

## Infrared Flicker Detector

**Flame monitoring device for  
oil and/or gas flames**

**With a row of 5 LED indicators and  
adjustable sensitivity**

### INTRODUCTION

The IRD 810 or 820 is employed to monitor the flame of an oil and/or gas burner. This flame monitoring device should be connected to a Satronic oil or gas burner control box. Monitoring is based on the infra-red flicker principle, in other words, the flickering infra-red light of the flame is detected. The steady radiation from, for example, the glowing refractory layer on the inside of the boiler, has no effect on the detector. The detectors are also available in 110 V versions or in an industrial version which has a particularly robust and water-proof detector probe.

### TYPES AVAILABLE

IRD 810	No potential difference at working contact 4-pole connection
IRD 820	With simulation of ionisation current For 3-pole connection to Satronic gas burner control boxes

### CONSTRUCTIONAL FEATURES

The monitoring device consists of the detector probe and the electronics. The infra-red sensor and the pre-amplifier are hermetically sealed in glass and along with the electronics form an integral part of the flame detector.

The indicator control unit contains a mains transformer and a relay which transmits the flame signal to the appropriate control box via a working contact which carries no other potential difference. Signal strength is indicated by a row of 5 LED's. Beside the LED's is a potentiometer for infinitely variable adjustment of the sensitivity.

A fixed cable runs between the flame detector and the indicator control unit. This cable must not be disconnected. Power is supplied through either a 3 or 4-core cable (live, neutral and flame signal).



### TECHNICAL DATA

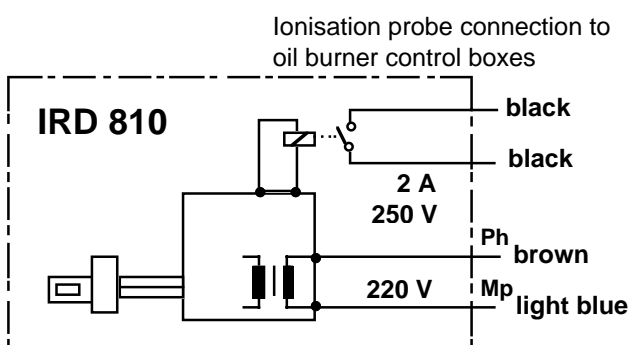
Supply voltage	220 / 240 V (-15... +10%) 50 Hz (40 - 60 Hz)
Power consumption	2 VA
Max. current output terminal	2 A, 250 V
Permissible ambient temp.	-20° to +60° C
Insulation standard	IP 41
Mounting attitude	any
Weight	250 g
Flame viewing attitude	side-on and end-on
Spectral response	800 - 1100 nm
Max. sensitivity	950 nm
Frequency range	15 - 150 Hz
Max. sensitivity	30 Hz
Response time	0,1 sec.
Cancelling time	0,5 sec.
Cable length, detector - indicator ctrl. unit	
Normal version	0,5 m
Industrial version	1,0 m

## TECHNICAL FEATURES

1. Oil and/or gas flames can be monitored.
2. The flame detector and indicator control unit are suitable for operation where the ambient temperature lies within the range  $-20^{\circ}$  to  $+60^{\circ}$  C. (Please contact the manufacturer for information on higher temperatures.)
3. The working contact carries no potential difference, allowing the flame signal to be transmitted over large distances.
4. The influence of possible stray light during the pre-purge phase or the intensity of the flame when the burner is operating is indicated by the row of 5 LED's. The status of the relay is visible at any time.
5. Sensitivity is adjustable.
6. The compact dimensions of the detector allow it to be installed on any burner.
7. The industrial version differs from the normal version by having a larger, robust, absolutely waterproof detector.
8. Unlike UV tubes, the IRD 810/820 flicker detector does not deteriorate with age.

## INSTALLATION INSTRUCTIONS

1. The detector probe should be fitted so that it receives the light which pulsates most strongly. This can be achieved by positioning the detector as close as possible to the flame or by directing it at a particular zone of the flame.
2. No stray light must be allowed to fall on the detector (e.g. through cracks or from a sight glass). Pulsating stray light (e.g. from fluorescent lighting or light bulbs) could cause the system to switch to lockout.
3. The infra-red flicker detector should be fitted in such a way that the ambient temperature cannot under any circumstances rise above  $60^{\circ}$  C. At higher temperatures, there is a risk of incorrect operation and the life expectancy of the unit could be reduced. In addition, care should be taken that the detector is not subjected to unusually harsh vibration and receives no hard knocks.
4. The cable connecting the detector with the indicator control unit must not be disconnected. It must not, therefore, be shortened or lengthened.



