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1. Instructions

1.1 General

The Power Supply Unit V40-3A exclusively serves as power supply for the ADICOS fire gas detectors. It is the responsibility of the fire detectors to safely recognize fire already in the starting phase.

1.2 Specifications (Standards)

Aside from the generally applicable Specifications (DIN VDE 0100, etc.) the following Standards and Specifications are to be considered:

- DIN VDE 0180
- DIN VDE 0845
- DIN VDE 0800
- DIN VDE 0833
- DIN VDE 14675
- VdS 2095
- Connection Requirements of the Responsible Fire Department
- Constructional Restrictions of the Local Constructional Planning Authority.

1.3 General Safety Instructions:

Basic Instructions:

The systems of the ADICOS series are produced and tested according to the state of the art, the up-to-date quality standard and the valid safety rules and regulations. They have left the factory complying with all respective safety specifications. To maintain this condition and to ensure safe operation the operator (owner) has to consider the instructions and warnings listed in the installation and operation manuals.

As a matter of principle only electricians or electric specialists are allowed to work at the electrical installation, as they have to be capable to

- assess the assigned tasks,
- recognize potential sources of danger and
- take adequate safety precautions.

Modifications or changes of the unit are only permitted if agreed with the manufacturer.

Only original spare parts and accessories authorized by the manufacturer are permitted for use and are required to ensure safety. If other parts are used the manufacturer is no longer liable.

The operational safety of the supplied systems is only guaranteed if applied in accordance with the regulations. The limit values stated in the technical data are not to be exceeded.

1.4 Safety-relevant Regulations:

The regulations for safety and accident prevention for the specific field of application have to be complied with during installation, initial operation, service and maintenance.

The following special regulations are to be followed (we do not claim, that all applicable regulations are listed):

VDE (Association of German Electrical Engineers) – Regulation:

- VDE 0100
Regulations for the construction of power plant with a nominal voltage of up to 1000V
- VDE 0113
Electric installations with electronic equipment
- and others

Fire Protection Regulations

Accident Prevention Regulations

1.5 Intended Application

The ADICOS components have been constructed in accordance with approved safety regulations. Nevertheless dangers for life and limb of the users or third persons may occur.

The components are only to be used if they are in perfect technical condition and are applied according to their intended use.

Faults, which may have an influence on safety, have to be eliminated immediately.

The components of the ADICOS series are exclusively intended for the recognition of fires in the starting phase by detecting of the different gas components developing during a fire and to report and forward these in combination with suitable fire detection centers. A different application or an application exceeding this purpose is considered as **not intended use**.

The manufacturer is not liable for damages, which were caused by unintended or unauthorized application or improper use of the fire detectors. The user is the sole bearer of the risk.

For **intended use** the following is to be considered

- compliance with the operating manual,
- compliance with the service intervals stated in the chapter **service and maintenance**.

Not intended use includes

- use of the ADICOS components for applications outside the field of fire detection

1.6 Qualification of the Service Staff

Only especially **qualified personnel** is allowed to operate this installation – i.e. persons who

- are familiar with the initial start- up and the operation of the installation.
- are qualified either by reading and understanding the operation manual or by education or instruction,
- are familiar with the Accident Protection Regulations.



The customer has to comply with the VDE regulations when installing the system.

1.7 Warning Notes and Symbols

In this operation manual the following names and symbols are used for very important information:



This sign points out risks endangering persons when carrying out the respective activity.



This sign points out dangers for objects, i.e. damage of the system control respectively the system.



This sign points out the danger of a possible electric shock. These situations may lead to endangering persons and objects (i.e. damage of the system control respectively the system).



The hand with the extended index finger indicates where to find additional information and hints.

Please read carefully all safety references in this operation manual and consider them when working with the system.

Children and public are not allowed to have access to these appliances.

Please store this operation manual carefully and make it available to every user.

2. Description and Application

The voltage supply of the ADICOS fire detectors is 24 - 40 VDC. This means that the detectors can be operated with every 24V industrial power supply. Since the detectors have to be supplied over large cable lengths, however, a 40 V DC supply is recommended to balance a possible voltage loss on large wire lengths.

The power supply unit serves for the supply of the required operation voltage in sufficient quantity – also ADICOS industrial detectors connected over large wire lengths. The NT V40-A3 is a Power Supply Unit in a compact steel sheet housing, for simple wall installation and a capacity of 40 V and 3 A. It is provided with terminal strips for simple cable connection to power supply and detector supply.

The power supply unit concept provides for the supply of detectors also over larger distances and branching.

