Gas burner automatic safety control

For 2-stage forced draught and gas burners

Possible flame detectors:
- Ionization probe
- Infrared flicker detector

INTRODUCTION

The gas burner automatic safety control MMI controls and monitors blown gas- and combined burners of any nominal thermal load (tested and certified according to EN 298).
The automatic safety controls MMI 810.1 models 13, 33 and 35 can also be utilized for burners on fixed hot air heaters (Direct air heaters according to DIN 4794).
Various types and model designations differentiate the automatic safety controls with respect to the programme times, as well as with regard to differing national standards.

TYPES AVAILABLE

MMI 810.1	Mod. 13 *	Art. Nr. 0620720
	Mod. 33	Art. Nr. 0620220
	Mod. 35	Art. Nr. 0620920
	Mod. 43	Art. Nr. 0622520
	Mod. 55	Art. Nr. 0621320
MMI 811.1	Mod. 35	Art. Nr. 0621120
	Mod. 63	Art. Nr. 0620420

* Must only be used on boilers or other applications where the 10 second pre-purge time is sufficient to provide at least 3 volume changes of the combustion chamber.

CONSTRUCTIONAL FEATURES

The automatic control is housed in a non-inflammable, transparent, plug-in type plastic case and contains:
- Synchronous motor with speed reducer gears as the drive for the switching cam
- Switching cam with informative programme display in colour
- 12 times cam drive for controlling the programme sequence
- Plug-in type circuit boards with the electronic components

The following important indicating - and operating elements are located on the front panel of the automatic control:
- Illuminated pushbutton for indication of malfunctions and reset
- Programme display in colour
- Screw for central mounting

TECHNICAL DATA

Operating voltage	220 / 240 V (-15... +10%) 50 Hz (50 - 60 Hz)
Differing frequency	Results in a proportional deviation of the time.
Rating fuse	max. 10 A rapid, 6 A slow
Power consumption	10 VA
Max. load per output:	
- term. 3	2A, cos φ 0.2
- term. 4, B	2A, cos φ 0.4
- term. 5, 6	1A, cos φ 0.4
total load	5A, cos φ 0.4
Amplifier sensitivity	1 µA
Minimum required Ionization current	5 µA
Flame detector cable	max. 20 m cable length
Air pressure monitor	working contact 4 A, 230 V
Waiting time for malfunction remedy	None
Flame detector	
- Ionization probe	
- Infrared flicker detector	IRD 1020
Weight, incl. base	350 g
Mounting position	any
Insulation standard	IP 44
Admissible ambient temperature for controller and flame detector	-20° C... +60° C
Classified acc. to EN 298	BTLLXN

program timings (sec.)		MMI 810.1					811.1	
Modell		13	33	35	43	55	35	63
Waiting time at start ca.	tw	6	9	9	9	9	9	6
Max. reaction time for air proving switch	tlw	3.5	6	6	6	17	6	5
Pre-purge time	tv1	3	24	24	40	20	24	55
Pre-ignition time	tvz	2	3	3	3	15	3	3
T. ignition time	tz	5	6	8	6	20	8	5.5
Safety time	ts	3	3	5	3	5	5	3
Time delay term.6/term.C	tv2	6	10	10	10	10	10	6

For external resetting, the remote reset device FR 870 (art. No. 70700) can be utilized. (Refer to doc. 750).

APPLICATION TECHNOLOGY FEATURES

1. Flame Monitoring

The flame monitoring can be effected with the following flame detectors:

- With ionization electrodes in power grids with earthed neutral conductor, utilizable with gas burners (interference effects of the ignition spark cannot influence the formation of the flame signal).
- With infrared flicker detector type IRD 1020 for all types of burners.

2. Burner Control

– The burner controls features a low-voltage protection. If the supply voltage dropps below 160 V during operation, the burner switches-off. When the supply voltage raises above 180 V, the burner performs a restart independently.
– The automatic burner controls MMI only operate, when a load is connected to terminal 5. If the fuel valve is interrupted by an external contact during the pre-purging phase, a resistance of max. 22 kW, 4 Watt has to be applied bet-ween the terminals 5 and 8.
– Functional test of the air pressure monitor before the startup and monitoring of the air pressure during the pre-purging time, as well as in the operating condition of the burner. For normal applications a working contact with a power rating of 4 A / 230 V is sufficient.
– In the case of the automatic control MMI 810.1, contacts can be installed between the terminals 1 and 9 (e.g., valve limit position contacts). These are checked for their correct closing position when the unit is started up. The connection 1 - 9 has to be closed during the starting phase of the automatic control.

3. Safety

With respect to design and programme sequence, the gas burner automatic safety controls of the MMI type range comply with the currently applicable European standards and regulations.

4. Mounting and Electrical Installation

On the base:

– 3 earth conductor terminals with additional strap for the earthing of the burner.
– 3 neutral conductor terminals with an internal, fixed connection to the neutral conductor input, terminal 8.
– 2 individual slide-in plates and 2 fixed knock-out apertures with thread PG 11, as well as 2 knock-out apertures from below, make the wiring of the base more easy.

General:

– Mounting position as required, insulation standard IP 44 (splash-proof). The automatic control and sensor should, however, not be exposed to excessive vibration.
– During mounting and installation, the applicable regulations for installation have to be observed.

COMMISSIONING AND SERVICE/MAINTENANCE

1. Important Remarks

– Before commissioning, the wiring has to be accurately checked. Faulty wiring can damage the unit and endanger the safety of the installation.
– The mains fuse has to be selected so that the limit values indicated under "Technical Specifications" are under no circumstances exceeded. Non-compliance with this regulation can have very serious consequences for the control unit and for the installation in the case of a short-circuit.
– For safety reasons, at least one control shut-down per 24 hours must be assured.
– The control unit must be plugged-in or -out only when the mains supply has been disconnected.
– Automatic burner safety controls are safety devices and must not be opened.

2. Functional Check

During commissioning and after an overhaul of the burner, the following checks have to be carried out:

a) Starting test with closed manual valve and bridged gas monitor contact:
   – The device must go into a fault condition after the safety period has elapsed.
b) Close the manual valve in operating position with the gas monitor contact bridged.
   – The device must go into a fault condition after a flame failure.
c) Air pressure monitor contact interrupted:
   – Device goes into a fault condition.
d) Bridge air pressure monitor contact before starting:
   – Device must not start.

3. Trouble Shooting

Burner does not go into operation, programme indication remains:

– Electrical connection defective.
– Thermostat or gas monitor "OFF".

Burner does not go into operation, programme indication rotates continuously:

– Air pressure monitor defective, respectively, not in starting position. (Working contact must be open).
– Connection term. 1 - term. 9 interrupted
– mains voltage < 180V

The automatic control switches to fault condition shortly after the start of the pre-purge time (line within the blue zone):

– Air pressure monitor contact does not close.
– No load on terminal 5.
– Flame signal.

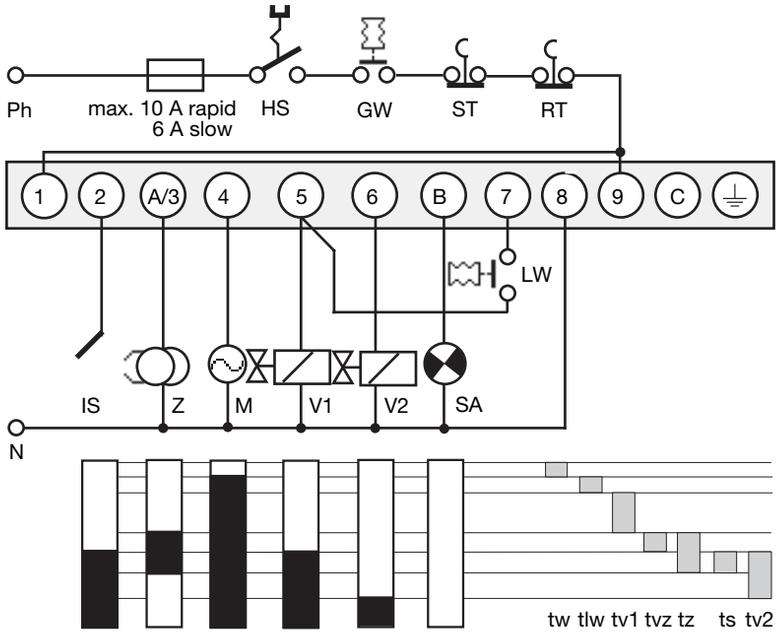
Automatic control switches to fault condition during the pre-purging (blue zone):

– No flame formation (ignition missing, valve does not open, etc.)
– No flame signal or too weak flame signal (flame does not adhere, poor insulation of the flame detector, burner not properly connected to the earth conductor).

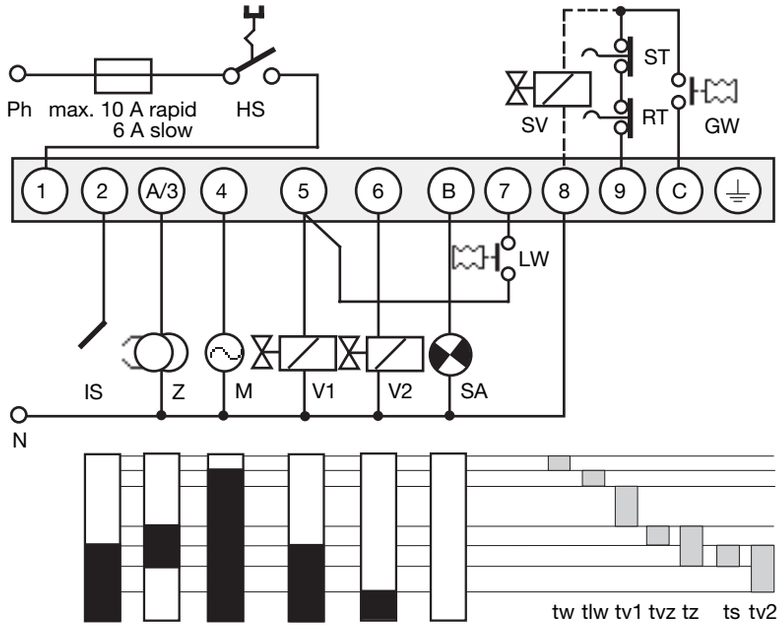
Automatic control switches to fault condition during the operating position (red, resp. green zone):

– Flame lift-off
– Air pressure monitor contact opens
– Flame signal too weak.

SCHEMATIC CONNECTION DIAGRAM AND PROCESS DIAGRAM MMI 810.1

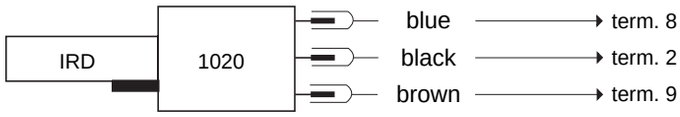


SCHEMATIC CONNECTION DIAGRAM AND PROCESS DIAGRAM MMI 811.1

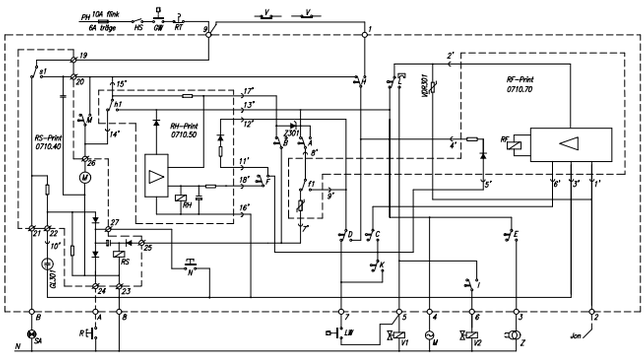


HS	Main switch
GW	Gas pressure switch
ST	Limit thermostat
RT	Control thermostat
IS	Ionization probe
Z	Ignition
M	Burner motor
V1	Solenoid valve 1st stage
V2	Solenoid valve 2nd stage
LW	Air pressure monitor
SA	External fault indication
SV	Safety valve
tw	Waiting time at start-up
tlw	Max. reaction time for air proving switch
tv1	Pre-purge time
tvz	Pre-ignition time
tz	Total ignition time
ts	Safety time
tv2	Time delay term.6 / term.C