## FAULT FINDING

### 1. LED's light up during the pre-purge phase (control box switches to lockout):

- a) Stray light
- b) Ignition spark visible to detector (only oil burners)  
Correct by preventing direct sight of ignition spark or install Satronic high-frequency ignition transformer.
- c) Interference from ignition cable (lay cables some distance apart)
- d) Live and neutral wired incorrectly
- e) Burner not earthed/grounded
- f) Detector or indicator control unit defective

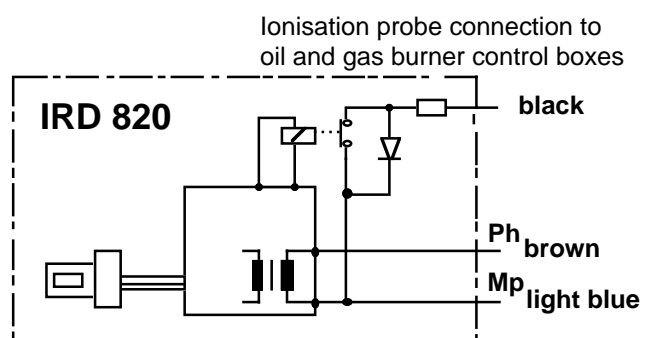
## COMMISSIONING AND MAINTENANCE

During commissioning and after servicing, the flame monitoring system should be checked for faultless operation as follows:

1. Check that the detector is connected properly. Wrong connections are a risk to safety, and could cause damage to the detector unit or burner system.
2. Adjust to maximum sensitivity and start the burner. After the start impulse, no LED should light up during the pre-purge phase.
3. With the system set for normal operation, pull out the detector probe and cover it up to cut off light. The LED indicators must go out. The control box should switch to lockout or attempt to restart the sequence.
4. Attempt to restart with the flame detector covered. There must be no indication from the LED's. The burner control box must switch to lockout at the end of the safety interval.
5. Attempt to start the burner with the detector exposed to stray light e.g. from fluorescent lighting, a cigarette lighter or light bulb (not daylight!). Depending on the type of control box, it should switch to lockout either immediately or at the end of the pre-purge, as a result of stray light.
6. Re-insert the detector into its mount. When the burner is operating normally, carefully turn back the sensitivity control until only one LED is lit. The control box must switch to lockout or restart the sequence.
7. Adjust the sensitivity to maximum. When the burner is operating normally, turn back the sensitivity control until only 4 LED's light continuously.

We recommend this method of adjustment, because in this way, changes in the burner settings, dirty detector probe etc. or also the influence of stray light, can be detected very easily. (The internal relay is activated when 2 LED's light.)

The flame detection device requires no maintenance of any kind, and as it is classed as safety equipment, no attempt should be made to open the housing. The LED indicators should be checked visually at regular intervals. If a lower signal strength is indicated, it could mean that the burner settings have changed or that dirt and dust have reduced the amount of light reaching the detector.



### 2. No indication from LED's after establishment of flame:

- a) Incorrect or faulty wiring
- b) Detector probe incorrectly installed („sees“ no light)
- c) Detector is dirty
- d) Sensitivity set at minimum
- e) Detector probe or indicator control unit defective

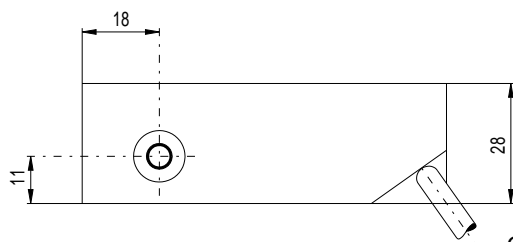
**CONNECTING THE IRD 810 TO SATRONIC OIL BURNER CONTROL BOXES (PHOTO-CELL CONNECTION)**

Control box type corresponding terminal no.	IRD 810 - cable core colours				max. cable length IRD to control box (m)	
	brown	light blue	black	black	multiple cables	laid separately
TF 801	9	8	1	2	2	10
TF 802	9	8	1	2	2	10
TF 830	9	8	1	2	2	10
TF 832	9	8	1	2	2	10
TF 834	9	8	1	2	2	10
TMO 720- 4	20	8	1	2	2	200

