# Linear Heat Detector

## SKM-03.1

Conventional Type

VdS Nr. G 203076
Art.-Nr. BK82008

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## 1.0 General / Product Features

The Sensorkabelmelder SKM-03.1 is a linear heat detector.
The maximum length which the sensor cable may have contained is up to 300 m.
Temperature increases are detected in dependency of the heat per cable length.
The sensor cable is stable against mechanical and chemical effects, corrosion, moisture and dust.
Easy and very economical installation of the system.
The Alarm indicator is in accordance with the DIN 14 623 „Parallelanzeige für Brandmelder".
licensed with DIN / EN 54-5 Class C

The VdS license number is **G 203076**.

With the sensor cable monitoring system is the early detection of a fire as possible as the overheating from for example: conveyor belts, cable paths or tunnel. For detection it can be mounted on the ceiling or also be mounted directly above a cable route. The sensor cable needs only a little space and detects in rough ambient in the same safe way, while other Fire detection systems produce false alarm.

SKM-03.1

1.) Control unit SKM
2.) End of line box for SKM
(is part of the delivery)
3.) Sensor cable – standard (red) Art.-Nr. BK82002
4.) Sensor cable - with Rilsan-coat (black) Art.-Nr. BK82004
5.) Sensor cable - with Stainless Steel Shelter Art.-Nr. BK82006

The cable is made of an inner- and an outer conductor, the outer conductor is trained as wire mesh. The insulation between both conductors is made out of a plastic material with a negative temperature coefficient, which means with increasing temperature, the insulation resistance decreases.
In the "end of line box", at the end of the sensor cable, the conductor will be connected with a defined resistor of 3,6 KOhm.

Because of that, the whole system is always monitored for wire breakage and short circuit. A break or a short circuit on one of this both conductors causes an fault alarm.

## 2.0 Technical Data

### Detector

| | |
|---|---|
| Operating Voltage | 24V DC |
| Current consumption standby | 28 mA |
| Current consumption alarm | 58 mA |
| Parallel indicator (external) | -Ub max. 30mA |
| Alarm contact | switching contact |
| Fault contact | switching contact |
| Max. contact load | 30 V / 1 A |
| Temperatur range | -25 °C up to +50 °C |
| Indicators | |
| - Fire Alarm | LED red |
| - Operation | LED green, on |
| - Malfunction | LED green, off |
| Dimensions SKM B/H/T | 110/110/65 mm |
| Weight | 270 Gramm |
| Color | grey, RAL 9002 |
| Ingress Protection | IP 65 |
| Dimensions end of line box B/H/T | 80/80/52 mm |

### Cable

| | |
|---|---|
| a) Sensor cable red (Standard) | Plastic coaxial conductor |
| Sensor cable-Diameter | 3,25 mm |
| Tensile strength | < 200N |
| Sensor cable-Weight | 1,6 kg per 100 Meter |
| b) Sensor cable black (Rilsan) | Plastic coaxial conductor with Nylon coating „Rilsan“ |
| Sensor cable-Diameter | 4,00 mm |
| Tensile strength | < 200N |
| Sensor cable-Weight | 3,0 kg per 100 Meter |
| c) Sensor cable stainless (V2A) | Plastic coaxial conductor with stainless steel mesh |
| Sensor cable-Diameter | 4,20 mm |
| Tensile strength | 1000N |
| Sensor cable-Weight | 3,75 kg per100 Meter |


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## 3.0 Projecting- and Assembly Note

The SKM controller in connection with the sensor cable will be mounted in the reporting area. The projecting and mounting have to be done after the rules of VdS and EN 54-5. In some areas, collusion with the firefighters is sense or necessary.

The height isn't allowed to be more than 6 meters. The sensor cable hast to be relocated like river loops in figure 1. Basically the designing rules of VdS for heat detectors apply. It is important to make sure that the distance between wall and sensor cable at least 0.5 meters is. This also applies at the laying parallel to beams. Crossing of ceiling beams is possible, but the length of sensor cable on the beams should not be longer than 10% of the overall cable length.

