Worldwide Supplier of Gas Detection Solutions

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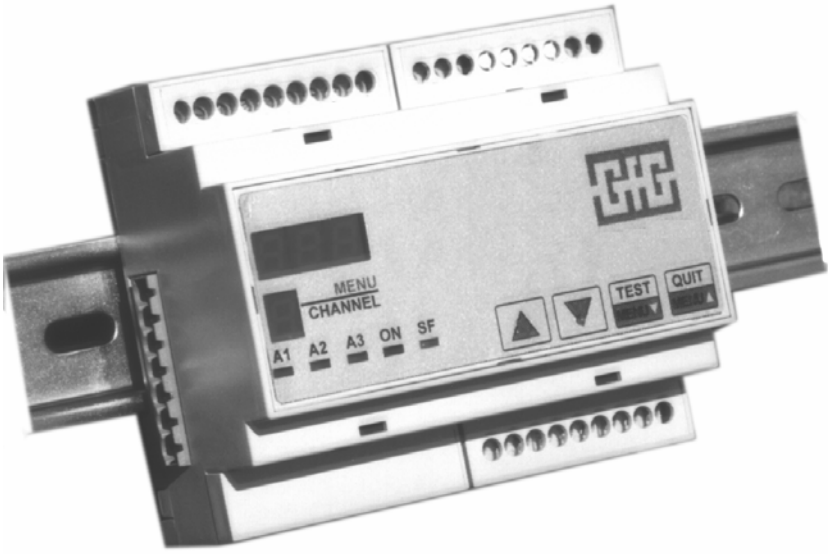
GMA4100-DP

Control Panel

Operation Manual



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Introduction

The GMA4100-DP controller module provides the power supply for the dew point transmitter and receives and processes the transmitters signals. The dew point transmitter continuously monitors the compressed air to which it is connected for the dew point level, and displays the dew point reading in degrees Celsius on the controller module.

The GMA4100-DP Control Panel offers a variety of features, which allows it to be adapted to your specific requirements:

- Reading of dew point values on a 3-digit display
- Menu display
- 3 variably adjustable alarm thresholds
- Peak value memory
- Adjustable relay functions: NC / NO contact, open-circuit / closed circuit
- Alarm hystereses prevents “flickering” of relays
- 4 - 20 mA analog output signal.

The GMA4100-DP continuously provides information on the measured dew point level, exceeded alarm thresholds and its operational status. As soon as the dew point exceeds one of the three pre-set levels, the GMA4100-DP gives a warning by means of the LED display, the console mounted horn/strobe, and controls the relevant alarm relays. In addition to this, the GMA4100-DP provides the measurement value as an analog output signal for further evaluation. The GMA4100-DP is easy to operate and maintenance-free. Should unexpected failures or system faults occur, the comprehensive failure recognition allows a quick and specific service.

For your Safety

This manual points out the proper use of this product and serves to prevent dangers. As any piece of complex equipment, the GfG GMA4100-DP will do the job designed to do, only, if it is used and serviced in accordance with the manufacturer's instructions. All individuals who have or will have the responsibility for using and servicing this product must carefully read this manual.

The warranties made by GfG with respect to the product are voided, if the adjustment of functions or parameters are changed without GfG’s permission. They are also voided, if the product is not used and serviced in accordance with the instructions in this manual. Please protect yourself and your employees by following them. The above does not alter statements regarding GfG's warranties and conditions of sale and delivery.

Front View of the GMA4100-DP Controller Module

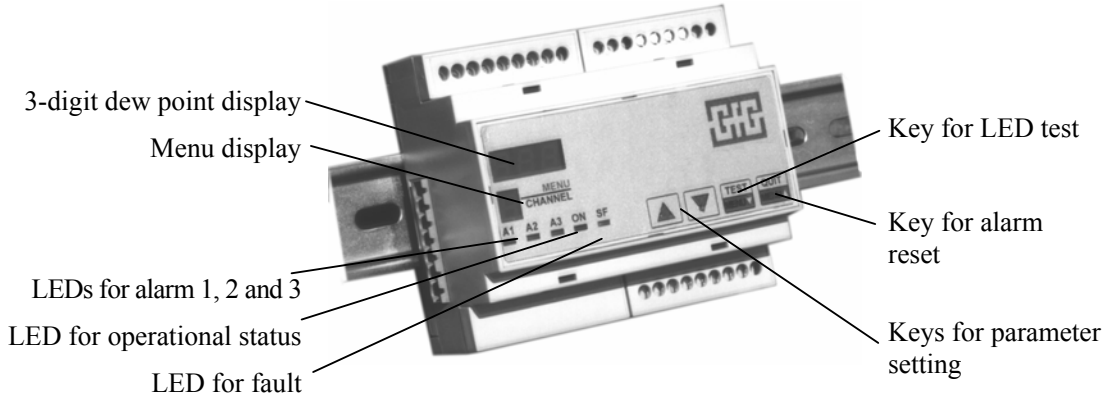

Fig. 1

Function Description

Powering On

After powering the system on, the GMA 4100-DP needs a warm-up time of a few minutes for:

- the self test, which checks functions, memory (ROM and RAM) and parameter memory (approx. 15 seconds),
- the warm-up of the dew point transmitter

During the warm-up period the GMA4100-DP displays the detection range, the detection unit, and the alarm thresholds one after the other. The LED "**ON**" flashes alternately with the measurement display and the LED "**S F**" is lit, i.e. the fault alarm is active. Alarm thresholds are not activated during the warm-up period. When the GMA4100-DP re-starts after a mains failure, the gas alarms are only evaluated, once the warm-up is completed. After the warm-up the GMA4100-DP automatically turns to detection mode.

Detection Mode

Detection Mode

In the detection mode, the green LED "**ON**" is lit. The 3-digit display reads the currently measured dew point concentration continuously, and exceeded threshold limit values are noticed and signaled immediately. Electronic functions like parameter memory and dew point transmitter output is monitored permanently and the transmitter cable is checked for short circuits and breaks.

Peak Value Memory

The GMA4100-DP provides a peak value memory, and stores the maximum dew point value.
The peak value memory is not activated during the warm-up time.

Press key [△] to indicate the peak value in the display. Measuring and warning functions are still working while the peak value is indicated. Press keys [△] and [QUIT MENU▼] simultaneously to reset the memory to the present measurement value. Once you release key [△], the controller returns to the standard display.

Check of Display and Parameter

During the test the measurement and warning functions are <u>not</u> activated!

LED Test
In the detection mode, shortly press the [TEST MENU▲] key to activate the LED test of the GMA41 controller.

The fault LED is not tested with LED test, and is only tested by using the service menu!

Display of Detection Range and Alarm Thresholds

For display of the detection range and the alarm threshold, keep the TEST MENU▲ key pressed for approx. 5 seconds. The LED "**ON**" flashes and the display reads the dew point parameters one after the other:

Once these readings are complete, the GMA4100-DP automatically returns to the detection mode.

Alarms

The GMA4100-DP provides 3 threshold alarms, which are activated as soon as the dew point exceeds the alarm threshold. An activated alarm is indicated by means of the relevant alarm LED. Press key QUIT MENU▼ to activate the external reset (see Technical Data) to acknowledge the alarm.

Alarm	Relevant Alarm LED
has been activated	Flashes
has been activated and acknowledged by pressing key QUIT MENU▼	lights permanently

Together with the alarm LEDs, the GMA4100-DP activates the relevant alarm relay.

Overrange Memory
In case the detection range is exceeded by more than 10 %, the GMA4100-DP activates the fault indication in addition to the 3 gas alarms. The display reads (— — —).

Remarks concerning Alarm Functions:

Latching / Non-latching Alarm
A latching alarm remains valid until it is reset externally, by pressing key QUIT MENU▼ at the GMA4100-DP. A non-latching alarm resets automatically, when the dew point falls below the pre-set threshold.

Time Delay of Alarms (#)

This function, which is factory set to 20 seconds, allows delaying the activation of the alarm (fig. 3). Should you wish to change the delay time or function, please call GfG service (800-959-0329).

