

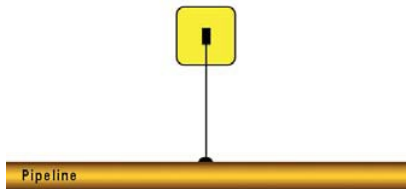
# PERMANENT TEST STATIONS

## Types and Functions

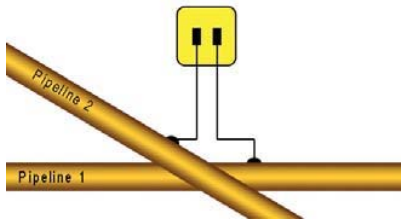
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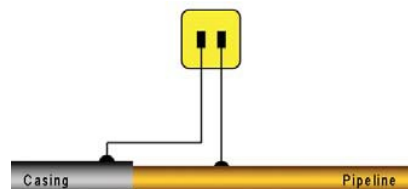
Permanent test stations are provided at selected locations along the protected structure to check, monitor and control the performance of cathodic protection.



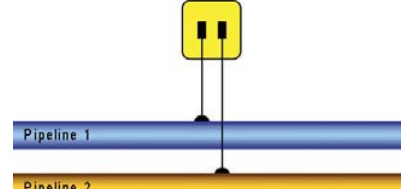
**Type - P -**  
For pipeline -to- soil potential measurements



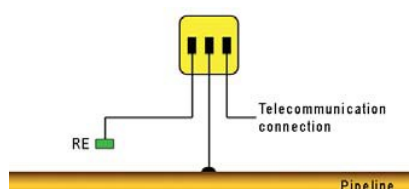
**Type - CR -**  
For checking interference effects between the protected pipeline and other pipelines or structures as well as pipeline -to- soil potential measurements



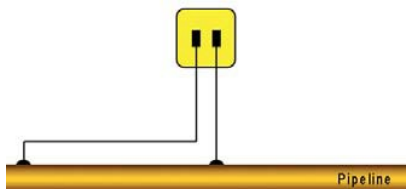
**Type - CA -**  
For checking the electrical isolation between pipeline and casing as well as pipeline -to- soil potential measurements



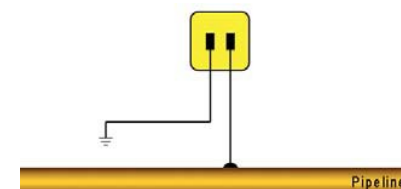
**Type - PB -**  
For bonding electrically isolated pipelines by using a variable resistor as well as pipeline -to- soil potential measurements



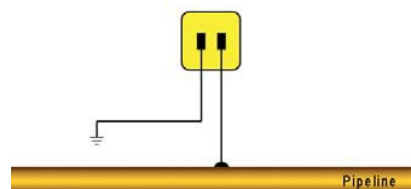
**Type - PB -**  
For bonding electrically isolated pipelines by using a variable resistor as well as pipeline -to- soil potential measurements



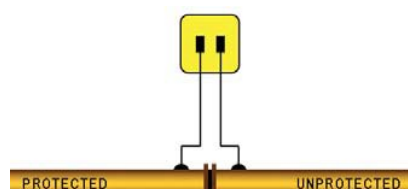
**Type - I -**  
For checking the efficiency of insulating flanges or insulating joints as well as pipeline -to- soil potential measurements



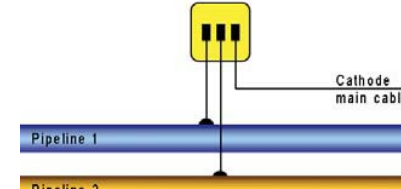
**Type - E -**  
For earthing the pipeline interfered by induced high voltage lines by means of lightning arresters as well as pipeline -to- soil potential measurements



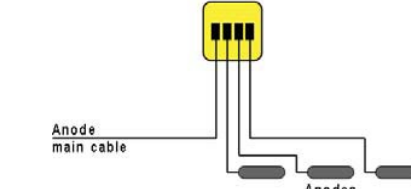
**Type - L -**  
For earthing the pipeline interfered by induced high voltage lines by means of diodes and condenser cascades as well as pipeline -to- soil potential measurements



