

## DPWL\*: sensore rilevatore perdite gas refrigerante / Gas Sensor leakage / Capteur détection de gaz / Kältegasdetektor / Sensor detector de fugas de gas refrigerante

### Descrizione generale

Il sensore rilevatore di gas refrigerante è un dispositivo che segnala le fughe dei più comuni gas (R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO<sub>2</sub>), R-1150 (Ethylene), R-1234yf, R-1234ze(E)). Può essere utilizzato in applicazioni stand-alone, integrato con i controllori Carel, o con dispositivi di terze parti. Prevede il collegamento con il controllo Carel attraverso l'uscita analogica, digitale, o tramite collegamento seriale RS485 Modbus\*. Quando viene rilevata la perdita oltre una certa concentrazione, il sensore segnala al controllo l'allarme e attiva localmente una segnalazione acustica e visiva e contemporaneamente un relé (SPDT). Offre il vantaggio di intervenire tempestivamente sulle perdite di gas evitando il fermo macchina e garantendo la sicurezza per le persone che soggiornano nelle vicinanze. Ogni modello è calibrato per uno specifico gas e viene installato tipicamente in edifici nuovi o esistenti, che richiedono un monitoraggio continuo delle perdite di gas. La sua installazione permette il rispetto delle normative Europee F-GAS e EN378 e ASHRAE 15. Disponibile nelle versioni semiconduttore IP41 e IP66, con sensore remoto.

#### Caratteristiche tecniche

|                            | Versione Semiconduttore                                                                                                                                                                                               | Versione Infrared CO <sub>2</sub> |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|                            | R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO <sub>2</sub> ), R-1150 (Ethylene), R-1234yf, R-1234ze(E) |                                   |
| Alimentazione:             | 12/24V+20% d.c./a.c. 50/60 Hz                                                                                                                                                                                         |                                   |
| Consumo elettrico (a 12V): | 153mA,                                                                                                                                                                                                                | 136mA                             |
| Controllo in funzione:     | Led verde                                                                                                                                                                                                             |                                   |
| Visualizzazione allarme:   | Led rosso                                                                                                                                                                                                             |                                   |
| Allarme acustico:          | abilitato/disabilitato                                                                                                                                                                                                |                                   |
| Guasto durante il monit.:  | Led rosso ON - Verde OFF                                                                                                                                                                                              |                                   |
| Stato di guasto:           | 1V, 2mA                                                                                                                                                                                                               | 1V, 2mA                           |
| Uscita analogica:          | 0-5V, 1-5V, 0-10V, 2-10V, 4-20mA                                                                                                                                                                                      |                                   |
| Comunicazione seriale:     | RS485 Modbus*                                                                                                                                                                                                         |                                   |
| Uscita digitale:           | 1 Relé nominale 1 Amp/24 Vdc/ac                                                                                                                                                                                       |                                   |
| Selectable delay:          | 0,1,5,10min                                                                                                                                                                                                           |                                   |
| Protezione IP:             | IP41 versione built-in<br>IP66 versione sensore remoto                                                                                                                                                                | IP66 built-in e sensore remoto    |
| Campo di lavoro tipico:    | 0-1.000 ppm (*)                                                                                                                                                                                                       | 0-10.000 ppm                      |
| Campo di lavoro:           | -20T50°C<br>(-40T50°C per versioni IP66)                                                                                                                                                                              | -40T50°C                          |
| Umidità senza condensa:    | 0 to 95%                                                                                                                                                                                                              |                                   |
| Vita del sensore attesa:   | 5-8 anni                                                                                                                                                                                                              |                                   |
| Soglia allarme             | 100 ppm                                                                                                                                                                                                               | 1500 ppm                          |
| Tempo di ripristino        | 600 s                                                                                                                                                                                                                 | 210 s                             |
| Linearità                  | su un campo di taratura                                                                                                                                                                                               |                                   |
| Campo di lavoro:           | • HCFC = 10 to 1.000 ppm (vers. semiconduttore)<br>• HFC's = 10 to 1.000 ppm (vers. semiconduttore)<br>• Carbon Dioxide = 0 to 10.000 ppm (vers. Infrared)                                                            |                                   |

**Nota:** per gas R-1234ze, R-449A, R-450A, R-513A limitati a 500ppm.

#### Requisiti di calibrazione

Le normative locali potrebbero richiedere procedure di controllo per la calibrazione del sensore. Le principali normative richiedono almeno l'analisi annua e taratura. I sensori a semiconduttore e infrared CO2 sono calibrati per un gas specifico. Il primo fatto dal costruttore, e successive dall'installatore.

