

Sigma Control H

Control Unit PW-075-A



Gas detection systems strongly vary from application to application. The number of gas detectors, the properties of volatile substances, the number of alarm zones and their configuration, the type of outputs and their functions require an individualistic approach. This is usually quite a complex task and the ability of a gas detection system to adapt to the particular application requirements is crucial for these Systems.

Sigma Control H is an advanced Control Unit dedicated to large and/or complex gas detection systems. It is intended to control all the devices connected to it and to integrate them into one **Sigma Gas** system. Its property is to provide two unique, clear and consistent perspectives of data presentation:

- System perspective:
Sigma Control H (similar to other Sigma Gas system control units) implements a unique **System State Indicator** which enables an unambiguous and immediate evaluation of the entire system state "at a glance" even from remote locations.

- Detailed perspective:
The user in proximity to the Control Unit is able to inspect particular indications (e.g. of detectors) and to manage it (to confirm alarms, change par., etc.).

Thanks to its modularity Control Unit Sigma Control H provides a wide range of configurations and has no strict limits. It enables the finding of an optimal, custom-dependant solution in terms of performance and price for each, even the most demanding application.

Sigma Control H control unit reads:

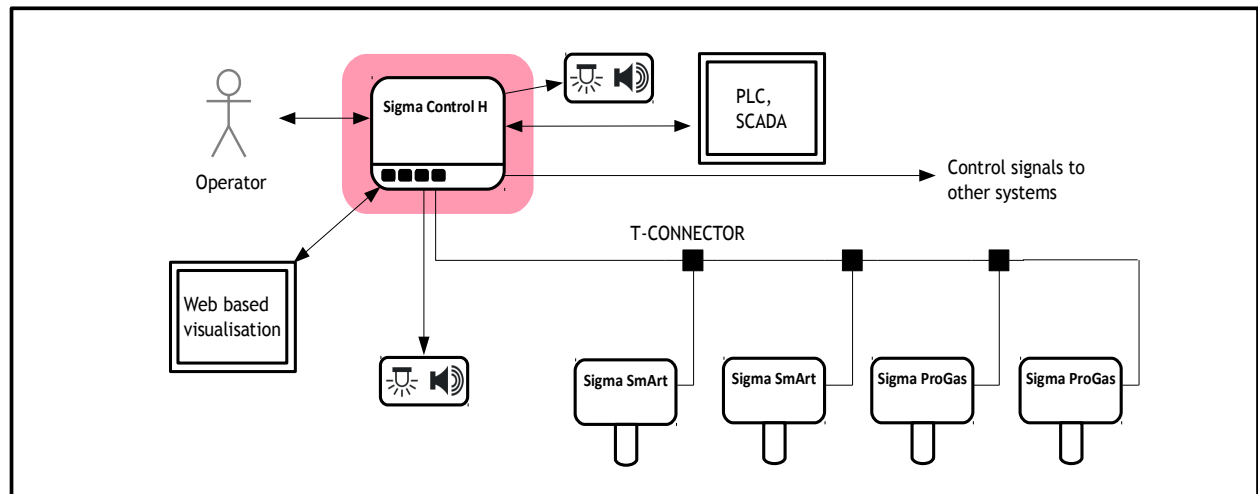
- signals generated by connected detectors

- (measurement values, diagnostic information, etc.),
 - signals from other inputs (buttons, outputs from other systems e.g. fire protection system, DCS),
 - operator's commands.
- Based on this information Sigma Control H controls the system by:
- activating the signalling equipment (audible and visual),
 - generating the indications for users,
 - setting the output values for other systems (e.g. DCS).

