

OBO protection and isolating spark gaps are intended to provide galvanic isolation between electrical installation parts where direct connections are not permitted. The galvanic isolation prevents not only electrochemical corrosion but provides also a connection capable of carrying lightning current. The spark gaps provide equipotential bonding in accordance to DIN VDE V 0185-305 (IEC 62305). The Parex version is also ATEX certified for use in explosion hazard areas.



# Surge protection systems

## Protective and isolating spark gaps



System overview from page 138

Principles from page 140

Products from page 142

# Surge protection systems

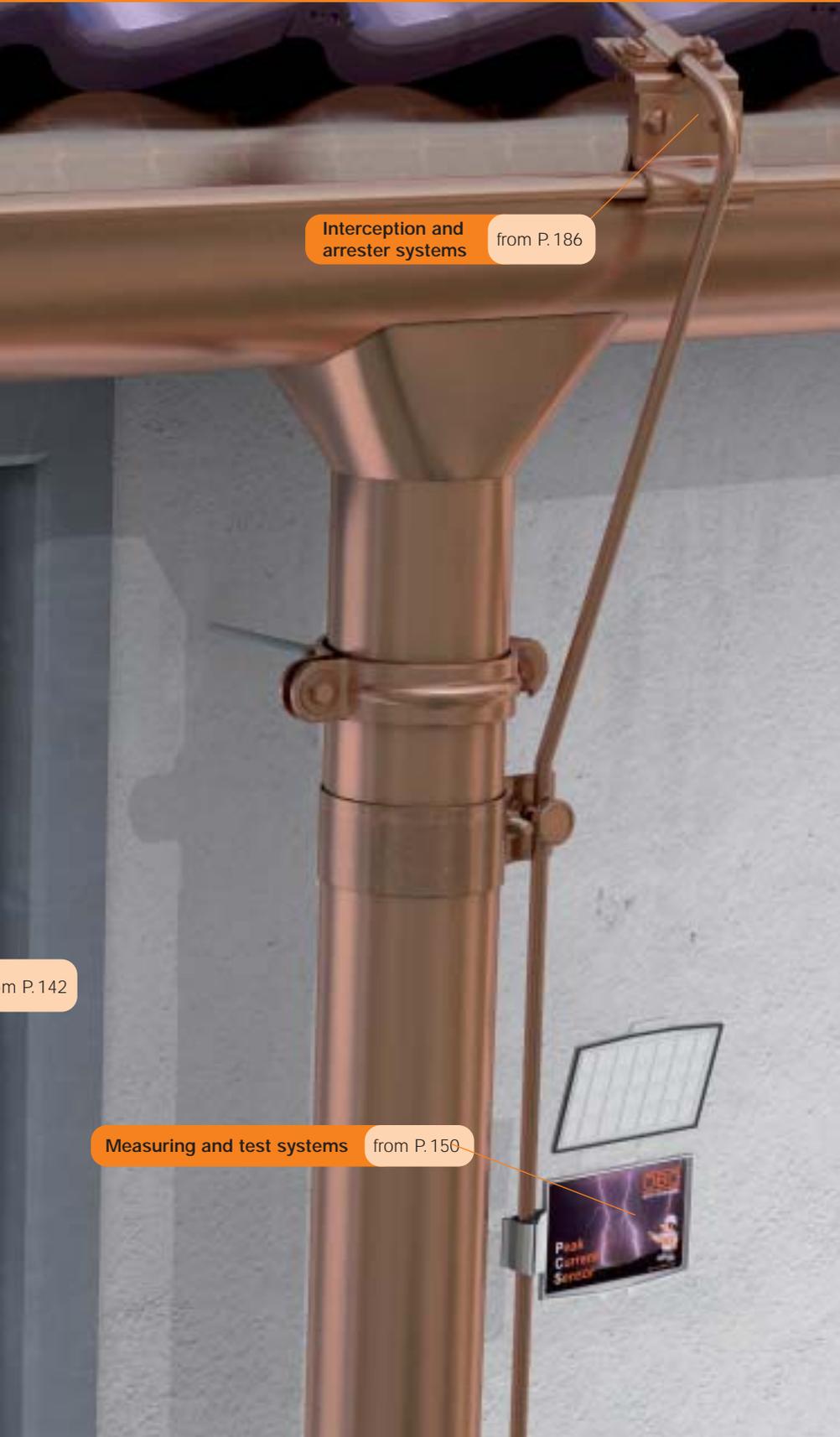
System overview protective and isolating spark gaps



Explosionsgefahr  
Flammen, offenes Licht  
und Funken verbieten  
Funktionstüchtigkeit versichern.

