



AUTOMATIC FIRE SUPPRESSION SYSTEM T SERIES FK-5-1-12

USER MANUAL

IMPORTANT! PLEASE READ CAREFULLY.

This user manual contains important information about the BlazeCut T Series fire suppression system, its use, operation, installation and maintenance. If further technical information is required, please request a copy of the system manual from a BlazeCut representative.



PACKAGE CONTENTS

- BlazeCut T Series Fire Suppression System with a pressure gauge
- Cable ties for installation
- General warning label ALA008
- User manual
- BlazeCut logo sticker

FIRE CLASS RATING

Extinguishing agent may be used for the following classes of fire (European Classification):



CLASS A:

Ordinary combustibles (creating flames)



CLASS C:

Flammable gases



CLASS B:

Flammable liquids



Energized electrical equipment

FIRST AID MEASURES

In case of direct contact with the extinguishing agent, follow the instructions below.

General Information

In all cases of doubt, or when symptoms persist, seek medical attention.

Following inhalation:

Move the person to fresh air and keep them in a resting position that is comfortable for breathing. If the person is not breathing or if breathing is irregular or breathing has stopped, administer artificial respiration or oxygen by trained personnel. Loosen tight clothing such as collar, tie, waistband, and belt. Do not administer adrenaline or its derivatives. Seek medical attention immediately.

Following skin contact:

Remove and isolate contaminated clothing and shoes. Wash immediately with plenty of soap and water.

Following eye contact:

Carefully flush/irrigate with water for several minutes. Where applicable, remove contact lenses, if they are inserted. Continue flushing. Seek medical attention.

Following ingestion:

Wash out mouth with water. Consult a doctor.

IMPORTANT! Always ventilate the area after activation.

CERTIFICATION

The safety and performance of the BlazeCut T Series system was confirmed by various independent bodies. Certificates or further information is available from the local BlazeCut agent or at www.blazecut.com.

WARRANTY AND LIFESPAN

BlazeCut offer a standard five-year warranty on all T Series models from the date of a retail purchase. For the full terms and conditions of the 5-year warranty please visit www.blazecut.com. A lifespan of up to 10 years can be achieved in non-harsh environments. Please note that this may reduce in unstable and harsh environments.



DISCLAIMER

The supplier or manufacturer shall not be liable for any damage. This directly relates to health, life, property or any monetary loss caused, due to failure to comply with instructions for installation, use, assembly, maintenance, functional testing, safety, or any other instructions provided in this user manual.

SYSTEM OPERATION

Designed to protect small, enclosed spaces with risks of fire. Simple and easy to install, the BlazeCut T Series with FK-5-1-12 system operates automatically without any external power source. The extinguishing agent is stored in a tube, which also applies the extinguishing agent directly to the fire at its source. When a fire occurs, the combination of heat and internal pressure causes the tube to rupture, creating a nozzle, releasing the extinguishing agent.

WARNINGS AND CAUTIONS



Please ensure that the safety instructions are fully understood before the equipment is put into service.



Do not modify any part of the BlazeCut components as this may void warranty, impair the performance of this product and cause damage or serious injury.



Always wear the appropriate protective equipment and clothing whilst installing or servicing.



The BlazeCut T Series with FK-5-1-12 is designed as independently operating unit. It is not possible to connect several independent systems into one unit.



The BlazeCut T Series with FK-5-1-12 is not compatible with other fire suppression systems, do not try to connect the system to any other equipment.



The system may be installed only by adult persons, physically and mentally capable. Incorrect interference with the system may cause malfunction of the system and provides threat to safety and health of people.



The system is under constant pressure, any mechanical interference is prohibited.



Never unscrew the pressure gauge, the sealing screw or the pressure switch mounted on the fittings.



Beware of any manipulation with the system if the system has been subjected to higher temperatures. When the system is heated (e.g. during the operation of the device), the gas pressure in the tube increases. If the pressure in the system is higher than 17 bar (247 psi) the system is reaching burst pressure. In this case, the tube must not be mechanically stressed. Release of a hot extinguishing agent under high pressure can cause serious injury. Wait till the system cools down.