**Type - C -**  
For pipeline current and pipeline -to- soil potential measurements



**Type - CJB -**  
For connection of pipelines or structures having extremely different current requirements by means of diodes and variable resistors



**Type - AJB -**  
For measuring and adjusting output current of individual single anode by means of shunts and variable resistors

## PERMANENT TEST STATIONS

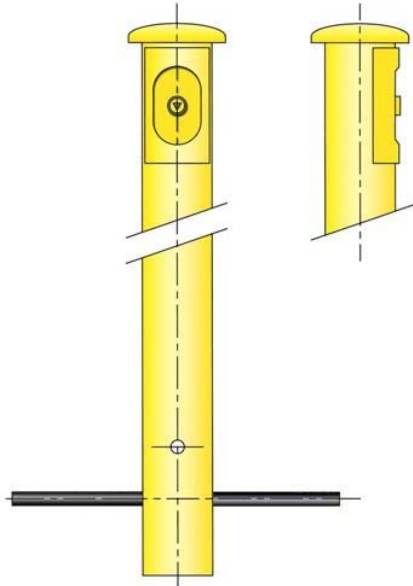
Model: TP-001 and TP-002

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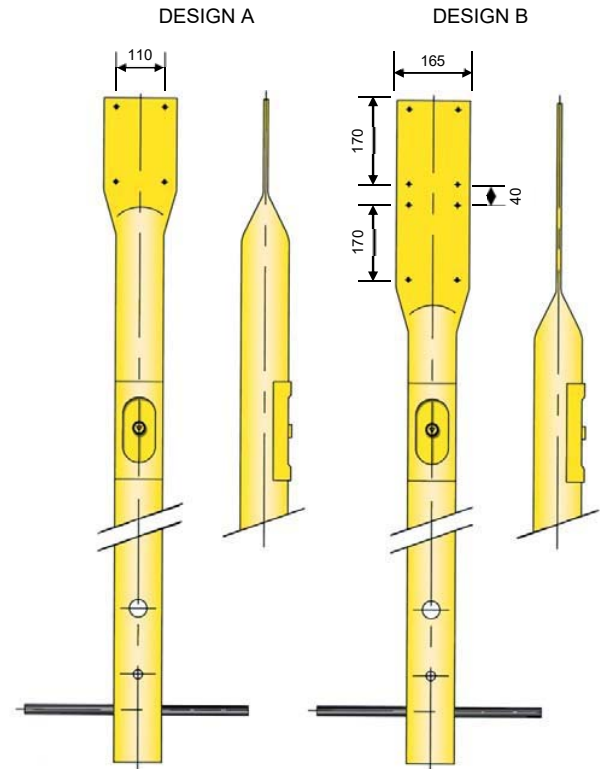
### Model: TP-001

Model	Material	Length	Outside diameter
TP-001 S	Steel	1500 mm	approx. 108 mm



### Model: TP-002

Model	Material	Length	Outside diameter
TP-002 S	Steel	3000 mm	approx. 108 mm
TP-002 P	Plastic	3000 mm	approx. 108 mm



### Specifications

- all steel parts painted with a two component epoxy resin paint, coating colour: yellow acc. to RAL 1018
- all PVC parts made of impact resistant hard PVC provided with a layer of PMMA for UV-stability and durability of more than ten years
- termination lid provided with a triangular lock
- two PVC pipes provided at the lower part of the post for ground anchoring
- cable termination plate: 60 x 90 mm with 6 coloured spade terminals for cables up to 6 mm.<sup>2</sup>
- proper facility for cable entrance at the bottom of the post
- Model TP-001 with a canopy at the top for rain and weather protection
- Model TP-002 with a special flat top for fixing of TS identification plates

### Optional features on request

- all steel parts hot galvanized
- main post of different length and colours
- additional / higher rated spade terminals



## PERMANENT TEST STATIONS

**Model: TP-003**

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### Model: TP-003

#### Specifications

Extruded aluminium posts (AlMgSi) with plain or yellow plastic coated finish, complete with aluminium caps with triangular lock for opening and closing. Posts are available with choice of metal rod type ground anchor or four slits at the lower end for splayed anchorage.