#### Manutenzione per versione semiconduttore e CO2 infrared

|               |                                                                                            |
|---------------|--------------------------------------------------------------------------------------------|
| Test annuale  | Per soddisfare la normativa EN378 e F-GAS è necessario eseguire il test di prova ogni anno |
| Ogni 3 anni   | Si consiglia una taratura (vedi procedura di calibrazione nel manuale d'uso).              |
| Ogni 5/6 anni | Si consiglia di cambiare l'elemento di rilevamento gas e fare una calibraz.                |

**Tab. 2**

**Nota:** dopo una fuga di gas consistente e prolungata all'esposizione, provvedere ad eseguire un controllo o alla sua sostituzione nel caso sia necessario. Per maggiori informazioni consultare il manuale tecnico (cod. +0300035IT e +0300035EN).

#### Codici:

| Refrigerante    | Infrared IP66 | Infrared IP66 - sensore remoto |
|-----------------|---------------|--------------------------------|
| CO <sub>2</sub> | DPWL417000    | DPWL427000                     |

| Refrige-rante | Semi-conduttore IP41 | Semi-conduttore IP66 - sensore remoto | Refrige-rante       | Semi-conduttore IP41 | Semi-conduttore IP66 - sensore remoto |
|---------------|----------------------|---------------------------------------|---------------------|----------------------|---------------------------------------|
| R-22          | DPWLA07000           | DPWLA27000                            | R-450A              | DPWL07000            | DPWL27000                             |
| R-32          | DPWL107000           | DPWL127000                            | R-452A              | DPWL07000            | DPWL27000                             |
| R-134A        | DPWL087000           | DPWL827000                            | R-513A              | DPWLX07000           | DPWLX27000                            |
| R-290         | DPWLP07000           | DPWLP27000                            | R-507A              | DPWLT07000           | DPWLT27000                            |
| R-404A        | DPWLC07000           | DPWLC27000                            | R-600               | DPWL207000           | DPWL227000                            |
| R-407A        | DPWLR07000           | DPWLR27000                            | R-600a              | DPWL307000           | DPWL327000                            |
| R-407C        | DPWLD07000           | DPWLD27000                            | R-1234ze(E)         | DPWLD07000           | DPWL27000                             |
| R-407F        | DPWLS07000           | DPWLS27000                            | R-1234yf            | DPWLY07000           | DPWLY27000                            |
| R-410A        | DPWLE07000           | DPWLE27000                            | R-717 (Ammonia NH3) | DPWL07000            |                                       |
| R-448A        | DPWLH07000           | DPWLH27000                            | R-1150 (ETHYLENE)   | DPWLQ07000           |                                       |
| R-449A        | DPWLU07000           | DPWLU27000                            |                     |                      |                                       |

| Opzioni:   |                                                                                                         |
|------------|---------------------------------------------------------------------------------------------------------|
| 6133015AXX | Elemento sensibile per gas refrigeranti HCFC e HFC - per versione a semiconduttore                      |
| 6133017AXX | Elemento sensibile per gas refrigeranti HCFC, HFC e ETILENE - per versione a semiconduttore con cavo 5m |
| 6133019AXX | Elemento sensibile per gas refrigerante NH3 - per versione a semiconduttore                             |
| 6133016AXX | Elemento sensibile per gas refrigerante CO2 - per versione a infrared                                   |
| 6133018AXX | Elemento sensibile per gas refrigerante CO2 - per vers a infrared con cavo 5m                           |
| DPWLKIT000 | Adattatore di calibrazione (tubo e cappuccio)                                                           |
| DPWLKIT010 | Adattatore di calibrazione (tubo e 4 cappucci)                                                          |
| DPWLKIT100 | Protezione agli spruzzi per versioni IP66                                                               |

### General description

The refrigerant gas leak sensor is a device that signals leakages of common gases (R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO<sub>2</sub>), R-1150 (Ethylene), R-1234yf, R-1234ze(E)). It can be used in stand-alone applications, or integrated into Carel controllers or third party devices. Connection to Carel controllers is made using an analogue or digital output or Modbus\* RS485 serial connection. When leaks are detected exceeding a certain concentration, the sensor sends an alarm signal to the controller, activating a local audible and visual warning and a relay (SPDT). This allows prompt identification of gas leaks, avoiding having to shut the unit down and at the same time guaranteeing the safety of any people in the vicinity. Each model is calibrated for a specific gas and is typically installed in new or existing buildings that require continuous monitoring of gas leaks. Installation of the device ensures compliance with European standards F-GAS and EN378 as well as ASHRAE 15. Available in semiconductor IP41 and IP66 versions, with remote sensor.

