FIPRON CORD Installation Instruction

version 1.0

Prepared by:

FIPRON, Inc.
211 E. 7th Street, Suite 620
Austin, Texas 78701, USA
+1 (832) 288-0257

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1. Introduction

This instruction is intended to get the knowledge for technically correct installation, adjustment and commissioning work when installing FIPRON CORD.

2. FIPRON CORD Overview

FIPRON CORD is a cord type of fire extinguisher. It is a new generation of a fire suppression products consisting of composite materials having a mixture of microcapsules with a heating compound. Under the effects of a fire and a temperature of 170 ℃ at any of its points, an initiation of the heating compound occurs with subsequent chemical reaction throughout its length. The reaction results in the bursting of all microcapsules of the extinguishing agent.

FIPRON CORD is intended for the protection against fires in junction boxes, power distribution boards, servers and other electrical equipment having a confined volume space of up to 4000 liters.

FIPRON CORD extinguishes inflammation sources at early stages of fire, prevents distribution of fire beyond limits of a protected space, and excludes repeated ignition in the protected space for over 30 minutes. Due to its elasticity it is simple in installation, does not require power source, and remains in a standby mode for over five years. Its operating temperature is 170 ℃ and is normal ambient temperature range is from -50 ℃ to +80 ℃ with relative humidity of up to 90%.

3. Technical Information of FIPRON CORD

3.1. Autonomous firefighting installation product «FIPRON CORD» with thermally activated microencapsulated fire extinguishing agent is a fundamentally new fire extinguishing product designed specifically to extinguish fires autonomously without human assistance and is effective on the fires of classes A, B and C. FIPRON CORD is intended to be used in electrical equipment under voltage in small volume objects and up to 4000 liters, such as electrical cabinets, cabinets with electrical equipment, cable channels, etc., located in rooms with operating temperatures from minus 50 °C to plus 80 °C and humidity of up to 90 percent. FIPRON CORD can be installed together with a high-voltage electrical cable in the closed cable channels without any modifications to the existing equipment.

3.2. Trade name of the product: Autonomous firefighting installation «FIPRON CORD» with thermally activated microencapsulated fire extinguishing agent.

3.3. FIPRON CORD operates as an intelligent fire extinguishing system. Influence of temperature on its active components causes the release of fire extinguishing component until the complete suppression of the fire.

3.4. Main distinguishing features of FIPRON CORD:

- Flexible base allows installation in confined spaces with different bending radius;
- Lightweight ensures easy transportation of the product;

- Strength properties allow the use of the product in a wide range of temperatures.

3.5. Use of FIPRON CORD to protect equipment located in electrical cabinets with forced ventilation in volumes bounded by structures with openings is possible, provided that the nominal volume or the number of FIPRON CORD is increased.

3.6. The contents of the microcapsules are a gas extinguishing agent (GEA) 3M™ Novec™ 1230 FIRE PROTECTION FLUID (FK-5-1-12; CF3CF2O(O)CF(CF3)2; 1,1,1,2,2,4,5,5,5-nonafluoride-4-(trifluoromethyl)-3-pentanone), which does not contain ozone-depleting substances.

4. Technical Characteristics of FIPRON CORD

Name	FIPRON CORD
Protected volume	up to 4000 liters
Triggering temperature	170 ± 5 °C
Class of fire	A, B, C
Protection class of the object	IP20 and higher
Optimal operating temperature	from -50 °C to +80 °C
Volume protected by 1 meter of the product	50 liters

5. General Operating and Installation Rules

5.1. FIPRON products can be installed in wall sockets, connectors, switchboards, electrical cabinets, control cabinets, large-scale storehouses of valuables, safes with a degree of protection not lower than IP20.

FIPRON CORD can be installed together with a high-voltage electrical cable in closed cable channels located both indoors and outdoors with operating temperatures from minus 50 °C to plus 80 °C.

5.2. During the installation of the products in wall sockets, connectors, switchboards, electrical cabinets, control cabinets and other electrical equipment it is necessary to follow the rules of installation and operation of electrical equipment and observe the safety precautions regarding works with electrical equipment.

5.3. For the period of installation, the supply of voltage must be stopped, and measures taken to exclude the possibility of electricity supply.

In case it is not possible to disconnect the power when installing the products in an object under a voltage, it is necessary to take measures to observe electrical safety rules (work in dielectric gloves, use of a dielectric mat, and other local regulations regarding working with electrical equipment).

In the case of the use of products in multiple-compartment control cabinets, each section must have a degree of protection of not less than IP20 and be protected independently for the corresponding volume of the compartment.