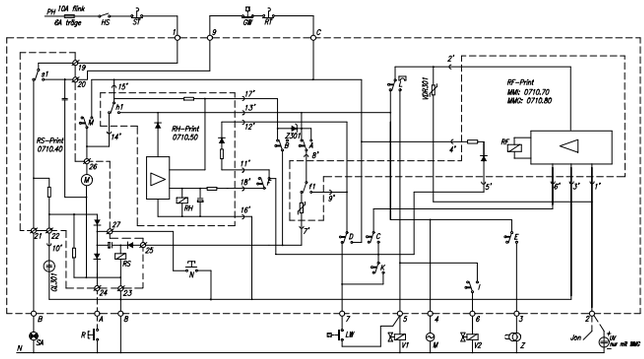
IRD CONNECTION



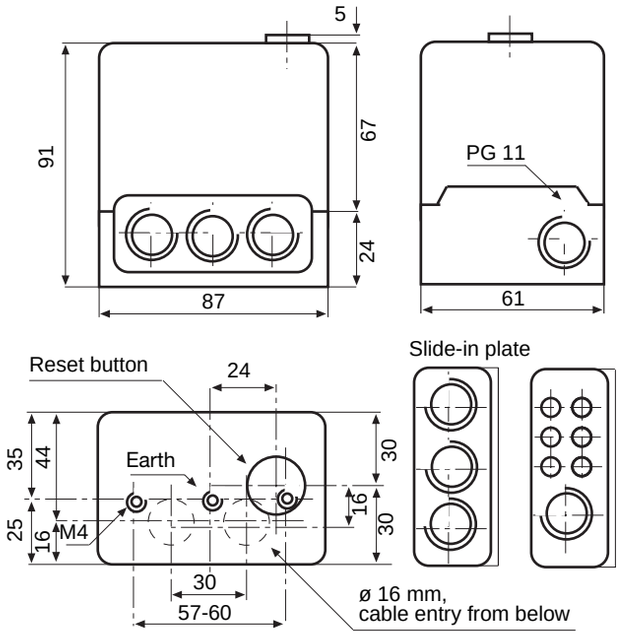
SCHEMATIC DIAGRAM MMI 810.1



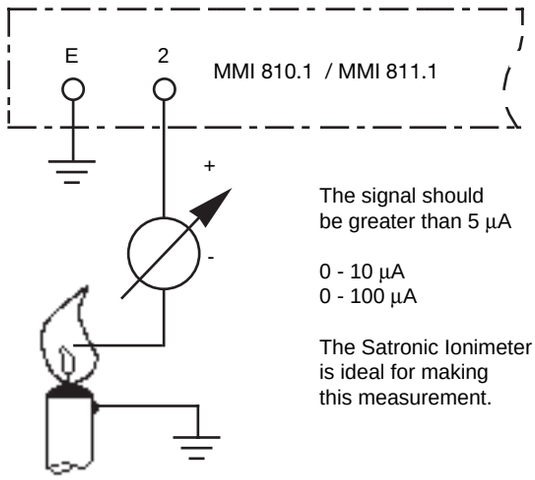
SCHEMATIC DIAGRAM MMI 811.1



MMI WITH BASE



MEASUREMENT OF THE FLAME SIGNAL

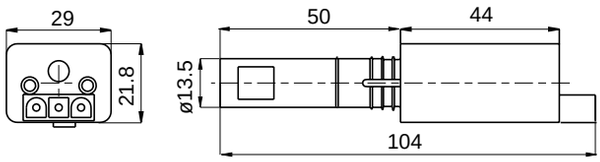


The signal should be greater than 5 µA

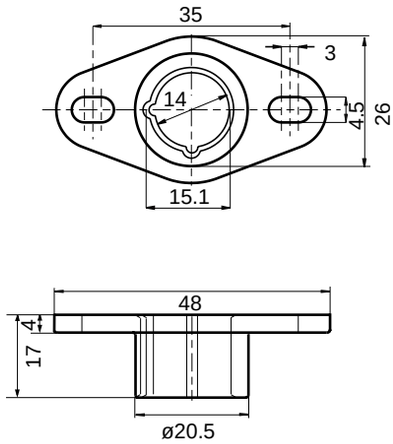
0 - 10 µA
0 - 100 µA

The Satronic Ionimeter is ideal for making this measurement.

IRD 1020



HOLDER M93



ORDERING INFORMATION

ITEM	DESIGNATION	ITEM NO.
Control unit	Type MMI 810.1 mod. 33	0620220
or	Type MMI 811.1 mod. 35	0621120
Base for MMI 810.1	Base 701 TTG-EN	70101
Base for MMI 811.1	Base 710 TTG-FN	70102
Slide-in plate	PG-plate	70502
optionally	Cable clamping plate	70501
Flame detector	IRD 1020 end-on viewing	16522
Flame detector	IRD 1020 side-on left	16523
Flame detector	IRD 1020 side-on right	16521
IRD mounting flange	IRD Holder M93	59093
Flame detector cable	3-wire, 0.6 m	7236001

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

Specifications subject to change without notice.

Satronic AG
Brüelstrasse 7
Postfach 324
CH-8157 Dielsdorf

Gas burner automatic safety control

For 2-stage forced draught gas burners
Facility to connect an air damper unit

Possible flame detectors:
- Ionization probe
- Infrared flicker detector

INTRODUCTION

The gas burner automatic safety control MMI 812 controls and monitors blown gas- and combined burners of any nominal thermal load (tested and certified according to EN 298).
If an air damper unit is connected, a 2-stage operation with two fuel valves or a modulating operation with one fuel valve is possible.
Various types and model designations differentiate the automatic safety controls with respect to the programme times, as well as with regard to differing national standards.

TYPES AVAILABLE

MMI 812.1	Modell 23	Art. Nr. 06223
MMI 812	Modell 33	Art. Nr. 06205

CONSTRUCTIONAL FEATURES

The automatic control is housed in a non-inflammable, transparent, plug-in type plastic case and contains:
- Synchronous motor with speed reducer gears as the drive for the switching cam
- Switching cam with informative programme display in colour
- 10 times cam drive for controlling the programme sequence
- Plug-in type circuit boards with the electronic components

The following important indicating - and operating elements are located on the front panel of the automatic control:
- Illuminated pushbutton for indication of malfunctions and reset
- Programme display in colour
- Screw for central mounting

TECHNICAL DATA

Operating voltage	220 / 240 V (-15... +10%) 50 Hz (40 - 60 Hz)
Differing frequency	Results in a proportional deviation of the time.
Rating fuse	max. 10 A rapid, 6 A slow
Power consumption	10 VA
Max. load per output	4 A
Overall	6 A
Amplifier sensitivity	1 µA
Minimum required Ionization current	5 µA
Flame detector cable	max. 20 m cable length
Air pressure monitor	1 working contact 4 A, 230 V
Waiting time for malfunction remedy	None
Flame detector - Ionization probe - Infrared flicker detector	 IRD 1020
Weight, incl. base	350 g
Mounting position	Any
Insulation standard	IP 44
Admissible ambient temperature for controller and flame detector	-20° C... +60° C
Classified acc. to EN 298	BTLLXN

program timings (sec.)		MMI 812.1	MMI 812
Modell		23	33
Waiting time at start-up	tw	8	5
Max. reaction time for air proving switch	tlw	15	18
Pre-purge time	tv1	30	42
LK open signal	tlk	36	49
Pre-ignition time	tvz	3	3
Total ignition time	tz	5.5	5.5
Safety time	ts	3	3
Time delay term.6 / term.C	tv2	6	6

For external resetting, the remote reset device FR 870 (art. No. 70700) can be utilized. (Refer to doc. 750).

APPLICATION TECHNOLOGY FEATURES

1. Flame Monitoring

The flame monitoring can be effected with the following flame detectors:
- With ionization electrodes in power grids with earthed neutral conductor, utilizable with gas burners (interference effects of the ignition spark cannot influence the formation of the flame signal).
- With infrared flicker detector type IRD 1020 for all types of burners.

2. Burner Control

- The automatic burner controls MMI only operate, when a load is connected to terminal 5. If the fuel valve is interrupted by an external contact during the pre-purging phase, a resistance of max. 22 kΩ, 4 Watt has to be applied between the terminals 5 and 8.
- Functional test of the air pressure monitor before the startup and monitoring of the air pressure during the pre-purging time, as well as in the operating condition of the burner. For normal applications a working contact with a power rating of 4 A / 230 V is sufficient.
- In the case of the automatic control MMI 810, contacts can be installed between the terminals 1 and 9 (e.g., valve limit position contacts). These are checked for their correct closing position when the unit is started up. The connection 1 - 9 has to be closed during the starting phase of the automatic control.
- No fuel valve must be connected to terminal 6.

3. Safety

With respect to design and programme sequence, the gas burner automatic safety controls of the MMI type range comply with the currently applicable European standards and regulations.

4. Mounting and Electrical Installation

On the base:
- 3 earth conductor terminals with additional strap for the earthing of the burner.
- 3 neutral conductor terminals with an internal, fixed connection to the neutral conductor input, terminal 8.
- 2 individual slide-in plates and 2 fixed knock-out apertures with thread PG 11, as well as 2 knock-out apertures from below, make the wiring of the base more easy.

General:
- Mounting position as required, insulation standard IP 44 (splash-proof). The automatic control and sensor should, however, not be exposed to excessive vibration.
- During mounting and installation, the applicable regulations for installation have to be observed.

COMMISSIONING AND SERVICE/MAINTENANCE

1. Important Remarks

- Before commissioning, the wiring has to be accurately checked. Faulty wiring can damage the unit and endanger the safety of the installation.
- The mains fuse has to be selected so that the limit values indicated under "Technical Specifications" are under no circumstances exceeded. Non-compliance with this regulation can have very serious consequences for the control unit and for the installation in the case of a short-circuit.
- For safety reasons, at least one control shut-down per 24 hours must be assured.
- The control unit must be plugged-in or -out only when the mains supply has been disconnected.
- Automatic burner safety controls are safety devices and must not be opened.

2. Functional Check

During commissioning and after an overhaul of the burner, the following checks have to be carried out:

a) Starting test with closed manual valve and bridged gas monitor contact:
   -The device must go into a fault condition after the safety period has elapsed.

b) Close the manual valve in operating position with the gas monitor contact bridged.
   -The device must go into a fault condition after a flame failure.

c) Air pressure monitor contact interrupted:
   -Device goes into a fault condition.

d) Bridge air pressure monitor contact before starting:
   -Device must not start.

3. Trouble Shooting

Burner does not go into operation, programme indication remains:
- Electrical connection defective.
- Thermostat or gas monitor "OFF".

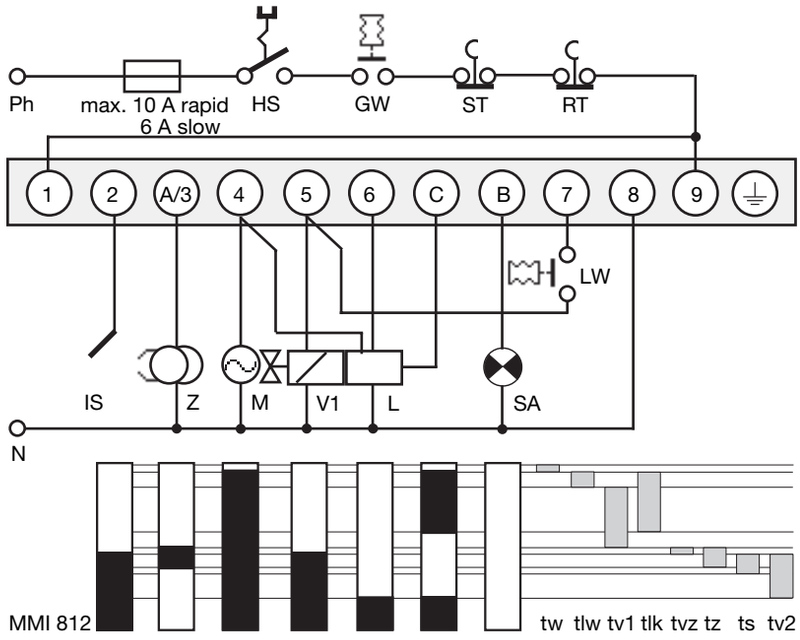
Burner does not go into operation, programme indication rotates continuously:
- Air pressure monitor defective, respectively, not in starting position. (Working contact must be open).

The automatic control switches to fault condition shortly after the start of the pre-purge time (line within the blue zone):
- Air pressure monitor contact does not close.
- No load on terminal 5.
- Flame signal.

Automatic control switches to fault condition during the pre-purging (blue zone):
- No flame formation (ignition missing, valve does not open, etc.)
- No flame signal or too weak flame signal (flame does not adhere, poor insulation of the flame detector, burner not properly connected to the earth conductor).

