

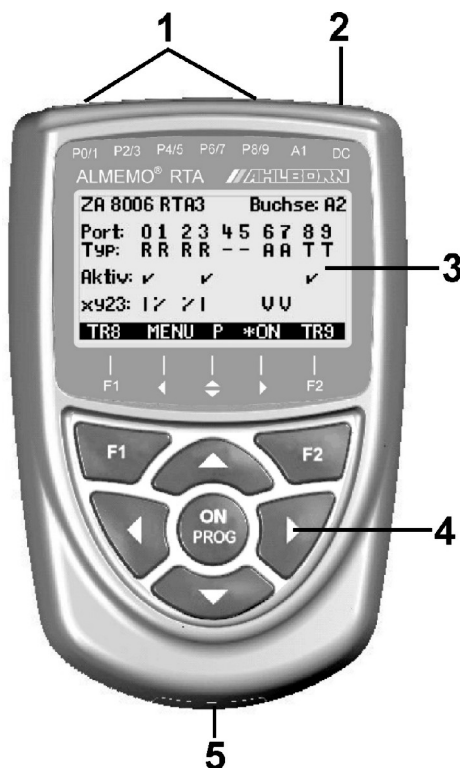
## Operating instructions



## Relay trigger adapter, analog ALMEMO® 8006-RTA3

V1.1  
25.03.2008

## 1. Operating controls



### (1) Sockets P0/1 to P8/9

for ALMEMO® clamp connectors  
**P0/1** 2 semiconductor relays R0, R1  
**P2/3** 2 semiconductor relays R2, R3  
**P4/5** 2 analog outputs (option)  
**P6/7** 2 analog outputs (option)  
**P8/9** 2 trigger inputs TR8, TR9

### (2) DC socket

Mains adapter (ZA1312-NA1, 12V, 0.2A)

### (3) LCD, graphics display

7 rows for functions  
 1 line for softkeys F1, ◀, ▲, ▶, F2  
 Shown in brackets : **<MENU>**

### (4) Operating keys

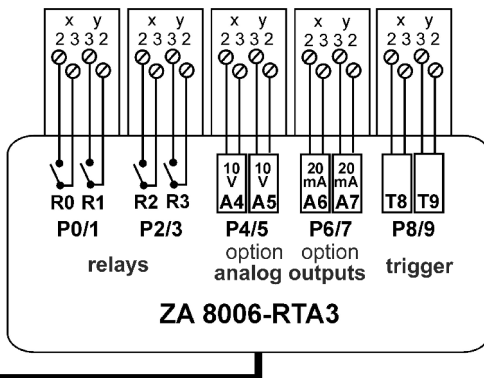
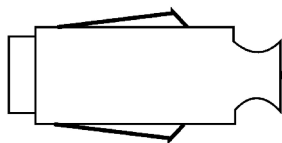
**<TR8 / 9>** Trigger keys (softkeys)  
**▲ ▼ P:** Port selection  
**<MENU>** Main menu  
**<ON>** Switch display illumination ON  
**▲ ▼ ▶** F: Function selection  
**<SET>** Direct data selection  
**PROG** Program  
**▲ ▼ ▶** P: Data entry

### (5) ALMEMO® connecting cable

to measuring instrument, socket A1, A2..

## 2. Connection diagram

At socket A1 or A2 of the measuring instrument are connected



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### 4. Function of relay trigger adapter, analog

The relay trigger adapter, analog, ZA 8006-RTA3, provides ALMEMO® V6 devices (as of 2008 and except 2390) with a universal trigger output interface with up to 10 interface elements (i.e. maximum 10 semiconductor relays, or 2 trigger inputs, or up to 4 electrically isolated analog outputs).

The adapter is connected via the ALMEMO® cable to output socket A1 to A5 (if available) on the ALMEMO® devices. All 10 interface elements of each module can be individually selected and configured as ports P0 to P9. Programming is via the ALMEMO® device (for a description please refer to the operating instructions for the device) or via its interface (for a description please refer to the Manual, 6.10.9.2).

