	OK/D 60*
Colour	Brown
Standard	IEC 60273:1990; IEC 60660:1999
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin

NOTE:
Insulators of type OK/D 60* exhibit excellent electrical and mechanical characteristics and can be used in extreme operating conditions such as high ambient temperatures, as well as when in contact with corrosive substances and vibrations. The hexagon in the middle is designed for a wrench to facilitate easy mounting and fixing of the insulator. Type OK/D 60* insulators are made of epoxy resin, which contributes to environmental protection and human health compared to similar materials such as polyglass-polyester with fiberglass.

CONTENTS

IPA-1





Low-voltage support insulators **IPA-1**

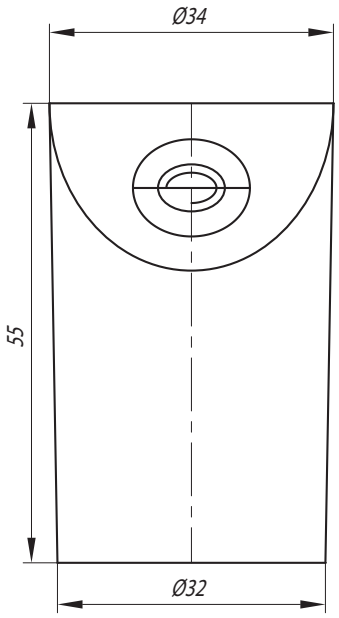
TECHNICAL DATA	IPA-1
Rated voltage (kV)	0,72
Highest voltage for equipment (eff.) (kV)	1
Breaking force (kN)	3,75
Colour	Brown
Standard	IEC 60273:1990; IEC 60660:1999
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin
Mass (kg)	0,2

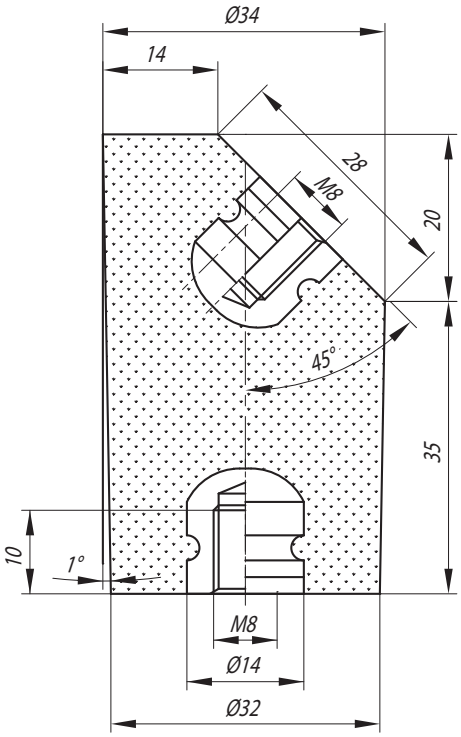
NOTE:

These epoxy resin post insulators can be used for all indoor applications.
They have a cylindrical shape which provides high structural robustness, completed with an appropriate creepage distance and number of ribs.

IP-1K





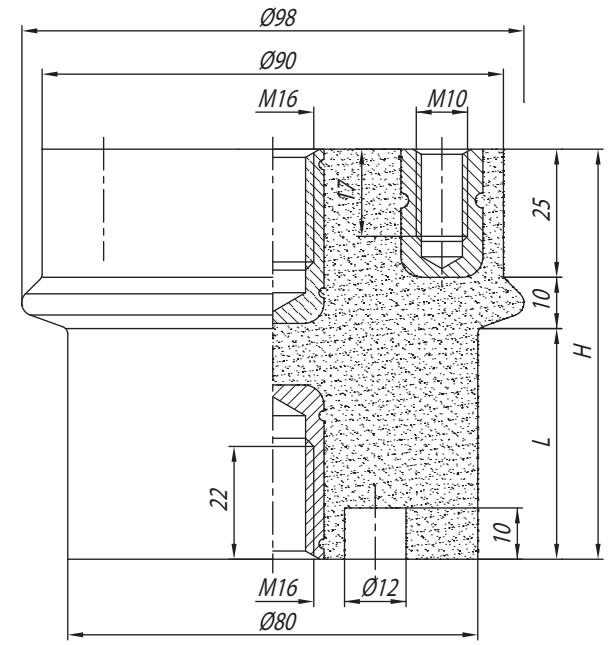


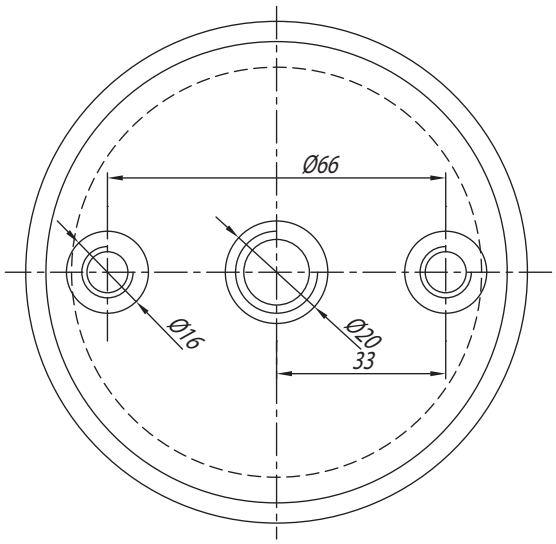
Support insulators for indoor mounting up to 1.2 kV **IP-1K**

TECHNICAL DATA	IP-1K
Rated network voltage (kV)	1
Maximal operating voltage (eff.) (kV)	1.2
Power-frequency withstand voltage, 1 min. (kV)	6
Mass (kg)	0,094
Valid standard	IEC 60660:1999
Breaking force (kN)	2
Mounting	Indoor
Temperature endurance	- 4 °C to +125°C
Installation environment	Every, including tropical
Temperature class of insulation	B
Main insulation	Epoxy resin

CONTENTS

IPC-1; IPC-1s







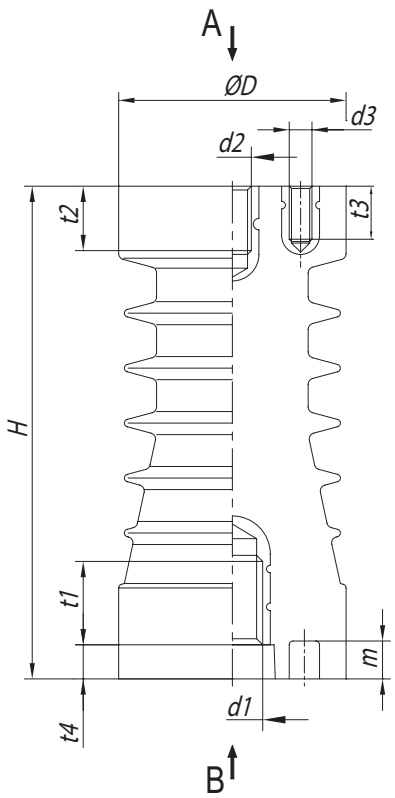
IPC-1

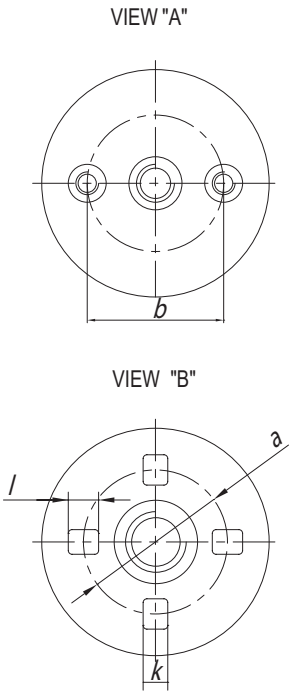
Low-voltage support insulators for indoor mounting **IPC-1, IPC-1s**

TECHNICAL DATA	IPC-1s	IPC-1
Rated voltage (kV)	0,72	1
Highest voltage for equipment (eff.) (kV)	0,8	1,2
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	6	6
Mass (kg)	0,53	0,67
Breaking force (kN)	12,5	
Valid standard	IEC 60664-1	
Mounting	Indoor	
Temperature endurance	- 40°C up to +125°C	
Type of main insulation	Epoxy resin	

Insulator type	Dimensions (mm)	
	H	L
IPC-1	80	45
IPC-1s	65	30

IPA-*







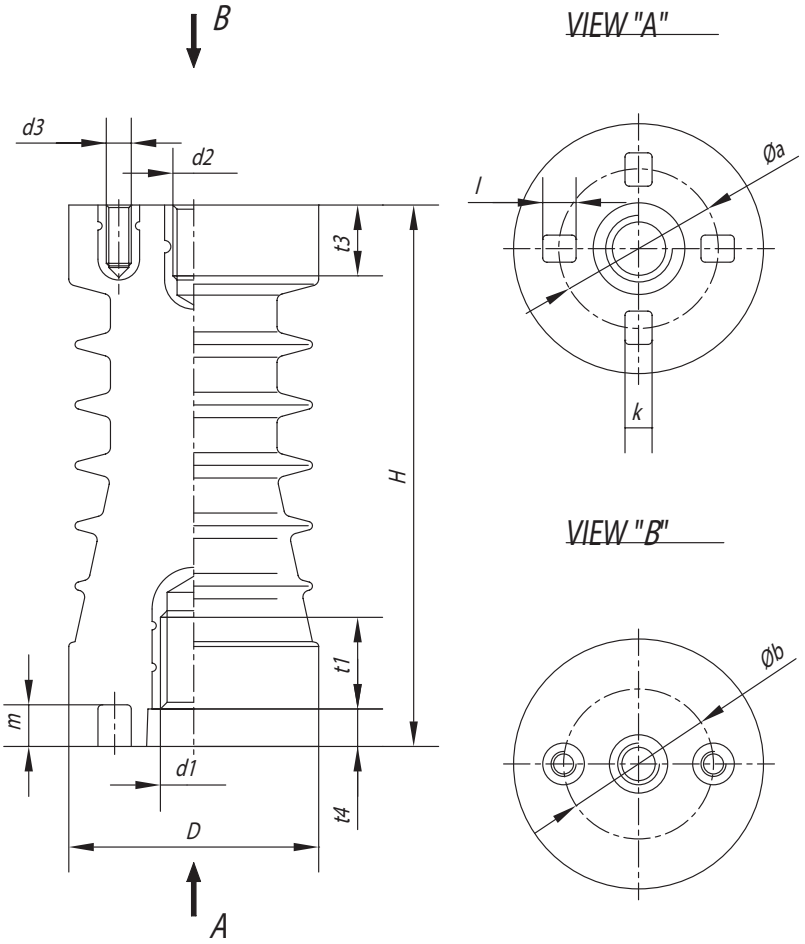
Support insulators for voltages up to 38 kV **IPA-***

TECHNICAL DATA	IPA-3,6	IPA-7,2	IPA-12	IPA-24	IPA-38	IPA-38d
Rated voltage (kV)	3	6	10	20	35	35
Highest voltage for equipment (eff.) (kV)	3,6	7,2	12	24	38	38
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	10	20	28	50	70	70
Rated impulse withstand voltage 1,2/50 µs (kV)	40	60	75	95	170	170
Mass (kg)	~0,32	~0,44	~0,57	~1,16	~2,09	~2,50
Breaking force (kN)	3,75	3,75	3,75	3,75	3,75	3,75
Creepage distance (mm)	61	160	205	365	490	575
Number of ribs	2	3	5	9	10	12
Valid standard	IEC 60660, IEC 60060-1, IEC 60273					
Mounting	Indoor					
Operation temperature	- 40°C up to +125°C					
Altitude	Not limited					
Type of main insulation	Epoxy resin					

