# FORMALDEHYDE SENSOR

This sensor is of the two-electrode electrochemical type, operating by the diffusion principle and as such requires no external sampling hardware. In the presence of formaldehyde gas a small direct current is produced; the sensor requires no power supply of its own but this current requires amplification to make it readable using external data collection equipment. There are several configuration options to suit a range of OEM applications.

## ABSOLUTE MAXIMUM RATINGS

| Parameter | Value | Units |
|---|---|---|
| HCHO Concentration | 0 - 1 | ppm |
| Temperature Range | -10 to +40 | °C |
| Humidity Range | 15 to 90 | %RH |
| Service Life | 3 | years |

## SENSOR CHARACTERISTICS

| Parameter | Min. | Typ. | Max. | Units |
|---|---|---|---|---|
| Output Signal | 150 | | 350 | nA/ppm |
| Resolution | | 0.01 | | ppm |
| Response Time (T90) | | <30 | | s |
| Baseline Offset | | <0.03 | | ppm |
| Repeatability | | TBD | | % of signal |
| Linearity | | Linear | | |
| Temperature Drift | | TBD | | %/°C |
| Baseline Drift (20°C-40°C) | | TBD | | ppm |
| Calibration Stability | | TBD | | %/yr |

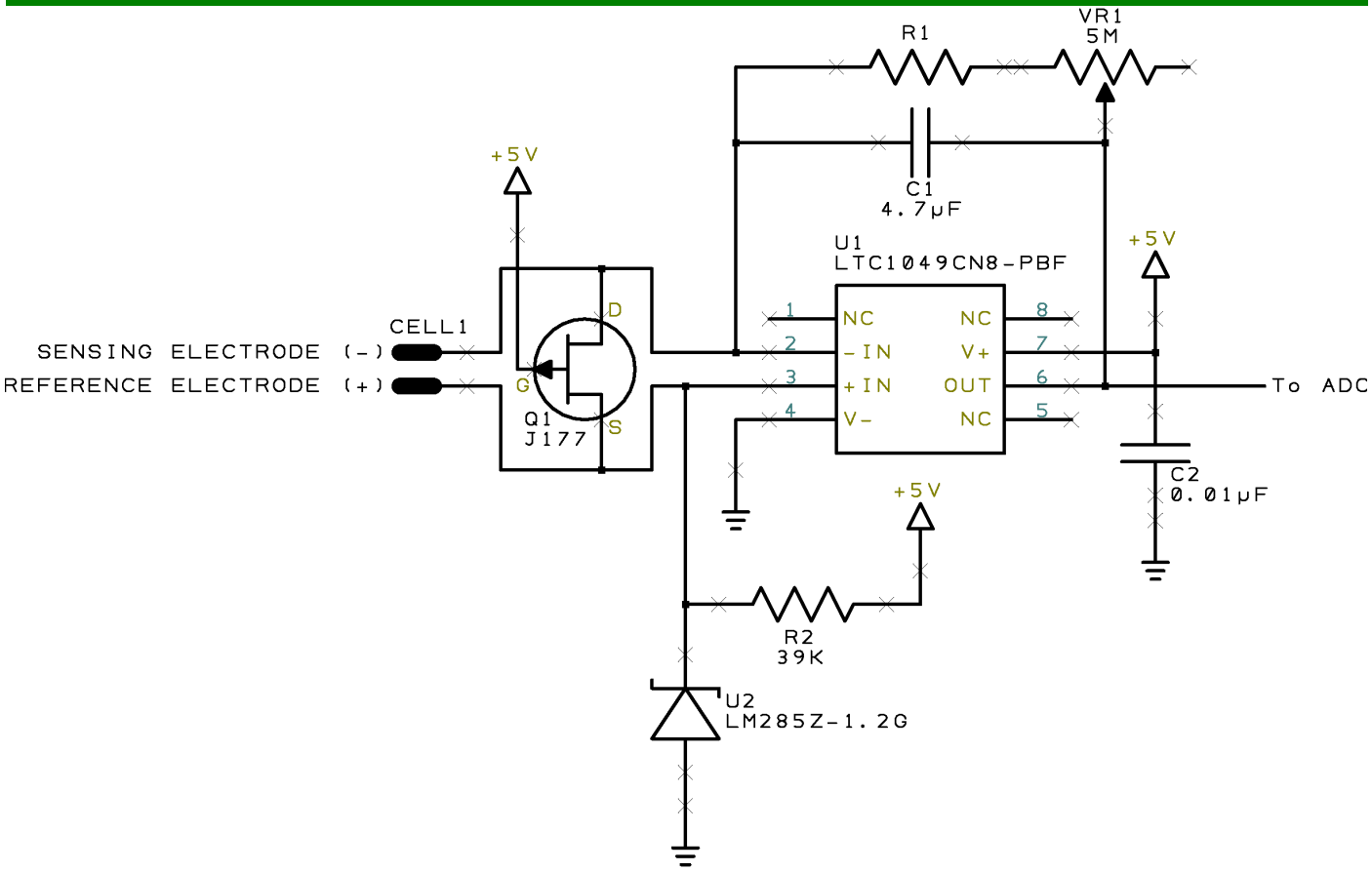
NB: Sensor performance tested under standard conditions of 296K, 1atm., 50%RH. Sensors are best stored at room temperature in sealed plastic bags for maximum storage life.

