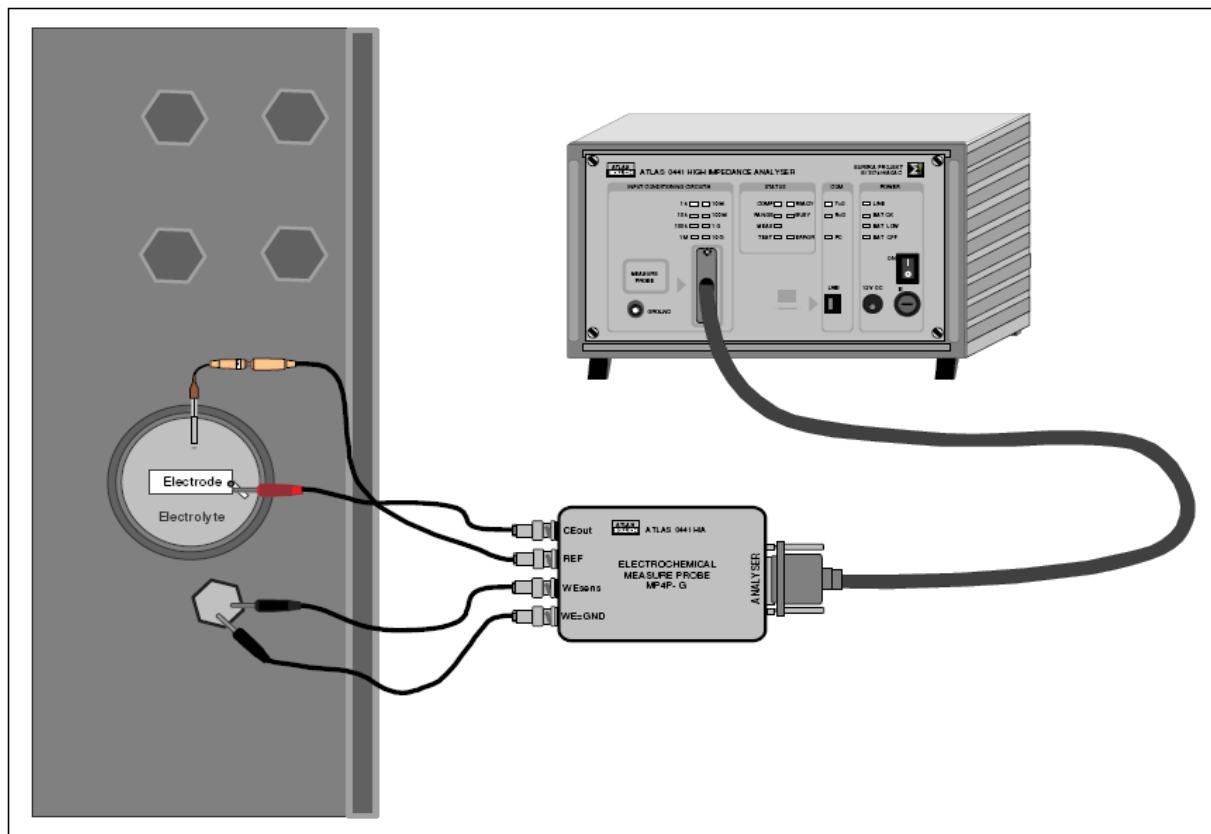


**ATLAS - SOLLICH  
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**ELECTROCHEMICAL CELL**

**NP 150-SR ... NP 22-SR**



**GDAŃSK 2008**

## PURPOSE

**NP xxx-SR** measurement cells are designed to use in anticorrosion research of varnish and paint coats which cover metal constructions – mostly steel made. It is adapted to mount on flat parts of constructions and buildings.

Measurement of impedance is made in two- or three terminals measuring system. One of terminals (measuring electrode) is a construction with tested material and second terminal is the electrode built-in lid of the cell. When three electrodes cell is applied then there is additionally mounted reference electrode.

In PERSPEX ('organic glass') lid of cells are holes to fill cells easily with electrolyte and to place reference electrode.

### 1. Construction of NPxxx-SR measurement cell

**NPxxx-SR** measurement cell is a single element. Ring of a measurement cell is made from PVC material. On the ring is mounted lid which is made from transparent PERSPEX ('organic glass'). On the lid is mounted Ag/AgCl counter electrode – created by silver sheet metal covered by chloride-silver coat or it is created by **H18N9** chrome-nickel sheet metal. Height of the ring is 13 to 20 [mm] and inside diameter of it is 22 to 150 [mm]. Tested surface limited by ring and capacity of measurement cell are presented in specification.