#### Technical specifications

|                             | Semiconductor version R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO <sub>2</sub> ), R-1150 (Ethylene), R-1234yf, R-1234ze(E) | Infrared version CO <sub>2</sub> |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Power supply:               | 12/24V+20% d.c/a.c. 50/60 Hz                                                                                                                                                                                                                |                                  |
| Power consumption (at 12V): | 153mA,                                                                                                                                                                                                                                      | 136mA                            |
| Monitoring active:          | Green LED                                                                                                                                                                                                                                   |                                  |
| Alarm display:              | Red LED                                                                                                                                                                                                                                     |                                  |
| Audible alarm:              | enabled/disabled                                                                                                                                                                                                                            |                                  |
| Fault during monitoring:    | Red LED ON - Green OFF                                                                                                                                                                                                                      |                                  |
| Fault status:               | 1V, 2mA                                                                                                                                                                                                                                     | 1V, 2mA                          |
| Analogue output:            | 0-5V, 1-5V, 0-10V, 2-10V, 4-20mA                                                                                                                                                                                                            |                                  |
| Serial communication:       | Modbus* RS485                                                                                                                                                                                                                               |                                  |
| Digital output:             | 1 relay rated at 1 A/24 Vdc/ac                                                                                                                                                                                                              |                                  |
| Selectable delay:           | 0,1, 5, 10min                                                                                                                                                                                                                               |                                  |
| IP protection:              | IP41 built-in version IP66 remote sensor version                                                                                                                                                                                            | IP66 built-in and remote sensor  |
| Typical operating range:    | 0-1.000 ppm (*)                                                                                                                                                                                                                             | 0-10.000 ppm                     |
| Operating conditions:       | -20T50°C<br>(-40T50°C for the IP66 version)                                                                                                                                                                                                 | -40T50°C                         |
| Non-condensing humidity:    | 0 to 95%                                                                                                                                                                                                                                    |                                  |
| Estimated sensor life:      | 5-8 years                                                                                                                                                                                                                                   |                                  |
| Alarm threshold             | 100 ppm                                                                                                                                                                                                                                     | 1500 ppm                         |
| Reset time                  | 600 s                                                                                                                                                                                                                                       | 210 s                            |
| Linearity                   | on calibration field                                                                                                                                                                                                                        |                                  |
| Operating range:            | • HCFC = 10 to 1.000 ppm (semiconductor vers.)<br>• HFC's = 10 to 1.000 ppm (semiconductor vers.)<br>• Carbon Dioxide = 0 to 10.000 ppm (infrared vers.)                                                                                    |                                  |

**Tab. 1**

**Note:** For gas R-1234ze, R-449A, R-450A, R-513A limited at 500ppm

#### Calibration requirements

Local standards may require control procedures for sensor calibration. The main relevant standards require testing and calibration at least once a year. The semiconductor and CO2 infrared sensors are calibrated for a specific gas. The first calibration is performed by the manufacturer, subsequent calibrations are performed by the installer.

#### Maintenance for the semiconductor and infrared CO2 version

|                 |                                                                         |
|-----------------|-------------------------------------------------------------------------|
| Annual testing  | Tests must be performed annually to meet EN378 and F-GAS standards      |
| Every 3 years   | Calibration recommended (see calibration procedure in the user manual). |
| Every 5/6 years | Gas sensor replacement and calibration recommended                      |

**Tab. 2**

**Note:** following a significant gas leak with extended exposure, check and if necessary replace the sensor. For further information, see the technical manual (code +0300035IT and +0300035EN).

#### Codes:

| Refrigerant     | Infrared IP66 | Infrared IP66 - capteur à distance |
|-----------------|---------------|------------------------------------|
| CO <sub>2</sub> | DPWL417000    | DPWL427000                         |

| Refrigerant | Semi-conductor IP41 | Semi-conductor IP66 - capteur à distance | Refrigerant         | Semi-conductor IP41 | Semi-conductor IP66 - capteur à distance |
|-------------|---------------------|------------------------------------------|---------------------|---------------------|------------------------------------------|
| R-22        | DPWLA07000          | DPWLA27000                               | R-450A              | DPWL07000           | DPWL27000                                |
| R-32        | DPWL107000          | DPWL127000                               | R-452A              | DPWL07000           | DPWL27000                                |
| R-134A      | DPWL087000          | DPWL827000                               | R-513A              | DPWLX07000          | DPWLX27000                               |
| R-290       | DPWLP07000          | DPWLP27000                               | R-507A              | DPWLT07000          | DPWLT27000                               |
| R-404A      | DPWLC07000          | DPWLC27000                               | R-600               | DPWL207000          | DPWL227000                               |
| R-407A      | DPWLR07000          | DPWLR27000                               | R-600a              | DPWL307000          | DPWL327000                               |
| R-407C      | DPWLD07000          | DPWLD27000                               | R-1234ze(E)         | DPWLD27000          | DPWL27000                                |
| R-407F      | DPWLS07000          | DPWLS27000                               | R-1234yf            | DPWLY07000          | DPWLY27000                               |
| R-410A      | DPWLE07000          | DPWLE27000                               | R-717 (Ammonia NH3) | DPWL07000           |                                          |
| R-448A      | DPWLH07000          | DPWLH27000                               | R-1150 (ETHYLENE)   | DPWLQ07000          |                                          |
| R-449A      | DPWLU07000          | DPWLU27000                               |                     |                     |                                          |