Spark gaps  
fro

Potential equalisation  
systems  
from P.166



Interception and arrester systems from P.186

m P.142

Measuring and test systems from P.150



# Isolating and protective spark gaps?

OBO isolating and protective spark gaps are designed to isolate electrical system components, which under normal operating conditions are not connected together. If lightning strikes cause a potential increase in one of the electrical system components, the isolating spark gap guarantees a conductive connection and therefore equipotential bonding.

## Applications

- ▶ For producing an indirect connection between insulating flanges (cathodic corrosion protection).
- ▶ For bridging insulating flanges, also in ex-protected areas (tested in accordance with ATEX Directive 94/9/EC).
- ▶ Avoidance of drag in residual voltages, especially TT systems.

- ▶ For lightning equipotential bonding in accordance with DIN V VDE V 0185.
- ▶ For connecting different earthing systems, the aim being to make optimum use of all earthers for lightning protection equipotential bonding.
- ▶ As a measure that saves isolating connections for measuring and test purposes.

Fig.: ATEX certificate



Fig.: Application example, isolating spark gap type 481

As their name suggests, isolating and protective spark gaps comprise a spark gap. This gap transfers from the insulating to the current-permeable condition when an electric arc is ignited by a surge voltage.

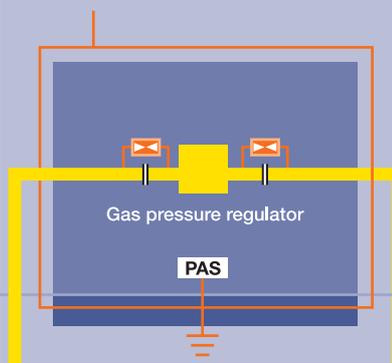
An isolating spark gap differs from a protective spark gap through its purpose for use. Isolating spark gaps isolate varying earth potentials, while the protective spark gap is used only in roof standard open-wire lines.

# Application example

## Isolating spark gaps for insulating flange (e.g. in a gas pressure control station)

(Isolating spark gap for the Ex-area) Type 480 isolating spark gap is highly suitable for the bridging of insulating flanges or insulating bolted connections (lightning current-carrying capable), especially in potentially explosive areas.

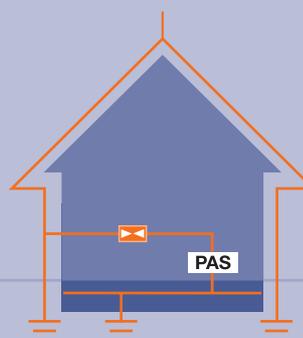
**Type 480**  
94/9/EG (ATEX Directive)



## Isolating spark gaps for potential isolation (several earthing systems on one building)

If a building has two earthing systems – e.g. foundation earth electrode and earthing rod – these can be connected together via an isolating spark gap. In contrast to a direct electrical connection, this prevents electrochemical corrosion of the earther. Furthermore, the entire earther surface is effective in the event of a direct lightning strike.

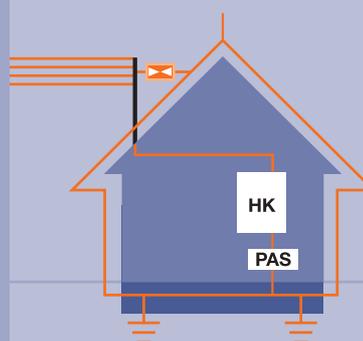
**Type 481**



## Over head connection (roof standard spark gaps for insulation)

With an over head line connection, the roof mast of a low-voltage open-wire line should have the largest possible distance to the lightning protection system. If this distance is less than half a metre, an enclosed protective spark gap must be integrated. The approval of the responsible energy supply company is required for the connection with the roof mast.