Reference electrode is placed in a hole which is situated in upper part of the cell. As a reference electrode may be used standard silver-silver chloride electrode made in a form of plastic tube whereby is not breakable, or pseudo-electrode made from silver wire covered with layer of silver chloride. The reference electrode is an external component of the cell and therefore ordered separately.

### 2. Fixing of NPxxx-SR measurement cells

Measuring cells are fixed on construction with the aid of silicone glue, for instance it may be colourless all-purpose silicone. It enables easy fixing and disassembly of the cell. Fixing of the cell to vertical surface requires in most cases to support it temporarily at the bottom in order not to move on the strength of its own weight. The support may be done using magnet, for example.

After the glue hardens, the cell is filled by electrolyte and then left filled for requested time of electrolyte exposure.

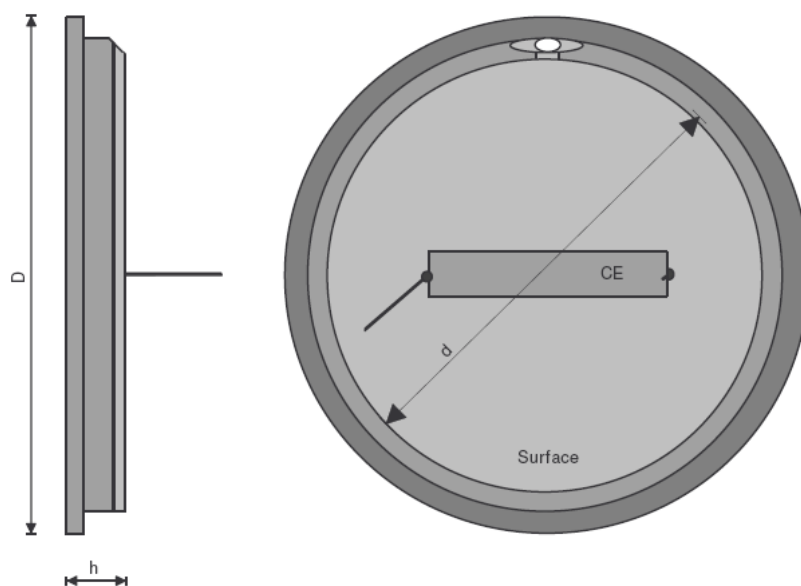
The reference electrode, if is used, should be fixed shortly before measurements start.

Connecting the device to the cell is carried out according to **ATLAS 0441 High Impedance Analyser** device instruction.

The way of connecting between the device and the cell depends on whether the measured object is a grounded construction (measurements of constructions in field conditions) or it is a sample electrically insulated from ground (measurements in laboratory conditions). According to this case there are employed measuring heads **MP4P-G** or **MP3P-UG**. The way of connecting these heads although depends on whether the reference electrode is mounted in the cell (three-electrode cell) or not (two-electrode cell).

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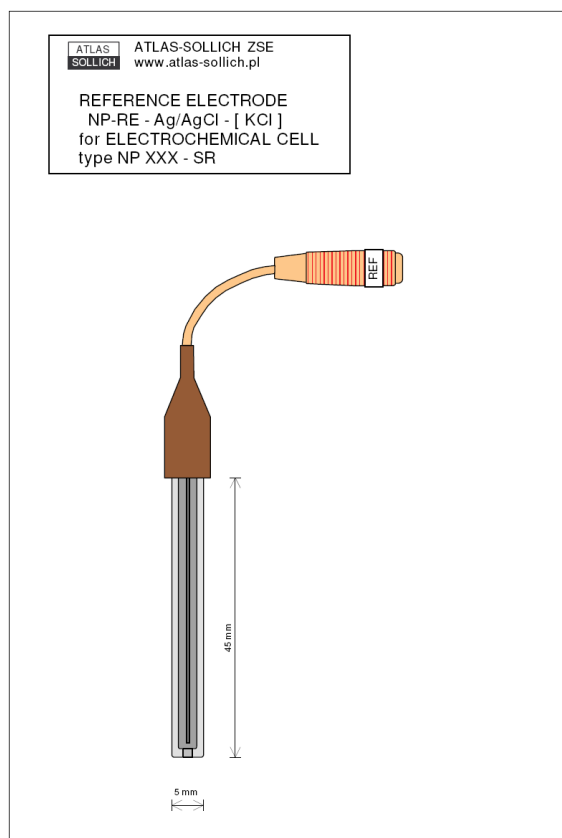
ELECTROCHEMICAL CELL  
type NP XXX - SR



