Alarm and Safety System AHD 414A

Alarm System

Safety System

- alarm and safety system for control desk mounting
- 10 binary measuring points
- inputs can be delayed up to 99s
- 1 input for alarm suppression
- override function
- 3 arbitrarily programmable group relays and 1 horn relay
- 24-pole pluggable terminal block
- 1 serial input and 1 serial output
- wire break supervision sensor and stop circuit (safety system)
- acknowledgement can be done at the front panel and externally over the terminal block
- type approved by ABS, BV, GL, LR, RMS

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Alarm and Safety System AHD 414A

1) Performance Features

AHD 414A is a microprocessor-controlled device for control desk installation with 10 binary inputs for alarm or status messages. It has the following features:

- can be used as alarm or safety system
- individual solutions possible
- small, robust design
- 1 horn relay and 3 arbitrarily programmable group relays
- high loadability of the relay outputs
- serial interface
- wire break control of the inputs and of the group relay K1 (stop relay in the safety system)
- low power consumption of the electronics (app. 0.15A)

2) Construction

AHD 414A consists of one electronic card with a processor system and all necessary periphery components. The card is fixed to a front panel made of aluminum over 4 distance bolts. All ICs are plugged into sockets. The program is saved in an EPROM 27C64 or, if desired, in an EEPROM 28C64. The in- and outputs are led to a 24-pole pluggable terminal block.

The unit is accommodated in a housing for control desk mounting acc. DIN 43700 and has a front-frame (dimensions: 144mm x 144mm) and an installation depth of 53mm. A laser foil is used for labeling. It rests on the front panel, under another, very robust plastic foil. Both are retained by the front frame of the device.

3) Function

3.1 Alarms/Status Messages

Every input can be programmed as alarm or status message. In the event of an alarm, the corresponding LED in the front panel flashes. Status messages are displayed optically as steady light. Alarms activate an internal buzzer and switch the horn relay on. Alarms, as well as status messages, can activate the group relays K1, K2 and/or K3.

3.2 Horn Acknowledgement

The horn relay is acknowledged by pushing of the upper key at the front panel, or externally over an input at the terminal block.

3.3 Optic Acknowledgement

Flashing LEDs turn into permanent light after the middle key in the front panel has been pushed. Furthermore, there is an external input for optical acknowledgement (via the terminal block).

3.4 Lamp Test

There is a key in the front panel for lamp test.

3.5 Canceling of Alarms/Reset

As long as the alarms are not acknowledged optically, they are always reported; independent of whether they are really still active or not. The LEDs do not go out before being

acknowledged optically and the corresponding alarms are not active anymore. In case of using the device as safety system, the RESET-key also has to be activated.

3.6 Group Relays

AHD 414A has 3 group relays, which can be assigned to every alarm. It is also possible to assign several group relays to one alarm. The group relays can be programmed as first-value- or new-value-indicator. Furthermore, they can be programmed as normally closed or open. If the device is used as safety system, relay K1 always operates as normally open and first-value-indicator.

3.7 Wire Break Supervision (Only Safety System)

The inputs and group relay K1 can be supervised against wire break. For input wire break control, Z-diodes BZX 7V5 have to be installed parallel to the contacts. Wire break control of the relay is done with a low test current (app. 4mA). As far as provided, its interruption causes an alarm. The bottom LED is used as indicator for a wire break. If only this LED flashes, the wire break report refers to group relay K1. If further LEDs are flashing, this refers to the corresponding input circuits. To ensure a clear distinction between the actual alarms and the wire break report, they flash phase-shifted by 180°.

3.8 Alarm Blocking

AHD 414A has an input (measuring point 1) that can be used for blocking of alarms (suppression of alarms). The upper LED is assigned to this input.

3.9 Override (Ship before Engine)

If the device is used as safety system, relay K1 (stop relay) can be assigned to an override function. Every stop alarm can be programmed as inferior or superior to the override function. Normally, this affects all stop alarms except “overspeed”. Override functions as follows:

If a stop criteria is activated for which the override function is provided, relay K1 does not react when the override input is active. Therefore, the engine will not be stopped. In case the override input was not active when the alarm occurred, stopping of the engine can be prevented by belated activation of the override input (activated relay K1 drops out). The precondition for this is, of course, that the engine is still running at a speed larger or equal to firing speed. In case a stop alarm is active, which, due to the active override input, did not cause stopping of the engine, this can be revised by deactivating “Override”. Now, the engine would stop belatedly. In the event of a stop criteria (e.g. overspeed) that is not assigned to the override function, the engine is always stopped.