The BlazeCut fire system is a suppression system only and is not designed or intended to extinguish all fires. Where there are high airflows and high accumulation of combustible materials, this will dramatically alter the systems performance. Always consider supplementary firefighting equipment be available in case system does not totally extinguish a fire. For more information about the use of the system in an area occupied by persons, please contact your supplier.

TECHNICAL SPECIFICATION

Extinguishing agent: FK-5-1-12

Material of the tube: heat sensitive plastic

Material of the fittings: stainless steel AISI 303

Material of the pressure gauge: nickel plated brass

Outer diameter: 19 mm (tube), 22 mm (fittings)

Minimum bending radius: 160 mm (6.30 in)

Standard operation pressure at 20 °C: 7 bar (101 psi)

Activation temperature: 149 °C ± 3 °C (300 °F ± 5 °F)

SIZING AND SELECTION

Other applications can be calculated by a simple process:

Measure the enclosures Width x Height x Depth in metres or feet and this will calculate your volume in m³ or ft³. Then refer to the chart below to select the suitable length.

Note: the enclosure should be enclosed or have minimal vents. T Series with FK-5-1-12 is not suitable for open areas.

T Series with FK-5-1-12 system – standard model

Model*	Volume protected at 20 °C (68 °F) Electrical Fires**	Amount of agent	Operation Temperature in the enclosure	System length
T025FK	0.08 m³ (2.82 ft³)	0.05 kg ± 2 g	0 °C to +50 °C (32 °F to +122 °F)	28 cm (11.02 in)
T050FK	0.18 m³ (6.35 ft³)	0.12 kg ± 2 g		53 cm (20.87 in)
T100FK	0.41 m³ (14.48 ft³)	0.27 kg ± 2 g		113 cm (44.48 in)
T200FK	0.81 m³ (28.6 ft³)	0.53 kg ± 5 g		215 cm (84.64 in)
T300FK	1.21 m³ (42.73 ft³)	0.80 kg ± 5 g		319 cm (125.59 in)
T400FK	1.61 m³ (56.86 ft³)	1.06 kg ± 5 g		422 cm (166.14 in)

*Additional sizes available on special order – please contact your local BlazeCut agent.

** Calculated at a 4.5 % (Electrical Fires) design concentration at an ambient temperature of 20 °C (68 °F) for the enclosure. Please note if a lower temperature is present the coverage potential will be reduced, please contact your local BlazeCut agent for further information

T Series with FK-5-1-12 system – with integrated pressure switch IP65

Model*	Volume protected at 20 °C (68 °F) Electrical Fires**	Amount of agent	Operation Temperature in the enclosure	System length
T025FKS	0.08 m ³ (2.82 ft ³)	0.05 kg ± 2 g	0 °C to +50 °C (32 °F to +122 °F)	35 cm (13.78 in)
T050FKS	0.18 m ³ (6.35 ft ³)	0.12 kg ± 2 g		60 cm (23.62 in)
T100FKS	0.41 m ³ (14.48 ft ³)	0.27 kg ± 2 g		120 cm (47.24 in)
T200FKS	0.81 m ³ (28.6 ft ³)	0.53 kg ± 5 g		222 cm (87.40 in)
T300FKS	1.21 m ³ (42.73 ft ³)	0.80 kg ± 5 g		326 cm (128.34 in)
T400FKS	1.61 m ³ (56.86 ft ³)	1.06 kg ± 5 g		429 cm (168.89 in)

*Additional sizes available on special order – please contact your local BlazeCut agent.
** Calculated at a 4.5 % (Electrical Fires) design concentration at an ambient temperature of 20 °C (68 °F) for the enclosure. Please note if a lower temperature is present the coverage potential will be reduced, please contact your local BlazeCut agent for further information.