Before you install the sensor cable system, you should be have a sketch drawing of the area which will be monitored. In this layout you have to draw under consideration of VdS and DIN-rules the way of the sensor cable. The following Points should be considerate:

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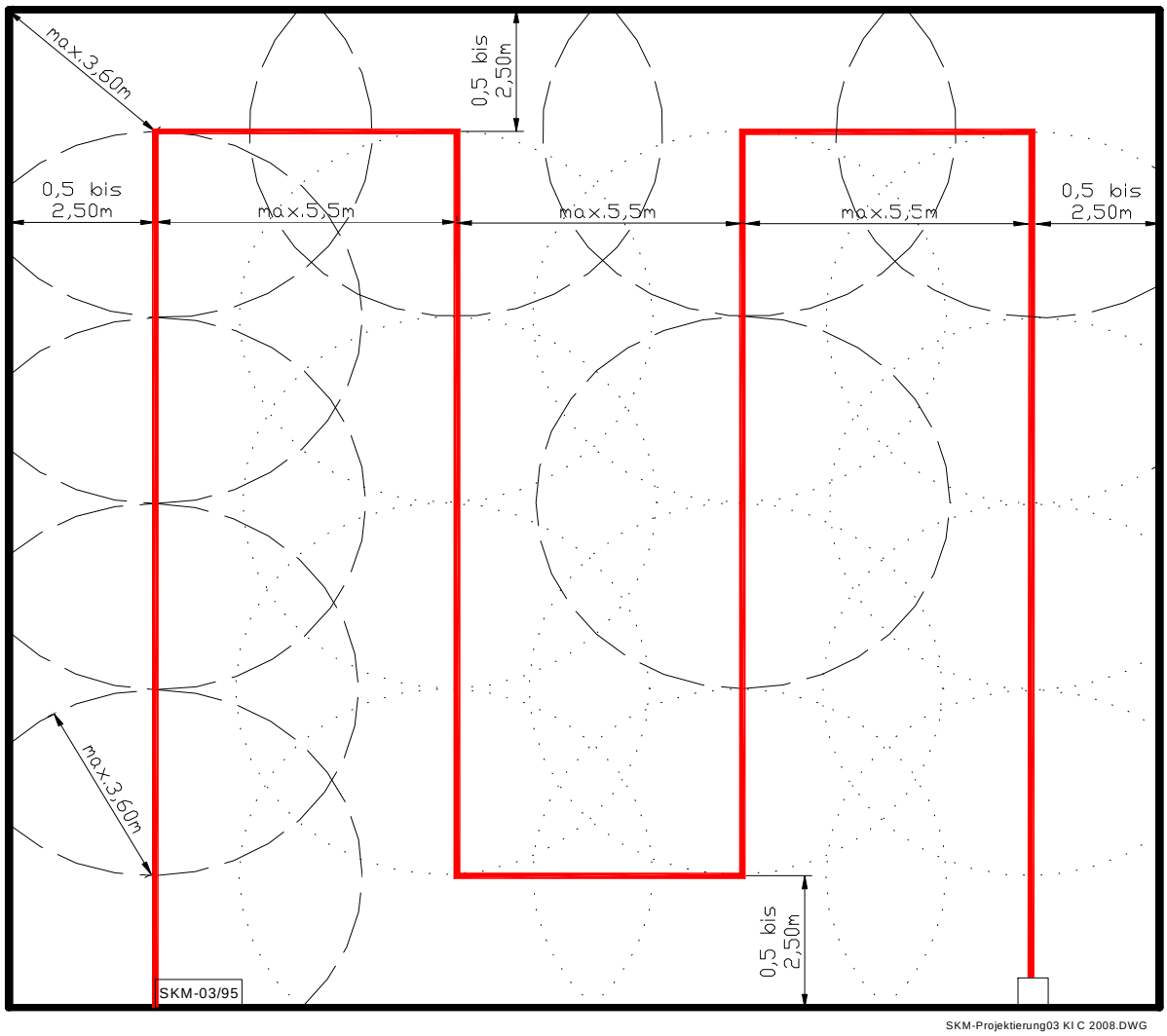
- The sensor cable should not get into contact with a material which „cools the cable", because this causes an alarm delay
- Laying on sharp objects and the squeezing is to be avoided so that the outer insulation of the sensor cable is not damaged
- for extending the sensor cable are only suitable housings with cable fixation to use. The connection of the wires should be made by soldering.
- The bending radius of the sensor cable must not fall below 20 mm.
- The sensor cable should not be fastened with cable ties. Better use our plug dowel clamps . ( Figure 3)
- The distance between the clamps should not exceed 40 cm.
- The mounting of the sensor cable near of the objects which radiate heat has to be avoided. These could be powerful light sources, steam pipes, drains or similar.
- The end of line box hast o be mounted in the same fire section as the SKM.
- The end of line box should, where appropriate, by a sign marked, and mounted at an height of 1,80m (+10cm / -20cm, means, outside of the area to be reached by hand.