Insulator type	Dimensions (mm)													
	H	ØD	d1	d2	d3	b	t1	t2	t3	t4	a	k	l	m
IPA-3,6	60	60	M10	M10	M6	36	12	12	9	2	35	7	8	8
IPA-3,6-1	60	60	M12	M12	M6	36	12	12	9	2	35	7	8	8
IPA-7,2	95	60	M16	M10	M6	36	22	17	6	8	42	7	8	8
IPA-12	130	56	M16	M10	M6	36	24	15	9	9	38	7	8	8
IPA-12-1	130	60	M16	M10	M6	36	24	15	9	9	38	7	8	8
IPA-12-2	130	68	M16	M10	M6	36	24	15	9	9	38	7	8	8
IPA-24	210	65	M16	M10	M6	36	24	15	9	15	45	7	8	8
IPA-24-1	210	70	M16	M10	M6	36	24	15	9	15	45	7	8	8
IPA-24-2	210	75	M16	M10	M6	36	24	15	9	20	45	7	8	8
IPA-38	300	79	M16	M10	M6	36	24	15	9	20	45	7	8	8
IPA-38-1	300	82	M16	M10	M6	36	24	15	9	20	45	7	8	8
IPA-38d	350	82	M16	M10	M6	36	24	15	9	20	45	7	8	10

CONTENTS

IPB-*





IPB-3.6

Support insulators for voltages up to 38 kV **IPB-***

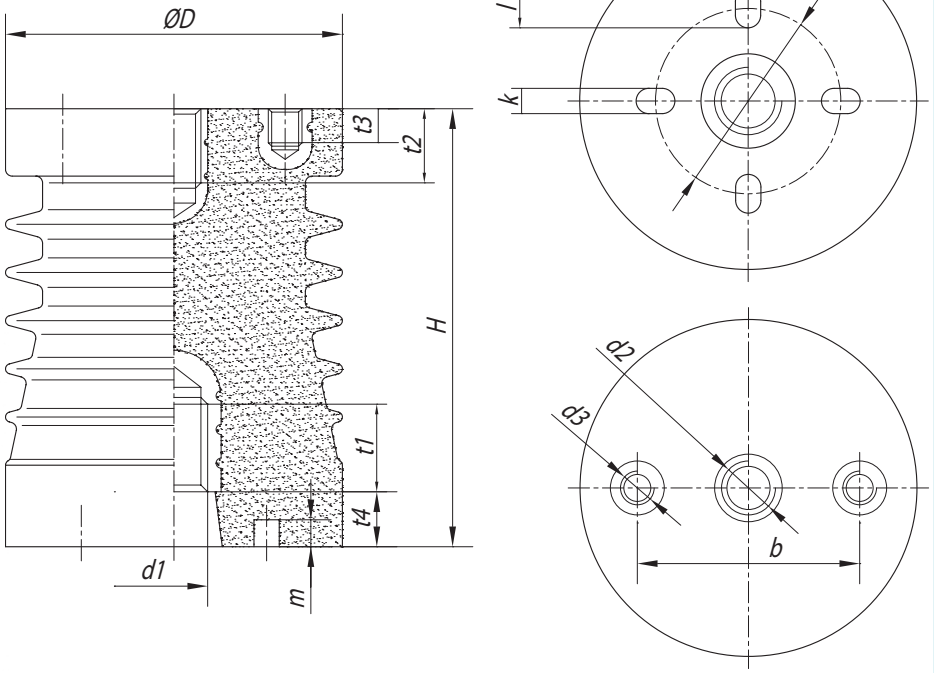
TECHNICAL DATA	IPB-3,6	IPB-12	IPB-24	IPB-24-1	IPB-38	IPB-38-1
Rated voltage (kV)	3	10	20	20	35	35
Highest voltage for equipment (eff.) (kV)	3,6	12	24	24	38	38
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	10	28	50	50	70	70
Rated impulse withstand voltage 1,2/50 µs (kV)	40	75	95	95	145	170
Mass (kg)	~0,62	~0,82	~1,97	~2,11	~2,99	~3,24
Breaking force (kN)	7,5	7,5	7,5	7,5	7,5	7,5
Number of ribs	1	5	8	5	11	8
Valid standard	IEC 60660, IEC 60060-1					
Mounting	Indoor					
Operation temperature	- 40°C up to +125°C					
Altitude	Not limited					
Type of main insulation	Epoxy resin					

Insulator type	Dimensions (mm)													
	H	ØD	d1	d2	d3	b	t1	t2	t3	t4	a	k	l	m
IPB-3,6	65	82	M16	M16	M10	46	20	20	12	/	35	7	8	8
IPB-3,6-1	87	75	M16	M16	M10	46	24	24	12	/	35	7	8	8
IPB-3,6-2	78	82	M16	M16	M10	46	24	24	14	/	42	7	8	8
IPB-12	130	76	M20	M16	M10	46	26	24	12	15	38	7	8	8
IPB-12-1	130	82	M20	M16	M10	46	30	24	12	12	38	7	8	8
IPB-24	210	80	M20	M16	M10	46	30	24	12	18	38	7	8	8
IPB-24-1	225	100	M20	M16	M10	46	26	22	16	/	38	7	8	8
IPB-38	300	93	M24	M16	M10	46	34	24	12	20	60	8,5	10	8
IPB-38-1	325	95	M24	M16	M10	46	34	22	12	/	60	8,5	10	8

IPC-*



IPC-12



Support insulators for voltages up to 38 kV **IPC-***

TECHNICAL DATA	IPC-12	IPC-24	IPC-38
Rated voltage (kV)	10	20	35
Highest voltage for equipment (eff.) (kV)	12	24	38
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	28	50	70
Rated impulse withstand voltage 1,2/50 μs (kV)	75	125	170
Mass (kg)	~1,70	~2,40	~4,10
Breaking force (kN)	12,5	12,5	12,5
Number of ribs	5	8	11
Valid standard	IEC 60660, IEC 60060-1, IEC 60273		
Mounting	Indoor		
Operation temperature	- 40°C up to +125°C		
Type of main insulation	Epoxy resin		

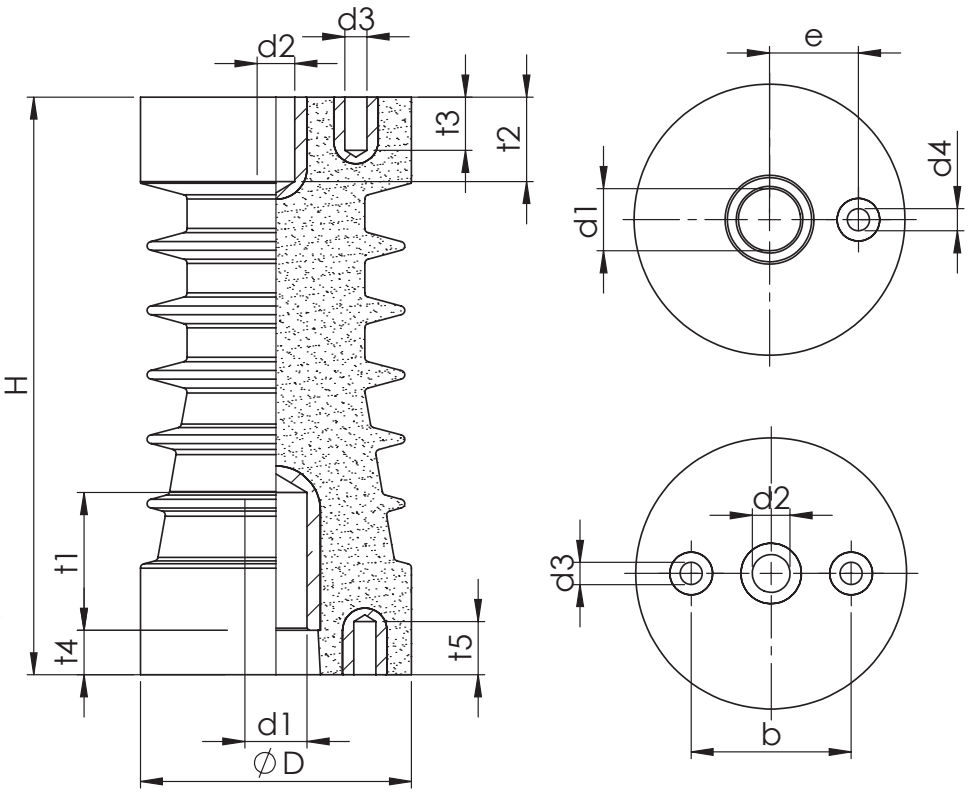
Insulator type	Dimensions (mm)													
	H	ØD	d1	d2	d3	b	t1	t2	t3	t4	a	k	l	m
IPC-12	130	100	M20	M16	M10	66	30	24	12	18	55	7	8	8
IPC-24	210	105	M24	M16	M10	66	34	24	12	24	50	7	8	8
IPC-38	300	105	M30	M16	M10	66	40	24	12	20	70	8,5	10	8

CONTENTS

IPA-12C, IPA-24C, IPA-38C



IPA-12C



Support insulators with voltage indicator **IPA-12C, IPA-24C, IPA-38C**

TECHNICAL DATA	IPA-12C	IPA-24C	IPA-38C
Rated voltage (kV)	6 ; 10	15 ; 20	35
Highest voltage for equipment (eff.) (kV)	7,2 ; 12	17,5 ; 24	38
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	20 ; 28	50	70
Mass (kg)	~0,4	~1,0	~2,0
Breaking force (kN)	3,75	3,75	3,75
Valid standard	IEC 60660, IEC 61243-5, IEC 60273		
Mounting	Indoor		
Operation temperature	- 40°C up to +125°C		
Type of main insulation	Epoxy resin		

NOTE:

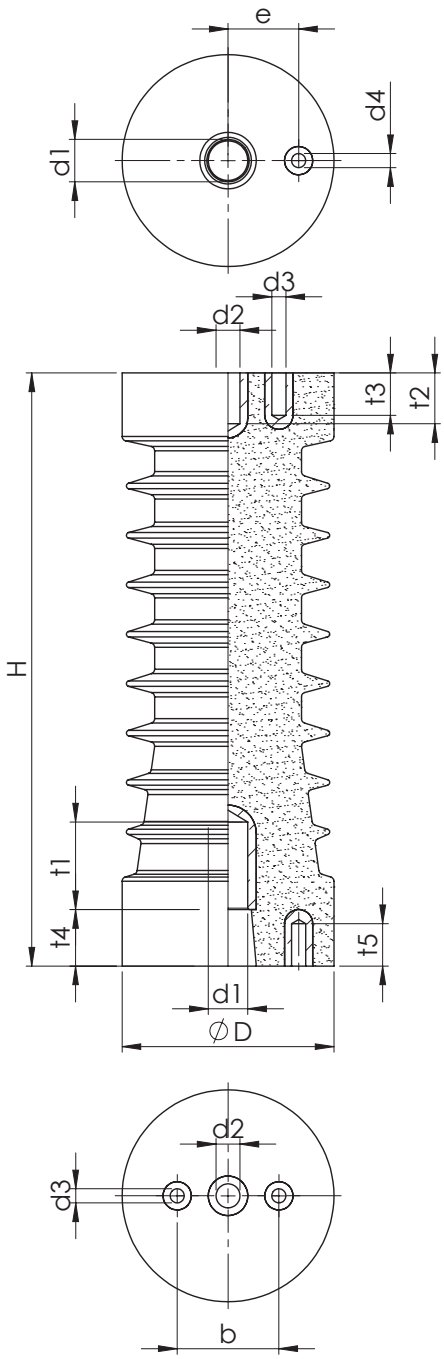
These insulators are used to detect the presence of voltage on phase lines. The basic principle of operation relies on capacitive division of the phase voltage. The voltage insulators are used in conjunction with a capacitive coupled voltage detecting system (VDS).
When ordering these insulators, the following information is required: Type of voltage detection system (HR or LRM system); rated (operating) voltage; capacitance of the indicator (insulator).