Addressing of the modules and ports is determined on the basis of the socket into which the module is plugged (see Manual 6.10.9.2) :

Modules in socket A1 :	Address 10 to 19
Modules in socket A2 :	Address 20 to 29, etc.

### 5. Power supply

The adapter is supplied with a voltage of 9 to 12 VDC via the measuring instrument. In the standard version the maximum requirement is 35 mA - even with illumination. It is only with optional analog outputs, in particular with electric current outputs, that the maximum supply current on the measuring instrument must take the sensors into consideration. If the maximum supply current is exceeded, a mains adapter (e.g. ZA1312-NA1) should be connected at the DC socket.

### 6. Interface elements

Sockets P0/1 and P2/3 are fitted as standard with four semiconductor relays, normally open type (or changeover type as option); socket P8/9 is fitted as standard with two trigger inputs.

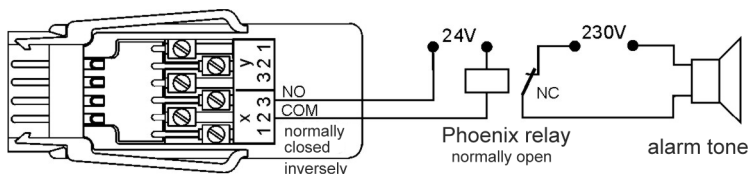
Sockets P4/5 and P6/7 can (as options) be fitted with analog outputs.

#### 6.1 Relays

The **output relays** are driven by the measuring instruments automatically in the event of alarm or by means of interface commands (see Manual 6.10.10). The function of each relay can be freely set by configuration (see Manual 6.10.9.2). The assignment of limit value to relay can be programmed in the sensor by the device (see Manual 6.10.8). Whenever a relay is activated a programmable message appears and whenever there is a change in status a short acoustic alarm is sounded. The way in which these relays are driven can be configured by means of inversion so that they pick up in normal conditions and drop out in the event of alarm or power failure (see below).

In the following cases it is advisable to connect a mains voltage changeover relay downstream (e.g. Phoenix PLC-RSC-24DC/21, 250V 6A) :

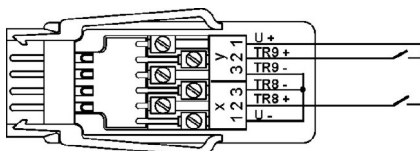
- ▶ Current or voltage capacity greater than 50 V, 0.5 A
- ▶ For separating the mains voltage side
- ▶ For implementing an alarm in the event of failure on the control side (see diagram)



## 6.2 Trigger inputs

The **trigger inputs** TR8 and TR9 can be driven either via optocouplers by voltage levels (4 to 30 V) or via the two keys **F1** and **F2** (configuration, see 6.3.). When using floating switch contacts the optocouplers must be appropriately wired with supply U+ and U- (see diagram).

The trigger function (as standard to start or stop a measuring operation) can also be freely configured (see Manual 6.10.9).



## 6.3 Analog outputs

The relay adapter can also - in various options - be fitted with electrically isolated **analog outputs** offering the following signals.

Option	Output signal	Gain
OA 8000-R2	0.000 to +10.000 V	0.5 mV / digit
OA 8000-R3	0.000 to +20.000 mA	1 $\mu$ A / digit

The output value normally corresponds to the measured value for the selected measuring point. Or alternatively the analog value can be specified as control variable via the interface (see Manual 6.10.7). The output signal from the three options can be programmed as standard output 0 to 10 V, 0 to 20 mA, 4 to 20 mA for any partial measuring ranges (see Manual 6.10.7).