3.10 Serial Communication

AHD 414A has a serial input that can only be used for customer-specific special functions. At the serial output, the following information is available with 1200 Baud:

Startbit (high), 12 bits corresponding to measuring points 1 to 11 (alarm system), 1 to 12 (safety system) from top to bottom (high, if measuring point is active, low if it is not active), 3 bits corresponding to the group relays K1 to K3 (active group relay creates high-bit).

Over this serial interface, it is possible, among other things, to transmit information, via data distributor AHD W, to the alarm system DZA 02 or to the relay station AHD R101 and to put it out (see last page of this documentation).

4) Labeling/Programming

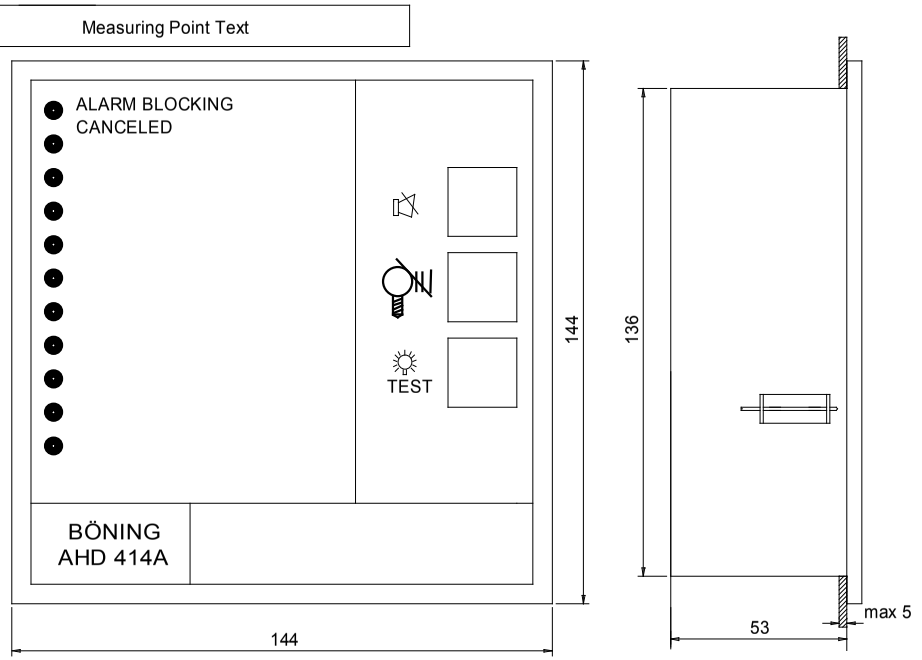
Depending on whether the device is used as alarm or safety system, the measuring point list and the programming list on page .... and/or .... must be filled out by the customer. Afterwards, the device will be produced accordingly. As mentioned under 2), a laser foil serves for labeling of the front panel. On request, we will provide an AutoCad-file with the template for the front foil, that can be labeled by the customer.

If the user has a programming device for programming of Eproms and/or Eeproms, he/she can change the function himself/herself. The address contents and the relevant functions can be gathered from the mentioned measuring point and programming list.

Empty fields for EPROM-addresses have the content "00". Exceptions are the addresses for the delays. They have, as far as not filled out, the content "01". Please only make entries, if changes are required.

414A-ALE.MCD

Measuring Point No.	Alarm/ Display		Delay		Group Relays K1		K2		K3		Input NC/NO (Rest/Operation)		Suppression by meas. point 1		LED color (red, yellow or green)
	EPROM Address	Display=01 Alarm=00	EPROM Address	Cont. (sec)	EPROM Address	switches if cont. 01	EPROM Address	switches if cont. 01	EPROM Address	switches if cont. 01	EPROM Address	NC = 00 NO = 01	EPROM Address	yes=01 no=00	
1	-	-	1F00		-	-	-	-	-	-	1F40		-	-	green
2	1Fd1		1F01		1F11		1F21		1F31		1F41		1F51		
3	1Fd2		1F02		1F12		1F22		1F32		1F42		1F52		
4	1Fd3		1F03		1F13		1F23		1F33		1F43		1F53		
5	1Fd4		1F04		1F14		1F24		1F34		1F44		1F54		
6	1Fd5		1F05		1F15		1F25		1F35		1F45		1F55		
7	1Fd6		1F06		1F16		1F26		1F36		1F46		1F56		
8	1Fd7		1F07		1F17		1F27		1F37		1F47		1F57		
9	1Fd8		1F08		1F18		1F28		1F38		1F48		1F58		
10	1Fd9		1F09		1F19		1F29		1F39		1F49		1F59		
11	1FdA		1F0A		1F1A		1F2A		1F3A		1F4A		1F5A		