Insulator type	Dimensions (mm)												
	H	ØD	d1	d2	d3	d4	e	b	t1	t2	t3	t4	t5
IPA-12C	130	56	M16	M10	M6	M6	20	36	24	15	9	10	10
IPA-12-1C	130	60	M16	M10	M6	M6	20	36	24	15	9	10	10
IPA-12-2C	130	68	M16	M10	M6	M6	20	36	24	15	9	10	10
IPA-24C	210	65	M16	M10	M6	M6	25	36	24	15	9	15	9
IPA-24-1C	210	70	M16	M10	M6	M6	25	36	24	15	9	15	9
IPA-24-2C	210	75	M16	M10	M6	M6	25	36	24	15	9	20	9
IPA-38C	300	79	M16	M10	M6	M6	25	36	24	15	9	20	9
IPA-38-1C	300	82	M16	M10	M6	M6	25	36	24	15	9	20	9

IPB-12C, IPB-24C, IPB-38C



IPB-24C



Support insulators with voltage indicator
IPB-12C, IPB-24C, IPB-38C

TECHNICAL DATA	IPB-12C	IPB-24C	IPB-38C
Rated voltage (kV)	6 ; 10	15 ; 20	35
Highest voltage for equipment (eff.) (kV)	7,2 ; 12	17,5 ; 24	38
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	20 ; 28	50	70
Mass (kg)	~0,8	~1,0	~2,0
Breaking force (kN)	7,5	7,5	7,5
Valid standard	IEC 60660, IEC 61243-5, IEC 60273		
Mounting	Indoor		
Operation temperature	- 40°C up to +125°C		
Type of main insulation	Epoxy resin		

NOTE:
These insulators are used to detect the presence of voltage on phase lines. The basic principle of operation relies on capacitive division of the phase voltage. The voltage insulators are used in conjunction with a capacitive coupled voltage detecting system (VDS).
When ordering these insulators, the following information is required: Type of voltage detection system (HR or LRM system); rated (operating) voltage; capacitance of the indicator (insulator).

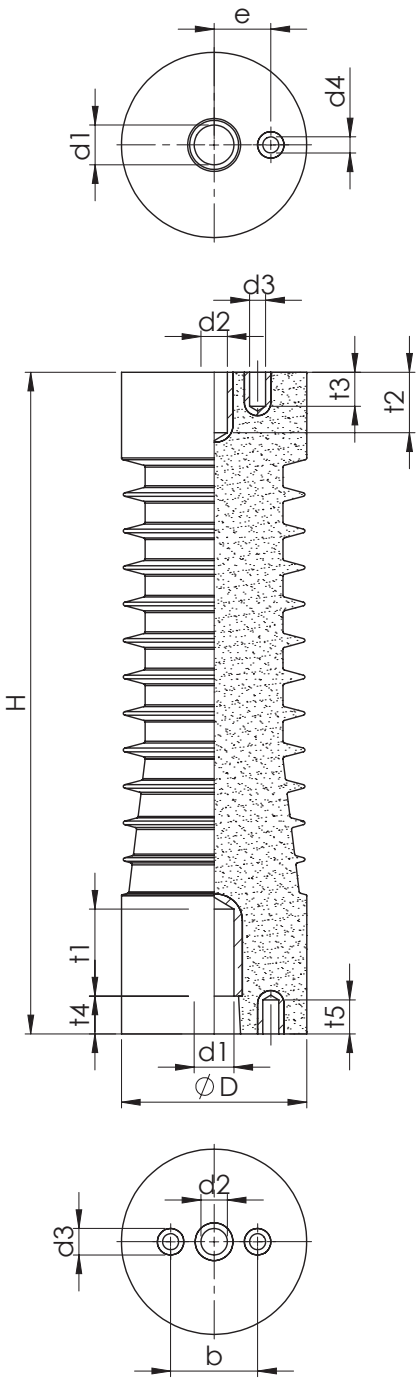
Insulator type	Dimensions (mm)												
	H	ØD	d1	d2	d3	d4	e	b	t1	t2	t3	t4	t5
IPB-12C	130	76	M20	M16	M10	M6	20	46	26	24	12	15	15
IPB-12-1C	130	82	M20	M16	M10	M6	20	46	30	24	12	12	12
IPB-24C	210	80	M20	M16	M10	M6	25	46	30	24	12	18	12
IPB-38C	300	93	M24	M16	M10	M6	25	46	34	24	12	20	12

CONTENTS

IPC-12C, IPC-24C, IPC-38C



IPC-38C



Support insulators with voltage indicator
IPC-12C, IPC-24C, IPC-38C

TECHNICAL DATA	IPC-12C	IPC-24C	IPC-38C
Rated voltage (kV)	6 ; 10	15 ; 20	35
Highest voltage for equipment (eff.) (kV)	7,2 ; 12	17,5 ; 24	38
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	20 ; 28	50	70
Mass (kg)	~0,9	~2,4	~4,1
Breaking force (kN)	12,5	12,5	12,5
Valid standard	IEC 60660, IEC 61243-5, IEC 60273		
Mounting	Indoor		
Operation temperature	- 40°C up to +125°C		
Type of main insulation	Epoxy resin		

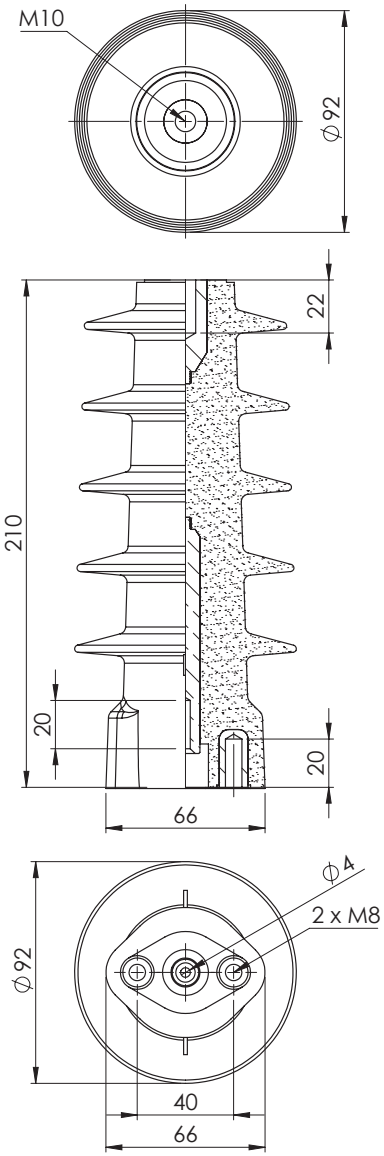
NOTE:
These insulators are used to detect the presence of voltage on phase lines. The basic principle of operation relies on capacitive division of the phase voltage. The voltage insulators are used in conjunction with a capacitive coupled voltage detecting system (VDS).
When ordering these insulators, the following information is required: Type of voltage detection system (HR or LRM system); rated (operating) voltage; capacitance of the indicator (insulator).

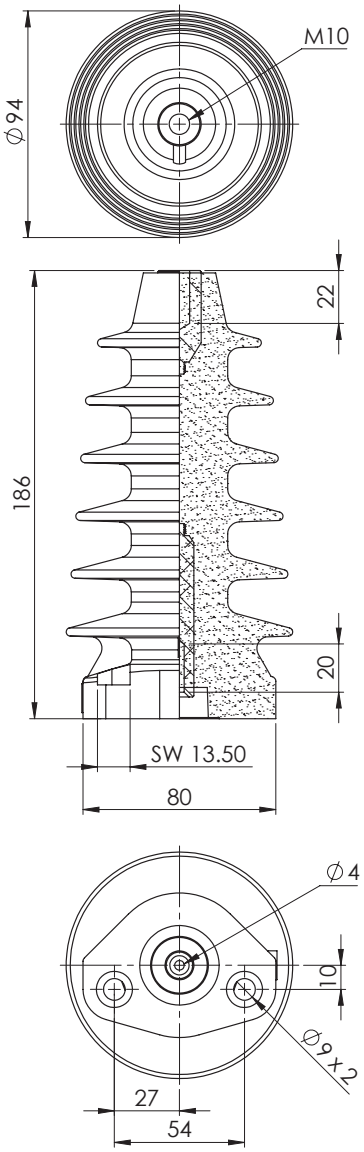
Insulator type	Dimensions (mm)												
	H	ØD	d1	d2	d3	d4	e	b	t1	t2	t3	t4	t5
IPB-12C	130	100	M20	M16	M10	M6	20	66	30	24	12	18	18
IPB-24C	210	105	M24	M16	M10	M6	25	66	34	24	12	24	12
IPB-38C	300	105	M30	M16	M10	M6	25	66	40	24	12	20	12

CSI 24-I, CSI 24-II



CSI 24-I



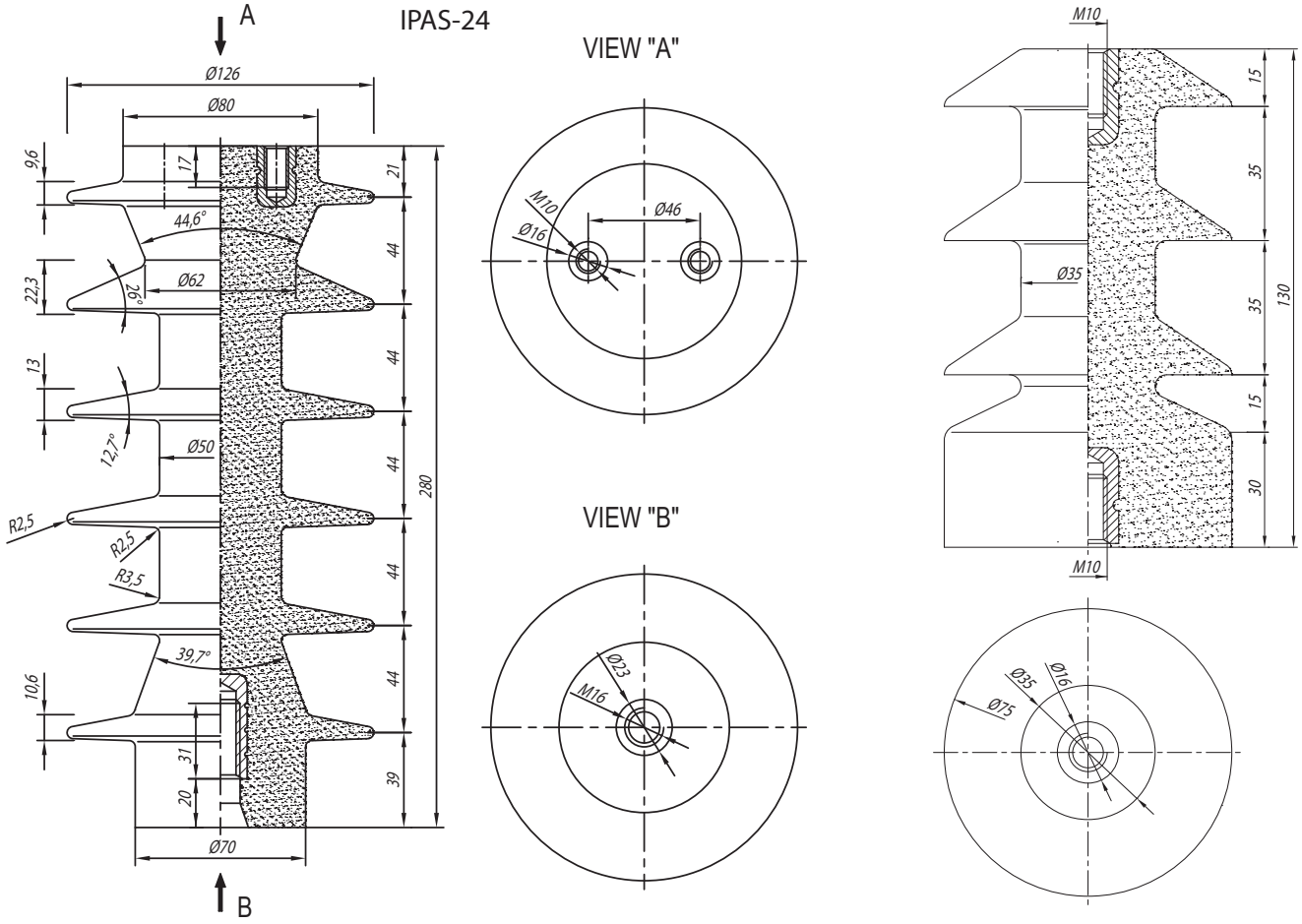


Support insulators with voltage indicator 24 kV **CSI-24-***

TECHNICAL DATA	CSI 24-1	CSI 24-2
Rated voltage (kV)	15; 20	
Highest voltage for equipment (eff.) (kV)	17,5; 24	
Breaking force (kN)	1,5	
Colour	Brown	
Standard	IEC 60273:1990; IEC 60660:1999; IEC 61243-5	
Mounting	Indoor	
Operation temperature (°C)	-40°C up to +125°C	
Type of main insulation	Epoxy resin	
Mass (kg)	1,1	0,9