Posts are also available in white (RAL 9010), grey (RAL 7001), or green (RAL 6005) plastic coated finish.

All posts can be marked with red fluorescent colour foil (fitted to purchaser's specification).

Model	Finish	Length	Dia.	Termination design
TP 003 SPM 6/1500	plain aluminium	1 500 mm	60 mm	A, C or D
TP 003 SPM 6/2000	plain aluminium	2 000 mm	60 mm	A, C or D
TP 003 SPM 6/2500	plain aluminium	2 500 mm	60 mm	A, C or D
TP 003 SPMG 6/1500	yellow plastic coated	1 500 mm	60 mm	A, C or D
TP 003 SPMG 6/2000	yellow plastic coated	2 000 mm	60 mm	A, C or D
TP 003 SPMG 6/2500	yellow plastic coated	2 500 mm	60 mm	A, C or D
TP 003 SPM 10/1500	plain aluminium	1 500 mm	100 mm	B, C or D
TP 003 SPM 10/2000	plain aluminium	2 000 mm	100 mm	B, C or D
TP 003 SPM 10/2500	plain aluminium	2 500 mm	100 mm	B, C or D
TP 003 SPM 10/3000	plain aluminium	3 000 mm	100 mm	B, C or D
TP 003 SPMG 10/1500	yellow plastic coated	1 500 mm	100 mm	B, C or D
TP 003 SPMG 10/2000	yellow plastic coated	2 000 mm	100 mm	B, C or D
TP 003 SPMG 10/2500	yellow plastic coated	2 500 mm	100 mm	B, C or D
TP 003 SPMG 10/3000	yellow plastic coated	3 000 mm	100 mm </td <td>B, C or D</td>	B, C or D

#### Accessories

Fastening clamps designed for attaching aluminium base plates. Aluminium base plates for attaching identification signs.

#### Termination Design

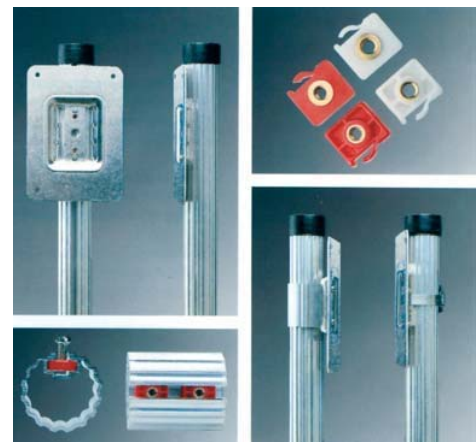
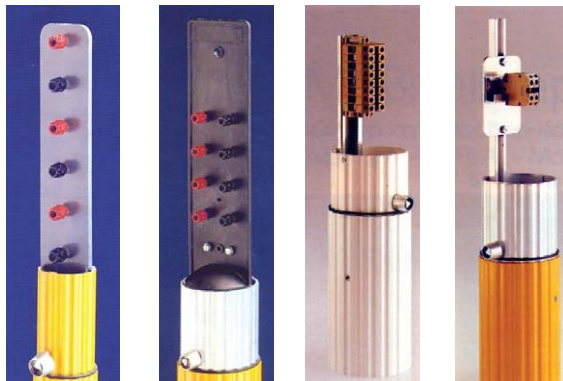
- Termination plate, made of PVC, 230 x 52 mm with 6 holes of 4.2 mm, spaced vertically
- Termination plate, made of PVC, 300 x 90 mm with 8 holes of 4.2 mm, spaced vertically
- Termination with vertical mounting rail built to take up to 12 coupler terminals
- Termination with horizontal mounting rail built to take up to 4 coupler terminals