Relay	Eprom-address	
K1	1F60	
K2	1F61	
K3	1F62	
K4	1F63	

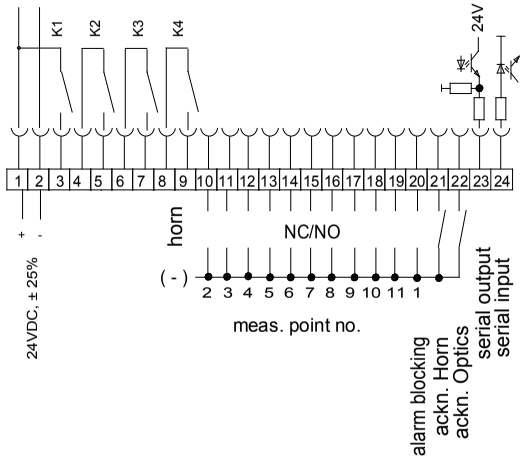
Cont. "00" - operating curr. relay

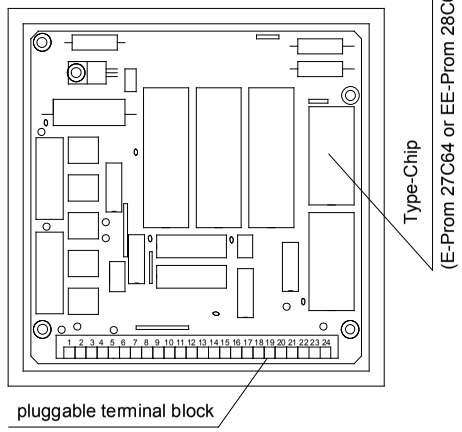
Cont. "01" - rest current relay

Relay	Eprom-address	
K1	1F64	
K2	1F65	
K3	1F66	

Content "00" = Relay operates as new-value-indicator

Content "01" = Relay operates as first-value-indicator





TECHNICAL DATA

Power supply	: 24VDC ± 25% or 12VDC
Consumption of electronics	: app. 0.15 A
Perm. load of relay contacts	: 3A, but total of 5A, 50VDC/AC
Serial interface	: TTY, standard edition 1200 baud, startbit (high) 11 data bits corresp. to meas. point 1 to 11, 1 x low, group relays K1, K2 and K3, app. 20ms to 100ms pause (low),
Perm. relative air humidity	: 99%
Panel cutout	: 138 mm x 138 mm
Protection class at front	: IP 54
Installation depth	: 53 mm
Weight	: 0.5 Kg

Meas. Point and Programming List for Alarm System AHD 414A

Alarm and Safety System AHD 414A

Empty fields for EPROM-addresses have the content "00". Exceptions are the addresses for the delays. They have, as far as not filled out, the content "01". Please only make entries, if changes are required.

Measuring point no.	Alarm / Display		Delay		Group relays K1		K2		K3		Input NC/NO (Rest/Operation)		Suppression by meas. point 1		Wire break supervision		Override		LED Color (red, yellow or green)
	EPROM Address	Display=01 Alarm=00	EPROM Address	Cont. (sec)	EPROM Address	switches if cont. 01	EPROM Address	switches if cont. 01	EPROM Address	switches if cont. 01	EPROM Address	NC = 00 NO = 01	EPROM Address	yes=01 no=00	EPROM Address	yes=01 no=00	EPROM Address	yes=01 no=00	
1	-	-	1F00		-	-	-	-	-	-	1F40		-	-	-	-	-	-	green
2	1Fd1		1F01		1F11		1F21		1F31		1F41		1F51		1FF1		1EF1		
3	1Fd2		1F02		1F12		1F22		1F32		1F42		1F52		1FF2		1EF2		
4	1Fd3		1F03		1F13		1F23		1F33		1F43		1F53		1FF3		1EF3		
5	1Fd4		1F04		1F14		1F24		1F34		1F44		1F54		1FF4		1EF4		
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11	1FdA		1F0A		1F1A		1F2A		1F3A		1F4A		1F5A		1FFA		-		
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
															1FFB				