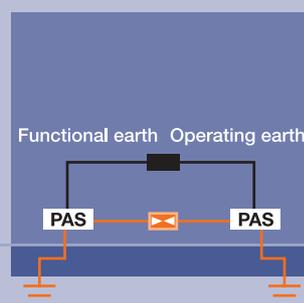
**Type 482**



## Coupling of earthing systems (several earthing systems on one building)

If it is necessary to fit a separate earthing system (functional earthing) to operate special electronic equipment, the ideal solution is a lightning current carrying connection to this earthing system. This can prevent dangerously high voltage differences occurring between the different earthing systems. An additional throttle is fitted to keep high-frequency voltages away from the functional earthing.

**Type FS-V20**



PAS = equipotential bonding rail

Protection and spark gaps

The spark gaps



Spark gaps 480 and 481 are installed with attaching straps or connectors between the system parts to be bridged. When installing, cable lengths should be kept as short as possible, as long cables increase the risk of insulation being subjected to unnecessary demands through inductive voltages.

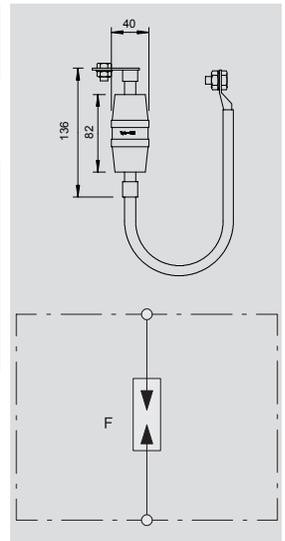
Parex spark gap

Spark gaps



Type	Connecting cable length m	Response voltage kV	Pulsed current kA	Nominal discharge current (8/20) kA	Voltage protection level kV	Pack. pcs	Weight kg/% pc	Item No.
480	0,18	1	100	100	< 3,0	1	48,000	<b>5240 03 4</b>
480	0,25	1	100	100	< 3,0	1	50,000	<b>5240 07 7</b>
480	0,35	1	100	100	< 3,0	1	53,000	<b>5240 06 9</b>

Price /pc



480...: Explosion-proof, closed spark gap.

- Ex-proofed according to ATEX Directive 94/9/EC
- Designation: Ex II 2G EEx d IIC T6
- Including attaching cable 25 mm<sup>2</sup> Cu, highly-flexible with cable lug, screw (M 10)
- Pulsed current 100 kA (10/350µs)
- BET-tested

Application: indirect bridging of insulating flanges and insulating threaded joints.

			5240 03 4	5240 07 7	5240 06 9
Pulsed current (10/350)	I <sub>imp</sub>	kA	100	100	100
Nominal discharge surge current (8/20)	I <sub>n</sub>	kA	100	100	100
Voltage protection level	U <sub>p</sub>	kV	< 3,0	< 3,0	< 3,0
Response time	t <sub>A</sub>	ns	< 100	< 100	< 100
Response voltage	U <sub>As</sub>	kV	1	1	1

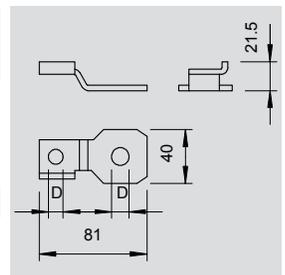
Connection strap for Parex spark gap

Spark gaps



Type	Bore hole-Ø mm	Version	Pack. pcs	Weight kg/% pc	Item No.
484	13	—	10	8,100	<b>5240 22 0</b>
484	17	—	10	7,700	<b>5240 23 9</b>
484	21	—	10	7,300	<b>5240 24 7</b>
484	25	—	10	6,800	<b>5240 25 5</b>

Price /pc

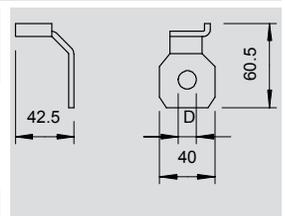


484...: Attaching flange for installing OBO-Parex spark gap 480 on insulating flanges.



Type	Bore hole-Ø mm	Version	Pack. pcs	Weight kg/% pc	Item No.
485	13	—	10	8,100	<b>5240 32 8</b>
485	11	—	10	8,300	<b>5240 30 1</b>
485	17	—	10	7,700	<b>5240 33 6</b>
485	21	—	10	7,300	<b>5240 34 4</b>

Price /pc

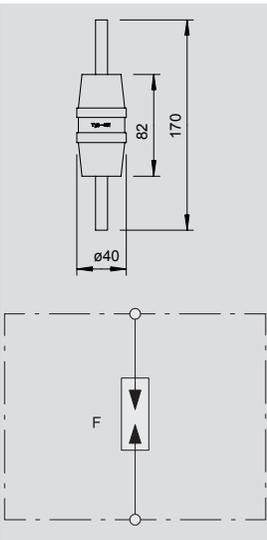


485...: Attaching flange for installing OBO-Parex spark gap 480 on insulating flanges.

