SIEMENS

7714



QRB1...A with large flange and clamp



QRB1...A with small flange and clamp



QRB1...B with plug



QRB3... with flange and clamp

Photo Resistive Flame Detectors

QRB1... QRB3...

Photo resistive 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... are designed for the supervision of yellow-burning oil flames in connection with burner controls type LAL..., LME7…, LMO..., LMV… and LOA…
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 must 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, completely isolate the plant from mains supply (all-polar disconnection). Ensure that the plant cannot be inadvertently switched on again and that it is indeed dead. If not observed, there is a risk of electric shock hazard
- Ensure protection against electric shock hazard by providing adequate protection for the connection terminals. If this is not observed, there is a risk of electric shock
- 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». If this is not observed, there is a risk of loss of safety functions and a risk of electric shock
- Fall, shock or damage to the housing can adversely affect the safety functions. Such detectors must not be put into operation even if they do not exhibit any damage. If this is not observed, there is a risk of loss of safety functions and a risk of electric shock

Mounting notes

- Ensure that the relevant national safety regulations are complied with
- Tightening torque clamp: Maximum 0.3 Nm

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

Note!
Only in connection with burner controls!

EAC Conformity mark (Eurasian Conformity mark)

ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007

China RoHS
Hazardous substances table:
http://www.siemens.com/download?A6V10883536

Service notes

When cleaning the detector, never use burner cleansing spray. Always use a clean and dry cloth exclusive.

Mechanical design

General

Compact photo resistive 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 and clamp or soft plastic plug (refer to «Type summary»).

QRB1...A

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 photo resistive flame detector is always correctly sited towards the flame.

QRB1...B

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»).
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 photo resistive flame detector with the flame.

Accessories QRB1…

- Small flange, 21 mm spacing, plastic version
- Large flange, 36 mm spacing, plastic version
- Clamp, plastic version

QRB3...

The detector is supplied with a metal protective tube having an external diameter of 17 mm.
This type of detector is always secured with a flange and a clamp (refer to «Accessories QRB3…»).

Accessories QRB3…

- Flange, metal version
- Clamp, metal version

Type summary

QRB1…

[1]) These types of flame detectors are not available for order in all countries!