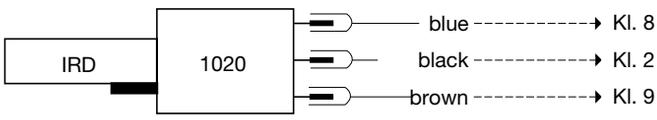
Automatic control switches to fault condition during the operating position (red, resp. green zone):
- Flame lift-off
- Air pressure monitor contact opens
- Flame signal too weak.

SCHEMATIC CONNECTION DIAGRAM AND PROCESS DIAGRAM MMI 812

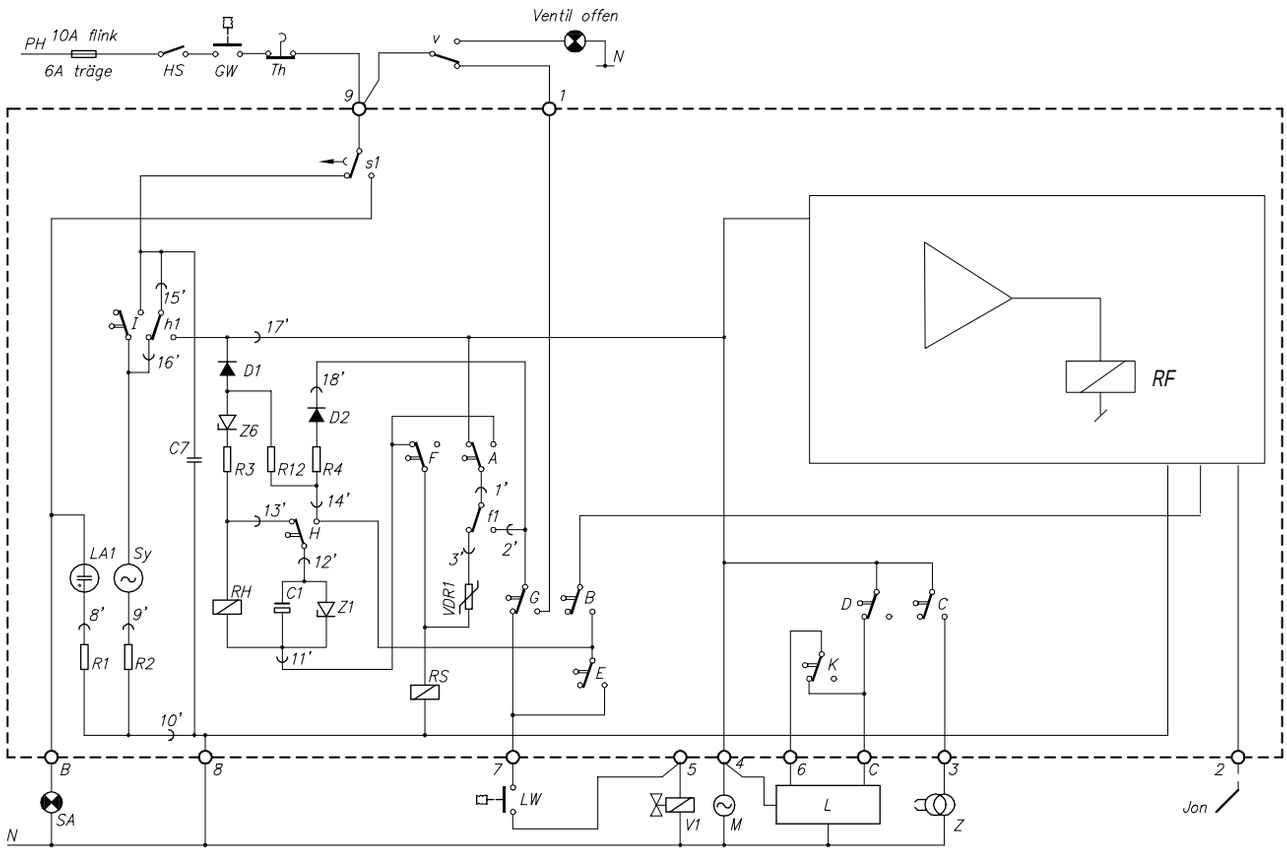


HS	Main switch
GW	Gas pressure switch
ST	Limit thermostat
RT	Control thermostat
IS	Ionization probe
Z	Ignition
M	Burner motor
V1	Solenoid valve 1st stage
L	Air damper unit
LW	Air pressure monitor
SA	External fault indication
tw	Waiting time at start-up
tlw	Max. reaction time for air proving switch
tv1	Pre-purge time
tlk	LK open signal
tvz	Pre-ignition time
tz	Total ignition time
ts	Safety time
tv2	Time delay term.6 / term.C

IRD CONNECTION

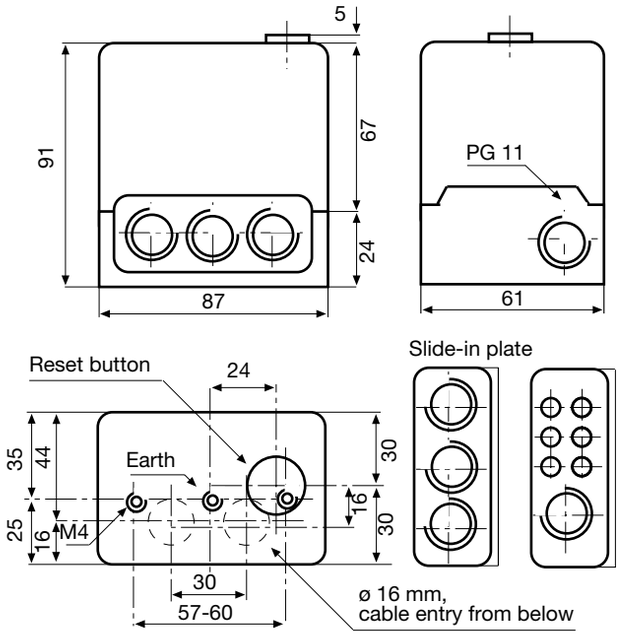


SCHEMATIC DIAGRAM MMI 812

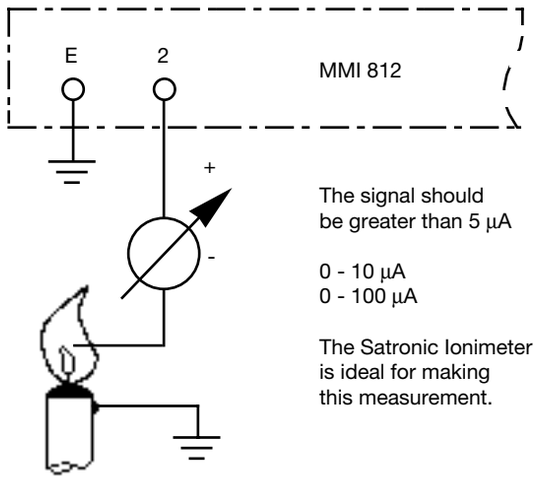


MMI 812

MMI WITH BASE



MEASUREMENT OF THE FLAME SIGNAL

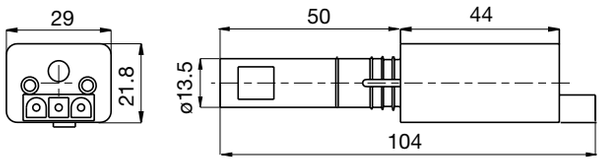


The signal should be greater than 5 µA

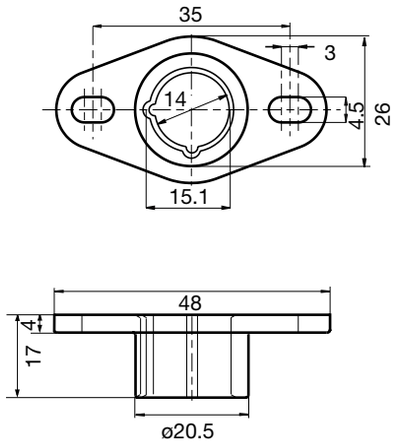
0 - 10 µA
0 - 100 µA

The Satronic Ionimeter is ideal for making this measurement.

IRD 1020



HOLDER M93



ORDERING INFORMATION

ITEM	DESIGNATION	ITEM NO.
Control unit	Type MMI 812.1 mod. 23	06223
or	Type MMI 812 mod. 33	06205
Base for MMI 811	Base 710 TTG-FN	70102
Slide-in plate	PG-plate	70502
optionally	Cable clamping plate	70501
Flame detector	IRD 1020 end-on viewing	16522
Flame detector	IRD 1020 side-on left	16523
Flame detector	IRD 1020 side-on right	16521
IRD mounting flange	IRD Holder M93	59093
Flame detector cable	3-wire, 0.6 m	7236001

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

Specifications subject to change without notice.

Satronic AG
Brüelstrasse 7
Postfach 324
CH-8157 Dielsdorf

Gas burner automatic safety control

For 2-stage forced draught gas burners
Designated for an air damper control

Possible flame detectors:
- Ionization probe
- Infrared flicker detector

INTRODUCTION

The gas burner automatic safety control MMI 813.1 controls and monitors blown gas- and combined burners of any nominal thermal load (tested and certified according to EN 298).
Together with an air damper motor, a 2-stage burner with 2 fuel valves, a 2-stage operation with 1 fuel valve or a modulating system ave possible.

CONSTRUCTIONAL FEATURES

The automatic control is housed in a non-inflammable, transparent, plug-in type plastic case and contains:
- Synchronous motor with speed reducer gears as the drive for the switching cam
- Switching cam with informative programme display in colour
- 12 times cam drive for controlling the programme sequence
- Plug-in type circuit boards with the electronic components

The following important indicating - and operating elements are located on the front panel of the automatic control:
- Illuminated pushbutton for indication of malfunctions and reset
- Programme display in colour
- Screw for central mounting

TECHNICAL DATA

Operating voltage	220 / 240 V (-15... +10%)
	50 Hz (50 - 60 Hz)
Differing frequency	results in a proportional deviation of the time.
Rating fuse	max. 10 A rapid, 6 A slow
Power consumption	10 VA
Max. current per output	
term. 3	2A, cos φ 0.2
term. 4, B	2A, cos φ 0.4
term. 5, 6, C	1A, cos φ 0.4
Total load	5A, cos φ 0.4
Amplifier sensitivity	1 µA
Minimum required Ionization current	5 µA
Flame detector cable	max. 20 m cable length
Air pressure monitor	1 working contact 4 A, 220 V
Waiting time for malfunction remedy	none
Running time air damper for 90°	max. 15 sec.
Flame detector	
- Ionization probe	
- Infrared flicker detector	IRD 1020
Weight, incl. base	350 g
Mounting position	any
Insulation standard	IP 44
Admissible ambient temperature for controller and flame detector	-20° C... +60° C
Classification acc. EN 298	BTLLXN

Automatic Control		MMI 813.1
Model		23
Waiting time at start approx.	tw	9
Maximum reaction time of air pressure monitor	tlw	10
Pre-purge time	tv1	34
Air damper open signal during pre-purge	tlk	36.5
Pre-ignition time	tvz	3
Ignition time, overall	tz	6
Ignition safety time	ts	3
Delay time terminal 6	tv2	6

For external resetting, the remote reset device FR 870 (art. No. 70700) can be utilized. (Refer to documentation 750).

APPLICATION TECHNOLOGY FEATURES

1. Flame Monitoring

The flame monitoring can be effected with the following flame detectors:

- With ionization electrodes in power grids with earthed neutral conductor, utilizable with gas burners (interference effects of the ignition spark cannot influence the formation of the flame signal).
- With infrared flicker detector type IRD 1020 for all types of burners.

2. Burner Control

- The burner controls features a low-voltage protection. If the supply voltage dropps below 160 V during operation, the burner switches-off. When the supply voltage raises above 180 V, the burner performs a restart independently.
- The automatic burner controls MMI only operate, when a load is connected to terminal 5. If the fuel valve is interrupted by an external contact during the pre-purging phase, a resistance of max. 22 kW, 4 Watt has to be applied bet-ween the terminals 5 and 8.
- Functional test of the air pressure monitor before the startup and monitoring of the air pressure during the pre-purging time, as well as in the operating condition of the burner. For normal applications a working contact with a power rating of 4 A / 220 V is sufficient.
- In the case of the automatic control MMI 813.1, contacts can be installed between the terminals 1 and 9 (e.g., valve limit position contacts). These are checked for their correct closing position when the unit is started up. The connection 1-9 has to be closed during the starting phase of the automatic control.

3. Safety

With respect to design and programme sequence, the gas burner automatic safety controls of the MMI type range comply with the currently applicable European standards and regulations.