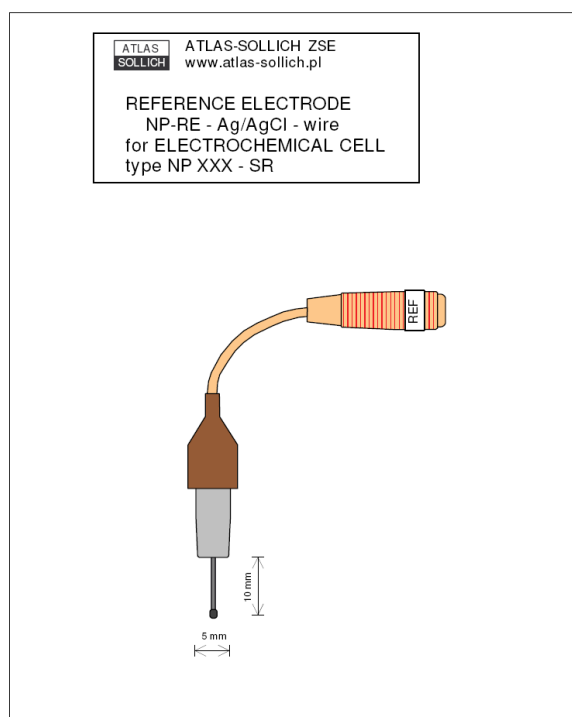
Type of cell	d [mm]	h [mm]	D [mm]	Surface [cm <sup>2</sup> ]	CE [cm <sup>2</sup> ]	Electrolyte volume [ ml ]
NP 150 -SR	150	13	160	176	20	~ 100
NP 100 -SR	102	13	110	81,6	10	~ 70
NP 70 -SR	70	13	83	38,5	10	~ 35
NP 46 -SR	46	18	57	16,6	5	~ 20
NP 35 -SR	35	18	47	9,6	5	~ 12
NP 28 -SR	28,5	20	42	6,4	2	~ 10
NP 22 -SR	22	20	34	3,8	1	~ 5