## 3.1 Complete monitoring required EN / DIN 54-5 Class C

The detector meets the values of EN54-5 for 5 meter sensor line, if the whole route will not be more than the maximum cable length of the graphic shown in figure 2. It is important to make sure that from every point of the monitored area, at least 5 meters sensor cable with a radius of 3,6m is relocated.

**Figure 1**




Anmerkung:
Die strichlierten Kreise stellen die Überwachungsfläche eines klassischen Punktmelders dar.
Bei der Verlegung der Sensorleitung müssen die angegebene Maße eingehalten werden.

Nur so ist sichergestellt, dass ein Brand, an einem beliebigen Punkt des Raumes, mindestens 5 Meter Sensorleitung erhitzen kann.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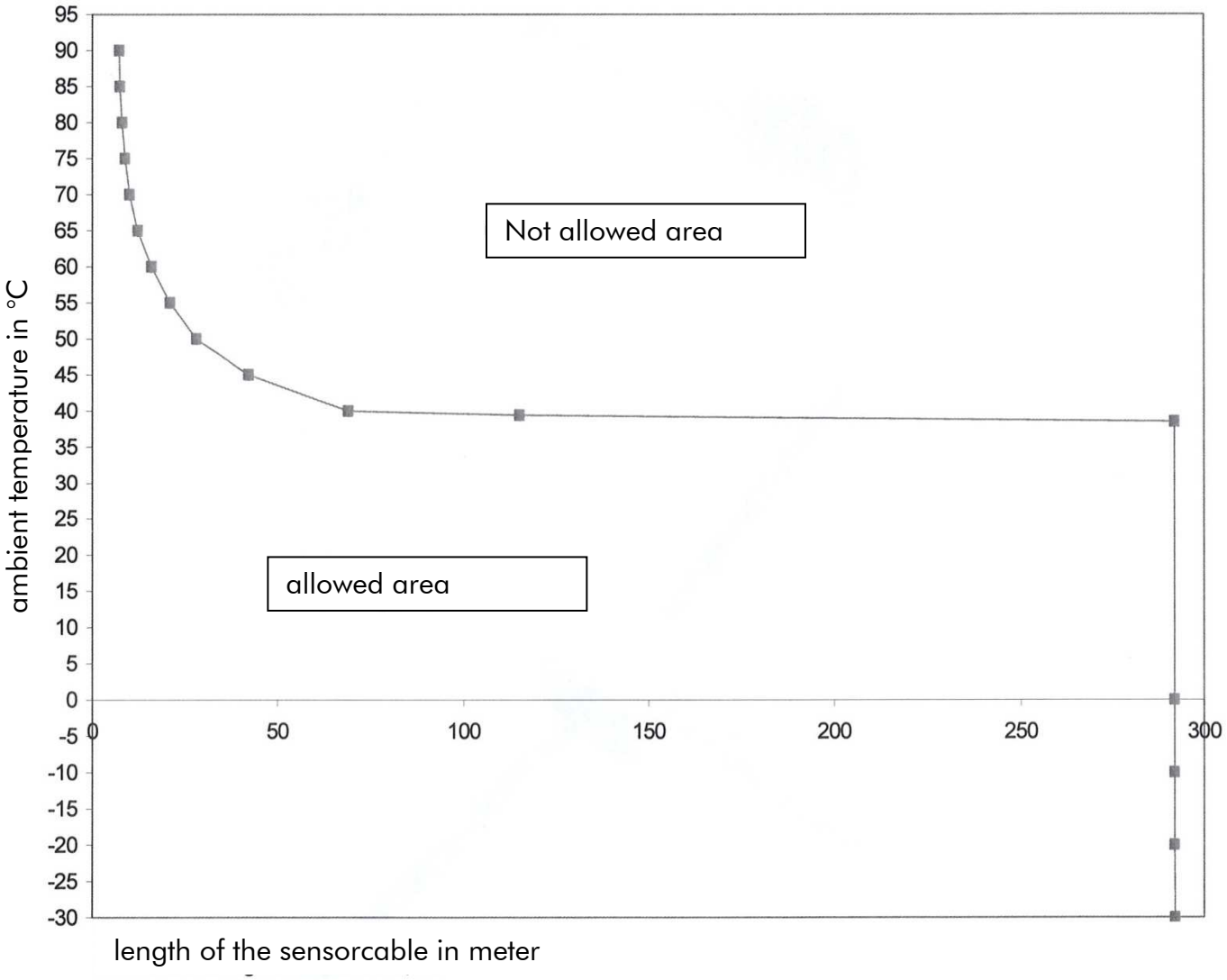
## 3.2 Maximum cable length