| Options:   |                                                                                  |
|------------|----------------------------------------------------------------------------------|
| 6133015AXX | "HCFC, HFC and ETHYLENE refrigerant gas sensor for semiconductor version         |
| 6133017AXX | HCFC, HFC and ETHYLENE refrigerant gas sensor for semiconductor version cable 5m |
| 6133019AXX | "NH3 refrigerant gas sensor - for semiconductor version"                         |
| 6133016AXX | CO2 refrigerant gas sensor - for infrared version                                |
| 6133018AXX | CO2 refrigerant gas sensor - for infrared version cable 5m                       |
| DPWLKIT000 | Calibration adapter (hose and hood)                                              |
| DPWLKIT010 | Calibration adapter (hose and 4 hoods)                                           |
| DPWLKIT100 | Protection against water spray for IP66 version                                  |

### Description générale

Le capteur détecteur de gaz réfrigérant est un dispositif qui signale les fuites des gaz les plus communs (R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO<sub>2</sub>), R-1150 (Ethylene), R-1234yf, R-1234ze(E)). Il peut être utilisé pour les applications stand-alone, il est intégré avec les contrôleurs Carel ou avec les dispositifs d'autres pièces. Il prévoit le raccordement avec le contrôle Carel à travers la sortie analogique, numérique ou par le raccordement sériel RS485 Modbus\*. Lorsque la fuite est détectée au-delà d'une certaine concentration, le capteur signale au moment du contrôle l'alarme, il active localement une signalisation acoustique et visuelle et simultanément un relai (SPDT). Il offre l'avantage d'intervenir en temps utile sur les fuites de gaz en évitant l'arrêt de la machine et en garantissant la sécurité des personnes qui sont aux alentours. Chaque modèle est calibré pour un gaz spécifique, il est installé en général dans des bâtiments neufs ou existants qui nécessitent un monitoring continu des fuites de gaz. Son installation respecte les réglementations Européennes F-GAS et EN378 et ASHRAE 15. Disponible dans les versions semi-conducteur IP41 et IP66 avec capteur à distance.

#### Caractéristiques techniques

|                             | Version Semi-conducteur R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO <sub>2</sub> ), R-1150 (Ethylene), R-1234yf, R-1234ze(E) | Version Infrared CO <sub>2</sub>    |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Alimentation:               | 12/24V+20% d.c./a.c. 50/60 Hz                                                                                                                                                                                                                 |                                     |
| Consom. électrique (à 12V): | 153mA,                                                                                                                                                                                                                                        | 136mA                               |
| Contrôle en fonction:       | Led vert                                                                                                                                                                                                                                      |                                     |
| Visualisation alarme:       | Led rouge                                                                                                                                                                                                                                     |                                     |
| Alarme acoustique:          | activée/désactivée                                                                                                                                                                                                                            |                                     |
| Panne durant le monitoring: | Led rouge ON - Vert OFF                                                                                                                                                                                                                       |                                     |
| Etat de panne:              | 1V, 2mA                                                                                                                                                                                                                                       | 1V, 2mA                             |
| Sortie analogique:          | 0-5V, 1-5V, 0-10V, 2-10V, 4-20mA                                                                                                                                                                                                              |                                     |
| Communication sérieelle:    | RS485 Modbus*                                                                                                                                                                                                                                 |                                     |
| Sortie numérique:           | 1 Relais nominal 1 Amp/24 Vdc/ac                                                                                                                                                                                                              |                                     |
| Selectable delay:           | 0,1,5,10min                                                                                                                                                                                                                                   |                                     |
| Protection IP:              | IP41 version encastree<br>IP66 version capteur à distance                                                                                                                                                                                     | IP66 encastré et capteur à distance |
| Zone de travail typique:    | 0-1.000 ppm (*)                                                                                                                                                                                                                               | 0-10.000 ppm                        |
| Zone de travail:            | -20T50°C (-40T50°C puor IP66 version)                                                                                                                                                                                                         | -40T50°C                            |
| Humidité sans condensat.:   | 0 to 95%                                                                                                                                                                                                                                      |                                     |
| Vis du capteur en attente:  | 5-8 ans                                                                                                                                                                                                                                       |                                     |
| Seuil d'alarme              | 100 ppm                                                                                                                                                                                                                                       | 1500 ppm                            |
| Temps de rétablissement     | 600 s                                                                                                                                                                                                                                         | 210 s                               |
| Linéarité                   | sur une zone d'étalementage                                                                                                                                                                                                                   |                                     |
| Zone de travail:            | • HCFC = 10 to 1.000 ppm (vers. semi-conducteur)<br>• HFC's = 10 to 1.000 ppm (vers. semi-conducteur)<br>• Carbon Dioxide = 0 to 10.000 ppm (vers. Infrared)                                                                                  |                                     |