## INTERFERING SUBSTANCES

| Substance | Cross Sensitivity (%) |
|---|---|
| CO | 1 |
| $H_2S$ | No data |
| $H_2$ | 0.1 |
| $SO_2$ | 12 |
| $NO_2$ | No data |
| NO | No data |
| $Cl_2$ | -3 |
| $C_2H_4$ | No data |
| $NH_3$ | 0 |
| $CO_2$ | 0 |
| Ethanol | 45 |
| Phenol | 7 |
| Water vapour | 0* |

*NB: Within specified range. Step changes in %RH produce short term transient response

## APPLICATION CIRCUIT

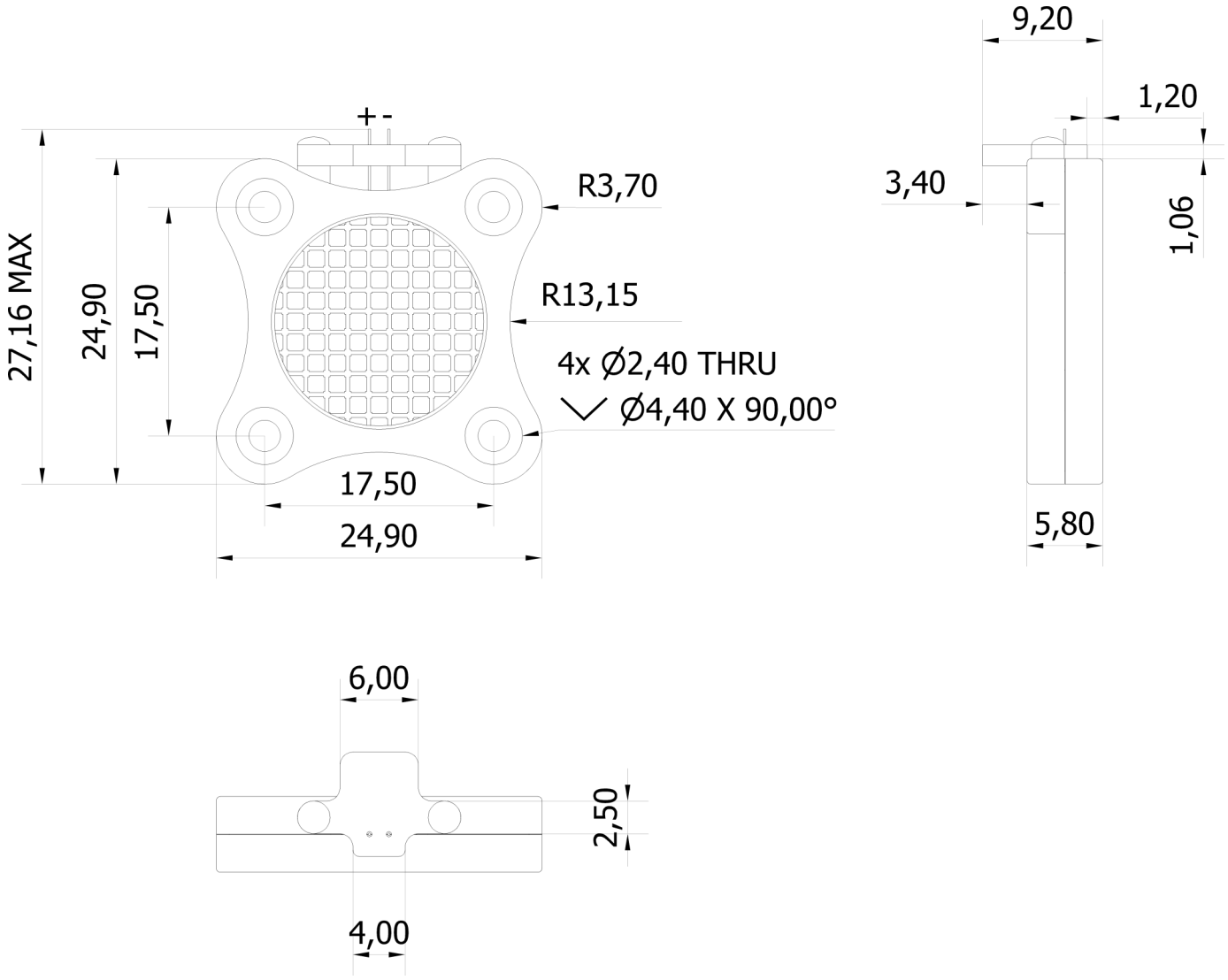



Due to the sensor's small signal, the amplifier circuit is high-gain; circuit design and component choice is therefore critical. Calibration can be achieved either by physically adjusting the gain of the circuit (manually with a variable resistor or electronically with a digital potentiometer), or using a fixed circuit gain, known sensor sensitivity and a calibration calculation in software.
The reference circuit above is available pre-built from us for development purposes. It incorporates a JFET to short the sensor, preventing offsets from building up when not in use. It also generates a virtual ground, a requirement when operating in single-supply environments.

