



Photoresistive Flame Detectors

QRB1... QRB3...

Photoresistive detectors for use with Siemens burner controls, for the supervision of oil flames in the visible light spectrum.

The QRB... are used primarily in connection with oil burner controls in intermittent operation.

The QRB... and this Data Sheet are intended for use by OEMs which integrate the flame detectors in their products.

Use

The QRB... flame detectors are designed for the supervision of yellow-burning oil flames in connection with burner controls type LAL..., LOA..., LMO... and LMV... They are suited for frontal or lateral (90°) illumination.

The maximum spectral sensitivity of the QRB... is about 600 nm, thus giving full consideration to the maximum level of visible light radiation of yellow-burning oil flames. Since the QRB... also acquires certain parts of the radiation spectrum of other light sources (boiler room lighting, solar radiation, etc.), the standard regulations regarding safety in connection with extraneous light still apply.

Warning notes



To avoid injury to persons, damage to property or the environment, the following warning notes should be observed!

Do not open, interfere with or modify the flame detector!

- All activities (mounting, installation and service work, etc.) must be performed by qualified staff
- Before making any wiring changes in the connection area of the QRB..., the burner control must be completely isolated from mains supply (all-polar disconnection)
- Ensure protection against electric shock hazard by providing adequate protection for the connection terminals
- Each time work has been carried out (mounting, installation, service work, etc.), check to ensure that wiring is in an orderly state and make the safety checks as described in «Commissioning notes»
- Fall or shock can adversely affect the safety functions. Such detectors must not be put into operation even if they do not exhibit any damage

Mounting notes

- Ensure that the relevant national safety regulations are complied with

Installation notes

- Always run the detector cable separate from other cables, especially from the high-voltage ignition cable, while observing the greatest possible distance

It is important to achieve practically disturbance- and loss-free signal transmission:

- Never run the detector cable together with other cables
 - Line capacitance reduces the magnitude of the flame signal
 - Use a separate cable
- Observe the permissible length of the detector cables (refer to «Technical data»)

Commissioning notes

- The intensity of the radiation of light on site is checked by measuring the detector current
- For information about the measuring circuit and the minimum detector current values required, refer to the Data Sheet of the relevant type of burner control

Standards and certificates



Conformity to EEC directives
- Electromagnetic compatibility EMC (immunity)

89 / 336 / EEC



ISO 9001: 2000
Certificate 00739



ISO 14001: 2004
Certificate 38233

Only in connection with
burner controls type
LAL...and LMV...



Service notes

- When cleaning the detector, never use burner cleansing spray. Always use a clean cloth

Mechanical design

| | |
|---------------------|---|
| General | <p>Compact photoresistive flame detector with infused 2-wire thermoplastic cable. The detector is available with normal sensitivity, high sensitivity, or selected higher sensitivity, with or without flange / clamp or soft plastic plug (refer to «Type summary»).</p> |
| QRB1...A | <p>Flame detector without soft plastic plug. This type of detector is fitted with the help of a flange. A guide groove in the securing flange and a cam on the detector clamp ensure vibration-free mounting and make certain that the detector is always correctly sited towards the flame.</p> |
| QRB1...B | <p>Flame detector with soft plastic plug. For mounting this type of detector on the burner, all that is required is a hole with a lateral groove (refer to «Dimensions»).</p> <p>The sealing and securing ribs of the soft plastic plug hold the detector firmly in the hole. The guide spring guarantees correct alignment of the photoresistive element with the flame.</p> |
| Accessories QRB1... | <ul style="list-style-type: none">• Small flange, 21 mm spacing, plastic version• Large flange, 36 mm spacing, plastic version• Clamp, plastic version |
| QRB3... | <p>The detector is supplied with a metal protective tube having a diameter of 17 mm. This type of detector is always secured with a flange and a clamp (refer to «Accessories QRB3...»).</p> |
| Accessories QRB3... | <ul style="list-style-type: none">• Flange, metal version• Clamp, metal version |

Type summary

QRB1...