**Tab. 1**

**Note:** Pour le gaz R-1234ze, R-449A, R-450A, R-513A limité à 500ppm.

#### Exigences de calibrage

Les réglementations locales peuvent nécessiter des procédures de contrôle pour le calibrage du capteur. Les principales réglementations et infrarouge CO2 nécessitent au moins une analyse annuelle et un étalonnage. Les capteurs à semi-conducteur sont calibrés pour un gaz spécifique. Le premier est effectué par le fabricant et les suivants par l'installateur.

#### Maintenance pour version semi-conducteur et CO2 infrarouge

|                  |                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------|
| Test annuel      | Pour satisfaire la réglementation EN378 et F-GAZ, il est nécessaire d'effectuer le test d'essai chaque année. |
| Tous les 3 ans   | On conseille un étalonnage (voir procédure de calibrage dans le manuel d'utilisation).                        |
| Tous les 5/6 ans | On conseille de changer l'élément de détection gaz et de faire un calibrage.                                  |

**Tab. 2**

**Remarque:** après une fuite de gaz consistante et prolongée à l'exposition, effectuer un contrôle ou son remplacement si c'est nécessaire. Pour plus d'informations, consulter le manuel technique (code +0300035IT et +0300035EN).

#### Codes:

| réfrigérant     | Infrared IP66 | Infrared IP66 - remote sensor |
|-----------------|---------------|-------------------------------|
| CO <sub>2</sub> | DPWL417000    | DPWL427000                    |

| réfrigérant | semi-conducteur-conducteur IP41 | semi-conducteur IP66 - remote sensor | réfrigérant         | semi-conducteur IP41 | semi-conducteur IP66 - remote sensor |
|-------------|---------------------------------|--------------------------------------|---------------------|----------------------|--------------------------------------|
| R-22        | DPWLA07000                      | DPWLA27000                           | R-450A              | DPWL07000            | DPWL27000                            |
| R-32        | DPWL107000                      | DPWL127000                           | R-452A              | DPWL07000            | DPWL27000                            |
| R-134A      | DPWL087000                      | DPWL827000                           | R-513A              | DPWLX07000           | DPWLX27000                           |
| R-290       | DPWLP07000                      | DPWLP27000                           | R-507A              | DPWLT07000           | DPWLT27000                           |
| R-404A      | DPWLC07000                      | DPWLC27000                           | R-600               | DPWL207000           | DPWL227000                           |
| R-407A      | DPWLR07000                      | DPWLR27000                           | R-600a              | DPWL307000           | DPWL327000                           |
| R-407C      | DPWLD07000                      | DPWLD27000                           | R-1234ze(E)         | DPWLD27000           | DPWL27000                            |
| R-407F      | DPWLS07000                      | DPWLS27000                           | R-1234yf            | DPWLY07000           | DPWLY27000                           |
| R-410A      | DPWLE07000                      | DPWLE27000                           | R-717 (Ammonia NH3) | DPWL07000            |                                      |
| R-448A      | DPWLH07000                      | DPWLH27000                           | R-1150 (ETHYLENE)   | DPWLQ07000           |                                      |
| R-449A      | DPWLU07000                      | DPWLU27000                           |                     |                      |                                      |