-A-

-B-

-C-

-D-



# PERMANENT TEST STATIONS

Model: TP-004 and TP-005

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## Model: TP-004

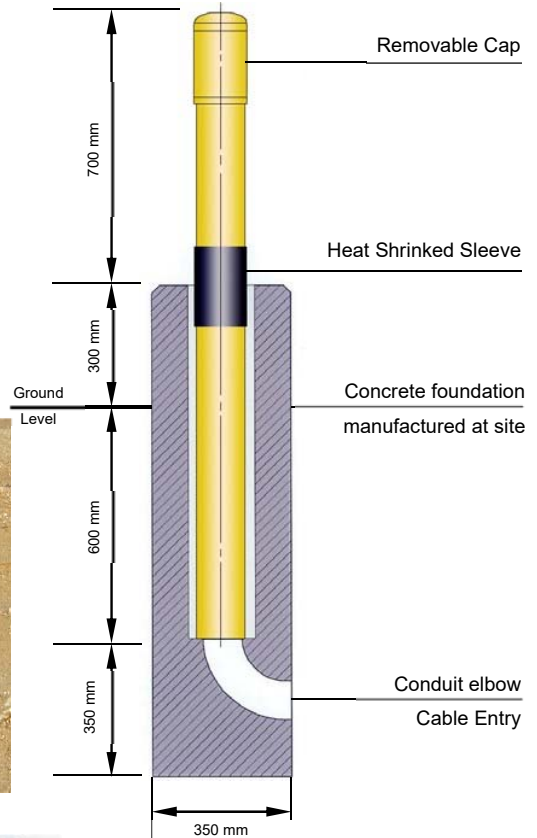
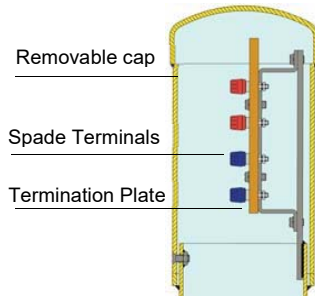
Model	Post	Termination cap	Length	Outside diameter
TP 004	Steel	Steel	1 600 mm	114.3 mm

### Standard features

- anti-vandalism design
- all parts made of mild steel painted with a two component epoxy resin paint, coating colour: yellow according to RAL 1018
- cable termination plate covered by a removable cap at the top fixed with three recessed galvanized steel bolts located in 120° position around the cap
- cable termination plate: 60 x 145 mm with 8 coloured spade terminals for cables up to 6 mm<sup>2</sup>
- a steel elbow for cable entry will be fixed at the bottom of the tube
- delivery of test station without concrete foundation

### Optional features on request

- main post of different length and colours
- additional / higher rated spade terminals



## Model: TP-005 (BIG FINK®)



Cap, terminal board and compression nut are made of non-corrodible Makrolon® polycarbonate

Accessories: all BIG FINK® terminal boards can accommodate shunts, resistors, banana jacks, locking devices, lightning arrestors etc.

Colours: red, orange, yellow, green, blue, white and black are standard on BIG FINK® and support post.

Anchor: polyethylene pipe provided at the lower post prevents pull-out.

Sizes: Available in models to fit 1 ¼", 2" and 3" pipe.

Standard nickel plated brass or optional stainless steel terminals for guaranteed long service life. Up to 11 terminals accessible from both sides of the board.



## PERMANENT TEST STATIONS

Model: TP-006

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**PSE ENGINEERING  
GMBH**

### Model: TP-006 (FLUSH FINK®)

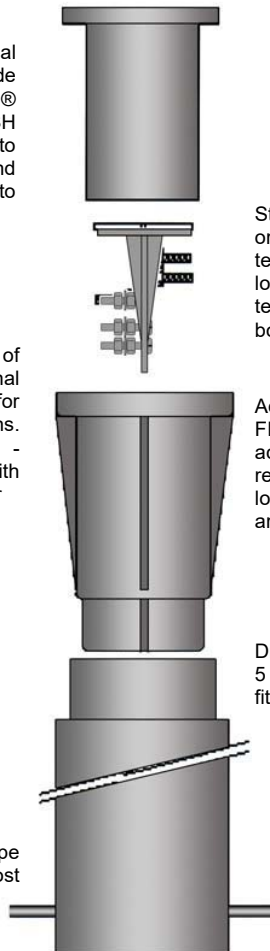
- Flush mounting surface chamber for use in trouble-some locations where water, street traffic and other adverse conditions exist. The chamber will maintain its structural integrity during hard usage and is suitable for installation in asphalted areas.
- The chamber can be used as a test station with 5 or 8 connections or as an access hole for placing reference cells.
- The chamber is made of non-corrodible hard-wearing glass filled polycarbonate, stable under ultraviolet attack and has dimensional and electrical stability from - 15° C up to 120° C.
- All electrical terminals are maintained in a dry environment even if the station is subjected to flooding or is completely submerged.
- The terminals are completely accessible from both sides of the terminal board and the board can be easily removed from the housing and brought above the surface of the ground or street for convenient access to the terminals when taking test readings.
- Available with colour coded lids in a choice of black, blue, red, orange, yellow, green, white. Other colours available on request.
- The lid is fitted with a metallic detector for ease of location should the box become covered for example by asphalt.