1) These types of flame detectors are not available in all countries!

| Type reference ¹⁾ | Sensitivity / casing color | | | Casing length "g" (mm) | Visible cable length "l" (cm) | Stripped length "m" (mm) | Plug | End of cable | Accessories (included) | |
|------------------------------|----------------------------|------------|-----------------------|---------------------------|----------------------------------|-----------------------------|---------|-------------------|---------------------------|----------------------|
| | Normal / black | High / red | High, selected / blue | | | | | | Small flange / clamp | Large flange / clamp |
| QRB1A-A020B40A | x | --- | --- | 50 | 20 | 40 | Without | Ferrule | --- | --- |
| QRB1A-A020B40A2 | x | --- | --- | 50 | 20 | 40 | Without | Ferrule | --- | x |
| QRB1A-A033B40B | x | --- | --- | 50 | 33 | 40 | With | Ferrule | --- | --- |
| QRB1A-A035B40A | x | --- | --- | 50 | 35 | 40 | Without | Ferrule | --- | --- |
| QRB1A-A035B40A1 | x | --- | --- | 50 | 35 | 40 | Without | Ferrule | x | --- |
| QRB1A-A048B70B | x | --- | --- | 50 | 48 | 70 | With | Ferrule | --- | --- |
| QRB1A-A050B40A | x | --- | --- | 50 | 50 | 40 | Without | Ferrule | --- | --- |
| QRB1A-A050B40A1 | x | --- | --- | 50 | 50 | 40 | Without | Ferrule | x | --- |
| QRB1A-A050B40A2 | x | --- | --- | 50 | 50 | 40 | Without | Ferrule | --- | x |
| QRB1A-A050B70A | x | --- | --- | 50 | 50 | 70 | Without | Ferrule | --- | --- |
| QRB1A-A050B70A1 | x | --- | --- | 50 | 50 | 70 | Without | Ferrule | x | --- |
| QRB1A-A050B70A2 | x | --- | --- | 50 | 50 | 70 | Without | Ferrule | --- | x |
| QRB1A-A068B70B | x | --- | --- | 50 | 68 | 70 | With | Ferrule | --- | --- |
| QRB1A-A070B70A | x | --- | --- | 50 | 70 | 70 | Without | Ferrule | --- | --- |
| QRB1A-A070B70A1 | x | --- | --- | 50 | 70 | 70 | Without | Ferrule | x | --- |
| QRB1A-A070B70A2 | x | --- | --- | 50 | 70 | 70 | Without | Ferrule | --- | x |
| QRB1A-A070B70B | x | --- | --- | 50 | 70 | 70 | With | Ferrule | --- | --- |
| QRB1A-A080B70A | x | --- | --- | 50 | 80 | 70 | Without | Ferrule | --- | --- |
| QRB1A-A148B70B | x | --- | --- | 50 | 148 | 70 | With | Ferrule | --- | --- |
| QRB1A-A150B70A | x | --- | --- | 50 | 150 | 70 | Without | Ferrule | --- | --- |
| QRB1A-A150B70A1 | x | --- | --- | 50 | 150 | 70 | Without | Ferrule | x | --- |
| QRB1A-A150B70A2 | x | --- | --- | 50 | 150 | 70 | Without | Ferrule | --- | x |
| QRB1A-B027A25A | x | --- | --- | 65 | 27 | 25 | Without | Unstripped | --- | --- |
| QRB1A-B030A25A | x | --- | --- | 65 | 30 | 25 | Without | Unstripped | --- | --- |
| QRB1A-B030B40A | x | --- | --- | 65 | 30 | 40 | Without | Ferrule | --- | --- |
| QRB1A-B080B70A | x | --- | --- | 65 | 80 | 70 | Without | Ferrule | --- | --- |
| QRB1B-A014U25B | --- | x | --- | 50 | 14 | 25 | With | Connector AGK53.0 | --- | --- |
| QRB1B-A017A25B | --- | x | --- | 50 | 17 | 25 | With | Unstripped | --- | --- |
| QRB1B-A018B40B | --- | x | --- | 50 | 18 | 40 | With | Ferrule | --- | --- |
| QRB1B-A033B40B | --- | x | --- | 50 | 33 | 40 | With | Ferrule | --- | --- |
| QRB1B-A035B40A | --- | x | --- | 50 | 35 | 40 | Without | Ferrule | --- | --- |
| QRB1B-A035B40A1 | --- | x | --- | 50 | 35 | 40 | Without | Ferrule | x | --- |
| QRB1B-A042B20B | --- | x | --- | 50 | 42 | 20 | With | Ferrule | --- | --- |
| QRB1B-A048B40B | --- | x | --- | 50 | 48 | 40 | With | Ferrule | --- | --- |
| QRB1B-A048B70B | --- | x | --- | 50 | 48 | 70 | With | Ferrule | --- | --- |
| QRB1B-A050B40A | --- | x | --- | 50 | 50 | 40 | Without | Ferrule | --- | --- |
| QRB1B-A050B70A | --- | x | --- | 50 | 50 | 70 | Without | Ferrule | --- | --- |
| QRB1B-A050B70A1 | --- | x | --- | 50 | 50 | 70 | Without | Ferrule | x | --- |
| QRB1B-A050B70A2 | --- | x | --- | 50 | 50 | 70 | Without | Ferrule | --- | x |
| QRB1B-A068B70B | --- | x | --- | 50 | 68 | 70 | With | Ferrule | --- | --- |




Type summary (cont'd)

QRB1...