The output voltage is electronically limited and short-circuit proof.



ATTENTION
Electro-static conditions may endanger components
Follow handling procedures

The unit contains assemblies that are sensitive to electro-static conditions. Installation, repair and service have to be carried out by expert personnel. Electrostatic discharge when touching the internal assemblies may lead to the destruction of components. When replacing the sensor head special care has to be taken to avoid electrostatic discharges, as the sensor head contains electronic components that may be destroyed by electrostatic tensions. Damages of this kind are not covered by the guarantee.

3. Technical Data

Special Characteristics:

- Robust sheet.-steel housing
- Resistant against air humidity and strong dust pollution
- Electronically controlled output voltage
- Short-circuit proof
- LED condition display
- Simple wall installation
- Simple connection with terminals
- Large wire lengths

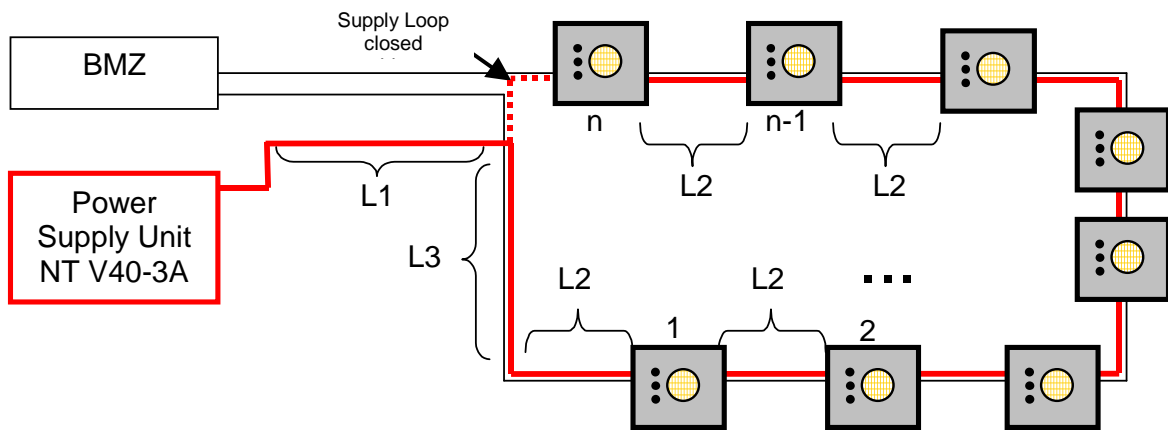
| Technical Data | | |
|--|-------------------------------------|--------|
| Line Voltage | 230 VAC +/- 15% | |
| Power Consumption | 160 VA | |
| Temperature Range | -10 ... +50 °C | |
| Relative Humidity | max. 95 % (not condensing) | |
| Output Voltage | 38 – 40 V DC electronically limited | |
| Fuse | 3 A automatic | |
| Output Voltage | 38 – 40 V DC | |
| Housing | | |
| Steel-sheet Housing (corrosion resistant), gray (Ral 7032) | | |
| Dimension (H, W, L) | 300, 200, 160 mm | |
| Weight | 6,3 kg | |
| Protection Type | IP 55 | |
| Installation | On the surface | |
| Electric Connection | Plug-in Terminals | Number |
| | ● Power Supply Unit | 2 |
| | ● Ground Terminals | 5 |
| | ● 40V DC | 3 |
| | ● GND DC | 3 |

4. Number of Detectors and Cable Lengths

The detectors of the ADICOS series have an internal current limitation, which limits the detector current to maximally 150 mA. Considering various operation conditions and average power consumption we developed the following examples

- for cable lengths,
- number of units and
- the basics for calculation.

Example calculation for a simple spur:



Explanation of the chart:

- n: Number of detectors, the detectors are numbered from 1 to n.
- L1: Cable length between power unit and next detector (i.e. Detector n)
- L3: Additional cable length to length L1 between power unit and detector 1
- L2: Cable length between 2 successive detectors

Example: Figures (Simple Loop):

Simple Loop: All detectors are connected in series

| Number of Detectors | L1 + L3 | L2 | Total Length (Spur) |
|---------------------|-------------|------|---------------------|
| 1 | Max. 2600 m | - | 2600 m |
| 2 | 1280 m | 33 m | 1350 m |
| 4 | 580 m | 33 m | 710 m |
| 6 | 326 m | 33 m | 720 m |
| 8 | 180 m | 33 m | 440 m |
| 12 | 180 m | 7 m | 264 m |
| 16 | 110 m | 7 m | 222 m |

4.1 Basics for the calculation of the cable lengths:

To ensure that all detectors work even in the worst case, which means even if the supply loop is interrupted before the last detector n (arrow), the following condition has to be fulfilled:

The voltage drop of the whole spur line to the last detector should not be more than 20 V at a voltage supply of 40 V.