Article no.	Type [1])	Sensitivity / casing color			Casing length "g" (mm)	Visible cable length "l" (cm)	Stripped length "m" (mm)	Plug	End of cable			Accessories		
												included		mounted
		Normal / black	High / red	High, selected / blue					Plug AGK...	Ferrule	Skinning	Small flange and clamp	Large flange and clamp	Bride
BPZ:QRB1A-A020B40A	QRB1A-A020B40A	●	---	---	50	20	40	---	---	●	●	---	---	---
BPZ:QRB1A-A033B40B	QRB1A-A033B40B	●	---	---	50	33	40	●	---	●	●	---	---	---
BPZ:QRB1A-A035B40A	QRB1A-A035B40A	●	---	---	50	35	40	---	---	●	●	---	---	---
BPZ:QRB1A-A035B40H	QRB1A-A035B40H	●	---	---	50	35	40	---	---	●	●	---	---	●
BPZ:QRB1A-A048B70B	QRB1A-A048B70B	●	---	---	50	48	70	●	---	●	●	---	---	---
BPZ:QRB1A-A050B40A1	QRB1A-A050B40A1	●	---	---	50	50	40	---	---	●	●	●	---	---
BPZ:QRB1A-A050B40A2	QRB1A-A050B40A2	●	---	---	50	50	40	---	---	●	●	---	●	---
BPZ:QRB1A-A050B70A	QRB1A-A050B70A	●	---	---	50	50	70	---	---	●	●	---	---	---
BPZ:QRB1A-A050B70A1	QRB1A-A050B70A1	●	---	---	50	50	70	---	---	●	●	●	---	---
BPZ:QRB1A-A050B70A2	QRB1A-A050B70A2	●	---	---	50	50	70	---	---	●	●	---	●	---
BPZ:QRB1A-A068B70B	QRB1A-A068B70B	●	---	---	50	68	70	●	---	●	●	---	---	---
BPZ:QRB1A-A070B70A	QRB1A-A070B70A	●	---	---	50	70	70	---	---	●	●	---	---	---
BPZ:QRB1A-A070B70A1	QRB1A-A070B70A1	●	---	---	50	70	70	---	---	●	●	●	---	---
BPZ:QRB1A-A070B70A2	QRB1A-A070B70A2	●	---	---	50	70	70	---	---	●	●	---	●	---
BPZ:QRB1A-A080B70A	QRB1A-A080B70A	●	---	---	50	80	70	---	---	●	●	---	---	---
BPZ:QRB1A-A148B70B	QRB1A-A148B70B	●	---	---	50	148	70	●	---	●	●	---	---	---
BPZ:QRB1A-A150B70A	QRB1A-A150B70A	●	---	---	50	150	70	---	---	●	●	---	---	---
BPZ:QRB1A-A150B70A2	QRB1A-A150B70A2	●	---	---	50	150	70	---	---	●	●	---	●	---
BPZ:QRB1A-B036A25A	QRB1A-B036A25A	●	---	---	65	36	25	---	---	---	---	---	---	---
BPZ:QRB1A-B080B70A	QRB1A-B080B70A	●	---	---	65	80	70	---	---	●	●	---	---	---
BPZ:QRB1A-B110B70A	QRB1A-B110B70A	●	---	---	65	110	70	---	---	●	●	---	---	---
BPZ:QRB1B-A014U25B	QRB1B-A014U25B	---	●	---	50	14	25	●	53.0	---	●	---	---	---
BPZ:QRB1B-A017A25B	QRB1B-A017A25B	---	●	---	50	17	25	●	---	---	---	---	---	---
BPZ:QRB1B-A018B40B	QRB1B-A018B40B	---	●	---	50	18	40	●	---	●	●	---	---	---
BPZ:QRB1B-A033B40B	QRB1B-A033B40B	---	●	---	50	33	40	●	---	●	●	---	---	---
BPZ:QRB1B-A035B40A	QRB1B-A035B40A	---	●	---	50	35	40	---	---	●	●	---	---	---
BPZ:QRB1B-A035B40H	QRB1B-A035B40H	---	●	---	50	35	40	---	---	●	●	---	---	●
BPZ:QRB1B-A035B40A1	QRB1B-A035B40A1	---	●	---	50	35	40	---	---	●	●	●	---	---
BPZ:QRB1B-A042B20B	QRB1B-A042B20B	---	●	---	50	42	20	●	---	●	●	---	---	---
BPZ:QRB1B-A048B40B	QRB1B-A048B40B	---	●	---	50	48	40	●	---	●	●	---	---	---