NOTE:
These insulators are used to detect the presence of voltage on phase lines. The basic principle of operation relies on capacitive division of the phase voltage. The voltage insulators are used in conjunction with a capacitive coupled voltage detecting system (VDS).
When ordering these insulators, the following information is required: Type of voltage detection system (HR or LRM system); rated (operating) voltage; capacitance of the indicator (insulator).

IPAS-7.2, IPAS-24



IPAS-7,2

Support insulators for outdoor mounting **IPAS-7,2**, **IPAS-24**

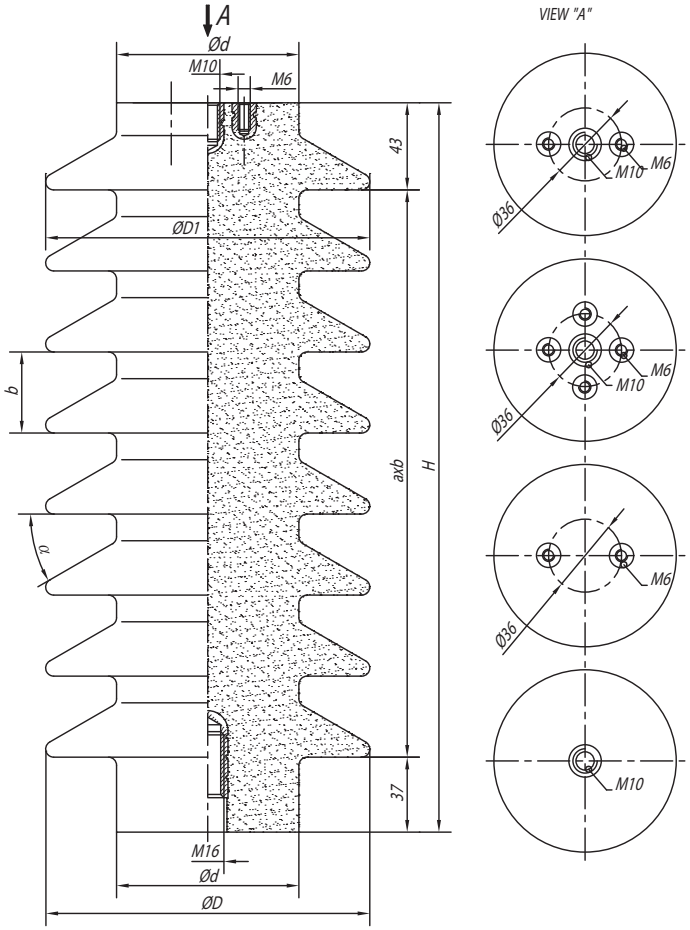
TECHNICAL DATA	IPAS-7,2	IPAS-24
Rated voltage (kV)	6	15 ; 20
Highest voltage for equipment (eff.) (kV)	7,2	17,5 ; 24
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	20	38 ; 50
Rated impulse withstand voltage 1,2/50 μs (kV)	60	95 ; 125
Mass (kg)	0,55	2,0
Breaking force (kN)	3,75	12,5
Number of ribs	3	6
Creepage distance (mm)	230	617
Valid standard	IEC 60660, IEC 60060-1	
Mounting	Outdoor	
Operation temperature	- 40°C up to +125°C	
Type of main insulation	Epoxy resin	



NOTE:

These epoxy resin post insulators can be used for all outdoor applications. These insulators feature a cylindrical shape which provides high structural robustness, completed with an appropriate creepage distance and number of ribs.

IPBS-12, IPBS-24, IPBS-38





IPBS-24

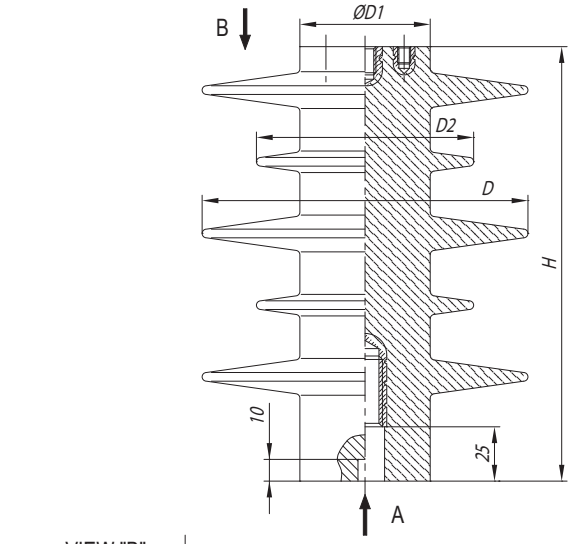
Support insulators for outdoor mounting **IPBS-12, IPBS-24, IPBS-38**

TECHNICAL DATA	IPBS-12	IPBS-24	IPBS-38
Rated voltage (kV)	10	20	35
Highest voltage for equipment (eff.) (kV)	12	24	38
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	28	50	70
Rated impulse withstand voltage 1,2/50 μs (kV)	75	125	170
Mass (kg)	3,20	4,83	5,70
Breaking force (kN)	7,5	7,5	7,5
Creepage distance (mm)	350	645	778
Number of ribs	4	6	8
Valid standard	IEC 60660, IEC 60060-1		
Mounting	Outdoor		
Operation temperature	- 40°C up to +125°C		
Type of main insulation	Epoxy resin		

Insulator type	Dimensions (mm)						
	H	Ød	ØD	ØD1	b	a	α°
IPBS-12	210	70	120	115	43	3	30°
IPBS-24	280	80	160	160	40	5	26°
IPBS-36	360	90	160	160	40	7	26°

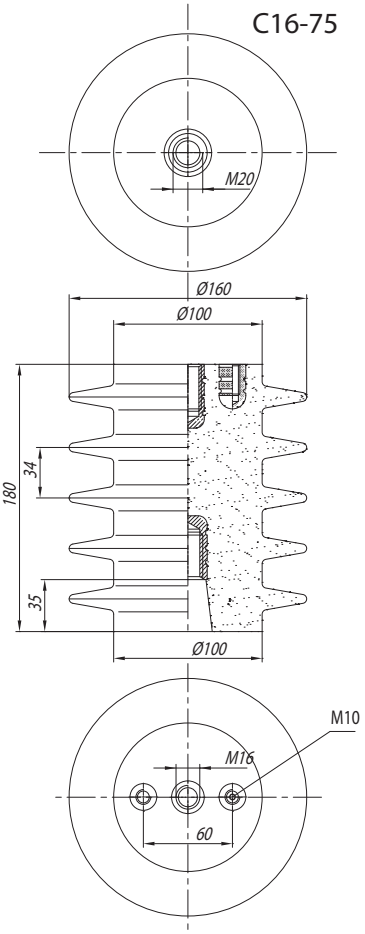
CONTENTS

C4-75, C4-125, C4-170 I C16-75





C4-75



Support insulators for outdoor mounting **C4-75**, **C4-125**, **C4-170**, **C16-75**

TECHNICAL DATA	C4-75	C4-125	C4-170	C16-75
Rated voltage (kV)	10	20	35	10
Highest voltage for equipment (eff.) (kV)	12	24	38	12
Rated power-frequency withstand voltage, 1 min (r.m.s.) (kV)	28	50	70	28
Rated impulse withstand voltage 1,2/50 µs (kV)	75	125	170	75
Mass (kg)	1,78	2,82	5,17	3,60
Breaking force (kN)	4	4	4	12,5
Creepage distance (mm)	485	670	890	415
Number of ribs	5	7	10	5
Valid standard	IEC 60660, IEC 60060-1			
Mounting	Outdoor			
Operation temperature	- 40°C up to +125°C			
Altitude	Not limited			
Type of main insulation	Epoxy resin			

Insulator type	Dimensions (mm)					
	H	ØD	ØD1	ØD2	E	K
C4-75	200	150	60	100	36	38
C4-125	300	160	70	110	50	42
C4-170	400	170	80	120	46	46
C16-75	180	160	100	/	60	/



C4-125

BUSHING INSULATORS

INTRODUCTION

APPLICATION

Bushing insulators are used in various types of installations when it is necessary for a conductor to pass from one room to another, or from an indoor space to an outdoor space. Due to the characteristics of epoxy resin, they can operate in all exploitation conditions, including tropical ones. They have a particular application in locations requiring resistance to moisture, chemical influences, impulse overvoltages, and breaking forces. Because of these properties, they are suitable for use in the industries, as well as for installation in marine plants.

DESCRIPTION

Bushing insulators are manufactured with main insulation made of epoxy resin of thermal class B (maximum temperature 125°C). Detailed technical characteristics for each type of insulator are provided in tabular form next to each model.

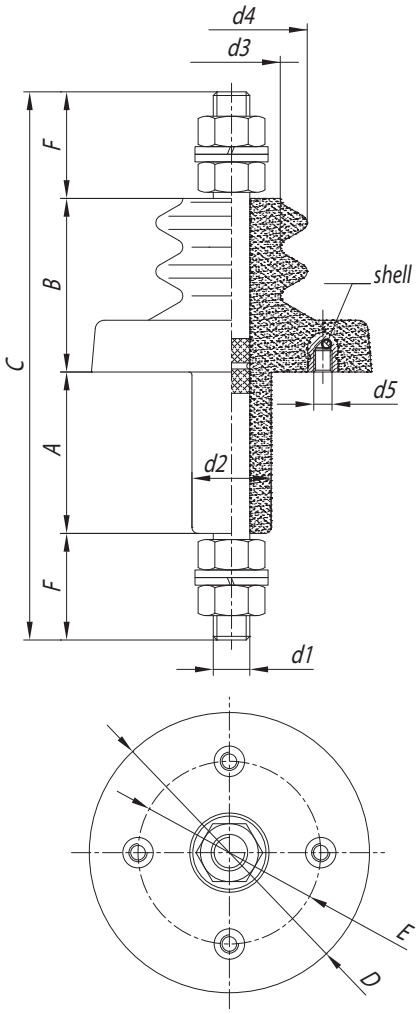
INSTALLATION

The installation of the insulators is performed via cast-in inserts or bolts, depending on the insulator type. During installation, pay close attention to the tightening torque of the bolts; tightening beyond the permissible limit can cause insert extraction, bolt breakage, or insulator damage.

