AUTOMATIC FIRE
SUPPRESSION SYSTEMS

Technical Manual

Installation and Service

BlazeCut Automatic Fire Suppression System

C Series Indirect Foam Agent Systems

CSF200 CSF210
CAF200 CAF210
CFF200 CFF210

TABLE OF CONTENTS

1 INTRODUCTION

1.1.1 MANUFACTURER INFORMATION

BlazeCut s.r.o., Triblavinská 3191, 90025 Chorvátsky Grob, Slovakia

GLOBAL HEAD OFFICE

BlazeCut Pty Ltd, 45 Evans St, Balmain NSW 2041 Australia

+61 2 8006 1300

www.blazecut.com; customerservice@blazecutgroup.com

1.1.2 INSTRUCTIONS FOR USE OF THE MANUAL

This manual is intended to supply technical information for the trained and authorized by BlazeCut Group. Any personnel performing installation, inspection, maintenance or replacement of components with the BlazeCut system shall have this manual available and proceed solely in accordance with it. Failure to follow the instructions in this manual and any other BlazeCut manuals may result in system malfunctioning, causing damage to the protected equipment and presents serious danger to the life and health of others.

1.1.3 SAFETY FIRST

Please read this manual in its entirety. Operation and installation instructions need to be fully understood before this BlazeCut product is installed. Failure to do so may void warranty. Your local governing regulations for safety and compliance must be followed.

1.1.4 WARNINGS AND CAUTIONS

This symbol within the manual represents warning of specific risks, dangers, or warning of described procedures. Failure to follow the instructions in the text marked with this symbol may result in loss of warranty, damage to property, threat to safety or life of persons performing the operation on the system or persons in the vicinity. Do not proceed without following the instructions marked with such symbols.

1.1.5 FURTHER INFORMATION

BlazeCut® is a registered trademark of BlazeCut and is recorded in the Register of Community Trade Marks.

If any of the instructions in this manual are unclear or in case of further questions, contact the BlazeCut Team.

WARNING

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 cause serious injury or a failure of the system.

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

2 BASIC INFORMATION ABOUT THE SYSTEM

2.1 EXPLANATION OF TYPE NAME CAPTION

C SF 211-01-6.2-3-S-C

Product line
C – Cylinder Series systems

Extinguishing agent
SF – Standard foam
AF – Antifreeze foam
FF – Fluorine-free foam (FFF)

Valve series
201 – pneumatic with BlazeTube push-in connector straight
202 – pneumatic with BlazeTube push-in connector 90° elbow
203 – pneumatic with BlazeTube push-in connector Tee
207 – pneumatic with plugged top port
211 – electric valve with 12 V solenoid
212 – electric valve with 24 V solenoid

Top G1/8" port left and right on the valve
0 – plug
1 – ball valve with BlazeTube push-in connector
2 – ball valve with LOP hose fitting
3 – M10x1 adapter with a plug

Quantity of extinguishing agent
6.2 – 6.2 litres of agent
10.4 – 10.4 litres of agent
12.8 – 12.8 litres of agent etc.

Quantity of nozzles
3 – 3 discharge nozzles
5 – 5 discharge nozzles
6 – 6 discharge nozzles etc.

Type of hose/tube
B – braided hose
G – galvanised tube
H – red fire hose
S – stainless steel tube
GB – galvanised tube and braided hose
GH – galvanised tube and hose
SB – stainless steel tube and braided hose
SH – stainless steel tube and hose

Application variant
C – customised kit
M – mobile application
MC – mobile application customised

Example 1: CSF202-30-4-2-H-M – includes system BlazeCut with one cylinder (C) with the extinguishing agent used standard foam with the valve type 202 (202), M10x1 adapter on the left and plug on the right (-30), total amount of extinguishing agent 4 L (-4), 2 nozzles (-2), red fire hose (-H), mobile application (-M).

Example 2: CAF211-31/203-00/202-00-18.6-6-G-M – includes system BlazeCut with three cylinders (C) with the extinguishing agent used antifreeze foam (AF), with the valve types 211 (211) with a M10 Adapter on the left and a BlazeTube push-in connector on the right (-31), valve 203 with plug on the left and plug on the right (/203-00) and valve 202 with plug on the left and plug on the right (/202-00), total amount of extinguishing agent 3x6.2 L (-18.6), 3x2 nozzles (-6), galvanised tube (-G), mobile application (-M).

2.1.1 ASSOCIATED NAMES

In certain parts of this manual, it is needed to state use of multiple valves or cylinders. In these cases, associated naming is used.

Table 1: Naming explanation

Designation	Meaning
valves 20x	all the following: 201, 202, 203, 207
valves 21x	all the following: 211, 212
systems Cxx (201, 202, 211)	all the following: Cxx201, Cxx202 and Cxx211

2.1.2 DESCRIPTION OF THE SYSTEM

Commercial name: BlazeCut

Characteristics: Foam Agent Automatic Fire Suppression System

Type: Cylinder Series (C Series), Indirect Low Pressure (ILP)

Functionality: BlazeCut system is designed to protect spaces from fire using local fire suppression based on foam extinguishing agent. Some examples are engine compartments of mobile equipment, boats and vehicles, industrial equipment, power generators and compressors, and others.

Both the pneumatic and electric systems are referred to as indirect low pressure or ILP systems for short. The system can be activated by pneumatic detection or electric detection and the agent is distributed via discharge lines using distribution hoses/tubes, fittings and nozzles.

The pneumatic fire suppression system operates by detecting fire using a BlazeTube detection connected to the cylinder valve. The BlazeTube detection is placed in the protected enclosure and is under constant pressure whereby keeping the valve piston closed. When a fire occurs, the BlazeTube detection degrades by the effect of fire or high temperature and ruptures, releasing the pressure in the detection circuit. The cylinder valve's piston opens, allowing the extinguishing agent in the cylinder to be released via the discharge outlet(s) on the valve. The agent is dispersed to the protected enclosure through a network to nozzles. The detection system is independent of any electrical supply and operates solely on physical principles and is fully automatic.

Alternatively, the electric system can detect the fire using electric devices such as a Linear Heat Detection (LHD) BlazeWire, heat probes and others. These electric devices must be used in conjunction with the integrated solenoid valves – types 211 (12 V), 212 (24 V).

The BlazeCut systems C(SF, AF and FF)(211, 212) have an integrated solenoid valve, which allows the activation of a system by receiving a signal from an external device. These can include an alarm panel, fire panel, detector etc.

2.1.3 OPTIONAL COMPONENTS

The BlazeCut ILP systems can have optional components added to the system which increase the features of the system. Installation, use, function and service of selected optional components is described in annexes of the Installation and service manual or supplied as a separate manual. For more information contact the supplier.

2.2 TECHNICAL SPECIFICATION AND TYPES

Table 2: Types of BlazeCut C Series ILP systems with standard foam

Model	Pre-installed BlazeTube outlets	Pneumatic activation	Electrical activation (solenoid)	Operation pressure at 20°C [bar]	Operation temperature [°C]
CSF201	Yes	Yes	-	16	0 to +60
CSF202	Yes	Yes	-		
CSF203	Yes	Yes	-		
CSF207	Yes	Yes	-		
CSF211	optional	optional	Yes		
CSF212	optional	optional	Yes		

Table 3: Types of BlazeCut C Series ILP systems with antifreeze foam

Model	Pre-installed BlazeTube outlets	Pneumatic activation	Electrical activation (solenoid)	Operation pressure at 20°C [bar]	Operation temperature [°C]
CAF201	Yes	Yes	-	16	-30 to +60
CAF202	Yes	Yes	-		
CAF203	Yes	Yes	-		
CAF207	Yes	Yes	-		
CAF211	optional	optional	Yes		
CAF212	optional	optional	Yes		

Table 4: Types of BlazeCut C Series ILP systems with fluorine-free foam (FFF)

Model	Pre-installed BlazeTube outlets	Pneumatic activation	Electrical activation (solenoid)	Operation pressure at 20°C [bar]	Operation temperature [°C]
CFF201	Yes	Yes	-	16	0 to +60
CFF202	Yes	Yes	-		
CFF203	Yes	Yes	-		
CFF207	Yes	Yes	-		
CFF211	optional	optional	Yes		
CFF212	optional	optional	Yes		

Table 5: Installation characteristics for BlazeCut ILP foam agent systems

Description	Value
Test pressure of pressure equipment	30 bar
Amount of agent	4 to 25.6 L
Type of extinguishing agent	standard foam, antifreeze foam, fluorine-free foam
Expellant gas	nitrogen
Connection to a fire alarm or other warning device	with AAP210, AAP211
Display, monitor and provide a low-pressure alarm	with APS001/ATA100 + AAP210/AAP211; APS001 + custom panel
Connection to a sounder or other alarm activation system	with APS001 + signalling unit
Isolating power supplies and shutting down equipment upon system activation	with APS001, AAP210 or AAP211

2.3 USE OF THE SYSTEM

The BlazeCut system is designed for protection of equipment from fire using a local application design method.

The fire suppressing performance depends on many factors, including the size of the protected equipment, the restriction on the placement of extinguishing nozzles etc. In order to reach the desired effectiveness of BlazeCut system the correct type and amount of agent is required. Please discuss with the supplier if unsure.

In order to achieve accurate design of the system it is necessary to obtain the following information:

- the measurement of the surfaces to be protected,
- the nature of fire risk on the protected equipment (presence of flammable materials, their amount, location),
- layout of the protected risks,
- risks with the highest probability of fire (considering possible ignition sources of fire),
- placement options of the system within the protected area (especially the location of the cylinder, distribution tubes/hoses, nozzles and detection devices),
- the method of operation of the protected equipment, etc.
- minimum and maximum temperatures the protected equipment is exposed to.

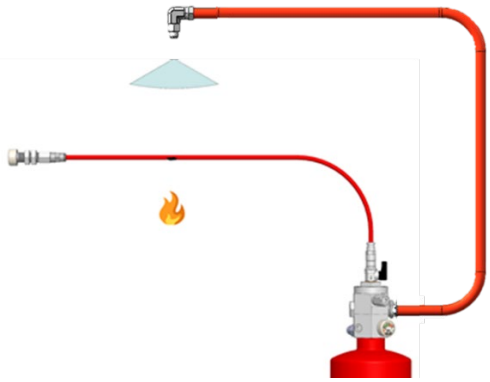
It is always recommended to discuss the potential fire risk factors on the protected equipment with the owner of the equipment or a specialist who has knowledge about the protected equipment. This information is used for the design of the system. A BlazeCut risk assessment template is available for this purpose, if required.

It is also necessary that the conditions in the protected area are in accordance with the permissible parameters of the system, especially the minimum and maximum temperatures in the protected area.

Remember that there are many factors and variables that can affect the extinguishing process in event of fire. It is not possible to guarantee total suppression of fire on the protected equipment under all circumstances.

During activation of the system the equipment may need to be switched-off immediately to avoid the decrease of fire suppression efficiency. A shutdown can be achieved with a Pressure Switch APS001-xx.

Use of the system is also limited by the properties of extinguishing agent used and the application it is intended for. Detailed information is described in Chapter 6.



Principle of operation of BlazeCut ILP foam system with BlazeTube detection

2.3.1 ELECTRIC SYSTEMS – Cxx(211,212)

The system does not use BlazeTube for automatic activation and can be designed to suit each application by having different activation behaviours. Available options are a manual only, a fully automatic or a combination of both.

The manual only option, could be used to reduce the risk of human exposure to the agents and give the persons in charge an opportunity to assess the surroundings before activating a system. Electrical detection can be used for sounding an alarm if required. Activating manually can be instigated by using an electric signal sent from an alarm panel or an electric actuation device.

The automatic option can be achieved by using LHD BlazeWire or an electrical detection device without any delay programmed. This will deliver an instant actuation upon detection of fire or there is an option to delay discharge that can be achieved with programming an alarm panel output to the solenoid on the cylinder valve.

The automatic/manual option usually consists of a combination of an electric actuation device and an electrical detection device. If a fire is noticed before it is detected, a manual activation device can be used to achieve a quicker discharge.

Never untighten a plug or fitting that closes the detection ports on the cylinder valve. If removed, this can cause the immediate opening of the cylinder valve piston and will release the extinguishing agent.

With electric detection it is still possible to install a pneumatic remote actuator ARA010 or ARA020 directly to the cylinder valves 211 and 212. This can be done by changing the detection port options on the valves before the cylinder has been filled and charged.

2.3.2 BLAZETUBE USED OUTSIDE THE PROTECTED ENCLOSURE

In some non-harsh environments, use of the BlazeTube can be useful to connect two or more cylinder valves together or to supply a detection circuit directly to a pneumatic remote actuator ARA010 or ARA020 from a cylinder valve. In this case the BlazeTube detection is not installed in the protected enclosure and is not used for fire detection.

In harsh environments or high vibration installations the detection outlet on the valve and remote actuators can be fitted with a pneumatic hose fitting. A pneumatic hose then can be used for connecting the detection circuit between cylinder valves and remote actuators. The pneumatic hose has a higher durability against mechanical damage and direct weather exposure compared to the BlazeTube.

2.3.3 WARNINGS

The BlazeCut system is a suppression system only and is not designed or intended to extinguish all fires. Where there are high airflows and a high accumulation of combustible materials, this will dramatically alter the systems performance. Always consider supplementary firefighting equipment be available in case the 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.

The use of the system in vehicles must be done with additional considerations for shutting down the engine. If the engine continues to run after discharge the systems performance will be impaired.

Install and use the BlazeCut C Series with originally supplied components. Do not replace anything in the system. The use of external components not approved by the manufacturer, for example beacons and alarms, will not be the responsibility of BlazeCut and no warranty or claim will be acknowledged in this regard.

Each BlazeCut system cylinder is designed as an independently operating unit (also in case of a multiple cylinder connection). It is not possible to connect several independent systems into one discharging unit. Each cylinder must have separate feedlines.

BlazeCut system is not compatible with other fire suppression systems, do not try to connect the system to any other equipment.

The system may be installed, maintained and repaired only by persons trained or authorized by the manufacturer and should have relevant professional qualification depending on the procedure. Incorrect interference with the system may cause malfunction of the system and may threaten the safety and health of people.

The system is not designed to be used as portable fire extinguisher. Do not try to suppress fire by holding the system in hands or sprinkling the extinguishing agent directly into the fire. Do not use the system in any other way than described in this manual.

3 SYSTEM DESIGN LIMITATIONS

3.1 GENERAL RULES FOR DESIGN

The BlazeCut pre-engineered systems minimise the amount of engineering required in the application design. No hydraulic calculations are required to determine pressure drop, agent flow, or discharge time. The feed lines and nozzles need to be installed within the limitations in this manual.

The BlazeCut fire system is a pre-engineered fire suppression system and must not be designed outside any limits mentioned in this manual. If unsure of what application type and application rates are required, please contact a BlazeCut representative.

Table 6: Foam system limitations

Type	Standard foam	Antifreeze foam	Fluorine-free foam
Operation pressure at 20 °C	16 bar	16 bar	16 bar
Operating pressure range	14 – 20 bar	12 – 20 bar	14 – 20 bar
Operation temperature range of the system	0 °C to +60 °C	-30 °C to +60 °C	0 °C to +60 °C
Maximum vertical distance between the cylinder valve and distribution hose/tube	2 m		
Maximum length of distribution network from cylinder valve to nozzle	6 m		
Maximum length of distribution network between each nozzle	1.5 m		
Maximum number of nozzles per one cylinder	2 (4 litre systems) 3 (6.2 litre systems) 5 (10.4 litre systems) 7 (12.8 litre systems) 12 (25.6 litre systems)		
Number of discharge outlets used	1		
Maximum number of cylinders connected in series	6		
Maximum length of BlazeTube for one or multiple cylinder configurations	40 m		
Maximum total amount of fittings per discharge outlet	4 litre systems: elbows = 3, Tees = 1 6.2 litre systems: elbows = 3, Tees = 2 10.4 litre systems: elbows = 4, Tees = 4 12.8 litre systems: elbows = 4, Tees = 6 25.6 litre systems: elbows = 4, Tees = 9		
Maximum coverage	see chapter 3.2	see chapter 3.2	see chapter 3.3

All parts of the system must be placed into the protected enclosure so that they are not in direct contact with parts of the protected equipment or in the immediate vicinity of the equipment parts that reach high temperatures during operation (transformers, engine block, exhaust pipes, etc.), not exposed to aggressive chemical substances (caustic, acids, solvents, corrosive substances etc.) and it is not exposed to direct atmospheric influences.

All components of the BlazeCut system must be firmly secured by using the recommended fixings to avoid movement and vibration. Do not secure any components to parts, which may move when the protected equipment is in operation. Choose mountings so that fastening components are not damaged when the device is in operation. Accidental displacement of any part of system BlazeCut from the place of installation may result in reduction of the extinguishing effect of the system, its damage or device damage.

The system has to be positioned so that it is possible to perform future maintenance, component replacement, inspections and optimising safety of the pressurized equipment. Do not secure any components that will interfere with future inspection and maintenance of the equipment.

Ensure that no part is damaged after closing of the protected enclosure (e.g., after closing the covers/doors of the installation, engine etc.) and that no part is affected by moving parts of the device (fans etc.).

Install the system so that it is not exposed to aggressive chemical substances (caustic, acids, solvents, corrosive substances etc.) and it is not exposed to direct atmospheric influences.

When fastening the system, make sure not to damage other parts of the device.

Do not overload the threads on the components, do not tighten or release the threads on the components forcibly, use the correct tightening torque. Make sure not to damage the components of the system by tools. Always check that the thread is clean and undamaged before installation.

In the event of subsequent changes in the protected enclosure during operation of system BlazeCut, always check whether changes are or not necessary in the installation of the system, relocation of hoses, tubes, nozzles etc. to secure the functionality and efficiency of the system.

3.1.1 WARNINGS

Installation of the system, its activation and repair and maintenance is governed by specific legislation and these activities may only be performed by persons with relevant professional qualification subject to applicable legislation.

After the installation of the system, the configuration is under constant pressure. Never tamper with the system under pressure.

In the case of work in the vicinity of electrical equipment observe corresponding safety rules and instructions. Do not perform installation and maintenance of the system the equipment is in operation. In the case of work in the vicinity of electrical equipment observe corresponding safety rules and instructions. Work on electrical installations may be performed only by qualified persons.

Install and use system BlazeCut only with original supplied components. Do not replace anything in the system; use only original component and spare components. Using components not approved by the manufacturer causes loss of warranty, may cause malfunction of the system and presents danger to life and health of persons.

Do not install the cylinder to configuration if non-corresponding pressure is detected in the cylinder during inspection.

The system may be installed, maintained and repaired only by persons trained or authorized by the manufacturer and depending on procedure also with relevant professional qualification. Unprofessional interference with the system may cause malfunction of the system and provides danger to safety and health of people.

When handling parts of the system under pressure (cylinder, valves, pressure switch, BlazeTube detection) always wear appropriate protective glasses with side-shields. Eyes may be seriously damaged when coming into contact with extinguishing agent in case of sudden leak.

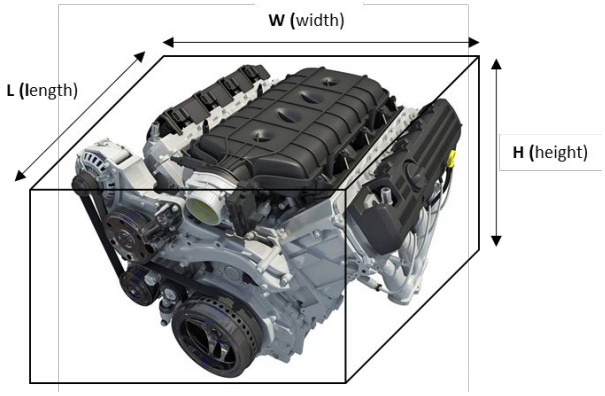
If leak of liquid extinguishing agent occurs, always prevent contact with skin. Use suitable impermeable protective work gloves.

Refrain from handling the system, if it was exposed to high temperature (as a result of operation of the protected device or after exposure to fire etc.). If the system is hot, temperature of extinguishing agent increases and pressure in the system increases. In this case the BlazeTube detection cannot be put under mechanical stress. Splashing of hot extinguishing agent under high pressure may cause serious injury. Wait until the system cools off naturally.

A local application is calculated by surface area of the intended area to be directly covered with the fire system.

The calculation is based on critical application rates specified by the NFPA in NFPA 11 with the minimum application rate of 4.1 litres/minute/m^2.

A combination of ANF060 and ANF120 nozzles can be used in local applications to ensure the most effective coverage is achieved. Location of nozzles must always be above or centred with the application and the nozzles oriented horizontally or slightly downwards, so a full application of foam is achieved throughout the area.



Simplified model of the protected hazard

$$A = W \times L + 2(W \times H) + 2(H \times L) \quad (1)$$

A – surface of the protected hazard [m^2] *

W – width [m] L – length [m] H – height [m]

* The bottom of the application is excluded as agent will cover it indirectly.

3.2 STANDARD AND ANTIFREEZE FOAMS

To guide which system to select, the below lists the maximum surface coverage for the standard and anti-freeze foam agents. The design limitations have been established as a result of inhouse testing results and are based on critical application rates specified by the NFPA in NFPA 11. The flow rates are based on a minimum application rate of 4.1 litres per minute per metre square (4.1 Lpm/m^2). When the system is using standard and antifreeze foams nozzles can cover up to 0.80 m^2 per nozzle.

Table 7: Estimates with standard foam and antifreeze foam

		Number of nozzles																			
Cylinder size litres	**Agent fill litres**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**28**	**32**	**36**	**40**
5L	**4L**	50	28																**Numbers shown in the green cells are approximate discharge times in seconds that are inline with NFPA application rates for foam systems**		
7.8L	**6.2L**		37	27																	
13L	**10.4L**			46	39	33															
16L	**12.8L**				48	41	37	32													
2x 16L	**25.6L**				82	71	57	52	46	42	38	33									
3x 16L	**38.4L**								65	61	56	47	44	40	36						
Maximum system coverage m^2		0.80	1.60	2.40	3.20	4.00	4.80	5.60	6.40	7.20	8.00	9.60	11.20	12.80	14.40						
Discharge ports used per cylinder		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
32L	**25.6L**							79	76	71	60	56	53	50	47	44					
Maximum system coverage m^2								4.60	4.90	5.20	6.20	6.70	7.00	7.40	7.90	8.40					
Discharge ports used per cylinder								1	1	2	2	2	2	2	2	2					
2x 32L	**51.2L**												75	71	66	56	50	47			
Maximum system coverage m^2													9.80	10.50	11.30	13.20	14.80	15.50			
Discharge ports used per cylinder													1	1	2	2	2	2			
3x 32L	**76.8L**														80	76	70	64	56	50	44
Maximum system coverage m^2															13.80	14.50	15.70	17.20	19.70	22.00	25.00
Discharge ports used per cylinder															1	1	1	2	2	2	2

NOTE:

- Flow rates exceed the minimum recommended by NFPA at 4.1 litres/minute/m^2
- Minimum discharge time is 25 seconds.
- Delayed engine shutdown will increase discharge time required e.g., if 6 second engine shutdown a minimum discharge of 31 seconds will be required: 25+6.
- No adjustments need to be made for cylinders angled up to 45 degrees. Adjustments need to be made for cylinders mounted horizontally - they must include an angled dip tube.
- If requiring a larger system than shown, please contact the BlazeCut supplier.

3.3 FLUORINE-FREE FOAM (FFF)

To guide which system to select, the below lists the maximum surface coverage for the fluorine-free foam agent. The design limitations have been established as a result of inhouse testing results and are based on critical application rates specified by the NFPA in NFPA 11. The flow rates are based on a minimum application rate of 4.1 litres per minute per metre square (4.1 Lpm/m^2). When the system is using the Fluorine free foam nozzles can cover up to 0.60 m^2 per nozzle.

Table 8: Estimates with fluorine-free foam (FFF)

		Number of nozzles																			
Cylinder size	**Agent fill**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**28**	**32**	**36**	**40**
5 L	**4 L**	50																			
7.8 L	**6.2 L**		37																		
13 L	**10.4 L**			46	39	33															
16 L	**12.8 L**				48	41	37	32													
2x 16 L	**25.6 L**				82	71	57	52	46	42	38	33									
3x 16 L	**38.4 L**								65	61	56	47	44	40	36						
Maximum system area coverage		0.60	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40	6.00	7.20	8.40	9.60	10.80						
Discharge ports used per cylinder		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
32 L	**25.6 L**							79	76	71	60	56	53	50	47	44					
Maximum system area coverage								4.20	4.80	5.20	6.00	6.70	7.00	7.40	7.90	8.40					
Discharge ports used per cylinder								1	1	2	2	2	2	2	2	2					
2x 32 L	**51.2 L**												75	71	66	56	50	47			
Maximum system area coverage													8.40	9.60	10.80	12.00	14.40	15.50			
Discharge ports used per cylinder													2	2	4	4	4	4			
3x 32 L	**76.8 L**														80	76	70	64	56	50	44
Maximum system area coverage															10.80	12.00	14.40	16.80	19.20	21.60	24.00
Discharge ports used per cylinder															3	3	3	6	6	6	6

Numbers shown in the green cells are approximate discharge times in seconds that are inline with NFPA application rates for foam systems

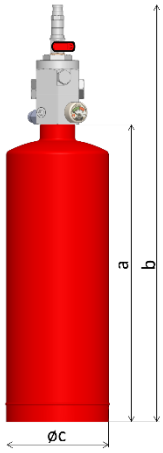
NOTE:

- Flow rates exceed the minimum recommended by NFPA at 4.1 litres/minute/m^2
- Minimum discharge time is 32 seconds.
- Delayed engine shutdown will increase discharge time required e.g., if 6 second engine shutdown a minimum discharge of 38 seconds will be required: 32+6.
- No adjustments need to be made for cylinders angled up to 45 degrees. Adjustments need to be made for cylinders mounted horizontally – they must include an angled dip tube.
- If requiring a larger system than shown, please contact the BlazeCut supplier.

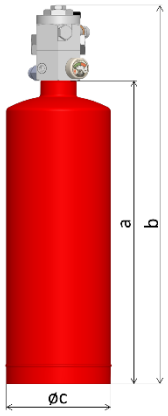
4 COMPONENTS OF THE SYSTEM AND THEIR DESCRIPTION

4.1 CYLINDER

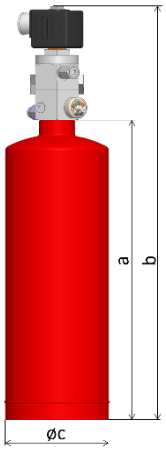
Depending on the system configuration and the necessary amount of the extinguishing agent different size cylinders filled with the necessary amount of extinguishing agent may be used. The set size and selected parameters of normally used cylinders and valves are shown in pictures and table below.



Cylinder with the valve 201



Cylinder with the valve 207



Cylinder with the valve 21x

Table 9: Parameters and dimensions of cylinders including a valve for foam agent

Volume of the cylinder [L]	Valve	M** [kg]	a* [mm]	b* [mm]	Ø c [mm]	Max. amount of agent [kg]
5.0	201, 202, 203	3.53	348	473	150	4.0
	207	3.54		427		
	211, 212-01 (-30)	3.82		469		
7.8	201, 202, 203	4.42	460	585	160	6.2
	207	4.43		539		
	211, 212-01 (-30)	4.71		581		
13.0	201, 202, 203	6.13	533	658	190	10.4
	207	6.14		612		
	211, 212-01 (-30)	6.42		654		
16.0	201, 202, 203	8.19	645	770	190	12.8
	207	8.20		724		
	211, 212-01 (-30)	8.48		766		
32.0	201, 202, 203	12.51	783	908	245	25.6
	207	12.52		862		
	211, 212-01 (-30)	12.80		904		

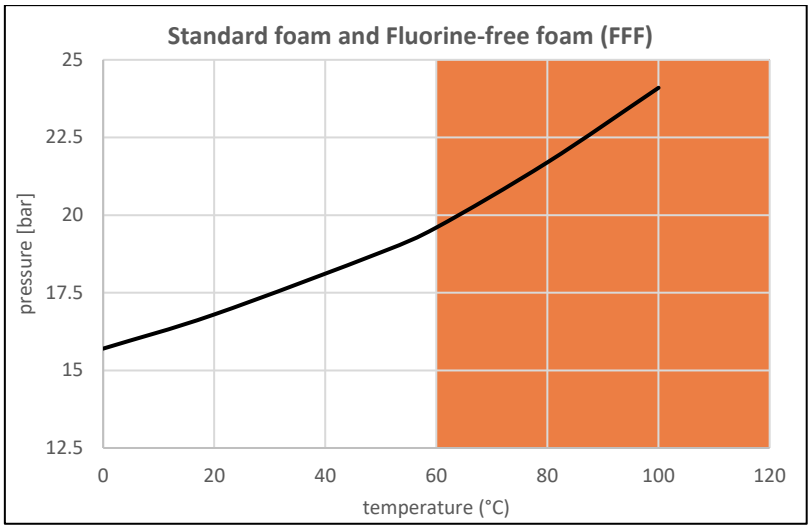
*tolerance ±3 mm
**weight of the empty cylinder, dip tube, valve, valve plugs, pressure gauge and without the extinguishing agent, tolerance ± 0.05 kg

Table 10: Cylinders parameters

Parameter	Description
Certification	2014/68/EU
Material	steel DC04 EN10130
Surface treatment	high resistant powder coating
Neck ring	stainless steel 316L AISI/EN 1.4435/1.4404
Inside surface	polymer coating
Max. working pressure	PS 20 bar at 60 °C
Working temperature	-30 to +60 °C
Testing pressure	PT 30 bar
Colour	red RAL 3000

Cylinder label with model designation and production data

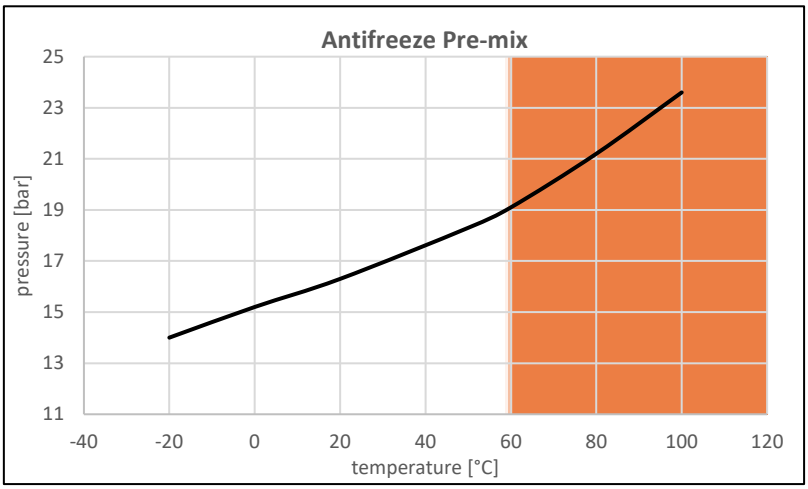
The cylinder is used for storage of extinguishing agent and expellant gas. The expellant gas is required to release the agent through the nozzle(s) and also assists in the stabilization of pressure in the cylinder. Pressure in the cylinder will vary depending on the ambient temperature (see graph below). The amount of the extinguishing agent and its fill pressure are indicated on the label of the cylinder. Cylinders arrive **unpressurized** as standard but can be delivered pressurized at customer's request.



The relationship between temperature and pressure in the cylinder

Table 11: Values of pressure in the cylinder at given temperatures

Temperature [°C]	0	10	20	30	40	50	60
Pressure [bar]	14.0	15.0	16.0	16.9	17.9	18.9	20.0



The relationship between temperature and pressure in the cylinder

Table 12: Values of pressure in the cylinder at given temperatures

Temperature [°C]	-30	-20	-10	0	10	20	30	40	50	60
Pressure [bar]	12	12.6	13.3	14.1	15.0	16.0	16.9	17.9	18.9	20.0

4.1.1 WARNINGS

In case of a significant difference between the actual pressure in the system with the data on the cylinder label, conduct an inspection of the system.

Do not install the cylinder, if the incorrect pressure is detected in the cylinder during inspection (i.e., pressure is significantly different from the values stated on the label).

The cylinder of the system is under constant pressure. Do not damage, puncture or throw the cylinder. During transferring or transporting, secure the cylinder to avoid tipping, rolling or rubbing against other objects or the ground. Do not mend or solder a damaged cylinder, it must be replaced.

During storage, separate empty cylinders from fully charged cylinders and appropriately label their storage area. Do not store or transport in vicinity of strong sources of heat, aggressive chemical (caustic, corrosive) substances, prevent contact with sharp objects, vibrations or loading with other objects. Store in dry and well ventilated rooms.

Do not expose the cylinder to extreme heat or direct sunlight if possible . Heating the surface of the cylinder may significantly increase pressure in the cylinder.

Always handle the cylinder as if it was under pressure, unless it is directly verified that it is completely empty (e.g., by pressing the Schrader valve in the M10x1 pressure gauge outlet on the cylinder valve; the value of the pressure on the pressure gauge may be incorrect or the pressure gauge may be malfunctioning).

Transportation of equipment under pressure by transportation vehicles is governed by specific legislation. Seek information and follow corresponding security requirements during transportation depending on the method of transport.

4.1.2 SIMULTANEOUS CONNECTION OF MULTIPLE CYLINDERS

In case of simultaneous connection of multiple cylinders, the extinguishing agent in all cylinders must be the same and all containers must be under the same pressure before installation.

The amount of extinguishing agent in each cylinder is indicated on the label of the cylinder, the total amount of the extinguishing agent in the system is the sum of the quantities of extinguishing agent in individual cylinders. The cylinders are connected into one pressurized unit after installation of the system, the pressure in all cylinders at steady state is always equal.

4.2 CYLINDER VALVE

The cylinder valve is assembled and part of the cylinder when the BlazeCut system is supplied. The valve is closed by an internal piston, which holds the pressure in the cylinder. The piston opens with a rapid decrease of pressure on the top side of the piston. This can be caused by a pneumatic activation or with an electric activation using an electric solenoid.

Prevent the cylinder valve from damage and impact. Do not lift the cylinder holding it by the cylinder valve or by other components connected to the valve. Always store and transport cylinders with the valve facing upwards.

Do not try to remove the valve off the cylinder if the cylinder is under pressure. Never untighten a plug or fitting closing the detection ports on the cylinder valve. If removed, this can cause the immediate opening of the cylinder valve piston and release the extinguishing agent.

The valve is mounted on the cylinder by a specific tightening torque. Do not tighten or release the valve. If a leak is detected between the valve and cylinder join, the charged cylinder cannot be used.