T Series with FK-5-1-12 system – with integrated economy pressure switch

Model*	Volume protected at 20 °C (68 °F) Electrical Fires**	Amount of agent	Operation Temperature in the enclosure	System length
T025FKS	0.08 m ³ (2.82 ft ³)	0.05 kg ± 2 g	0 °C to +50 °C (32 °F to +122 °F)	31 cm (12.20 in)
T050FKS	0.18 m ³ (6.35 ft ³)	0.12 kg ± 2 g		56 cm (22.05 in)
T100FKS	0.41 m ³ (14.48 ft ³)	0.27 kg ± 2 g		116 cm (45.67 in)
T200FKS	0.81 m ³ (28.6 ft ³)	0.53 kg ± 5 g		218 cm (85.83 in)
T300FKS	1.21 m ³ (42.73 ft ³)	0.80 kg ± 5 g		322 cm (126.77 in)
T400FKS	1.61 m ³ (56.86 ft ³)	1.06 kg ± 5 g		425 cm (167.32 in)

*Additional sizes available on special order – please contact your local BlazeCut agent.
** Calculated at a 4.5 % (Electrical Fires) design concentration at an ambient temperature of 20 °C (68 °F) for the enclosure. Please note if a lower temperature is present the coverage potential will be reduced, please contact your local BlazeCut agent for further information.

COMPONENTS OF THE SYSTEM AND THEIR DESCRIPTION

Extinguishing agent
Type of extinguishing agent: FK-5-1-12
Chemical name: Perfluoro (2-Methyl-3-Pentanone)
General characteristic: liquid, colourless, odourless

Extinguishing agent is clean extinguishing medium, used in the BlazeCut T Series with FK-5-1-12 for volume fire suppression. Extinguishing effects are due to cooling and anticatalyst effect. Extinguishing agent siphons heat from fire, enters the chain chemical reaction of burning, slows this reaction and stops it. Extinguishing agent is not toxic or poisonous, it does not have carcinogenic or mutagenic effects and it is considered environmentally accepted substitute for halon extinguishing agents.
GWP: 1

Although the extinguishing agent is not toxic or poisonous, unnecessary excessive exposure of persons to its influence should be avoided. Under no circumstances should persons be exposed to the extinguishing agent for more than 5 minutes. A protected area cannot have people present when the extinguishing concentration exceeds the 10.5% LOAEL level (contact your local BlazeCut supplier for more information).

During the system activation the extinguishing agent is discharged from the tube under high pressure. No permanent work place should be placed less than 1 meter (3.28 feet) from the system if the system is not installed in enclosure that prevents the extinguishing agent being discharged onto the people or no other barriers are in place preventing the extinguishing agent being discharged onto the people.

If people are constantly present in the protected area, always consult the use of the system with the supplier. The system must be designed so that when the extinguishing agent is released the extinguishing concentration level, which could be dangerous to people, is not exceeded.

Extinguishing agent under normal (atmospheric) pressure evaporates. Do not breathe vapours. Exposure to high concentrations may cause health problems: a temporary loss of nerve activity, numbness, dizziness, confusion, loss of coordination, drowsiness, unconsciousness, irregular heartbeat, palpitations, depression, fainting, weakness. Exposure to extreme concentrations of extinguishing agent may cause death without warning.

Avoid contact of liquid extinguishing agent with eyes. For installation, inspection, maintenance and repair of the system always use eye protection - wear appropriate protective glasses with side-shields.

When leak of liquid extinguishing agent from the system is detected use appropriate protective impervious working gloves.

Extinguishing agent is subject to thermal decomposition and forms toxic products - hydrogen halides after exposure to high temperatures in the fire area. Avoid prolonged exposure of extinguishing agent to high temperatures. After fire is indicated take precautions to avoid prolonged exposure of extinguishing agent to high temperatures. After use of the system secure the area by natural or forced ventilation. Use the system only in permissible ways required by the manufacturer.

BlazeCut Pressure Tube

Unique BlazeCut Pressure Tube has both storage and detection function which means that the extinguishing agent is stored directly in the pressure tube. The pressure tube is made of special heat stabilized plastic resistant to most of alcohols, bases, water, ethers, ketones, hydrocarbons, mineral oils, standard fuels, salt solutions, organic acids.

Always consult use of the system in application with presence of mineral acids, phenol and other aggressive chemicals with your supplier.

Pressure tube is under constant pressure. Do not damage the tube, do not puncture or throw. During transportation secure against movement. During transfer do not rub against the ground. Do not mend damaged tube. Do not store or transport in vicinity of strong sources of heat, aggressive chemical substances (caustic, corrosive substances), prevent contact with sharp objects, vibrations or loading with other objects. Store in dry and well-ventilated rooms. Protect from sunlight.