4. Mounting and Electrical Installation

Wiring base:

- 3 earth terminals with additional terminal for burner earthing
- 3 neutral terminals with internal permanent connection to neutral terminal 8
- 2 independant spare terminals (S1 and S2)
- extra terminals A, B and C are standard
- 2 slide-in plates and 2 easy knock out holes (PG11 thread) plus 2 knock out holes in the base bottom faciliate the base wiring

General:

- Mounting position as required, insulation standard IP 44 (splash-proof). The automatic control and sensor should, however, not be exposed to excessive vibration.
- During mounting and installation, the applicable regulations for installation have to be observed.

COMMISSIONING AND SERVICE/MAINTENANCE

1. Important Remarks

- Before commissioning, the wiring has to be accurately checked. Faulty wiring can damage the unit and endanger the safety of the installation.
- The mains fuse has to be selected so that the limit values indicated under "Technical Specifications" are under no circumstances exceeded. Non-compliance with this regulation can have very serious consequences for the control unit and for the installation in the case of a short-circuit.
- For safety reasons, at least one control shut-down per 24 hours must be assured.
- The control unit must be plugged-in or -out only when the mains supply has been disconnected.
- Automatic burner safety controls are safety devices and must not be opened.

2. Functional Check

During commissioning and after an overhaul of the burner, the following checks have to be carried out:

a) Starting test with closed manual valve and bridged gas monitor contact:
   - The device must go into a fault condition after the safety period has elapsed.

b) Close the manual valve in operating position with the gas monitor contact bridged.
   - The device must go into a fault condition after a flame failure.

c) Air pressure monitor contact interrupted:
   - Device goes into a fault condition.

d) Bridge air pressure monitor contact before starting:
   - Device must not start.

3. Trouble Shooting

Burner does not go into operation, programme indication remains:

- Electrical connection defective
- Thermostat or gas monitor "OFF"

Burner does not go into operation, programme indication rotates continuously:

- Air pressure monitor defective, respectively, not in starting position. (Working contact must be open).
- Connection term. 1 - term. 9 interrupted
- mains voltage < 180V

The automatic control switches to fault condition shortly after the start of the pre-purge time (line within the blue zone):

- Air pressure monitor contact does not close
- No load on terminal 5
- Flame signal

Automatic control switches to fault condition during the pre-purge (blue zone):

- Air pressure monitor contact open
- Flame signal (stray light)

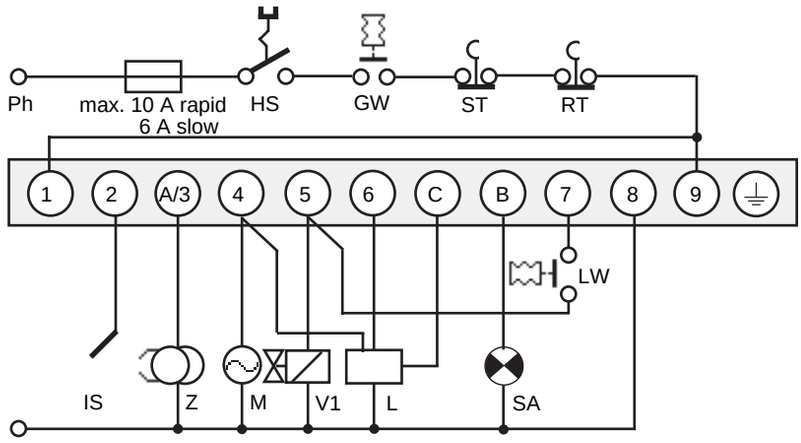
Automatic control switches to fault condition during the safety time (yellow zone):

- No flame formation (ignition missing, valve does not open, etc.)
- No flame signal or too weak flame signal (flame does not adhere, poor insulation of the flame detector, burner not properly connected to the earth conductor).

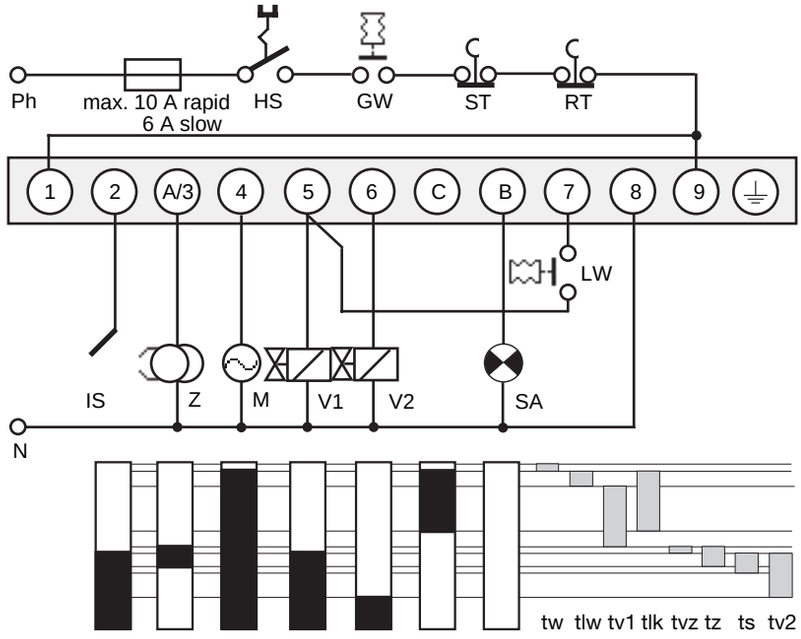
Automatic control switches to fault condition during the operating position (red, resp. green zone):

- Flame lift-off
- Air pressure monitor contact opens
- Flame signal too weak.

SCHEMATIC CONNECTION DIAGRAM AND PROCESS DIAGRAM MMI 813.1 WITH AIR DAMPER CONTROL

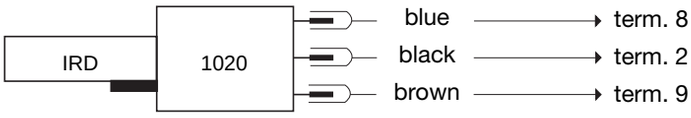


WITHOUT AIR DAMPER CONTROL

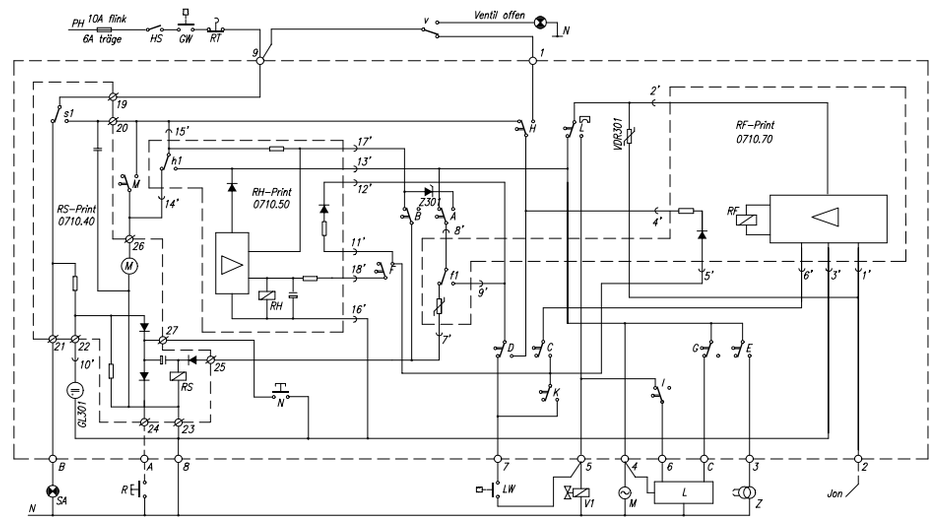


HS	Main switch
GW	Gas pressure switch
ST	Limit thermostat
RT	Control thermostat
IS	Ionization probe
Z	Ignition
M	Burner motor
V1	Solenoid valve 1st stage
V2	Solenoid valve 2nd stage
L	Air damper control unit
LW	Air pressure monitor
SA	External fault indication
tw	Waiting time at start-up
tlw	max. reaction time of air pressure monitor
tv1	Pre-purge period
tlk	Air damper open signal during pre-purge
tvz	Pre-ignition period
tz	Overall ignition period
ts	Safety period
tv2	Time delay terminal 6

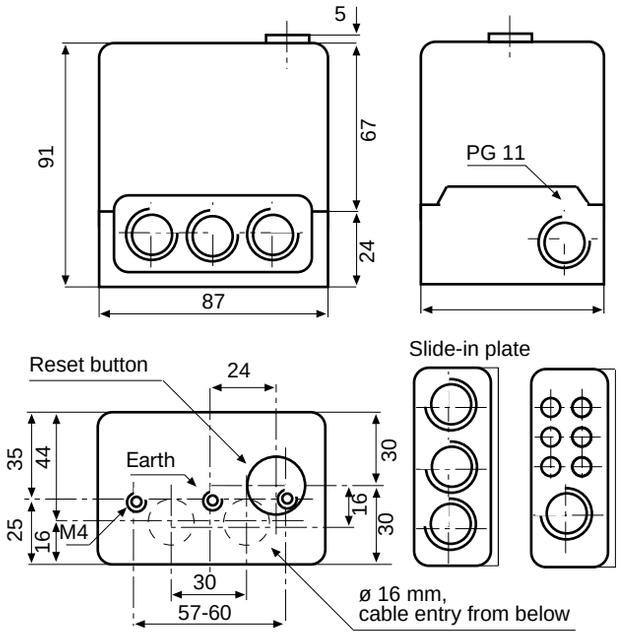
IRD CONNECTION



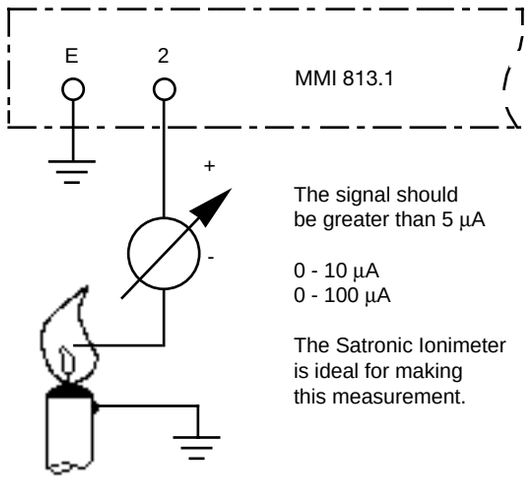
SCHEMATIC DIAGRAM MMI 813.1



MMI WITH BASE



MEASUREMENT OF THE FLAME SIGNAL

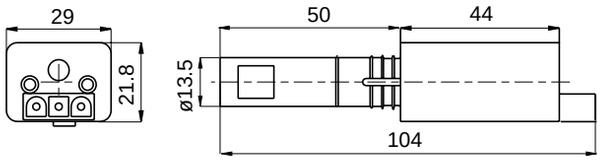


The signal should
be greater than 5 µA

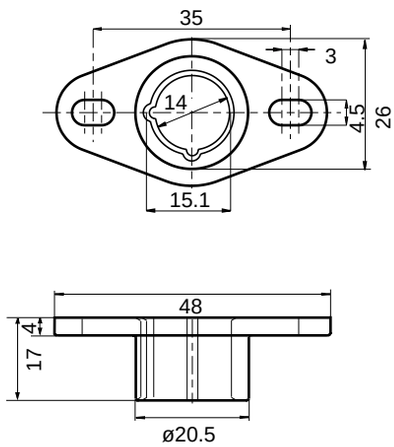
0 - 10 µA
0 - 100 µA

The Satronic Ionimeter
is ideal for making
this measurement.

IRD 1020



HOLDER M93



ORDERING INFORMATION

ITEM	DESIGNATION	ITEM NO.
Control unit	Type MMI 813.1 mod. 23	0622220
Base for MMI 813.1 (without air damper)	Wiring base 701 TTG-EN	70101
Base for MMI 813.1 (with air damper)	Wiring base S 98	75310
Slide-in plate	PG-plate	70502
optionally	Cable clamping plate	70501
Flame detector	IRD 1020 end-on viewing	16522
Flame detector	IRD 1020 side-on left	16523
Flame detector	IRD 1020 side-on right	16521
IRD mounting flange	IRD Holder M93	59093
Flame detector cable	3-wire, 0.6 m	7236001

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

Specifications subject to change without notice.