Watertight bell, terminal board and housing are made from Makroblend® polycarbonate alloy. FLUSH FINK® is impervious to impact, traffic loads and chemical spills common to street usage.

Support posts are made of PE (polyethylene) optional polycarbonate is available for the toughest applications. Standard length: 1 foot - available to 40 feet with Cott's telescoping extender

Anchor: polyethylene pipe provided at the lower post prevents pull-out.



Standard nickel plated brass or optional stainless steel terminals for guaranteed long service life. Up to 11 terminals accessible from both sides of the board.

Accessories: all FLUSH FINK® terminal boards can accommodate shunts, resistors, banana jacks, locking devices, lightning arrestors etc.

Dimensions:  
5 ½" Diameter X 8" height  
fits 4" schedule 40 pipe.

Model	No. of Terminals	Colour
FF-5-1	5	black
FF-5-2	5	blue
FF-5-3	5	red
FF-5-4	5	orange
FF-5-5	5	yellow
FF-5-6	5	green
FF-5-7	5	white
FF-8-1	8	black
FF-8-2	8	blue
FF-8-3	8	red
FF-8-4	8	orange
FF-8-5	8	yellow
FF-8-6	8	green
FF-8-7	8	white
FF-0-1	-	black
FF-0-2	-	blue
FF-0-3	-	red
FF-0-4	-	orange
FF-0-5	-	yellow
FF-0-6	-	green
FF-0-7	-	white

## PERMANENT TEST STATIONS

### Model: TP-007

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### Model: TP-007

Polycarbonate plastic housing in combination with aluminium stands provides full insulated test stations according to IP 43.

Exceptional features are:

- excellent UV and chemical resistance
- high elasticity, gradual brittleness begins only below - 90° C
- high ignition temperature (500° C) and self-extinguishing according to DIN 9102 and ASTM D 635.

### Housing details

Model TP 104 KG1 / ZV  
(with a central locking system)

Housing model KG1 measures 494 x 134 x 120 mm. Standard colour is grey (RAL 7023). Housing lid opens downward on a hinge made with a stainless steel pin and fasteners at the top with two staked in place hexagon socket screws to prevent loss of the screws. Special identification plates can be attached to the lid.

The insulating termination plate made of hard PVC (plexiglass is optional) measures 250 x 82 x 6 mm and has 8 holes of 4.2 mm spaced horizontally and vertically 40mm, intervals or according to purchaser's specifications. The spade terminals are available in red, green, black, yellow or blue. The strain relief clamp is in the centre of the housing. The stand has a 130 x 45 mm hole for passing cables into the housing.

Model TP 104 KG2 / ZV  
(with a central locking system)

Model KG2 is similar to model KG1 but is designed for cable entry into the housing from below through a plastic or aluminium channel. (figure 3).

### Stands and cable channels

#### ALST1

Aluminium stand (Al Mg Si 0.5) measures 120 x 50 x 1500 mm long and has two threaded holes (M10) for mounting house model KG1. Cables brought through stand and enter rear of housing. (figure 1).



1

2

3

#### ALST2

Aluminium stand (Al Mg Si 0.5) measures 120 x 50 x 1500 mm long and has two threaded holes (M10) for mounting house model KG2. Two extra threaded holes (M6) are provided for attaching plastic or aluminium cable channel.

Cable entry through cable channel and an opening in the lower face of the housing. (figure 3).