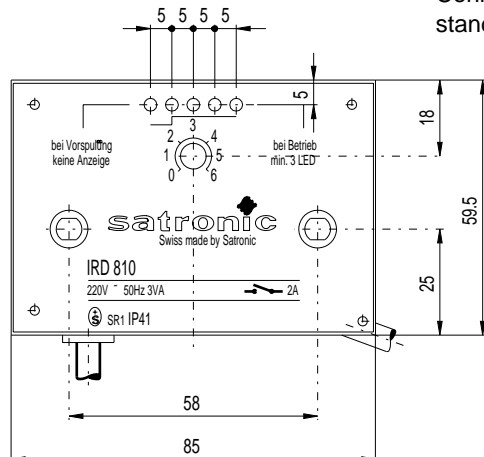
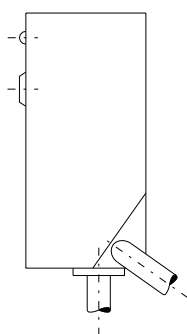
**CONNECTING THE IRD 820 TO SATRONIC OIL BURNER CONTROL BOXES (IONISATION PROBE CONNECTION)**

Control box type corresponding terminal no.	IRD 820 - cable core colours				max. cable length IRD to control box (m)	
	brown	black	light blue		multiple cables	laid separately
MMI 810	9	2	8		2	200
MMI 812	9	2	8		2	200
MMG 810	9	2	8		2	200
TMG 740-2 / 740-3	20	1	8		2	200

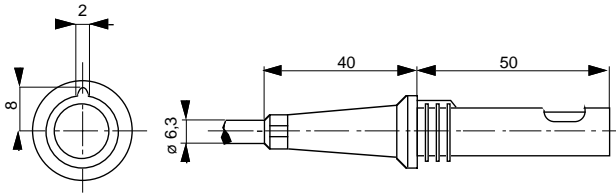
**IRD 810 AND 820 DETECTOR**



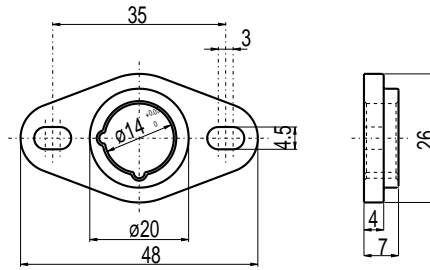
Connection to burner control box, standard cable length 0.5 m



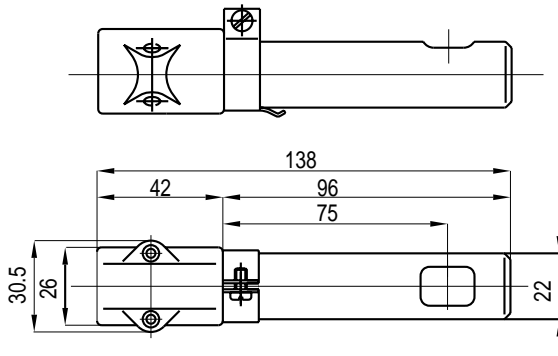
**IRD 810 AND 820 DETECTORS  
NORMAL VERSION**



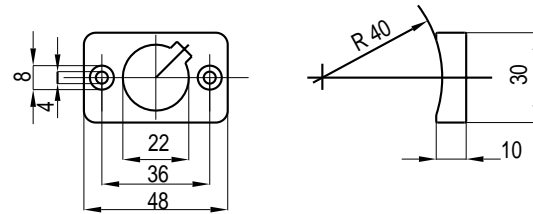
**M 74 DETECTOR MOUNT  
NORMAL VERSION**



**IRD 810 AND 820 DETECTORS  
INDUSTRIAL VERSION**



**DETECTOR MOUNT  
INDUSTRIAL VERSION**



**ORDERING INFORMATION**

ITEM	DESIGNATION	ITEM NO.
Flame detector	IRD 810	16001
Flame detector	IRD 820	16201
Flame detector	IRD 810 Industrial	16002
Flame detector	IRD 820 Industrial	16202
Flame detector	IRD 810 110 volts	16021
Flame detector	IRD 820 110 volts	16221
Flame detector holder	FZ Holder M 68	59068
Flame detector holder	FZ Holder M 74	59074
Flame detector holder	FZ Holder M 75	59075
Holder	Industrial, UVZ + FZ	18807

The above ordering information refers to the standard version.  
Spezial versions are also included in our product range.

Specifications subject to change without notice.

**IRD 810 / 820**

**satronic**

A Honeywell Company

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