Satronic AG
Brüelstrasse 7
Postfach 324
CH-8157 Dielsdorf

Gasfeuerungsautomat

**Für atmosphärische Gasbrenner
bis max. 350 kW Nennleistung 2-stufig**

Mögliche Flammenfühler:
- Ionisationssonde
- Infrarot-Flackerdetektor

ANWENDUNGSBEREICH

Der Gasfeuerungsautomat MMI 815 steuert und überwacht atmosphärische Gasbrenner.

AUFBAU UND KONSTRUKTION

Die Automatik ist gut geschützt in einem schwer entflammbaren, transparenten und steckbaren Kunststoffgehäuse eingebaut und beinhaltet:
- Synchronmotor mit Untersetzungsgetriebe als Schaltwalzenantrieb
- Schaltwalze mit informativer, farbiger Programmanzeige
- 10-fach Nockenschaltwerk zur Steuerung des Programmablaufs
- Steckbare Printplatten mit den elektronischen Komponenten

Folgende wichtige Anzeige- und Bedienungselemente sind auf der Frontseite des Automaten zusammengefasst:
- Leuchttaste für Störanzeige und Entriegelung
- Farbige Programmanzeige
- Schraube zur Zentralbefestigung

TECHNISCHE DATEN

Betriebsspannung	220 / 240 V (-15... +10%) 50 Hz (40 - 60 Hz)
Abweichende Frequenz	ergibt proportionale Abweichung der Zeit
Vorsicherung	max. 10 A flink, 6 A träge
Eigenverbrauch	10 VA
Max. Belastung pro Ausgang	4 A
Total	6 A
Empfindlichkeit Verstärker	1 µA
Min. erforderlicher Ionisationsstrom	5 µA
Leitung Flammenfühler	max. 20 m Kabellänge
Wartezeit für Entstörung	keine
Flammenfühler	
- Ionisationssonde	
- Infrarot-Flackerdetektor	IRD 1020
Gewicht inkl. Sockel	350 g
Einbaulage	beliebig
Schutzart	IP 44
Zugelassene Umgebungstemperatur für	
Gerät und Flammenfühler	-20° C… +60° C

Automat	MMI 815	
Modell	5	10
Wartezeit Start ca.	17	17
Vorspülzeit	-	-
Vorzündzeit	4	4
Zündzeit total	8	13
Sicherheitszeit	5	<9
Verzög. 2. Stufe	15	15

Zur externen Entriegelung kann die Fernrückstellung FR 870 (Art. Nr.70700) eingesetzt werden.

ANWENDUNGSTECHNISCHE MERKMALE

1. Flammenüberwachung

Die Flammenüberwachung kann mit folgenden Flammenfühlern erfolgen:
- Mit Ionisationselektrode in Netzen mit geerdetem Nulleiter, anwendbar bei Gasbrennern (Störeinflüsse des Zündfunkens können die Bildung des Flammensignals nicht beeinflussen)
- Mit Infrarot-Flackerdetektor Typ IRD 1020 für alle Brennerarten

2. Sicherheit

Bezüglich Konstruktion und Programmablauf entsprechen die Feuerungsautomaten der Typenreihe MMI den zur Zeit geltenden europäischen Normen und Vorschriften.

3. Montage und Elektroinstallation

Sockelseitig:
- 3 Erdleiterklemmen mit zusätzlicher Lasche für die Brennererdung
- 3 Nulleiterklemmen mit interner, fester Verbindung zum Nulleitereingang Klemme 8
- 2 individuelle Einschiebeplatten und 2 feste Ausbruchöffnungen mit Gewinde PG 11, sowie 2 Ausbruchöffnungen von unten erleichtern die Sockelverdrahtung.

Allgemein:
- Einbaulage beliebig, Schutzart IP 44 (spritzwassersicher). Automat und Fühler sollen jedoch nicht übermässigen Vibrationen ausgesetzt werden.
- Bei der Montage sind die einschlägigen Installationsvorschriften zu beachten.

INBETRIEBNAHME UND UNTERHALT

1. Wichtige Hinweise

- Vor Inbetriebnahme ist die Verdrahtung genau nachzuprüfen. Fehlverdrahtungen können das Gerät beschädigen und die Sicherheit der Anlage gefährden.
- Die Vorsicherung ist so zu wählen, dass die unter den Technischen Daten angegebenen Grenzwerte keinesfalls überschritten werden.
- Das Nichtbeachten dieser Vorschrift kann bei einem Kurzschluss schwerwiegende Folgen für Steuergerät oder Anlage haben.
- Aus sicherheitstechnischen Gründen muss mindestens eine Regelabschaltung pro 24 Std. sichergestellt sein.
- Steuergerät nur spannungslos ein- und ausstecken.
- Feuerungsautomaten sind Sicherheitsgeräte und dürfen nicht geöffnet werden.

2. Funktionskontrolle

Bei der Inbetriebsetzung und nach einer Revision des Brenners sind folgende Kontrollen durchzuführen:

a) Anlaufversuch bei geschlossenem Handventil und überbrücktem Gaswächterkontakt:
   - Gerät muss nach Ablauf der Sicherheitszeit auf Störung gehen.

b) In Betriebstellung bei überbrücktem Gaswächterkontakt das Handventil schliessen:
   - Gerät muss nach Flammenausfall auf Störung gehen.

3. Fehlermöglichkeiten

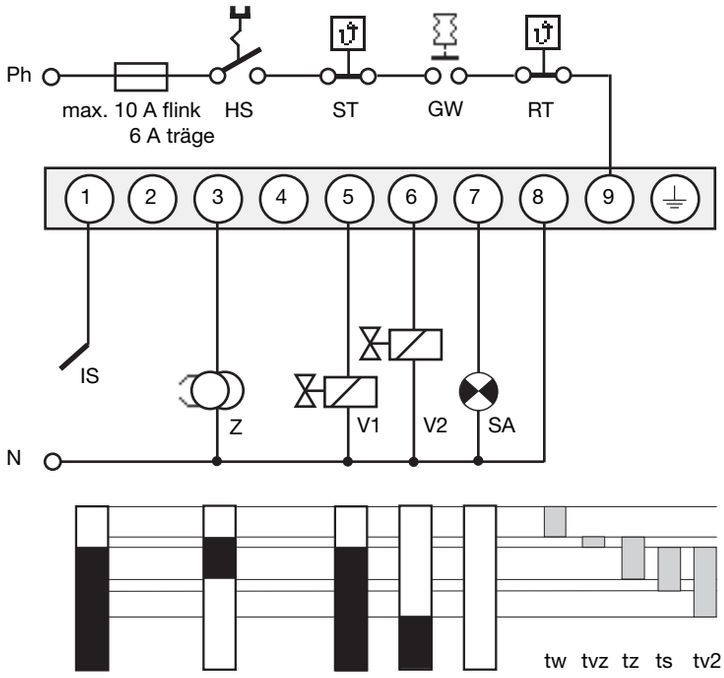
Brenner geht nicht in Betrieb, Programmanzeige bleibt stehen:
- Elektrische Zuleitung fehlerhaft
- Thermostat oder Gaswächter "AUS"

Automat schaltet auf Störung im blauen Feld:
- Flammensignal

Automat schaltet während der Sicherheitszeit auf Störung (gelber Bereich):
- Keine Flammenbildung (fehlende Zündung, Ventil öffnet nicht etc.)
- Kein oder zu schwaches Flammensignal (Flamme haftet nicht, schlechte Isolation des Flammenfühlers, Brenner nicht richtig an Erdleiter angeschlossen).

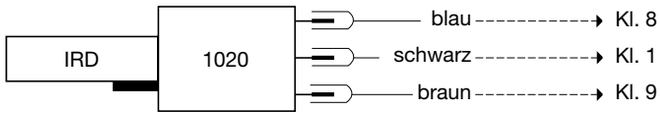
Automat schaltet während der Betriebsstellung auf Störung (roter resp. grüner Bereich):
- Flammenabriss
- Flammensignal zu schwach

ANSCHLUSSSCHEMA UND ABLAUFDIAGRAMM MMI 815

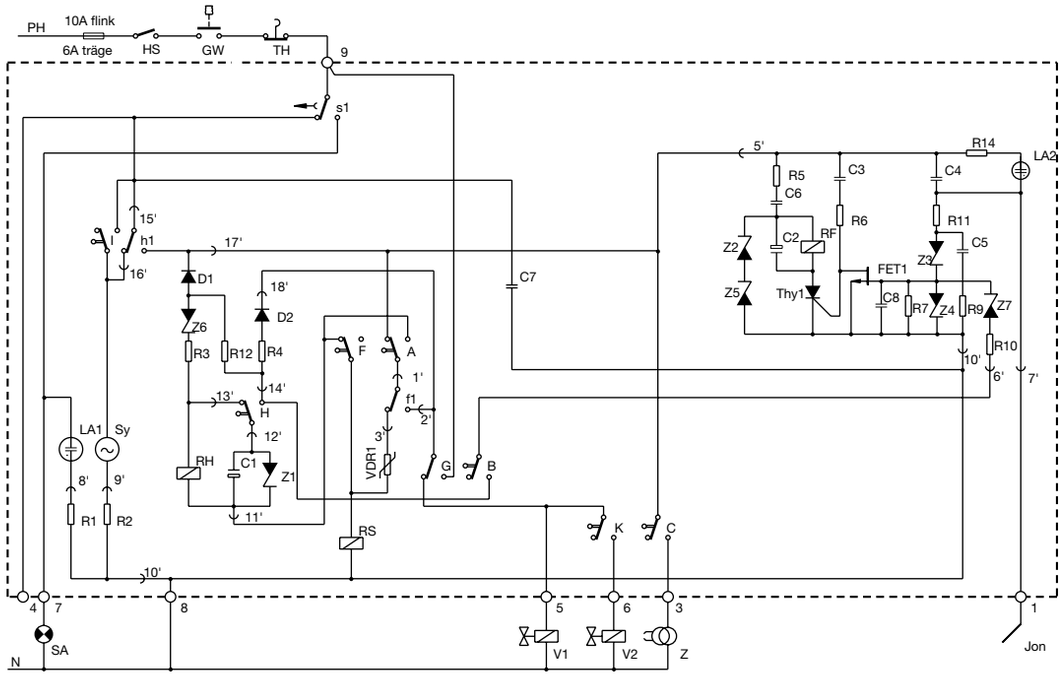


HS	Hauptschalter
GW	Gaswächter
ST	Sicherheitsthermostat
RT	Regelthermostat
IS	Ionisationssonde
V1	Magnetventil 1. Stufe
V2	Magnetventil 2. Stufe
tw	Wartezeit
tvz	Vorzündzeit
tz	totale Zündzeit
ts	Sicherheitszeit
tv2	Verzögerung Ventil 2

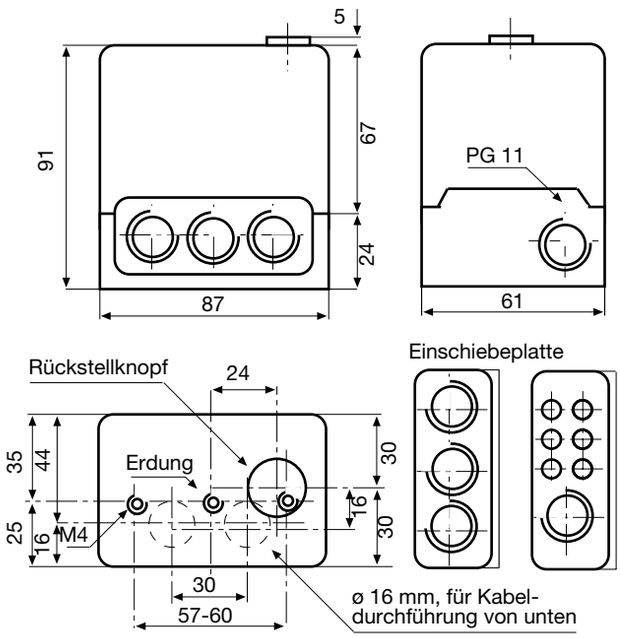
IRD ANSCHLUSS



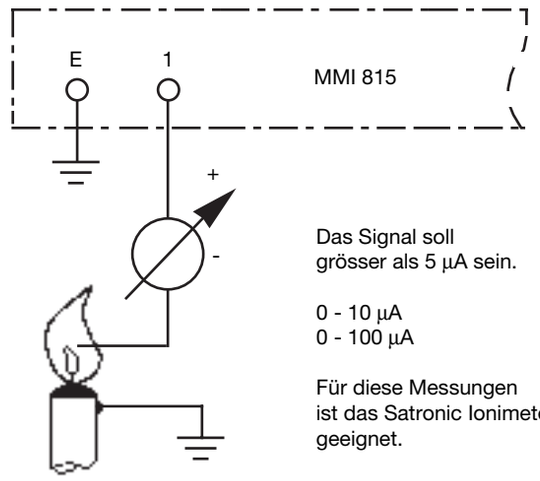
PRINZIPSCHEMA MMI 815



MMI MIT SOCKEL



MESSUNG DES FLAMMENSIGNALS

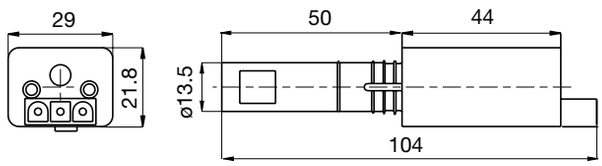


Das Signal soll
grösser als 5 µA sein.