#### ALKK

Aluminium cable channel (AlMgSi 0.5) is made for mounting on stand ALST2. Consisting of 1 piece measuring 50 x 120 mm for a total length of 600mm. (figure 2).

#### KUKK

Plastic cable channel (Polycarbonate) is made for mounting on stand model ALST2; consisting of two pieces measuring 110 x 52 mm for a total length of 680 mm. (figure 3).

## PERMANENT TEST STATIONS

### Model: AJB (Anode Junction Box)

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Anode Junction Boxes are used for terminating the anode cables and for connecting them with the main positive cable coming from the DC-source unit.

AJB's can be provided with a shunt to measure the output current of each anode or group of anodes.

The tailor made anode junction boxes are provided with necessary components such as:

- shunts according to required ratings and standards
- cable terminations for cable lugs or screw clamp connections
- cable glands or conduits for cable entries

### Robust aluminium enclosures Internal Hinge

#### Technical Data

Material:	DIN EN 1706 EN AC-AISI 12 (Fe)
Painting:	Powder coating
Colour:	RAL 7001, silver grey special colours on request
Ingress protection:	IP 66 to EN60529
Impact resistance:	> 7 Joule; EN 50014
Temperature resistance:	PUR-(polyurethane) seal (standard) -40° C to +90° C CR-(chloroprene) seal -40° C to +100° C VMQ-(silicone) seal (optional) -60° C to +130° C

Enclosures in polyester or stainless steel as outdoor weatherproof design to IP 66 and different EX-versions are available.

In addition, various types of enclosures can be supplied workshop-built and tested to fulfil the required standards, layouts and site conditions.



Enclosure



External Brackets



External Hinge



Internal Hinge

### Accessories

DIN rail, Earthing rail, Mounting plate, External brackets, External aluminium hinge, Internal hinge, Quick lock, Turn bolt fastener, etc.

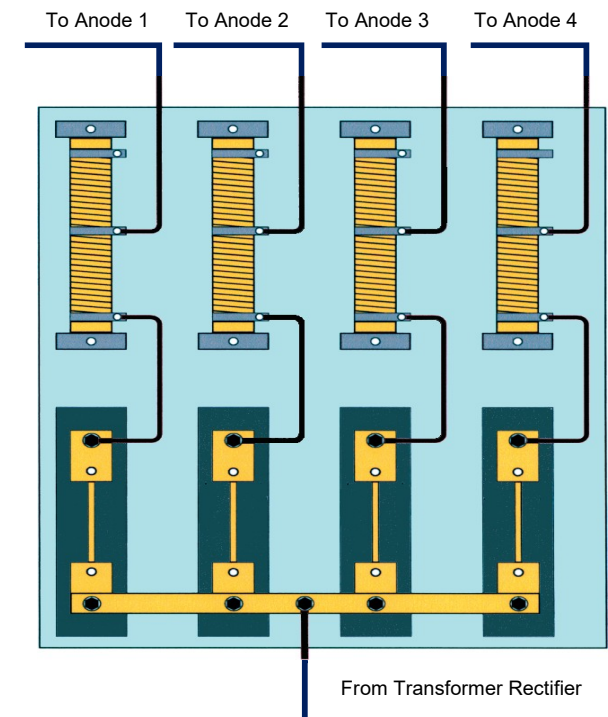
### Options

Hot dip galvanized steel supports for fixing on concrete foundations or supports for wall mounting with conduits etc. can be supplied on request.



Anode Junction Box fixed with steel support mounted on concrete foundation at anode deep groundbed structure

### Anode Junction Box - Layout of main components



## PERMANENT TEST STATIONS

### Model: CJB (Cathode Junction Box)

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In case a common impressed current cathodic protection system is provided for a number of separate metallic structures; it becomes necessary to adjust or to balance the flow of protective current between the protected structures by using a Cathode Junction Box.