## 6.4 Connecting peripheral equipment

Peripherals can be connected via the supplied ALMEMO screw connector according to the following schematic diagram :

Terminals	P0/1 Relay	P2/3 Relay	P4/5 Analog (option)	P6/7 Analog (option)	P8/9 Trigger
y1	R1 normally closed (NC) (option)	R3 normally closed (option)	(option)	(option)	U+
y2	R1 common	R3 common	AO5 +	AO7 +	TR9+
y3	R1 normally open (NO)	R3 normally open	AO5 -	AO7 -	TR9 -
x3	R0 normally open	R2 normally open	AO4 -	AO6 -	TR8 -
x2	R0 common	R2 common	AO4 +	AO6 +	TR8+
x1	R0 normally closed (option)	R2 normally closed (option)			U-

## 7. Commissioning

1. Connect the relay adapter to socket A2 on the ALMEMO® device; the integrated interface elements are then available as port P20 to P29.
2. Switch the ALMEMO® device ON; see 5.
3. Connect the peripheral equipment to the clamp connectors and on the relay adapter to the appropriate port sockets; see 6.4.
4. All the following programming functions can be performed via the device keypad in the "output modules" menu (if available) or using the AMR-Control software or by means of a terminal command.

### Application Summated alarm :

1. For critical measuring points program limit values on the ALMEMO® device.
2. With ALMEMO® device program the first relay port to variant 0 'Summated alarm' using command 'i20 f9 k0' (see Manual 6.10.9.2).
3. In the event of any limit value being overshoot the associated relay is activated.
4. If it is intended that the relay should drop out in the event of an alarm it can be programmed to operate inversely.

### Application Monitoring a measuring point :

1. Program the limit value for the critical measuring point xx on the ALMEMO® device.
2. Program relay yy as limit value action (special function) :  
Limit value maximum, command : 'Exx ipp f2 Ryy',  
Limit value minimum, command : 'Exx ipp f3 Ryy',  
The relay is configured automatically to the 'assigned' variant.
3. If it is intended that the relay should drop out in the event of an alarm it can be programmed to operate inversely.

### Application Driving via the interface :

1. With ALMEMO® device in the output modules menu program the relay port pp to variant 8 'driven' using command 'ipp f9 k8'.
2. If it is intended that the relay should drop out in the event of activation it can be programmed to operate inversely - using the command 'ipp f9 k-8'.

3. Activate the relay using the command 'ipp f1 Rpp',  
Deactivate the relay using the command 'ipp f1 R-pp'.

### Application Driving the analog output :

1. Configure analog output port 6 or 7; see Manual 6.10.7:  
e.g. assigning to the selected measuring point (command 'ipp f9 E-00')  
or assigning to any reference channel xx (command 'ipp f9 Exx')  
or output the value yyyyy via the interface (command 'ipp f9 ayyyyy')
2. Define the desired measuring range for the measuring point, to be output over the whole analog output range (0 to 10 V or 0 to 20 mA), using the parameters analog start and analog end in sensor programming, special functions, see Manual 6.10.7.
3. If for a current output the output range 4 to 20 mA is to be used (instead of 0 to 20 mA), the element flag for 4 to 20 mA must be activated for the appropriate measuring point; see Manual 6.10.3.

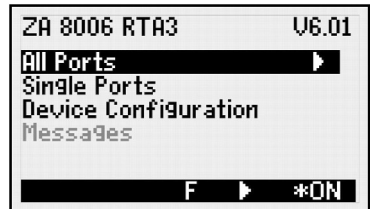
## 8. Display and operating controls

The adapter incorporates a graphics display that can show exactly all states affecting the interface elements. This is configured largely by the device itself.

### 8.1 Main menu

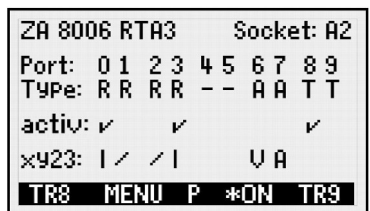
The main menu is called up by pressing **<MENU>**. Here, by pressing **▲** / **▼**, you can access menu items **All Ports** or **Single Ports** or **Device configuration** and then, by pressing **▶** or **PROG**, activate these.