Always handle the pressure tube as if it were under pressure, unless it is directly verified that it is completely empty.

Fittings

The fittings of the tube close the tube and keep the system under pressure. The fitting is closed by a pressure gauge on one end and sealing screw or pressure switch on the other end. The pressure switch is fitted at the factory when ordered.

Do not try to remove fittings of the tube if it is under pressure. Protect the fittings from corrosive substances during storage and transportation.

Pressure Gauge

Actual pressure in the system can be determined by reading the value on the pressure gauge, which is mounted on the fitting tube. Try to install the pressure gauge so that the pressure values can be read.

Pressure Switch

T Series models with the letter "S" in model designation have an integrated pressure switch that allows connection of signalling devices or to perform a shutdown operation at agent discharge. An IP65 Pressure Switch is factory fitted for outdoor and mobile applications.

T Series models with the letters "S-E" in model designation have an integrated economical pressure switch that allows connection of signalling devices operation at agent discharge. An IP54 economical pressure switch is factory fitted for indoor and fixed applications only.

If you have purchased a model with the pressure switch, please refer below in this User Manual or to the System Manual for more information about the pressure switch and its wiring.

INSTALLATION INSTRUCTIONS

1. The tube in the retail packaging is secured with cable ties. Cut the cable ties carefully, avoiding damage to the tube. Dispose of the plastic cushion and silicone protectors used for packing and transport purposes.
2. The package contains high temperature cable ties for installation in the protected equipment. It is possible to use PVC dipped or rubber insulated metal clamps in harsher environments to prevent detachment of the tube. Do not use a steel fastening material for installation, it must be insulated. If in direct contact, steel clamps, steel cable ties or wire will cause heat concentrations on the pressure tube. This can result in a false or lower temperature actuation.
3. Place the BlazeCut T Series with FK-5-1-12 in the proximity of the protected equipment where the risk of fire is greatest (in the area containing flammable liquids or gases, protected objects, electrical installations, connections, circuit breakers, inductors, batteries etc.).
4. Bend the tube to shape for the installation. A minimum bend radius of 160 mm (6.30 inches) must be maintained.
5. The tube (filled with FK-5-1-12 agent) is allowed to be mounted only in horizontal position.

6. The BlazeCut T Series with FK-5-1-12 must be mounted away from hot parts and cannot directly contact parts or be in proximity of parts that during operation have temperatures exceeding operation temperature of the T Series used (e.g., hot parts of inductors etc.).
7. If there are doubts on the operating temperature exceeding maximum temperature allowed for the T Series used, measure the max ambient heat in the area where the tube is to be installed. The tube may not be in direct proximity, but the radiant heat rising to the top of the equipment may exceed the maximum temperature limit, causing a false actuation.
8. For maximum efficiency, do not place the BlazeCut T Series with FK-5-1-12 behind barriers that could restrict or prevent direct penetration of extinguishing agent into the protected equipment. Do not place the T Series close to vents or openings as this may reduce the amount of agent applied to the protected equipment.
9. Proceed carefully with the installation, so no damage is caused to the tube by sharp objects. Do not break or crimp the tube. Make sure that the tube will not be damaged after closing doors or covers of the equipment (e.g., installation of covers or enclosure etc.). No part of the system should be hit by moving parts (fans etc.).
10. The BlazeCut T Series with FK-5-1-12 must be firmly mounted in the protected equipment so that it does not move. Use included cable ties or PVC dipped/rubber insulated metal clamps. The maximum distance between the mounts shall not be more than 250 mm (10 inches).
11. Fasten the system to fixed interior parts of the protected equipment. Do not fasten to parts, which move during operation of the vehicle or equipment. Make sure that the cable ties or clamps are not damaged during operation of the vehicle or equipment. If the BlazeCut T Series with FK-5-1-12 moves out of place after installation, the extinguishing effect of the system may be decreased and part or the entire protected equipment may be damaged.
12. Install the system so that it is not exposed to aggressive chemical substances (caustic, acids, solvents, corrosive substances etc.) and avoid direct influence of weather conditions and direct sunlight.
13. When fastening the system make sure not to damage other parts of the vehicle or equipment.
14. After installation, place the general warning label (ALA008) on a highly visible area of the protected equipment. The label should be placed on an even smooth surface. Clean the surface thoroughly before sticking. Do not place the label in areas reaching high temperatures.
15. Ensure to follow all local laws, for example if required, ensure a date tag is installed and dated.