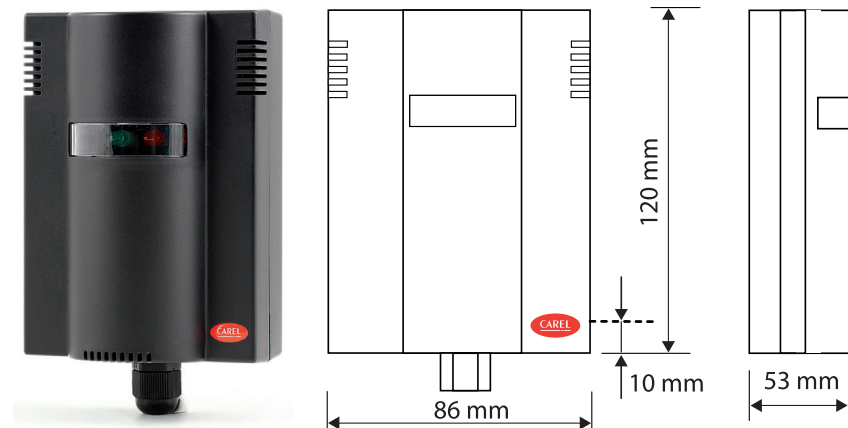
| Options:   |                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------|
| 6133015AXX | Élément sensible pour gaz réfrigérant HCFC et HFC – vers. à semi-conducteur                            |
| 6133017AXX | Élément sensible pour gaz réfrigérant HCFC, HFC et éthylène – version à semi-conducteur avec câble 5 m |
| 6133019AXX | Élément sensible pour gaz réfrigérant NH3 – version à semi-conducteur                                  |
| 6133016AXX | Élément sensible pour gaz réfrigérant CO2 – version à infrarouge                                       |
| 6133018AXX | Élément sensible pour gaz réfrigérant CO2 – vers. à infrarouge avec câble 5 m                          |
| DPWLKIT000 | Adaptateur d'étalementage (tube et bouchon)                                                            |
| DPWLKIT010 | Adaptateur d'étalementage (tube et 4 bouchons)                                                         |
| DPWLKIT100 | Protection contre les éclaboussures pour versions IP66                                                 |

### Allgemeine Beschreibung

Der Kältegasdetektor ist ein Sensor für die Erfassung und Meldung der Entweichung der häufigsten Kältegase (R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO<sub>2</sub>), R-1150 (Ethylene), R-1234yf, R-1234ze(E)). Er kann in eigenständigen Anwendungen, integriert mit den Carel-Steuerungen oder mit Geräten von Drittherstellern, verwendet werden. Er wird an die Carel-Steuerung über den analogen oder digitalen Ausgang oder über die serielle RS485-Modbus\*-Schnittstelle angeschlossen. Bei der Erfassung eines Kältegasaustrittes oberhalb einer bestimmten Konzentration meldet der Sensor der Steuerung einen Alarm und aktiviert lokal ein Warn- und Leuchtsignal sowie ein Relais (SPDT). Der Detektor lässt bei Kältegasentweichungen also rechtzeitig eingreifen und Anlagenstopps verhindern und gewährleistet gleichzeitig die Sicherheit der sich in der Nähe aufhaltenden Personen. Jedes Modell ist für eine spezifische Kältegasart kalibriert und wird allgemein in neuen oder Algebäuden installiert, die eine ständige Überwachung der Kältemittelaustritte erfordern. Seine Installation ist konform mit den Europäischen Vorschriften F-GAS und EN378 sowie ASHRAE 15. Verfügbar in der Halbleiter-Version mit Schutzart IP41 und IP66 mit Remote-Sensor.

#### Technische Daten

|                                       | Halbleiter-Version                                                                                                                                                                                                    | Infrarot-Version                |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
|                                       | R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO <sub>2</sub> ), R-1150 (Ethylene), R-1234yf, R-1234ze(E) | CO <sub>2</sub>                 |
| Spannungsversorgung:                  | 12/24V+20% GS/WS 50/60 Hz                                                                                                                                                                                             |                                 |
| Stromverbrauch (bei 12 V):            | 153mA                                                                                                                                                                                                                 | 136mA                           |
| Steuerung in Betrieb:                 | Grüne LED                                                                                                                                                                                                             |                                 |
| Alarmanzeige:                         | Rote LED                                                                                                                                                                                                              |                                 |
| Warnsignal:                           | Aktiviert/deaktiviert                                                                                                                                                                                                 |                                 |
| Funktionsstörung während Überwachung: | Rote LED EIN - Grüne LED AUS                                                                                                                                                                                          |                                 |
| Störungszustand:                      | 1V, 2mA                                                                                                                                                                                                               | 1V, 2mA                         |
| Analoger Ausgang:                     | 0-5V, 1-5V, 0-10V, 2-10V, 4-20mA                                                                                                                                                                                      |                                 |
| Serieller Anschluss:                  | RS485 Modbus*                                                                                                                                                                                                         |                                 |
| Digitaler Ausgang:                    | 1 Relé Bemessungswert 1 Amp/24 Vdc/ac                                                                                                                                                                                 |                                 |
| Einstellbare Verzögerung:             | 0,1,5,10 min                                                                                                                                                                                                          |                                 |
| IP-Schutzart:                         | IP41 Built-in-Version<br>IP66 Version mit Remote-Sensor                                                                                                                                                               | IP66 Built-in und Remote-Sensor |
| Typischer Arbeitsbereich:             | 0-1.000 ppm (*)                                                                                                                                                                                                       | 0-10.000 ppm                    |
| Arbeitsbereich:                       | -20T50°C<br>(-40T50°C für IP66 version)                                                                                                                                                                               | -40°C bis 50°C                  |
| Feuchte ohne Betauung                 | 0 bis 95%                                                                                                                                                                                                             |                                 |
| Lebenserwartung des Sensors:          | 5-8 Jahre                                                                                                                                                                                                             |                                 |
| Alarmschwelle:                        | 100 ppm                                                                                                                                                                                                               | 1500 ppm                        |
| Wiederherstellungszeit:               | 600 s                                                                                                                                                                                                                 | 210 s                           |
| Linearität:                           | Kalibrierungsbereich                                                                                                                                                                                                  |                                 |
| Arbeitsbereich:                       | • FCKW = 10 bis 1.000 ppm (Halbleiter-Version)<br>• FKW = 10 bis 1.000 ppm (Halbleiter-Version)<br>• CO <sub>2</sub> = 0 bis 10.000 ppm (Infrarot-Version)                                                            |                                 |