By means of **<ON>** you can switch on display illumination.



### 8.2 Showing all elements :

Below the port number the type of elements available is shown with its abbreviation. Below this the activation status of the relays and trigger inputs is shown and in line xy23 the actual switching status of the relays and the type of analog outputs.



### 8.3 Showing single elements :

You can by pressing **▲** and **▼** scroll through and select any port individually and display details of address, element type, variant, and status.

With **relays** one can also see the actual switching status of the individual contacts.



### Analog outputs

With **analog outputs** the measuring point and the effective output signal at the associated terminals are displayed.

```

ZA 8006 RTA3      Socket: A2
Port: 6           Adr: 26
AnalogOutput:    0-10 V
2: int. assigned  M01
Analogue value:  3.4560 V
Connection:      x3: - x2: +
TR8 MENU P *ON TR9
    
```

### Trigger inputs

With **trigger inputs** the configurable trigger source can be seen on the device itself; the fields that follow show the trigger function, the activation status, and the contact assignment in the plug connector; this information is helpful when connecting.

```

ZA 8006 RTA3      Socket: A2
Port: 8           Adr: 28
Trigger: Key + Optokopleer
0: Start-Stop
State:            inactive
Connection:      x3: - x2: +
TR8 MENU P *ON TR9
    
```

## 8.4 Device configuration

In this menu the display illumination and the internal alarm signaling device can be configured and, if necessary, the watchdog function can be activated. The desired function can be selected by means of keys **PROG** and **▲** / **▼**. Programming is by means of the softkeys **<ON>**, **<OFF>** or **<SET>** and input is by means of keys **PROG**, **▲** / **▼**..., **PROG**.

```

* DEVICECONFIGURATION *
Light:             ✓ Durat.: 20sec
Alarm tone:       P0 UBat: 4.5 V
Watchdog:         ✓
MENU *ON
    
```

### Illumination

To switch display illumination ON press :

To switch display illumination OFF press

To save battery consumption the duration of display illumination can be set by means of :

To switch illumination ON permanently,

To switch back ON again without this function press

```

<ON>      Illumination ✓
<OFF>     Illumination -
Duration : 20 seconds
<SET> or PROG, ▲ ..., PROG
Symbol: - -
ON or <MENU>
    
```

### Alarm tone

Normal short alarm tone on each change :

Having selected the function **Alarm tone** the beeper can be reprogrammed by means of :  
e.g switched off by means of :

Assign relay ports configured in any way :

In permanent alarm status :

To switch this signal OFF press

```

Symbol: ON
PROG, ▲ / ▼ ..., PROG
Symbol: OFF
Symbol: Px
Symbol: 'Px' flashes.
( <MENU> ), <OFF>
    
```



## Watchdog

If the signal needed to drive the measuring instrument or any driven relay, normally received via the interface, is affected by a failure that persists for one minute, the watchdog function ensures that all relays drop out. In the event of alarm **Device configuration** will be displayed and next to the **Watchdog** function a flashing 'Error' symbol will appear.

To switch the watchdog function ON press :

**<ON>**

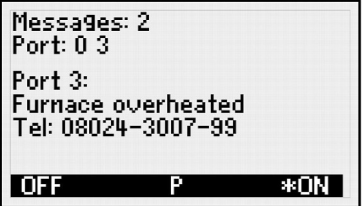
To switch the watchdog function OFF press :

**<OFF>**

## 8.5 Messages

Each relay can be assigned a particular message - either via the AMR-Control software or a terminal; as soon as such a relay is activated the associated message will appear in the display in its own window. If several relays are active, you can leaf up and down through the associated messages by pressing **▲** / **▼**.

These windows can be closed by pressing **<OFF>** but can be reopened at any time via main menu (see 6.1), menu item **Messages**.



## 9. Programming via the device interface

The port address pp is determined on the basis of the socket into which the module is plugged :

Modules in socket A1 :

Port address pp = 10 to 19

Modules in socket A2 :

Port address pp = 20 to 29

etc.