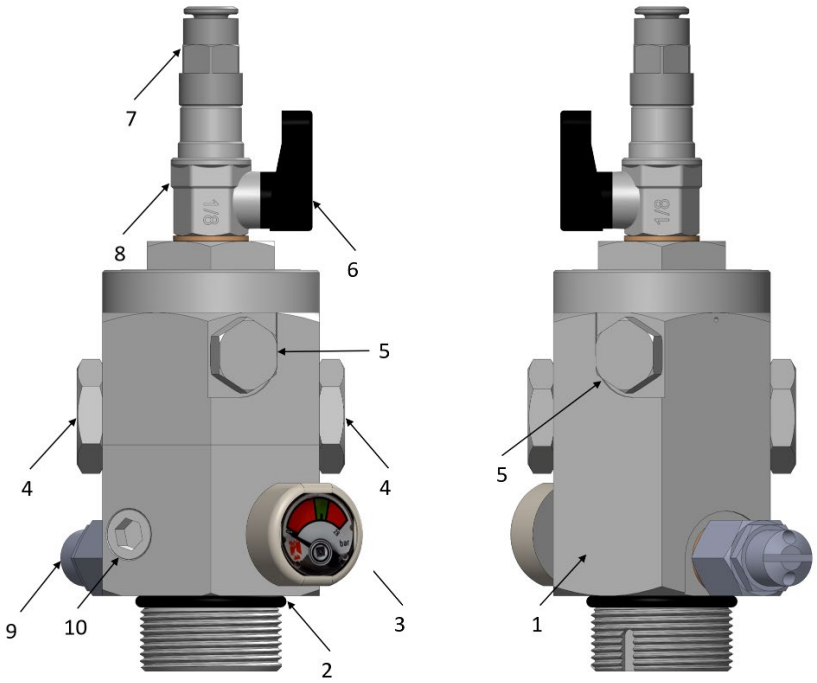
4.2.1 VALVE 20x WITHOUT THE INTEGRATED SOLENOID – SYSTEMS C(SF, AF, FF)20x

Pressure that is in the detection circuit keeps the piston in closed position. The piston of the valve will open when there is a drop of pressure in the detection circuit which is connected to the top side of the cylinder valve. This principle is solely mechanical and independent of any external power supply. The piston can be also released by a manual actuation device.

Valve Series 20x are mostly used in LOP applications with BlazeTube detection. A pneumatic hose can be used for connecting directly to a remote actuator, for a manual system only when required.

Table 13: Parameters of valves 201, 202, 203

Total height of the valve	Height of the valve without the cylinder thread	Cylinder thread	Dip tube thread	Distribution outlet thread	Pressure gauge thread	BlazeTube detection outlet	Ball valve thread
141 mm	125 mm	M30x1.5	M16x1.5	G3/8“	M10x1	Ø 6 mm	G1/8“

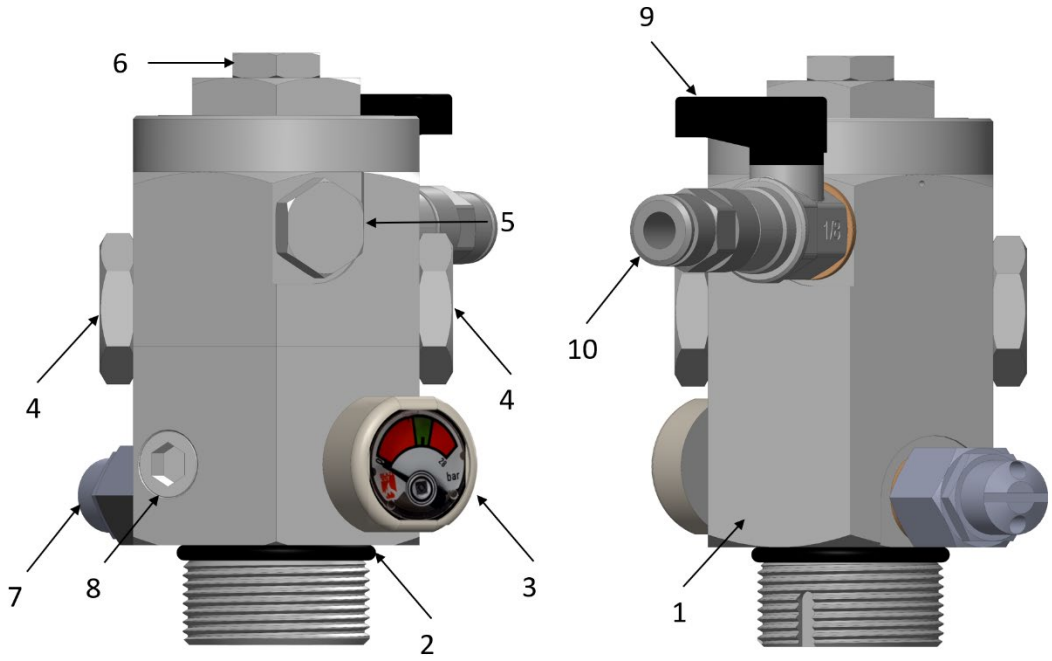


Standard configuration of the 201, 202, 203 valves

1. body of the cylinder valve
2. O-ring seal of the cylinder valve
3. M10x1 port with an installed pressure gauge APG004
4. 2x G3/8” agent discharge outlet with a valve plug FVP1B06 – for fittings for a Red Fire Hose, Feed Hose or steel tubes
5. 2x G1/8” outlet with a valve plug FVP1B02. Can be ordered with:
   a) valve adapter FVABM0210
   b) ball valve ABV001 with BlazeTube push-in connector and a bonded seal FVG02
6. removable lever of the ball valve
7. push-in connector for a Ø 6 mm BlazeTube detection
   a) valve 201: straight fitting FBT1BP026
   b) valve 202: elbow fitting FBT2BP026
   c) valve 203: Tee fitting FBT3PBP6026
8. G1/8” outlet with a ball valve ABV001 and a bonded seal FVG02
9. G1/8” outlet with a pressure relief valve APR001 and a bonded seal FVG02
10. M10x1 port with a valve plug FVP1M10 – for Pressure Switch APS001-xx or Pressure Transducer ATA100 (see Annex A2.2.1)

Table 14: Parameters of the valves 207-01

Total height of the valve	Height of the valve without the cylinder thread	Cylinder thread	Dip tube thread	Distribution outlet thread	Pressure gauge thread	BlazeTube detection outlet	Ball valve thread
95 mm	79 mm	M30x1.5	M16x1.5	G3/8“	M10x1	Ø 6 mm	G1/8“



Standard configuration of the 207-01 valve

1. body of the cylinder valve
2. O-ring seal of the cylinder valve
3. M10x1 port with an installed pressure gauge APG003
4. 2x G3/8” agent discharge outlet with a valve plug FVP1B06 – for fittings for a Red Fire Hose, Feed Hose or a steel tube
5. G1/8” outlet with a valve plug FVP1B02. Can be ordered with:
   a) valve adapter FVABM0210 (G1/8” to M10x1)
   b) ball valve ABV001 with BlazeTube push-in connector and a bonded seal FVG02
6. G1/8” outlet with a valve plug FVP1B02
7. G1/8” outlet with a pressure relief valve APR001 and a bonded seal FVG02
8. M10x1 port with a valve plug FVP1M10 – for Pressure Switch APS001-xx or Pressure Transducer ATA100 (see Annex A2.2.1)
9. removable lever of the ball valve
10. G1/8” outlet with a ball valve ABV001 with BlazeTube push-in connector and a bonded seal FVG02 Can be ordered also with:
    a) valve plug FVP1B02

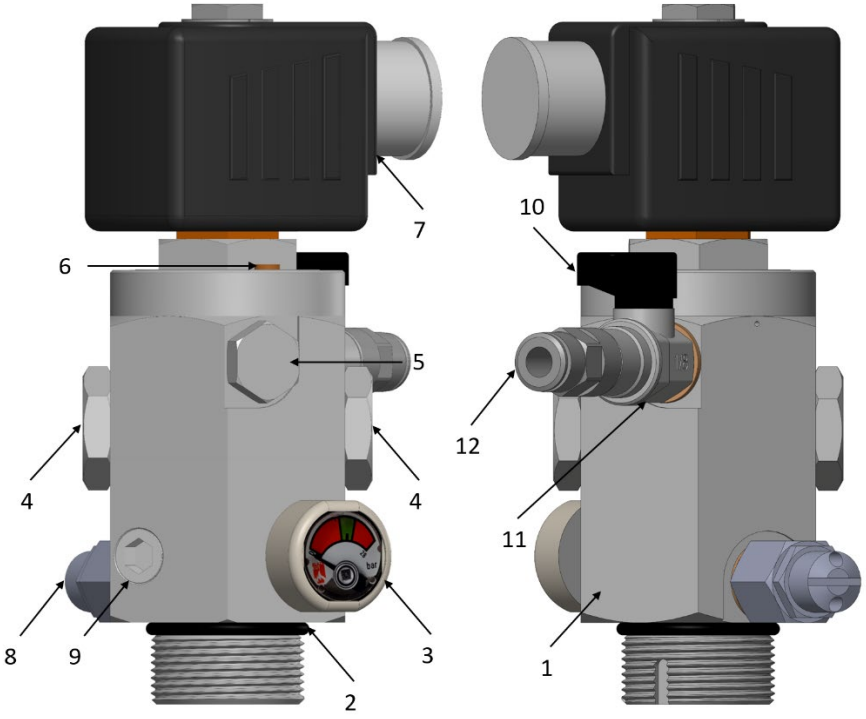
4.2.2 VALVES 211 AND 212 WITH THE INTEGRATED SOLENOID – SYSTEMS C(SF, AF, FF)(211, 212)

The solenoid is an electromagnetic coil. When electrical current is sent to the coil, it produces a magnetic field. The field transforms into mechanical energy, which secures the release of pressure from the top side of the valve piston opening the discharge ports and releasing the agent.

The system is supplied with a solenoid connector mounted on the solenoid. When fire is detected, the solenoid allows to activate the system manually (e.g., alarm panel, electric actuator) or automatically using electrical detection such as smoke and/or heat detectors, LHD BlazeWire etc.

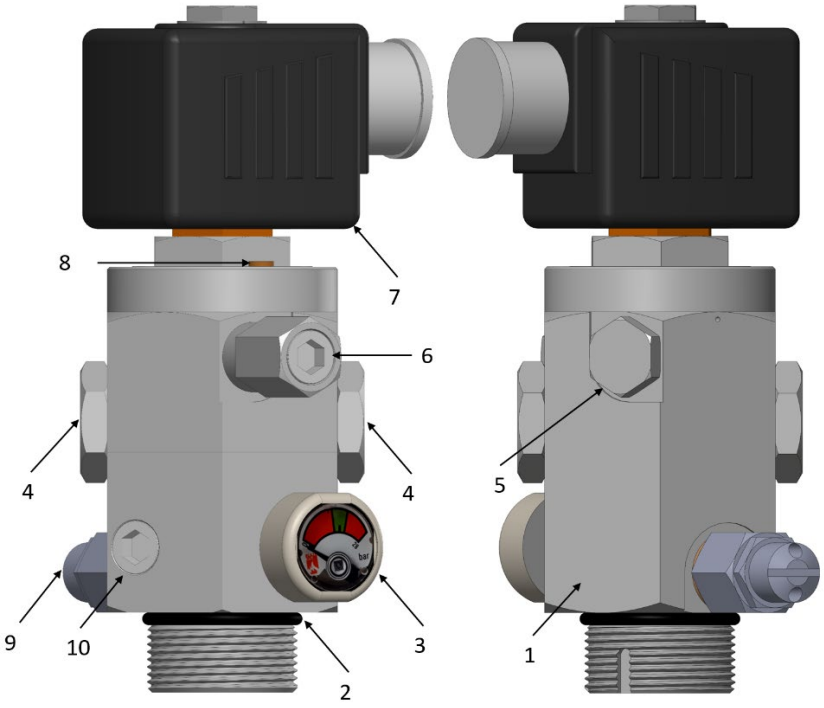
Table 15: Parameters of the 211 and 212 valves

Total height of the valve	Height of the valve without the cylinder thread	Cylinder thread	Dip tube thread	Distribution outlet thread	Pressure gauge thread	BlazeTube detection outlet	Ball valve thread
137 mm	121 mm	M30x1.5	M16x1.5	G3/8“	M10x1	Ø 6 mm	G1/8“



Standard configuration of 21x-01 valves

1. body of the cylinder valve
2. O-ring seal of the cylinder valve
3. M10x1 port with an installed pressure gauge APG004
4. 2x G3/8” agent discharge outlet with a valve plug FVP1B06 – for fittings for a Red Fire Hose, Feed Hose or steel tubes
5. G1/8” outlet with a valve plug FVP1B02. Can be ordered with:
   a) valve adapter FVABM0210
   b) ball valve ABV001 with BlazeTube push-in connector and a bonded seal FVG02
6. venting port cap – **keep in place at all times**
7. solenoid valve 24 V DC or 12 V DC
8. G1/8” outlet with a pressure relief valve APR001 and a bonded seal FVG02
9. M10x1 port with a valve plug FVP1M10 – for Pressure Switch APS001-xx or Pressure Transducer ATA100 (see Annex A2.2.1)
10. removable lever of the ball valve
11. G1/8” outlet with a ball valve ABV001 and a bonded seal FVG02
12. push-in connector FBT1BP026 for a Ø 6 mm BlazeTube detection



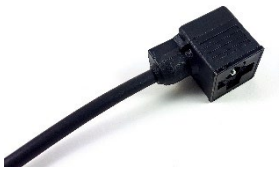
Standard configuration of 21x-30 valves

1. body of the valve
2. O-ring seal of the valve
3. M10x1 port with an installed pressure gauge APG004
4. 2x G3/8” agent discharge outlet with a valve plug FVP1B06 – for fittings for a Red Fire Hose, Feed Hose or steel tubes
5. G1/8” outlet with a valve plug FVP1B02. Can be ordered with:
   a) valve adapter FVABM0210
   b) ball valve ABV001 with BlazeTube push-in connector and a bonded seal FVG02
6. G1/8” outlet with a valve adapter FVABM0210 (G1/8” to M10x1) with a plug
7. solenoid valve 24 V DC or 12 V DC
8. venting port cap – keep in place at all times
9. G1/8” outlet with a pressure relief valve APR001 and a bonded seal FVG02
10. M10x1 port with a valve plug FVP1M10 – for Pressure Switch APS001-xx or Pressure Transducer ATA100 (see Annex A2.2.1)

Table 16: Types of solenoid connectors

Part №	IP rating	Description
ASP001	IP65 with ASS001	Solenoid connector for Electrics DIN EN175301-803 type A, no polarity. Fixed Indoor applications.
ASP101	IP67 with ASS101	Solenoid connector for Electrics with moulded 30 cm electrical cable, 4 x 0.75 mm² wires (see below a wiring diagram). Mobile and harsh applications.
ASS001	-	solenoid seal for electrical connector ASP001
ASS101	-	solenoid seal silicone for electrical connector ASP101

ASP001

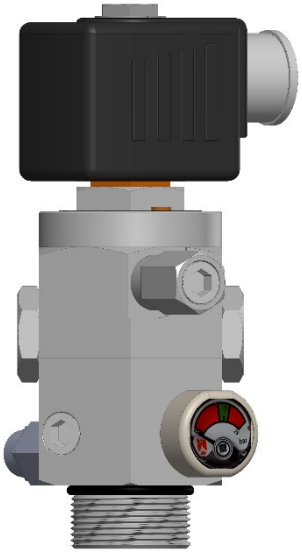


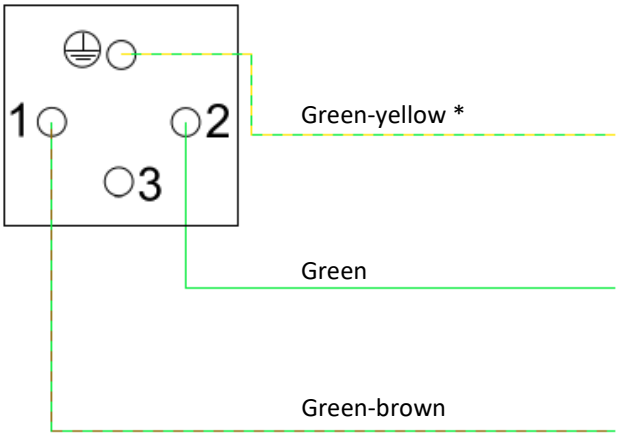
ASP101

ASS001

ASS101

Please refer to the APM210-310 – ALARM PANEL MANUAL for full wiring detail.





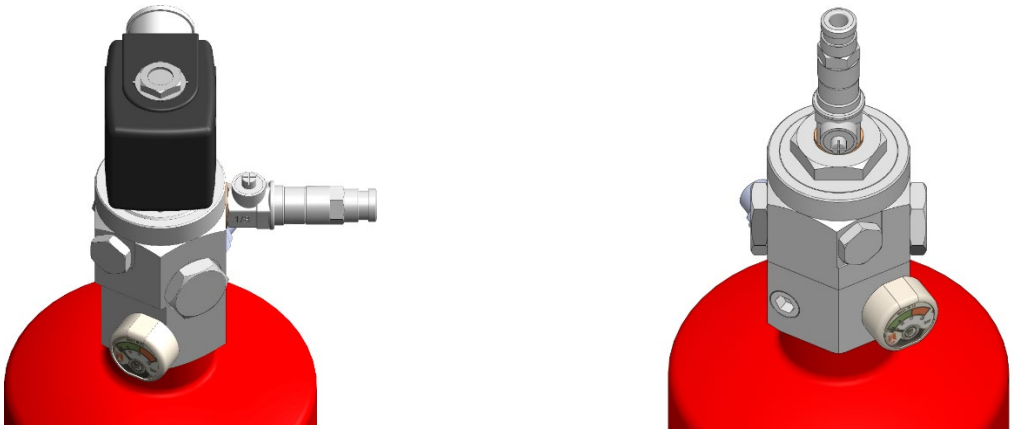
** optional ground wire*

ASP101 wiring diagram

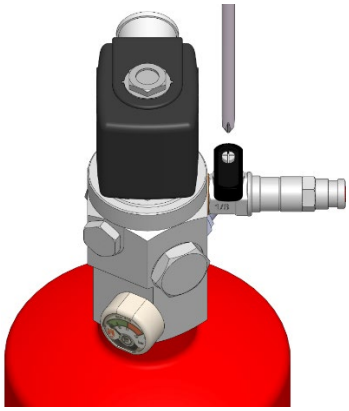
4.2.3 BLAZETUBE DETECTION CONNECTOR

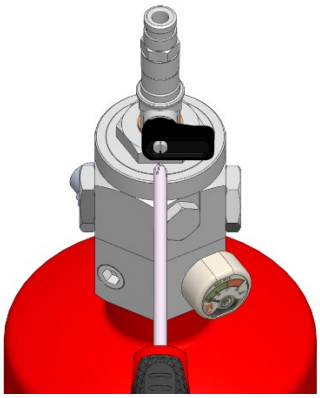
The BlazeTube detection connector with a Ø 6 mm outlet is on the cylinder valve. Part of this connector is a small ball valve mounted in the valve detection outlet with thread G1/8“. The ball valve is closed when supplied and must only be opened after pressurization of the BlazeTube detection, for the system to become fully functional.

For safety reasons cylinders under pressure must be protected against accidental activation by removal of the lever of the ball valve during transportation of the cylinder. Install the lever during installation of the BlazeTube detection. During the installation of the ball valve lever, follow the steps listed below. To uninstall the ball valve lever, remove the red cover by pushing its pin on the back and follow the steps backwards to the installation.

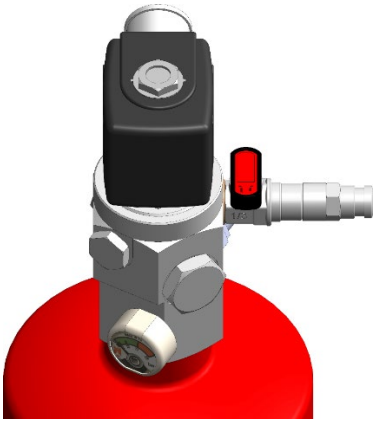


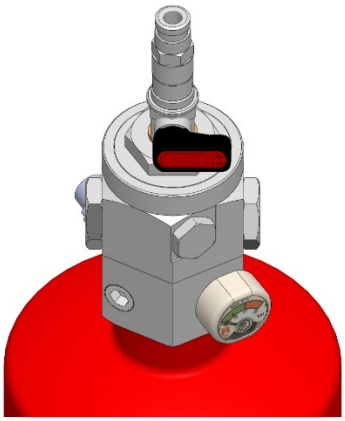
Ball valves without a lever





Use a screwdriver for mounting and dismounting





Place the red cover on the lever

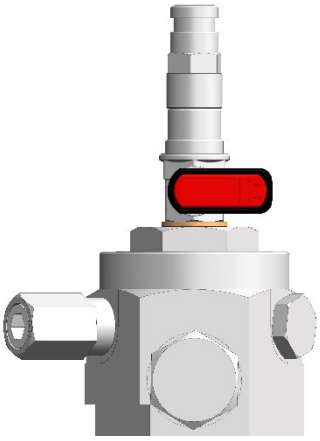
Do not try to remove the BlazeTube detection ball valve connector from the cylinder valve if the system is under pressure. This will cause the cylinder valve to activate and discharge the agent.

Always remove the lever of the ball valve during transportation of cylinders which are under pressure.

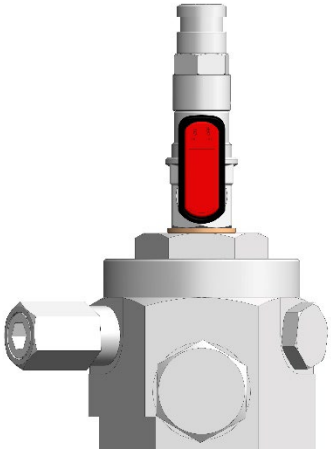
Do not open the ball valve of the BlazeTube detection connector before pressurization of the tube, the valve piston of the cylinder will open and the extinguishing agent will be released. Protect the ball valve from accidental opening during transportation and handling of the cylinder. Follow the instructions for transportation of the cylinder.

Always keep the discharge ports on the valve plugged until the BlazeTube detection is pressurized to the correct pressure.

The ball valve of the BlazeTube detection connector can only be opened after completing the following:
- the cylinder of the system is properly fastened;
- the system is completely installed, without discharge hoses connected;
- both discharge outlets are to remain plugged off until charging is completed correctly;
- the BlazeTube detection is properly connected to the valve and to the end-of-line adapter;
- the end-of-line adapter is properly mounted and secured with a P-clamp;
- the BlazeTube detection is pressurized to 1 bar above the current cylinder pressure.

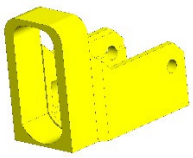


Ball valve is closed

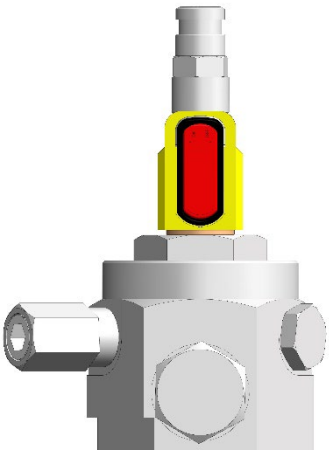


Ball valve is open

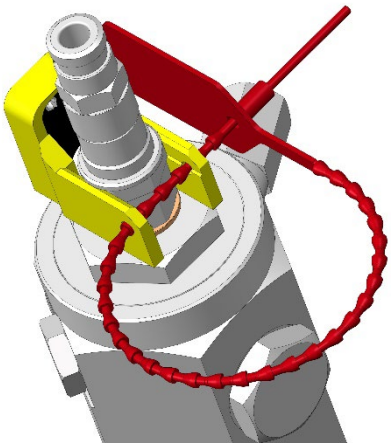
To prevent unintentional switch of the ball valve lever to closed position, install the ball valve anti tamper safety lock ABL001 and a plastic lock seal ALS001.



Ball valve anti tamper safety lock ABL001



Installed ball valve anti tamper safety lock



Installed plastic lock seal

Put the ball valve anti tamper safety lock in position so that the front face of it and the front face of the ball valve lever are in plane. To secure the ball valve anti tamper safety lock, insert a plastic lock seal through the two holes on the ball valve anti tamper safety lock. Fasten the lock seal tightly.

4.2.4 DISCHARGE OUTLET

The cylinder valve contains two outlets for the discharge networks. They are closed by the valve piston of the cylinder. The outlets have a thread G3/8“. These outlets are sealed with plugs to prevent accidental activation of the system when system BlazeCut is supplied and installed.

The valve plugs of the outlets for discharge networks must always be mounted on the cylinder valve. Remove the valve plugs after the BlazeTube has been charged correctly and the ball valve has been successfully opened without issue. The connecting of discharge hoses will be one of the last steps in the systems installation process.

Table 17: Parts for the cylinder valve

Part №	Picture	Description	Material
FDO1BB0608		discharge outlet fitting straight reduced coupling, G3/8" - G1/2", male-male	stainless steel
FDO1BB0604		discharge outlet fitting straight reduced coupling, G3/8" - G1/4", male-male	galvanized steel
FDO1BM0618		discharge outlet fitting straight reduced coupling G3/8" - M18 to suit 12 mm tube - BODY, male-male	galvanized steel
FDO1BM0618-SET		discharge outlet fitting straight reduced coupling G3/8" - M18 to suit 12 mm tube - SET, male-male	galvanized steel
FRC1BB0402		LOP hose fitting straight reduced coupling G1/4" - G1/8"	galvanized steel
FVABM0210		valve adaptor G1/8" - M10x1 with internal Schrader valve, includes M10x1 plug	stainless steel, EPDM sealing
APR001		pressure relief valve G1/8", 22 bar set pressure	stainless steel, EPDM sealing
FVP1B02		valve plug G1/8"	stainless steel sealing
FVP1B06		valve plug G3/8"	stainless steel sealing
FVP1M10		valve plug M10x1	stainless steel sealing
FVG02		bonded seal 1/8" used with ball valve ABV001, pressure relief valve APR001, FRC1BB0402	stainless-steel, EPDM seal
ABV001		ball valve G1/8" to G1/8"	chrome nickel-plated brass body, EPDM sealing

4.3 PRESSURE GAUGE

Actual pressure in the cylinder can be determined by reading the value on the pressure gauge, which is mounted on the cylinder valve, alternatively an additional gauge on the end-of-line adapter or pneumatic remote actuator ARA010 or ARA020. Green zone of the pressure gauge indicates the permissible pressure in the system.

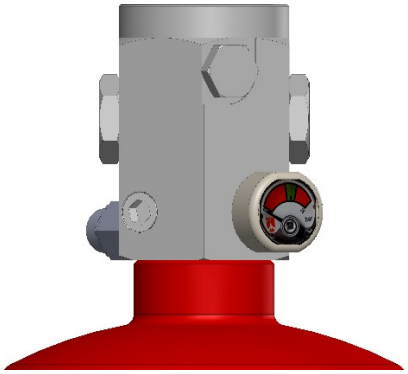
Table 18: Types of pressure gauges

Part №	Description	Pressure range	Thread	Material
APG004	for foam agents	green zone: 14 – 20 bar red zones: 0 – 14 bar, 20 – 28 bar	M10x1	body: nickel plated brass O-ring: EPDM

Pressure gauge APG004

When the system is supplied, the pressure gauge is mounted on the cylinder valve in the bottom port with a thread M10x1. It is always recommended to keep the pressure gauge located in the same position as it was supplied. If there is a need for the pressure gauge relocation, replacement or installation of additional gauge, follow instructions in Annex A2.2.1).

If the system is in operation and the BlazeTube detection under pressure, when mounting and dismounting the pressure gauge at the end-of-line device, the ball valve on the cylinder valve must be closed to avoid a false actuation.



Standard location of a pressure gauge

4.4 BLAZETUBE DETECTION

The BlazeTube detection works on pneumatic principles and is an automatic activator of the BlazeCut system. BlazeTube is manufactured to fulfil the highest market standards and combining key features like high chemical resistance, long lifetime, UV stability, flexibility and reliable fire detection.

BlazeTube is connected to the valve using the BlazeTube detection outlet with the push-in connector FBT1BP026. The BlazeTube has an end of line device at the opposing end. The BlazeTube detection is placed in the protected enclosure. During installation the tube is pressurized by nitrogen gas and this keeps the piston of the cylinder valve closed. Pressure in the tube and in the cylinder is the same during the operation of the system. During fire the tube ruptures where the fire and temperature are at their greatest. This immediately decreases pressure in the tube and opens the piston of the cylinder valve. The fire suppression system activates and releases the extinguishing agent without any delay.

The time taken to cause the rupture of the BlazeTube detection may vary and depends on the pressure in the tube, which is affected by the level of pressurization in the system and ambient temperature. The higher the pressure in the BlazeTube detection, the sooner the BlazeTube detection ruptures and activates the system.

Table 19: BlazeTube detection parameters

Parameter	Property
material	special heat sensitive plastic
colour	red RAL3000
outside diameter	6 mm
operating temperature	-30 to +110 °C
activation temperature	about 170 °C
life span	up to 10 years

BlazeTube Detection ABT170

Table 20: Compatibility with selected common chemicals

Name	Status	Name	Status
Sodium Hydroxide, 35 %	OK	Standard fuel with alcohol	OK
Ammonium Hydroxide, 10 %	OK	Standard fuel without alcohol	OK
Isopropyl alcohol	OK	Sodium Carbonate, 20 %	OK
Ethanol	OK	Sodium Hypochlorite, 10 %	OK
Methanol	OK	Sodium Chloride, 10 %	OK
Diethyl ether	OK	Zinc Chloride, 50 %	OK
Acetone	OK	Citric Acid, 10 %	OK
Toluene	OK	Acetic Acid, 5 %	OK
Hexane	OK	Sulfuric Acid, 38 %	OK
iso-Octane	OK	Lactic Acid, 10 %	OK
Insulating Oil	OK	Ethylene Glycol in water, 50 %	OK
Multi-grade motor oil	OK	Hydrogen peroxide	OK
Hypoid gear oil	OK	Ethyl Acetate	OK
Diesel fuel	OK	Water	OK

Table 21: Types of BlazeTube detection

Part №	Description
ABT170	Ø 6 mm BlazeTube detection suits valve types 201, 202, 203, 20x-01, 21x-01

Table 22: BlazeTube detection standard kits

Part №	Description
KABT170-005	Ø 6 mm BlazeTube 5 metres, cable gland ACG112, 20 cable ties ACT314, 2 labels ALA018
KABT170-010	Ø 6 mm BlazeTube 10 metres, cable gland ACG112, 40 cable ties ACT314, 4 labels ALA018
KABT170-015	Ø 6 mm BlazeTube 15 metres, cable gland ACG112, 60 cable ties ACT314, 6 labels ALA018
KABT170-020	Ø 6 mm BlazeTube 20 metres, cable gland ACG112, 80 cable ties ACT314, 8 labels ALA018
KABT170-030	Ø 6 mm BlazeTube 30 metres, cable gland ACG112, 120 cable ties ACT314, 12 labels ALA018
KABT170-040	Ø 6 mm BlazeTube 40 metres, cable gland ACG112, 160 cable ties ACT314, 16 labels ALA018

Table 23: BlazeTube detection heavy-duty kits

Part №	Description
KABT170-005-HD	Ø 6 mm BlazeTube 5 metres, cable gland ACG112, 10 P-clamps APC020, 10 grommets AGBT005, 2 labels ALA018
KABT170-010-HD	Ø 6 mm BlazeTube 10 metres, cable gland ACG112, 10 P-clamps APC020, 20 grommets AGBT005, 4 labels ALA018
KABT170-015-HD	Ø 6 mm BlazeTube 15 metres, cable gland ACG112, 10 P-clamps APC020, 30 grommets AGBT005, 6 labels ALA018
KABT170-020-HD	Ø 6 mm BlazeTube 20 metres, cable gland ACG112, 10 P-clamps APC020, 40 grommets AGBT005, 8 labels ALA018
KABT170-030-HD	Ø 6 mm BlazeTube 30 metres, cable gland ACG112, 10 P-clamps APC020, 60 grommets AGBT005, 12 labels ALA018
KABT170-040-HD	Ø 6 mm BlazeTube 40 metres, cable gland ACG112, 10 P-clamps APC020, 80 grommets AGBT005, 16 labels ALA018

BlazeTube detection standard kit

BlazeTube detection heavy duty kit

4.5 BLAZETUBE PUSH-IN CONNECTORS

BlazeCut double seal push-in connectors provide a double tight connection on the BlazeTube, thus ensuring a highly reliable connection and avoiding possible leakage that may occur. Connection and disconnection of the tube can be repeated several times without the use of proper tools and without compromising the performance of the connector and the sealing of the tube.

The BlazeTube detection can be connected through Tee, elbow or straight push-in connectors. It is recommended to minimise the use of connectors and install them low in the main fire risk areas to avoid high temperatures during the operation of the equipment.

Table 24: BlazeTube push-in connectors

Part №	Description	Working temperature	Working pressure	Material
FBT1PP66	straight push-in connector for BlazeTube Ø 6 mm, NBR	-20 to +80 °C	0.9 – 60 bar	body and gripper: nickel-plated brass seals: EPDM or NBR
FBT3PPP666	Tee push-in connector for BlazeTube Ø 6 mm, NBR			
FBT1BP026	outlet push-in connector for BlazeTube Ø 6 mm, G1/8", EPDM	-30 to +80 °C		
FBT2BP026	elbow push-in connector 360° rotation for BlazeTube Ø 6 mm, G1/8", EPDM			
FBT3PBP6026	Tee push-in connector 360° rotation for BlazeTube, Ø 6 mm, G1/8", EPDM			

FBT1PP66

FBT1BP026

FBT3PPP666

FBT2BP026

FBT3PBP6026

4.6 BLAZETUBE END OF LINE DEVICES

Table 25: List of end-of-line devices

Part №	Description
FBT1P6	End-of-line plug Ø 6 mm
AEA006	End-of-line adapter Ø 6 mm with standard push-in connector for BlazeTube
ARA010	Remote actuator pneumatic, bulkhead mount*
ARA020	Remote actuator pneumatic, boxed*
ARA110	Remote actuator electric, bulkhead mount*
ARA120	Remote actuator electric, boxed*

*see Annex for detail description.

4.6.1 END-OF-LINE PLUG

End-of-line plugs are used to close one of the BlazeTube detections when branching the BlazeTube.

Table 26: Types of end-of-line plugs

Part №	Description	Working temperature	Working pressure	Material
FBT1P6	End-of-line plug Ø 6 mm	-30 to +80 °C	0.9 – 60 bar	body and gripper: nickel-plated brass seals: EPDM

FBT1P6

4.6.2 END-OF-LINE ADAPTER

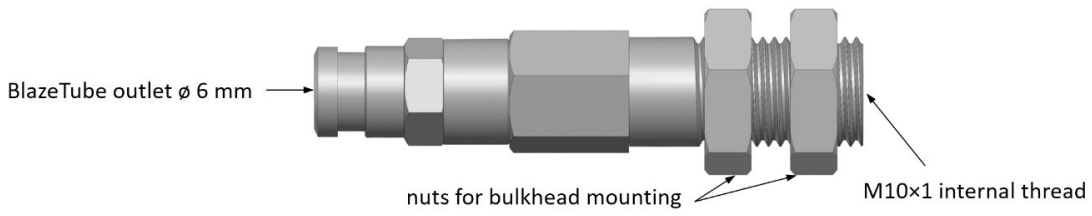
BlazeTube end-of-line adapter is used for pressurization of the BlazeTube detection system when the system is installed (see Chapter 7.1 and for pressurization of the system during inspection (see Chapter 8.2).