5.4. When the FIPRON CORD is triggered (the red thread of the sheath burns out and if there are signs of failure of the electrical equipment (darkening of housings, wires, signs of overheating and sparking), the defect should be eliminated, and the product should be replaced with a new one.

5.5. Do not hit the product and do not carry out works related to the use of open flame near the surface of the product.

5.6. Re-use of disassembled product is forbidden.

5.7. It is necessary to replace the product if the external damage is present, signs of ignition are visible, or at the expiration of the warranty period.

6. Safety Rules

WARNING!

During the installation, electricity should be shutoff and the measures should be taken in order to exclude the possibility of electricity flow.

In case of fire ignition signs occur:

- disconnect the electric power using local or general switch;
- act in accordance with the fire regulations applied for the object;
- do not attempt to open the protected object;
- leave the premises and call fire department.

The room should be ventilated after fire extinguishing has occured.

The components of the product are nontoxic in terms of impact on the human body and the environment. In accordance with Federal Classificatory Catalogue of Wastes, used products are disposed of as SMW (waste polymer materials which lost their consumer properties, and which do not have hazardous properties).

7. Warranties of the Manufacturing Plant

7.1. The manufacturer guarantees that FIPRON CORD complies with the manufacturing requirements of TU 28.29.22-002-89538614-2018 provided that the conditions of transportation and storage are observed.

7.2. Manufacturer guarantees efficient operation when the products are installed in protected objects manufactured and staffed by qualified specialists who have certificates of admission to the electrical works and **FIPRON Installation Certificate**.

7.3. Warranty period for FIPRON CORD is 5 years (60 months) after the installation.

8. FIPRON CORD Installation Instruction

8.1. Preliminary work

8.1.1. Prepare necessary tools and materials: measurement tape, electrical tape, scissors, pliers, standard self-adhesive pads, wiring clamps (screeds).

8.1.2. Determine linear dimensions of protected volume: measure (in centimeters) Length (L), Width (W), Height (H).

8.1.3. Determine the amount of protected volume (V) (in liters): V = (L x W x H)/1000.

8.1.4. Calculate required length (L) of FIPRON Cord in meters depending on the volume of the protected object by using 1 meter of FIPRON Cord for the 50 liters of protected volume: L = V/50

8.1.5. Measure the required length (L) of FIPRON Cord (in meters) based on the installed internal electrical equipment or circuit breakers located in the protected object, as to ensure that FIPRON Cord covers all connections. FIPRON Cord must be in close proximity to all contact groups in the protected object of all possible sources of ignition. This must be done to ensure extinguishing of the fire at any potential source.

8.1.6. Choose the largest of the lengths (L) of FIPRON Cord in meters, as determined above in paragraphs 15.1.4 and 15.1.5.

8.1.7. Cut off the determined amount of FIPRON Cord Length (L) as chosen according to the rule indicated in paragraph 15.1.6. Tie both ends of FIPRON Cord with electrical tape.

8.2. Installation work

8.2.1. Disconnect power supply from the electrical equipment.

During the installation period, the voltage should be cutoff, and measures taken to ensure that electricity flow is eliminated. In case of necessity to install FIPRON Cord in a live electricity supply facility is necessary to take measures to comply with electrical safety rules according to applicable national safety regulations (work in dielectric gloves, use of dielectric mat).

8.2.2. The surface of FIPRON Cord must be in contact or located at the minimum possible distance from the possible source of ignition.

If the required length is chosen based on the volume of a protected unit and if some portion of FIPRON Cord is left, it is possible to leave the remaining FIPRON Cord anywhere inside protected equipment.

8.2.3. The installation of the product must ensure that it is placed along the perimeter of the protected equipment, starting from the top, and then evenly distributed inside the protected volume, depending on the geometric dimensions and shape of the protected object.

8.2.4. Fastening of FIPRON Cord can be done in any possible way by either using standard self-adhesive pads or plastic clamps. If plastic clamps are used TIGHTEN THE CLAMPS

WITH FIPRON CORD IN SUCH A WAY AS TO ENSURE THAT THERE IS SPACE BETWEEN THE CORD AND THE CLAMP.

8.2.5. It is forbidden to hit FIPRON Cord and carry out work associated with the use of an open flame near the surface of the product. IT IS NOT ALLOWED TO TAKE OUTSIDE HOSING FROM FIPRON CORD.