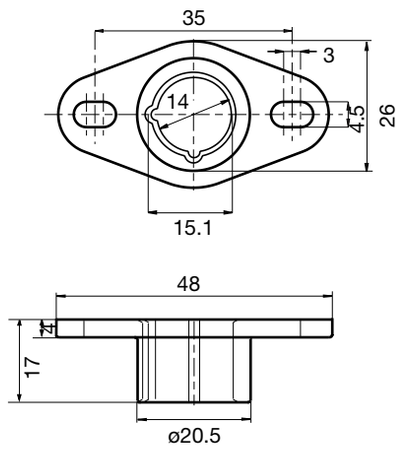
0 - 10 µA
0 - 100 µA

Für diese Messungen
ist das Satronic Ionimeter
geeignet.

IRD 1020



HALTER M93



BESTELLANGABEN

ARTIKEL	BESTELLTEXT	ART. NR.
Steuergerät	Typ MMI 815 Mod. 5	06217
oder	Typ MMI 815 Mod. 10	06218
Sockel für MMI 815	Sockel 701 ABEN	70001
Einschiebeplatte	PG-Platte	70502
wahlweise	Kabelklemmplatte	70501
Flammenfühler	IRD 1020 axial	16522
Flammenfühler	IRD 1020 links	16523
Flammenfühler	IRD 1020 rechts	16521
Halter IRD	Halter M 93 zu IRD 1020	59093
Fühlerkabel	3-polig, 0.6 m	7236001

Obige Bestellangaben beziehen sich auf die Normalausführung.
Das Verkaufsprogramm umfasst auch Spezialausführungen.

Technische Änderungen vorbehalten.

Satronic AG
Brüelstrasse 7
Postfach 324
CH-8157 Dielsdorf

Gasfeuerungsautomat

Für atmosphärische Gasbrenner, 2-stufig, mit Ionisationsüberwachung

Mögliche Flammenfühler:
- Ionisationssonde
- Infrarot-Flackerdetektor

ANWENDUNGSBEREICH

Der Gasfeuerungsautomat MMI 816.1 steuert und überwacht atmosphärische Gasbrenner, mit einem abschaltenden Zündgasventil.

Der Gasfeuerungsautomat MMI 816.1 ersetzt den Typ TFI 716. Eine Umverdrahtung oder Auswechslung des Sockels ist nicht notwendig.

AUFBAU UND KONSTRUKTION

Die Automatik ist gut geschützt in einem schwer entflammbaren, transparenten und steckbaren Kunststoffgehäuse eingebaut und beinhaltet:
- Synchronmotor mit Untersetzungsgetriebe als Schaltwalzenantrieb
- Schaltwalze mit informativer, farbiger Programmanzeige
- 12-fach Nockenschaltwerk zur Steuerung des Programmablaufs
- Steckbare Printplatten mit den elektronischen Komponenten

Folgende wichtige Anzeige- und Bedienungselemente sind auf der Frontseite des Automaten zusammengefasst:
- Leuchttaste für Störanzeige und Entriegelung
- Farbige Programmanzeige
- Schraube zur Zentralbefestigung

Im Montagesockel befinden sich die Anschlußklemmen für die Speisung (220 / 240 V, 50 Hz), die Ionisationssonde, den Zündtrafo, das Zünd- und Hauptgasventil. Der Automat ist mit einem Anschluss für eine externe Störanzeige versehen. Der Automat kann in jeder beliebigen Lage eingebaut werden.

TECHNISCHE DATEN

Betriebsspannung	220 / 240 V (-15... +10%) 50 Hz (50 - 60 Hz)
Vorsicherung	10 A flink, 6 A träge
Eigenverbrauch	10 VA
Max. Belastung pro Ausgang	
- Kl.3	2 A, cos φ 0.2
- Kl. 7	2 A, cos φ 0.4
- Kl. 5, 6	1 A, cos φ 0.4
Total Belastung	5 A, cos φ 0.4
Wartezeit ca.	18 sec.
Vorzündzeit ca.	3 sec.
Zündzeit total ca.	11 sec.
Sicherheitszeit Zündgasventil	10 sec.
Einschaltdauer Zündgasventil ca.	24 sec.
Verzögerung Hauptgasventil ca.	14 sec.
Sicherheitszeit Hauptgasventil	10 sec.
Wartezeit nach Störung	keine
Zugelassene Umgebungstemperatur	-20° C... +60° C
Min. erforderlicher Ionisationsstrom	5 µA
Sondenisolation	>50 MΩ
Max. Länge Ionisationsleitung	20 m
Schutzart	IP 44
Gewicht inkl. Sockel	340 g
Einbaulage	beliebig

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ANWENDUNGSTECHNISCHE MERKMALE

1. Flammenüberwachung

Die Flammenüberwachung erfolgt mittels Ionisationselektrode. Dabei ist besonders auf temperaturfestes Material und gute Isolierung zu achten.
Die Flammenüberwachung mit der Ionisationssonde ist nur in Netzen mit geerdetem Nulleiter möglich.
Mit Infrarot-Flackerdetektor Typ IRD 1020 für alle Brennerarten

2. Brennersteuerung

- Bei Wärmeanforderung erfolgt zuerst eine programmierte Wartezeit von 18 Sekunden. Danach wird die Zündung eingeschaltet und 3 Sekunden später das Zündgasventil.

- Bei Flammenbildung während der ersten Sicherheitszeit wird 14 Sekunden nach Öffnung des Zündgasventiles (Stabilisierung der Zündgasflamme) das Hauptgasventil geöffnet. Das Zündgasventil bleibt jetzt noch 10 Sekunden geöffnet (zweite Sicherheitszeit). Wenn nach Ablauf dieser zweiten Sicherheitszeit keine Hauptflamme vorhanden ist, werden Zünd- und Hauptgasventil sofort geschlossen und der Automat verriegelt.

- Bei Flammenausfall während des Betriebes verriegelt der Automat ebenfalls. Wenn vorzeitig, d.h. während der Wartezeit, ein Flammensignal gemeldet wird, kann die Zündung nicht eingeschaltet, und die Gasventile nicht geöffnet werden, der Automat verriegelt.

- Der Automat MMI 816.1 ist unterspannungssicher ausgelegt. Sinkt die Betriebsspannung, wird bei spätestens 160V der Brenner abgeschaltet. Steigt die Betriebsspannung wieder an, erfolgt bei spätestens 180 V selbsttätig ein neuer Anlauf.

- Nach einer Störung kann der Automat sofort entriegelt werden.

3. Sicherheit

Bezüglich Konstruktion und Programmablauf entsprechen die Feuerungsautomaten der Typenreihe MMI den zur Zeit geltenden europäischen Normen und Vorschriften.

4. Montage und Elektroinstallation

Sockelseitig:
- 3 Erdleiterklemmen mit zusätzlicher Lasche für die Brennererdung
- 3 Nulleiterklemmen mit interner, fester Verbindung zum Nulleitereingang Klemme 8
- 2 individuelle Einschiebeplatten und 2 feste Ausbruchöffnungen mit Gewinde PG11, sowie 2 Ausbruchöffnungen von unten erleichtern die Sockelverdrahtung.

Allgemein:
- Einbaulage beliebig, Schutzart IP 44 (spritzwassersicher). Automat und Fühler sollen jedoch nicht übermässigen Vibrationen ausgesetzt werden.
- Bei der Montage sind die einschlägigen Installationsvorschriften zu beachten.

INBETRIEBNAHME UND UNTERHALT

1. Wichtige Hinweise

- Vor Inbetriebnahme ist die Verdrahtung genau nachzuprüfen. Fehlverdrahtungen können das Gerät beschädigen und die Sicherheit der Anlage gefährden.
- Die Vorsicherung ist so zu wählen, dass die unter den Technischen Daten angegebenen Grenzwerte keinesfalls überschritten werden. Das Nichtbeachten dieser Vorschrift kann bei einem Kurzschluss schwerwiegende Folgen für Steuergerät oder Anlage haben.
- Aus sicherheitstechnischen Gründen muss mindestens eine Regelabschaltung pro 24 Std. sichergestellt sein.
- Steuergerät nur spannungslos ein- und ausstecken.
- Feuerungsautomaten sind Sicherheitsgeräte und dürfen nicht geöffnet werden.

2. Funktionskontrolle

Eine sicherheitstechnische Überprüfung der Flammenüberwachung muss sowohl bei der erstmaligen Inbetriebnahme wie auch nach Revisionen oder längerem Stillstand der Anlage vorgenommen werden

a) Anlaufversuch bei geschlossenem Handventil und überbrücktem Gaswächterkontakt:
   - Gerät muss nach Ablauf der Sicherheitszeit auf Störung gehen.

b) In Betriebstellung bei überbrücktem Gaswächterkontakt das Handventil schliessen:
   - Gerät geht nach Flammenausfall auf Störung.

3. Mögliche Störungsursachen

Achten Sie bei einer Störung immer auf die Position der farbigen Programmanzeige.

- Brenner geht nicht in Betrieb, Walze bleibt stehen:
  –> Elektrische Zuleitung fehlerhaft
  –> Thermostat oder Gaswächter "Aus"

- Automat schaltet während der Wartezeit (blauer Bereich) auf Störung:
  –> Flammensignal

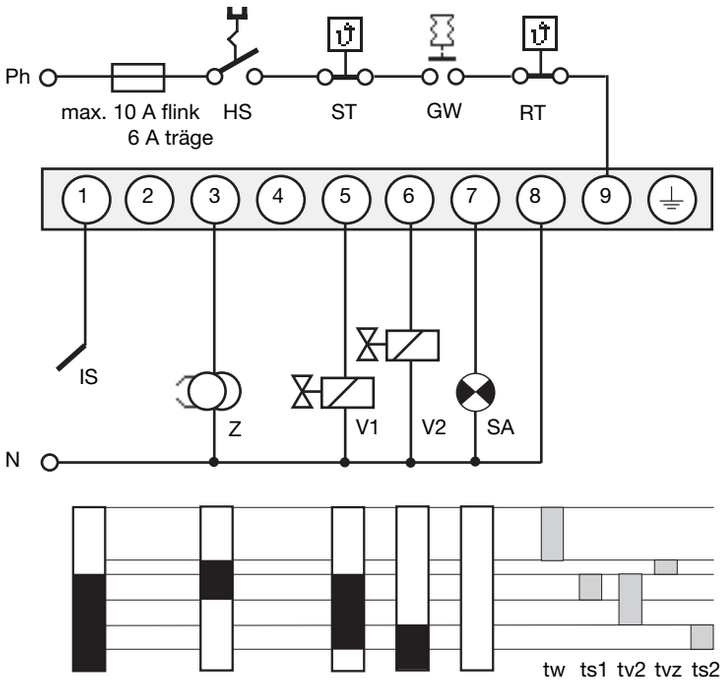
- Automat schaltet während der Sicherheitszeit (Zündgasventil, erster gelber Bereich) auf Störung:
  –> keine Zündgasflamme (fehlende Zündung, Ventil öffnet nicht etc.)
  –> kein oder zu schwaches Flammensignal (Flamme haftet nicht, schlechte Isolation des Flammenfühlers, Brenner nicht richtig an Erdleiter angeschlossen)

- Automat schaltet im roten Bereich auf Störung:
  –> Zündgasflamme instabil, Flammenabriss
  –> Flammensignal zu schwach

- Automat schaltet während der Sicherheitszeit (Hauptgasventil, zweiter gelber Bereich) auf Störung:
  –> keine Hauptgasflamme (Ventil öffnet nicht, Zündung durch Zündgasflamme nicht möglich, ungeeignete Position des Flammenfühlers)
  –> Flammensignal zu schwach

- Automat schaltet während der Betriebstellung (grüner Bereich) auf Störung:
  –> Hauptgasflamme instabil, Flammenabriss
  –> Flammensignal zu schwach

