



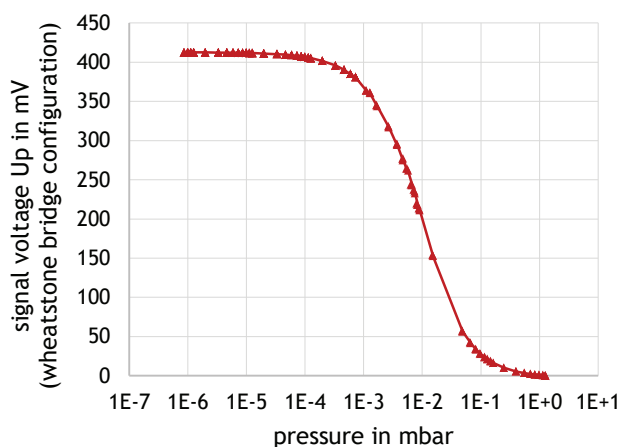
## HVS Series – TO-39

### MEMS Type Pirani Vacuum Sensors

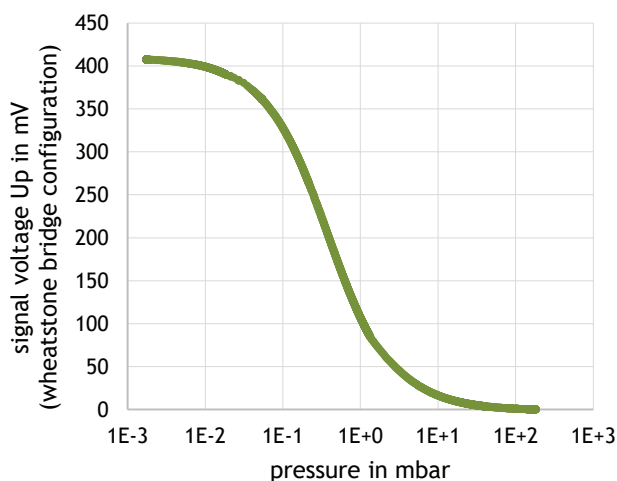
The HVS Series is the vacuum sensing series of Heimann. These miniature Pirani-type vacuum sensors allow measurements in a pressure range starting from 1000 to  $10^{-3}$  mbar (HVS 04) and 10 down to  $10^{-5}$  mbar (HVS 03k). These sensors are built in small and robust TO-39 metal housing.

Common operation modes for this sensor type comprise either constant voltage or constant temperature mode. Regarding the constant temperature mode, we suggest a circuit for a constant resistance ratio (see next page).

#### HVS 03k Characteristics

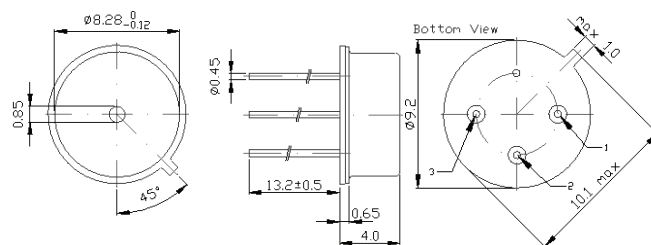


#### HVS 04 Characteristics

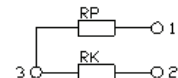


#### Dimensions and PIN-Configuration

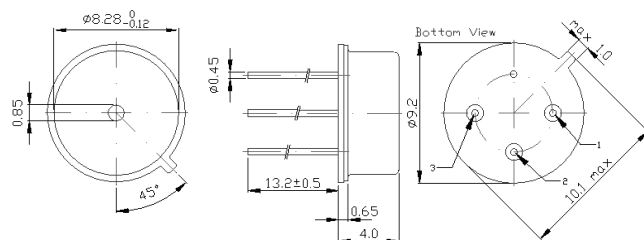
HVS 03k



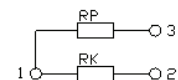
Configuration 03k:



HVS 04



Configuration 04:



#### Characteristics

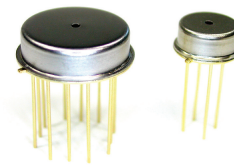
	HVS 03k	HVS 04 (single)	Unit
<b>Housing</b>	TO-39	TO-39	
<b>Chip size</b>	4.0 <sup>2</sup>	1.0 <sup>2</sup>	mm <sup>2</sup>
<b>Max. signal voltage U<sub>p</sub></b>	400	410	mV
<b>Resistance sensor chip R<sub>p</sub></b>	9	1	kOhm
<b>On chip reference resistor R<sub>k</sub></b>	9	1	kOhm
<b>Supply voltage U<sub>0</sub><sup>a)</sup></b>	3.2	2	V
<b>Operating temperature</b>	-20 ... 120		°C
<b>Storage temperature</b>	-40 ... 120		°C

a) Bridge circuit

#### Ordering Information

HVS            Heimann Vacuum Sensor  
03k, 04        Chip type and package type (TO-8 / TO-39)