The figure below shows the maximum of allowed cable length related with the maximum ambient temperature which is to expect.

**Figure 2**

Allowed area



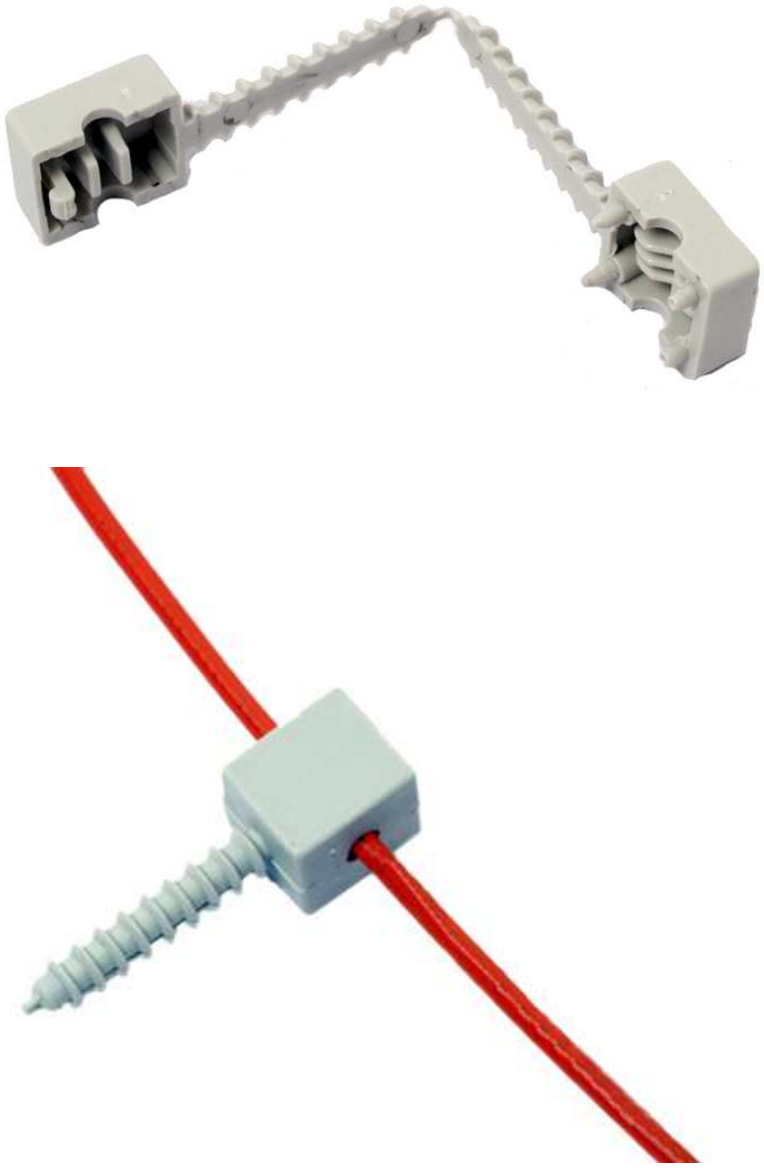

An alarm will be detected when 5 meters sensor cable are warmed up between 84°C and 100°C.

## 4.0 Assembly Tools

To attach the sensor cable you can use different systems. It's just to make sure that the sensor cable is not damaged and the cable is at least 5mm away from the ceiling.

In practice the „Plug in dowel" below has proved its worth because of its simply and time-saving mounting. (Drilling ∅ 6mm – Click – Plug)
It can be used with the cable types „Standard" and „Rilsan".