1) These types of flame detectors are not available in all countries!

| Type reference ¹⁾ | Sensitivity / casing color | | | Casing length "g" (mm) | Visible cable length "l" (cm) | Stripped length "m" (mm) | Plug | End of cable | Accessories (included) | |
|------------------------------|----------------------------|------------|-----------------------|---------------------------|----------------------------------|-----------------------------|---------|--------------|------------------------|------------|
| | Normal / black | High / red | High, selected / blue | | | | | | Normal / black | High / red |
| QRB1B-A070B40A1 | --- | x | --- | 50 | 70 | 40 | Without | Ferrule | x | --- |
| QRB1B-A070B70A | --- | x | --- | 50 | 70 | 70 | Without | Ferrule | --- | --- |
| QRB1B-A070B70A1 | --- | x | --- | 50 | 70 | 70 | Without | Ferrule | x | --- |
| QRB1B-A070B70A2 | --- | x | --- | 50 | 70 | 70 | Without | Ferrule | --- | x |
| QRB1B-A070B70B | --- | x | --- | 50 | 70 | 70 | With | Ferrule | --- | --- |
| QRB1B-A078B70B | --- | x | --- | 50 | 78 | 70 | With | Ferrule | --- | --- |
| QRB1B-A148B70B | --- | x | --- | 50 | 148 | 70 | With | Ferrule | --- | --- |
| QRB1B-B030A25A | --- | x | --- | 65 | 30 | 25 | Without | Unstripped | --- | --- |
| QRB1B-B035B40A | --- | x | --- | 65 | 35 | 40 | Without | Ferrule | --- | --- |
| QRB1B-C036B40A | --- | x | --- | 105 | 36 | 40 | Without | Ferrule | --- | --- |
| QRB1B-D025B40B | --- | x | --- | 137 | 25 | 40 | With | Ferrule | --- | --- |
| QRB1B-D042B20B | --- | x | --- | 137 | 42 | 20 | With | Ferrule | --- | --- |
| QRB1C-A050B40A | --- | --- | x | 50 | 50 | 40 | Without | Ferrule | --- | --- |
| QRB1C-B030A25A | --- | --- | x | 65 | 30 | 25 | Without | Unstripped | --- | --- |
| QRB1C-B080B70A | --- | --- | x | 65 | 80 | 70 | Without | Ferrule | --- | --- |

Accessories QRB1...
(version without plug)



| | Item | Part number ¹⁾ |
|---|-----------------------------|---------------------------|
|  | Small flange, 21 mm spacing | 4 241 1462 0 |
|  | Large flange, 36 mm spacing | 4 241 1600 0 |
|  | Clamp | 4 186 1096 0 |

1) To be specified when ordering individual items

QRB3...

| Type reference | Flange | Clamp | Feature | Sensitivity |
|----------------|---------|---------|-----------------|-------------|
| QRB3 | Without | Without | Protective tube | Normal |
| QRB3(1) | With | With | Protective tube | Normal |
| QRB3S | Without | Without | Protective tube | High |
| QRB3S(1) | With | With | Protective tube | High |

Accessories QRB3...

| | Item | Part number ¹⁾ |
|---|--------|---------------------------|
|  | Flange | 4 286 1490 0 |
|  | Clamp | 4 186 8806 0 |

1) To be specified when ordering individual items

Ordering

When ordering, please give type reference according to «Type summary».
QRB1... with plug is always to be ordered without flange / clamp, and vice versa.