Material: Ring - PVC; Cover - plexi; Counter Electrode CE - rustresisting steel

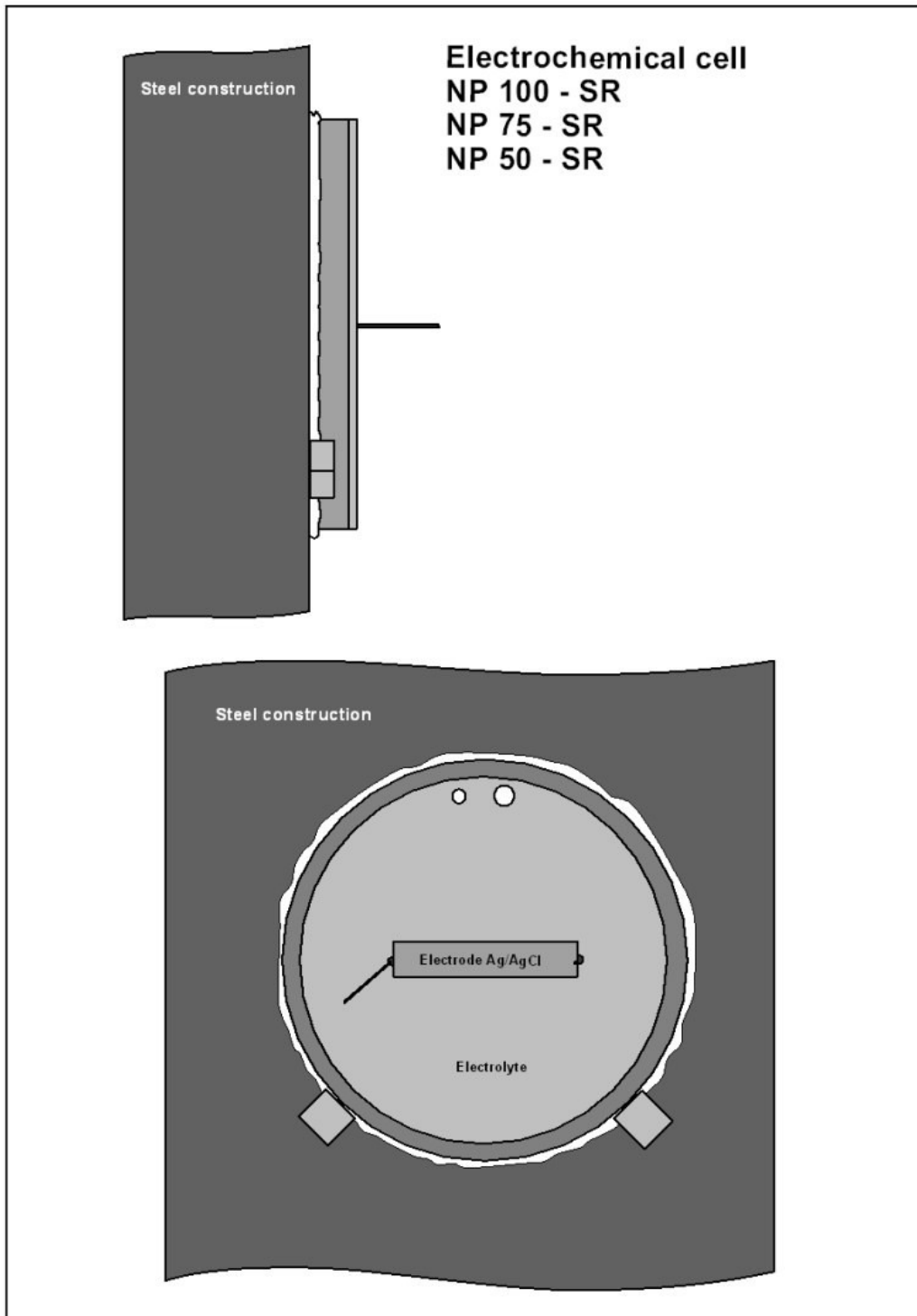
NPxxx-SR measurement cells – specification.



Silver-silver chloride reference electrode NP-ER-Ag/AgCl [KCl] for NP type cells.



Silver-silver chloride reference electrode NP-ER-Ag/AgCl – wire, for NP type cells.