**Figure 3**



As alternative you can use OBO Clamp 2730, too.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## 5.0 Indicators / Settings

The indicators for alarm and operation / fault alarm are placed on the top of the PCB. You find it mounted behind the makrolon cover in the ingress protected area.
The alarm indicator is in accordance with the DIN 14 623 „Parallelanzeige für Brandmelder".

### 5.1 Indicators and Jumper

On the PCB in the housing you can find the wire clamps

**Figure 4**


You can choose following settings for a fire alarm:

| | |
|---|---|
| Jumper in Pos A: | If there is a fire alarm recognized, the SKM is steady holding the alarm relay. For resetting this, the operating voltage has to be cut for a moment (Delivery setting) |
| Jumper open: | If there is a fire alarm recognized, the SKM is holding the alarm relay while the Alarm criterion is available. When the Alarm criterion is no longer available, the SKM resets automatically |
| Jumper in Pos B: | Test Alert |

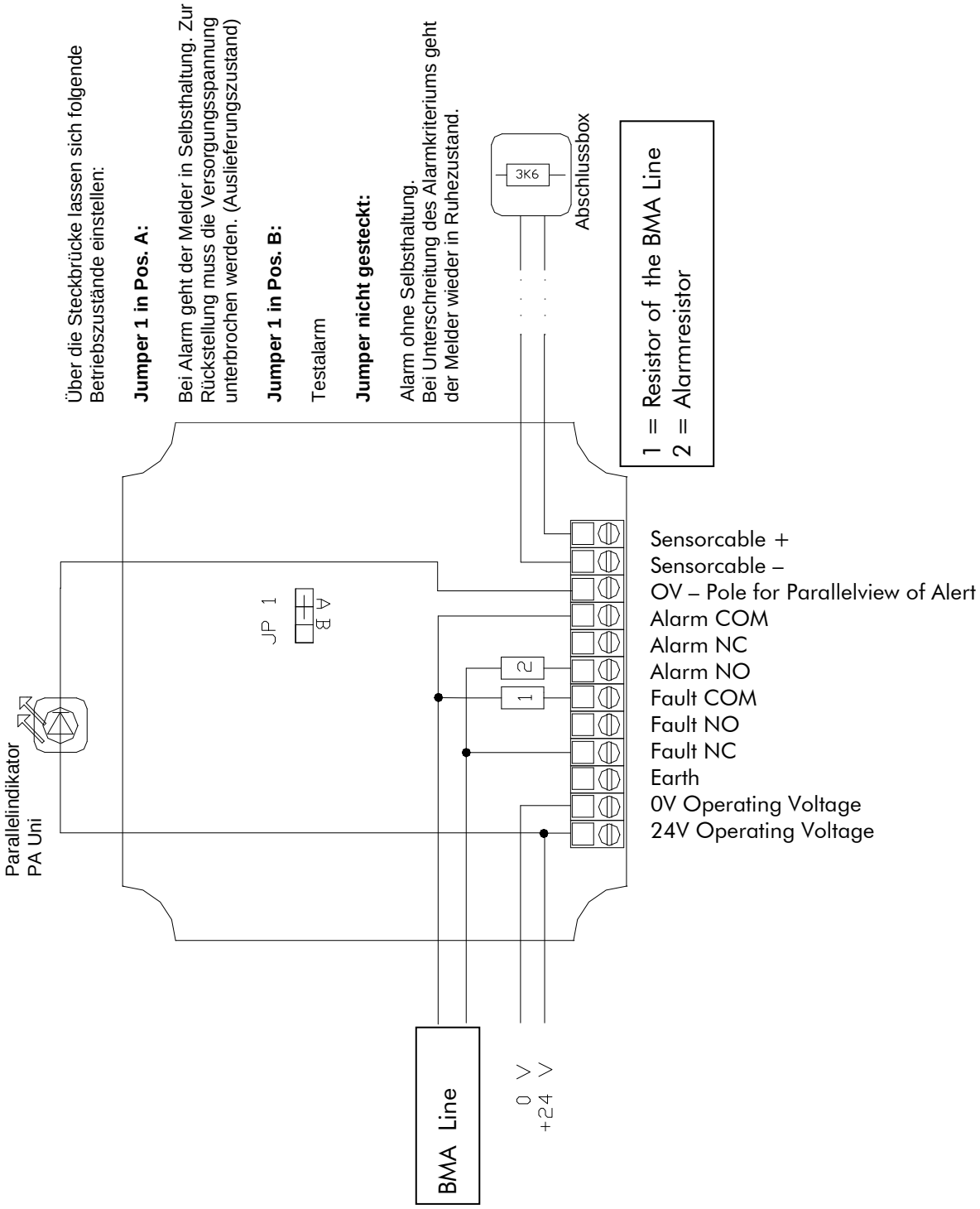
### 5.2 End of line Box

In the end of line Box you find a 3, 6 KOhm resistor.
This is used for monitoring the case of cable break and short circuit.