Example

- QRB1A-A035B40A**
- Sensitivity: Normal
 - Casing length: 50 mm
 - Visible cable length: 35 cm
 - Stripped length: 40 mm
 - End of cable: With ferrule
 - Without plug
 - Accessories: Without flange / clamp

- QRB1A-A035B40A1** As above, but with:
- Accessories: Small flange / clamp included

Technical data

General detector data

| | |
|-------------------------------|--|
| Degree of protection | IP40 |
| Mounting position | optional |
| Detector cable (only QRB1...) | stranded copper wire 2 x 0.75 mm ² jacket 5.1 mm dia., PVC cable length according to «Type summary» |
| Weight | |
| - QRB1... (depending on type) | approx. 20...35 g |
| - QRB3... (without cable) | approx. 35 g |

Environmental conditions

| | |
|-----------------------|-------------------|
| Storage | DIN EN 60721-3-1 |
| Climatic conditions | class 1K3 |
| Mechanical conditions | class 1M2 |
| Temperature range | -20...+60 °C |
| Humidity | < 95 % r.h. |
| Transport | DIN EN 60 721-3-2 |
| Climatic conditions | class 2K2 |
| Temperature range | -20...+60 °C |
| Humidity | < 95 % r.h. |
| Operation | DIN EN 60 721-3-3 |
| Climatic conditions | class 3K5 |
| Mechanical conditions | class 2M2 |
| Temperature range | -20...+60 °C |
| Humidity | < 95 % r.h. |



Condensation, formation of ice and ingress of water are not permitted!

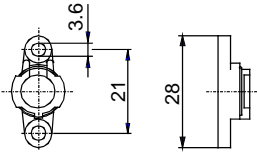
Function

Supervision of light radiation of oil flames in the visible range of the light spectrum.
The light-sensitive element is a photoresistor whose electrical dark resistance lies in the MΩ range.
As the intensity of light increases, the electrical resistance drops to the kΩ range and is evaluated by the burner control for generating the flame signal.
In contrast to RAR selenium photocell detectors, glowing firebrick in the combustion chamber can be detected.

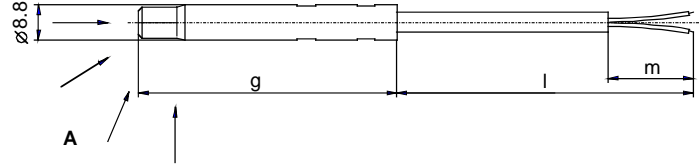
Dimensions

Dimensions in mm

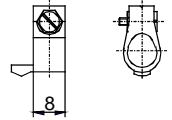
4 241 1462 0



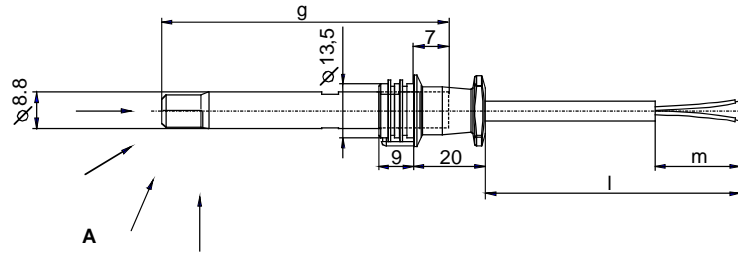
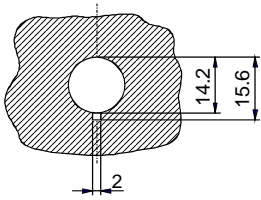
QRB1...A without plug



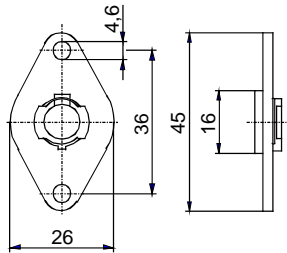
4 186 1096 0



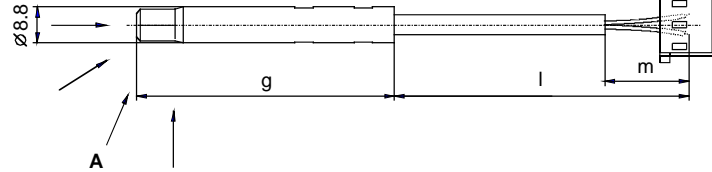
QRB1...B with plug



4 241 1600 0



QRB1... with connector AGK56.38

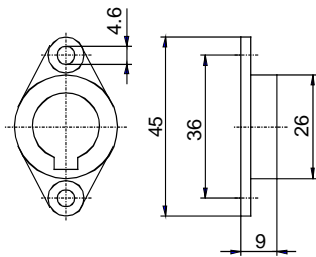


7714m04e/0706

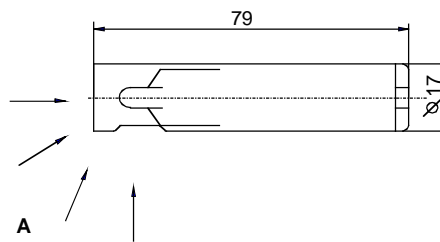
QRB1... with connector AGK53.0



4 286 1490 0



QRB3...



4 186 8806 0