IMPORTANT!

The end of the adapter with internal thread M10x1 must be occupied by a pressure gauge, Pressure Switch APS001 or Pressure Transducer ATA100, to protect the Shrader valve inside.

Table 27: End-of-line adapter

Part №	Description	Working temperature	Working pressure	Thread
AEA006	End-of-line adapter Ø 6 mm with push-in connector, EPDM	-30 to +80 °C	0.9 – 60 bar	M10x1 to connect the pressure gauge or pressure switch/transducer



End-of-line adapter AEA006

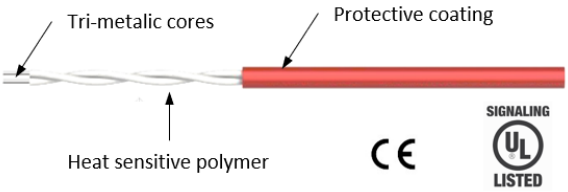
Table 28: End-of-line adapter accessories and kit

Part №	Description
ANE001	spare nut for end-of-line adapter AEA006 and AEA008, M14x1.5, galvanized steel
KCEA006-F	end-of-line adapter for 6 mm BlazeTube detection, APG004 pressure gauge and P-clamp APC014

ANE001

End-of-line adapter kit

4.7 BLAZEWIRE



BlazeWire Linear Heat Detector is a cable constructed using two twisted and tensioned, tri-metallic conductors. Each of the conductive cables are coated in a heat sensitive polymer which, when heated to its rated temperature, melts, causing the two wires to touch. The resulting short sends a signal to the alarm panel, indicating that a fire (or excessive heat) has been detected. This action takes place at the first heated point anywhere along the Blaze Wire's length, which can be up to 50 metres in length. It does not require that a specific length be heated in order to initiate an alarm nor is system calibration necessary to compensate for changes in the installed ambient temperature.

BlazeWire is specifically designed for use in applications where extreme environmental and product performance must be met. It provides excellent abrasion resistance and excellent chemical and permeation resistance to a wide variety of acids, bases, organic solvents as well as simple gases. In addition, the jacket exhibits very little change in tensile properties upon outdoor exposure to sunlight and weather.

Table 29: Types of BlazeWire

Part №	Colour	Outside diameter	Max. recommended ambient temperature	Activation temperature	Length
ABW105	black	4.50 ± 0.12 mm	70 °C	105 °C	per metre, max. 50 m
ABW185	red	3.60 ± 0.12 mm	125 °C	185 °C	

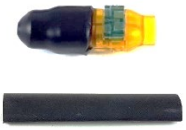
Table 30: Common BlazeWire parameters

Parameter	Property
maximum voltage rating	30 V AC, 42 V DC
resistance	100 Ω/km per leg
minimal bend radius	50 mm
minimum operation temperature	-40 °C

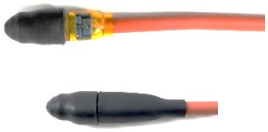
Features

- line coverage - continuous sensitivity up to 50 metres,
- 185 °C (365 °F) or 105 °C (221 °F) temperature rating. (Other temperatures available for special projects);
- withstands severe environmental conditions;
- approved for hazardous locations;
- easy to install, test, and splice;
- compatible with other initiation devices on same circuit (detectors, actuators);
- UL 521 approved and compliant with the EN54:28 standard;
- complies with the CPR, EMC and the Low Voltage Directive (LVD).

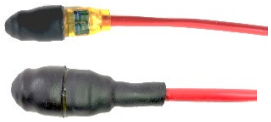
5 m coil of BlazeWire ABW185



End of line resistor AER001 with heat shrink



Silicone cable connected with the AER001 and covered with heat shrink



BlazeWire connected with the AER001 and covered with heat shrink

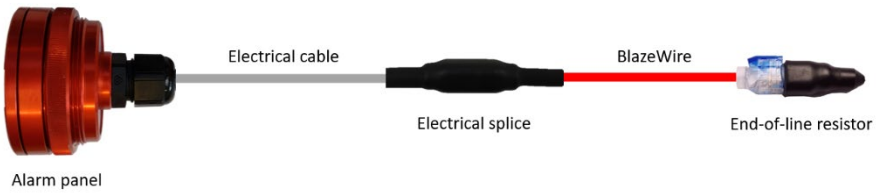
Silicone cable and BlazeWire connected to the Electrical splice AES3550-2

Silicone cable and BlazeWire connected to Electrical splice AES3550-2 heat shrink covered

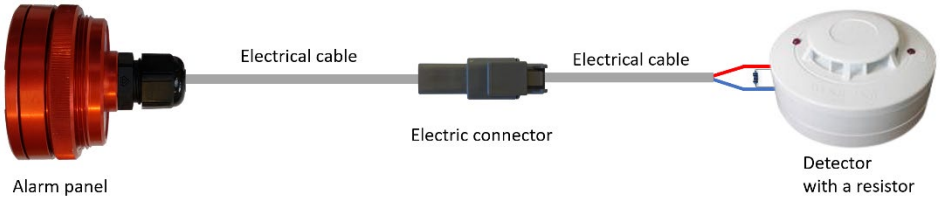
The BlazeWire must be installed above main fire risk areas. Make sure it is not in direct contact with parts of the protected equipment or close to parts that reach high temperatures during operation. Some examples are engine turbos and exhausts, heat diffusers etc.

When using BlazeWire, the end of detection line must be secured by the End-of-line Resistor (EOR) AER001 that is supplied in a kit. For electric detectors a resistor AER101 is required. It is recommended to keep the EOR low in the main fire risk areas to avoid heat sources, so it is not exposed to the risk of damage. Maximum allowed operation temperature of the EOR AER001 is 100 °C. The resistor is supplied with a glue heat shrink that is placed over the resistor and BlazeWire when spliced to the resistor connector to seal and hold it firmly to the BlazeWire. The EOR with equal parameters can be yellow or transparent in colour.

It is recommended to use the Electrical Splice AES3550-2 with the heat shrink between the BlazeWire and electrical cable for firm hold and sealing. The Electrical splice connectors are supplied in the BlazeWire kits. See below pictures for suggested installation of the Electrical splice connector. The Electrical splice with equal parameters can be yellow or transparent in colour. It is not necessary to install the BlazeWire in whole length from the protected enclosure to the alarm panel. The BlazeWire can be used in the main fire risk area and standard or silicone cable can be used to connect to the alarm panel. See below figures for possible connection options.

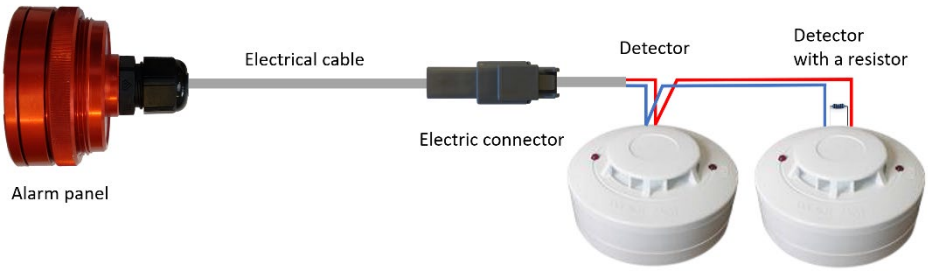


Connection of the BlazeWire to the alarm panel

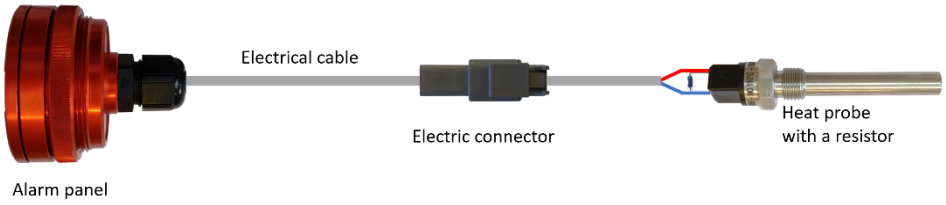


Connection of a detector to the alarm panel

When installing two or more relay detectors, they have to be connected in parallel. The furthest one requires a resistor AER101 installed.

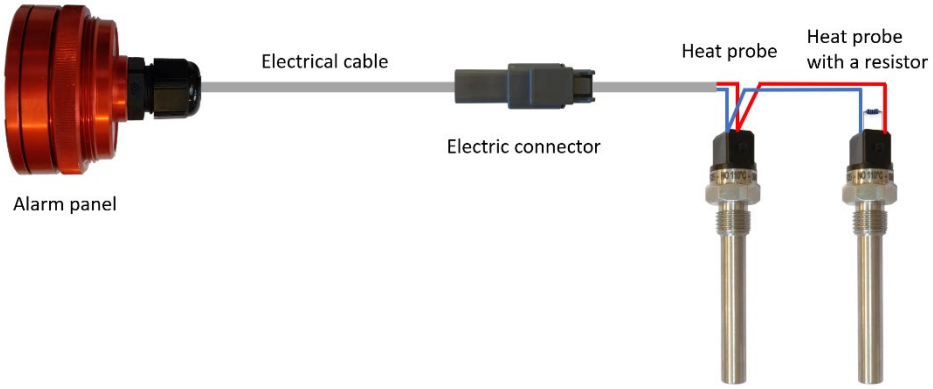


Parallel connection of two detectors to the alarm panel



Connection of a heat probe to the alarm panel

When installing two or more heat probes, they have to be connected in parallel. The furthest one requires a resistor AER101 installed. For specifications and connection details see manual HPD - HEAT PROBE DETECTOR.



Parallel connection of two heat probes to the alarm panel

Table 31: Standard BlazeWire kits

Part №	Content
KABW185-005	5 metres 185 °C BlazeWire, 3x Electrical Splice connector AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001, P-clamp APC014, 20x Cable Ties ACT314 and 2x label ALA018
KABW185-010	10 metres 185 °C BlazeWire, 3x Electrical Splice connector AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001, P-clamp APC014, 40x Cable Ties ACT314 and 4x label ALA018
KABW185-015	15 metres 185 °C BlazeWire, 3x Electrical Splice connector AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001, P-clamp APC014, 60x Cable Ties ACT314 and 6x label ALA018
KABW185-020	20 metres 185 °C BlazeWire, 3x Electrical Splice connector AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001, P-clamp APC014, 80x Cable Ties ACT314 and 8x label ALA018
KABW105-005	5 metres 105 °C BlazeWire, 3x Electrical Splice connector AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001, P-clamp APC014, 20x Cable Ties ACT314 and 2x label ALA018
KABW105-010	10 metres 105 °C BlazeWire, 3x Electrical Splice connector AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001, P-clamp APC014, 40x Cable Ties ACT314 and 4x label ALA018
KABW105-015	15 metres 105 °C BlazeWire, 3x Electrical Splice connector AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001, P-clamp APC014, 60x Cable Ties ACT314 and 6x label ALA018
KABW105-020	20 metres 105 °C BlazeWire, 3x Electrical Splice connector AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001, P-clamp APC014, 80x Cable Ties ACT314 and 8x label ALA018

Table 32: Heavy duty BlazeWire kits

Part №	Content
KABW185-005-HD	5 metres 185 °C BlazeWire, 3x Electrical Splice connectors AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001 with P-clamp APC014, 10x silicone grommets AGBW003 with P-clamps APC020 and 2x label ALA018
KABW185-010-HD	10 metres 185 °C BlazeWire, 3x Electrical Splice connectors AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001 with P-clamp APC014, 20x silicone grommets AGBW003 with P-clamps APC020 and 4x label ALA018
KABW185-015-HD	15 metres 185 °C BlazeWire, 3x Electrical Splice connectors AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001 with P-clamp APC014, 30x silicone grommets AGBW003 with P-clamps APC020 and 6x label ALA018
KABW185-020-HD	20 metres 185 °C BlazeWire, 3x Electrical Splice connectors AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001 with P-clamp APC014, 40x silicone grommets AGBW003 with P-clamps APC020 and 8x label ALA018
KABW105-005-HD	5 metres 105 °C BlazeWire, 3x Electrical Splice connectors AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001 with P-clamp APC014, 10x silicone grommets AGBW003 with P-clamps APC020 and 2x label ALA018
KABW105-010-HD	10 metres 105 °C BlazeWire, 3x Electrical Splice connectors AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001 with P-clamp APC014, 20x silicone grommets AGBW003 with P-clamps APC020 and 4x label ALA018
KABW105-015-HD	15 metres 105 °C BlazeWire, 3x Electrical Splice connectors AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001 with P-clamp APC014, 30x silicone grommets AGBW003 with P-clamps APC020 and 6x label ALA018
KABW105-020-HD	20 metres 105 °C BlazeWire, 3x Electrical Splice connectors AES3550-2, 3x Heat Shrink AHS001, End-of-line Resistor AER001 with P-clamp APC014, 40x silicone grommets AGBW003 with P-clamps APC020 and 8x label ALA018

BlazeWire Standard Kit

BlazeWire Heavy Duty Kit

4.8 FASTENING MATERIAL

Linear parts of The BlazeCut system (BlazeTube detection, hoses, tubes, cables, LHD BlazeWire) must be tightly fastened and secured against movement. Use enclosed connecting material if necessary. It is possible to use other suitable fastening systems if they provide secure mounting of the components and are suitable for the environment (high temperatures etc.). Avoid damaging the components when fastening. Follow the instructions in this manual when fastening.

4.8.1 P-CLAMPS AND FASTENERS

BlazeCut system kits are supplied with various P-clamps suitable for firm fastening of the BlazeCut components.

Table 33: P-clamps

Part №	Description	Material
APC006	6 mm – suits 6 mm BlazeTube detection	galvanized steel, rubber insert
APC008	8 mm – suits LOP hose G1/4" ALH050-G14 - ALH500-G14	galvanized steel, rubber insert
APC010	10 mm – suits spiral ABTS006 and 1/4” Red Fire Hose ARFH04	galvanized steel, rubber insert
APC012	12 mm – suits all BlazeTube push-in connectors and 1/4” Red Fire Hose ARFH04 sleeve with fitting	galvanized steel, rubber insert
APC014	14 mm – suits end of line plug FBT1P6, end-of-line resistor AER001, end-of-line adapters AEA006	galvanized steel, rubber insert
APC016	16 mm – crimped sleeve LOP hose G1/4" ALH050-G14 - ALH500-G14	galvanized steel, rubber insert
APC018	18 mm – suits feed hose crimped sleeve AFH050-M22 - AFH500-M22, 1/2” Red Fire Hose ARFH08	galvanized steel, rubber insert
APC020	20 mm – suits 1/2” Red Fire Hose ARFH08 sleeve with fitting, grommets	stainless steel, PVC cover

Table 34: Through panel fasteners

Part №	Description	Material
ACG112	cable gland with locknut, for detection tube, 12 mm steel tube and electrical cable, 18.5 mm hole for mounting	polyamide

P-clamp APC006 - APC018

P-clamp APC020

Cable gland ACG112

4.8.2 PROTECTIVE SPIRALS AND BRAIDS FOR THE BLAZETUBE DETECTION

In case of installation in the engine compartment or other enclosures with increased risk of mechanical damage the BlazeTube detection must be installed in the protective spiral or braid. Slot the BlazeTube detection into the protective spiral or braid before installation.

Do not use the protective braid on the BlazeTube detection in the main fire risk area as it could affect activation time of the BlazeTube detection.

IMPORTANT!

Always ensure the cut ends of spiral do not turn inward towards the BlazeTube, this will avoid scratches and damage to the BlazeTube.

Table 35: Types of protective spirals and braids

Part №	Description	Material	Length
ABTS006-005	protective spiral for Ø 6 mm BlazeTube detection	stainless steel	5 m
ABTS006-010	protective spiral for Ø 6 mm BlazeTube detection	stainless steel	10 m
ABTB006-005	protective braid for Ø 6 mm and Ø 8 mm BlazeTube, from -55 °C to 180 °C	polyamide	5 m
ABTB006-010		polyamide	10 m

Table 36: Protective spiral kits

Part №	Description
KABTS006-005	for Ø 6 mm BlazeTube, 5 metres protective spiral ABTS006, 10 P-clamps APC010
KABTS006-010	for Ø 6 mm BlazeTube, 10 metres protective spiral ABTS006, 20 P-clamps APC010

Protective spiral

Protective spiral with BlazeTube

Protective spiral kit

Protective braid

4.8.3 BLAZEWIRE AND BLAZETUBE GROMMETS

For installation of the BlazeWire and BlazeTube (ABT170 only) in harsh environments use silicone grommets and plastic-coated P-clamps APC020. Maximum recommended distance between the clamps is 500 mm. When ordering the heavy duty BlazeWire and BlazeTube kits, the clamps and silicone grommets are included.

Table 37: Types of grommets

Part №	Description	Material
AGBW003	3 mm hole – suits BlazeWire	silicone
AGBT005	5 mm hole – suits BlazeTube	silicone

ABW185 BlazeWire in the P-clamp APC020 and grommet AGBW003

ABT170 BlazeTube in the P-clamp APC020 and grommet AGBT005

Table 38: Tube clamps

Part №	Description
ATC015	Ø 12 - 16 mm – suits Ø 12 steel tubes
ASC236	block clamp polyamide, zinc plated, 12 mm – suits Ø 12mm tube
ASC264-SS	block clamp polyamide, stainless steel with bolting flaps, 12 mm – suits Ø 12 mm tube

Tube clamp ATC015

Block clamp ASC236

Block clamp ASC264-SS

Two lengths of high temp cable ties are available for fastening of cables and BlazeTube in fixed installations.

Table 39: Cable ties

Part №	Description
ACT314	heat resistance up to +125°C, 3.6 x 140 mm, black colour
ACT528	heat resistance up to +125°C, 5 x 280 mm, black colour

Never use cable ties for installation of BlazeTube in engine compartment or other installations with high ambient temperature. Always use suitable P-clamps.

4.9 LABELS

Various high-quality UV stabilized labels are supplied with the BlazeCut system to ensure that the operator or people that may come in contact with the system are informed about its presence and operation. All labels can be reordered separately when replacement is required due to damage.

Table 40: Notification labels

Part №	Description	Comment
ALA001	General Warning 150 x 100 mm	To notify there is a fire suppression system.
ALA002	"Shutdown Equipment" 100 x 70 mm	Label placed in the cabin near the alarm panel to notify the operator about delay time set to shut down equipment. Includes peel-off numbers that are placed on label in accordance with delay time set on the panel.
ALA003	"Delay discharge" 100 x 70 mm	Label placed in the protected area to notify the operator or personnel about delay time set to discharge the system. Includes peel-off numbers that are placed on label in accordance with delay time set on the panel.
ALA004	"In the event of a fire" 100 x 70 mm	Vehicle system label placed in the cabin to notify the operator about procedure in the event of a fire.
ALA005	"In the event of a fire" 100 x 70 mm	system label (fixed installation) placed in the protected area to notify the operator or personnel about procedure in the event of a fire.
ALA006	"Actuation arrow" 200 x 90 mm	Reflective label to highlight location of remote manual actuator.
ALA007	"Manual Actuator" 100 x 70 mm	Label placed next to remote actuators to notify the operator or personnel how to manually actuate the system in the event of a fire.
ALA018	"Caution fire detection" 135 x 25 mm	Label for BlazeTube and BlazeWire
ALA019	"Fire alarm" Ø 53 mm	Label for Buzzer fire alarm
ABS110	"BlazeCut" 110 x 68 mm	promotional sticker
ABS220	"BlazeCut" 220 x 135 mm	promotional sticker
ABS300	"BlazeCut" 300 x 110 mm	promotional sticker AFSS

General warning label ALA001

ALA002

ALA003

ALA004

ALA005

ALA006

ALA007

ALA018

ALA019

ABS110 and ABS220

ABS300

Table 41: Labels for cylinders

Part №	Agent	Cylinder size
ALA027	Antifreeze foam	5.0 L, 7.8 L
ALA028	Antifreeze foam	13 L, 16 L, 32 L
ALA033	Standard foam	5.0 L, 7.8 L
ALA034	Standard foam	13 L, 16 L, 32 L

Cylinder labels identifying type of extinguishing agent and basic information and instructions about the system

5 DEFINITION OF LEGAL REQUIREMENTS

BlazeCut system – cylinder, valve and BlazeTube detection form a pressure configuration. It forms a system that is under constant pressure, after the system is installed. Installation of the pressure configuration of the system, its activation and inspection, maintenance and operation is governed by specific legislation and these activities may only be performed by persons with relevant professional qualification subject to applicable legislation. Activation and operation of the equipment under pressure is also governed by specific legislation and professional inspections and tests.

Always observe local legislation and statutory requirements.

6 INFORMATION ON EXTINGUISHING AGENT USED

System BlazeCut uses water based extinguishing agents with additives creating foam during application. Based on type of application three types of extinguishing agents are used:

- Water with 6 % concentrate, with minimum operation temperature 0 °C,
- Special antifreeze pre-mix with low freezing point, with minimum operation temperature -30 °C. The antifreeze pre-mix is ready to use and no dilution is needed,
- Fluorine-free foam, with minimum operation temperature 0 °C

6.1 DESCRIPTION

The fire suppression is based on the cooling effect of water in combination with smothering effect of the foam created. During application the focal point of combustion is cooled off by the foam, the heat i.e., the combustion energy is extracted, and the fire is suppressed. The foam thus created prevents the air from entering the fire whereby fostering the fire suppression and preventing re-ignition of the fire.

Foam concentrate does not contain dangerous materials, is not toxic or poisonous, it does not have carcinogenic or mutagenic effects and is environmentally friendly.

Detail information about the extinguishing agent, features, risks and first aid measures are described in material safety data sheet.

6.1.1 MAIN FEATURES

- environmentally formulated
- non-toxic
- non hazardous
- exceptional cooling effect
- 98 % organic compounds
- contains no PFOA or PFOS
- zero hazardous chemicals
- fully biodegradable

6.2 PERMISSIBLE USES OF EXTINGUISHING AGENTS

Standard foam and antifreeze pre-mix can be used for the following classes of fire:

Class A – flammable combustibles (creating flames)

Class B

flammable liquids

Class F

cooking oils and fats

Always consult suitability of use of the system and type of extinguishing agent in specific conditions with the supplier.

6.3 IMPROPER USES OF EXTINGUISHING AGENT

Extinguishing agent is not suitable for fire extinguishing of:

- alkali metals, alkaline earth metals and metals in powder form (e.g., sodium, magnesium, aluminium, zinc, lithium etc.). The metals are not normally found in these forms. If the metals are found in compact, commonly used form the use of system BlazeCut is not limited;
- gaseous substances;
- electrical equipment under voltage;
- devices sensitive to water (electronic devices, substances and equipment which are discarded by water etc.).

6.4 WARNINGS

During the system activation the extinguishing agent emerges from nozzles under high pressure. It is recommended that the automatic activation function of the system is isolated when working in the protected area.

No permanent workplace should be placed within the area covered by the system. The system should not be installed allowing the extinguishing agent being discharged onto the people. Fire extinguishing foam can irritate the eyes, skin and throat and should be washed off skin as soon as possible.

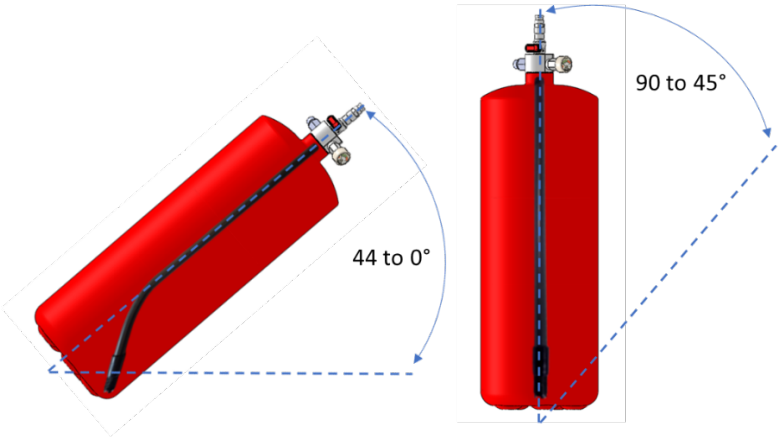
For installation, inspection, maintenance and repair of the system always use eye protection – wear appropriate protective glasses with side-shields and appropriate protective impervious working gloves.

7 INSTRUCTIONS FOR INSTALLATION OF THE SYSTEM

7.1 INSTALLATION AND PLACEMENT OF THE CYLINDER

In order to release the extinguishing agent by pressure, there is a dip tube in the cylinder. This is why the cylinder is recommended to be installed in vertical position. If the cylinder is leaning, the extinguishing agent may not be fully released, the greater the mounted angle of the cylinder the higher risk of the agent not discharging entirely. Maximum recommended tilt of the cylinder is 45° from vertical axis.

If the installation of the cylinder cannot be in the recommended position due to the design of the protected equipment, a customised dip tube may be the solution and supplied at the time of filling the system by the manufacturer.



All cylinders mounted between an angle of 45° to 90° (vertical) can have a straight dip tube that is supplied as standard from the factory. However, any angle between 44° and 0° (a full horizontal position) will require an angled dip tube fitted at the factory and this will ensure the overall performance of the system will be maintained. Please contact BlazeCut technical support if your cylinder requires an angled dip tube.

The cylinder should be placed as close to the protected area as possible, so that the length of the agent distribution network and detection lines can be as short as possible. If the cylinder is placed directly into the protected area, the cylinder should be protected from elevated temperatures or potential damage if necessary.

The cylinder should be placed so that the cylinder label is visible and the current pressure can be read on the pressure gauge and be readily accessible to allow future servicing or inspection.

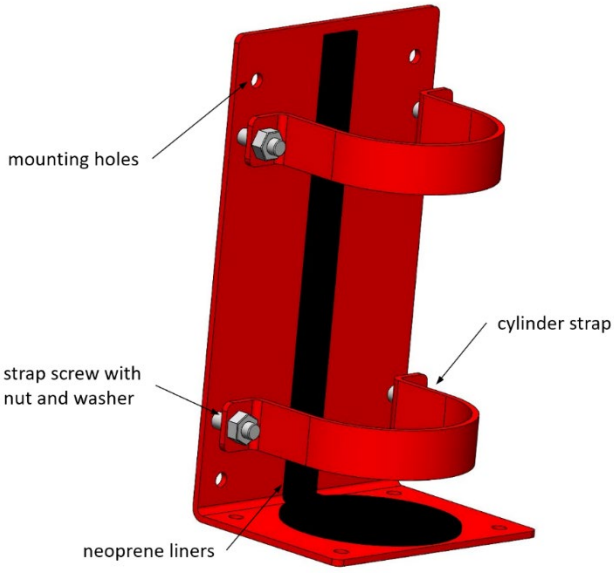
Only install undamaged cylinders that are properly labelled and with the correct mounted cylinder valve. The cylinder is supplied pressurised to required pressure at the time of filling. The current pressure can be determined by reading the value on the pressure gauge, which is mounted on the cylinder valve when the system is supplied.

Do not install the cylinder, if the pressure is significantly different from values stated on the cylinder label or stated in this manual.

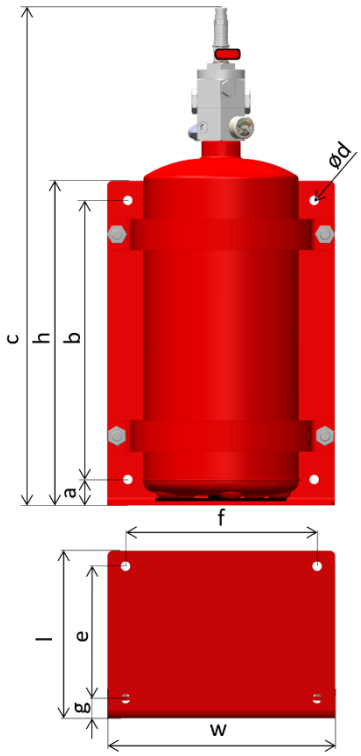
Carefully select a firm and secure part of the equipment to install the cylinder bracket using appropriate fasteners. If necessary, fabricate additional support to mount the cylinder. The cylinder must be properly fastened in the bracket using the bracket straps supplied. Once installed ensure all fastenings are firm and have no risk of loosening.

When installed in a vehicle, if the cylinder is situated in a horizontal position the valve must not be situated in a driving direction. Situate the bracket of the cylinder in a position so the cylinder will not eject from the bracket during a crash.

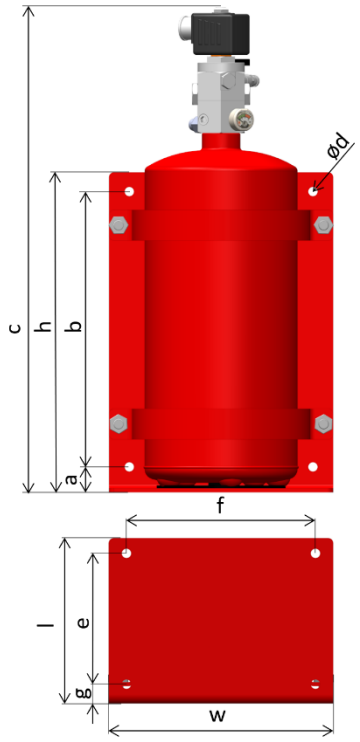
BlazeCut fire suppression systems are supplied with heavy duty brackets for mobile equipment, vehicles or other harsh environment applications.



Heavy-duty bracket



Cylinder with 20x valve in a heavy-duty bracket



Cylinder with 21x valve in a heavy-duty bracket

Table 42: Brackets

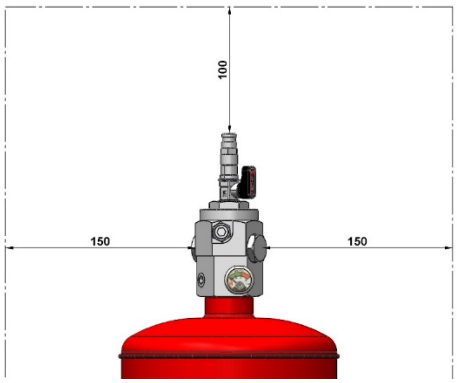
Part №	l × w × h [mm]	a [mm]	b [mm]	Ø d [mm]	e [mm]	f [mm]	g [mm]	Material	Colour	Operating temperature
ACB124	122×165×294	23	242	9	83	130	22	powder coated steel	red RAL3000	-40 to +80 °C
ACB150	162×220×314	25	270	9	123	180	22			
ACB113	182×250×504	30	445	9	143	210	22			

Table 43: Cylinder assembly dimensions and weights (cylinder with valve fitted in a bracket)

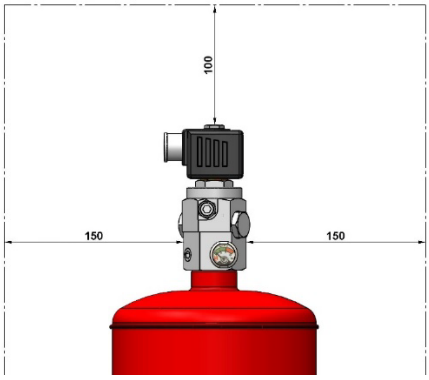
Cylinder volume [L]	Bracket	Valve type	Total height c [mm]	Total weight [kg]*
5.0	ACB150	201, 202, 203	483	7.43
		207	437	7.44
		211, 212	479	7.72
7.8	ACB150	201, 202, 203	595	8.32
		207	549	8.33
		211, 212	591	8.72
13.0	ACB113	201, 202, 203	668	12.19
		207	622	12.25
		211, 212	664	12.53
16.0	ACB113	201, 202, 203	780	14.25
		207	734	14.25
		211, 212	776	14.53

*all weights do not include extinguishing agent.

When placing the cylinder, leave free area around the cylinder valve of minimum 150 mm on the sides and minimum 100 mm above the valve, to install other components of the system and perform maintenance of the system in future.



Example with the valve 201



Example with the valve 211

7.2 MULTIPLE CYLINDERS CONNECTION

The BlazeCut system can have multiple cylinders connected to each other to protect larger spaces.

The method of functioning and activation of the system are the same when multiple cylinders are connected simultaneously. The BlazeTube detection must be connected to all the cylinder valves so that when the pressure in it decreases, all the valve pistons on all the cylinders are opened simultaneously.

7.2.1 INSTALLATION

In case of simultaneous connection of multiple cylinders, the extinguishing agent in all cylinders must be the same and all cylinders must be under the same pressure before installation.

The amount of extinguishing agent in each cylinder is indicated on the label of each cylinder, the total amount of the extinguishing agent in the system kit is the sum of the quantities of extinguishing agent in individual cylinders. The cylinders are connected into one pressurized unit after installation of the system, the pressure in all cylinders at steady state is always equal.

When multiple cylinders are connected it is possible to combine systems. If an electronic detection or activation is required, the master cylinder valve will be a 21x series valve with solenoid and is connected to multiple 20x series valves. If a pneumatic detection or activation is preferred, the master cylinder valve will be a 20x series valve, which is connected to multiple 20x series valves. In order to simultaneously release the extinguishing agent, all the cylinders must connect to the master cylinder valve which is connected to one detection circuit.

Table 44:BlazeTube installation limits in single and multiple cylinders configurations

Number of cylinders	Valve type combinations	Maximum length of BlazeTube [m]
Single cylinder	20x	40
	211	40
	212	40
Multiple cylinders: Electronic actuation and BlazeTube in protected enclosure	211/212 + 20x	15
	211/212 + 20x + 20x	15
	211/212 + 20x + 20x + 20x	10
	211/212 + 20x + 20x + 20x + 20x	10
	211/212 + 20x + 20x + 20x + 20x + 211/212	10
Multiple cylinders: LOP actuation with BlazeTube in protected enclosure	20x + 20x	40
	20x + 20x + 20x	40 in a loop
	20x + 20x + 20x + 20x	40 in a loop
	20x + 20x + 20x + 20x + 20x	40 in a loop
	20x + 20x + 20x + 20x + 20x + 20x	40 in a loop

IMPORTANT!