## 6.0 Wiring of the control unit

The SKM is designed that all of the LED's are behind the makrolon cover in the IP-65 protection. A 12-pole terminal block is there for the connection. See the wiring schematic in the image below.

**Figure 5**





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# 7.0 Testing the unit

## 7.1 Function control SKM-03.1

a) Green LED glows when operating voltage is OK and there is no fault.
(This means, there is no cable break and the 3,6KOhm resistor is recognized)

b) Heating up minimum 5 meter of sensor cable with help of a water boiler onto 100°C (max. 115°C) is setting a fire alarm. You can reset the alarm only if the temperatur of the 5 meters cable are „normal".
A Test alarm could also be simulated while setting Jumper JP-1 in position „B".
Further you can use an internal Reed contact for simulating alarm. Hold a magnet near the M16 Cable input for simulating an alarm without opening of the housing.

In all cases the red alarm LED has to glow and if connected, the parallel indicator also.

**** If the sensor cable is heated up to 150°C or higher, you cannot use these part of the cable anymore. You have to renew this part of the cable.**

## 8.0 Find out the length of installed Sensor cable

If the total length of an installed sensor cable is not known, you can measure it with the help of a multi meter. For this, you have to clamp both wires of the sensor cable in the end of line box together. Then measure the resistance at the other end of the cable. The sensor cable has a resistance of 0,2 Ohm per meter.

The cable length is calculated as follows:

$$\text{Length in meter} = \frac{\text{resistance (Ohm)}}{0,2\ (\Omega/m)}$$

## 9.0 Mounting sensor cable in a garage

**Figure 6**

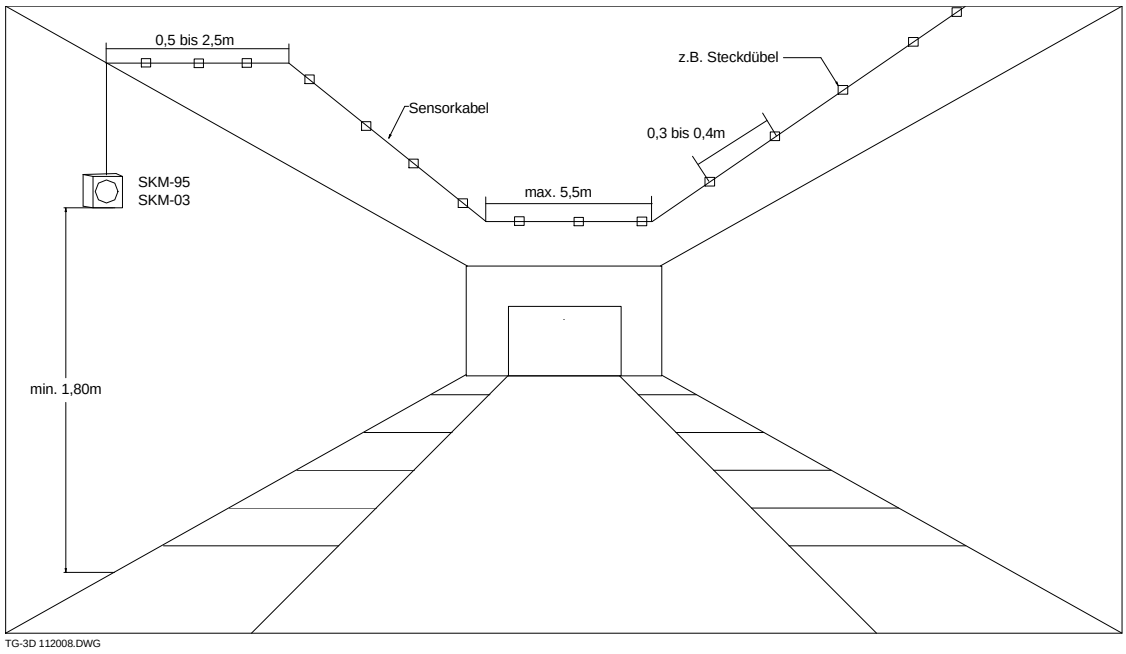



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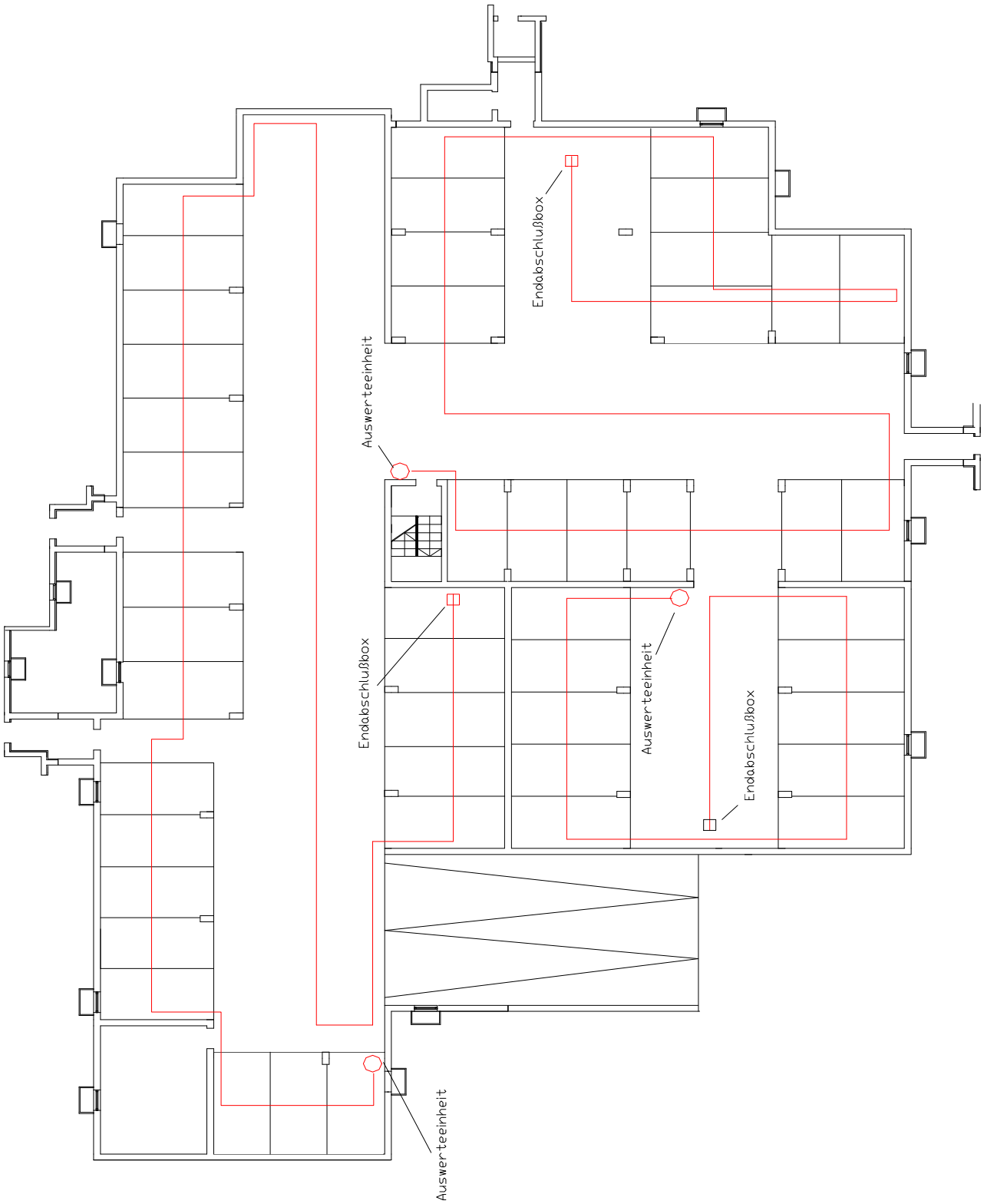
Figure 7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