MAINTENANCE

Almost no maintenance is required during exploitation. It is only necessary during regular annual overhauls to clean them of dirt and to tighten the mounting bolts and connection interfaces, especially for insulators installed in machinery whose operation is accompanied by high vibrations.

IPSU-1/300, IPSU-1/400, IPSU-1/500, IPSU-1/600





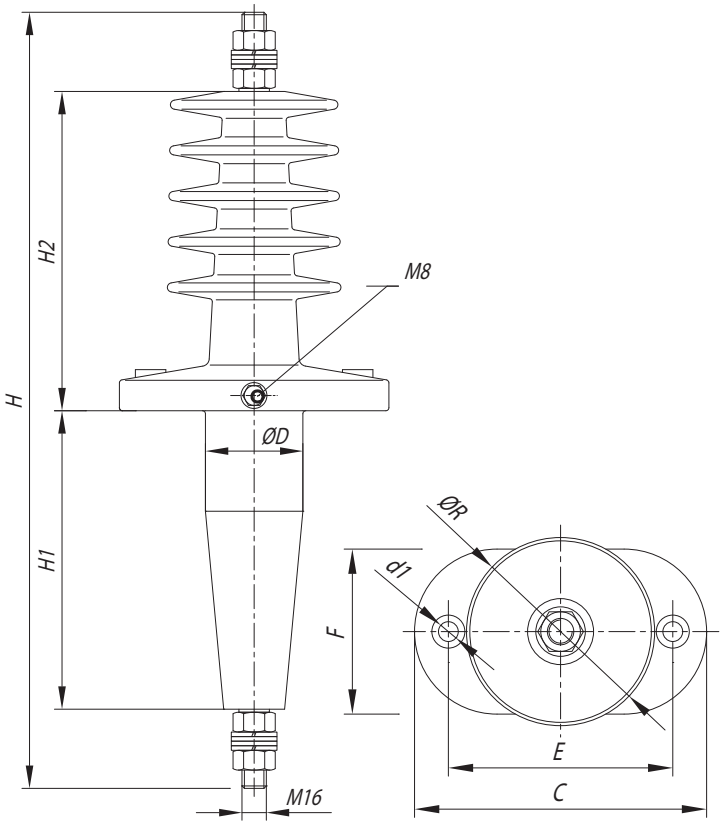
IPSU-1/300

Bushing insulators up to 1 kV **IPSU-1/300**, **IPSU-1/400**, **IPSU-1/500**, **IPSU-1/600**

TECHNICAL DATA	IPSU-1/300	IPSU-1/400	IPSU-1/500	IPSU-1/600
Rated voltage (kV)	0,8	0,8	0,8	0,8
Highest voltage for equipment (eff.) (kV)	1	1	1	1
Rated power-frequency withstand voltage, 1 min. (kV)	3	3	3	3
Rated current (A)	300	400	500	600
Mass (kg)	0,64	0,83	1,07	1,71
Creepage distance (mm)	105/70	107/70	110/70	110/70
Valid standard	IEC 60664-1			
Breaking force (kN)	3,75			
Mounting	Outdoor/Indoor			
Operation temperature	- 40°C up to +125°C			
Type of main insulation	Epoxy resin			

Insulator type	Dimensions (mm)										
	A	B	C	D	E	F	d1	d2	d3	d4	d5
IPSU-1/300	53	57	180	Ø92	60	33	M12	Ø26	32	48	M6
IPSU-1/400	53	57	190	Ø94	62	38	M14	Ø30	36	54	M6
IPSU-1/500	55	57	200	Ø98	64	42	M16	Ø36	42	62	M8
IPSU-1/600	55	57	210	Ø98	64	47	M20	Ø36	42	62	M8

IPSU-12S/630, IPSU-12/630, IPSU-24/630, IPSU-38/630





IPSU-12S/630



IPSU-12/630

Medium-voltage bushing insulators up to 38 kV **IPSU-***

TECHNICAL DATA	IPSU-12S/630	IPSU-12/630(1250)	IPSU-24/630(1250)	IPSU-38/630
Rated voltage (kV)	6	10	20	35
Highest voltage for equipment (eff.) (kV)	7,2	12	24	38
Rated power-frequency withstand voltage, 1 min. (kV)	20	28	50	70
Rated impulse withstand voltage 1.2/50 μs (kV)	60	75	125	170
Number of ribs	3	5	6	6+5
Mass (kg)	3,50	3,90	5,80	8,80
Creepage distance (mm)	355	455(430)	590(605)	830
Valid standard	IEC 60137			
Rated current (A)	630			
Breaking force (kN)	7,5			
Mounting	Outdoor/Indoor			
Operation temperature	- 40°C up to +125°C			
Type of main insulation	Epoxy resin			

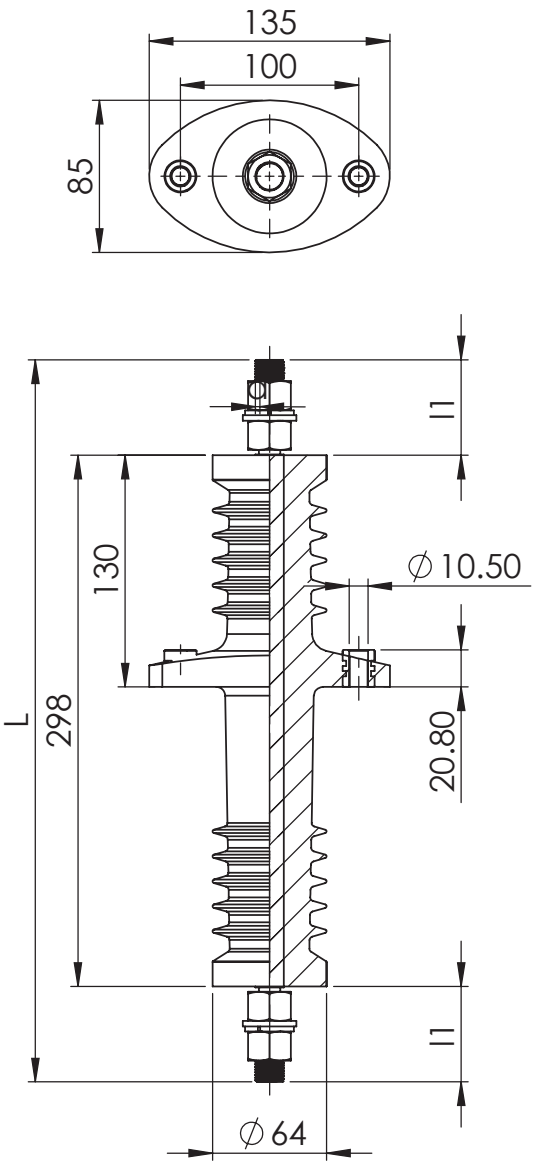
NOTE:

For currents exceeding 630 A (800 A, 1250 A, 2000 A), we recommend terminal lugs (connecting flags) as they provide superior contact connections and are adapted for busbar distribution systems. We can supply these terminal lugs upon request.

Insulator type	Dimensions (mm)											
	H	H1	H2	C	D	d1	E	F	R	M (630A)	M (1250A)	M (2000A)
IPSU-12S/630 (1250)	380	145	155	178	Ø60	Ø13	136	100	Ø115	M16	-	-
IPSU-12/630 (1250, 2000)	500	195	210	178 (198)	Ø60 (Ø80)	Ø13	136 (156)	100 (120)	Ø115 (Ø134)	M16	M32	M42
IPSU-24/630 (1250, 2000)	680	288	294 (296)	196 (216)	Ø80 (Ø90)	Ø13	156 (176)	120 (140)	Ø136 (Ø160)	M16	M32	M42
IPSU-38/630 (800, 1250, 2000)	907 (932)	371 (372)	442	230 (250)	Ø90 (Ø110)	Ø13	165 (190)	140 (160)	Ø145 (Ø165)	M16	M32	M42

CONTENTS

PI 12/23, PI 12/23-1, PI 12/23-2, PI 12/23-3





PI 12/23-3

Medium-voltage bushing insulator 10 kV

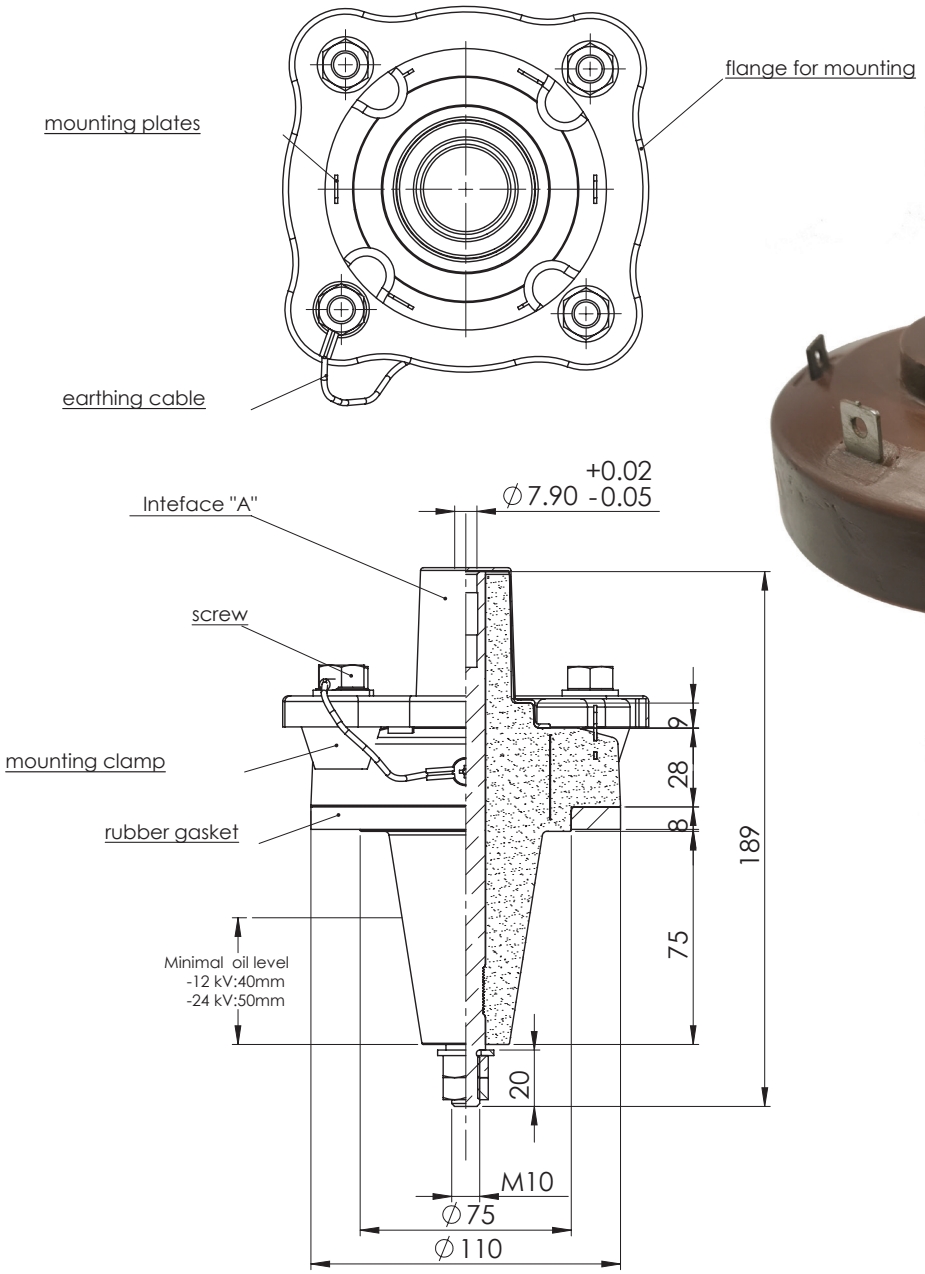
Type	Dimensions (mm)				Mass (kg)
	Rated current (A)	d	L	L1	
PI 12/23	200	M10	385	30	2.2
PI 12/23-1	315	M12	395	35	2.4
PI 12/23-2	400	M16	405	40	2.8
PI 12/23-3	630	M20	425	50	3.2

TECHNICAL DATA	PI 12/23
Rated voltage (kV)	10
Highest voltage for equipment (eff.) (kV)	12
Breaking force (kN)	3,75
Colour	Brown
Standard	IEC 60173:2017
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin

NOTE:

Primary conductors are manufactured from brass as standard.
At the customer's request, the primary conductors can also be made of copper or aluminium.