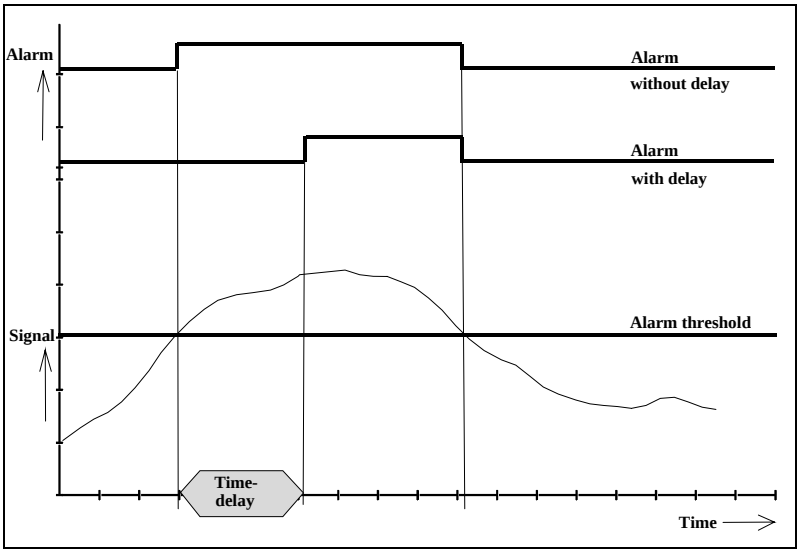

Fig. 3

The time delay prevents a warning from dew point concentrations only exceeding the threshold for a very short time, such as transition time from dryer cycling, etc. It can be set from 0 to 2 minutes (factory set to 20 seconds). For safety reasons the time delay should be kept as short as possible.

Fault

In case of dew point transmitter failure, the yellow LED "**S F**" lights up and the fault relay and the logic output are activated. A fault is signalized, if:

- the cable between the dew point transmitter and the GMA4100 unit is damaged;
- the sensor or the circuit of the transmitter is faulty;
- the detection range is exceeded (together with alarm activation);
- the CPU self-monitoring is faulty.

As soon as the fault situation is corrected, the yellow LED **"S F"** goes out, the fault relay and the logic output deactivate and the GMA4100-DP returns to standard detection mode.

Relays

The GMA4100-DP provides 4 relays:

- 3 alarm relays for controlling external alarm devices,
- 1 fault relay for signaling failures.

The switching behavior of the relays is the same for alarm or fault signals. Every relay can be operated as a NC or NO contact in closed or open circuit systems. For the switching functions as NC and NO relays you can connect to the contact clamps. In the standard setting all 4 relays are NO contacts. The alarm relays are standard operated as open circuit system; the fault relay is a closed circuit. This results in the below mentioned switching functions:

In the standard setting the switching functions of the relays are as follows:

	The relay switches:							
Relays for:	in detection mode (no alarm)	during dp alarm not reset	during dp alarm reset	after dp alarm not reset	after dp alarm reset	in case of power failure	in case of failure	in case of dp alarm and failure
Alarm 1								
Alarm 2								
Alarm 3								
Fault								

It is essential to take note of the switching behavior of the relays when connecting external devices. In the default setting alarm 3 (buzzer relay) can be reset even during dew point alarm! All three alarms are set to non-latching. (see controller info. sheet for details.)

For special settings of the relay switching functions please contact GfG service (800-959-0329).

Service

Display of Dew Point Transmitter Signal

Press key [▽] and after approx. 2 seconds the GMA4100 unit displays the signal received from the dew point transmitter in mA (4 .. 20 mA). This function allows troubleshooting for GfG service in case of failure of the dew point transmitter to the GMA4100 unit.

The 4..20 mA output continuously reads the actual measurement value!

Activation of Service Menus

The service menus allow to select and to change all important parameters of the GMA4100-DP.

A security code protects the service menus A and B from accidental maladjustment and unauthorized access. Adhere to the following procedure to enter the service menus:

1. Press key [QUIT MENU▼], then key [TEST MENU▲] and keep both keys pressed, until "**SER**" is read on the display.
2. Use keys [△] and [▽] to enter the security code.

	Security Code	Adjustments
Menu A	**11**	Alarm thresholds and adjustment
Menu B	**222**	Deactivation points of alarm thresholds

3. Press key [QUIT MENU▼] to confirm the entered security code.
   The GMA41 turns to the selected service menu
   or
   Press key [TEST MENU▲] to return to detection mode.

In the service mode the alarms are locked. The GMA41 switches to fault. The LEDs "**ON**" and "**S F**" light up, and the fault relay is activated.

Adjustments in Service Mode

The display of the GMA4100-DP reads the set parameters. The menu display indicates the menu point, where the displayed parameter value can be found. Use keys TEST MENU▲ and QUIT MENU▼ to scroll forward and back. For changing of parameters use keys △ and ▽.