T SERIES MODELS WITH INTEGRATED PRESSURE SWITCH

The Pressure Switch models TxxxFKS and TxxxFKS-E, are mechanical switches with one pre-set pressure value (switch point). When the pressure in the system drops below the switch point the pressure switch sends a signal to an Alarm Panel or an external device to perform the designed operation. The pressure switch is supplied with the cable connector and can be monitored by the AAP310 or AAP400 panel for connectivity and faults if required.

The Pressure Switch models TxxxFKS and TxxxFKS-E will send a signal when the pressure in the system decreases regardless of the cause – in case of fire or accidental activation or a decrease of pressure in the system which is below the pre-set value. If the cable is disconnected or damaged a fault signal will be displayed on the AAP310 or AAP400 panel if fault monitoring was an installed feature.

The pressure switch can be used as a universal means of sending signal after a T Series system activation. External devices can be informed via the signal (alarm panel, sounder, beacon etc.) or automatic processes can be performed (switching off electrical current, equipment shut-down etc.).

For more information about the pressure switch and its operation/functions please refer to the System Manual *SM-TSFK-xxxx-EN T Series FK-5-1-12 Systems* or contact your BlazeCut local agent.

	Models TxxxFKS	Models TxxxFKS-E
Indoor use	✓	✓
Fixed applications	✓	✓
Harsh environments	✓	✗
Outdoor use	✓	✗
Mobile/Vibrating applications	✓	✗
Switch monitoring	✓	✗



The pressure switch is factory fitted during manufacturing process and must not be tampered with, disassembled or removed. Any user interference will void warranty.



Be aware of the danger posed by the protected equipment. When working in the vicinity of electrical equipment observe corresponding safety rules and instructions. Working on electrical installations may be performed only by qualified persons.



Install the T Series so that the pressure switch is not exposed to aggressive chemical substances (caustic, acids, solvents, corrosive substances etc.) and in direct influence of weather conditions.



Always place the pressure switch in the lower part of the risk area to avoid direct flames and heat. The pressure switch cannot be in direct contact or be in immediate proximity with parts which heat to temperatures of more than operation temperature.

Specifications of the Pressure Switch on models TxxxFKS

Parameter	Description		
Material of body	nickel plated steel		
Switch point	set to 1 bar (14 psi)		
Switch configuration	open or closed (SPDT)		
Hysteresis	min. 0.3 bar (4 psi) / max. 1 bar (14 psi)		
Switching frequency	max. 100 min ⁻¹		
Maximum pressure	60 bar (870 psi)		
Power rating	Voltage		
Resistive load AC-12, DC12	AC 250 V	DC 24 V	Current 4 A
Inductive load AC-14, DC14	AC 250 V	DC 24 V	2 A
IP rating	IP65 with cable connector and seal		
Electrical outlet	DIN EN 175301-803 A		
Operation temperature	from -20 °C up to 80 °C (-4 °F to 176 °F)		
Tested to	EN60947 – Low-voltage switchgear and control gear IEC 68-2-78 Permissible air humidity (4K4H per EN 60721-3-4) IEC 60068-2-6 Vibration resistance 10 g (10.....2,000 Hz) IEC 60068-2-27 Shock resistance 30 g		
Advantages	heavy duty, higher power rating, monitoring function, open or closed state		

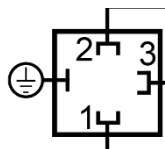


Pressure Switch models TxxxFKS

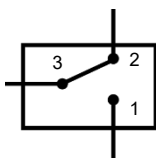
TxxxFKS models have a selectable switching function, so it can be set to open or closed state.

IMPORTANT! Diagram on the pressure switch label is at atmospheric pressure (e.g., unpressurised system or discharged system).