BI 12/24-250A





Medium-voltage bushing insulator **BI 12/24-250A**

TECHNICAL DATA	BI 12/24-250A
Rated voltage (kV)	10/11/15/20/22
Highest voltage for equipment (eff.) (kV)	12/17.5/24
Rated current (A)	250
Colour	Brown
Standard	IEC 60137:2017
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of basic insulation	Epoxy resin
Mass (kg)	1,9

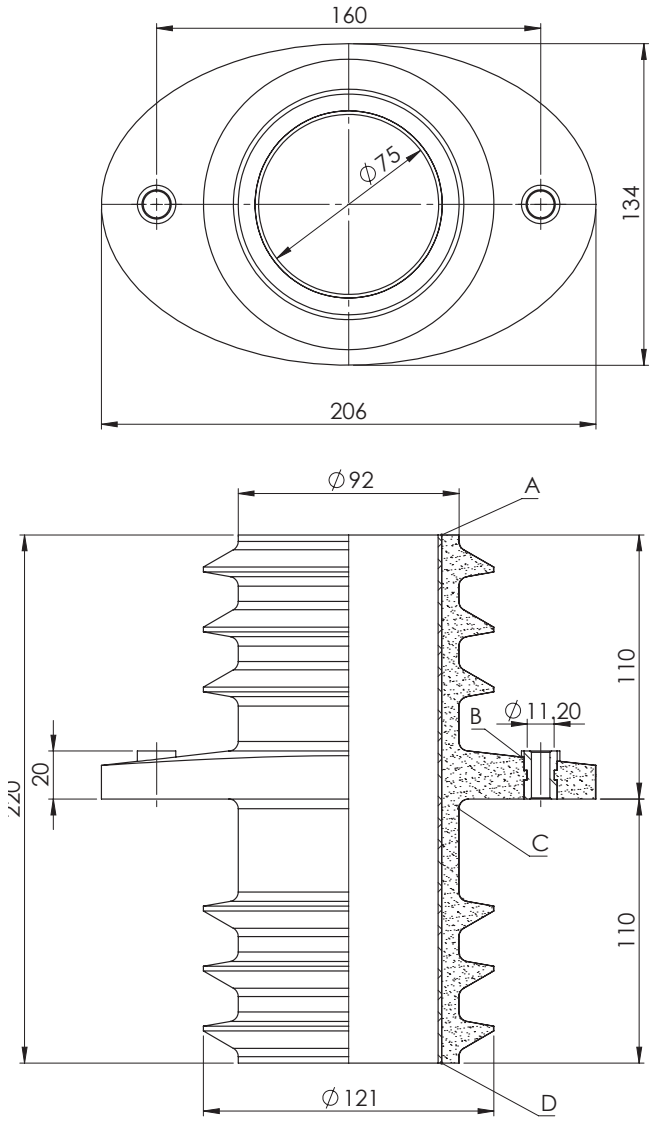
NOTE:

For use in equipment insulated with oil fluid, typically for transformers, switchgears, capacitors...

CONTENTS

PI 12/75



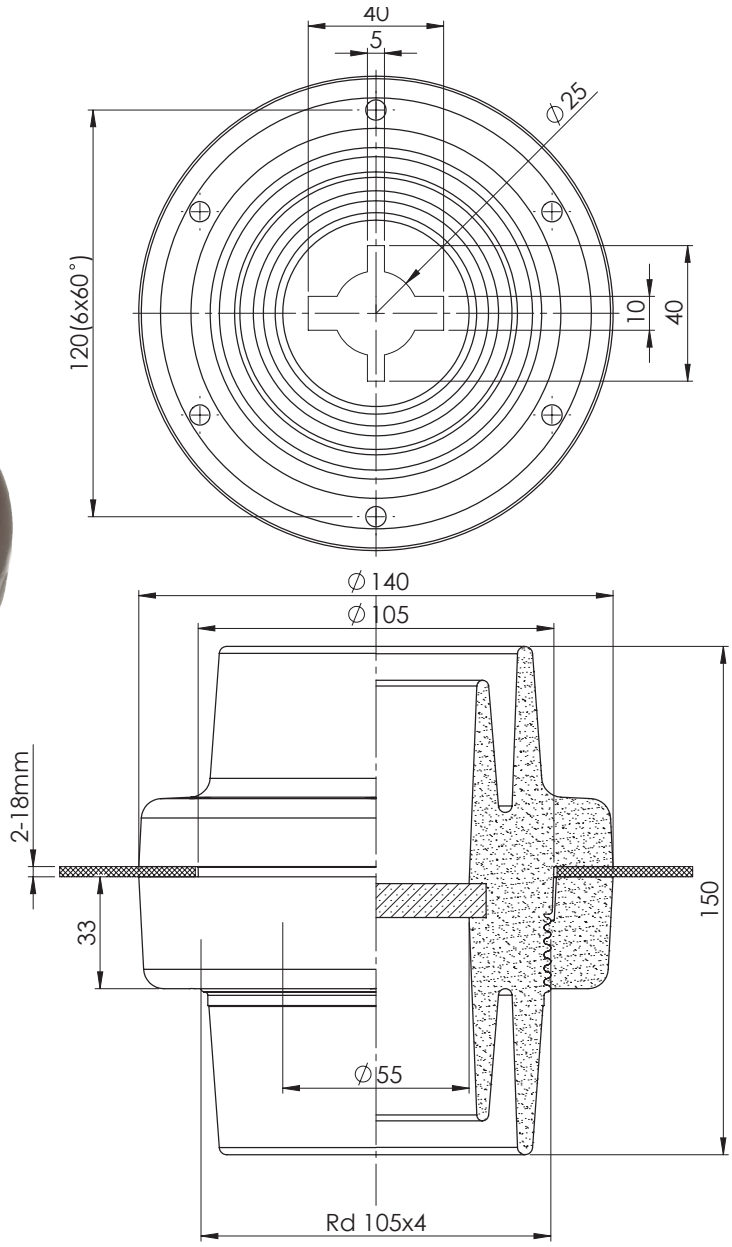


Through-wall bushing insulators **PI 12/75**

TECHNICAL DATA	PI 12/75
Rated voltage (kV)	10
Highest voltage for equipment (eff.) (kV)	12
Breaking force (kN)	10
Colour	Brown
Standard	IEC 60173:2017
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin
Mass (kg)	1,9
Creepage distance A-B (mm)	148
Creepage distance C-D (mm)	161

BI 20/55





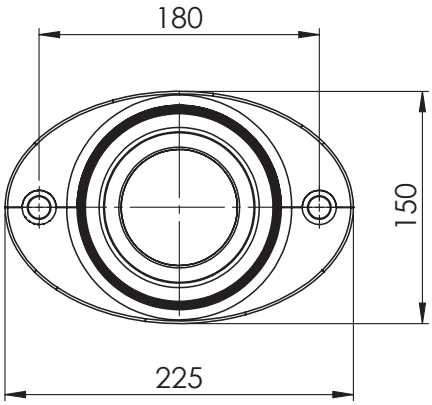
Through-wall bushing insulator **BI 20/55**

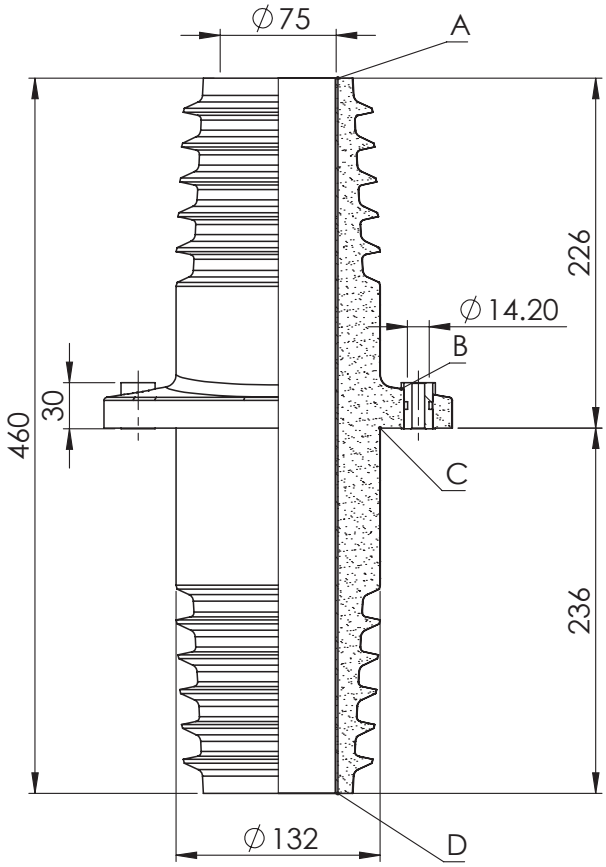
TECHNICAL DATA	BI 20/55
Rated voltage (kV)	20
Highest voltage for equipment (eff.) (kV)	24
Busbar dimensions (mm)	40x10; 40x5; Ø25
Colour	Brown
Standard	IEC 60173:2017
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin
Mass (kg)	1,5

CONTENTS

PI 24/75





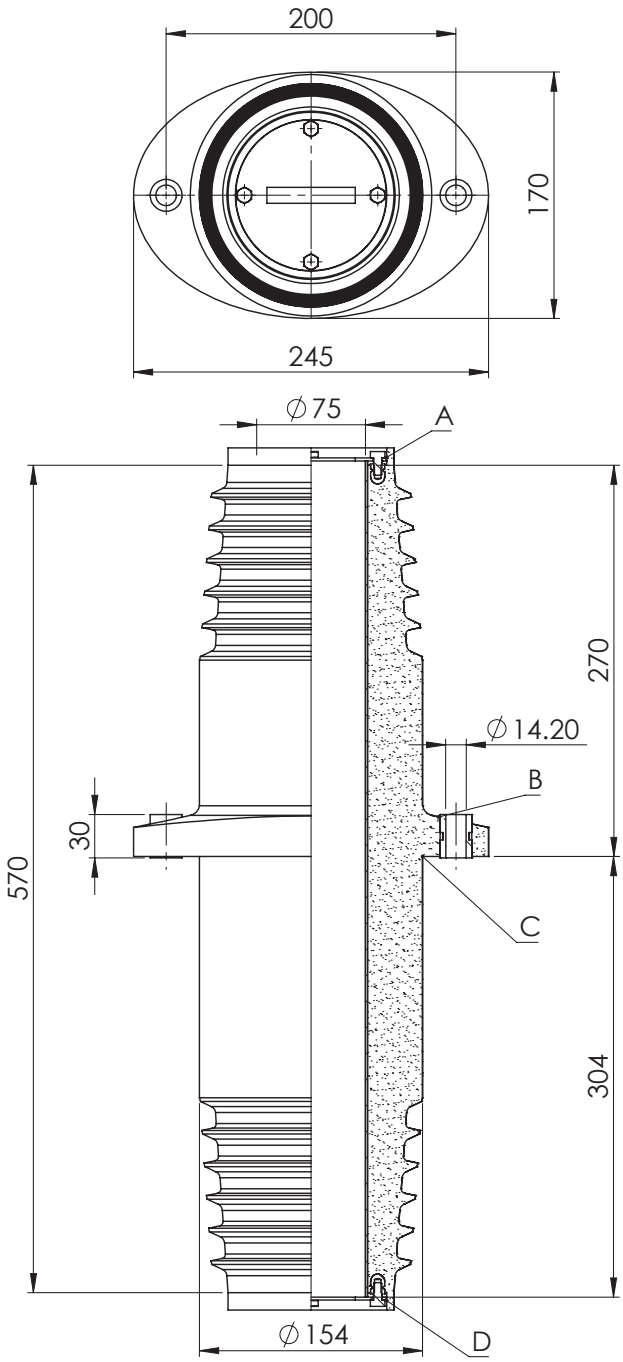


Through-wall bushing insulators **PI 24/75**

TECHNICAL DATA	PI 24/75
Rated voltage (kV)	20
Highest voltage for equipment (eff.) (kV)	24
Breaking force (kN)	10
Colour	Brown
Standard	IEC 60173:2017
Mounting	Indoor
Operation temperature (°C)	-40°C up to +125°C
Type of main insulation	Epoxy resin
Mass (kg)	6,5
Creepage distance A-B (mm)	283
Creepage distance C-D (mm)	288

