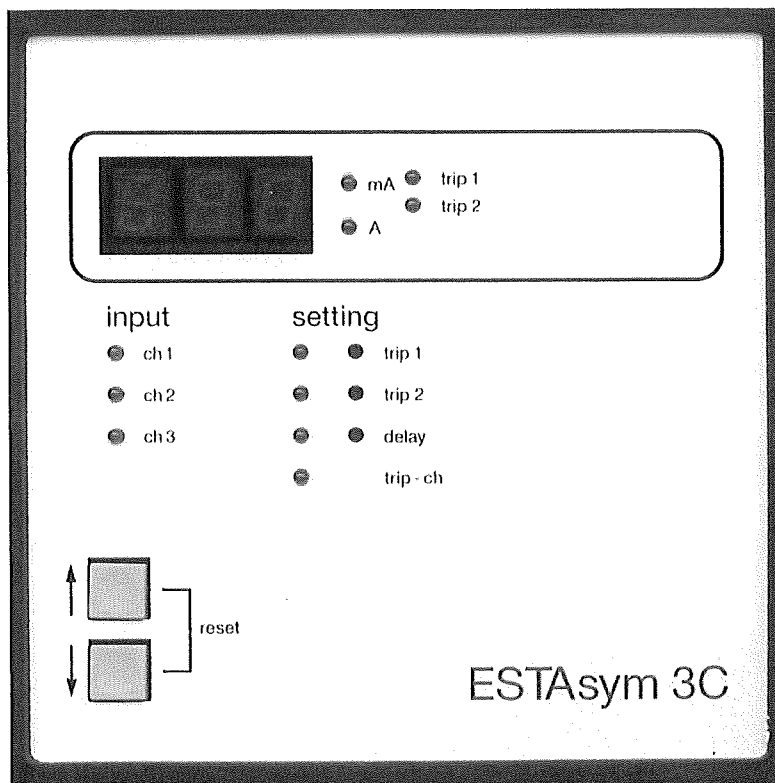


# ESTAsym 3C

## Unbalance Monitoring Relay



## Operating Instructions

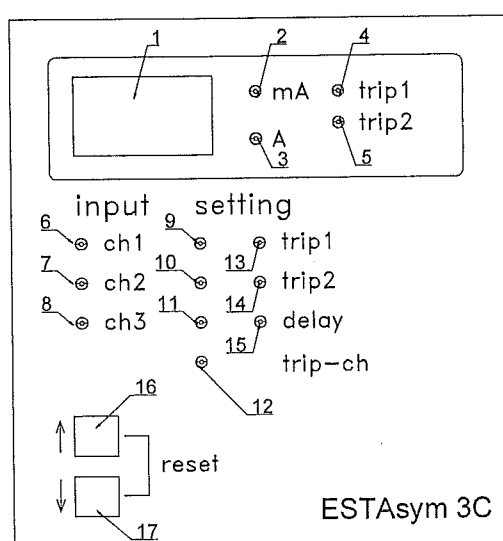
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ESTAsym 3C front panel

# 1 Controls and display elements

## 1.1 Display panel

- 1 – Three-digit display
- 2 - "mA" measured value in mA
- 3 - "A" measured value in A

The display shows the measured (actual) values and the selected desired values. With the aid of LEDs 6 to 11 the displayed value can be related to the measuring point. LEDs 2 and 3 define the unit of measurement applicable to the displayed value. If both LEDs are dark, the ESTAsym 3C is either in the alarm mode, or the trip delay time is shown in seconds.

In the alarm mode, the display shows the location of the fault in the third display digit.

## 1.2 Alarm panel

- 4 - "trip 1" = Trip 1
- 5 - "trip 2" = Trip 2

Exceeding the set trip value is indicated by the corresponding LED.