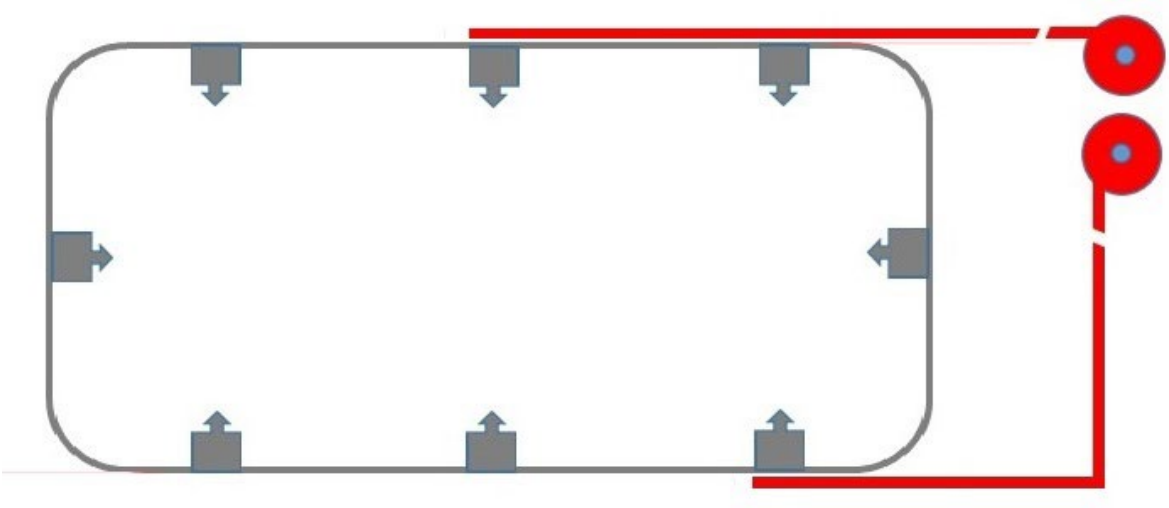
Maximum multiple cylinders configuration using the solenoid require two 211 or 212 series valves situated as first and last valve in the multiple cylinders configuration.

7.2.2 DISTRIBUTION NETWORK

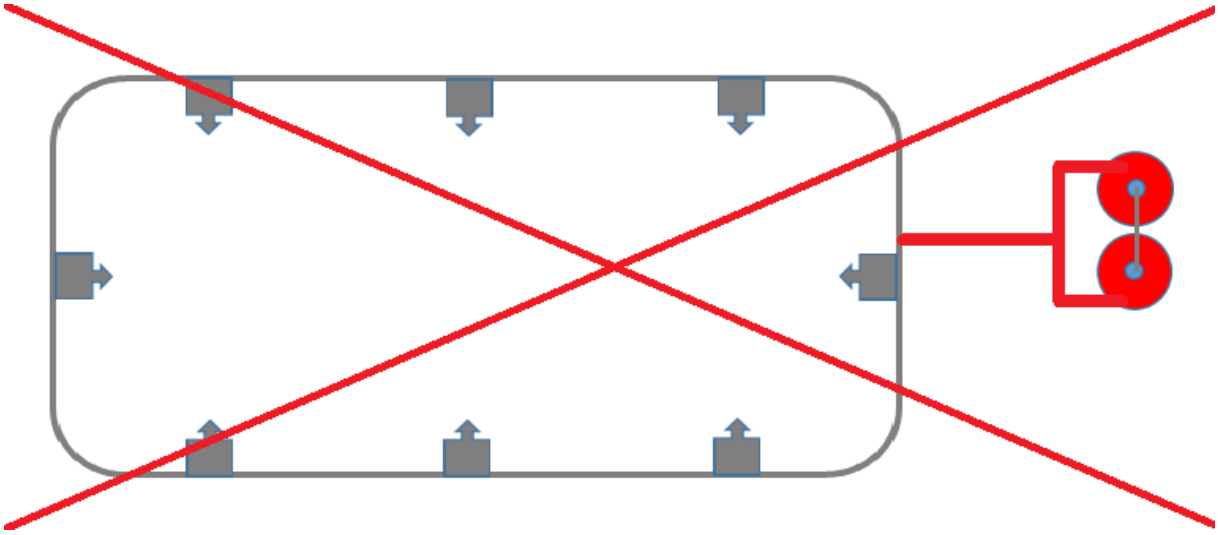
If multiple cylinders are connected, the distribution tubes must be connected to each cylinder by using at least one agent discharge outlet on each valve. In order to secure a fast discharge of the agent, it is necessary to use separate distribution networks from each cylinder.

Never connect distribution lines from several cylinders into one distribution circuit as this will restrict the flow rate, extend the discharge time and reduce the performance of the system.

In case of multiple cylinder connection, the cylinders must be placed on the same level and the tubes must be installed as symmetric as possible in order to prevent the extinguishing agent to extrusion from one cylinder to another and incomplete discharge of the extinguishing agent.



Recommended configuration of multiple cylinders connection



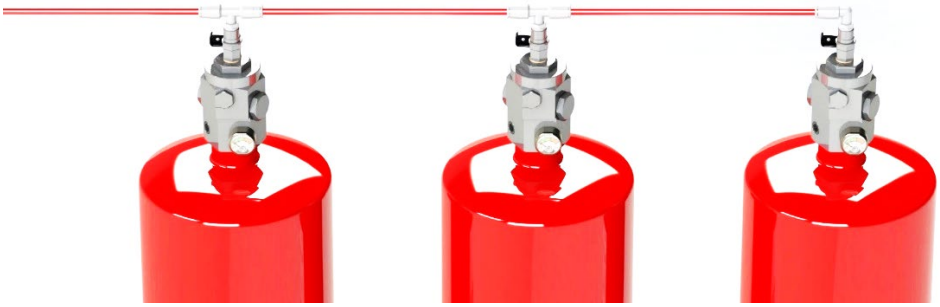
Not recommended configuration of multiple cylinders in joint distribution tubes

7.2.3 BLAZETUBE IN MULTIPLE CYLINDERS CONNECTION

BlazeTube connection in multiple cylinders is used:

- for a fire detection and also to connect the cylinders to secure simultaneous discharge of all cylinders,
- only to connect the cylinders to secure simultaneous discharge of all cylinders e.g., in installations using an electronic detection (BlazeWire, detector).

If the BlazeTube is used also for detection any part of this manual related to installation and pressurization of the BlazeTube detection applies also to multiple cylinder connection.



Multiple cylinders connection of two 203 and one 202 series valves with BlazeTube used for both detection and connection of the cylinders

In installations where the BlazeTube is used only to connect the valves, the BlazeTube is not pressurized through the end-of-line device but from the master cylinder. Once the BlazeTube is installed slowly open ball valves on all cylinders one by one, starting closest to the master cylinder. This is to pressurize the BlazeTube and connect all cylinders into one pressurized unit. Once pressurized the discharge plugs can be removed and the discharge lines can be connected.

Multiple cylinders connection of one 211 or 212, 203 and 202 series valves with BlazeTube used only for connection of the cylinders

NOTE:

When using BlazeTube for connection of valves make sure the length of BlazeTube is as symmetric as possible to secure simultaneous opening of all pistons in the cylinder valves.

7.2.4 PRESSURE MONITORING

Only one Pressure Switch APS001-xx or one Pressure Transducer ATA100 is required when having a multiple cylinder connection. The pressure device can connect to one of the valves after completing the installation and the cylinder valves are connected into one pressurized unit (see Chapter A2.2.1).

7.3 INSTALLATION OF DISTRIBUTION NETWORK

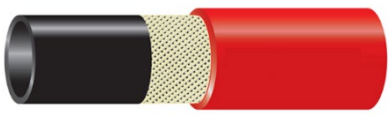
Use only original components in distribution networks. Do not extend the network with unoriginal components. Do not use unoriginal hoses, tubes, fittings and nozzles.

7.3.1 RED FIRE HOSES

Red Fire Hose is easy to assemble with straight or elbow reusable push-on couplings. Both size variants can be used as part of the agent distribution network combined with distribution tubes.

Table 45: Red Fire Hoses

Part №	Size	Inner diameter	Outside material	Inside material	Operating temperature	Length
ARFH08	1/2”	13 mm	NBR/PVC based	rubber with fibre braid reinforcement	-40 to 100 °C	per metre
ARFH04	1/4”	6 mm				



Cut of the Red Fire Hose

7.3.2 FEED HOSES

Feed hose is used as follows:

- from discharge outlet connector to first fitting connecting rigid tube in order to secure maximum flow rate and fast discharge;
- in between the nozzles if it is not possible to use a rigid tube due to obstructions in enclosure (depending on size of the system);

- in whole installation e.g., in vehicle applications (depending on size of the system).
- depending on type of installation, only one feed hose is used or if required two feed hoses from both discharge outlets can be used.

Table 46: Feed hoses

Part №	Length [cm]	Thread size	Material - outside	Operating temperature
AFH050-M22	50	M22x1.5	stainless steel wire braid	-40 to 230 °C
AFH075-M22	75			
AFH100-M22	100			
AFH200-M22	200			
AFH300-M22	300			
AFH400-M22	400			
AFH500-M22	500			

Feed hose

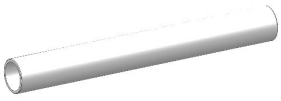
7.3.3 DISTRIBUTION TUBES

Steel tubes can be used in whole installation (fixed applications) or in part of installation where use of Red Fire Hoses is not possible e.g., due to high temperatures like in engine compartment above the turbo or exhaust manifold.

Table 47: Tubes

Part №	Outer diameter	Inner diameter	Length	Material
ATG012	12 mm	10 mm	1000 mm	galvanized steel
ATS012	12 mm	10 mm	1000 mm	stainless steel Type 341 (EN1.4541 grade)

ATG012



ATS012

NOTE:

The feed hoses and steel tubes use metric parallel thread fittings to connect between each other, so it is possible to combine hoses and tubes at any place using same fittings.

To achieve most effective use of BlazeCut system consult the type of hoses and tubes, method of creating the networks and their placement in the protected enclosure with the supplier of the system. In some cases, it may be necessary to add further components to the distribution networks (e.g., extension if the cylinder with extinguishing agent is located far from the protected enclosure). Consult specific cases with the supplier of the system.

To reduce the chance of contamination and an accidental discharge with the discharge circuit, the G 3/8“ valve plugs must remain mounted on the cylinder valve as supplied and only be removed after the detection circuit is connected and charged.

The distribution network includes all hoses, tubes and fittings installed, from the discharge port to the nozzles including. The network should be as short, straight and simple as possible to achieve sufficient pressure and maximum flow of the extinguishing agent through to the nozzles. Emptying the cylinder and achieving the required extinguishing concentration in the protected area should be as fast as possible. When designing the distribution hose/tubes it is appropriate to use as few connections and fittings as possible. Especially avoid using too many elbows in the distribution networks. Narrowing of the diameter in network is possible only in the direction of the flow of the extinguishing agent. If possible, the hoses and tubes should be as symmetric as possible.

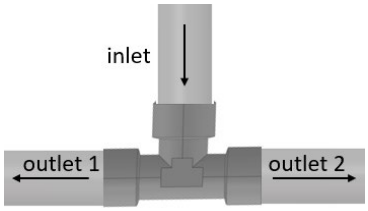
Other ways of streamlining the flow of extinguishing agent in the distribution hose/tubes, which can be used, if possible:

- When using two discharge lines, connect the ends to create a loop. This may increase the flow of extinguishing agent and accelerate the emptying of the cylinder.
- Avoid changes of direction of the distribution networks in the vicinity of the fittings within the distance of 20 times the internal diameter of the tubes. Keep this distance between the fittings.

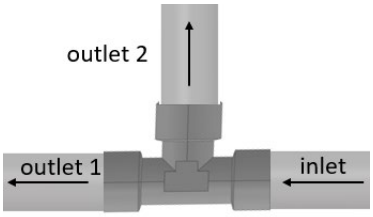
To ensure even distribution of the agent to both outlets in a Tee fitting, make sure that all the following conditions are met:

- inlet is perpendicular to both outlets, while both outlets lie in a horizontal plane
- at least minimum allowed distance between fittings is preserved
- both outlets are connected to the same diameter distribution hose or tube
- the distribution hoses or tubes are fitted with nozzles with equal flow rates
- bend tubes rather than use elbow fittings.

Not following these conditions can lead to significant disproportion of flow rates of over 50 %.



Example of connection with even distribution of agent



Example of connection with uneven distribution of agent

Acceptable ways of connections into a Tee

Table 48: Bending radius

Type of hose or tube	Minimum bending radius [mm]
Feed hose	85
Red Fire Hose 1/4”	45
Red Fire Hose 1/2”	80
galvanized/stainless steel tube 12 mm	25

Do not forcibly bend the hoses and tubes below the minimum bending radius . This can cause damage and reduce the performance of the system.

Place the hoses/tubes through appropriate parts of the protected enclosure and gradually clamp with appropriate fastening material (see Chapter 4.8). Proper mounting of the hoses/tubes prevents them from rubbing and vibrating ensuring durability of the installed system. When the system is activated and extinguishing agent released, the hoses/tubes are exposed to the forces of pressure and flow of extinguishing agent. During the activation of the fire system the hoses/tubes must not be displaced, as it may change the desired flow and direction of extinguishing agent from the nozzles.

Always place clamps next to fittings connecting nozzles to make sure they will hold firmly in place at time of discharging the extinguishing agent.

Table 49: Maximum fastening distance

Type of hose/tube	Maximum fastening distance [mm]
Feed hose	500
Red Fire Hose 1/4”	350
Red Fire Hose 1/2”	350
galvanized/stainless steel tube 12 mm	750

Fasten hoses also in place of bending. Properly fasten the hoses just before the ending with the nozzle to prevent change to the flow direction of the extinguishing agent. When using the tube, the maximum distance between the last fastening and nozzle must not be more than 100 mm.

7.3.4 FITTINGS

Fittings for steel tubes are supplied in two versions:

1. SET: includes rings and nuts – suitable when connecting ATG012 or ATS012 steel tubes
2. BODY: supplied without rings and nuts – suitable when connecting Red Fire Hose

Table 50: List of fittings for 12 mm tube (M18x1.5)

Part №	Picture	Description	Material
FTFTN12U18		Tube nut for 12 mm compressing ring M18x1.5 thread	galvanised steel
FTFCR12		Tube compressing ring	galvanised steel
FTF3MUM181818		Tube fitting Tee with rotary nut to nozzle connector 12 mm (M18x1.5) - BODY	galvanised steel
FTF3MUM181818-SET		Tube fitting Tee with rotary nut to nozzle connector 12 mm (M18x1.5) - SET (with rings and nuts)	galvanised steel

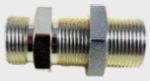
FTF3MMU181818		Tube fitting Tee with rotary nut to distribution hose 12mm (M18x1.5) - BODY	galvanised steel
FTF3MMU181818-SET		Tube fitting Tee with rotary nut to distribution hose 12mm (M18x1.5) - SET	galvanised steel
FTF2MU1818		Tube fitting Elbow with rotary nut to nozzle connector 12mm (M18x1.5) - BODY	galvanised steel
FTF2MU1818-SET		Tube fitting Elbow with rotary nut to nozzle connector 12mm (M18x1.5) - SET	galvanised steel
FTF3MMM181818		Tube fitting Tee equal 12mm, M18x1.5 - BODY	galvanised steel
FTF3MMM181818-SET		Tube fitting Tee equal 12mm, M18x1.5 - SET	galvanised steel
FTF2MM1818		Tube fitting elbow equal, M18x1.5 – BODY, male-male suits Ø 12 mm tube	galvanised steel
FTF2MM1818-SET		Tube fitting elbow equal, M18x1.5 – SET (with rings and nuts), male-male suits Ø 12 mm tube	galvanised steel
FTF1MM1818		Tube fitting straight coupling, M18x1.5 - BODY, male-male suits Ø 12 mm tube	galvanised steel
FTF1MM1818-SET		Tube fitting straight coupling, M18x1.5 - SET, male-male suits 12 mm tube	galvanised steel
FBH1MM1818		Tube fitting Bulkhead 12mm (M18x1.5) - BODY	galvanised steel
FBH1MM1818-SET		Tube fitting Bulkhead 12mm (M18x1.5) - SET	galvanised steel

Table 51: List of fittings for Red Fire Hose

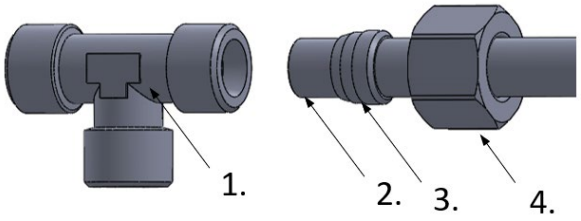
Part №	Picture	Description	Material
FRC1BM0818		Reduced coupling fitting G1/2" - M18x1.5 - BODY, male-male	galvanised steel
FRC1BM0818-SET		Reduced coupling fitting G1/2" - M18x1.5 – SET (with ring and nut), male-male	galvanised steel
FHF1CR0808		Hose push on fitting straight female swivel, G1/2" to suit 1/2" RFH hose	galvanized steel

FHF2CR0808		Hose push on fitting elbow female swivel, G1/2" to suit 1/2" RFH hose	galvanized steel
FHF3BBB080808		Hose fitting equal Tee G1/2”, male-male-male	galvanised steel
FHF3BCB080808		Hose fitting swivel nut Tee G1/2", male-male-female	galvanised steel
FHF3BBC080808		Hose fitting swivel nut side tee G1/2", male-male-female	galvanised steel
FHF2BC0808		Hose fitting swivel nut elbow G1/2", male-female	galvanized steel
FHF4BC0808		Hose fitting swivel nut 45°elbow G1/2", male-female	galvanized steel
FHF1BB0808		Hose fitting straight coupling G1/2", male-male	galvanized steel
FBH1BB0808		Bulkhead fitting straight G1/2”, male-male	galvanized steel
FRC1BB0804		Reduced coupling fitting G1/2" - G1/4", male-male	galvanized steel
FHF1CR0404		Hose push on fitting straight female swivel, G1/4" to suit 1/4" RFH hose	galvanized steel
FHF2CR0404		Hose push on fitting elbow female swivel, G1/4" to suit 1/4" RFH hose	galvanized steel
FHF3BCB040404		Hose fitting swivel nut Tee G1/4", male-female-male	galvanized steel
FHF2BC0404		Hose fitting swivel nut elbow G1/4", male-female	galvanized steel
FHF1BB0404		Hose fitting straight coupling G1/4", male-male	galvanized steel
FBH1BB0404		Bulkhead fitting straight G1/4”, male-male	galvanized steel
FRC1BC0408		Hose fitting reduced coupling Swivel Nut Elbow G1/4" - G1/2", male-female	galvanized steel

FRC1CB0808		Hose fitting G1/2" - G1/2" Male-Female; custom with longer outer thread	galvanized steel
FHF3CCC080808		Hose fitting swivel nut tee G1/2", Female-Female-Female, galvanized steel	galvanized steel
FRC1CB0408		Hose fitting reduced coupling straight G1/4" - G1/2", female-male	galvanized steel

Table 52: List of nozzle fittings for 12 mm tube

Part №	Picture	Description	Material
FNF1MB1804		Nozzle connector 12 mm (M18x1.5) x G1/4" - BODY	galvanized steel
FNF1MB1804-SET		Nozzle connector 12 mm (M18x1.5) x G1/4" - SET	galvanized steel
FNF1MC1804		Nozzle connector for ANF060 and ANF120 12 mm (M18x1.5) x G1/4" - BODY	galvanized steel
FNF1MC1804-SET		Nozzle connector for ANF060 and ANF120 12 mm (M18x1.5) x G1/4" - SET	galvanized steel



Connection of steel tube to a fitting

1. Tube Tee fitting FTF3MMM181818
2. Tube ATG012 or ATS012
3. Tube compressing ring fitting FTFCR12
4. Tube compressing nut fitting FTFTN12U18

The Red Fire Hose is connected by the use of push on fittings.

3. Measure and cut the hose using a hose cutter or a sharp knife.
4. When inserting the fitting into the hose use a light coating of soapy water or a light oil.
5. Place the fitting inside the hose. You will need to grip the hose approximately 25-50 mm (1-2 inches) from the end with the fitting inserted.
6. Press the push on fitting against a hard surface, or use a vice while holding the hose, until fully inserted and pushing hard against the red cap.

NOTE:

Once assembled the hose and push on fittings are rated to very high pressures. There is no need to use additional hose clamps or cable ties to further secure the hose fitting.

7.3.5 NOZZLES

Plan ahead where to place the extinguishing nozzles. The nozzles on the distribution networks must be placed inside the protected enclosure and be above the riskiest places of the enclosure.
For maximum efficiency and protection, do not place the nozzles of the system behind barriers that could restrict or reduce the fire suppression effect of the system by preventing direct penetration of extinguishing agent into the protected enclosure and forming desired coverage.
The distribution networks must always be ended by a nozzle. There may not be any free outlets in the distribution network e.g., connectors without nozzles.

Table 53: Specification of nozzles

Part №	Thread size	Spray angle	Orifice size	Material
ANF120	G1/4"	120°	2.6 mm	stainless steel
ANF060	G1/4"	60°	2.6 mm	

ANF120

ANF060

7.3.6 NOZZLE DUST CAPS

Nozzle dust caps are flexible protection caps that stop the ingress of unwanted debris or environmental contaminants. All nozzles must be protected with a supplied silicone caps to prevent dirt penetrating the nozzle. The nozzles have a special groove to hold the cap firmly on place but also ensure secure and fast ejection when the agent is discharged.

Table 54: Nozzle dust cap

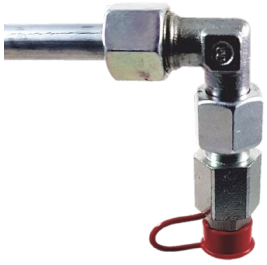
Part №	Length	Operating Temperature	Inside diameter	Material
ANC001	75 mm	-40 to +180 °C	13 mm	thermoplastic elastomer

Nozzle cap ANC001

Nozzle with fitted dust cap

Nozzles can be installed directly to fitting using Tee or Elbow fittings with rotary nut or through the tube extension. See below figures.

Nozzle connection through Elbow equal and tube extension



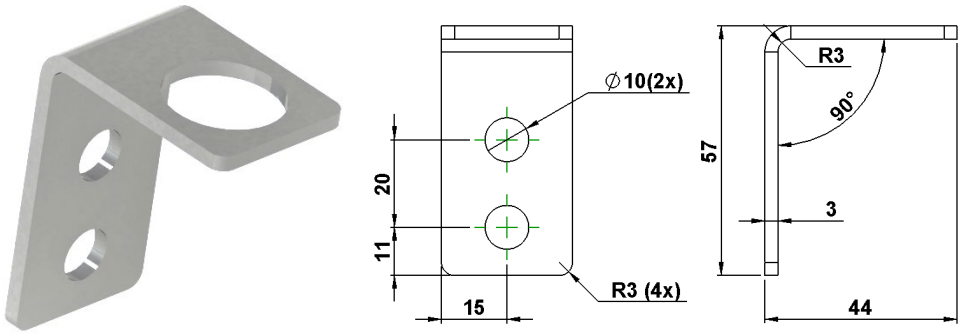
Direct nozzle connection on Elbow with rotary nut

NOTE:

Favour nozzle connection through Elbow fitting and tube extension. Use of Elbow with a rotary nut will reduce agent flow, as it has a smaller internal diameter.

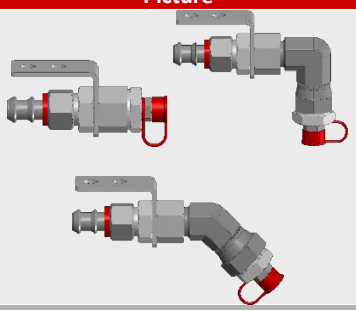
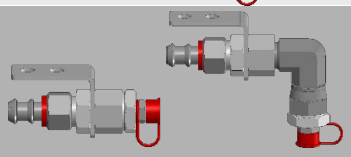
Table 55: Nozzle bracket

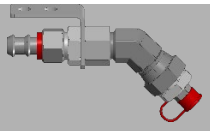
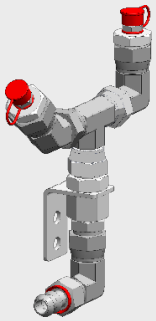
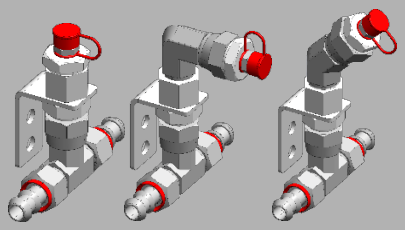
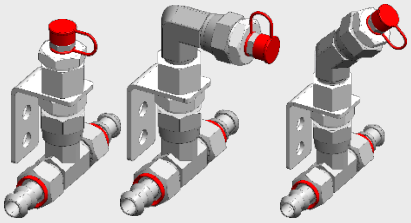
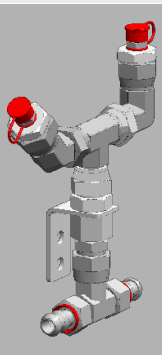
Part №	Assembly hole	Description	Material
ANB001	22 mm	for firm fixing of nozzle assembly or other components (remote actuator, EOL adapter)	stainless steel



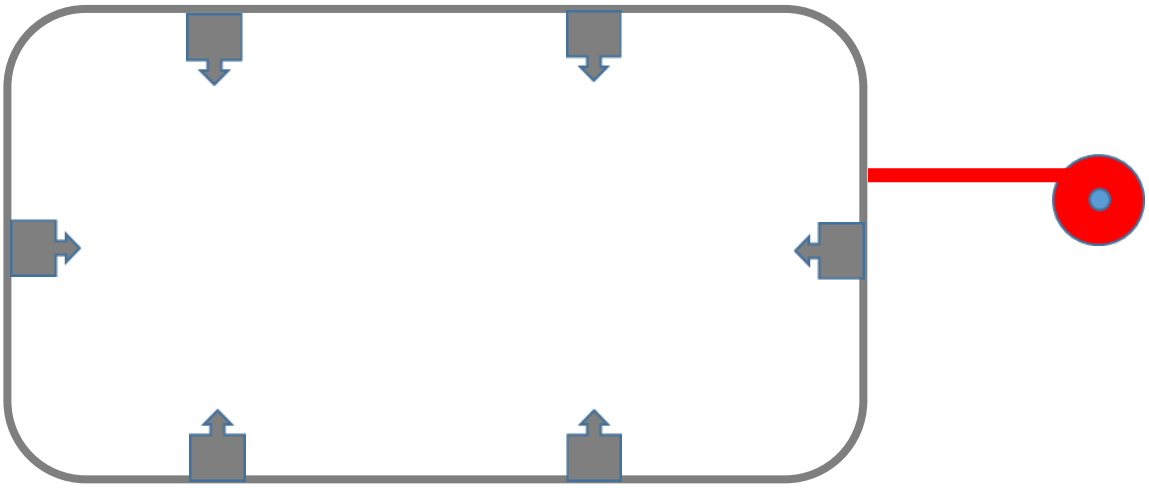
Nozzle bracket ANB001 dimensions

Table 56: Nozzle assemblies for mobile applications

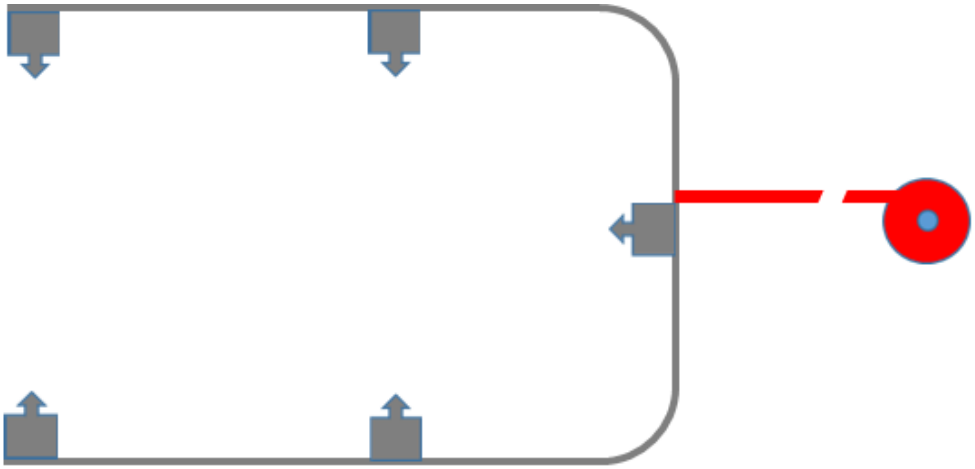
Part №	Picture	Description	Components
KNAF11-060		Nozzle Kit Assembly Foam 60° angle G1/4" Nozzle - End Of Line Type	1x FHF1CR0808 1x FRC1CB0808 1x FRC1CB0408 1x FHF2BC0808 1x FHF4BC0808 1x ANF060 1x ANC001 1x ANB001 1x AWR001
KNAF11-120		Nozzle Kit Assembly Foam 120° angle G1/4" Nozzle - End Of Line Type	1x FHF1CR0808 1x FRC1CB0808 1x FRC1CB0408 1x FHF2BC0808 1x FHF4BC0808 1x ANF120

			1x ANC001 1x ANB001 1x AWR001
KNAF12-120		Nozzle Kit Assembly Foam 2x 120° angle G1/4" Nozzle - End Of Line Type	1x FHF1CR0808 1x FHF3BCB080808 1x FHF1BB0808 2x FRC1CB0408 1x FRC1CB0808 1x FHF3CCC080808 2x FHF2BC0808 1x FHF4BC0808 2x ANF120 2x ANC001 1x ANB001 1x AWR001
KNAF21-060		Nozzle Kit Assembly Foam 60° angle G1/4" Nozzle - T fitting In Line Type	2x FHF1CR0808 1x FRC1CB0808 1x FRC1CB0408 1x FHF3BCB080808 1x FHF2BC0808 1x FHF4BC0808 1x ANF060 1x ANC001 1x ANB001 1x AWR001
KNAF21-120		Nozzle Kit Assembly Foam 120° angle G1/4" Nozzle - T fitting In Line Type	2x FHF1CR0808 1x FRC1CB0808 1x FRC1CB0408 1x FHF3BCB080808 1x FHF2BC0808 1x FHF4BC0808 1x ANF120 1x ANC001 1x ANB001 1x AWR001
KNAF22-120		Nozzle Kit Assembly Foam 2x 120° angle G1/4" Nozzle - T fitting In Line Type	2x FHF1CR0808 1x FHF1BB0808 2x FRC1CB0408 1x FRC1CB0808 1x FHF3CCC080808 1x FHF3BCB080808 1x FHF2BC0808 1x FHF4BC0808 2x ANF120 2x ANC001 1x ANB001 1x AWR001

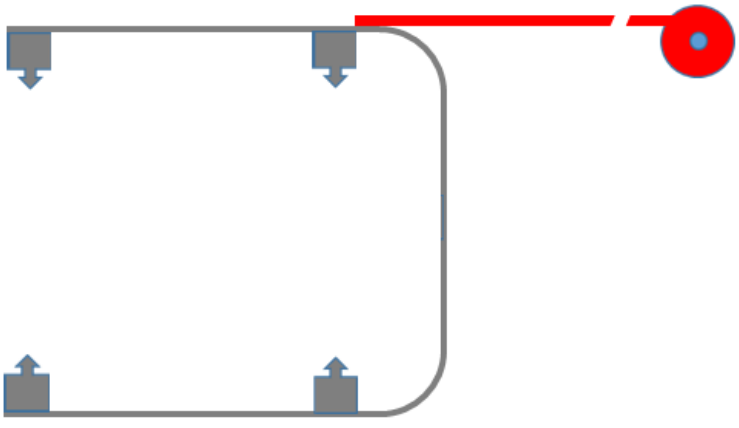
7.3.7 STANDARD NOZZLE DESIGNS



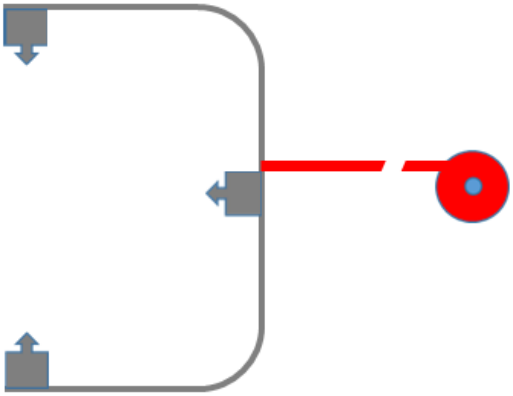
6-nozzle layout



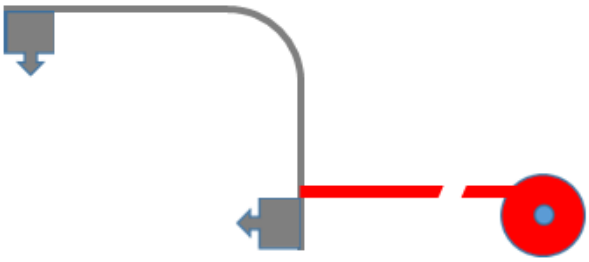
5-nozzle layout



4-nozzle layout



3-nozzle layout



2-nozzle layout

7.4 INSTALLATION OF THE BLAZETUBE DETECTION

Table 57: Tool charging kit

Model	Included components
KATC001	1 x adjustable regulation valve (Standard W 24,32x1/14") 1 x Charging adapter ATC001 2 m BlazeTube, 6 mm 1 x BlazeTube cutter ATC002

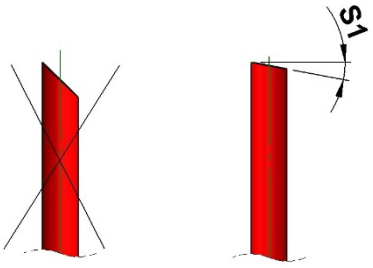
Tool charging kit KATC001

The efficiency of BlazeCut system significantly depends on correct placement of the BlazeTube detection. Follow the instructions below. The BlazeTube must be placed so that it is disrupted as soon as the fire starts before damaging other components of BlazeCut system and before the fire spreads outside of the protected enclosure.

BlazeCut system uses quick slotting system of mounting BlazeTube detections in connectors with double seal to prevent leak of extinguishing agent and of pressure. Use only the connectors supplied with the system. Ends of

the BlazeTube detection must be properly adjusted. End of the BlazeTube detection must be straight before inserting, without cuttings and notches to avoid damaging the seals in the connectors.

To cut the BlazeTube detection use special cutter ATC002 included in the Tool charging kit KATC001.