E.g.:    **HVS 03k**  
          **HVS 04 (Single)**



## HVS Series - TO-8

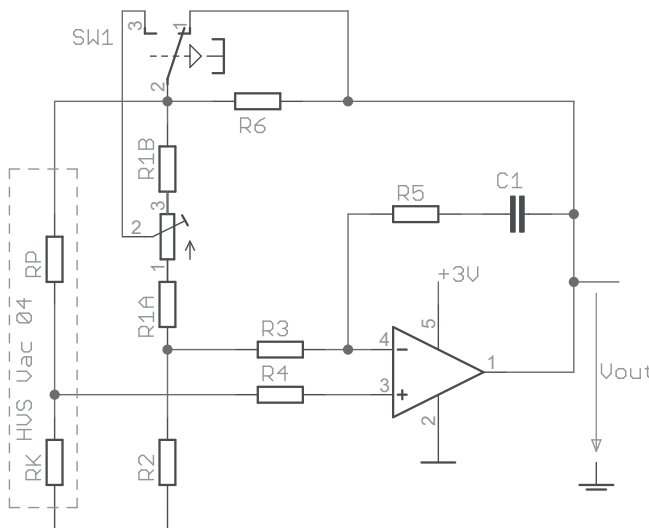
### MEMS Type Pirani Vacuum Sensors

The HVS Series is the vacuum sensing series of Heimann. These miniature Pirani-type vacuum sensors allow measurements in a pressure range starting from 1000 to  $10^{-3}$  mbar (HVS 04) and 10 down to  $10^{-5}$  mbar (HVS 03k). These sensors are built in small and robust TO-8 metal housings.

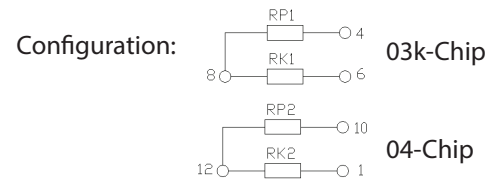
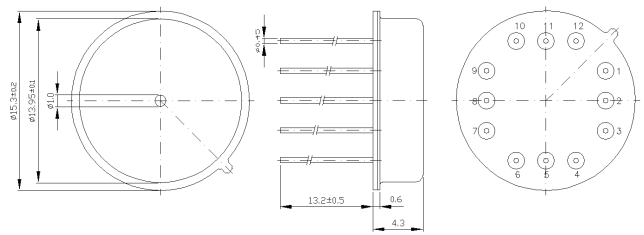
Combining the HVS 03k and HVS 04 type chip in one TO-8 housing results in a dual-chip model with an extended pressure measurement range.

#### Constant Temperature Readout Circuit

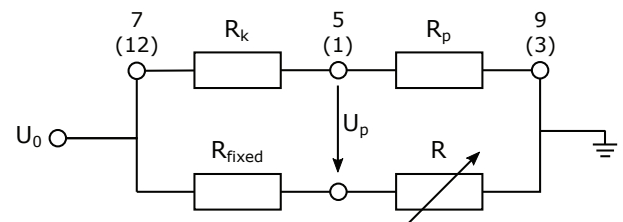
The constant resistance readout is commonly used as it can reduce - however not eliminate - unwanted signal drift caused by changing ambient temperature. It is best suited for rough and fine vacuum regimes. The op-amp is part of a control loop which keeps  $R_p$  and  $R_k$  at a certain temperature difference.



#### Dimensions and PIN-Configuration



#### Wheatstone Bridge Configuration



One possible readout is the wheatstone bridge arrangement. The output voltage  $U_p$  should be balanced ( $U_p = 0$  V) at atmospheric pressure (1013 mbar) by using the potentiometer  $R$ . The resistance  $R_p$  is changing with pressure  $p$  and therefore  $U_p$  is changing as well.

The wheatstone bridge is recommended for high vacuum measurements and low power operation, but requires an advanced calibration.

#### Characteristics

	HVS 03k + HVS 04 (dual)	Unit
Housing	TO-8	
Chip size	4.0 <sup>2</sup> + 1.0 <sup>2</sup>	mm <sup>2</sup>
Signal voltage $U_p$	180 + 410	mV
Resistance sensor chip $R_p$	9 + 1	kOhm
On chip reference resistor $R_k$	9 + 1	kOhm
Supply voltage $U_0$ <sup>a)</sup>	2	V
Operating temperature	-20 ... 120	°C
Storage temperature	-40 ... 120	°C

a) Bridge circuit

#### Ordering Information

HVS Heimann Vacuum Sensor  
03k, 04 Chip type and package type (TO-8 / TO-39)

E.g.: HVS 03k + HVS 04 (Dual)