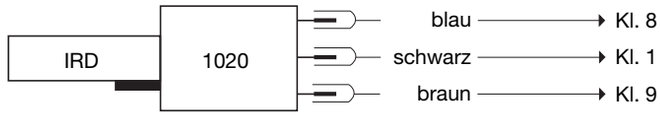
ANSCHLUSSSCHEMA MMI 816.1



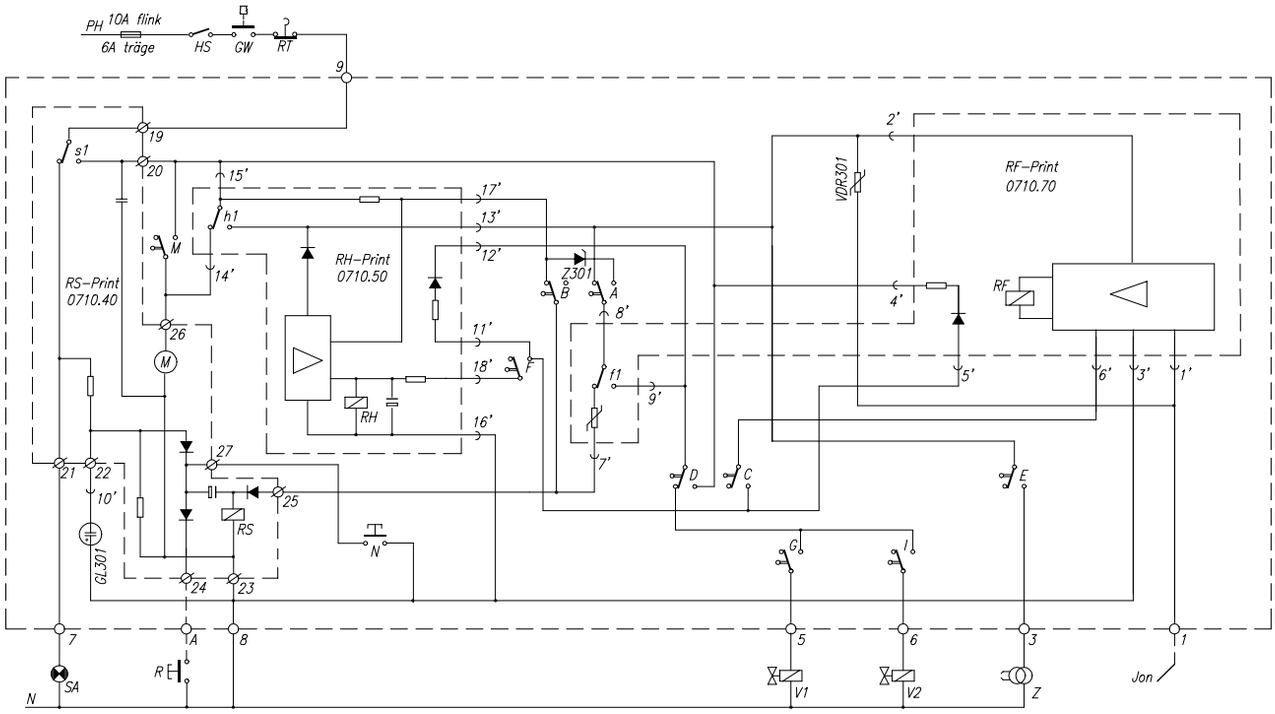
HS	Hauptschalter
GW	Gaswächter
ST	Sicherheitsthermostat
RT	Regelthermostat
IS	Ionisationssonde
Z	Zündtrafo
V1	Zündgasventil
V2	Hauptgasventil
SA	Externe Störanzeige

tw	Wartezeit
ts1	1. Sicherheitszeit
tv2	Verzögerung Hauptventil
tvz	Vorzündzeit
ts2	2. Sicherheitszeit

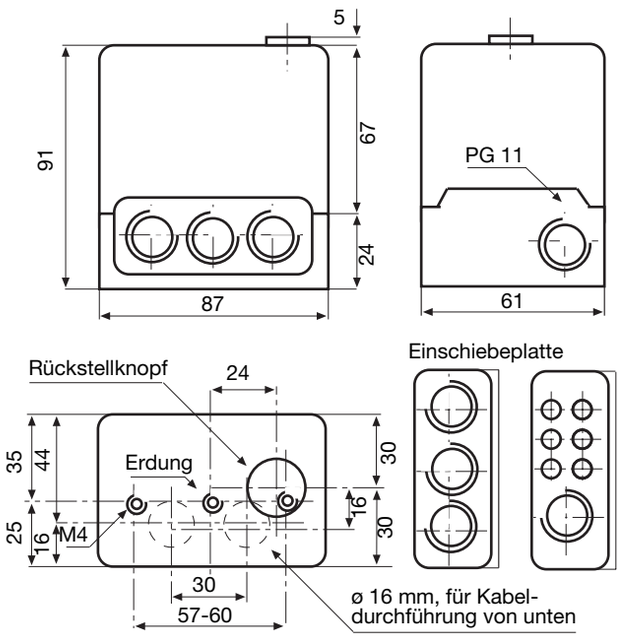
IRD ANSCHLUSS



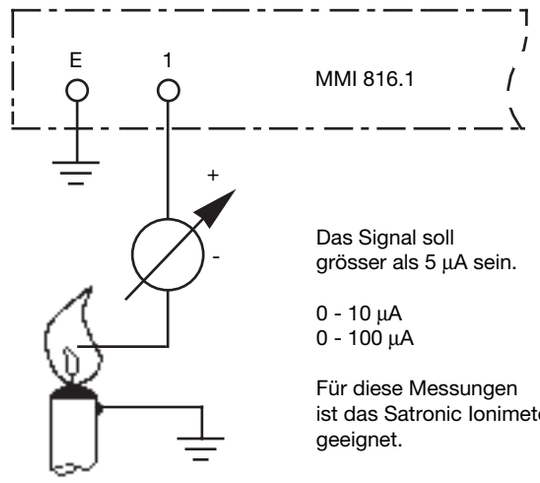
PRINZIPSCHEMA MMI 816.1



MASSBILD MMI 816.1



MESSUNG DES FLAMMENSIGNALES

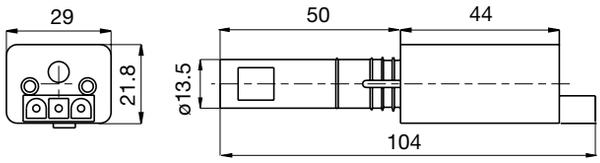


Das Signal soll
grösser als 5 µA sein.

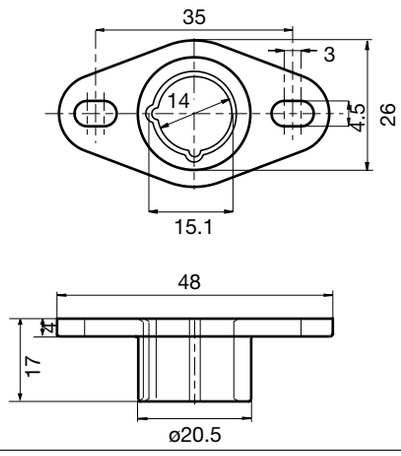
0 - 10 µA
0 - 100 µA

Für diese Messungen
ist das Satronic Ionimeter
geeignet.

IRD 1020



HALTER M93



BESTELLANGABEN

ARTIKEL	BESTELLTEXT	ART. NR.
Feuerungsautomat	MMI 816.1	0621620
Sockel	Typ ABEN	70001
Einschiebeplatte	PG-Platte	70502
wahlweise	Kabelklemmplatte	70501
Flammenfühler	IRD 1020 axial	16522
Flammenfühler	IRD 1020 links	16523
Flammenfühler	IRD 1020 rechts	16521
Halter IRD	Halter M 93 zu IRD 1020	59093
Fühlerkabel	3-polig, 0.6 m	7236001

Obige Bestellangaben beziehen sich auf die Normalausführung.
Das Verkaufsprogramm umfasst auch Spezialausführungen.

Technische Änderungen vorbehalten

Satronic AG
Brüelstrasse 7
Postfach 324
CH-8157 Dielsdorf

Gas burner automatic safety control

For power gas burners
Terminals for air damper motor
Built-in remote reset for lock-outs

Possible flame detectors:
- Ionization probe
- Infrared flicker detector

INTRODUCTION

The gas burner automatic safety control MMI 962.1 controls and monitors blown gas- and combined burners of any nominal thermal load (tested and certified according to EN 298).
If an air damper unit is connected, a 2-stage operation with two fuel valves or a modulating operation with one fuel valve is possible.
Various types and model designations differentiate the automatic safety controls with respect to the programme times, as well as with regard to differing national standards.
The control box type MMI 962.1 Mod. 23 can be used instead of the types MMI 812 Mod. 23 or MMI 812.1 Mod. 23.

CONSTRUCTIONAL FEATURES

The automatic control is housed in a non-inflammable, transparent, plug-in type plastic case and contains:
- Synchronous motor with speed reducer gears as the drive for the switching cam
- Switching cam with informative programme display in colour
- 12 times cam assembly for controlling the programme sequence
- Plug-in type circuit boards with the electronic components

The following important indicating - and operating elements are located on the front panel of the automatic control:
- Illuminated pushbutton for indication of malfunctions and reset
- Programme display in colour
- Screw for central mounting

TECHNICAL DATA

Operating voltage	220 / 240 V (-15... +10%) 50 Hz
Differing frequency	Results in a proportional deviation of the time
Rating fuse	max. 10 A rapid, 6 A slow
Power consumption	10 VA
Max. load per output:	
- term. 3	2A, cos φ 0.2
- term. 4, B	2A, cos φ 0.4
- term. 5, 6, C	1A, cos φ 0.4
total load	5A, cos φ 0.4
Amplifier sensitivity	1 µA
Minimum required Ionization current	5 µA
Flame detector cable	max. 20 m cable length
Air pressure monitor	working contact 4 A, 230 V
Waiting time for malfunction remedy	None
Flame detector	
- Ionization probe	
- Infrared flicker detector	IRD 1020
Weight, incl. base	350 g
Mounting position	any
Insulation standard	IP 44
Admissible ambient temperature for controller and flame detector	-20° C... +60° C
Classified acc. to EN 298	BTLLXN

program timings (sec.)		MMI 962.1
Model		23
Waiting time at start-up	tw	8
Max. reaction time for air proving switch	tlw	15
Pre-purge time	tv1	30
LK open signal	tlk	38
Pre-ignition time	tvz	3
Total ignition time	tz	6.6
Safety time	ts	3
Time delay term.6 / term.C	tv2	8

APPLICATION TECHNOLOGY FEATURES

1. Flame Monitoring

The flame monitoring can be effected with the following flame detectors:
- With ionization electrodes in power grids with earthed neutral conductor, utilizable with gas burners (interference effects of the ignition spark cannot influence the formation of the flame signal).
- With infrared flicker detector type IRD 1020 for all types of burners. (siehe Dok. 746)

2. Burner Control

- The burner controls MMI 962.1 features a low-voltage protection. If the supply voltage dropps below 160 V during operation, the burner switches-off. When the supply voltage raises above 180 V, the burner performs a restart independently.
- The automatic burner controls MMI only operates when a load is connected to terminal 5. If the fuel valve is interrupted by an external contact during the pre-purging phase, a resistance of max. 22 kW, 4 Watt has to be applied bet-ween the terminals 5 and 8.
- Functional test of the air pressure monitor before the startup and monitoring of the air pressure during the pre-purging time, as well as in the operating condition of the burner. For normal applications a working contact with a power rating of 4 A / 230 V is sufficient.
- In the case of the automatic control MMI 962.1, contacts can be installed between the terminals 1 and 9 (e.g., valve limit position contacts). These are checked for their correct closing position when the unit is started up. The connection 1-9 has to be closed during the starting phase of the auto-matic control.
- No fuel valve must be connected to terminal 6.

3. Safety

With respect to design and programme sequence, the gas burner automatic safety controls of the MMI 962 type range comply with the currently applicable European standards and regulations.

4. Mounting and Electrical Installation

Wiring base:
- 3 earth terminals with additional terminal for burner earthing
- 3 neutral terminals with internal permanent connection to neutral terminal 8
- 2 independant spare terminals (S1 and S2)
- extra terminals A, B and C are standard
- 2 slide-in plates and 2 easy knock out holes (PG11 thread) plus 2 knock out holes in the base bottom faciliate the base wiring

General:
- Mounting position as required, insulation standard IP 44 (splash-proof). The automatic control and sensor should, however, not be exposed to excessive vibration.
- During mounting and installation, the applicable regulations for installation have to be observed.