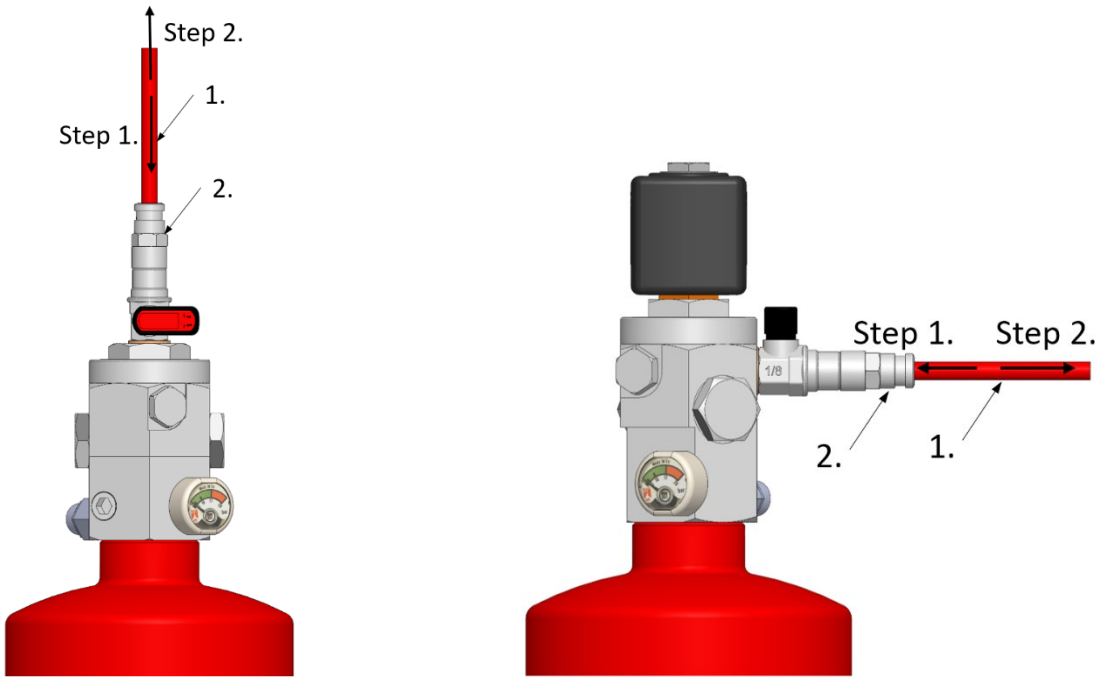


Example of incorrect (left) and correct (right) BlazeTube end cuts

BlazeTube cutter ATC002

Step 1. Cut the BlazeTube detection straight, maximum degree of chamfer is 5°

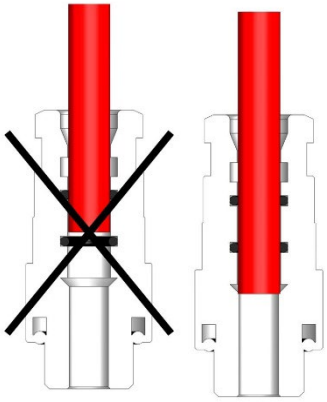
Fasten the BlazeTube detection firmly so that it is slotted into the BlazeTube outlet connector and pushed all the way by hand. After slotting always check if the BlazeTube is firmly fastened by gently pulling it. Do not open the ball valve on the BlazeTube outlet connector yet.



Scheme of connecting the BlazeTube detection to the fittings on the cylinder valve (example: valve 201 on the left, valve 211-30 on the right)

1. BlazeTube Detection
2. BlazeTube Detection outlet connector FBT1BP026
   Step 1. Slot the BlazeTube detection firmly into the connector all the way
   Step 2. Pull the BlazeTube detection slightly and make sure that it is firmly fastened

Always slot the BlazeTube detection to the outlet all the way in.

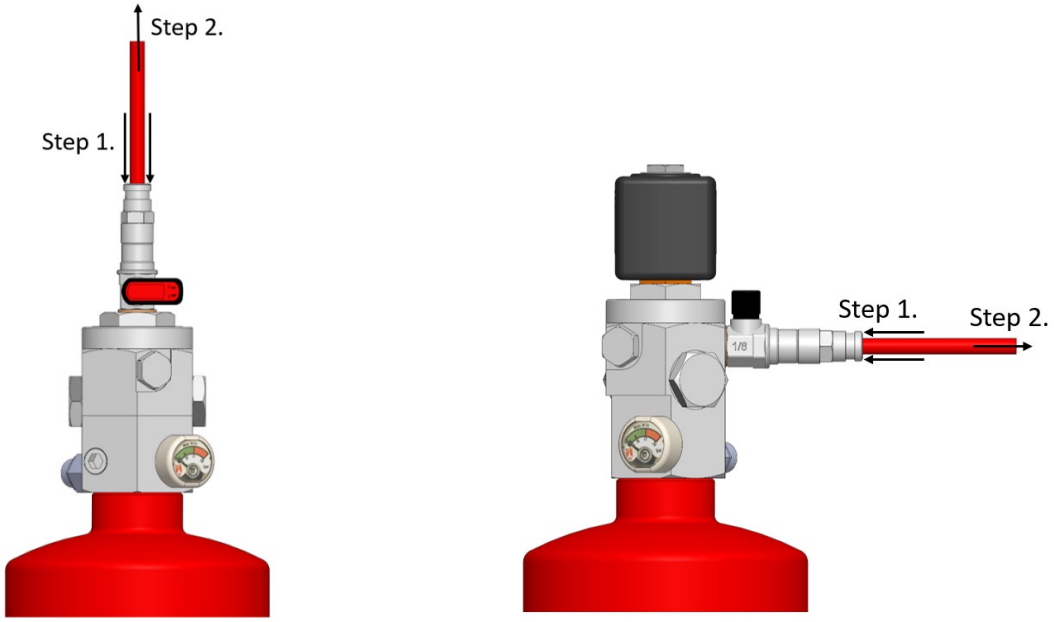


Detail of slotting the BlazeTube detection to the end-of-line adapter

Do not open the ball valve before pressurizing the BlazeTube! This may open the valve piston of the cylinder and extinguishing agent will be released. Protect the ball valve before accidental opening during transportation and handling of the cylinder. Follow the instructions for transportation of the cylinder.

During normal operation of the system, the pressure in the BlazeTube detection is the same as in the cylinder.

Disconnect the BlazeTube detection from a BlazeTube connector by pushing the connector's ring in (away from the BlazeTube detection) and pull the BlazeTube detection away from the BlazeTube connector. Proceed accordingly when disconnecting the BlazeTube detection from the end-of-line adapter.



Disconnection of the BlazeTube detection from the valve
(example: valve 201 on the left, valve 211 or 212 on the right)

Step 1: Push the ring of the BlazeTube detection outlet connector
Step 2: Pull the BlazeTube detection from the connector

During disconnection of the BlazeTube detection under pressure a pressure is released and if the system was in operation also small amount of agent is released. In such case always wear appropriate protective glasses with side-shields and suitable protective gloves. Aim the BlazeTube detection always apart. Make sure not to interpose any other person.

If the BlazeTube detection is under pressure disconnection can be more difficult. The pressure can be released by pushing a small pin of the charging adapter inside the end-of-line device. Before this procedure, dismount the pressure gauge and make sure that the ball valve is closed.

7.4.1 PROCEDURE OF INSTALLATION OF THE BLAZETUBE DETECTION IN THE PROTECTED ENCLOSURE

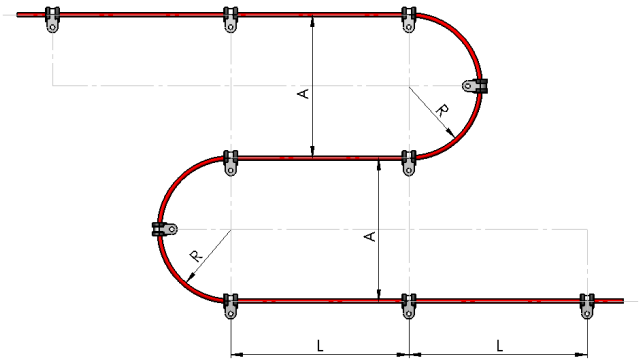
Place the BlazeTube detection in the protected enclosure and gradually fasten with P-clamps and fastening elements. Proper fastening of BlazeTube detection is important. In case of fire, it is exposed to fast changes in pressure and forces of flowing gas. Maximum distance between fastenings of the tube cannot be more than 250 mm. Fastening must also be in place where the tube bends. The BlazeTube detection has minimum bend radius of 100 mm. Do not bend the tube more. To preserve sufficient flexibility of the BlazeTube detection, it is recommended to install it at ambient temperature of more than 10 °C.

IMPORTANT!

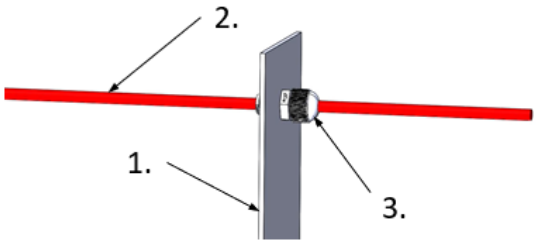
The BlazeTube detection must come out of each connection in direct position in order to avoid any leakage. If a redirection of the BlazeTube detection is needed the bend of the tube from the connection must be in a minimum distance of 50 mm.

Table 58: Boundary dimension values

Symbol	Value
A	max 1000 mm
L	max 250 mm
R	min 100 mm
Max. number of bends per 1 m	3



At the crossing of the BlazeTube through a structure it is advised to protect the BlazeTube



1. structure
2. BlazeTube detection
3. protective element (cable gland ACG112, rubber grommet etc.)

Place the BlazeTube detection as close as possible above the places with greatest risk of fire. Do not place the tube horizontally next to places of possible fire, it may significantly delay activation of the system in case of fire.

The BlazeTube detection cannot be placed freely in the protected enclosure. It must be tightened to appropriate construction. If necessary, the BlazeTube detection can be installed in open space (e.g., above the protected device) by using steel wire, which is wired in suitable area of the protected enclosure and the BlazeTube detection can be tightened on a steel wire. Use a steel wire with appropriate strength and wire the steel wire firmly.

Proceed carefully during installation not to damage the tube with sharp objects. Do not stretch or forcibly bend the BlazeTube.

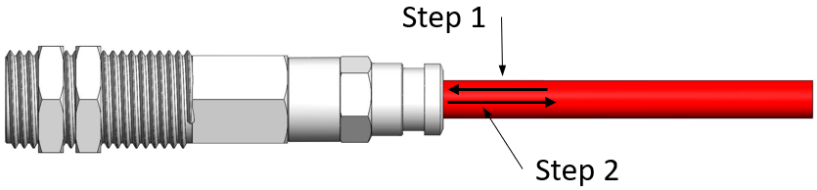
During the installation of BlazeTube detection, specifically make sure that the tube will not be damaged during operation of the equipment covered. After the system is fully installed and functional, if the BlazeTube is damaged, the system will activate.

The tube cannot be in direct contact with hot parts of the protected device or in immediate proximity of parts of the device, which heat to high temperatures during operation (transformers etc.).

Depending on the size and shape of the protected enclosure use necessary length of the BlazeTube detection. If you do not use the whole tube, cut the ending; the ending must be adjusted, see figures above.

Place the loose ending of the BlazeTube detection into the area so that it is possible to pressurize the system using charging kit through end-of-line adapter of the tube, and also to enable in future to perform inspection of pressure in the system with pressure gauge on end-of-line adapter of the tube, if the pressure gauge will be installed at the end-of-line adapter.

Fasten the end-of-line adapter into the ending of the BlazeTube; proceed according to the figure below.

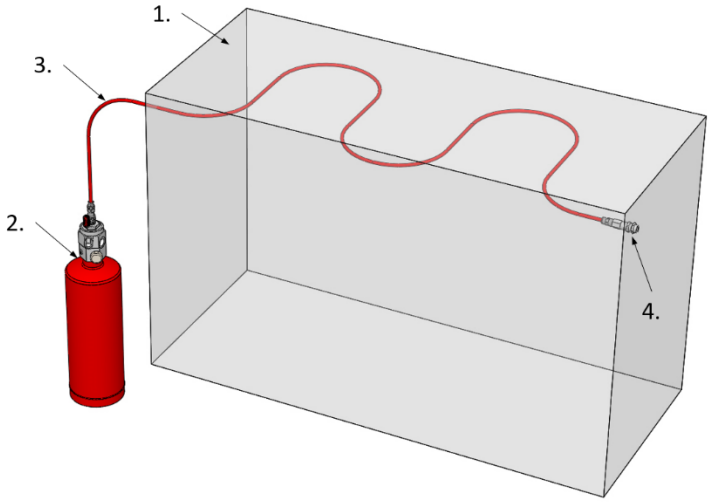


Connection of the BlazeTube detection on the end-of-line adapter

Step 1: BlazeTube detection properly slotted to the end-of-line adapter all the way
Step 2: After slotting always make sure that the BlazeTube is firmly fastened by gentle pulling it

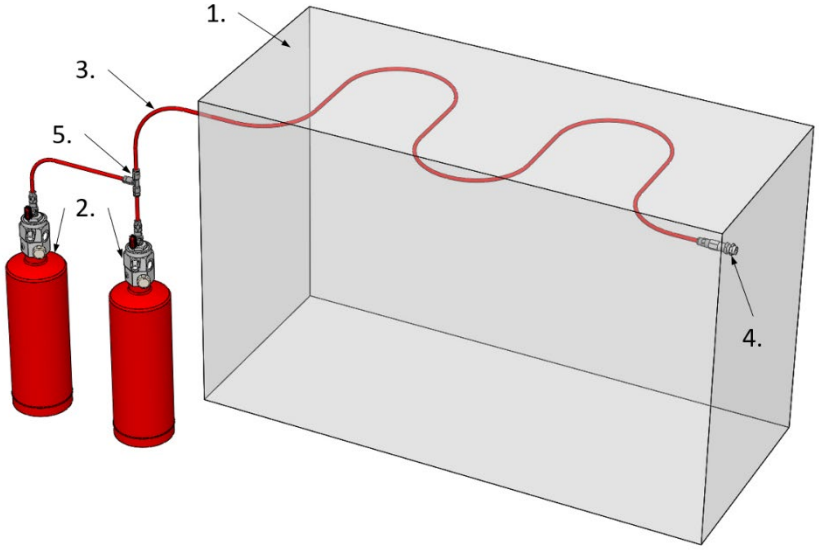
7.4.2 EXAMPLES OF INSTALLATION OF THE BLAZETUBE DETECTION

For maximum length of BlazeTube see Table 45 in Chapter 7.2.



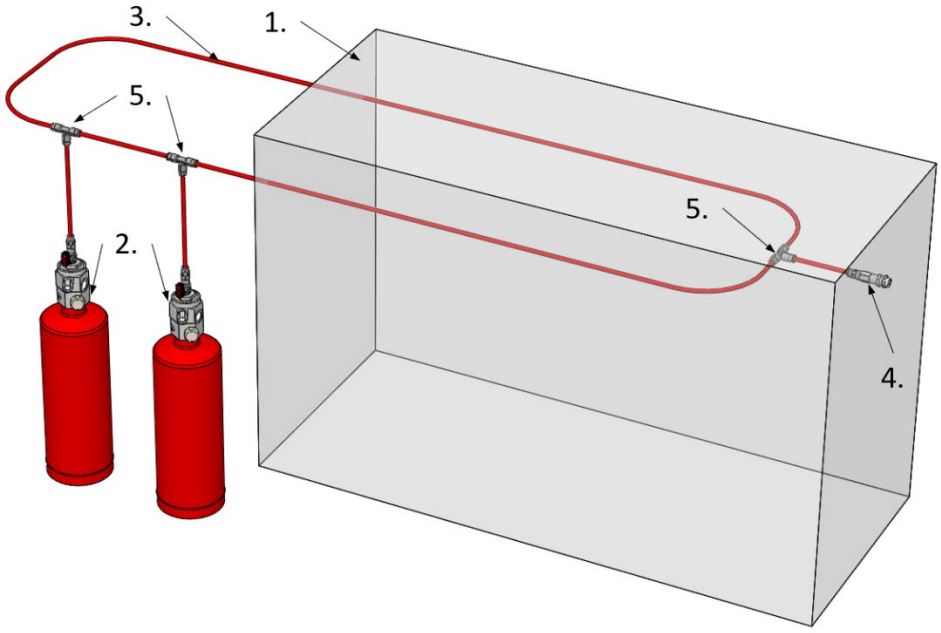
Simple installation with one cylinder

1. Protected enclosure
2. Cylinder with the valve
3. BlazeTube detection
4. End-of-line adapter or pneumatic actuator



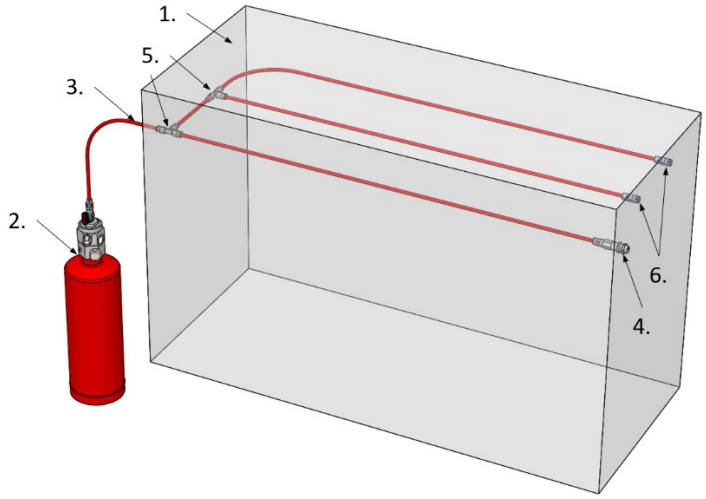
Simple installation of multiple cylinders. The BlazeTube detection must be connected to both cylinders by using a Tee connector.

1. Protected enclosure
2. Cylinder with the valve
3. BlazeTube detection
4. End-of-line adapter or pneumatic actuator
5. BlazeTube Tee connector



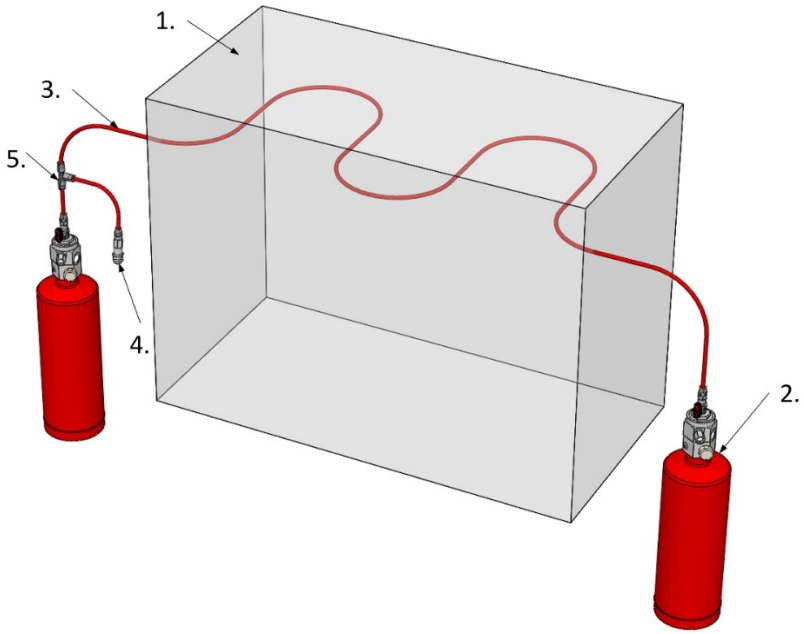
Multiple cylinders installation with the BlazeTube detection in loop.
Recommended for applications where long BlazeTube detection is needed.

1. Protected enclosure
2. Cylinder with the valve
3. BlazeTube detection
4. End-of-line adapter or pneumatic actuator
5. BlazeTube Tee connector



Installation with one cylinder, the BlazeTube detection is branched. This method reduces length of the BlazeTube detection. It is suitable for installations where large space has to be covered and the BlazeTube detection would have to be very long when using simple installation.

1. Protected enclosure
2. Cylinder with the valve
3. BlazeTube detection
4. End-of-line adapter or pneumatic actuator(one end-of-line device is sufficient for one installation)
5. Tee connection
6. End-of-line plug



Cylinders are situated on opposite sides of the protected enclosure. This method is suitable when larger space needs to be protected, for example the protected enclosure is long (shafts etc.).

1. Cylinder with the valve
2. Protected enclosure
3. BlazeTube detection
4. End-of-line adapter or pneumatic actuator
5. BlazeTube Tee connector

7.4.3 GENERAL WARNINGS AND INSTRUCTIONS

Manual activation devices must always be installed in easily accessible places so that the person operating them would not be endangered by fire the operation of the system itself (e.g., when releasing extinguishing agent, oil from a fryer might suddenly burst out) (see ANNEX 3: PNEUMATIC REMOTE ACTUATORS ARA010 AND ARA020).

Electronic activation of the system (using an electric actuator or an alarm panel) enables to place the devices for manual activation in greater distance from the protected area than activation using pneumatic remote actuators (see ANNEX 4: ELECTRIC REMOTE ACTUATORS ARA110 AND ARA120).

7.5 PRESSURIZATION OF THE BLAZETUBE DETECTION SYSTEM

The cylinder and BlazeTube detection must be pressurized with the correct pressure by nitrogen gas (N_2) before the system is put into operation. Use appropriate source of N_2 – cylinder with control valve. The pressurized system must be pressurized to value corresponding to the operating pressure for the given temperature (see Chapter 4.1).

Tool charging adapter ATC001

Pressurization is performed through the end-of-line adapter of the BlazeTube detection using charging adapter ATC001. The BlazeTube detection end-of-line adapter has a port with thread M10x1 and contain a Schrader valve.

This valve closes and opens automatically during removal or installation of the charging adapter or the pressure gauge. It is possible to install and remove these components even when the tube is under pressure.

Depending on the cylinder valve used, proceed according to instructions in Chapter 7.5.1 or 7.5.2 to pressurize both the cylinder and BlazeTube at once or BlazeTube separately. For pressurization of the cylinder only, follow steps in the Technical Bulletin – TB008 Filling and Charging of Cylinders with Foam.

For multiple cylinder configurations (MCC), follow steps in Chapter 8.3.1.

If your system uses pneumatic remote actuator (ARA010 or ARA020), you can also pressurize the system following procedures in the corresponding Annex.

Proceed carefully and strictly follow the following steps. Fasten the connectors of the tubes, charging adapter and BlazeTube detection firmly and inspect. Their accidental disconnecting during pressurization would release the extinguishing agent into the system.

Never connect or disconnect the charging adapter to the BlazeTube detection if the ball valve of the port of the BlazeTube detection on the cylinder valve is open.

Due to risk of activation during pressurization of the system it is necessary to seal the outlets of the discharge networks on the cylinder valve. Remove the discharge networks and seal the outlets with the G3/8" valve plugs.

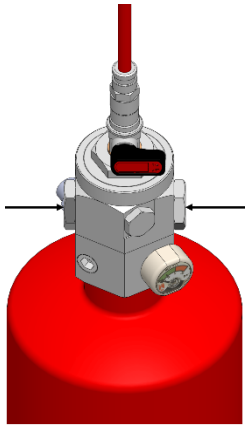
Pressurize the BlazeTube detection correctly. If the pressure in it is lower than in the cylinder, the valve piston of the cylinder could open and extinguishing agent could be released when opening the ball valve.

7.5.1 PRESSURIZATION PROCEDURE OF THE CYLINDER AND THE DETECTION SYSTEM – VALVES 201 AND 202

Proceed according to instructions in this chapter to pressurize the cylinder and BlazeTube detection at once.

For pressurization of BlazeTube detection only, skip steps 6 and 7.

Procedure for valves 211-01 and 212-01 is described in Chapter 7.5.1, for valves 211-30 and 212-30 (without BlazeTube outlet) in Chapter 8.3.2.

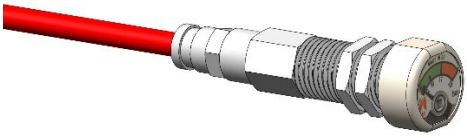


Step 1:

Make sure that the discharge ports are plugged with valve plugs FVP1B06, to avoid loss of agent in case of an accidental discharge when pressurising.

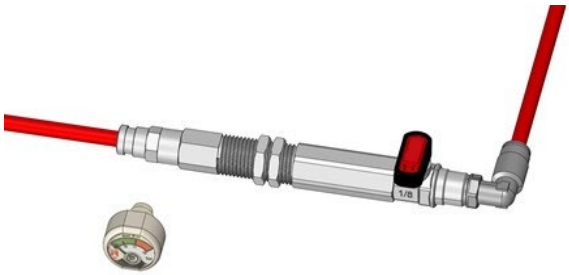
Make sure that the ball valve on the cylinder valve is closed.

Read and write down the value of pressure from the pressure gauge on the cylinder valve.



Step 2:

If installed, remove the pressure gauge (pressure switch or transducer) from the end-of-line adapter AEA006 at the end of the BlazeTube.



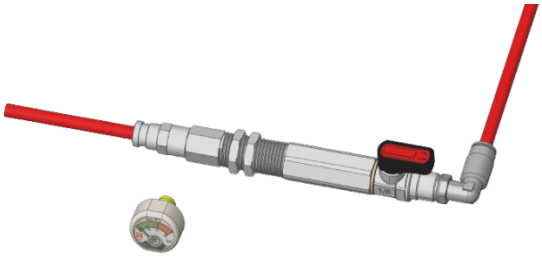
Step 3:

Make sure the ball valve on the charging adapter is closed.

Mount by hand the charging adapter ATC001 to the end-of-line adapter's M10x1 port by rotating clockwise. Hold the end-of-line adapter to push counter-clockwise while tightening. Tighten the charging adapter properly.

Step 4:

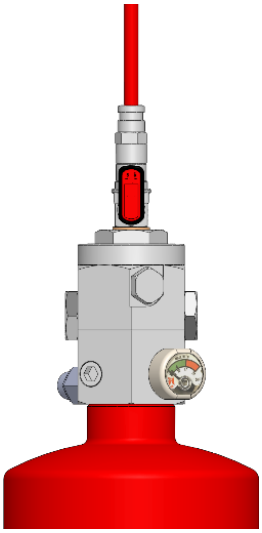
Set the regulator on the source of N_2 to the desired value (**16 bar at 20 ± 3 °C ambient temperature**). Setting must be at least 1 bar higher than the pressure in the cylinder. Graph of relationship between temperature and pressure in the cylinder is show in Chapter 4.1. Open the regulator valve.



Step 5:

Slowly open the ball valve of the charging adapter and pressurize the BlazeTube detection first.

During pressurization hissing can be heard. When the sound stops, pressurization is finished. Keep the ball valve open for at least 30 seconds to stabilize the pressure in the BlazeTube detection.

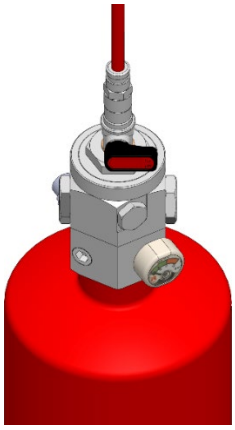


Step 6 (skip if pressurizing only the BlazeTube):

Slowly open the ball valve on the cylinder valve and pressurize the cylinder.

During pressurization hissing can be heard. When the hissing stops, keep the valve open for at least 30 seconds to stabilize the pressure.

Close the ball valve on the cylinder valve, shake the cylinder several times and repeat Step 6 until the pressure stabilises at the desired value.



Step 7 (skip if pressurizing only the BlazeTube):

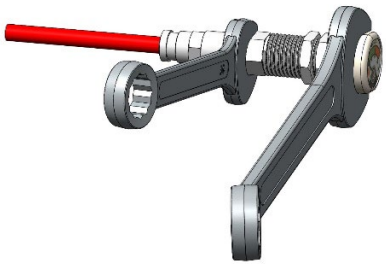
Close the ball valve on the cylinder valve.

Step 8:

Close the ball valve on the charging adapter.

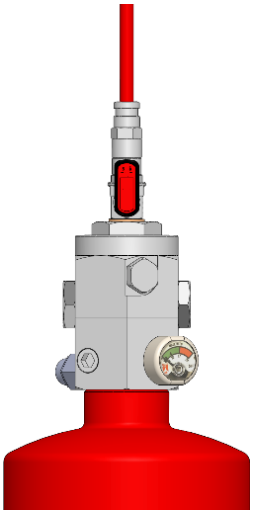
Step 9:

Unscrew the charging adapter from the M10x1 port of the end-of-line adapter (with size 16 spanner). You can use size 14 spanner on the valve adapter to push clockwise while unscrewing the charging adapter.



Step 10:

Mount the pressure gauge (pressure switch or transducer) back. Tighten it with spanner 22 mm.



Step 11:

If the pressure is not decreasing, very slowly open the ball valve on the cylinder valve. Pressures in the tube and the cylinder will equalise. Wait approximately 30 seconds.

Follow additional steps from Chapter 7.5.3.

Since this moment the cylinder and the BlazeTube detection are connected in one pressure unit. Proceed carefully not to damage the BlazeTube detection. Its damage would cause activation of the system and release of extinguishing agent.

Do not try to remove the BlazeTube detection from the BlazeTube outlet on the cylinder valve or remove the end-of-line adapter if the BlazeTube is under pressure and the ball valve is open.

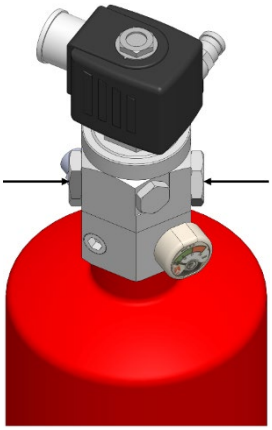
Fast and careless opening of the ball valve may activate the system and release extinguishing agent.

7.5.2 PRESSURIZATION PROCEDURE OF THE CYLINDER AND THE DETECTION SYSTEM – VALVES 21X-01

Proceed according to instructions in this chapter to pressurize the cylinder and BlazeTube detection at once.

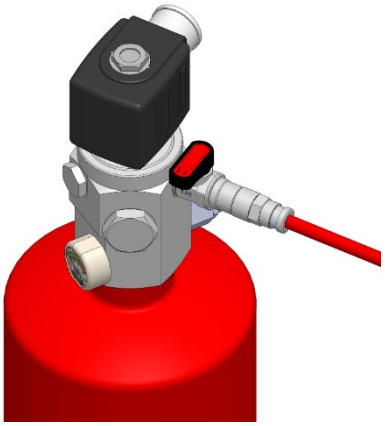
For pressurization of BlazeTube detection only, skip steps 7 and 8.

Procedure for valves 201 and 202 is described in Chapter 7.5.1, for valves 211-30 and 212-30 (without BlazeTube outlet) in Chapter 8.3.2.



Step 1:

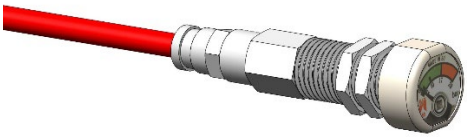
Make sure that the discharge ports are plugged with valve plugs FVP1B06, to avoid loss of agent in case of an accidental discharge when pressurising.



Step 2:

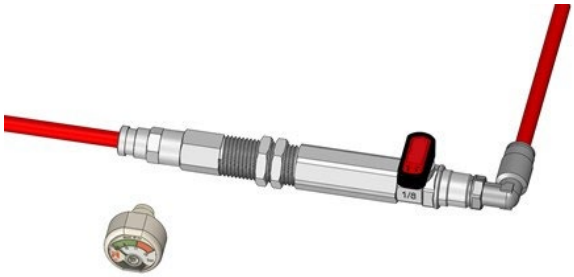
Make sure that the ball valve on the cylinder valve is closed.

Read and write down the value of pressure from the pressure gauge on the cylinder valve.



Step 3:

If installed, remove the pressure gauge (pressure switch or transducer) from the end-of-line adapter AEA006 at the end of the BlazeTube.



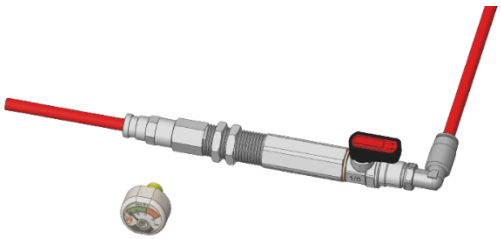
Step 4:

Make sure the ball valve on the charging adapter is closed.

Mount by hand the charging adapter ATC001 to the end-of-line adapter's M10x1 port by rotating clockwise. Hold the end-of-line adapter to push counter-clockwise while tightening. Tighten the charging adapter properly.

Step 5:

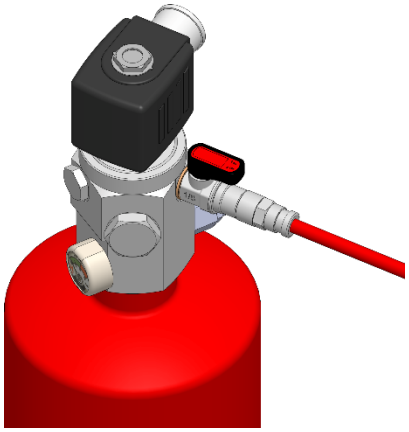
Set the regulator on the source of N_2 to the desired value (**16 bar at 20 ± 3 °C ambient temperature**). Setting must be at least 1 bar higher than the pressure in the cylinder. Graph of relationship between temperature and pressure in the cylinder is show in Chapter 4.1. Open the regulator valve.



Step 6:

Slowly open the ball valve of the charging adapter and pressurize the BlazeTube detection first.

During pressurization hissing can be heard. When the sound stops, pressurization is finished. Keep the ball valve open for at least 30 seconds to stabilize the pressure in the BlazeTube detection.



Step 7 (skip if pressurizing only the BlazeTube):

Slowly open the ball valve on the cylinder valve and pressurize the cylinder.

During pressurization hissing can be heard. When the hissing stops, keep the valve open for at least 30 seconds to stabilize the pressure.

Close the ball valve on the cylinder valve, shake the cylinder several times and repeat Step 7 until the pressure stabilises at the desired value.

Step 8 (skip if pressurizing only the BlazeTube):

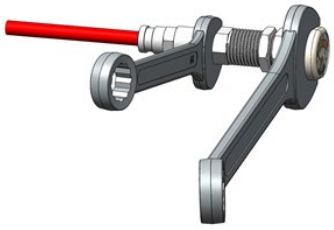
Close the ball valve on the cylinder valve.

Step 9:

Close the ball valve on the charging adapter.

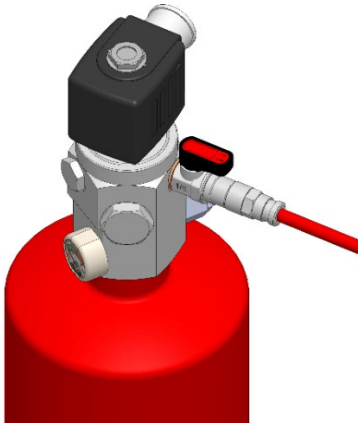
Step 10:

Unscrew the charging adapter from the M10x1 port of the end-of-line adapter (with size 16 spanner). You can use size 14 spanner on the valve adapter to push clockwise while unscrewing the charging adapter.



Step 11:

Mount the pressure gauge (pressure switch or transducer) back. Tighten it with spanner 22 mm.



Step 12:

If the pressure is not decreasing, very slowly open the ball valve on the cylinder valve. Pressures in the tube and the cylinder will equalise. Wait approximately 30 seconds.

Follow additional steps from Chapter 7.5.3.