If the alarm is triggered off, note the following points in particular:

- The ESTAsym 3C is designed for trip 1 to act as a warning stage and trip 2 as an alarm and switch-off stage. This must always be remembered when using the ESTAsym 3C, since peak-value storage only occurs in the trip 2 mode, when the capacitor system has been switched off.
- If an alarm trip has occurred, the fault location is displayed immediately. By pressing key 16 or 17, the desired or actual values, and possibly stored peak values can then be obtained in the usual way.
- If several fault indications occur at the same time, their locations are displayed according to the following priority:

1. "ch 1" or "ch 4"
2. "ch 2"
3. "ch 3"

(\*ch 4 = trip signal for one channel mode)

- The trip 1 and trip 2 signals can be cancelled by either:
  1. pressing the 16 and 17 keys together for at least 5 seconds or,
  2. by adjusting the measuring signal to be lower than the set trip value.

The coding switch can be used to select the mode of cancellation (see chapter 3).

### 1.3 Key panel

Key 16 – Move back by one step

Key 17 – Move on by one step

Keys 16 and 17 select actual or desired values for display. When the power supply is first switched on, or after "Reset", LED 6 is always selected. Pressing key 17 moves on to LED 7. Each time key 17 is pressed, a further move of one step forward is made. Key 16 is pressed to move back. In this direction too, the key must be pressed again for each further step. The step selected for display has no effect on the ESTAsym's Monitoring function.

If both keys are pressed simultaneously for 5 seconds, the software is reset.

### 1.4 Actual values

The following actual values can be selected:

- 6 - "ch 1" measuring current input 1
- 7 - "ch 2" measuring current input 2
- 8 – "ch 3" measuring current input 3

### 1.5 Desired values

The following desired values can be selected:

- 9 - „trip 1“ = trip value 1
- 10 - „trip 2“ = trip value 2
- 11 - „delay“ = trip delay time
- 12 - „trip – ch“ = fault channel

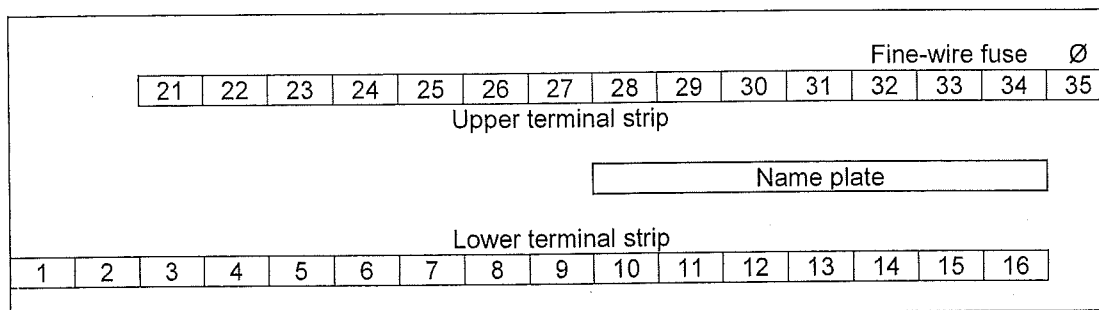
There are trimming potentiometers to the right of LEDs 9 to 11 for desired value selection. For the meaning and correct operation of the trimmer potentiometers, please refer to Item 3.3 "Adjusting desired values".

The display "trip-ch" indicates the location of the fault; if there is no fault signal, the display remains dark. If the one-channel mode is selected and a fault signal is present, the display indicates „ch 4“.

## 2 Connections to the ESTAsym 3C

There are two terminal strips on the back of the ESTAsym 3C to connect the power supply, current transformer, and signal output.