Survey of Menu Points

Menu A TEST MENU▲ QUIT MENU▼	**Description**	**Display, e.g.**	**Parameter Setting**
r 1	**Relay test**	**r l**	
The menu starts with "G 1"			
G 1	Detection unit	dew point	Display only
G 2	Gas	dew point (do not use)	Display only
A 1	Threshold Alarm 1	Value in detection range	Adjustment with △ and ▽
A 2	Threshold Alarm 2	Value in detection range	
A 3	Threshold Alarm 3	Value in detection range	
0	Zeropoint adjustment	N/A	
C	Sensitivity adjustment	Value in detection range	

Menu B TEST MENU▲ QUIT MENU▼	**Description**	**Display, e.g.**	**Parameter Setting**
A 1	Threshold Alarm 1	Value in detection range	Adjustment with △ and ▽
A 2	Threshold Alarm 2	Value in detection range	
A 3	Threshold Alarm 3	Value in detection range	

Check of Relays and Logical Outputs

The display of the GMA4100-DP reads **"rL".** The relays and logic outputs can be switched, one after the other, by pressing the keys △ and ▽ The relevant LEDs for alarm and fault indicate, which relay (and which logical output) was activated. When you set up this menu all alarms are deleted and afterwards newly set, so use caution in this menu.

Setting of Alarm Thresholds

1. Activate service **menu A**.
2. Use keys TEST MENU▲ and QUIT MENU▼ to select menu point A 1, A 2 or A 3 for the alarm threshold to be set.
3. Set the new alarm threshold by means of keys △ and ▽.
4. Store the parameters (see storing of changed parameters).

Adjustable alarms	
Highest alarm	**Lowest alarm**
End of measurement range	Begin of measurement range + Hysteresis

Alarm Threshold Hysteresis

This function allows adjusting the hysteresis (point of deactivation) of the alarm thresholds (factory set to 20 seconds). This point can be set from the start of the detection range up to two digits below the alarm threshold.

Example:
The hysteresis of a controller was set to 8 degress C for alarm 1, 16 for alarm 2, and 24 for alarm 3. This results in the following alarm activations/deactivations:

	Alarm 1	**Alarm 2**	**Alarm 3**
Alarm threshold	= 10 deg C	= 20 deg C	= 30 deg C
Alarm activation	≥ 10 deg C	≥ 20 deg C	≥ 30 deg C
Alarm deactivation	≤ 8 deg C	≤ 16 deg C	≤ 24 deg C

Adjustment of deactivation point:

1. Activate service **menu B**.
2. Use keys TEST MENU▲ and QUIT MENU▼ to select menu point A1, A2 or A3 for the alarm deactivation point to be set.
3. Use keys △ and ▽ to adjust the new deactivation point.
4. Store the parameter.

Storing of Changed Parameters and Leaving the Service Mode

All changes done in the service mode have to be stored:

1. Press keys TEST MENU▲ and QUIT MENU▼ simultaneously to activate the memory function.
   The display reads "**Sto**".
2. **Confirm storage:** Press key QUIT MENU▼ to confirm the storage of the parameter.
   The GMA4100-DP stores all changed parameters and returns to detection mode.

or

No storage: Press key TEST MENU▲, and the GMA4100-DP returns to detection mode without storing the changed parameters. If you are unsure of the changes which were made in the service menu, choose this option to prevent saving incorrect information.

☞ You can change several parameters one after the other, without storing them individually. Once you have set all parameters, one storage confirmation is sufficient to store all changed parameters.

Maintenance

Inspection, maintenance, calibration and adjustment

Maintenance and adjustment describe those measures, which retain the nominal status of the warning system. They shall be checked in regular inspection intervals. Inspection intervals should not exceed 4 months.

- dew point reading (sensor reading within reasonable range)
- Activation of alarm thresholds
- Alarm output visible and audible
- Fault circuit operation

Calibration Adjustment

For dewpoint transmitter calibration, please contact GfG service (800-959-0329).

Overhaul

Overhaul describes all repairs and exchange of components. This has to be done by the manufacturer or persons authorized by him. Only those spare parts and structural components that have been tested and approved by GfG may be used for exchange.

Instruction for Installation

The GMA4100-DP controller must not be installed in hazardous areas. It shall preferably be installed so the cabinet will be vibration-free, and in a suitable location where necessary service inspections can be carried out.

Trouble Shooting

Failure	Cause	Solution
LED "**S F**" lights up, display "**EEP**"	- System error, fault in parameter memory	- Re-start of system - Call GfG service
LED " **S F** " lights up, LED "**ON**" flashes	- System is in warm-up period, alarm suppression is still active	- Wait until warm-up period is over
LEDs do not light up	- Faulty voltage supply, defective fuse	- Ensure proper voltage supply - Call GfG service
Display - - - LED "**S F**" lights up	- ADC overrange - stored overrange - short circuit at the transmitter cable	- check transmitter cable -Call GfG service - check transmitter cable

Service Address

For additional questions on the product or in case of failure and problems please contact:

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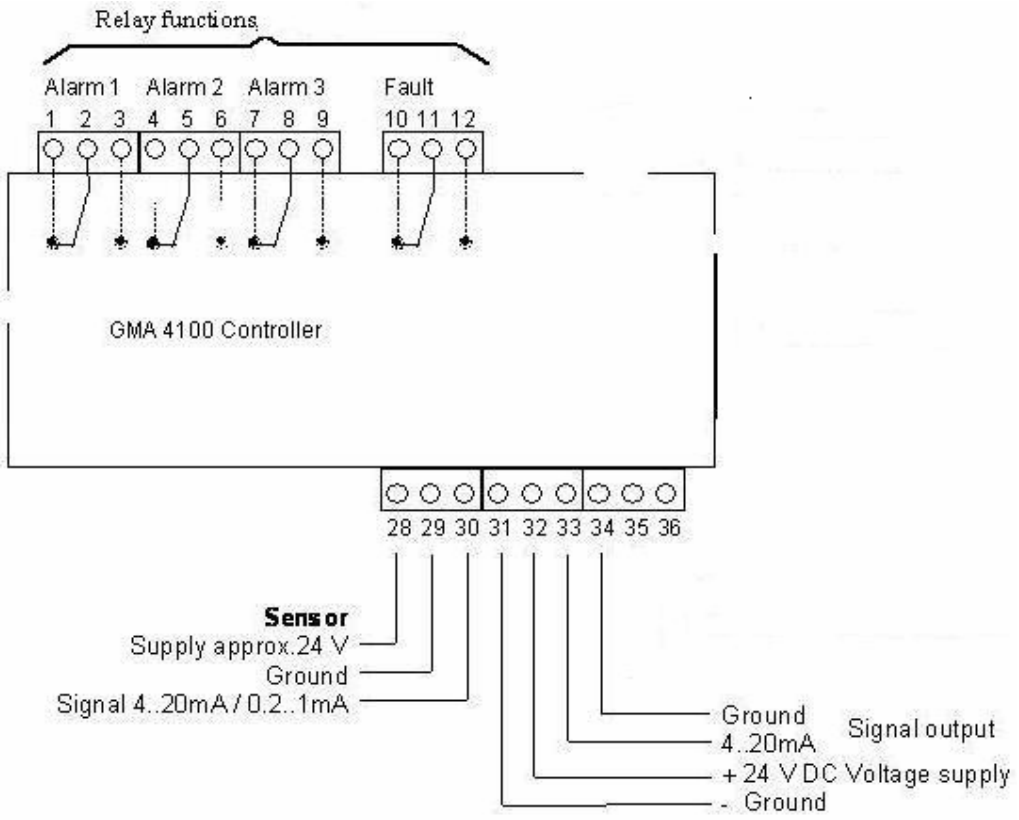
Terminal Assignment - GMA4100 Controller



Technical Data

Gas Monitor GMA41	for mounting on DIN rail
Type:	GMA4100-DP, Software version 2.03
Dimensions:	106 x 90 x 58 mm (WxHxD)
Power supply	
Operational voltage:	GMA4100-DP 24 V DC
Current consumption:	max. 150 mA at 24 V DC
Primary fuse:	GMA4100-DP 0.08 A
Secondary fuse:	
Climate Conditions	
for operation:	0 to +55 °C, 0 to 99 % r.h., 700 to 1300 hPa
recommended storage conditions for GMA4100-DP:	-25 to +50 °C, 0 to 99 % r.h.
Transmitter connection	
Transmitter connection:	3-wire transmitter
Voltage supply output:	24 V DC max. 250 mA
Input signal:	4 .. 20 mA,
Output signals	
Analog outputs for meas. value:	4 .. 20 mA, max. load 300 Ω
Display and activation of alarm	T 90 < 3 seconds
Relays:	max. switch voltage 250 V AC 50/60 Hz or 250 V DC max. switch current 4 A AC/DC max. switch performance 1000 VA AC or depending on voltage 50 .. 200 W DC Relay outputs and mains entry are operation insulated
Logical outputs	4 open collector outputs for alarm 1, alarm 2, alarm 3, fault Operation only on safety low voltage Max. switch voltage: 30 V Max. switch current: 100 mA
External reset:	High active from 3 .. 24 V DC (input resistance 11kΩ)
DIN rail mounting:	DIN EN 50022
Safety	
Protection:	DIN 40050 - IP -20
Protective separation:	by safety transformer
Protective insulation:	as per EN 61010 up to over voltage category III and soiling degree 2

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