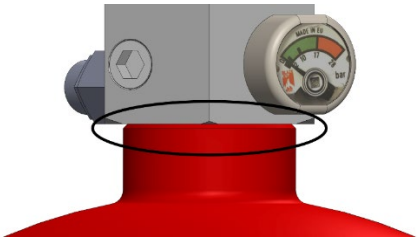
Since this moment the cylinder and the BlazeTube detection are connected in one pressure unit. Proceed carefully not to damage the BlazeTube detection. Its damage would cause activation of the system and release of extinguishing agent.

Do not try to remove the BlazeTube detection from the BlazeTube outlet on the cylinder valve or remove the end-of-line adapter if the BlazeTube is under pressure and the ball valve is open.

Fast and careless opening of the ball valve may activate the system and release extinguishing agent.

7.5.3 ADDITIONAL STEPS AFTER PRESSURIZATION

Observe the value on the cylinder valve's pressure gauge and check the system components for leaks right away and after 30 minutes. If pressure is decreasing, the BlazeTube detection may not be connected properly or some component may not be mounted tightly. Also check the connection between the cylinder neck ring and the cylinder valve using a foaming solution. Observe if no bubbles are formed due to loss of pressure through the connection.



Connection between the cylinder neck ring and the valve

IMPORTANT!

Never install the cylinder assembly if any leak is detected!

If the BlazeCut system is installed in a kitchen, it should be operational and functional. In case of deactivation of the system (for any reasons), the kitchen staff should be informed thereof to prevent the staff from wrongly assuming, that the system is functional and will be activated automatically or activated manually in case of fire.

7.6 FINAL INSPECTION OF THE SYSTEM INSTALLATION

Fill-out the Commissioning/Installation Report.

8 REGULAR INSPECTION AND MAINTENANCE OF THE FIRE SUPPRESSION SYSTEM

Pressure configuration of the system is reserved technical equipment under pressure. Its activation and operation is subject to professional inspections and tests performed by revision technician according to applicable legislation. Operator is obliged to have inspections of safety condition of the equipment performed and immediately remove defects detected.

Always follow local legislation and statutory requirements.

All inspections (except daily operator's checks) and repairs, whether during regular maintenance or in exceptional situation, must be performed by a person authorized and trained by the manufacturer and depending on the procedure with corresponding professional qualification to ensure correct operation of the fire suppression system.

Required system inspection and maintenance must be followed to ensure long term, reliable and safe operation of BlazeCut system.

Visual inspections of the fire suppression system shall be carried out regularly at least once a month by the responsible person. Overall inspection must be performed at least once in 12 months for non-harsh environments and once per 6 months for harsh environments. Inspection must be performed also after each exceptional circumstance (e.g., accidental activation, exposure to mechanical or excessive thermal stress for example in case of fire without activation of the system).

In case of performing exceptional inspection, the 12-month period to perform the next regular inspection starts only when exceptional inspection was performed in full scope.

Regular replacement of components subject to wear and tear (effects of temperature, pressure and environment) is also necessary in BlazeCut system.

Proceed according to the instructions in the table below.

Table 59: Overview of inspections

Period / interval	Obligatory scope
Daily operator's check	1. Check System pressure 2. Fire Alarm Panel check (if used) 3. Ensure actuators are undamaged and tamper seals are in place and in good condition (if used) 4. Visual inspection of system: check for loose and/or damage to cylinder assembly, hoses, brackets, nozzles/caps, detection, etc.
1 x 12 months	1. Overall inspection of the system 2. Inspection of pressure in the system
1 x 5 years	1. Overall inspection of the system
1 x 10 years	1. Overall inspection of the system 2. Pressure test of the cylinder 3. Service of the cylinder valve (see Maintenance Manual for ILP valves) 4. Replacement of BlazeTube detection (if used)
In special incident	1. Overall inspection of the system 2. Inspection of pressure in the system
As necessary	1. Inspection of weight of extinguishing agent in the system 2. Pressurization of the system 3. Replacement of wear and tear parts

If any deficiencies are found, appropriate corrective action shall be taken immediately.

Inspection and test intervals stated in the table are minimum intervals required by the manufacturer. If the legislation in place of installation require shorter intervals as stated in the table or additional inspections and tests, which are not stated in the table, it is necessary that these inspections are performed in accordance with this legislation. Additionally, if the environment where the system is installed is harsh, the system may require inspections every 3-6 months due to possible damage that may occur.

Agents removed from containers during service or maintenance procedures shall be recovered and recycled or disposed of in accordance with any applicable laws and regulations.

8.1 COMPREHENSIVE INSPECTION OF THE SYSTEM

Basic points of inspection of the system:

- Check completeness of the system,
- Clean surface of the cylinder and the cylinder valve, tubes/hoses, pressure gauges and nozzle dust caps from major dirt,
- Check surface of the cylinder, focus on possible changes in shape of the cylinder, mechanical damage, signs of corrosion, signs of leak, etc.,
- Check firmness of the connection of the discharge network, check correct tightening of the fittings with spanner,
- Check firmness of the connection of the BlazeTube detection by gently pulling the tube,
- Check that the discharge network is not damaged, focus on possible change of shape, colour, dents, damage caused by temperature or mechanical damage,
- Check firmness of the fastening of the cylinder in the bracket, check the fastenings of the hoses/tubes, of the nozzles, firmness of the fastening of the electrical installation, check firmness of the mounting of the cable connectors depending on installed components (the solenoid, the pressure switch/transducer, the alarm panel etc.),
- Check cleanliness of the nozzle caps; the nozzles cannot be covered with dirt and grease; do not clean forcibly, make sure the nozzle caps are not loose,
- Force air through the discharge line and blow off nozzle caps to ensure all delivery lines are clear and caps will open,
- Manual actuators – check actuator housing for damage & security, condition of indicator gauge if fitted,
- Electronic system – check condition of BlazeWire and supports,
- Clean and check that all corresponding labelling of the system and warning labels marking the area protected by BlazeCut system are undamaged.

Remove detected defects immediately. During replacement of components and reconnecting the hoses/tubes , the electrical installation and during pressurization of the system proceed in accordance with the procedures described in Chapter 12.

8.2 INSPECTION OF THE SYSTEM INSTALLATION

8.2.1 GENERAL RULES

The pressure of the system is inspected by control pressure gauge situated on the cylinder valve or on the end-of-line adapter. If both pressure gauges are installed use the most accessible pressure gauge.

During inspection of pressure, the ball valve on the cylinder valve must be open to inspect pressure in the system correctly (like during regular operation of the system). During inspection the system cannot be heated (e.g., during operation of the protected enclosure) and exposed to a direct sunlight.

8.2.2 DAILY OPERATOR PRESSURE CHECK

Read the pressure gauge. If the pressure is within the green zone, the system is operational. If the pressure indicator is in the red zone, contact the service technician.

Pressure level is optimal

Pressure level is critical

If the system is using a Pressure Switch APS001 for monitoring of low pressure or a Pressure Transducer ATA100 for constant monitoring with the AAP210/AAP211 panel the visual check of pressure gauge is not necessary as the alarm panel will notify the operator by warning light and buzzer on the panel, in case of low pressure.

8.2.3 12-MONTH PRESSURE INSPECTION

When mounting and unmounting the pressure gauge or control pressure gauge to the end-of-line device the ball valve of the outlet of the BlazeTube detection must be always closed.

During inspection proceed as follows:

- Read pressure on pressure gauge (on the cylinder valve or end-of-line adapter) and remove it.
- Measure pressure by installing control pressure gauge (with adapter compatible with outlet M10x1) and compare detected value with data from the pressure gauge of the system. Values must be equal, permissible tolerance of pressure is maximum 1 bar. In case of discrepancy replace the pressure gauge of the system.
- If the control pressure gauge detects pressure in the system lower by more than 10 % than the required value of pressure, taking into consideration temperature (see Chapter 4.1), perform the pressurization of the system and proceed according to Chapter 8.3.

8.3 PRESSURIZATION OF THE SYSTEM

During the operation of the system there is always a natural slight pressure leak in the system. The leak occurs on the BlazeTube connectors and through the BlazeTube detection itself due to permeability of the material. The operation conditions and the size of the cylinder also influence the pressure decrease. Therefore, it is necessary to pressurize the system occasionally if the pressure decrease is more than 10 %.

During pressurization of the system during maintenance the cylinder is also pressurized as opposed to pressurizing only the BlazeTube detection during installation.

Pressurization is performed through the end-of-line adapter of the BlazeTube detection. The BlazeTube detection end-of-line adapter has outlet with thread M10x1 and it contains Schrader valve, which must be pushed and opened with the charging adapter. This valve closes and opens automatically during removal or installation of the charging adapter.

For valves 201, 202, 211 and 212 follow steps in Chapter 7.5.

For multiple cylinder configurations, follow steps in Chapter 8.3.1.

If your system uses pneumatic remote actuator (ARA010 or ARA020), you can also pressurize the system following procedures in the corresponding Annex.

8.3.1 PROCEDURE OF PRESSURIZATION

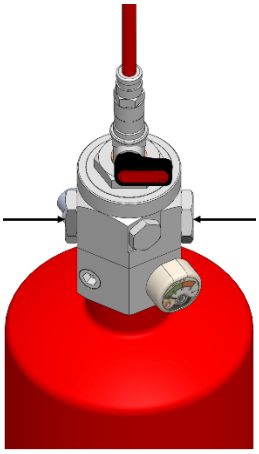
Use the charging adapter ATC001 with swivel neck. Procedure of pressurization using end-of-line adapters AEA006 is shown in figures below.

Procedure for valves 201 and 202 is described in Chapter 7.5.1, for valves 211-01 and 212-01 is described in Chapter 7.5.2.

Proceed carefully and strictly follow the following steps. Fasten the connectors of the tubes, charging adapter and BlazeTube detection firmly and inspect. Their accidental disconnecting during pressurization would release the extinguishing agent into the system.

Due to risk of activation during pressurization of the system it is necessary to seal the outlets of the discharge networks on the valve. Remove the discharge networks and seal the outlets with the G3/8" valve plugs.

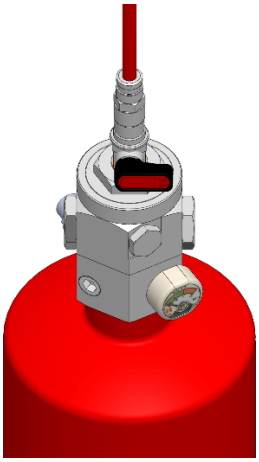
Never connect or disconnect the charging adapter to the BlazeTube detection if the ball valve of the outlet of the BlazeTube detection on the cylinder valve is open.



Step 1:

Make sure that the discharge ports are plugged with valve plugs FVP1B06, to avoid loss of agent in case of an accidental discharge when pressurising.

For MMC: Make sure Step 1. is carried out on all cylinders.

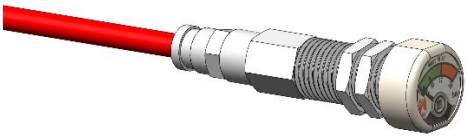


Step 2:

Make sure that the ball valve on the cylinder valve is closed.

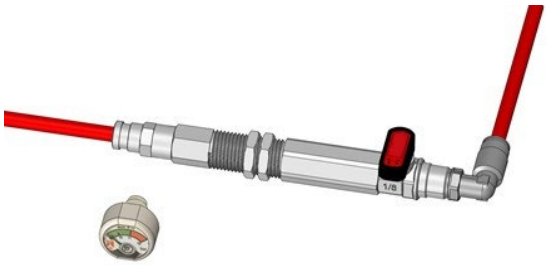
Read and write down the value of pressure from the pressure gauge on the cylinder valve.

For MMC: Make sure Step 2. is carried out on all cylinders and pressure in all cylinders is the same.



Step 3:

If installed, remove the pressure gauge (pressure switch or transducer) from the end-of-line adapter AEA006 at the end of the BlazeTube.



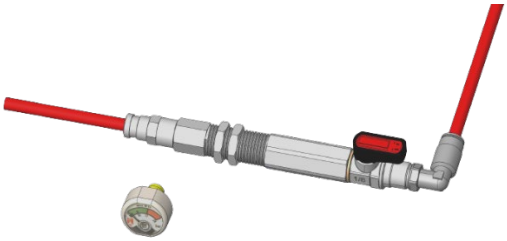
Step 4:

Make sure the ball valve on the charging adapter is closed.

Mount by hand the charging adapter ATC001 to the end-of-line adapter's M10x1 port by rotating clockwise. Hold the end-of-line adapter to push counter-clockwise while tightening. Tighten the charging adapter properly.

Step 5:

Set the regulator on the source of N_2 to the desired value (**16 bar at 20 ± 3 °C ambient temperature**). Setting must be at least 1 bar higher than the pressure in the cylinder. Graph of relationship between temperature and pressure in the cylinder is show in Chapter 4.1. Open the regulator valve.

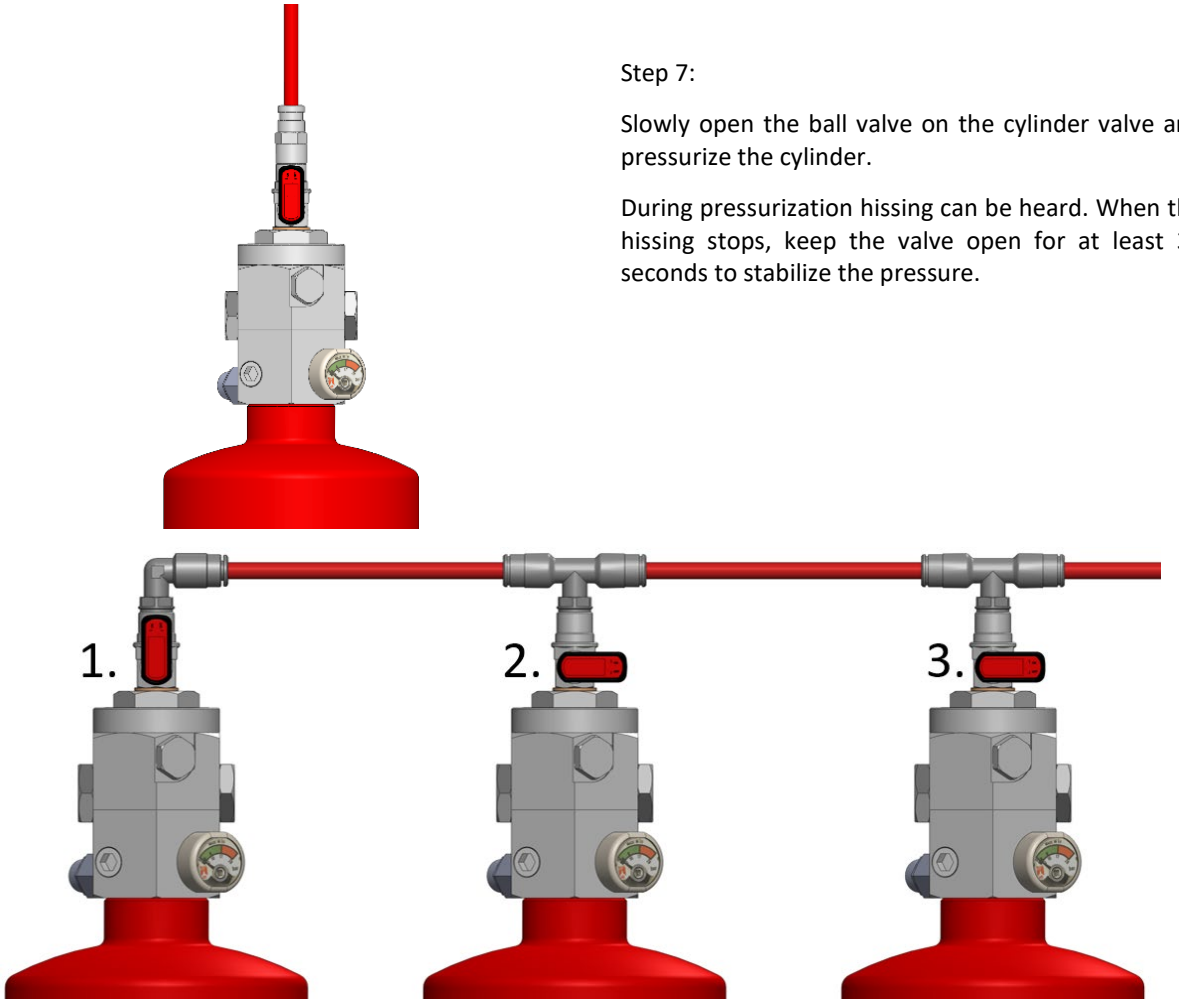


Step 6:

Slowly open the ball valve of the charging adapter and pressurize the BlazeTube detection first.

During pressurization hissing can be heard. When the sound stops, pressurization is finished. Keep the ball valve open for at least 30 seconds to stabilize the pressure in the BlazeTube detection.

Always open the regulation valve and ball valve of the charging adapter and pressurize the BlazeTube detection first.

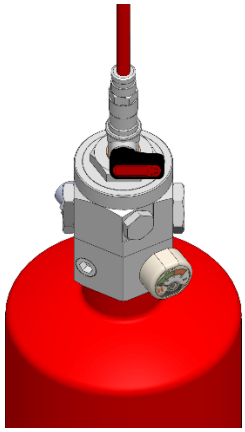


Step 7:

Slowly open the ball valve on the cylinder valve and pressurize the cylinder.

During pressurization hissing can be heard. When the hissing stops, keep the valve open for at least 30 seconds to stabilize the pressure.

For MCC: On the furthest cylinder (1.), open the ball valve on the cylinder valve and follow Step 7. Leave the valve open and repeat Step 7. with cylinder 2. and so on, until all the cylinders are pressurized.



Step 8:

Close the ball valve on the cylinder valve.

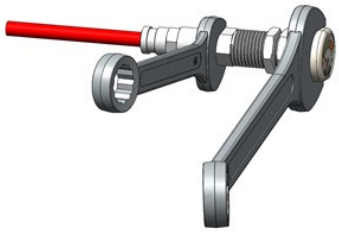
For MCC: Close the ball valve on all the cylinder valves.

Step 9:

Close the ball valve on the charging adapter.

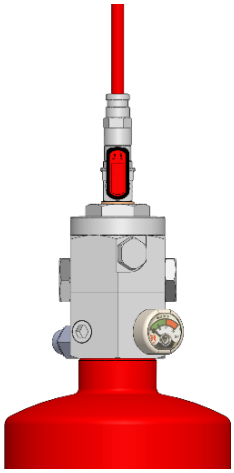
Step 10:

Unscrew the charging adapter from the M10x1 port of the end-of-line adapter (with size 16 spanner). You can use size 14 spanner on the valve adapter to push clockwise while unscrewing the charging adapter.



Step 11:

Mount the pressure gauge (pressure switch or transducer) back. Tighten it with spanner 22 mm.



Step 12:

If the pressure is not decreasing, very slowly open the ball valve on the cylinder valve. Pressures in the tube and the cylinder will equalise. Wait approximately 30 seconds.

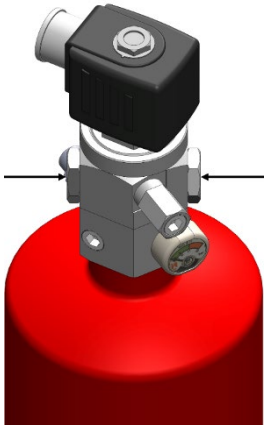
For MCC: Open the ball valve on all the cylinder valves.

Follow additional steps from Chapter 7.5.3.

8.3.2 SYSTEMS WITHOUT BLAZETUBE – VALVES 211-30 AND 212-30

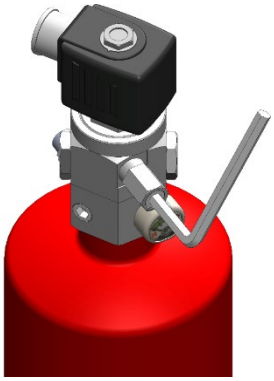
IMPORTANT!

Always charge the cylinder through the valve adapter's M10x1 port.



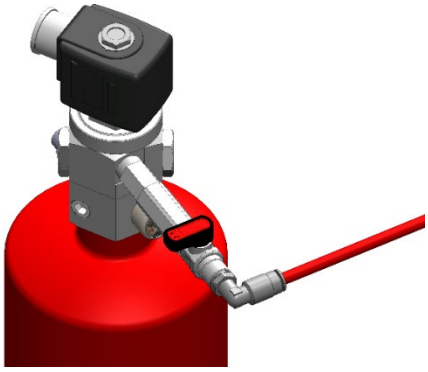
Step 1:

Make sure that the discharge ports are plugged with valve plugs FVP1B06, to avoid loss of agent in case of an accidental discharge when pressurising.



Step 2:

Remove the pressure switch, transducer or M10x1 plug FVP1M10 from the valve adapter FVABM0210 using a size 4 hex key.



Step 3:

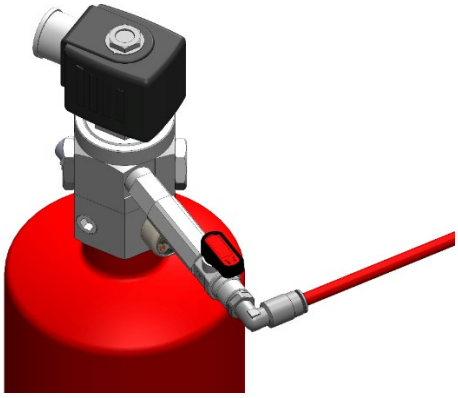
Make sure the ball valve on the charging adapter is closed.

Mount the charging adapter ATC001 to the valve adapter's M10x1 port by rotating clockwise. Tighten the charging adapter properly.

Step 4:

Set the regulator on the source of N_2 to the desired value (**16 bar at 20 ± 3 °C ambient temperature**).

Setting must be at least 1 bar higher than the pressure in the cylinder. Graph of relationship between temperature and pressure in the cylinder is show in Chapter 4.1. Open the regulator valve.

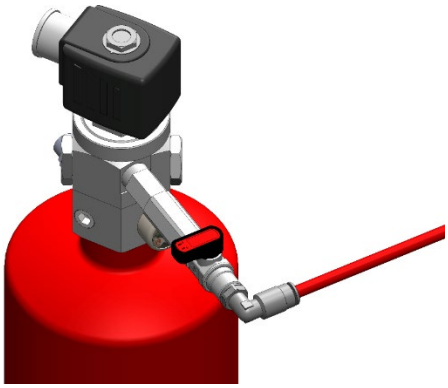


Step 5:

Slowly open the ball valve on the charging adapter and pressurize the cylinder.

During pressurization hissing can be heard. When the hissing stops, keep the valve open for at least 30 seconds to stabilize the pressure.

When pressurizing an unpressurized cylinder, close the ball valve on the charging adapter, shake the cylinder several times and repeat Step 5 until the pressure stabilises at the desired value.

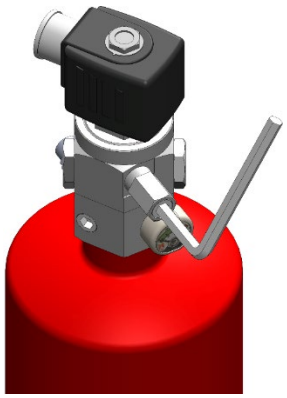


Step 6:

Close the ball valve on the charging adapter.

Step 7:

Unscrew the charging adapter from the M10x1 port of the valve adapter FVABM0210 (with size 16 spanner). You can use size 14 spanner on the valve adapter to push clockwise while unscrewing the charging adapter.



Step 8:

Screw in the M10x1 plug FVP1M10 and tighten it using a size 4 hex key.

Follow additional steps from Chapter 8.3.3.

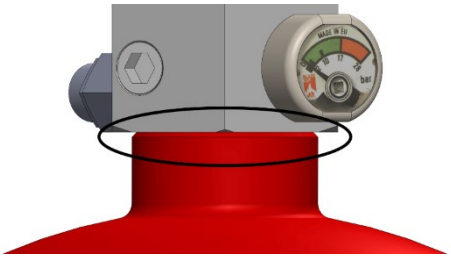
8.3.3 ADDITIONAL STEPS AFTER PRESSURIZATION

Observe the value on the cylinder valve's pressure gauge and check the system components for leaks right away and after 30 minutes. If pressure is decreasing, some component may not be mounted tightly. Also check the

connection between the cylinder neck ring and the cylinder valve using a foaming solution. Observe if no bubbles are formed due to loss of pressure through the connection.

IMPORTANT!

Never install the cylinder assembly if the connection is not tight!



Connection between the cylinder neck ring and the valve

8.4 REMOVAL OF THE SYSTEM FROM THE SERVICE

The system must be immediately put out of service in the following cases:

- The system has been used or emptied for other reason.
- The system has been exposed to direct flame or temperatures exceeding the limits of the system operation.
- The cylinder or valve shows signs of damage (deformation, cracks, leaks, severe corrosion, unusual phenomena that cannot be inspected of removed during operation of the system).
- If the pressure in the system is significantly higher with the respect to the ambient temperature or if it exceeds the highest permissible pressure level of the system.

Subsequent measures to ensure safety of the system and protection of persons must be taken by the persons trained and authorized by the manufacturer and, depending on the procedure, with corresponding professional qualification. If necessary, contact your supplier of the BlazeCut system.

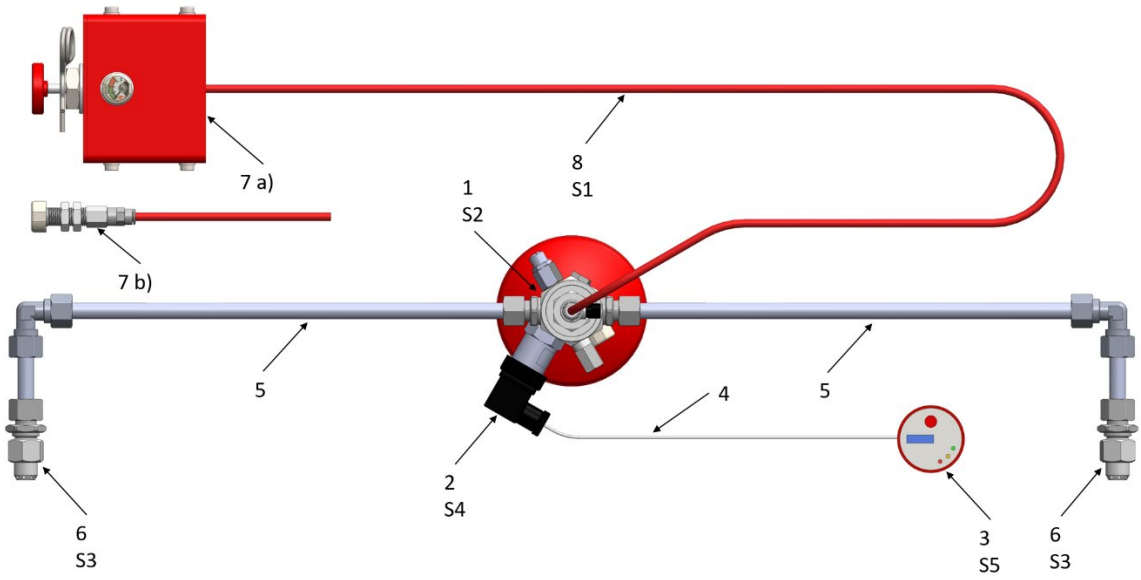
9 OPERATION OF SYSTEM BLAZECUT IN CASE OF FIRE

BlazeCut system is designed to protect closed spaces from fire using volume or local fire suppression applying foam extinguishing agent. BlazeCut system suppresses fire automatically without any external power source (LOP principle) or through electric activation (LHD BlazeWire, detectors etc.).

Below is description of operation using BlazeTube detection, but the principle of operation is the same also with electric activation through LHD BlazeWire, detectors etc.

9.1.1 OPERATION OF SYSTEMS USING VALVE TYPE 20x WITHOUT A SOLENOID – CPO20x

Procedure during automatic activation of the system is described in figure below.



Procedure during automatic activation of the system

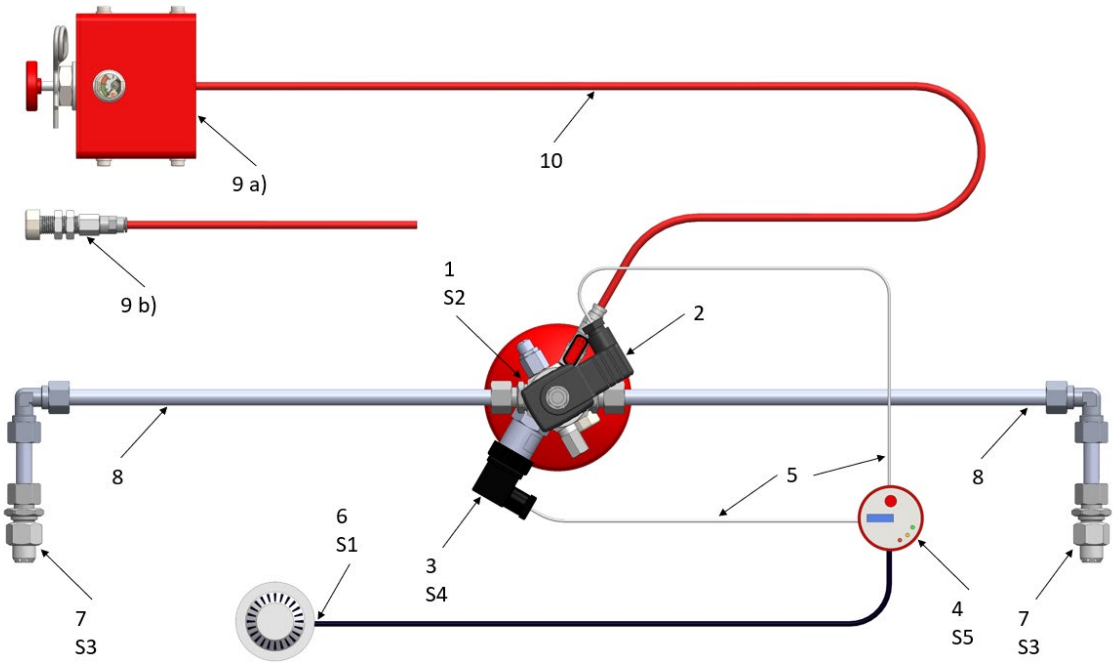
1. Cylinder valve (view from above)
2. Pressure Switch/Transducer with a cable connector
3. *External device (e.g., Alarm Panel AAP210)
4. Electrical cables
5. Extinguisher distribution network
    a) steel tubing and fittings
    b) Fire hose and fittings
    c) combination of steel tubing and Fire hoses, fittings
6. Nozzles
7. End-of-line device
    a) pneumatic remote actuator
    b) End-of-line connector with a manometer
    c) another cylinder (without a solenoid – valve type 20x) for multiple cylinder connection
    d) another cylinder (with a solenoid – valve type 21x-01) for multiple cylinder connection
8. BlazeTube detection

Step 1. BlazeTube detection (8.) detects fire
Step 2. Piston of the cylinder valve (1.) opens as a result of decrease of pressure in the BlazeTube detection (8.)
Step 3. Release of the extinguishing agent through nozzles (6.)
Step 4. * The Pressure Switch/Transducer sends signal to the external device after decrease of pressure in the system
Step 5. * External device makes the operation

*Applicable only when the Pressure Switch/Transducer is installed.

The system can be activated manually using a remote pneumatic actuator.

9.1.2 OPERATION OF SYSTEMS USING VALVE TYPE 211 AND 212 WITH A SOLENOID – CPO21x



Procedure during automatic activation of the system with valve type 21x-01

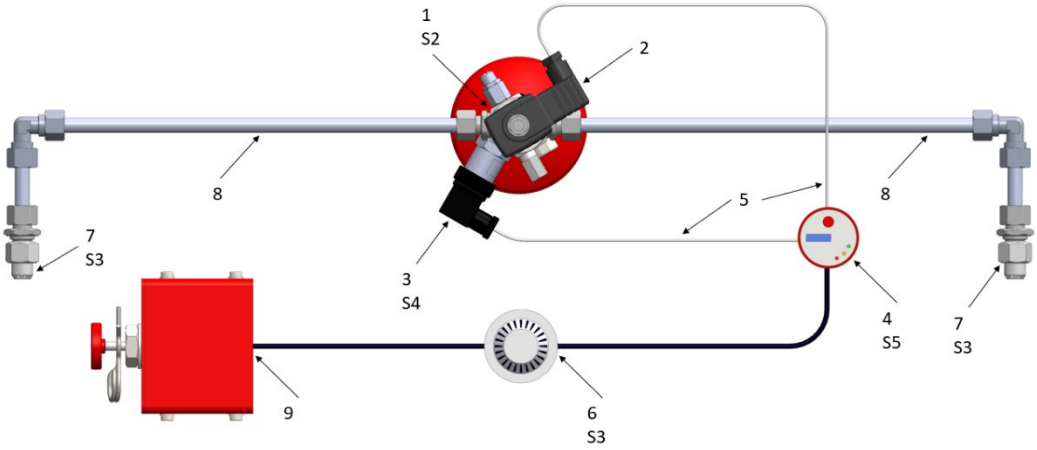
1. Cylinder valve (view from above)
2. Solenoid with a cable connector
3. Pressure Switch/Transducer with a cable connector
4. **External device (e.g., Alarm Panel AAP211)
5. Electrical cables
6. Fire detection device
    a) heat/smoke detector and electrical cable
    b) BlazeWire and end-of-line resistor
7. Nozzles
8. Extinguisher distribution network
    a) steel tubing and fittings
    b) Fire hose and fittings
    c) combination of steel tubing and Fire hoses, fittings
9. End-of-line device
    a) pneumatic remote actuator
    b) End-of-line connector with a manometer
    c) another cylinder (without a solenoid – valve type 20x) for multiple cylinder connection
10. BlazeTube detection

Step 1. Fire detection device (6.) detects fire
Step 2. Piston of the cylinder valve (1.) opens as a result of electric signal to the solenoid (2.)
Step 3. Release of the extinguishing agent through nozzles (7.)
Step 4. * The Pressure Switch/Transducer sends signal to the external device after decrease of pressure in the system
Step 5. ** External device makes the operation

*Applicable only when the Pressure Switch/Transducer is installed.

**External device described in the pictures above shall not be only one device but also separate independent devices.

The system can be activated manually using a remote pneumatic actuator or a solenoid connected to an external device - e.g., Alarm Panel AAP211.



Procedure during manual activation of the system with valve type 21x-30

1. Cylinder valve (view from above)
2. Solenoid with a cable connector
3. Pressure Switch/Transducer with a cable connector
4. **External device (e.g., Alarm Panel AAP211)
5. Electrical cables
6. Fire detection device
    a) heat/smoke detector and electrical cable
    b) BlazeWire and end-of-line resistor
7. Nozzles
8. Extinguisher distribution network
    a) steel tubing and fittings
    b) Fire hose and fittings
    c) combination of steel tubing and Fire hose, fittings
9. Electric remote actuator

Step 1. Fire detection device (6.) detects fire
Step 2. Piston of the cylinder valve (1.) opens as a result of electric signal to the solenoid (2.)
Step 3. Release of the extinguishing agent through nozzles (7.)
Step 4. * The Pressure Switch/Transducer sends signal to the external device after decrease of pressure in the system
Step 5. ** External device makes the operation

*Applicable only when the Pressure Switch/Transducer is installed.