Remote reset for lock-outs:
- For the external reset, a temporary switch (push-button switch) has to be wired between terminals A and Mp.
- The terminal A can be broke-off if not used.

COMMISSIONING AND SERVICE/MAINTENANCE

1. Important Remarks
- Before commissioning, the wiring has to be accurately checked. Faulty wiring can damage the unit and endanger the safety of the installation.
- The mains fuse has to be selected so that the limit values indicated under "Technical Specifications" are under no circumstances exceeded. Non-compliance with this regulation can have very serious consequences for the control unit and for the installation in the case of a short-circuit.
- For safety reasons, at least one control shut-down per 24 hours must be assured.
- The control unit must be plugged-in or -out only when the mains supply has been disconnected.
- Automatic burner safety controls are safety devices and must not be opened.

2. Functional Check
During commissioning and after an overhaul of the burner, the following checks have to be carried out:

a) Starting test with closed manual valve and bridged gas monitor contact:
   - The device must go into a fault condition after the safety period has elapsed.

b) Close the manual valve in operating position with the gas monitor contact bridged.
   - The device must go into a fault condition after a flame failure.

c) Air pressure monitor contact interrupted:
   - Device goes into a fault condition.

d) Bridge air pressure monitor contact before starting:
   - Device must not start.

3. Trouble Shooting
Burner does not go into operation, programme indication remains:
- Electrical connection defective.
- Thermostat or gas monitor "OFF".

Burner does not go into operation, programme indication rotates continuously:
- Air pressure monitor defective, respectively, not in starting position. (Working contact must be open).
- Connection term. 1 - term. 9 interrupted
- mains voltage < 180V

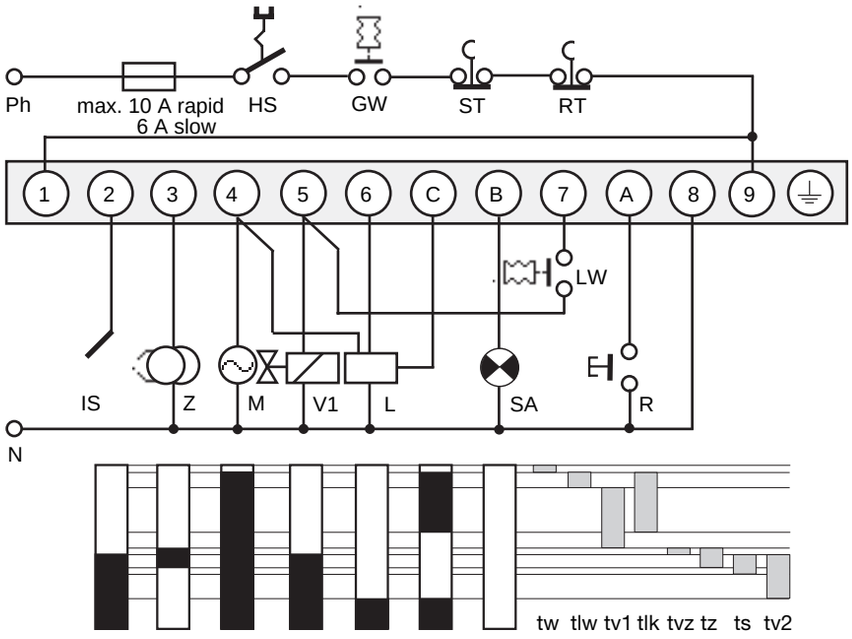
The automatic control switches to fault condition shortly after the start of the pre-purge time (line within the blue zone):
- Air pressure monitor contact does not close.
- No load on terminal 5.
- Flame signal.

Automatic control switches to fault condition during the pre-purging (blue zone):
- Air pressure monitor contact open
- Flame signal (stray light)

Automatic control switches to fault condition during the safety time (yellow zone):
- No flame formation (ignition missing, valve does not open, etc.)
- No flame signal or too weak flame signal (flame does not adhere, poor insulation of the flame detector, burner not properly connected to the earth conductor).

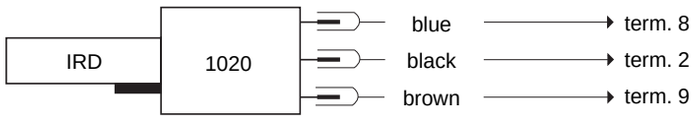
Automatic control switches to fault condition during the operating position (red, resp. green zone):
- Flame lift-off
- Air pressure monitor contact opens
- Flame signal too weak.

SCHEMATIC CONNECTION DIAGRAM AND PROCESS DIAGRAM MMI 962.1

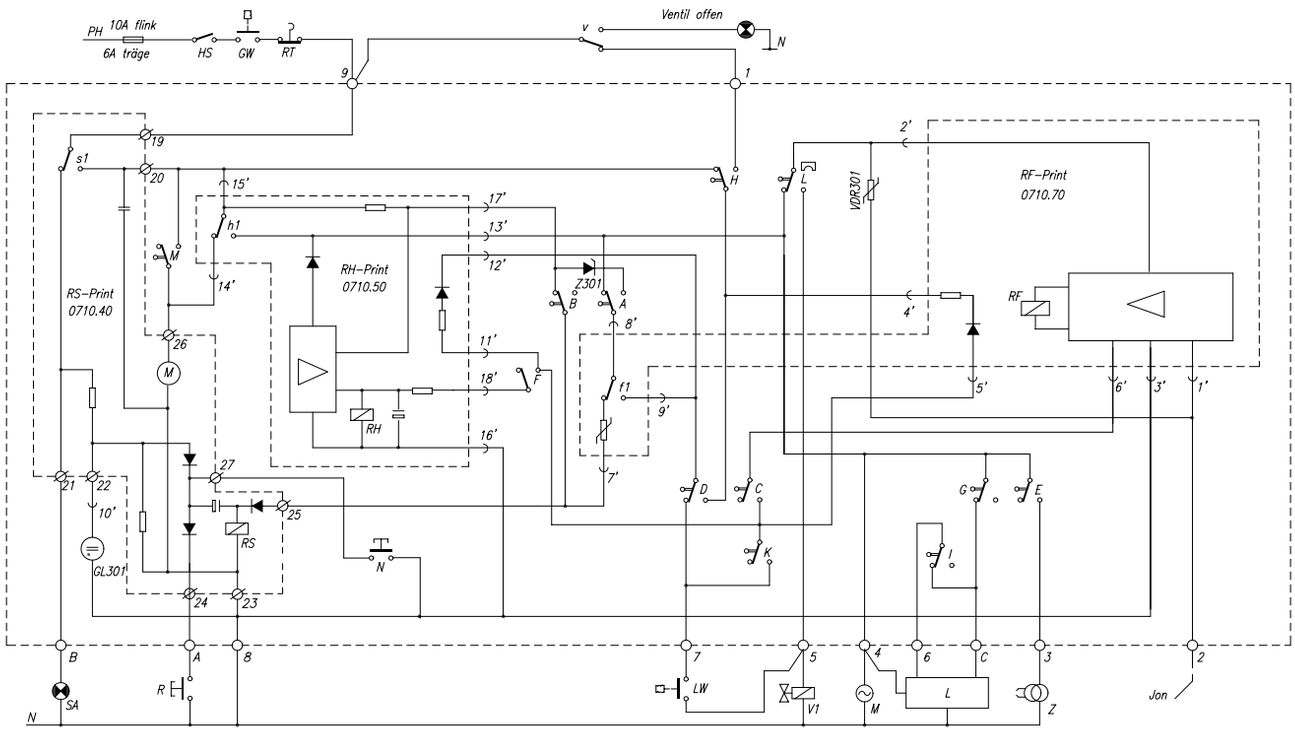


HS	Mains switch
GW	Gas pressure switch
ST	Limit thermostat
RT	Control thermostat
IS	Ionization probe
Z	Ignition
M	Burner motor
V1	Solenoid valve 1st stage
L	Air damper unit
LW	Air pressure monitor
SA	External fault indication
R	Remote reset temporary switch
tw	Waiting time at start-up
tlw	Max. reaction time for air proving switch
tv1	Pre-purge time
tlk	LK open signal
tvz	Pre-ignition time
tz	Total ignition time
ts	Safety time
tv2	Time delay term. 6 / term. C

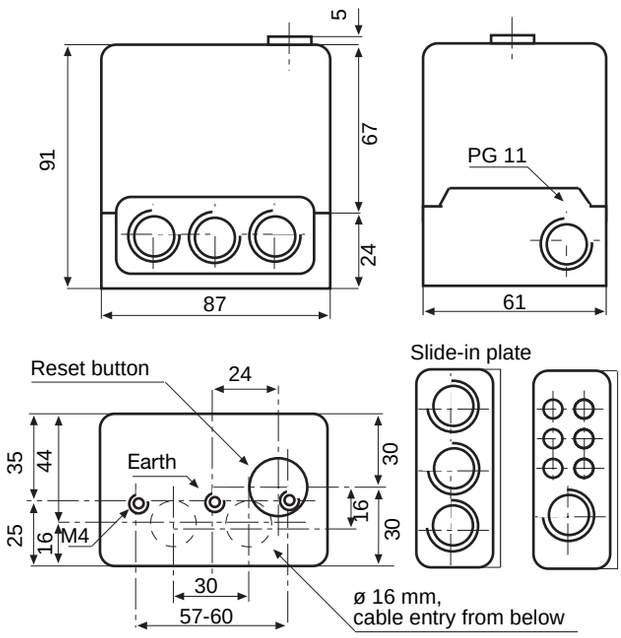
IRD CONNECTION



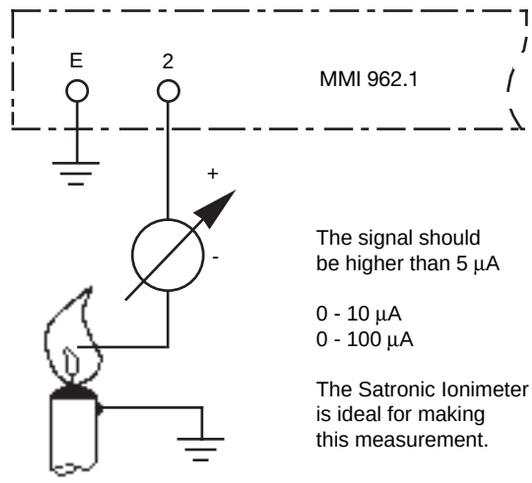
SCHEMATIC DIAGRAM MMI 962.1



MMI WITH BASE



MEASUREMENT OF THE FLAME SIGNAL

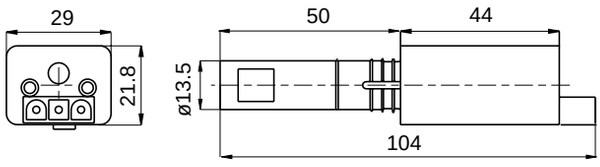


The signal should be higher than 5 µA

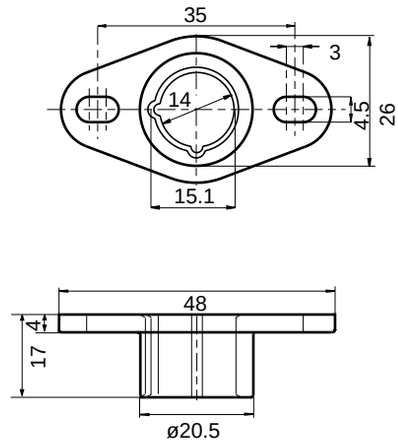
0 - 10 µA
0 - 100 µA

The Satronic Ionimeter is ideal for making this measurement.

IRD 1020



HOLDER M 93



ORDERING INFORMATION

ITEM	DESIGNATION	ITEM NO.
Control unit	Type MMI 962.1 mod. 23	06256
Socket	Wiring base S 98	75310
Multiwire base	Wiring base MW 880 ABC	74001
Slide-in plate	PG-plate	70502
optionally	Cable clamping plate	70501
Flame detector	IRD 1020 end-on viewing	16522
Flame detector	IRD 1020 side-on left	16523
Flame detector	IRD 1020 side-on right	16521
IRD mounting flange	Mounting flange M 93 for IRD 1020	59093
Flame detector cable	3-wire, 0.6 m	7236001

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

Specifications subject to change without notice.

Satronic AG
Brüelstrasse 7
Postfach 324
CH-8157 Dielsdorf