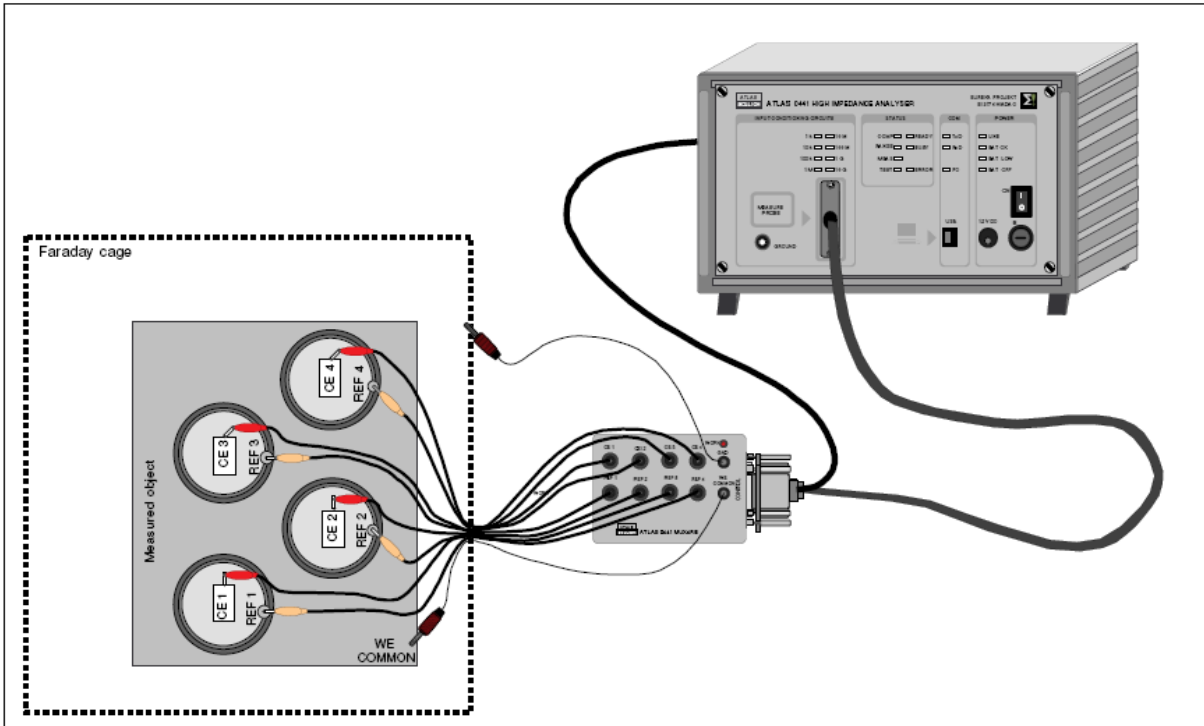


Fixing of **NPxxx-SR** measuring cell

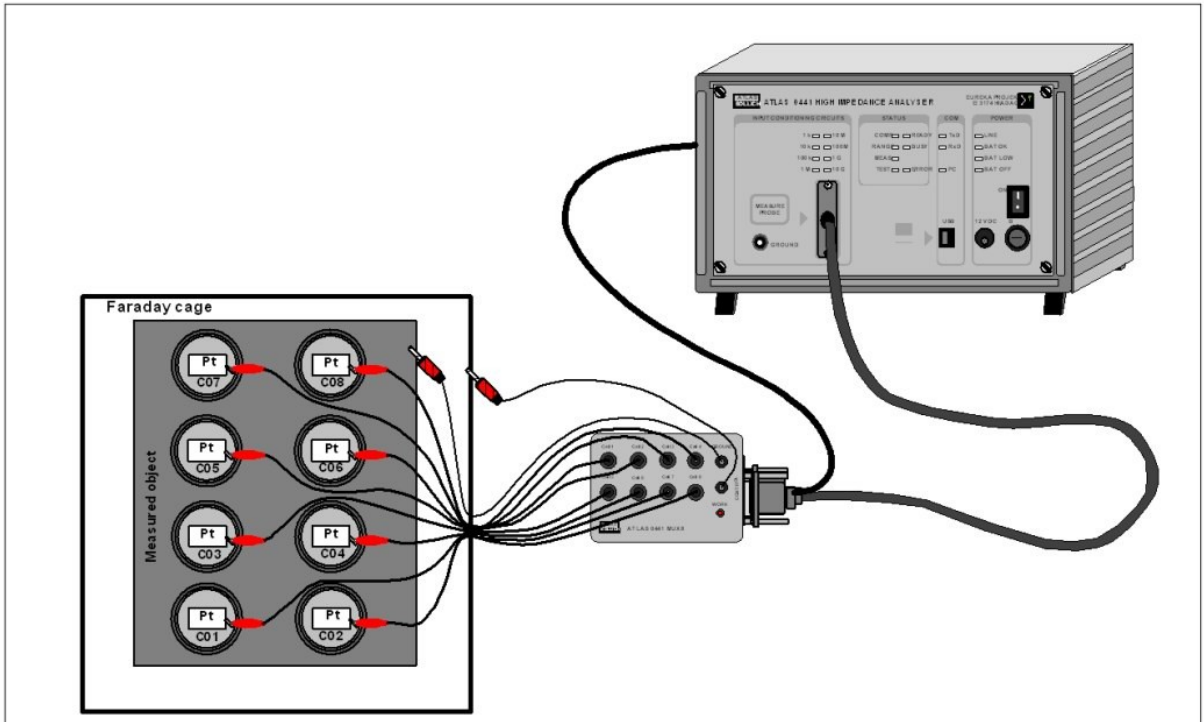
**NPxxx-SR** measurement cell may be applied in anticorrosion research of varnishes coatings, painted coatings and insulating coatings which cover metallic elements of construction, which may be conducted in field conditions as well as in laboratory conditions.

They may be fixed on flat surfaces of construction elements.  
The cell filled with electrolyte may be stored for a long time and the research may be repeatedly performed without refilling the cell with electrolyte.

There can be fixed few cells on construction at the same time.  
A sample of such solution is presented on figure beneath.  
As a measuring instrument was applied **ATLAS 0441 High Impedance Analyser** with measuring head **ATLAS 0441 MUX8**, which allows to measure impedance spectrum of 8 cells at the same time.



The connection way of 4 **NPxxx-SR** measuring cells with installed reference electrodes to measuring head **ATLAS 0441 MUX4REF**



The connection way of 8 **NPxxx-SR** measuring cells without reference electrodes to measuring head **ATLAS 0441 MUX8**