Wire break supervision relay circuit K1

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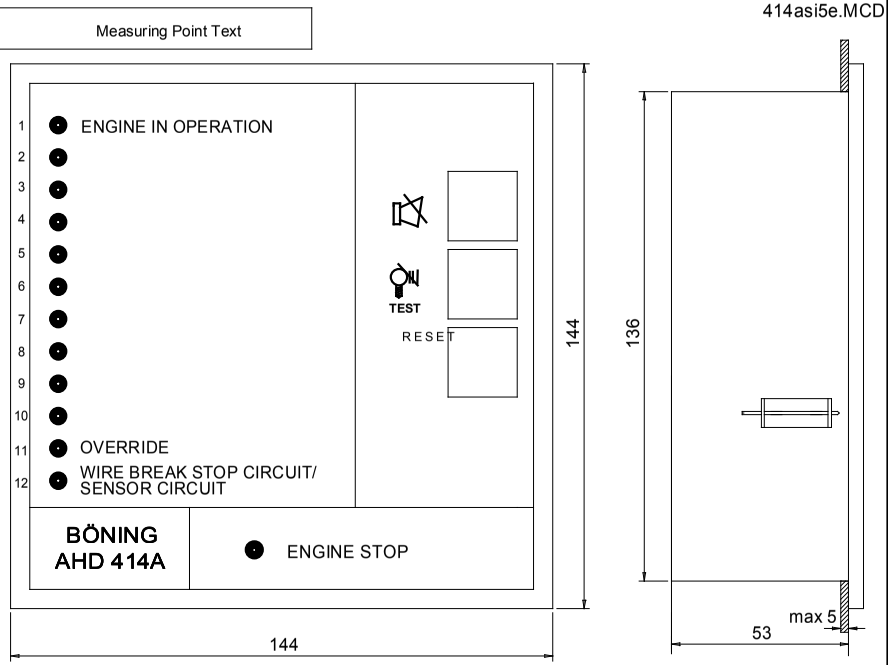
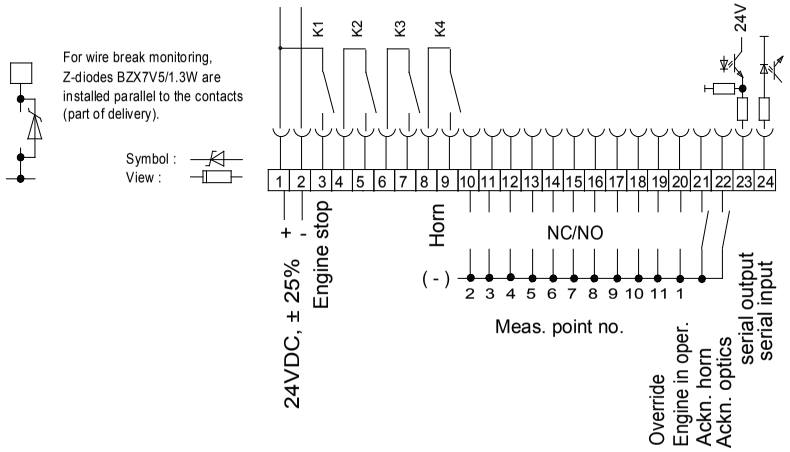


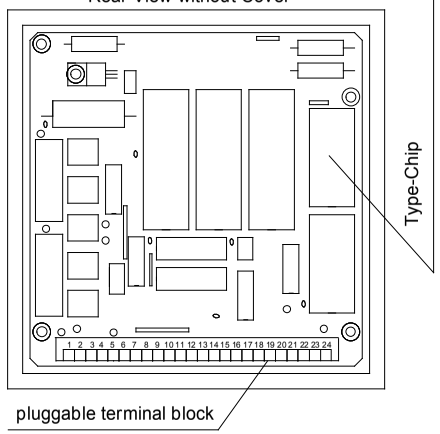
Relay	Eprom-address	
K2	1F61	
K3	1F62	

Cont. "00" - operating curr. relay
Cont. "01" - quiesc. current relay

Relay	Eprom-address	
K2	1F65	
K3	1F66	

Content "00" = Relay operates as new-value-indicator
Content "01" = Relay operates as first-value-indicator