**External device described in the pictures above shall not be only one device but also separate independent devices.

The system can be activated manually using solenoid connected to an external device - e.g., Alarm Panel AAP211, remote electric actuator.

9.1.3 WARNINGS

Do not manually activate the system without reason. Use manual activation only in case of reasonable suspicion of fire in the protected enclosure.

Do not manually activate the system if persons are present in the protected enclosures.

In case of fire the system activates automatically without previous warning. Do not come to immediate proximity of the nozzles of the system in case of fire, there is risk of being struck by extinguishing agent.

If the system is activated, wait for its activity to finish. Do not enter the protected enclosures and do not open the covers of the protected enclosure during the activity of the system.

In case of fire in the vehicle the driver must immediately stop the vehicle, stop the engine of the vehicle and perform further measures according to operation instructions of the vehicle (for example cut-off the supply of gas/fuel) in order to protect the persons and property according to applicable legislation.

10 RESTORATION OF ACTIVITY OF SYSTEM BLAZECUT IN CASE OF FIRE

Install and use system BlazeCut only with original supplied components. Do not replace anything in the system; use only original component and spare components. Using components not approved by the manufacturer causes loss of warranty, may cause malfunction of the system and presents danger to life and health of persons.

The system may be installed, maintained and repaired only by persons trained or authorized by the manufacturer and depending on procedure also with relevant professional qualification. Unprofessional interference with the system may cause malfunction of the system and presents danger to safety and health of people.

After the fire extinguishing is finished, observe the following instructions:

- Enter the protected area only after the system operation is finished,
- Unless absolutely necessary (e.g., fire is still present and it is necessary to use a portable fire extinguisher), enter the protected area only after is has been properly ventilated and cooled off and make sure that entry is safe,
- If immediate entry is necessary, persons must be properly protected (using self-contained breathing apparatus, protective clothing, etc.).

If the system is automatically activated in case of fire in the protected enclosure, it is necessary to replace several components. Proceed as follows:

- Check all components of the system for any damage. Any part that was exposed to direct fire or temperature above maximum operation temperature of the component shall be replaced,
- Replace the cylinder with extinguishing agent – it is possible to replace the cylinder assembly (cylinder, extinguishing agent, valve) or only cylinder with extinguishing agent and use old valve that needs to be serviced – ask the BlazeCut system supplier for refilled cylinder or refilled cylinder assembly. Proceed according to Chapter 12.2 of this Manual,
- Replace the detection (BlazeTube or BlazeWire) if the reason for system activation was detection of fire through this detection system - BlazeTube detection is replaced always in whole length (proceed according to Chapter 12.3 of this Manual; BlazeWire must be replaced at least 3 meters on each side of the detection point or damaged part,
- Replace caps on all nozzles,
- Force air through the discharge line to ensure all delivery lines are clear before installing new caps,
- Check if electrical installation was not damaged, replace possible damaged parts,
- Clean all components from the foam and dirt caused by the fire,
- When all components are checked, cleaned and replaced connect the cable connectors to the Pressure Switch/Transducer or solenoid and check correct functioning of the electrical installation.

During installation of new components or their replacement and during repeatedly connecting the tubes/hoses, electrical installation and pressurization of the system proceed according to instruction in respective chapters.

Proceed likewise in case of manual activation of the system or accidental activation of the system for other reasons.

11 SYSTEM DEACTIVATION

If necessary, system BlazeCut may be disabled without removing it from of the protected enclosure. Disablement is possible as follows:

11.1.1 DISAMBLEMENT OF THE BLAZETUBE DETECTION (AUTOMATIC ACTIVATION):

Close the ball valve on the cylinder valve. In this case even after damaging the tube the cylinder valve does not open and extinguishing agent is not released. However, it remains possible to activate the system manually from the external device (e.g., AAP211 alarm panel) using solenoid.

11.1.2 DISAMBLEMENT OF ACTIVATION FROM EXTERNAL DEVICE – ONLY FOR SYSTEMS WITH THE VALVE TYPE 10 WITH SOLENOID: CSF(AF)10

Disconnect the cable connector from the solenoid on the cylinder valve. Protect uncovered electrical connectors from dirt (e.g., by insulation tape). All electrical detection (LHD BlazeWire or detectors) and electrical manual activation is now disabled. In this case automatic activation using the BlazeTube detection remain active.

11.1.3 TOTAL DISAMBLEMENT OF THE SYSTEM

Disable the BlazeTube detection and solenoid. The system cannot be activated.

12 MAINTENANCE OF THE SYSTEM, REPLACEMENT OF COMPONENTS

12.1 GENERAL RULES

Follow general rules stated in Chapter 3.1.

Fill-out the Maintenance/Inspection Report.

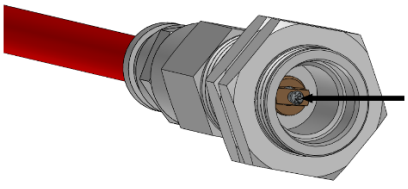
12.2 REPLACEMENT OF THE CYLINDER

During replacement use only undamaged cylinder filled with the correct extinguishing agent, properly labelled, with correctly mounted cylinder valve. Cylinder is supplied pressurized with required pressure. Detect the pressure in the cylinder with the pressure gauge mounted on the cylinder valve. Pressures corresponding to actual temperature are stated in Chapter 4.1.

If the pressure gauge is not mounted on the cylinder valve, external control pressure gauge with adapter compatible with outlet with thread M10x1 on the cylinder valve or the pressure gauge of system BlazeCut which is mounted on the end of line adaptor of the BlazeTube detection may be used. In such case, remove the pressure gauge from the end of line adaptor of the BlazeTube detection and mount it to the outlet on the cylinder valve with thread M10x1.

During replacement of the cylinder proceed as follows:

1. Close the ball valve on the cylinder valve of the old cylinder assembly. Disconnect cable connectors on the Pressure Switch/Transducer or solenoid, if used in the system and remove the Pressure Switch/Transducer.
2. If the BlazeTube detection is under pressure, remove the pressure gauge (pressure switch or transducer) from the end-of-line adapter AEA006 at the end of the BlazeTube, if installed. Push in the Schrader valve inside the end-of-line adapter to release the pressure from the BlazeTube.



Shrader valve inside the end-of-line adapter

3. Disconnect the BlazeTube detection and the distribution tubes/hoses.
4. Loosen the clamps of the bracket of the cylinder and remove it from the bracket.
5. Place a new cylinder assembly into the bracket and fasten properly with clamps.
6. Connect the BlazeTube detection, the distribution tubes/hoses on the cylinder valve, install the Pressure Switch/Transducer and connect the cable connector, if used in the system and connect the cable connectors of the electrical components.
7. If the removed cylinder assembly is under pressure, seal both outlets of distribution tubes with thread G3/8“ with corresponding valve plugs.

After replacement of the cylinder assembly, have corresponding safety inspection of the pressure device performed according to Chapter 8.

During removal and installation of individual components proceed according to the instructions as stated in individual Chapters relating to components.

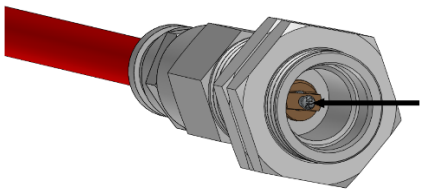
12.3 REPLACEMENT OF THE BLAZETUBE DETECTION

Do not try to remove the BlazeTube detection from the cylinder valve when the tube is under pressure and the ball valve on the cylinder valve is open.

Before handling the BlazeTube detection during removal, replacement or adjustment fastening in the protected enclosure always close the ball valve on the cylinder valve where the tube is fastened. When the BlazeTube detection is connected to the cylinder valve and the ball valve is open, if the tube is damaged and the pressure decreases, the fire suppression system is always activated and the extinguishing agent is released completely.

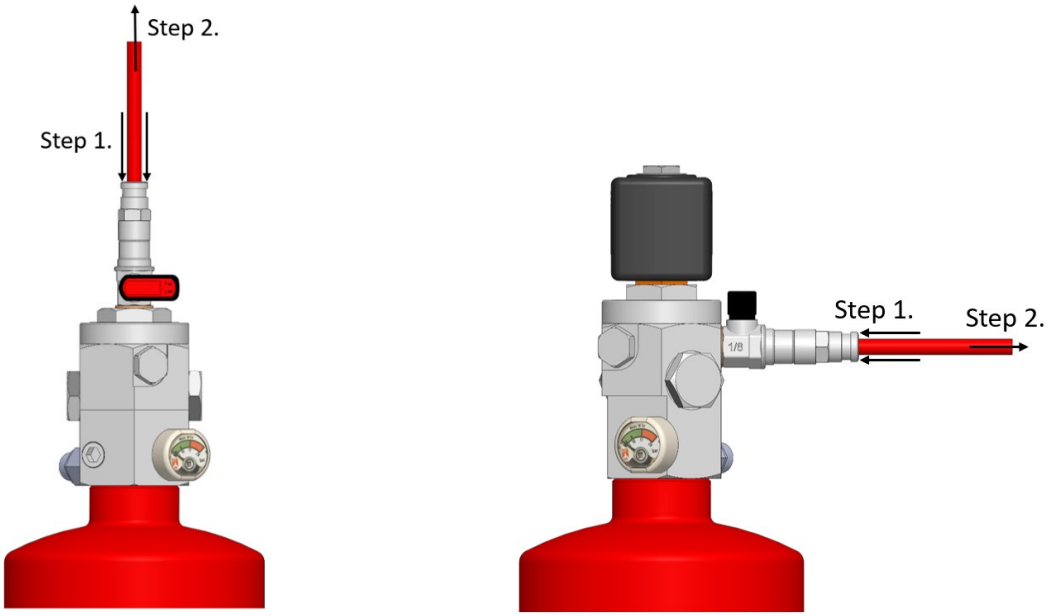
During disconnection of the BlazeTube detection under pressure a pressure is released and if the system was in operation also small amount of agent is released. In such case always wear appropriate protective glasses with side-shields and suitable protective gloves. Aim the BlazeTube detection always apart. Make sure not to interpose any other person.

1. Close the ball valve on the cylinder valve, position of the lever as shown on figure below.
2. If the BlazeTube detection is under pressure, remove the pressure gauge (pressure switch or transducer) from the end-of-line adapter AEA006 at the end of the BlazeTube, if installed. Push in the Schrader valve inside the end-of-line adapter to release the pressure from the BlazeTube.



Shrader valve inside the end-of-line adapter

3. Disconnect the BlazeTube detection from the outlet connector of the cylinder valve. Disconnect the tube by pushing the ring inwards in the place of entry of the tube to the fitting (toward the fitting) and remove the tube. Proceed accordingly when disconnecting the end-of-line adapter of the BlazeTube detection. Proceed according to the instructions in Chapter 7.4. Be careful, if the tube was under pressure, the pressure will leak from the BlazeTube detection.



The ball valve is closed

4. Fasten the new BlazeTube detection properly to the outlet connector of the cylinder valve. Fasten the BlazeTube detection so that the tube is slotted to the outlet of the connector and pushed by hand all the way in. After slotting always make sure by pulling that the tube is firmly gripped.
5. Place the BlazeTube detection in the protected enclosure and gradually fasten with clamps.
6. During installation proceed further according to Chapter 7.4.
7. Pressurize the BlazeTube detection, proceed according to Chapter 7.5.

12.4 RELEASE OF THE PISTON OF THE VALVE IN CASE OF ACCIDENTAL OPENING

In case the valve plugs are installed in outlets for the distribution tubes/hoses and the piston of the valve opens accidentally (e.g., during transport, accidental opening of the ball valve, troubles during pressurization of the system), it is necessary to release the piston back into closed position.

This operation is possible through the outlet for the BlazeTube detection by using pressure of gas (nitrogen). Close the ball valve on the cylinder valve (if it's open), connect the source of gas to the outlet for the BlazeTube detection by using charging adapter and release the gas under pressure into the outlet. Slowly open the ball valve of the outlet. Piston of the valve will move into closed position; this will be indicated by an audible click. Close the ball valve again.

Due to contamination of piston chamber and outlets by released foam it is necessary, in case of accidental activation of the system with sealed outlets, to depressurize the system and cylinder, and do a maintenance of the valve (See the ILP Valve Maintenance Manual) before the system can be installed and put back to operation.

Never remove the valve plugs before you release the piston back into closed position.

12.5 CLEANING THE SYSTEM

During cleaning process always wear appropriate protective glasses, and suitable protective gloves and clothes.

During maintenance of system BlazeCut clean the surface of the cylinder, the cylinder valve and the tubes from major dirt with appropriate cleaning textiles or cloths and nonaggressive cleaning products.

Do not use aggressive cleaning products such as solvents and caustic to clean the system.

Do not expose the system and especially its electronic parts to direct effect of water pressure during cleaning of the protected enclosure with high-pressure water.

12.6 DECLARATION OF CONFORMITY

Upon installation of each piece of the system the Commissioning/Installation Report must be prepared. Send the original of the Report to the manufacturer of the system. Keep the copy of the original.

Records on the maintenance and inspection of the system indicating the scope of service must be kept. Keep the maintenance records.

Declaration of conformity is issued by the manufacturer for each of the systems. The basis and requirement to issue the declaration of conformity is the Report issued by the authorized qualified person with relevant professional qualification in accordance with the relevant legislation and delivered to the manufacturer, whereby the authorized person certifies correct installation of the system pursuant to the technical documentation.

In the declaration of conformity, the manufacturer declares that the equipment under pressure is in conformity with the certificate of the type of the equipment under pressure issued in accordance with the requirements of European directive 2014/68/EU, Module B+E.

Supervising the implementation of the obligations arising out of the approved quality assurance system is ensured by notified body:

Technická inšpekcia, a.s., Trnavská cesta 56, 821 01 Bratislava, Slovak Republic (NB 1354).

Pursuant to the abovementioned, the equipment under pressure is labelled with CE conformity mark and identification code of notified body: 1354.

The products are safe when the terms of use and technical requirements are observed.

A copy of the current certificates can be requested by emailing technical@blazecutgroup.com

13 LIST OF ANNEXES

ANNEX 1: DETECTION, SIGNALING AND ACTIVATION DEVICES

A1.1. DETECTORS

Table 60: Detectors

Part №	Type	Description
ASD001	smoke detector	with relay output and base, IP40, 0 – 45 °C, EN54
AHD001	heat detector	differential with relay output and base, IP40, -10 – 45 °C, EN54, actuates at 54 °C
AHD002	smoke and heat detector	optical with relay output and base, IP40, 0 – 45 °C, EN54, actuates at 54 °C
AER101	end-of-line resistor	1 kΩ for ASD001, AHD001, AHD002
AHP110	heat probe detector	switching temperature 110 °C, IP67, operating temperature up to 130 °C, with a 2-pin connector and a mounting nut

ASD001

AHD001

AHD002

AER101

AHP110

A1.2. SIGNALLING UNITS

Table 61: Signalling units

Part №	Type	Description
ASU001	sound and light signalling unit	81 dB, CE, 6 - 28 V DC, CE exceeds EN54-3; suitable for indoor, fixed, low vibration installations
ASU002	sound and light signalling unit	high base, 114 dB, IP44, EN54-3/CE/LPCB, 24 V DC, CE exceeds EN54-3; suitable for indoor, fixed, low vibration installations
ASU003	sound and light signalling unit	high base, 101 dB(A), IP65, 18-24 V DC, CE exceeds EN54-3; suitable for indoor, fixed, low vibration installations
ASR001	sounder	multitone with high base, 92 – 112 dB, IP65, CE/VdS, LPCB, 9 – 15 V DC, CE exceeds EN54-3; suitable for indoor, fixed, low vibration installations
ABR001	red xenon beacon	IP65, CE, VdS, 9 – 60 V DC, CE exceeds EN54-3; suitable for indoor, fixed, low vibration installations
ABR002	red led beacon	IP65, CE, R10, 12-24 V DC, -20 to +50 °C, 3 bolt mounting; suitable for outdoor mobile applications
ASB001	sounder	97 dB, IP65, SAE J994 Type C, AMCA, UL, CE, E, 12 – 24 V DC, -40 to +85 °C; suitable for outdoor mobile applications
AWB012	warning buzzer	red LED dots, 12V DC, 80 dB (@1 m), IP54. -20 to +50 °C, stainless steel; suitable for fixed and mobile installations; includes ALA019 label
AWB024	warning buzzer	red LED dots, 24 V DC, 80 dB (@1 m), IP54. -20 to +50 °C, stainless steel; suitable for fixed and mobile installations; includes ALA019 label

ASU001

ASU002

ASU003

ASR001

ABR001

ABR002

ASB001

AWB012 and AWB024

A1.3. ALARM PANELS

Table 62: Alarm panels and accessories

Part №	Type	Description
AAP210	alarm panel	without a fire button for C Series, fully configurable via Wi-Fi, data logging, 9 - 36 V DC, 85 dB, IP67, CE, EMC tested, integrated relay, red anodized aluminium body, 55 mm diameter.
AAP211	alarm panel	with a fire button for C Series, fully configurable via Wi-Fi, data logging, 9 - 36 V DC, 85 dB, IP67, CE, EMC tested, integrated relay, red anodized aluminium body, 55 mm diameter.
AAP310	alarm panel	without a fire button for C Series, preconfigured from factory, data logging, 9 - 36 V DC, 85 dB, IP67, CE, EMC tested, integrated relay, red anodized aluminium body, 55 mm diameter. Can be used for: a) C Series with just one pressure switch b) as a fire warning device
APB210	panel bracket	stainless steel, for AAP210, AAP310 Alarm Panels
ATS002	tamper seal	for manual button on Alarm Panel AAP211, includes adhesive
ABP212	back-up power supply	12 V for AAP alarm panels, includes 1 x 7.0 Ah battery, for indoor use only
ABP224	backup power supply	24 V for AAP alarm panels, includes 2 x 7.0 Ah battery, for indoor use only
ACF001	fuse case	case for external fuse for Alarm Panels AAP210, AAP211 and AAP310
AEF002	fuse	external fuse 2 A for Alarm Panels AAP210, AAP211 and AAP310

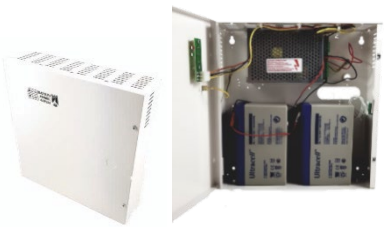
AAP210, AAP310

AAP211

APB210

ATS002

ABP212



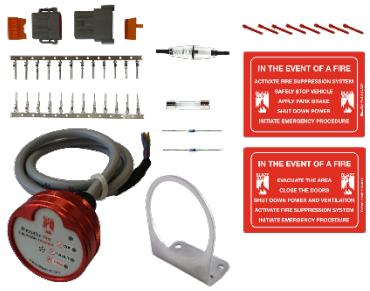
ABP224

ACF001

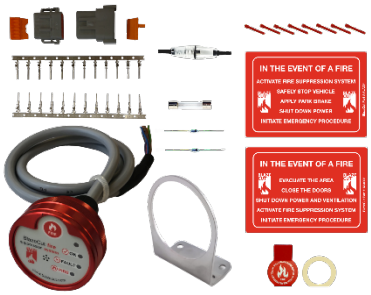
AEF0002

Table 63: Alarm panel kits

Part №	Content
KAAP210	Alarm Panel AAP210 without a fire button, Panel Bracket APB210, 12-pin Connector ADC012, 8x Sealing Plug ADP001, Fuse AEF002, Fuse Case ACF001, 2x End-of-line Resistor AER101, labels ALA004 and ALA005
KAAP211	Alarm Panel AAP210 with a fire button, Panel Bracket APB210, Tamper Seal ATS002, 12-pin Connector ADC012, 8x Sealing Plug ADP001, Fuse AEF002, Fuse Case ACF001, 2x End-of-line Resistor AER101, labels ALA004 and ALA005
KAAP310	Alarm Panel AAP310 without a fire button, Panel Bracket APB210, 6-pin Connector ADC006, 2x Sealing Plug ADP001, Fuse AEF002, Fuse Case ACF001, End-of-line Resistor AER101, label ALA005



KAAP210



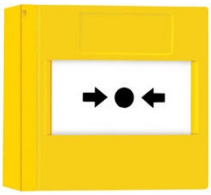
KAAP211

KAAP310

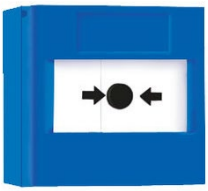
A1.4. ELECTRIC ACTUATORS

Table 64: Electric actuators and accessories

Part №	Type	Description
ARA132-YEL	remote electric actuator	yellow, IP32, -20 – 65 °C, EN54-11
ARA132-BLU	remote electric actuator	blue, IP32, -20 – 65 °C, EN54-11
ARA132-RED	remote electric actuator	red, IP32, -20 – 65 °C, EN54-11
ARC113	plastic cover	for remote electric actuators against accidental activation
ARK113	reset key	spare remote reset key for ARA132-YEL, ARA132-BLU, ARA132-RED



ARA132-YEL



ARA132-BLU

ARA132-RED

ARC113

ARK113

ANNEX 2: PRESSURE MONITORING

A2.1. PRESSURE TRANSDUCER ATA100

Pressure Transducer ATA100 provides full range constant pressure monitoring in the system. It can identify a low pressure or overpressure in the system and notify the operator through an Alarm Panel or other external device.

Depending on the valve type, the Pressure Transducer ATA100 can be installed to the system in several ways described in Chapter A2.2.1.

Table 65: Specifications of pressure transducer ATA100

Parameter	Description
Material of body	stainless steel
Pressure range	0 – 40 bar
Accuracy	0.5 % BFSL
Maximum overpressure	80 bar
Operation voltage	8 – 30 V DC
Power consumption	8 mA
IP rating	IP67
Operation temperature	from -40 °C up to 70 °C
Thread	M10x1 (14 mm with O-ring and filter)
Electrical cable	25 cm length, 3 x 0.75 mm^2

Pressure Transducer ATA100

A2.2. PRESSURE SWITCH APS001-XX

Pressure Switch APS001-xx is a mechanical switch 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 operation. The pressure switch is supplied with a cable connector.

The Pressure Switch APS001-xx will send a signal when the pressure in the system decreases regardless of the cause, in case of fire or accidental activation and rapid decrease of pressure in the system which is below the pre-set value.

Depending on the valve type, the Pressure Switch APS001 can be installed to the system in several ways described in Chapter A2.2.1.

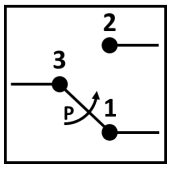
Table 66: Specifications of pressure switch APS001-xx

Parameter	Description		
Material of body	nickel plated steel		
Hysteresis	min. 0.5 bar, max. 1.5 bar		
Switching frequency	max. 100 min-1		
Power rating	Voltage		Current
Resistive load AC-12, DC12	AC 250 V	DC 24 V	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 -30 °C up to 100 °C		
Thread	M10x1 (12.5 mm with O-ring and filter)		

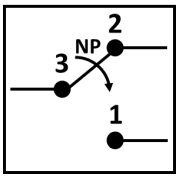
Pressure Switch APS001-xx

Table 67: Versions of APS001-xx for foam agents

Part №	Suitable for	Switch point	Pressure value
APS001-9	antifreeze foam	Fire indication	9
APS001-11	antifreeze foam	Low pressure	11
APS001-12	fluorine-free foam	Fire indication	12
APS001-14	fluorine-free foam	Low pressure	14
APS001-12	standard foam	Fire indication	12
APS001-14	standard foam	Low pressure	14



When supplied and before pressurized (before connected to the valve or end-of-line adapter)



After being connected to the valve or end-of-line device with the system pressurized.

A2.2.1. INSTALLATION OF THE PRESSURE TRANSDUCER OR PRESSURE SWITCH

Pressure monitoring components such as pressure transducers, pressure switches and additional pressure gauges are usually delivered not installed, to prevent them from damaging during transportation. All pressure monitoring components are compatible with M10x1 ports. The M10x1 ports are sealed by a Schrader valve, which closes and opens automatically during removal or installation of the components. The Schrader valve allows to perform these operations even when the system is under pressure. The same principle of sealing is also used on end-of-line adapters and M10x1 adapter FVABM0210 on the cylinder valve.

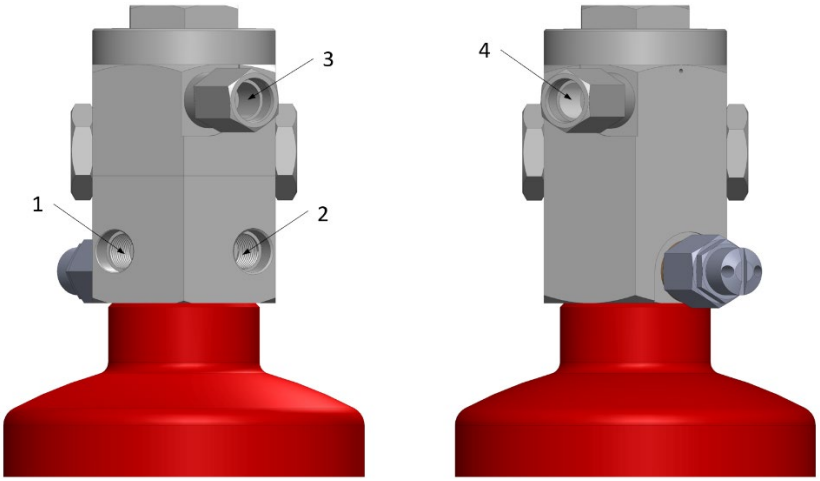
At the time of order, a valve adapter FVABM0210 can be requested to allow for additional M10x1 port for pressure monitoring components.

Suitable outlets for individual components:

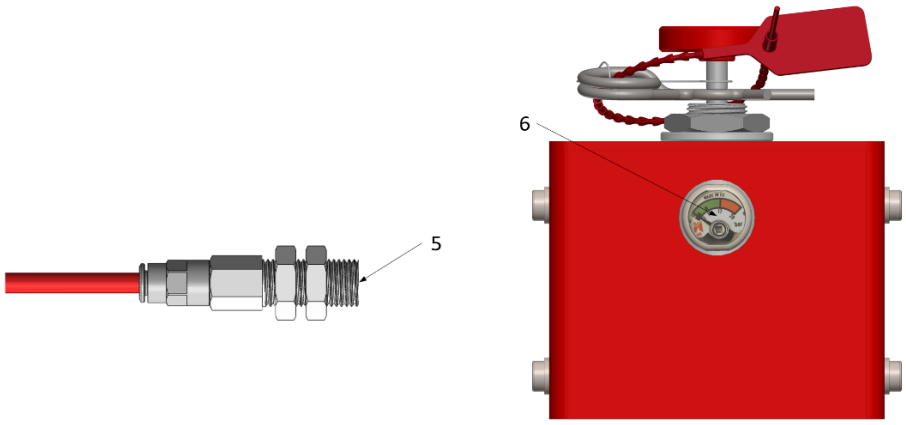
11. first M10x1 port on the cylinder valve
    a) main pressure gauge
    b) Pressure Transducer ATA100
    c) Pressure Switch APS001 (version for monitoring low pressure recommended)
12. second M10x1 port on the cylinder valve
    a) main pressure gauge
    b) Pressure Transducer ATA100
    c) Pressure Switch APS001 (version for monitoring low pressure recommended)
13. front Valve Adapter FVABM0210 (optional component)
    a) Pressure Switch APS001 (version for fire indication recommended)
14. back Valve Adapter FVABM0210 (optional component)
    a) Pressure Switch APS001 (version for fire indication recommended)
15. End-of-line Adapter AEA006 on a BlazeTube
    a) additional pressure gauge
    b) Pressure Transducer ATA100
    c) Pressure Switch APS001 (version for fire indication recommended)
16. Pneumatic Manual Actuator ARA010 or ARA020 (see ANNEX 3 or ANNEX 4)
    a) additional pressure gauge (comes installed as standard)

IMPORTANT!

Main pressure gauge must always be installed in the appropriate outlet on the cylinder valve. It can be uninstalled only momentarily, during maintenance or gauge relocation.



All M10x1 ports on front (left picture) and back (right picture) of a cylinder valve



Additional M10x1 ports on external components

NOTE:

In case of malfunction or disconnection of the pressure monitoring components (Pressure Switch APS001, Pressure Transducer ATA100) the system remains functional. These components are not necessary for its automatic activation in case of fire.

A2.2.2. WARNINGS

If the system is in operation and the BlazeTube detection under pressure, when mounting and dismounting a pressure monitoring component at the end-of-line device, the ball valve on the cylinder valve must be closed, to avoid a false actuation.

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

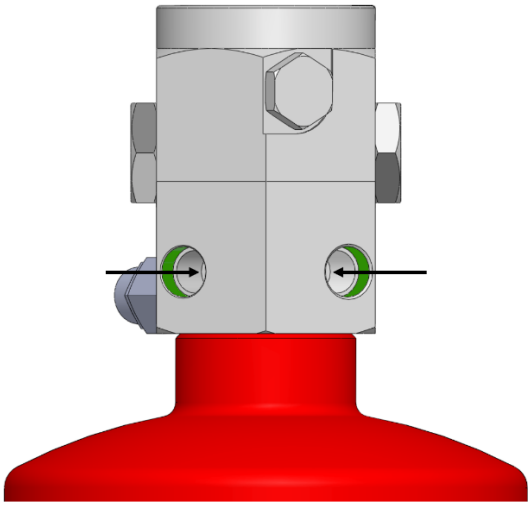
Always place the pressure switch and pressure transducer in the lower part of the risk area to avoid direct flames and heat. The pressure switch cannot be in direct contact or be in immediate proximity with parts which heat to temperatures of more than 80 °C (176 °F) e.g. engine block, engine turbocharger, exhaust pipe, heated parts of inductors etc.

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

When unscrewing a plug or a component from the M10x1 ports, do it right before installation of the new component, in order to prevent dirt from getting into the outlet. To properly install the components and prevent any malfunctions of the system, screw in the components tightly and check for presence of any leaks.

In case a pressure transducer, a pressure switch or a pressure gauge has to be uninstalled from any of the bottom M10x1 ports on the cylinder valve, follow these steps:

1. Uninstall (fully unscrew) the desired component. A small amount of extinguishing agent may be released from the port.
2. Clean up the whole port, mainly the sealing surfaces (green area in the picture) on the cylinder valve with a clean dry cloth.
3. Install the new component or seal the outlet with a FVP1M10 plug.



Bottom M10x1 ports with exposed Schrader valves after component uninstallation

A2.3. ELECTRICAL CABLES AND CONDUITS

For installation of electrical components use the appropriate electrical cables supplied as optional components:

- solenoid – two core electrical cable,
- Pressure Transducer ATA100 – two core electrical cable;
- Pressure Switch APS001-xx – two, three or four core electrical cable.

Table 68: Specifications of cables

Part №	Description	Comment	Length
ASC002	standard cable, 2x0.75 mm², -40°C up to 80 °C, UV stabilized	for standard installations	per metre
ASC004	standard cable 4x0.5 mm², -40°C up to 80 °C, UV stabilized	for standard installations	per metre
ASC008	standard cable 8x0.5 mm², -40°C up to 80 °C, UV stabilized	for standard installations	per metre
ASC010	standard cable 10x0.5 mm², -40°C up to 80 °C, UV stabilized	for standard installations	per metre
ASC102	silicone cable 2x0.75 mm², -60 °C up to 180 °C, UV stabilized, up to 500 V	for installations with high temperatures like in engine compartments	per metre
ASC103	silicone cable 3x0.50 mm², -60 °C up to 180 °C, UV stabilized, up to 500 V	for installations with high temperatures like in engine compartments	per metre
ASC104	silicone cable 4x0.50 mm², -60 °C up to 180 °C, UV stabilized, up to 500 V	for installations with high temperatures like in engine compartments	per metre

Standard cable

Silicone cable

Table 69: Silicone cable kits

Part №	Description
KASC102-005	2-core Silicone cable kit, 5 metres, 15 cable ties, -60 °C up to 180 °C
KASC102-010	2-core Silicone cable kit, 10 metres, 30 cable ties, -60 °C up to 180 °C
KASC102-015	2-core Silicone cable kit, 15 metres, 45 cable ties, -60 °C up to 180 °C
KASC102-020	2-core Silicone cable kit, 20 metres, 55 cable ties, -60 °C up to 180 °C
KASC103-005	3-core Silicone cable kit, 5 metres, 15 cable ties, -60 °C up to 180 °C
KASC103-010	3-core Silicone cable kit, 10 metres, 30 cable ties, -60 °C up to 180 °C
KASC103-015	3-core Silicone cable kit, 15 metres, 45 cable ties, -60 °C up to 180 °C
KASC103-020	3-core Silicone cable kit, 20 metres, 55 cable ties, -60 °C up to 180 °C
KASC104-005	4-core Silicone cable kit, 5 metres, 15 cable ties, -60 °C up to 180 °C
KASC104-010	4-core Silicone cable kit, 10 metres, 30 cable ties, -60 °C up to 180 °C
KASC104-015	4-core Silicone cable kit, 15 metres, 45 cable ties, -60 °C up to 180 °C
KASC104-020	4-core Silicone cable kit, 20 metres, 55 cable ties, -60 °C up to 180 °C

In case of installation in spaces with increased risk of damage due to mechanical interference use the cable conduit with conduit connector to protect the electrical cables.

Table 70: Specifications of conduits

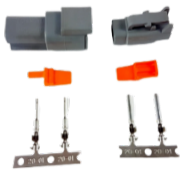
Part №	Description	Length
ACC110	internal Ø 10 mm, -40 °C to 120 °C, UV stabilized	per metre

Cable conduit ACC110

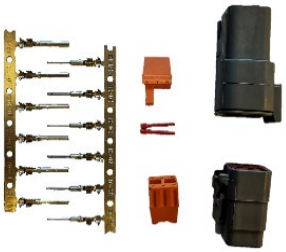
Table 71: Specifications of electrical connectors

Part №	Description	Working temperature
ADP001	sealing plug for Deutsch connectors	-55 °C to +125 °C
ADC002	2-pin Deutsch connector	
ADC006	6-pin Deutsch connector	
ADC012	12-pin Deutsch connector	

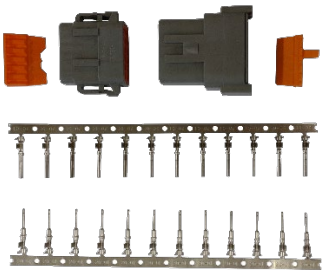
ADP001



2-pin Deutsch connector



6-pin Deutsch connector



12-pin Deutsch connector

ANNEX 3: PNEUMATIC REMOTE ACTUATORS ARA010 AND ARA020

A3.1. BASIC INFORMATION ABOUT THE COMPONENTS

The remote pneumatic actuator is an optional component of the BlazeCut system. The actuator is using a unique double sealing mechanism on the internal shaft that keeps the pressure in the LOP line. It operates on the principle of manual release of pressure from the LOP line after breaking the seals when pressing the knob of the actuator. This results in opening of the piston of the cylinder valve, activating the suppression system and completely releasing the extinguishing agent. This is the same process as during disruption of the BlazeTube detection by effect of fire or heat. After activation, actuator`s pin can be easily reset with no need to replace a burst disc or similar.