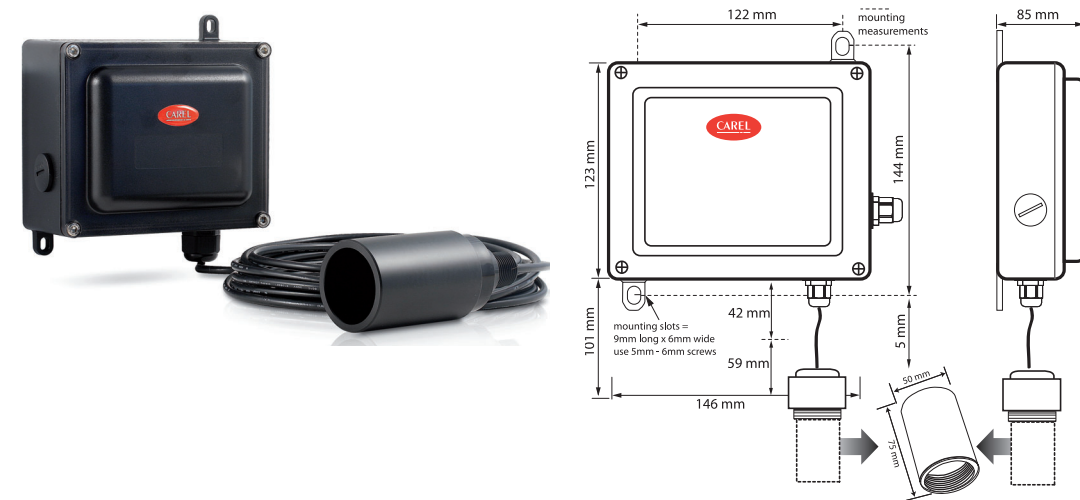
Technical drawing of the Carel 10000 BT unit, showing front, top, and side views with dimensions.

**Front View:** The unit is black with a red "CAREL" logo and a green LED indicator. It has a mounting bracket on the left and a cable entry on the bottom.

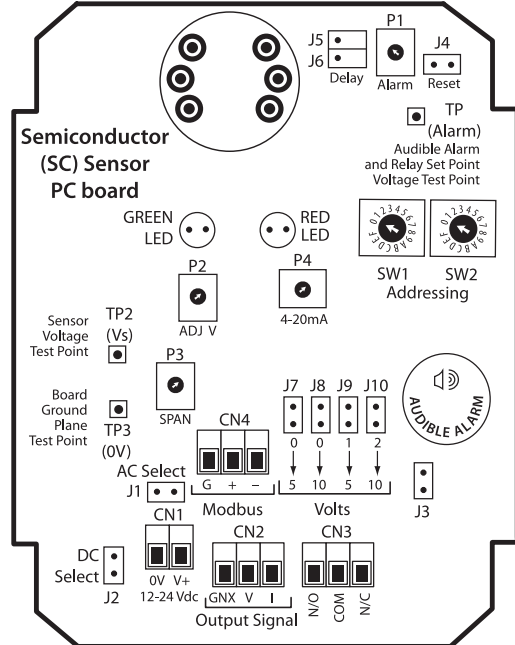
**Top View:** Shows the unit's footprint with dimensions: 122 mm (width), 144 mm (height), and 146 mm (total width including mounting slots). Mounting slots are 42 mm wide and 59 mm deep. Mounting measurements are indicated for the top and right sides.

**Side View:** Shows the unit's profile with dimensions: 85 mm (width) and 101 mm (height). A cable entry is shown on the bottom.