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Perm. relative air humidity	: 99%
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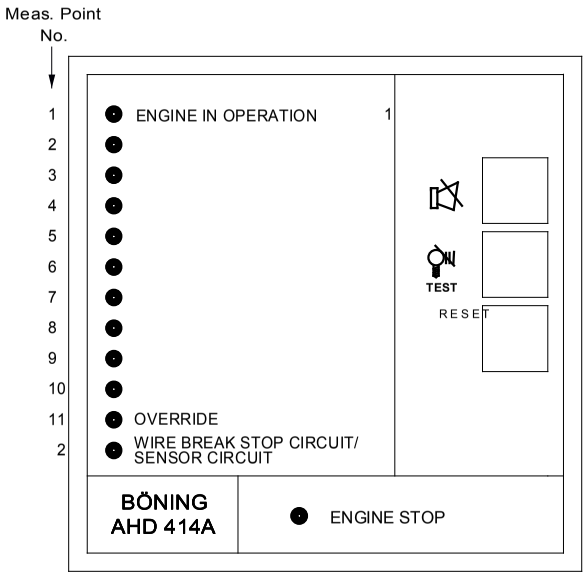
Protection class at front	: IP 54
Installation depth	: 53 mm
Weight	: 0.5 Kg

Measuring Point and Programming List for Safety System AHD 414A

Alarm and Safety System AHD 414A



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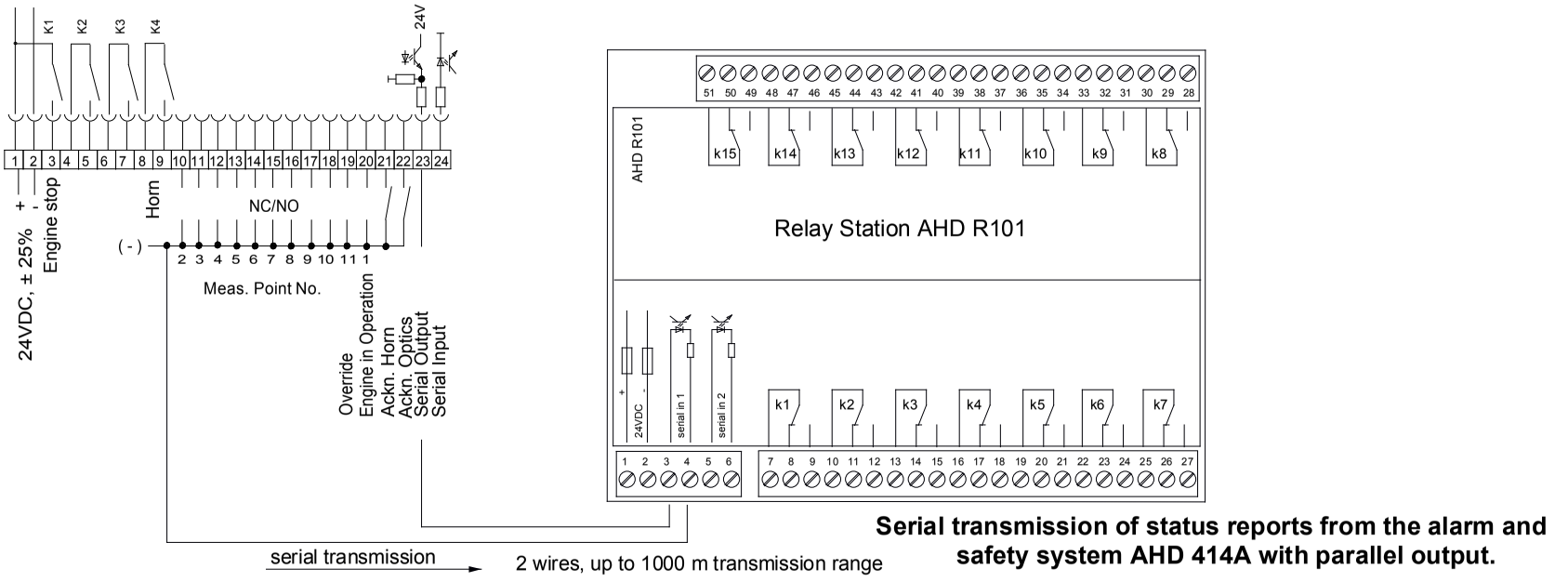
This example shows safety system AHD 414A. It has a serial output that transmits, in cycles of less than 0.3s, the 15 status reports listed below. With the relay station, they can be assigned to relays 1 to 15.

One standard application is to assign measuring points 1 to 12 to relays 1 to 12, and group relays 1 to 3 to relays 13 to 15. As the relay station contains a microprocessor system, almost any arbitrary assignment can be realized. On request, we can offer the relevant software adjustments.



Serial transmission of status reports from the alarm and safety system AHD 414A with parallel output.