Protection and spark gaps

Spark gaps

Spark gap



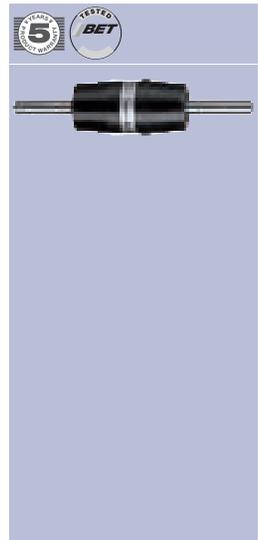
Type	Pack.	Weight	Item No.	Price /pc
481	1 pcs	26,500 kg/% pc	5240 08 5	

481...: Closed, lightning current carrying spark gap for separation of electrically conductive plant components.

- Connecting bolt; Ø 10 mm; stainless steel
- Pulsed current 50 kA (10/350)
- BET-tested

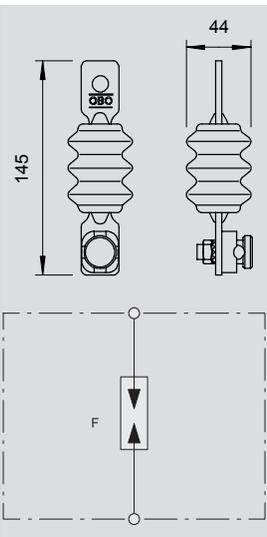
Application: setting-up galvanic separations for outer lightning protection and earthing systems, e.g. two earthing systems due to reciprocal influence or corrosion (preventing corrosion currents).

5240 08 5			
Pulsed current (10/350)	I <sub>imp</sub>	kA	50
Nominal discharge surge current (8/20)	I <sub>n</sub>	kA	100
Voltage protection level	U <sub>p</sub>	kV	< 5
Response time	t <sub>A</sub>	ns	< 100
Response voltage	U <sub>AS</sub>	kV	2,5



Spark gaps

Spark gap



Type	Pack.	Weight	Item No.	Price /pc
482	1 pcs	56,000 kg/% pc	5240 05 0	

482...: Closed spark gap for bridging a proximity point between roof standard of low-voltage system and components of external lightning protection systems.

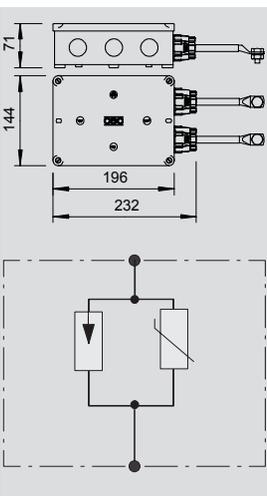
- Protection rating IP 54
- Including pre-mounted connector type 5001 for round conductor Rd 8-10

5240 05 0			
Voltage protection level	U <sub>p</sub>	kV	< 10 kV
Response time	t <sub>A</sub>	ns	< 100
Response voltage	U <sub>AS</sub>	kV	10



Spark gaps

Spark gap / overvoltage protection for coupling earthing systems



Type	Dimension	Pack.	Weight	Item No.	Price /pc
FS-V20	196 x 144 x 71 mm	1 pcs	170,000 kg/% pc	5099 80 3	

FS-V20: The FS-V 20 device is a spark gap with parallel-connected surge arrester. It is used to couple different earthing systems. It is connected directly to the appropriate equipotential bonding rail.

- High pulsed current resistance
- Low protection level
- Quick response time

Application: K coupling earthing systems in data technology sector (functional and operational earthing)

5099 80 3			
Maximum continuous operating voltage	U <sub>c</sub>	V	280
Pulsed current (10/350)	I <sub>imp</sub>	kA	100
Nominal discharge surge current (8/20)	I <sub>n</sub>	kA	100
Voltage protection level	U <sub>p</sub>	kV	< 1,5
Response time	t <sub>A</sub>	ns	< 25
Dimension	mm	196 x 144 x 71	
Protection rating			IP 54