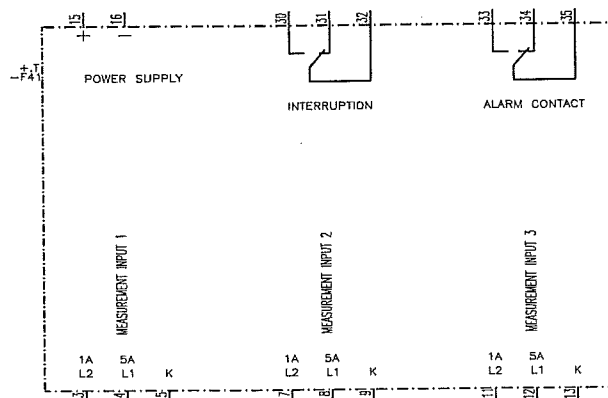
Back of the unit:



Terminal	Designation
3	I2 1A Measuring input1 ( ch 1)
4	I1 5A Measuring input1
5	k Measuring input1
7	I2 1A Measuring input2 ( ch 2)
8	I1 5A Measuring input2
9	k Measuring input2
11	I2 1A Measuring input3 ( ch 3)
12	I1 5A Measuring input3
13	k Measuring input3
15	Power supply AC or DC +
16	Power supply AC or DC -
30	Signal output, trip value 2 Ak (trip 2)
31	Signal output, trip value 2 Rk
32	Signal output, trip value 2 Mk
33	Signal output, trip value 1 Ak (trip 1)
34	Signal output, trip value 1 Rk
35	Signal output, trip value 1 Mk

Ak = make contact  
 Rk = break contact  
 Mk = change-over contact

Terminal diagram:





## 3 Setting up

### 3.1 Standard setting of ESTAsym 3C at factory

#### 3.1.1 Desired value

When the ESTAsym 3C is delivered, the desired values of "trip 1", "trip 2", and "delay" are all at maximum setting.

#### 3.1.2 Coding switch

The setting of the coding switch is shown in the chapter „Project's specific setup values“. The switches have the following functions:

Switch 1	off	=	Automatic RESET, i. e. the alarm is cancelled when the unbalance signal is lower than the set trip values
	on	=	Manual RESET, i. e. the alarm is cancelled only by pressing the keys 16 and 17.
Switch 2	off	=	All measuring current input terminals are activated.
	on	=	1 <sup>st</sup> measuring current input is activated only.
Switch 3	off	=	Measuring current transformer X/5
	on	=	Measuring current transformer X/1
Switch 4	vacant		

If a change of coding is required, proceed as follows:

- Interrupt voltage supply to the capacitor system,
- Remove ESTAsym 3C from the capacitor system,
- Pull off both the black front frame and the front panel.
- The coding switch is located at the upper right-hand corner of the **front plate**.

**After having changed the settings**, re-mount the ESTAsym 3C into the capacitor system following the above procedure in the reverse way.

### 3.2 Setting up of ESTAsym 3C

Before the ESTAsym can be set up, the following conditions must be fulfilled:

- Unbalance protection connected in accordance with the specified Monitoring circuit
- Capacitor system is ready to switch on.

Upon connecting the ESTAsym 3C to the supply, the measuring current input 1 is addressed automatically after a brief self-testing. After the capacitor system has been started up, the corresponding measuring current value will be displayed.

If an alarm is triggered off at this stage, this means that natural unbalance in one phase is greater than the ESTAsym's adjustment range; in this event the capacitor system must be checked. The natural unbalance should not exceed a value of 30% of the trip value.

### 3.3 Adjusting the desired values

Adjustment is by means of trimmer potentiometers, located to the right of the corresponding desired-value LEDs. For reliable adjustment of the trimmer potentiometers, a screwdriver with a blade width of 2 mm is needed.

You are recommended to proceed as follows:

1. Use key 16 or 17 to move to selection of the desired trip value 1 (LED 9).
2. Turn trimmer potentiometer 13 to set up the desired trip value.
3. Use key 16 or 17 to move to selection of the desired trip value 2 (LED 10).
4. Turn trimmer potentiometer 14 to set up the desired trip value.
5. Use key 16 or 17 to move to selection of the desired delay time (LED 11)
6. Turn trimmer potentiometer 15 to set up the desired time.