PI 38/75





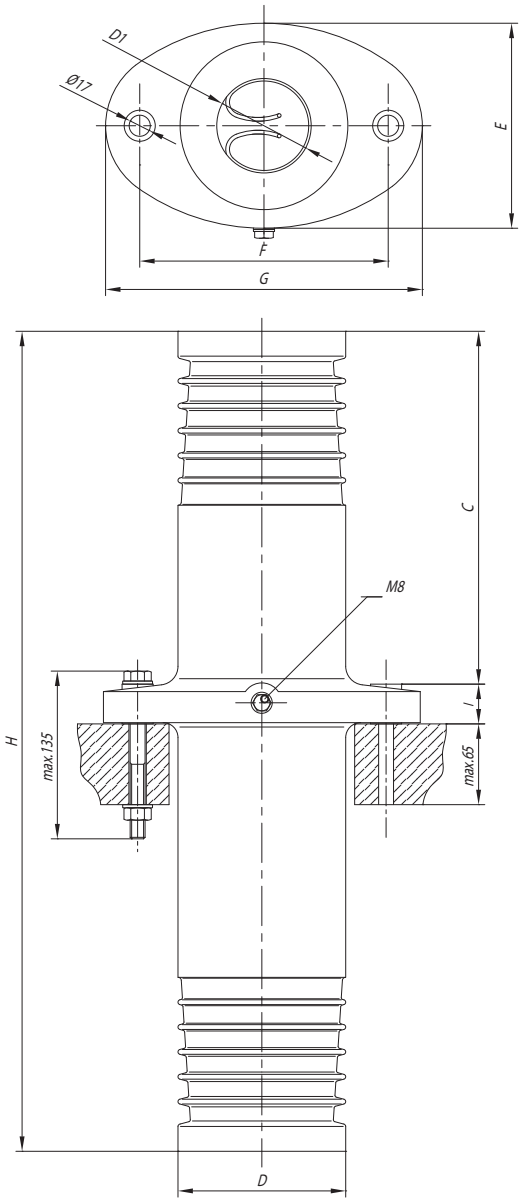
Through-wall bushing insulators **PI 38/75**

TECHNICAL DATA	PI 35/75
Rated voltage (kV)	35
Highest voltage for equipment (eff.) (kV)	38
Breaking force (kN)	10
Colour	Brown
Standard	IEC 60173:2017
Mounting	Indoor
Operation temperature (°C)	-40°C up to +130°C
Type of main insulation	Epoxy resin
Mass (kg)	13,5
Creepage distance A-B (mm)	338
Creepage distance C-D (mm)	342

IPU-12, IPU-24, IPU 38



IPU-38

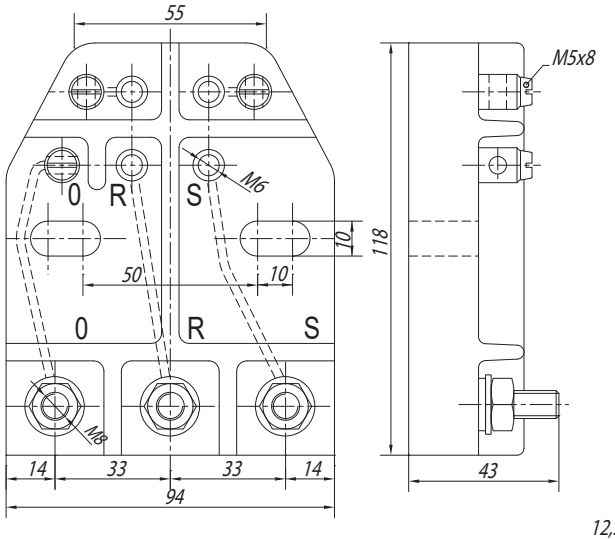


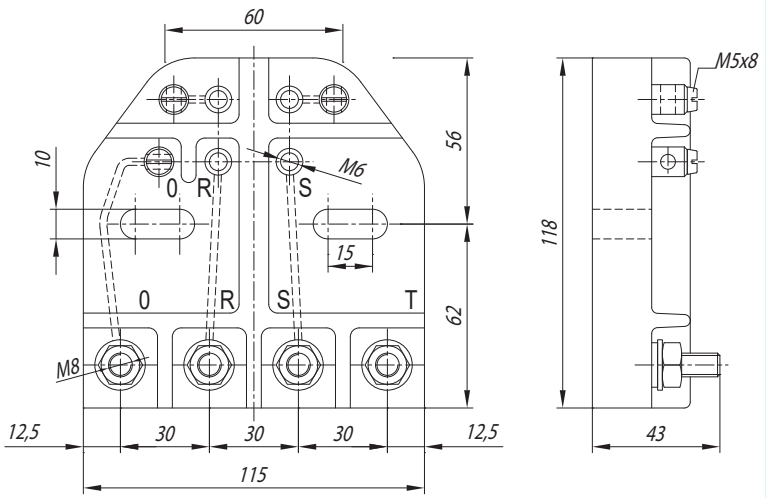
Through-wall bushing insulators from 10 up to 38 kV **IPU-12, IPU-24, IPU-38**

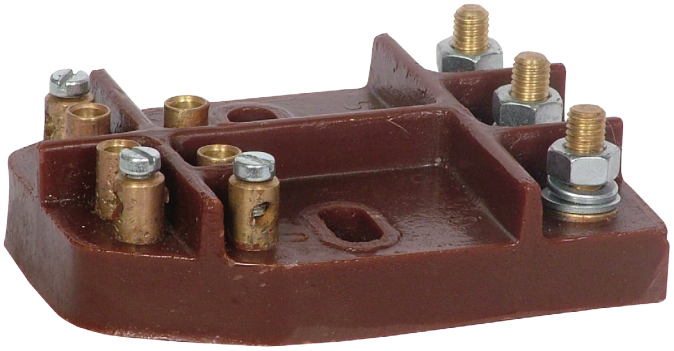
TECHNICAL DATA	IPU-12	IPU-24	IPU-38
Rated voltage (kV)	10	20	35
Highest voltage for equipment (eff.) (kV)	12	24	38
Rated power-frequency withstand voltage, 1 min. (kV)	28	50	70
Rated impulse withstand voltage 1.2/50 μs (kV)	75	125	170
Mass (kg)	3,1	7,30	12,9
Hole for busbars (mm)	Max. 2x(60x10)		
Valid standard	IEC 60137		
Breaking force (kN)	3,75		
Mounting	Indoor		
Operation temperature	- 40°C up to +125°C		
Type of main insulation	Epoxy resin		

Insulator type	Dimensions (mm)							
	H	ØD	ØD1	C	E	F	G	I
IPU-12	293	110	70	125	130	150	190	20
IPU-24	525	120	70	212	150	180	225	32
IPU-38	660	135	70	284	165	200	255	32

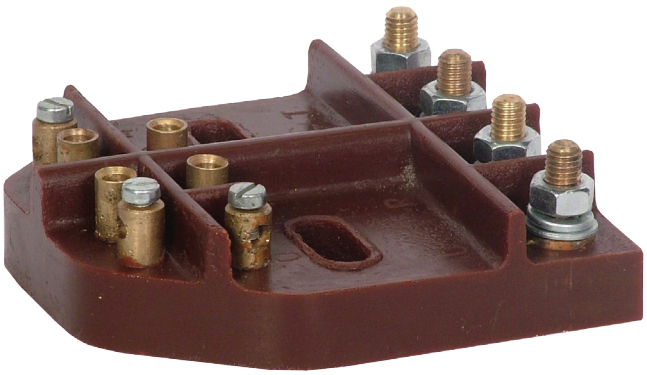
PPR-3, PPR-4







PPR-3



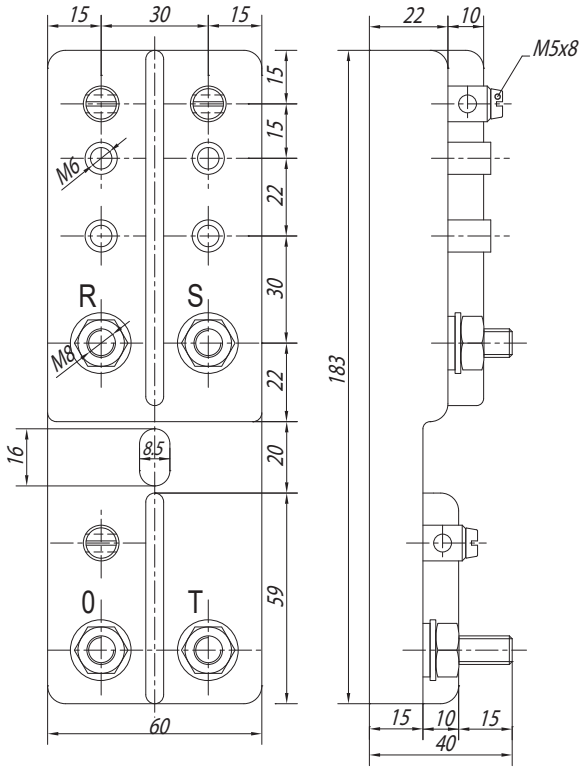
PPR-4

Terminal plates for street lighting **PPR-3, PPR-4**

TECHNICAL DATA	PPR-3	PPR-4
Rated voltage (kV)	0,72	0,72
Highest voltage for equipment (eff.) (kV)	0,8	0,8
Rated power-frequency withstand voltage, 1 min. (kV)	3	3
Mass (kg)	0,60	0,76
Number of terminals	3 (2 phases + neutral)	4 (3 phases + neutral)
Valid Standard	IEC 60664-1	
Rated fuse current (A)	Max.16	
Number of fuses per bulb	2	
Mounting	In the public lighting poles	
Frequency (Hz)	50/60	
Operation temperature	- 40°C up to +125°C	
Type of main insulation	Epoxy resin	