### Function

Port pp, relay variant, driven normally

Port pp, relay variant, driven inversely :

To activate relay port pp

To deactivate relay port pp

To set analog value of analog output port pp

Program message for port pp (e.g.):

Start new line with special character '[':

To output message :

Response

To output programming and status

Response

Output module

### Pxx Interface element

### Variant

### Status

### Contact

00	Normally open 0.5 A	Driven	Inactive	Open	00:NO0 8 0 0
01	Normally open 0.5 A	Driven inversely	Inactive	Closed	01:NO0-8 0 C
02	Normally closed 0.5 A	Driven	Inactive	Closed	02:NC0 8 0 C
03	Changeover 0.5 A	Driven inversely	Active	Open	02:CO0-8 1 0
06	Analog output 10 V	Driven	by	value	06:A05 COM +08.345 V
07	Analog output 20 mA	Driven	by	value	07:A06 COM +12.345mA
08	Trigger key	Start / stop			08:TR1 0
09	Trigger Optocoupler	Manual			09:TR2 1
					NO=Normally open
					NC=Normally closed
					CO=Changeover

## 10. Electromagnetic compatibility

Peripheral adapter ZA8006-RTA3 complies in full with the safety requirements specified in the EU directive relating to electromagnetic compatibility (EMC) (89/336/EEC).

The following standards have been applied in evaluating the product.

IEC 61326:1997+A1:1998+A2:2000

IEC 61000-6-1:1997

IEC 61000-4-2: 1995+A1:1998+A2:2000 8kV

IEC 61000-6-3:1996

IEC 61000-4-4: 1995+A1:2000 2kV

IEC 61000-4-3: 1995+A1:1998+A2:2000 3V/m

## 11. Appendix

### 11.1 Technical data

**Relay :** Semiconductor relay, 1 ohm Load capacity : 50 V, 0.5 A

**Trigger inputs :** Optocoupler 4 to 30 V Input current 2 mA

**Analog outputs :** Electrically isolated

OA 8006-R22 -4.00 to +10.0 V 0.5 mV / digit Load > 100 kW

OA 8006-R32 0.0 to +20.0 mA 1  $\mu$ A / digit Load < 500 W

Residual ripple : < 2 digits

Accuracy :  $\pm 0.1\% \pm 6$  digits

Temperature drift : 1 digit / K

Time constant : 100 ms

**Power supply :** 9 to 12 VDC from the measuring instrument

Current consumption : Standard approx. 10 mA, with illumination approx. 25 mA

Per 2 analog outputs approx. 15 mA +  $1.75 \times I_{OUT}$

**Standard equipment :** Graphics display 126 x 64 (55 x 30 mm)

7 silicone keys

**Housing:** (LxWxH) 127 x 83 x 42 mm ABS (acrylonitrile butadiene styrene), weight : approx. 260 g

#### Suitable conditions :

Operating temperature : -10 to +50 °C (storage temperature : -20 to +60 °C)

Ambient relative humidity : 10 to 90 % RH (non-condensing)

### 11.2 Product overview

Order no.

#### ALMEMO® relay trigger adapter

with 2 trigger inputs, 4 normally open relays, graphics display and keypad, including 1.5-meter ALMEMO® connecting cable and 3 ALMEMO® clamp connectors

ZA 8006-RTA3

Mains adapter with ALMEMO connector, 12 V, 0.2 A

ZA 1312-NA1

#### Options :

2 additional relays (maximum 10),

including 1 ALMEMO® clamp connector

OA 8006-SH2

2 additional normally closed relays per relay pair

OA 8006-OH2

2 analog outputs 0 to 10 V, electrically isolated,

1 ALMEMO® clamp connector

OA 8006-R22

2 analog outputs 0 to 20 mA, electrically isolated,

1 ALMEMO® clamp connector

OA 8006-R32

Fixture for top-hat rail mounting

ZB 2490-HS

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## 11.4 your contact