After concluding the setting-up work, or during regular operation, all desired values can be monitored at any time. For the function of the ESTAsym 3C, it is of no significance which display setting has been selected.



## 4 Technical data

### 4.1 Measuring circuit

Possible C.T. types	X/1 or X/5
Measuring range	0 - 999 mA or 0 - 5.0 A
Galvanic isolation	via current-voltage transformer, electric strength 2kV
Power consumption per measuring circuit	1 VA
Measurement input filter	50 Hz or 60 Hz band-pass filter in each measuring circuit (a = 10 dB)
Measuring accuracy	Class 1
Electrical overloading capacity	2500 A at t = 0.1 ms

### 4.2 Control circuit

Adjustment range for trip values 1 and 2	0 - 1000 mA or 0 - 5,0 A
Trip delay	0,1 - 6,5 seconds
Trip resetting	By pressing keys 16 and 17 together for at least 5 s or, if unbalance signal is turned lower than trip values.
Trip display	a, trip stage by LEDs b, fault location with display
Signal outputs (relay contacts)	a, for - trip value 1 - trip value 2 b, accepts load of 5 A / 265 V
Display	3-digitig; red
Display resolution	5 mA or 25 mA
Watchdog	monitors ESTAsym's function

### 4.3 Electric power supply to ESTAsym 3C

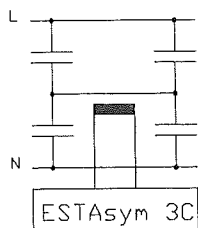
Operating voltages	a, 110 V AC or 220 V AC b, 110 V DC or 350 V DC c, 24 V DC
Fuses	160 mA slow-acting fine-wire fuse, 5 x 20 mm, on rear of ESTAsym 3C
Power consumption	approx. 10 VA

### 4.4 Mechanical construction

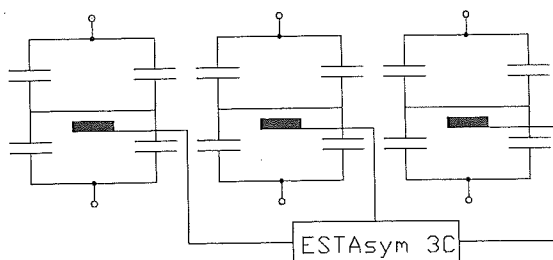
Front panel	144 * 144 mm
Switch panel cut-out	138 * 138 mm
Depth	129 / 138 mm
Weight	1000 g
Installed position	any
Mounting	with angle brackets supplied
Housing	Switch panel = Noryl, with lockable front door (acrylic glass) as optional extra
Connections	16-pin and 15-pin socket strips
Protection degree	IP 41 when installed
Operating/ambient temperature	-10 to +60 °C
Storage temperature	-40 to +70 °C

## Project's specific setup values

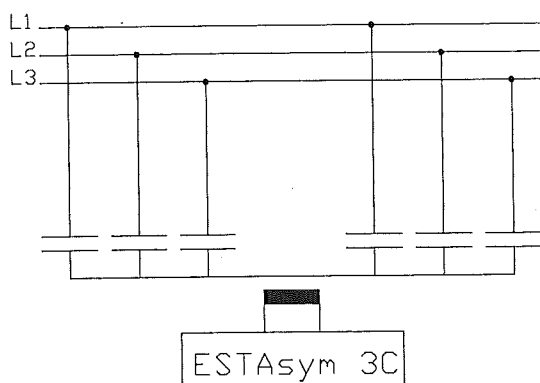
☐ Single-phase bridge circuit



☐ Three-phase bridge circuit



☒ Double-star circuit



☐ other

Measuring current transformer:

XX / X A

serial number of ESTAsym 3C:

XXXXXX / XXXX

Code switches:

1= XX 2= XX 3= XX 4= XX

Initial settings:

☐ trip1, trip2, delay are set to maximum.

☒ specific setup values

trip1: XXX mA

trip2: XXX mA

delay: XX seconds