**Mounting Details:** The unit is mounted using 5mm - 6mm screws. The mounting slots are 9mm long and 6mm wide. The unit is shown being inserted into a mounting bracket.



Semiconductor sensor R-22, R-32, R-134a, R-290, R-404A, R-407A, R-407C, R-407F, R-410A, R-448A, R-449A, R-450A, R-452A, R-507A, R-513A, R-600, R-600a, R-717 (Ammonia), R-744 (CO<sub>2</sub>), R-1150 (Ethylene), R-1234yf, R-1234ze(E) version



The diagram illustrates the Infrared (IR-RS) Sensor PC board layout. Key components and their connections include:

- Infrared (IR-RS) Sensor PC board:** The main title of the board.
- TX, RX, +V, -V, SIGNAL:** A circular sensor assembly with five pins.
- GREEN LED:** A green light-emitting diode.
- RED LED:** A red light-emitting diode.
- TP2 (Vs):** A test point for supply voltage.
- TP3 (0V):** A test point for ground.
- DC Select:** A switch for selecting DC voltage.
- J1:** A connector for AC Select.
- CN1, CN2, CN3:** Connectors for various signals.
- J2:** A connector for 0V, V+, and 12-24Vdc.
- J3:** A connector for GND, V, and I.
- J4:** A connector for Reset.
- J5, J6:** Connectors for Delay and P2.
- P1:** A potentiometer for Alarm.
- P4:** A potentiometer for 4-20mA.
- SW1, SW2:** Switches for addressing.
- TP1 (Alarm):** A test point for the alarm signal.
- Volts:** A scale for voltage measurement (0 to 2).
- AUDIBLE ALARM:** A speaker icon indicating an audible alarm.
- Output Signal:** A label for the output signal.

**SW1 and SW2 Modbus Addressing**

| ADDR (DEC) | SW1 (LSB) | SW2 (MSB) |                    |
|------------|-----------|-----------|--------------------|
| D00        | 0         | 0         | Reserved Address   |
| D01        | 1         | 0         |                    |
| D02        | 0         | 1         |                    |
| :          | :         | :         |                    |
| D17        | 1         | 1         | Valid Addresses    |
| :          | :         | :         |                    |
| 247        | 7         | 7         |                    |
| :          | :         | :         |                    |
| 248        | 8         | F         | Reserved Addresses |
| :          | :         | :         |                    |
| 255        | F         | F         |                    |

**J3 Audible Alarm Jumper**

OFF (Then OFF) / ON (Then OFF)

Normal Operation / Reset

**J4 Reset Jumper**

OFF (Then OFF) / ON (Then OFF)

Normal Operation / Reset

**CN3 Relay Connector**

N/O: Normally Open

COM: Common

N/C: Normally Closed

**J1 and J2 Power Supply Selection Jumper**

AC Power Selected / DC Power Selected

J1: ON / OFF

J2: OFF / ON

CN1: 12-24 Vac / 0V V+ 12-24 Vdc

**P1-P4 Adjustment Pots**

P1: Adjusts Alarm Setpoint for Audible Alarm and Relay

P2: Adjusts Zero Level Voltage for Output Signal

P3: Adjusts Output Signal Span

P4: Adjusts 4-20 mA Current Output

**J5 and J6 Delay Jumper for Audible Alarm and Relay**

J5: 0 Minutes (No Delay) / 1 Minutes Delay / 5 Minutes Delay / 10 Minutes Delay

J6: 0 / 1 / 5 / 10

**CN4 Modbus Connector**

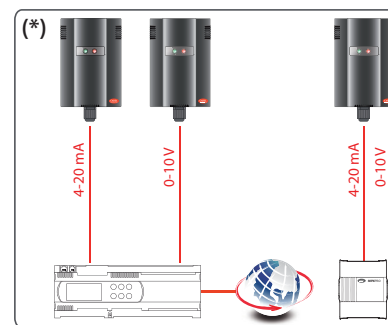
Modbus: G (Ground (Isolated from 0V)), + (Non-inverting Modbus Signal TxD+/RxD+), - (Non-inverting Modbus Signal TxD-/RxD-)

Output Signal: GNX (0 Volt, Ground), V (0-5 V Output, 0-10 V Output, 1-5 V Output, 2-10 V Output), I (Current Output, 4-20 mA)

Nota: da installare vicino all'unità di raffreddamento. / Note: to be installed close the cooler unit.

(\*) RS485 Modbus<sup>®</sup> devices are connected to an Access Point and a Router Bridge, which are then connected to a remote serial line. The diagram also shows a computer and a mobile phone connected to the system, indicating remote access capabilities.

**Nota:** verificar la compatibilidad con la aplicación de controlador.



The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.



CAREL reserves the right to modify the features of its products without prior notice.