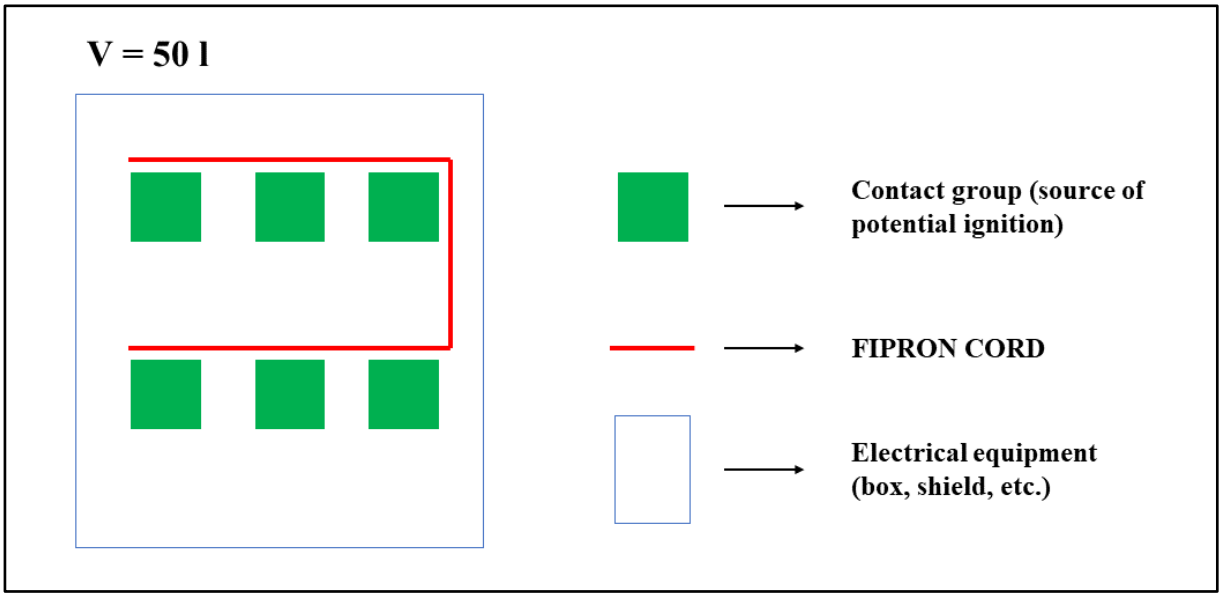
8.2.6. ATTENTION: when mounting FIPRON Cord, do not pinch it and leave clearance at least 1 mm from the potential source of fire.

8.3. Diagrams of possible installation for FIPRON Cord

8.3.1. Scheme 1:

In scheme 1 the volume of protected object is 50 liters and there are 2 rows of contact groups. After measuring, we found out that we need 1 meter of FIPRON Cord due to the volume of the object (50 / 50 = 1 m). When measuring the distance of the contact groups, we found out that we still need 80 cm of FIPRON Cord to cover all the possible contact groups, which are potential sources of ignition.

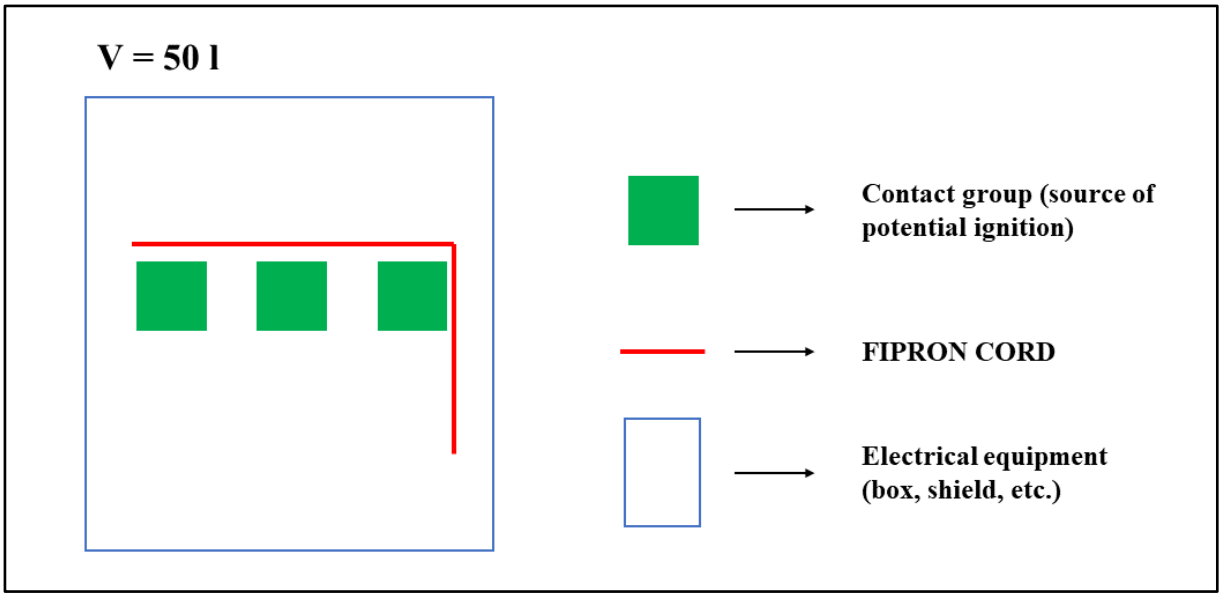
Final decision: use 1 meter of FIPRON Cord to protect the equipment.



