

# DART SENSORS

## 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.



### ABSOLUTE MAXIMUM RATINGS

Parameter	Value	Units
HCHO Concentration	TBD	ppm
Temperature Range	-10 to 40	°C
Humidity Range	15 to 90	%RH
Service Life	5	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

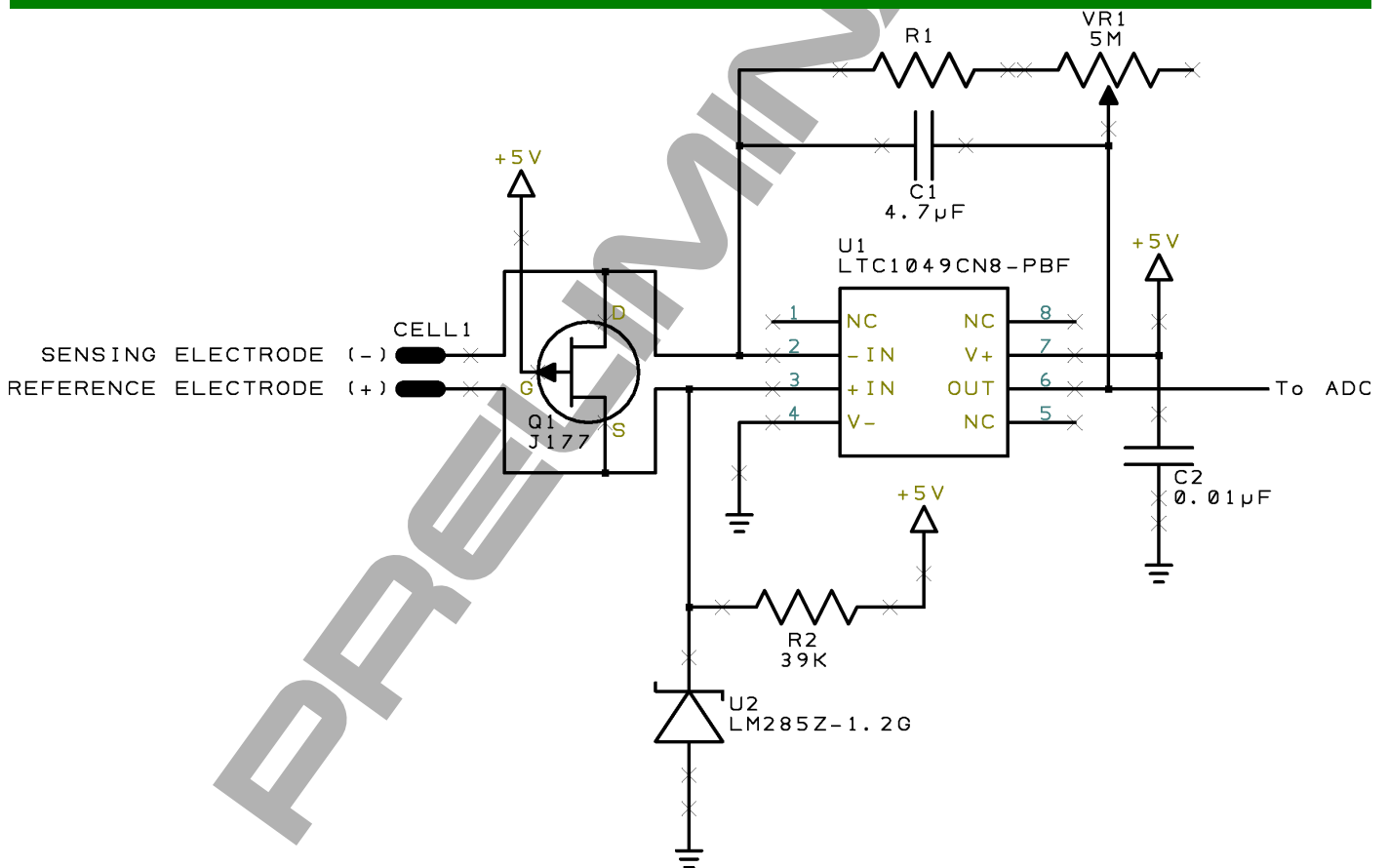
Substance	Cross Sensitivity (%)
CO	1
H <sub>2</sub> S	No data
H <sub>2</sub>	0.1
SO <sub>2</sub>	12
NO <sub>2</sub>	No data
NO	No data
Cl <sub>2</sub>	-3
C <sub>2</sub> H <sub>4</sub>	No data
NH <sub>3</sub>	0
CO <sub>2</sub>	0
Ethanol	45
Phenol	7
Water vapour	0*

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

## SENSOR CHOICE

The sensor is available in two versions; the standard sensor, and a variant offered for compatibility where customers have previously ordered the discontinued "premium" version of the sensor. This variant is the "high catalyst content" version.