Basic functionalities

- vastly-configurable in terms of hardware modules and working parameters,
- supports from 1 up to more than 100 Sigma type gas detectors (**Sigma SmArt** and **Sigma ProGas**),
- provides from 4 up to more than 30 broadly configurable two-state outputs (relay type or energised 24 V DC or 230 V AC) which:

The location and role of the Sigma Control H Control Unit in a gas detection system



- can be activated by various signals e.g. alarm, special states and external signals from other systems (e.g. DCS),
 - can be organised in any alarm zones, including overlapped ones,
 - has a special operation mode intended for controlling signalling equipment (audible and visual; see principles of operation for signalling equipment {audible and visual} outputs),
 - has such functions as: on/off delay, temporal deactivation, latched mode, inversion, impulse operation mode dedicated for valves,
 - is characterised by a hysteresis based on alarm thresholds,
 - can provide special state indications (measurement, service and fault mode).
- modern, user-friendly, intuitive, decipherable user interface (see further paragraphs for details),
- can be connected to local DCS or SCADA via a digital communication interface e.g. RS-485 (Modbus ASCII/RTU) TCP-IP (Modbus TCP),
- enables user to control a gas detection system using different commands i.e.:
- unlocking the locked sensors (typical of detectors with catalytic sensors),
 - setting an inhibit mode for detectors (it allows the user to temporarily disable a detector without having to reconfiguration the system; such detectors will be ignored in the alarm and fault evaluation),
 - changing the detector parameters, e.g. alarm threshold, noise gate.
- information security – a different password for each access level.

Other functionalities (optional)

- built-in UPS,
- historic data and events archives,
- web based system visualisation via Ethernet,
- provides 4÷20mA outputs (active or passive operation mode) to integrate with other systems e.g. PLC.

User interface

The user interface consists of an LCD display with a touch panel, an internal buzzer and a large System State Indicator:

- LCD display presents the measurement data, diagnostic results and status of all detectors using different views (general, detailed; based on gauges, plant map, trends etc.); it enables the user to navigate through the device menu in an easy, intuitive way,
- an internal buzzer notifies the operator when his attention is necessary,
- the system state indicator enables the user to evaluate the general system status “at a glance” from a distance.

Philosophy of operation:

- During typical operation (no gas hazards and special states) only the system state indicator remains active. It shows the “monitoring” status of the system.
- When some gas alarms and/or special states occur, the internal buzzer audibly warns the operator who can then easily identify the new system status, as the general system state is continuously displayed by the large four-coloured indicator.
- If more detailed information about the current situation is needed and/or any human – system interaction should be performed, the operator can obtain it using a device screen.



The system state indicator shows four independent types of information:

- monitoring (green) – active if at least one of

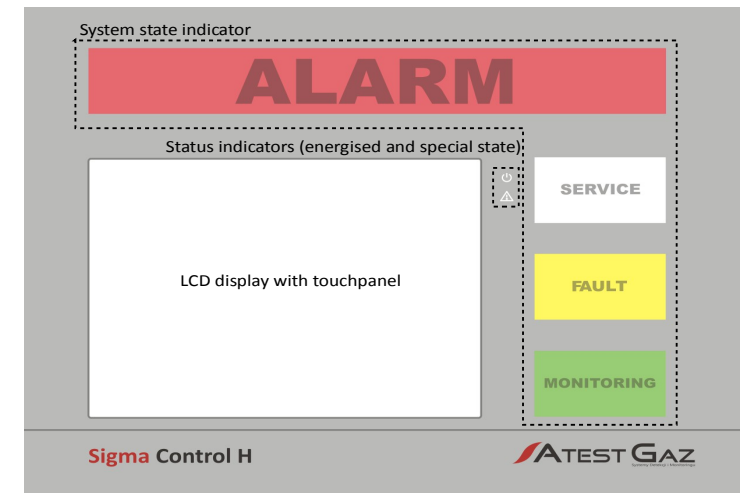
the connected detectors is performing a gas measurement,

- fault (yellow) – active if at least one of the system elements covered by the auto-diagnostic mechanism is out of order,
- service (white) – active if at least one of the system elements is in maintenance and/or service mode (e.g. detector calibration, warm-up, inhibit mode; system configuration),
- alarm (red) – the most important and the largest indicator is active when at least one gas detector detects a hazardous gas concentration.