Article no.	Type [1])	Sensitivity / casing color			Casing length "g" (mm)	Visible cable length "l" (cm)	Stripped length "m" (mm)	Plug	End of cable			Accessories		
												included		mounted
		Normal / black	High / red	High, selected / blue					Plug AGK...	Ferrule	Skinning	Small flange and clamp	Large flange and clamp	Bride
BPZ:QRB1B-A048B70B	QRB1B-A048B70B	---	●	---	50	48	70	●	---	●	●	---	---	---
BPZ:QRB1B-A050B70A	QRB1B-A050B70A	---	●	---	50	50	70	---	---	●	●	---	---	---
BPZ:QRB1B-A050B70A1	QRB1B-A050B70A1	---	●	---	50	50	70	---	---	●	●	●	---	---
BPZ:QRB1B-A050B70A2	QRB1B-A050B70A2	---	●	---	50	50	70	---	---	●	●	---	●	---
BPZ:QRB1B-A068B70B	QRB1B-A068B70B	---	●	---	50	68	70	●	---	●	●	---	---	---
BPZ:QRB1B-A070B70A	QRB1B-A070B70A	---	●	---	50	70	70	---	---	●	●	---	---	---
BPZ:QRB1B-A070B70A1	QRB1B-A070B70A1	---	●	---	50	70	70	---	---	●	●	●	---	---
BPZ:QRB1B-A070B70A2	QRB1B-A070B70A2	---	●	---	50	70	70	---	---	●	●	---	●	---
BPZ:QRB1B-A148B70B	QRB1B-A148B70B	---	●	---	50	148	70	●	---	●	●	---	---	---
BPZ:QRB1B-B017A25B	QRB1B-B017A25B	---	●	---	65	17	25	●	---	---	---	---	---	---
BPZ:QRB1B-B035B40A	QRB1B-B035B40A	---	●	---	65	35	40	---	---	●	●	---	---	---
BPZ:QRB1B-B036A25A	QRB1B-B036A25A	---	●	---	65	36	25	---	---	---	---	---	---	---
BPZ:QRB1B-C036B40A	QRB1B-C036B40A	---	●	---	105	36	40	---	---	●	●	---	---	---
BPZ:QRB1B-C048A40B	QRB1B-C048A40B	---	●	---	105	48	40	●	---	---	---	---	---	---
BPZ:QRB1B-C060B40A	QRB1B-C060B40A	---	●	---	105	60	40	---	---	●	●	---	---	---
BPZ:QRB1B-D025B40B	QRB1B-D025B40B	---	●	---	137	25	40	●	---	●	●	---	---	---
BPZ:QRB1B-D042B20B	QRB1B-D042B20B	---	●	---	137	42	20	●	---	●	●	---	---	---
BPZ:QRB1C-A050B40A	QRB1C-A050B40A	---	---	●	50	50	40	---	---	●	●	---	---	---
BPZ:QRB1C-A050B40H	QRB1C-A050B40H	---	---	●	50	50	40	---	---	●	●	---	---	●
BPZ:QRB1C-B030A25A	QRB1C-B030A25A	---	---	●	65	30	25	---	---	---	---	---	---	---
BPZ:QRB1C-B080B70A	QRB1C-B080B70A	---	---	●	65	80	70	---	---	●	●	---	---	---

Type summary (cont'd)

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 (green)

Article no.	Type	Flange	Clamp	Feature	Sensitivity
BPZ:QRB3	QRB3	Without	Without	Protective tube	Normal
BPZ:QRB3(1)	QRB3(1)	With	With	Protective tube	Normal
BPZ:QRB3S	QRB3S	Without	Without	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 and clamp, and vice versa.

Example

QRB1A-A050B70A

- Sensitivity: Normal
- Casing length: 50 mm
- Visible cable length: 50 cm
- Stripped length: 70 mm
- End of cable: With ferrule
- Without plug
- Accessories: Without flange and clamp

QRB1A-A050B70A1 As above, but with:

- Accessories: Small flange and clamp included

Technical data

General detector data

Degree of protection	IP40
Safety class	II
Mounting position	Optional
Detector cable	
- QRB1	Cable included in scope of delivery! Stranded copper wire 2 x 0.75 mm² Jacket 5.2 mm dia., PVC Cable length according to «Type summary»
- QRB3	Cable to be supplied by thirds. Recommended: H05VV-F 2 x 0.75 Application standards should be observed.
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 60721-3-2
Climatic conditions	Class 2K2
Mechanical conditions	Class 2M2
Temperature range	-20...+60 °C
Humidity	<95 % r.h.
Operation	DIN EN 60721-3-3
Climatic conditions	Class 3K5
Mechanical conditions	Class 3M2
Temperature range	-20...+60 °C
Humidity	<95 % r.h.
Installation altitude	Max. 2,000 m above sea level



Caution!
Condensation, formation of ice and ingress of water are not permitted!
If not observed, the safety functions are no longer ensured and there will be a risk of electric shock!

Function

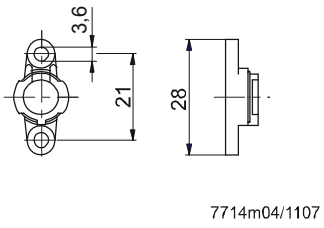
Supervision of light radiation of oil flames in the visible range of the light spectrum.
The light-sensitive element is a photo resistor whose electrical dark resistance lies in the MΩ range.
As the intensity of light increases, the electrical resistance drops to the kΩ range and is evaluated by the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

Dimensions

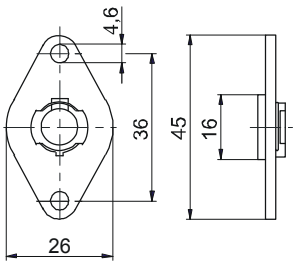
Dimensions in mm

QRB1...