## APPLICATION CIRCUIT



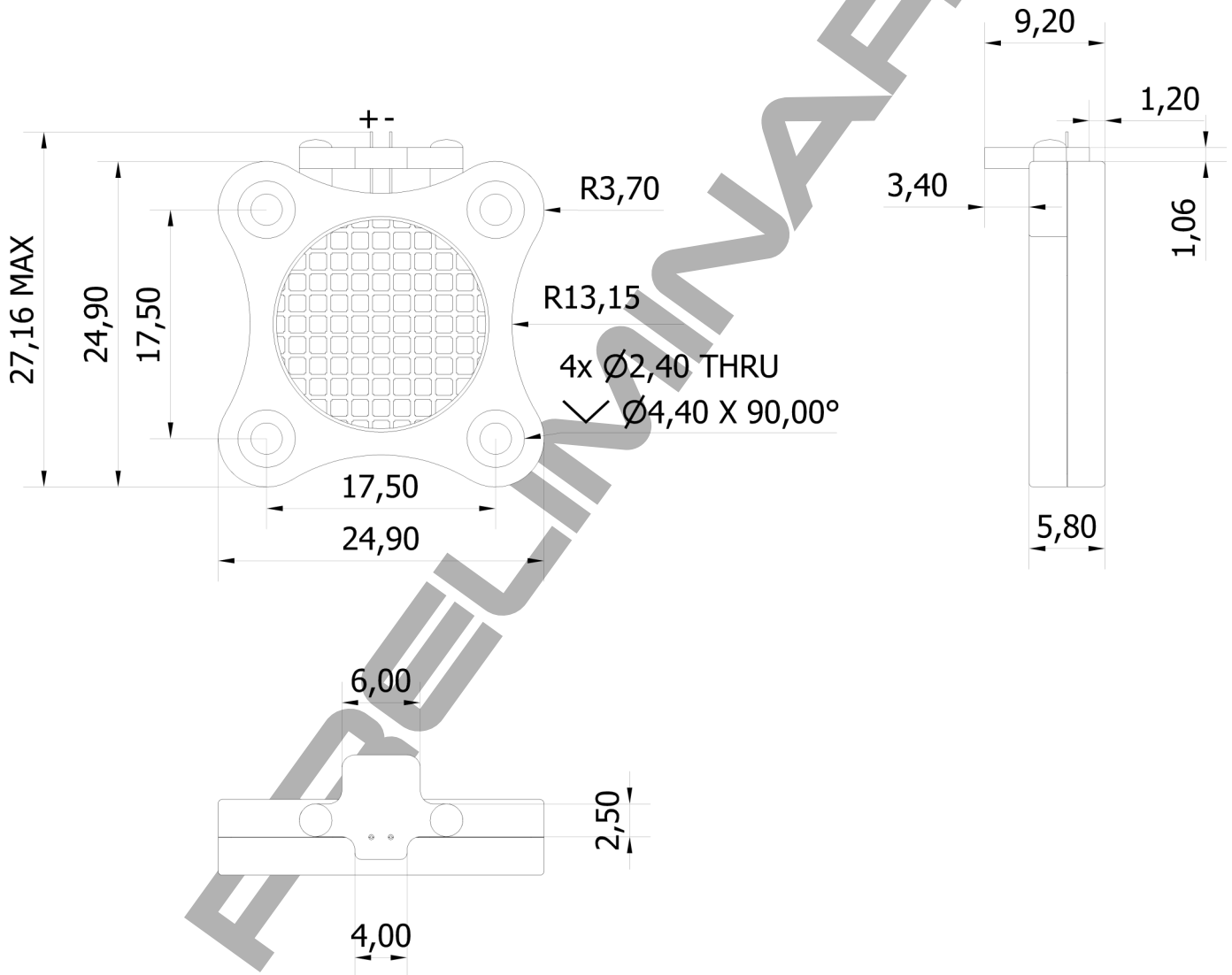
Due to the sensor's small signal, the amplifier circuit is high-gain; circuit design and component choice is therefore critical. Calibration can be achieved either by physically adjusting the gain of the circuit (manually with a variable resistor or electronically with a digital potentiometer), or using a fixed circuit gain, known sensor sensitivity and a calibration calculation in software. The reference circuit above is available pre-built from Dart Sensors 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 Dart Sensors 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. Dart Sensors will not offer technical support where inferior/unsuitable equipment has been used to generate calibration or test gases.

## DIMENSIONS



## ORDERING INFORMATION

Part Number	Description
2-FP5	Formaldehyde sensor, 11mm, high catalyst content
2-FE5	Formaldehyde sensor, 11mm



ELM HOUSE, 54 MARY ARCHES STREET, EXETER, EX4 3BA  
 TEL: +44 (0)1392 277733  
 E-MAIL: [customer.services@dart-sensors.com](mailto:customer.services@dart-sensors.com)  
[www.dart-sensors.com](http://www.dart-sensors.com)

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