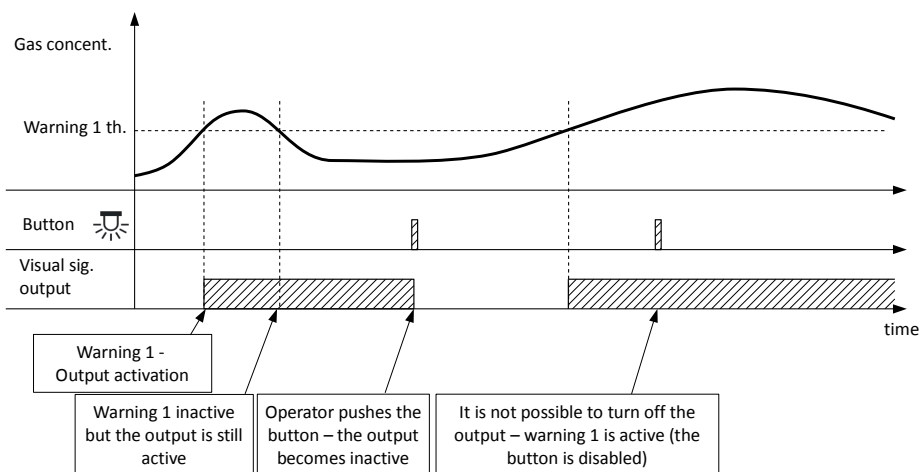
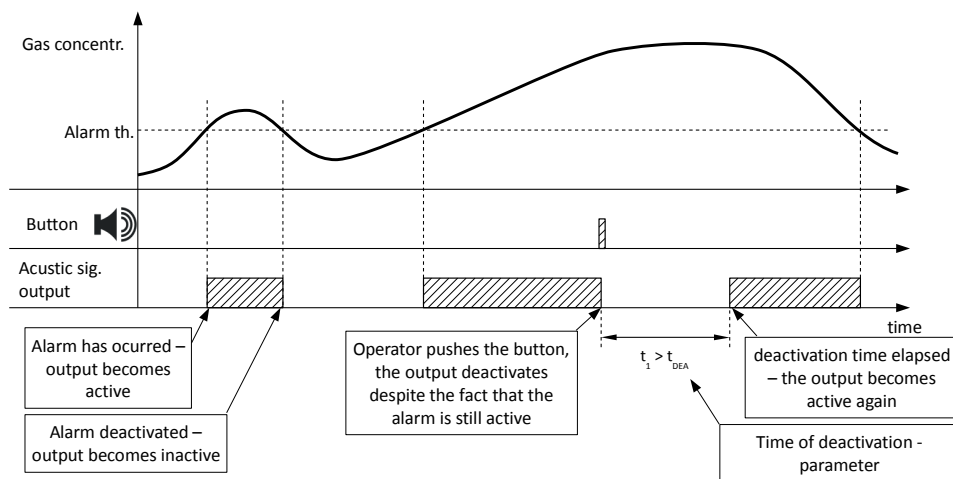
In addition, there are two light indicators:

-  (green) – active when the system is in operation,
-  (yellow) – indicates all kinds of special state occurrences.

The System State Indicator is directly controlled by the embedded electronic module. Thanks to this, the main and the most important part of the system state indication is highly reliable (failure of the very complex LCD display has no effect on the System State Indicator).