The voltage drop for the cable lengths before the first detector + cable lengths between the detectors
 $L1 + L3$ + $n * L2$

corresponds to:

$$(R1+R3) \times n \times I + R2 \times I \times (n+1) \times n \times \frac{1}{2} < 20 \text{ V}$$

where: I : maximum detector current: 150 mA
 n: number of detectors
 R2: wire resistance between 2 detectors
 R1+R3: wire resistance to first detector

At 0,75 mm² the following applies for the wire resistance: $R = L \times 2 \times 25 \text{ } \Omega/\text{km}$

Average power consumption per detector: $I = 0,15 \text{ A}$

Therefore applicable:

$$(L1 + L3) \times n + L2 \times (n+1) \times n \times \frac{1}{2} < 20\text{V} / (0.15 \text{ A} \times 2 \times 0.025 \text{ } \Omega/\text{m}) = 2600 \text{ m}$$

The calculation rule for limiting case therefore is:

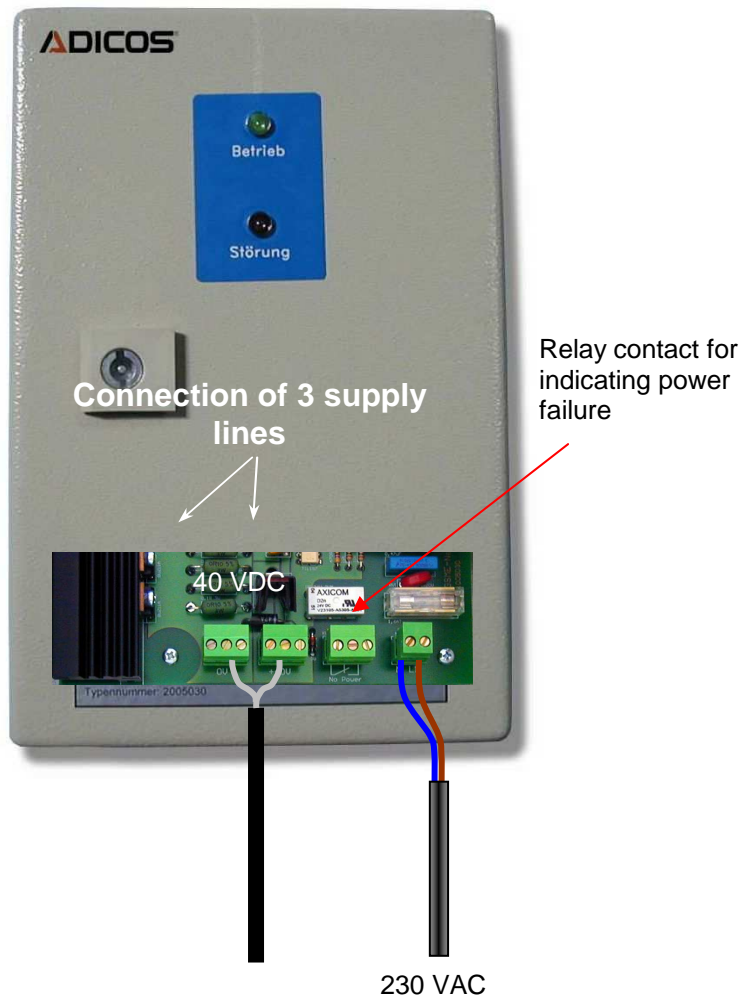
$$(L1 + L3) \times n + L2 \times (n+1) \times n \times \frac{1}{2} = 2600 \text{ m}$$



Remark:

Only the spur lines starting from the bus master/repeater were considered here. If a supply loop can be installed, like indicated by the dotted line in above diagram, the permitted cable lengths increase by approximately 50%.

5. Connection



The power supply lines (max. 3) for the detectors are connected to both terminals ‘**0V**’ and ‘**40V**’.

The power supply is carried out at the ‘**N**’ and ‘**L1**’ terminals. The ground terminator is connected to the ground strip installed in the unit. A power failure is indicated by an internal relay contact ‘**No Power**’, which is carried out as a changeover contact.

6. Service

The GSME units do not contain expendable or non-repairable parts. Therefore a respective service is not required.