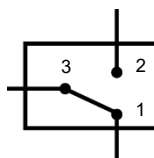
1. Connector for closed circuit – for sending signal to an alarm panel, switching on devices (sirens, beacons) or switching off devices using an external relay
2. Connector for open circuit – for switching off connected devices (e.g., ventilation, that is connected in the electric circuit)
3. COM connector
4. ground connector



Pressure switch connector



Pressurised



Discharged



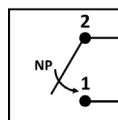
1. Fixing screw; use a screwdriver for installation and removal of the connector. Tightening torque max. 5 Nm.
2. Electrical connector; use flat head screwdriver to remove from the body and connect the electrical cable.
3. Gasket
4. Sealing nut to fix the electrical cable. Below the sealing nut is a grommet. Screw the sealing nut tight in order to seal the electrical cable properly.

Specifications of the Pressure Switch on models TxxxFKS-E

Parameter	Description		
Material of body	brass, nickel plated steel with plastic cover		
Switch point	set to 1 bar (14 psi)		
Maximum pressure	30 bar (435 psi)		
Max Power rating DC	50/60 Hz	36 V DC	3 A
Max Power rating AC		240 V AC	
Electrical outlet	2 x wire 0.75 mm ² , 150 mm length		
IP rating	IP54		
Operation temperature	from -20 °C up to 80 °C (-4 °F to 176 °F)		
Tested to	EN60730 - automatic electrical controls for household and similar use		
Advantages	light weight, cost-effective		



Pressure Switch models TxxxFKS-E



When supplied before actuation (pressurized)

TxxxFKS-E models have a set switching position:

- pressurised system – contact is open
- no pressure (discharged system) – contacts are closed

MAINTENANCE

The BlazeCut T Series with FK-5-1-12 does not require any special maintenance. It is recommended to visually inspect the system and its state at operating temperature, between every month and three months dependent on the type of environment it has been installed in. During the movement of the tube, bubbles of gas in the extinguishing agent will be visible. This indicates that extinguishing agent is in the tube and the BlazeCut T Series with FK-5-1-12 is functional.

SYSTEM PRESSURE INSPECTION

It is recommended to inspect the pressure in the tube when the equipment is at operating temperature. Due to physical and chemical properties of the agent, pressure in the tube can vary depending on the ambient temperature. The higher the ambient temperature, the higher pressure in the tube and vice versa.

Indicator on the pressure gauge can vary from 6 bar when temperatures are in the lower operation spectrum, to 13 bar when temperatures are in the higher operation spectrum. This is not a sign of defect in the system.

CASES WHEN THE BLAZECUT SYSTEM MUST BE REPLACED

- The system is leaking, was used or emptied for other reason.
- The system was exposed to direct fire.
- The tube shows signs of damage.
- Metal parts of the enclosure are corroded or show visible signs of damage.

INSTRUCTIONS FOR PROCEDURE AFTER SYSTEM ACTIVATION

Extinguishing agent does not leave residue. Ventilate the protected enclosure properly, do not enter the area before ventilation. Remove the used system from the protected enclosure. The same procedure should be followed after the release of extinguishing agent for other reasons (system damage etc.).

In case of fire the system activates automatically burning the tube without previous warning. In case of fire do not come into direct proximity of the system, there is a risk of being affected by the extinguishing agent.

In case of activation of the system do not enter the protected enclosure and do not open the covers of the protected enclosure, wait for total release of extinguishing agent.

PRODUCT DISPOSAL

Discharged system consists of recyclable materials. Please dispose of this product responsibly and recycle where possible. Dispose discharged system according to local waste management regulations. For proper recycling, return charged systems to your local BlazeCut agent.

IMPORTANT! Never dispose charged systems with the extinguishing agent to waste.

NEED SOMETHING MORE?

If there is a requirement for electronic monitoring, external alarm or other size of system, these are available. Please contact: technical@blazecut.com



GLOBAL HEAD OFFICE

BlazeCut Pty Ltd
Level 24, Three International Towers,
300 Barangaroo Avenue,
Sydney, NSW 2000, Australia
Tel.: +61 2 8006 1300

MANUFACTURER

BlazeCut s.r.o.
Triblavinská 3191
90025 Chorvátsky Grob
Slovakia
Tel.: +421 905 744 606

www.blazecut.com technical@blazecut.com

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