8.3.2. Scheme 2:

In scheme 2 the volume of protected object is 50 liters and there is 1 row of contact groups. After measuring, we found out that we need 1 meter of FIPRON Cord due to the volume of the object (50 / 50 = 1 m). When measuring the distance of the contact groups, we found out that we need only 0.5 meters of FIPRON Cord to cover all the possible contact groups, which are potential sources of ignition.

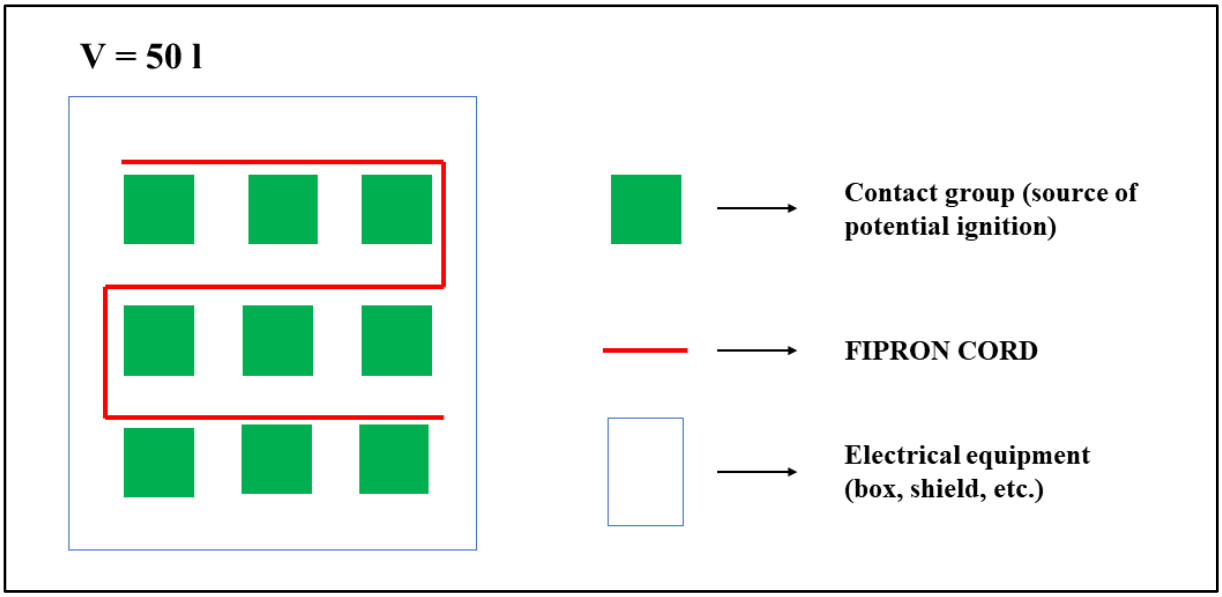
Final decision: use 1 meter of FIPRON Cord to protect the equipment.



8.3.3. Scheme 3:

In scheme 3 the volume of protected object is 50 liters and there are 3 rows of contact groups. After examining, we found out that we need 1 meter of FIPRON Cord due to the volume of the object (50 / 50 = 1 m). When measuring the distance of the contact groups, we found out that we need 1.5 meters of FIPRON Cord to cover all the possible contact groups which are potential sources of ignition.

Final decision: use 1.5 meters of FIPRON Cord to protect the equipment.



8.4. Example of Installed FIPRON CORD

9. Conclusion

This instruction was created for the partners, distributors and installers of FIPRON Inc. It contains all the required basic information of FIPRON CORD installation process.