## CALIBRATION

Production of a suitable span gas for performing formaldehyde calibrations is not trivial, and can only be achieved through the use of specialist equipment. In limited cases, by arrangement, a calibration or sensitivity determination can be carried out at the factory for an additional fee. In production situations, the only method approved by us is the use of permeation or diffusion tube based apparatus with a post-humidification unit. Contact us for advice on the choice of suitable equipment with which to assemble such an apparatus. We will not be able to offer technical support where inferior/unsuitable equipment has been used to generate calibration or test gases.

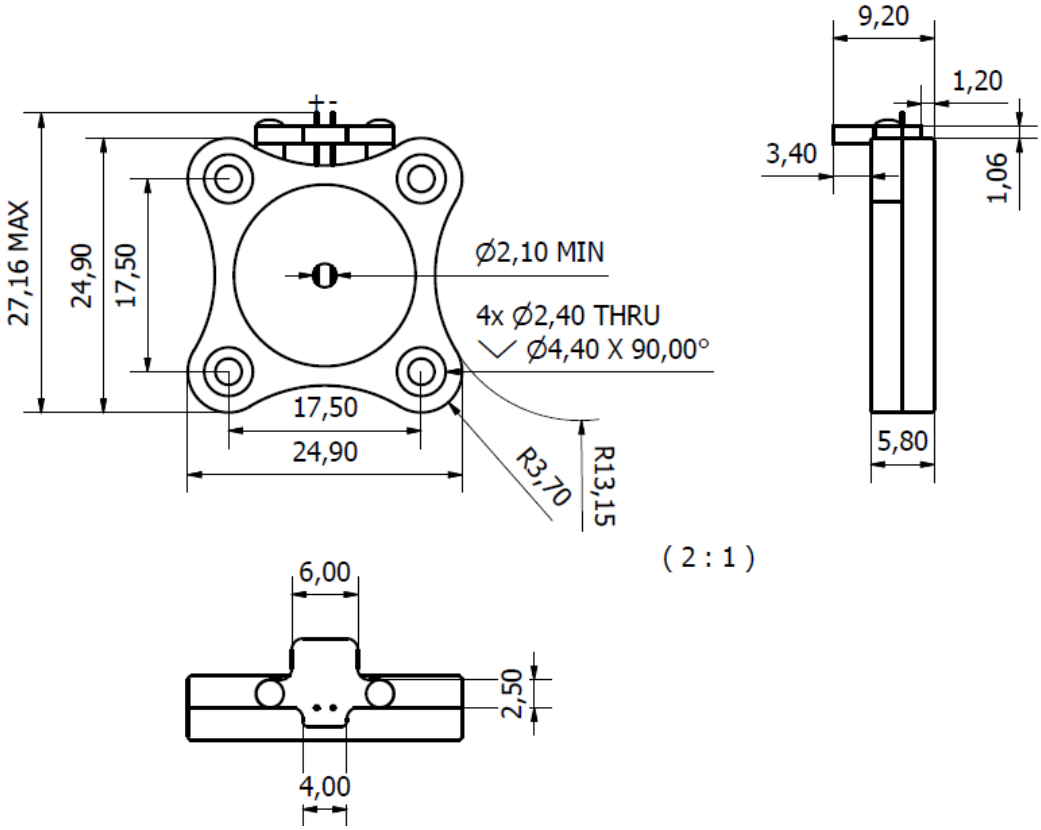
## DIMENSIONS



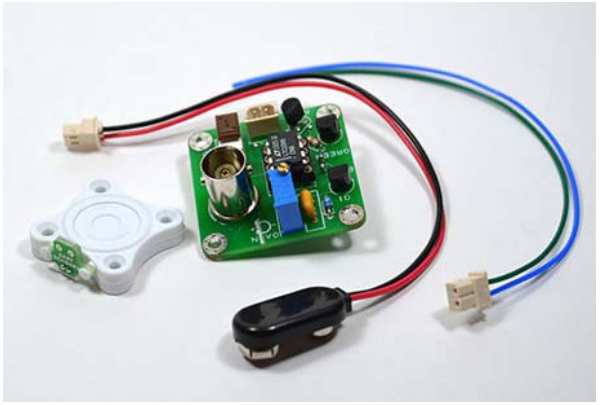

## ORDERING INFORMATION

| Part Number | Description |
|---|---|
| 2112B150350 | Sensor only |
| 2112B150352 | Sensor with Kit |

## SENSOR DIMENSIONS




HCHO Formaldehyde Sensor
Part no. 2112B150350



HCHO Formaldehyde Sensor with Transmitter Kit
Part no. 2112B150352