Principles of operation for signalling equipment (audible and visual) outputs:

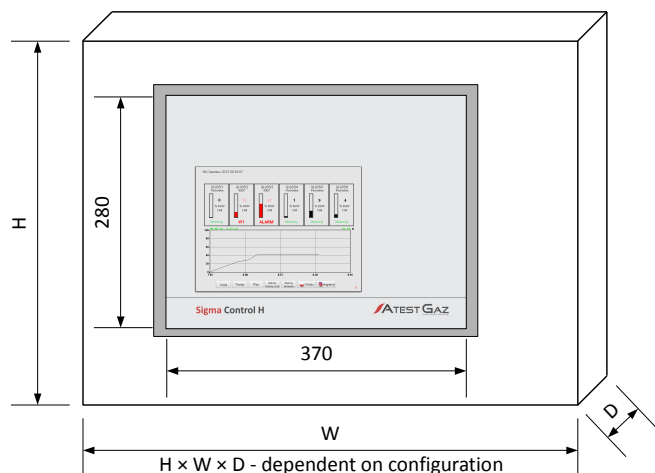


Electric interface of Sigma Control H strongly depends on configuration, here is an example:

230 VAC			PK1-2-3			PK4 (fault)		SOA 24 V			Detector bus					
L	N	PE	COM	NO1	NO2	NO3	COM	NO4	-	SO+	SA+	-	+	shield	A	B
1			2			3		4			5					

No.	Port Name	Pin	Description
1	230 V AC		230 V AC Power supply input
		L	Live wire
		N	Neutral wire
2	PK	PE	Earth wire
			Relay outputs
		NO1	Normally open relay output 1
		NO2	Normally open relay output 2
		NO3	Normally open relay output 3
3	PK4 (fault)	COM	Common pin for relay outputs PK1, PK2, PK3
			Fault relay output
		NO4	Normally open relay output 4
4	SOA	COM	Pin PK4
			Output for signalling equipment (audible and visual) 24 V DC
		-	Common pin for signalling equipment outputs
		SO+	Output for signalling equipment (visual)
5	Detectors bus	SA+	Output for signalling equipment (audible)
			Gas detectors bus
		-	GND of bus power supply
		+	V+ of bus power supply
		E	Cable shield
	A	Signal wire A	
	B	Signal wire B	

Dimensions



Technical Specification

Power supply:	
<ul style="list-style-type: none"> Vcc Power consumption 	<p>Typical 230 V AC, 24 V DC as option</p> <p>Depending on configuration</p>
Environment:	
<ul style="list-style-type: none"> ambient temperatures humidity 	<p>0 ÷ +40 °C</p> <p>10 ÷ 90% long term (no condensation)</p>
IP	IP43
Analogue output parameters:	
<ul style="list-style-type: none"> R_{LOAD_MAX} 	750 Ω
Digital input parameters:	
<ul style="list-style-type: none"> R_{IN} inactive active 	<p>10 kΩ</p> <p>0 ÷ 1 V (any polarisation)</p> <p>10 ÷ 30 V (any polarisation)</p>

Digital output parameters:	
<ul style="list-style-type: none"> relay 	Floating contacts, NO/NC, 230 V AC, 3 A not protected against overloading
Digital communication parameters:	
<ul style="list-style-type: none"> Internal communication bus <ul style="list-style-type: none"> Electric standard Communication protocol communication port for external systems (depending on configuration) <ul style="list-style-type: none"> Electric standard Communication protocol 	<p>RS-485</p> <p>Sigma BUS</p> <p>RS-485, Ethernet</p> <p>Modbus ASCII, Modbus RTU, Modbus TCP</p>
Protection class	I
Dimensions	See above
Cable glands (cable diameter range)	5 ÷ 11,5 mm
Acceptable cables:	1 ÷ 2,5 mm ²
Enclosure material:	ABS, Aluminium
Weight:	Dependent on configuration
Exploitation materials lifetime:	
<ul style="list-style-type: none"> rechargeable battery 	1 year
Mounting	Directly to the wall using pins Ø6 mm (4 pieces)

Please also refer to:

KK059 – Gas Detection System Sigma Gas – datasheet

Ordering information:

Product reference code: PW-075-A

This product is strongly customized. It is necessary that the customer specifies the following details: the number of gas detectors, the number of outputs and their types, the logic of outputs operation and any other important requirements.

Legal notice:

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