The tailor made anode junction boxes are provided with necessary components such as:

- variable resistors for the adjustment of currents
- shunts for measurement of currents
- blocking diodes to prevent the flow of currents in reverse direction
- terminals for cable lug or screw clamp connections
- cable glands or conduits for cable entries

### Robust aluminium enclosures

#### Technical Data

Material:	DIN EN 1706 EN AC-AISI 12 (Fe)
Painting:	Powder coating
Colour:	RAL 7001, silver grey special colours on request
Ingress protection:	IP 66 to EN60529
Impact resistance:	> 7 Joule; EN 50014
Temperature resistance:	PUR-(polyurethane) seal (standard) -40° C to +90° C CR-(chloroprene) seal -40° C to +100° C VMQ-(silicone) seal (optional) -60° C to +130° C

Enclosures in polyester or stainless steel as outdoor weatherproof design to IP 66 and different EX-versions are available.

In addition, various types of enclosures can be supplied workshop-built and tested to fulfil the required standards, layouts and site conditions.



Enclosure



External Brackets



External Hinge



Internal Hinge

### Accessories

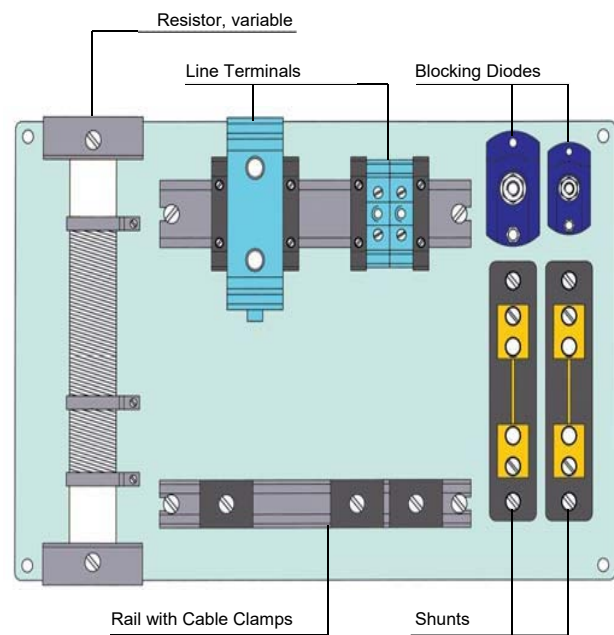
DIN rail, Earthing rail, Mounting plate, External brackets, External aluminium hinge, Internal hinge Quick lock, Turn bolt fastener, etc.

### Options

Hot dip galvanized steel supports for fixing on concrete foundations or supports for wall mounting with conduits etc. can be supplied on request.



### Cathode Junction Box - Layout of main components





**Aerial Line Markers**

Aerial line markers are available in a multitude of sizes and shapes. Together with an equally large selection of colours and reflecting films can be applied over the entire surface or as segment cut-outs.

**Materials**

Plastics made of PMMA- ASA - and glass fibre reinforced polyester, UV-stabilized and excellent reflective qualities. Other materials, special dimensions and other colours, not shown here are available, upon request.

**Accessories**

Fasteners or brackets and all required screws, nuts and washers are included.

Letters and figures made of black weatherproof plastic are available from A-Z and 0-9.



**Dimensions**

Type	50	51	60	70	90	100	110
Roof area	335 x 230 mm	350 x 230 mm	500 x 330 mm	400 x 300 mm	440 mm Ø	500 mm Ø	600 mm Ø
Roof pitch	45°	45°	60°	45°	--	--	--
Roof position	90° rotatable	90° rotatable	15° rotatable	90° rotatable	--	--	--
Material thickness	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
Material colour	e.g. yellow, red	e.g. yellow, red	e.g. yellow, red	e.g. yellow, red	e.g. yellow, red	e.g. yellow, red	e.g. yellow, red



**Identification Plates**

Identification plates according to DIN-Standard are made of a bicolour injection-moulded plate in Asa Thermoplast (Luran S), which can take extreme weather, temperatures and shocks.

Thanks to their absolutely non-reflecting matt surface, they allow easy reading, even at a distance.

They are firmly fastened by 4 countersunk stainless steel (V2a) screws in a firm, flat mount.

They can be fitted either with SGM inserts or with all inserts currently produced by other manufacturers.

Identification plates to other international Standards as well as the corresponding accessories in various sizes, colours, materials and inscription are available upon request.