

# Technical Specifications for the Perchlorate Ion-Selective Electrode ELIT 8061

## Introduction

The Perchlorate Ion-Selective Electrode has a solid-state PVC polymer matrix membrane. The electrode is designed for the detection of perchlorate ions ( $\text{ClO}_4^-$ ) in aqueous solutions and is suitable for use in both field and laboratory applications.

The Perchlorate Ion is a monovalent anion.

One mole of ( $\text{ClO}_4^-$ ) has a mass of 99.451 grams; 1000 ppm is 0.010 M

Dissolve 1.231g anhydrous sodium perchlorate ( $\text{NaClO}_4$ ) in 1 litre water.

## Physical Specifications

Length of body excl. gold contact	130 mm
Length of body incl. gold contact	140 mm
Diameter of body	8 mm
DC resistance at 25° C	< 2.5 MOhm
Minimum feasible sample volume	5 ml

## Chemical / Operational Specifications

Preconditioning / Standard solution	Normally 1000 ppm $\text{ClO}_4^-$ as $\text{NaClO}_4$
<i>(But see General Operating Instructions)</i>	
Preconditioning time	at least 5 minutes
Optimal pH range	pH 0 to pH 11
Temperature range	0 to 50° C
Recommended ISAB	1M $\text{CH}_3\text{COONa}$ (add 2% v/v)
Recommended reference electrode	Single junction (ELIT 001)
Electrode slope at 25° C	$54 \pm 5$ mV/ decade
Concentration range	0.2 to 9,960 ppm ( $2 \times 10^{-6}$ to 0.1 Molar)
Response time	< 10 seconds
<i>(Defined as time to complete 90% of the change in potential after immersion in the new solution.)</i>	
Potential drift <i>(in 1000 ppm)</i>	< 3 mV/ day (8 hours)
<i>(Measured at constant temperature and with ISE and Reference Electrode continually immersed)</i>	

## Interference:

The following ions interfere with the perchlorate electrode (selectivity coefficients (SC) in brackets): Thiocyanate (0.03), Iodide (0.02), Nitrate (0.02), Chloride (0.0003), Phosphate (0.0002), Acetate (0.0001).

The SC is the approximate apparent increase in the measured concentration caused by 1 unit of the interferent. Thus the likely effect of any interfering ion (% increase) can be calculated as follows:  $((\text{expected concentration}) \times (\text{SC}) / (\text{expected } \text{ClO}_4 \text{ concentration})) \times 100$ .

Thus nitrate can be tolerated up to the same concentration as perchlorate (this will cause an approximately 2% enhancement), and chloride can be present up to 100 times more concentrated before it will cause a significant error.

**For more information, see: [www.nico2000.net](http://www.nico2000.net).**