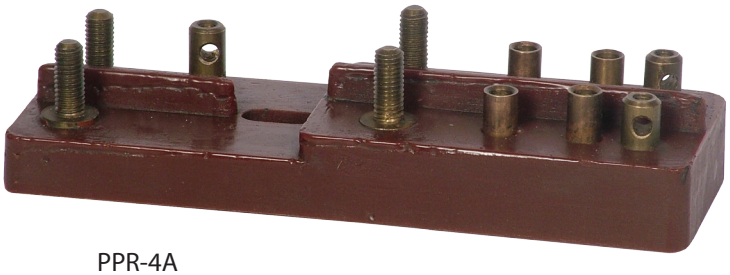
CONTENTS

PPR-4A, PPR-4B

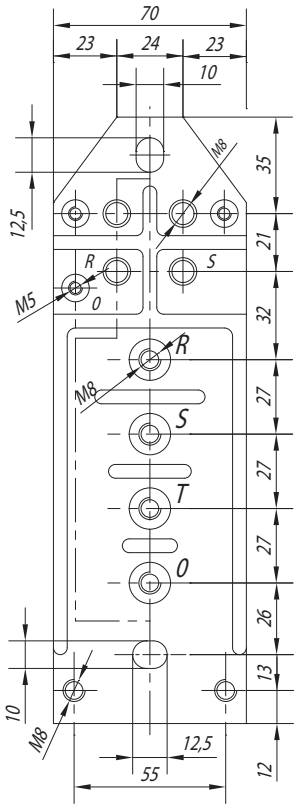


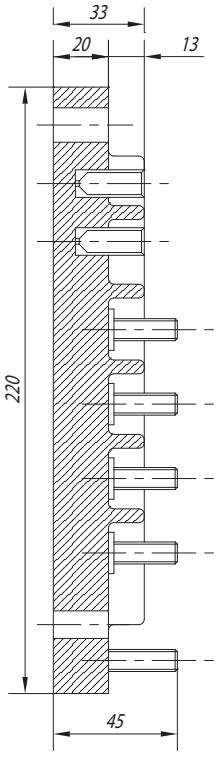


PPR-4B



PPR-4A

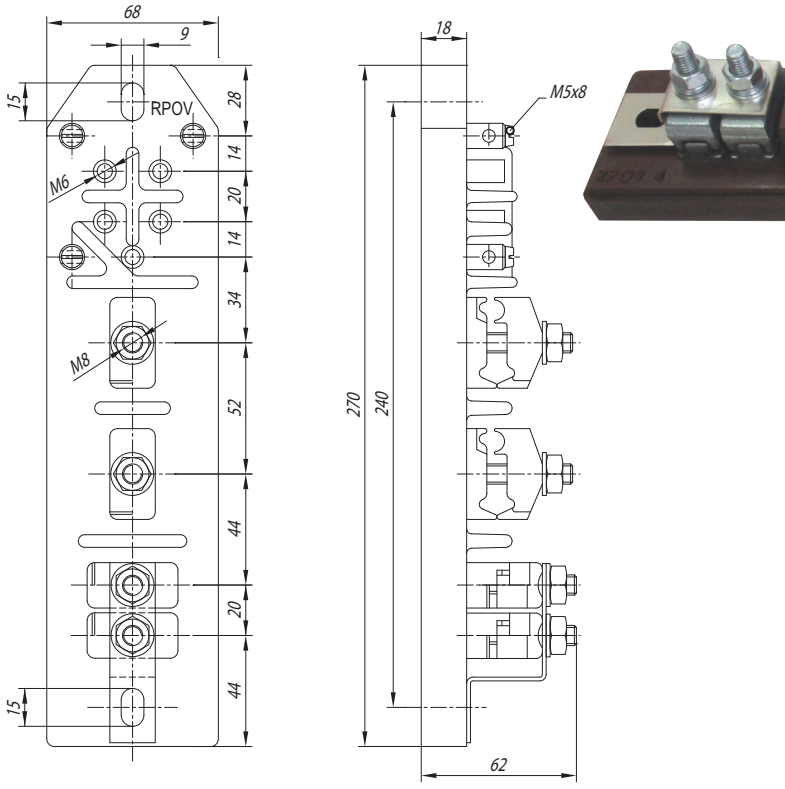


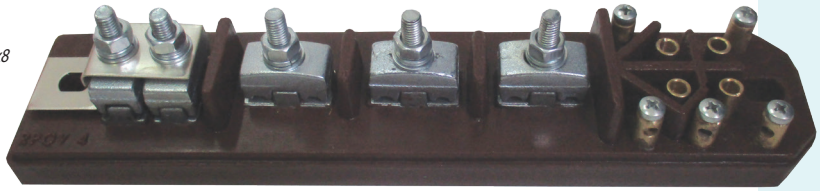


Terminal plates for street lighting **PPR-4A, PPR-4B**

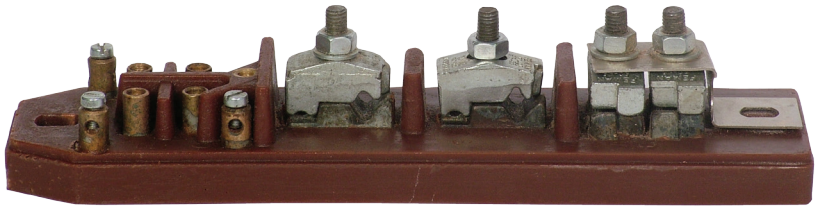
TECHNICAL DATA	PPR-4A	PPR-4B
Rated voltage (kV)	0,72	0,72
Highest voltage for equipment (eff.) (kV)	0,8	0,8
Rated power-frequency withstand voltage, 1 min. (kV)	3	3
Mass (kg)	0,69	0,79
Number of terminals	4 (3 phases + neutral)	
Valid Standard	IEC 60664-1	
Rated fuse current (A)	Max.16	
Number of fuses per bulb	2	
Mounting	In the public lighting poles	
Frequency (Hz)	50/60	
Operation temperature	- 40°C up to +125°C	
Type of main insulation	Epoxy resin	

RPOV-3, RPOV-4

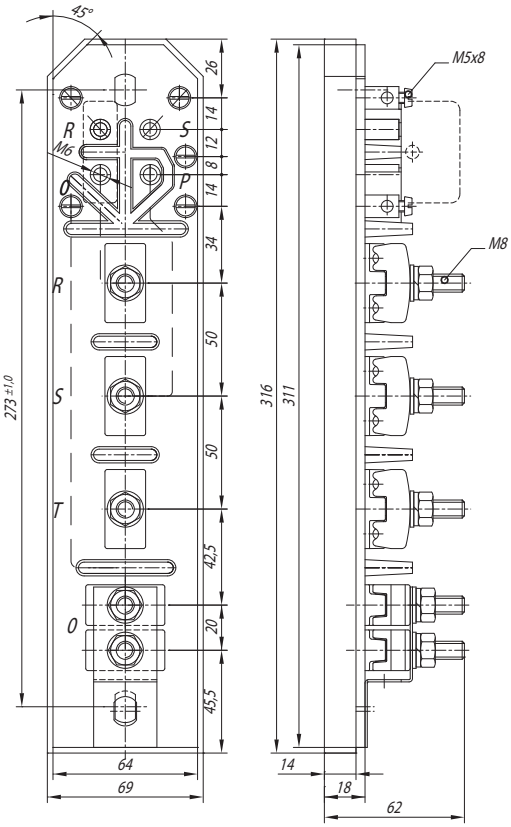




RPOV-4



RPOV-3

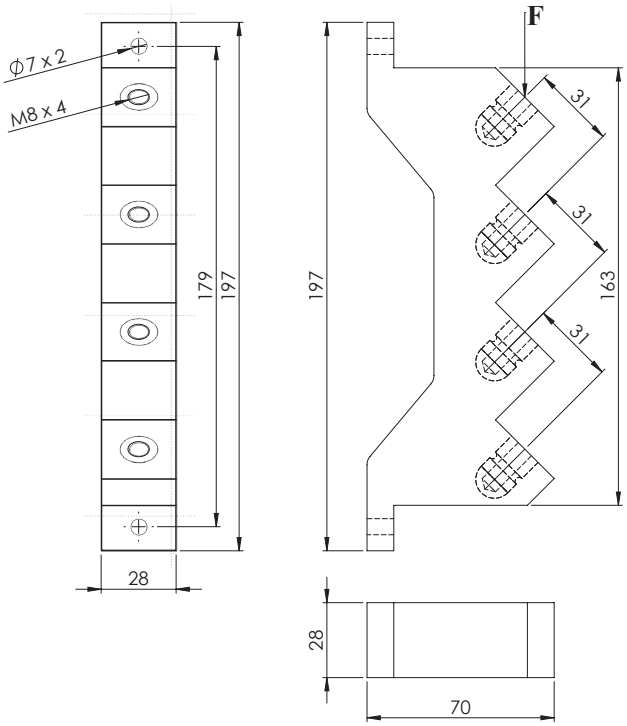


Terminal plates for street lighting type **RPOV-3**, **RPOV-4**

TECHNICAL DATA	RPOV-3	RPOV-4
Rated voltage (kV)	0,72	0,72
Highest voltage for equipment (eff.) (kV)	0,8	0,8
Rated power-frequency withstand voltage, 1 min. (kV)	3	3
Mass (kg)	1,2	1,5
Number of terminals	3 (2 phases + neutral)	4 (3 phases + neutral)
Valid Standard	IEC 60664-1	
Rated fuse current (A)	Max.16	
Number of fuses per bulb	2	
Mounting	In the public lighting poles	
Frequency (Hz)	50/60	
Operation temperature	- 40°C up to +125°C	
Type of main insulation	Epoxy resin	

CONTENTS

BH-1 45, BH-2 90

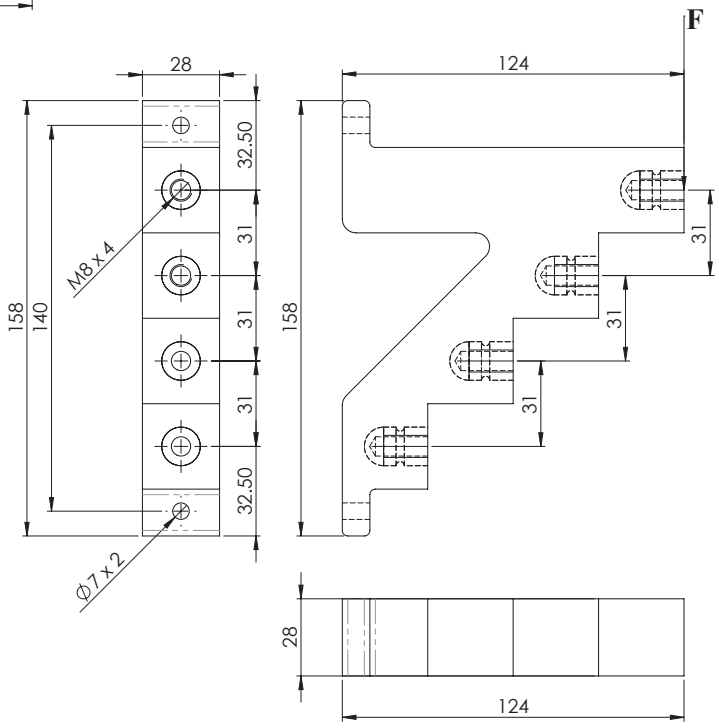




BH-1 45



BH-2 90



Busbar supports **BH-1 45**, **BH-2 90**

TECHNICAL DATA	BH-1 45	BH-2 90
Rated network voltage (kV)	0.72	0.72
Highest voltage for equipment (eff.) (kV)	0.8	0.8
Rated power-frequency withstand voltage 1 min. (kV)	3	3
Mass (kg)	0.42	0.67
Breaking force (kN)	3	3
Valid standard	IEC 60660:1999	
Mounting	Indoor	
Ambient temperature	- 40°C to +125°C	
Colour	Brown	
Main insulation	Epoxy resin	

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