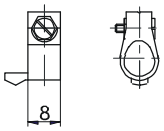
Small flange
4 241 1462 0



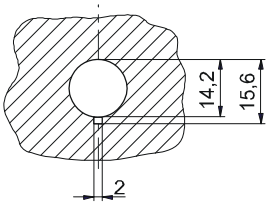
Large flange
4 241 1600 0



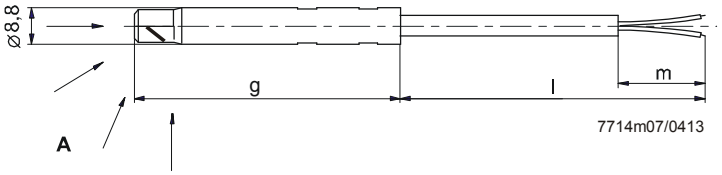
Clamp
4 186 1096 0



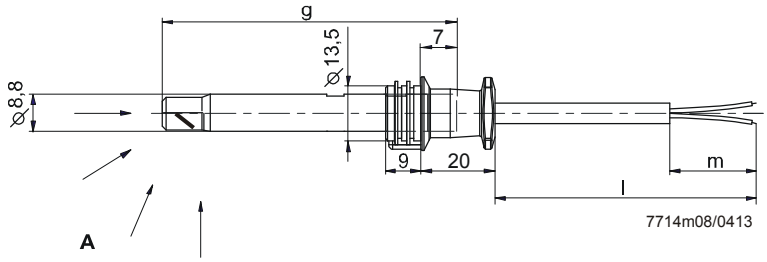
Mounting hole
at burner chassis



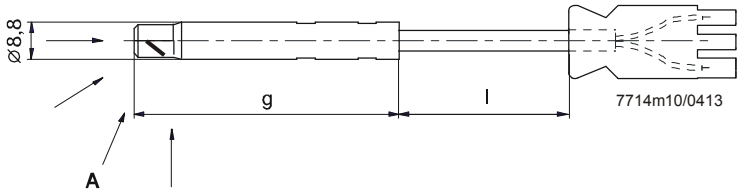
QRB1...A without plug



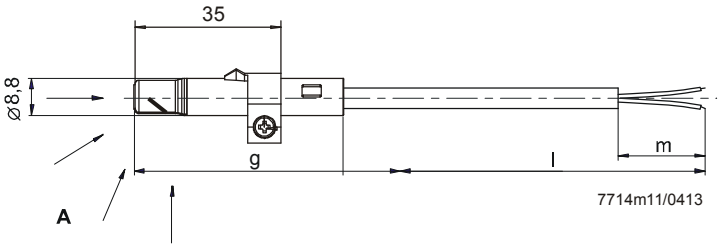
QRB1...B with plug



QRB1... with connector AGK53.0



QRB1x-xxxxxxxH with clamp

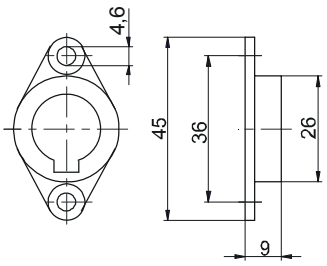


Dimension (cont'd)

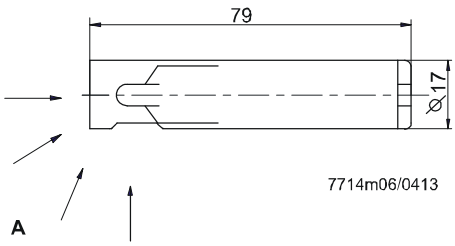
Dimensions in mm

QRB3...

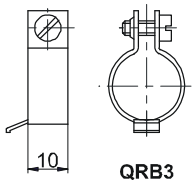
4 286 1490 0



QRB3



4 186 8806 0



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Subject to change!