The pneumatic remote actuator serves as an end-of-line device and comes with an adaptor G1/8"to M10x1 with internal Schrader valve, which can also be used to pressurize the LOP line. The M10x1 port comes with installed pressure gauge as standard.

Any instructions in this manual regarding the end-of-line adapter apply to remote actuator of the system.

The pressure gauge used on the pneumatic remote actuator must be the same type as the gauge used on the pressure cylinder with the extinguishing agent connected to the same LOP line.

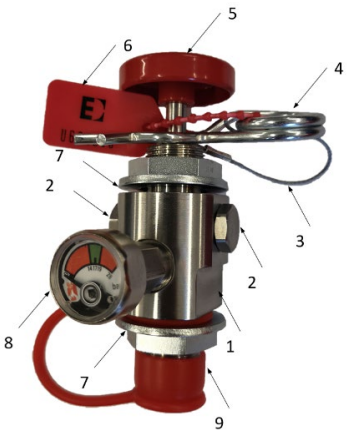
Do not press and pull the red knob with a sealing shaft installed in the actuator unless necessary. Excessive use may result in reduced sealing properties of the assembly.

Remote pneumatic actuator ARA010 and ARA020 work on the same principle and are built from the same components, in addition the ARA020 has comes with a protective steel cover.

The remote actuators are supplied with plugged side ports as standard. To be able to connect the BlazeTube detection to the remote pneumatic actuator a suitable connector must be ordered Table 74.

Additional parts and replacement components for pneumatic remote actuator are listed in Table 74.

Actuator material: stainless steel body, powder coated steel case.



Remote pneumatic actuator bulk ARA010

Remote pneumatic actuator boxed ARA020

1. Body of the remote actuator
2. G1/8” outlet with a valve plug FVP1B02 – for BlazeTube *
3. Securing wire
4. Safety pin
5. Red knob with a label ALA009
6. Plastic lock seal ALS001
7. Mounting nut and washer
8. Pressure gauge mounted on an adaptor FVABM0210
9. Dust cap on a vent

IMPORTANT!

Do not remove the dust cap (9.) from the actuator`s body.

NOTE

* When using a single pneumatic remote actuator on a LOP line, occupy one of the actuator`s G1/8” outlet with a connector and leave the other outlet plugged. For serial connection of multiple actuators, occupy both outlets with connectors.

Table 72: Remote pneumatic actuator connectors

Part №	Description	Working temperature	Working pressure	Material
FBT1BP026-A	outlet connector for BlazeTube Ø 6 mm, G1/8"	-30 to +80 °C	0.9 – 60 bar	body and gripper: nickel-plated brass seals: EPDM
FBT2BP026-A	elbow connector 360° rotation for BlazeTube Ø 6 mm, G1/8"			
FBT3PBP6026-A	Tee connector 360° rotation for BlazeTube, Ø 6 mm, G1/8"			

FBT1BP026-A

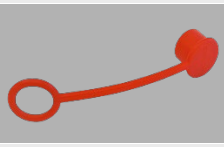
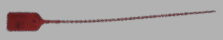
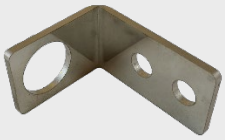
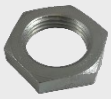
FBT2BP026-A

FBT3PBP6026-A

Table 73: Recommended connector combinations for remote pneumatic actuators

№	Suitable for	Left port	Right port	Connection type
1.	ARA010	FBT1BP026-A	FBT1BP026-A	passthrough
2.	ARA010	FBT1BP026-A	Plug	end-of-line
3.	ARA010	Plug	FBT1BP026-A	end-of-line
4.	ARA010	FBT1BP026-A	FBT2BP026-A	passthrough
5.	ARA010, ARA020	FBT2BP026-A	FBT2BP026-A	passthrough
6.	ARA010, ARA020	FBT2BP026-A	Plug	end-of-line
7.	ARA010, ARA020	Plug	FBT2BP026-A	end-of-line
8.	ARA010	FBT3PBP6026-A	Plug	passthrough
9.	ARA010	Plug	FBT3PBP6026-A	passthrough

Table 74: Remote pneumatic actuator accessories

Part №	Description	Comment	Material
FVP1B02		remote actuator plug G1/8"	stainless steel sealing
ANC002		Cap for remote actuators ARA010/ARA020, -40°C to 180 °C, ID 17 mm	silicone
APR002		Safety pin for remote actuator	galvanized steel
ALS001		Lock seal for remote actuator and ball valve anti tamper security lock	plastic
ANB001		Bracket for firm fixing of remote actuator	stainless steel
AWR001		Flat washer for remote actuator and nozzle assembly, M20	galvanized steel
ANR001		Nut for remote actuator for bulkhead mounting, M20	galvanized steel
ALA009		Ø 33 mm label for remote actuator "PULL PIN FIRE STRIKE KNOB"	-
ALA010		90 x 80 mm label for pneumatic remote actuator box, includes 3 x overlay stickers for agents (foam, powder, gas) "In case of fire • Remove safety pin • Strike knob firmly"	-

A3.2. INSTALLATION OF THE REMOTE ACTUATOR

Always place the remote actuator in the proximity of the protected enclosure so that it is easily accessible when necessary. Do not place it in the area of expected fire, where manual activation after the fire has started, is not possible.

Label the remote actuator visibly with the corresponding label ALA007.

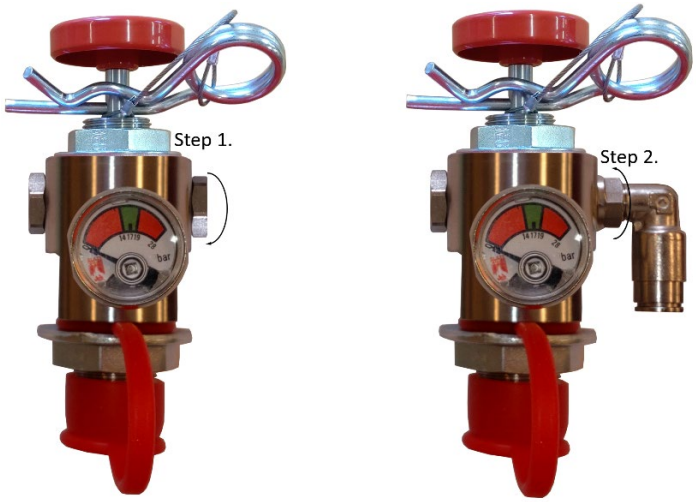
The pneumatic actuator ARA010 is suited for mounting onto a custom bracket, cover, dashboard or wall using the included fastening nuts and washers (see chapter A3.1.1).

The pneumatic actuator ARA020 with a cover is suited to wall mounting through mounting holes. Use suitable and durable screws to firmly secure the cover for the manual actuator (see chapter A3.1.2).

The BlazeTube detection is mounted onto the BlazeTube connector on the remote actuator by slotting into the outlet and pushed by hand all the way in. Always make sure after slotting that the tube is firmly fastened by pulling it gently. Follow all the provisions and instructions in Chapter 7.4.

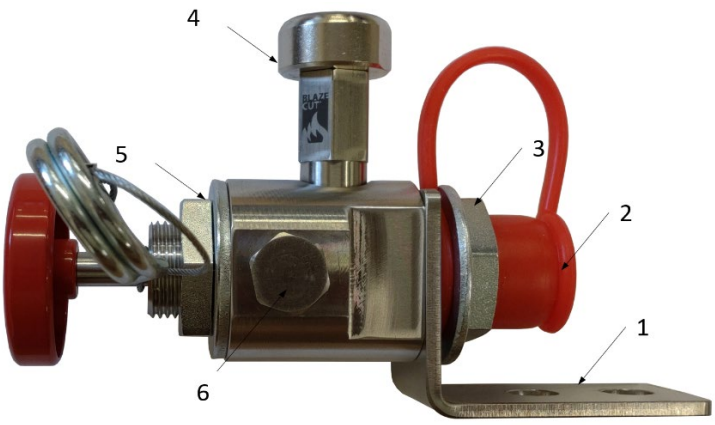
A3.1.1. INSTALLATION OF ARA010

Before installation of the actuator to the desired location, unscrew the plug FVP1B02 from the actuators body and screw in the chosen connector for BlazeTube.



Step 1: Unscrew the plug FVP1B02 from the actuators body;
Step 2: Screw in the chosen connector for BlazeTube.

To install the actuator ARA010 onto a custom bracket, cover, wall etc., follow the installation figures below.

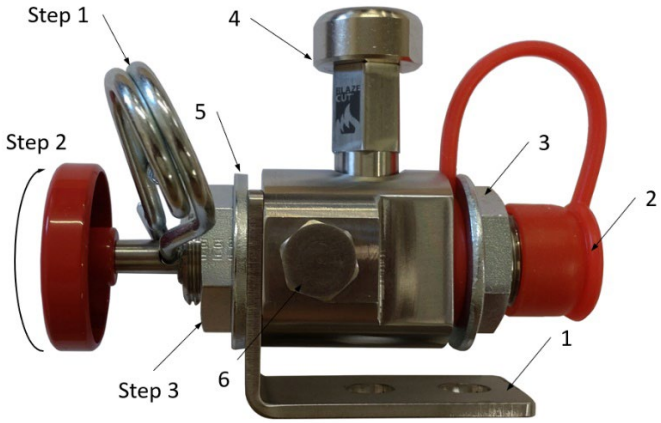


Pneumatic actuator ARA010 – back mounting

1. Bracket (e.g., ANB001) or a solid wall with a hole of Ø 21 mm
2. Dust cap ANC002
3. Nut with a washer – keep the order of components as shown on the figure
4. Pressure gauge – should be positioned so it is easy to read
5. Spare nut and washer – used for other mounting option
6. Plugged outlet for BlazeTube connector

IMPORTANT!

Before mounting in the following position, partial disassembly is required. For the assembly and disassembly of the actuator do not use other tools than mentioned in the procedure, as they can damage functional surfaces of the components.



Pneumatic actuator ARA010 – front mounting

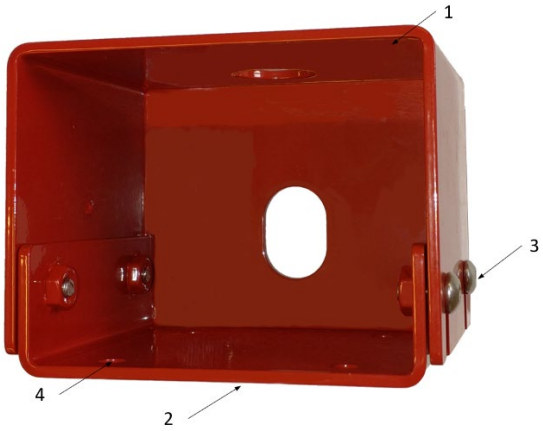
1. Bracket (e.g., ANB001) or a solid wall with a hole of Ø 21 mm
2. Nut with a washer – keep the order of components as shown on the figure
3. Nut and washer for the dust cap fixture
4. Pressure gauge
5. BlazeTube connector

Step 1: Put your finger into the safety pin, to use it as a lever;
Step 2: Grab the red knob with hand and unscrew it;
Step 3: Remove the safety pin, securing wire, nut and washer;
Step 4: Install the actuator to the bracket;
Step 5: Reinstall the washer and nut, and tighten them with a 27 mm spanner;
Step 6: Reinstall the securing wire and safety pin;
Step 7: Put your finger into the safety pin, grab the red knob with hand and screw it on the shaft;
Step 8: Install the bundled plastic lock seal ALS001.

A3.1.2. INSTALLATION OF ARA020

ARA020 is designed for a wall mount installations, for fixed installations in interior to mobile equipment in harsh environment due to its robust construction and stainless-steel materials.

Before installation of the actuator to the desired location, partial disassembly is required.

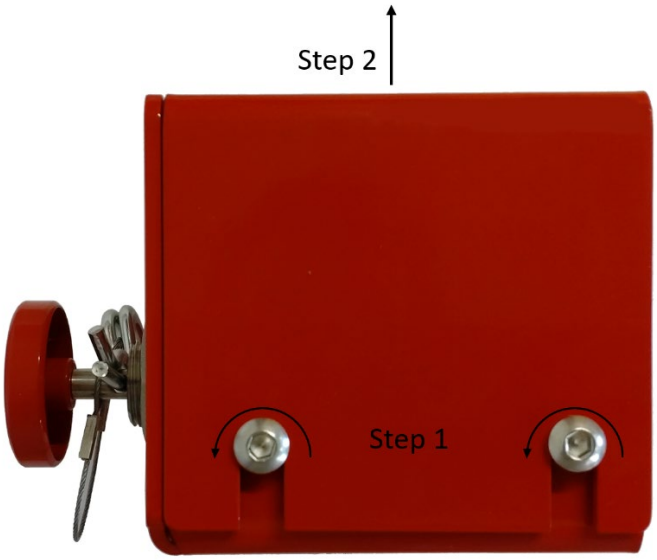


Steel cover of the Actuator ARA020

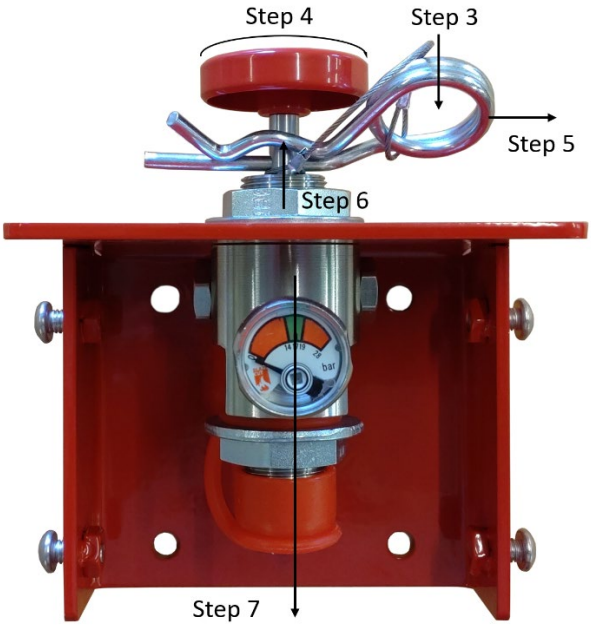
1. Top cover
2. Bottom cover
3. Fasteners for the cover
4. Mounting holes Ø 7 mm (mounting screws are not included)

IMPORTANT!

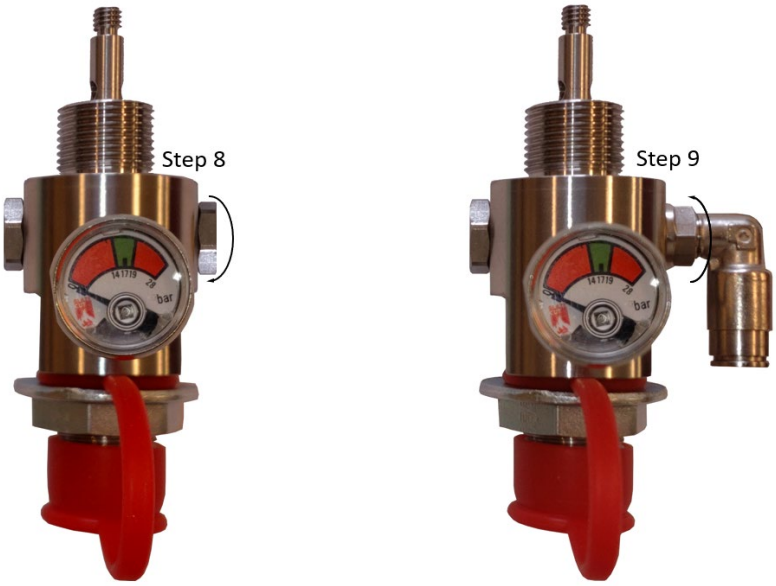
When following Step 3, Step 4 and Step 5, for assembly or disassembly, do not use any tools as they can damage functional surfaces of the components.



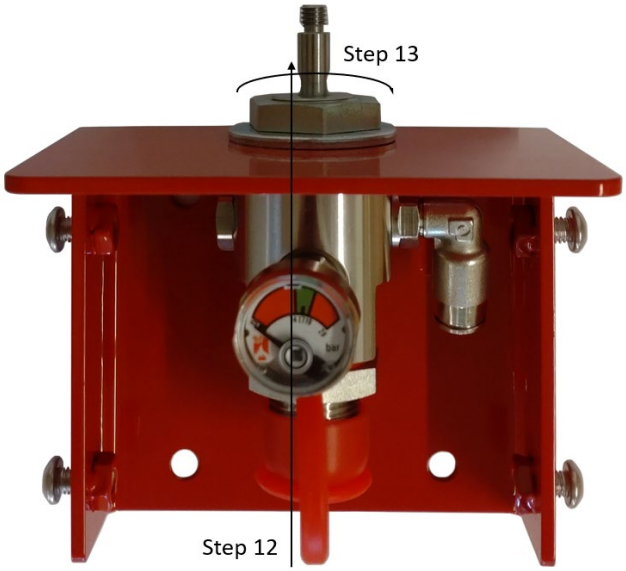
Step 1: Loosen the four screws on the actuator steel cover;
Step 2: Remove the top cover;



Step 3: Put your finger into the safety pin, to use it as a lever;
Step 4: Grab the red knob with hand and unscrew it;
Step 5: Remove the safety pin and securing wire;
Step 6: Remove the nut and the washer;
Step 7: Take out the actuator body from the cover;



Step 8: Unscrew the plug FVP1B02 from the actuators body with 14 mm spanner;
Step 9: Screw in the chosen connector for BlazeTube and tighten it with a 12 mm torque wrench to 10 Nm;
Step 10: Make holes to the wall on the desired location, following the pattern on the bottom cover;
Step 11: Secure the bottom cover to the wall (mounting screws are not included);



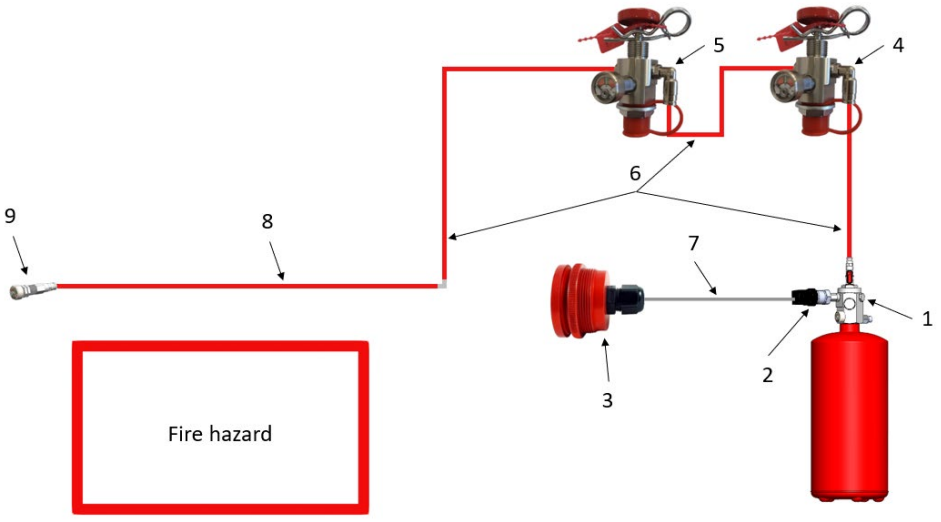
Step 12: Put the actuator body back to the cover;
Step 13: Reinstall the washer and nut, and tighten them with a 27 mm spanner
Step 14: Reinstall the securing wire and safety pin;
Step 15: Put your finger into the safety pin, grab the red knob with hand and screw it on the shaft;
Step 16: Put on the top cover and tighten the for screw on the cover;
Step 17: Install the bundled plastic lock seal ALS001.

A3.1.3. INSTALLATION OF ARA010 OR ARA020 INTO A SYSTEM

The remote pneumatic actuator can be installed in several ways to work in the desired configuration. It can be installed as an end-of-line device, or in between the end-of-line device and the cylinder valve. Using multiple actuators in series and combination of ARA010 with ARA020 is possible.

Table 75: Remote pneumatic actuator configurations

Configuration №	Valve type	Number of LOP lines	Number of pneumatic actuators	Method of connection between pneumatic actuators
1.	20x	1	1	-
2.	20x	2	1	-
3.	20x	1	2	serial
4.	20x	2	2	separate
5.	21x-01	1	1	-
6.	21x-01	1	2	serial
7.	21x-01	2	2	separate



Configuration № 3 of a detection system with pneumatic actuators

1. BlazeCut C Series system with 20x valve
2. Pressure Switch APS001/Pressure Transducer ATA100
3. Alarm panel AAP210
4. Pneumatic actuator ARA010 or ARA020
5. Optional secondary Pneumatic actuator ARA010 or ARA020
6. BlazeTube and BlazeTube connectors outside the fire hazard area
7. Electrical cable
8. BlazeTube monitoring the fire hazard
9. End-of-line adapter AEA006 or Pneumatic actuators ARA010 or ARA020

A3.3. ACTIVATION OF THE REMOTE ACTUATOR

The remote actuator activates the system by releasing pressure from the LOP line after breaking the seals maintaining pressure in the LOP line when pressing the knob of the actuator. Description of the activation is shown on the figure below.

Procedure of manual activation

Step 1: Firmly pull the safety pin and tear the plastic lock seal;
Step 2: Strike the red knob.

Do not manually activate the system without reason. Use manual activation only in case of reasonable suspicion of fire in the protected enclosure.

Do not manually activate the system if persons are present in the protected enclosures.

If the system is activated wait for its activity to finish. Do not enter the protected enclosures and do not open the covers of the protected enclosure during the activity of the system.

A3.4. PRESSURIZATION OF THE LOP LINE

Pressurization can be performed through the pneumatic remote actuator on end of the BlazeTube detection using a charging adapter ATC001. The pneumatic remote actuator has an outlet with thread M10x1 and contain a Schrader valve.

This valve closes and opens automatically during removal or installation of the charging adapter or the pressure gauge. It is possible to install and remove these components even when the tube is under pressure.

Proceed carefully and strictly follow the following steps. Fasten the connectors of the tubes, charging adapter and BlazeTube detection firmly and inspect. Their accidental disconnecting during pressurization would release the extinguishing agent into the system.

Never connect or disconnect the charging adapter to the BlazeTube detection if the ball valve of the outlet of the BlazeTube detection on the cylinder valve is open.

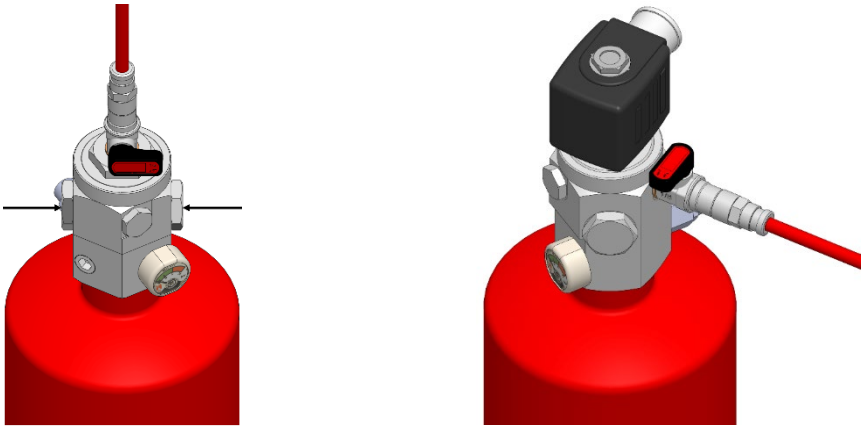
Due to risk of activation during pressurization of the system it is necessary to seal the outlets of the discharge networks on the cylinder valve. Remove the discharge networks and seal the outlets with the G3/8" valve plugs.

Pressurize the BlazeTube detection correctly. If the pressure in it is lower than in the cylinder, the valve piston of the cylinder could open and extinguishing agent could be released when opening the ball valve.

A3.4.1. PRESSURIZATION PROCEDURE OF THE CYLINDER AND THE DETECTION SYSTEM – VALVES 201, 202, 211-01, 212-01 THROUGH THE REMOTE ACTUATOR

Proceed according to instructions in this chapter to pressurize the cylinder and BlazeTube detection at once.

For pressurization of the LOP line only, skip steps 6 and 7.



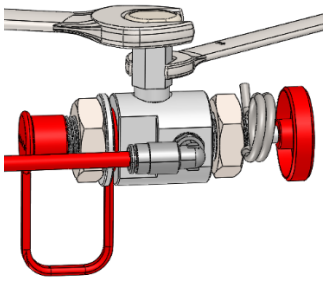
Valve 201 (left) and valve 211-01 (right) with plugged ports and closed ball valves

Step 1:

Make sure that the discharge ports are plugged with valve plugs FVP1B06, to avoid loss of agent in case of an accidental discharge when pressurising.

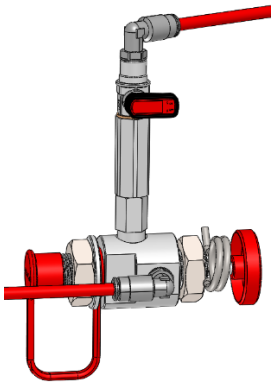
Make sure that the ball valve on the cylinder valve is closed

Read and write down the value of pressure from the cylinder valve.



Step 2:

Remove the pressure gauge from the charging port of the remote actuator.



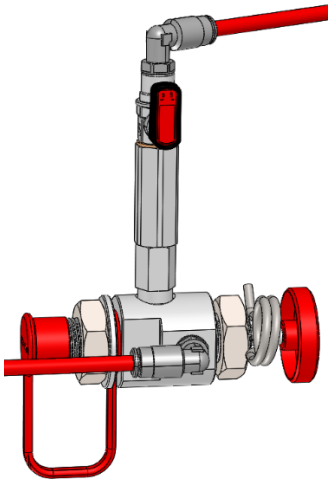
Step 3:

Make sure the ball valve on the charging adapter is closed.

Mount by hand the charging adapter ATC001 to the remote actuator's M10x1 port by rotating clockwise. Tighten the adapter properly.

Step 4:

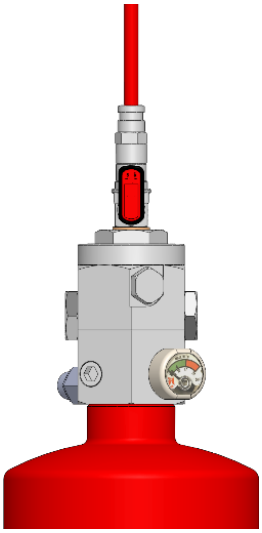
Set the regulator on the source of N_2 to the desired value (**16 bar at 20 ± 3 °C ambient temperature**). Setting must be at least 1 bar higher than the pressure in the cylinder. Graph of relationship between temperature and pressure in the cylinder is show in Chapter 4.1. Open the regulator valve.



Step 5:

Slowly open the ball valve of the charging adapter and pressurize the LOP line first.

During pressurization hissing can be heard. When the sound stops, pressurization is finished. Keep the ball valve open for at least 30 seconds to stabilize the pressure in the LOP line.

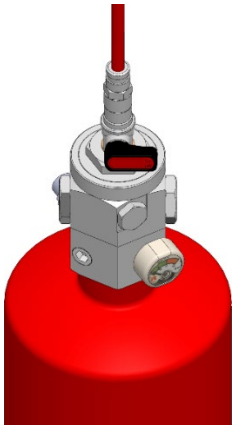


Step 6 (skip if pressurizing only the LOP line):

Slowly open the ball valve on the cylinder valve and pressurize the cylinder.

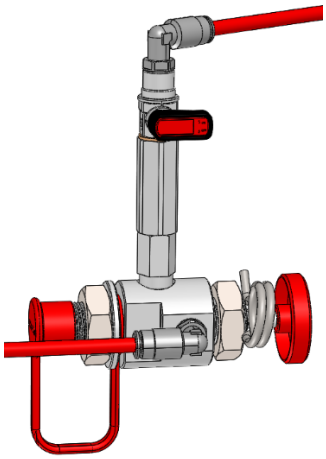
During pressurization hissing can be heard. When the hissing stops, keep the valve open for at least 30 seconds to stabilize the pressure.

Close the ball valve on the cylinder valve, shake the cylinder several times and repeat Step 6 until the pressure stabilises at the desired value.



Step 7 (skip if pressurizing only the LOP line):

Close the ball valve on the cylinder valve.

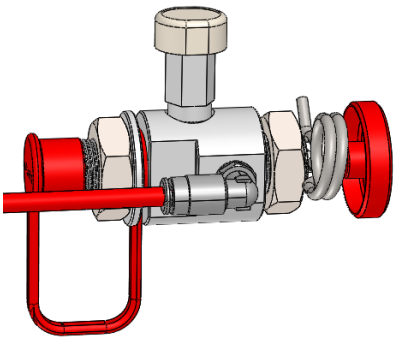


Step 8:

Close the ball valve on the charging adapter.

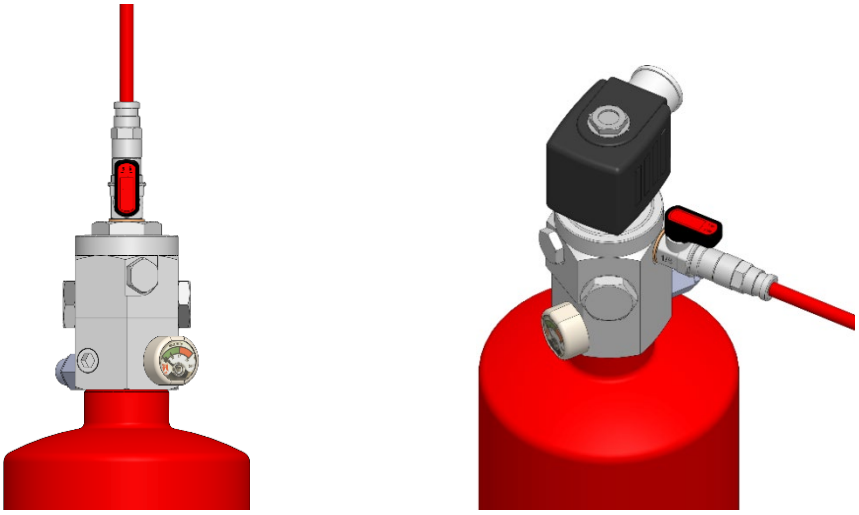
Step 9:

Unscrew the charging adapter from the M10x1 port of the remote actuator (with size 16 spanner). You can use size 14 spanner on the valve adapter to push clockwise while unscrewing the charging adapter.



Step 10:

Mount the pressure gauge back. Tighten it with spanner 22 mm.



Valve 201 (left) and valve 211-01 (right) with plugged ports and opened ball valves

Step 11:

If the pressure is not decreasing, very slowly open the ball valve on the cylinder valve. Pressures in the tube and the cylinder will equalise. Wait approximately 30 seconds.

Follow additional steps from Chapter 7.5.3.

Since this moment the cylinder and the BlazeTube detection are connected in one pressure unit. Proceed carefully not to damage the BlazeTube detection. Its damage would cause activation of the system and release of extinguishing agent.

Do not try to remove the BlazeTube detection from the BlazeTube outlet on the cylinder valve or remove the end-of-line adapter if the BlazeTube is under pressure and the ball valve is open.

Fast and careless opening of the ball valve may activate the system and release extinguishing agent.

ANNEX 4: ELECTRIC REMOTE ACTUATORS ARA110 AND ARA120

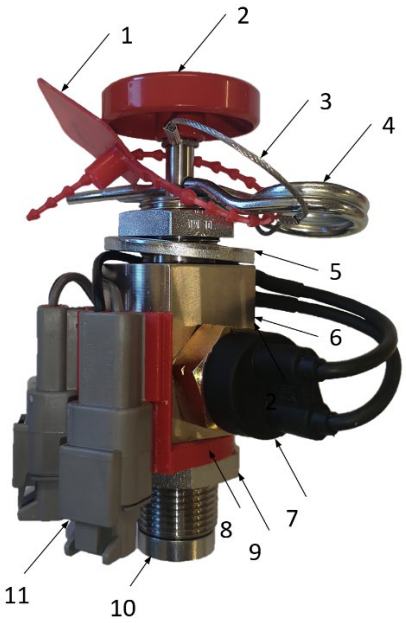
A4.1. BASIC INFORMATION ABOUT THE COMPONENTS

The remote electric actuator is an optional component of the BlazeCut system. It operates on the principle of displacing a ball in a switch, which sends a signal to the solenoid on the cylinder valve, when pressing the knob of the actuator. This results in opening of the piston of the cylinder valve, activating the suppression system and completely releasing the extinguishing agent. This is the same process as during disruption of the BlazeWire (heat detector, smoke detector or heat probe) by effect of fire or heat.

Remote pneumatic actuator ARA110 and ARA120 work on the same principle and are built from the same components, in addition the ARA120 has comes with a protective steel cover.

Additional parts and replacement components for electric remote actuator are listed in Table 78.

Actuator material: stainless steel body, powder coated steel case.

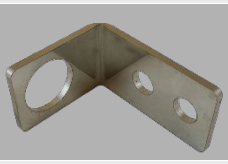
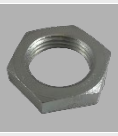


Remote electric actuator bulk ARA110

Remote electric actuator boxed ARA120

1. Plastic lock seal ALS001
2. Red knob
3. Securing wire
4. Safety pin
5. Mounting nut and washer
6. Body of the remote actuator
7. Ball switch
8. Connector holder
9. Securing nut for the connectors holder
10. Actuator plug FVP1B04
11. Electrical connectors

Table 76: Remote electric actuator accessories

Part №	Description	Comment	Material
APR002		Safety pin for remote actuator	galvanized steel
FVP1B04		Plug G1/4” for electric actuator ARA110, ARA120	galvanized steel, sealing
ALS001		Lock seal for remote actuator and ball valve anti tamper security lock	plastic
ANB001		Bracket for firm fixing of remote actuator	stainless steel
AWR001		Flat washer for remote actuator and nozzle assembly, M20	galvanized steel
ANR001		Nut for remote actuator for bulkhead mounting, M20	galvanized steel
ALA009		Ø 33 mm label for remote actuator “PULL PIN FIRE STRIKE KNOB”	
ALA011		90 x 80 mm label for electric remote actuator box, includes 3 x overlay stickers for agents (foam, powder, gas) “In case of fire • Remove safety pin • Strike knob firmly”	

A4.2. INSTALLATION OF THE REMOTE ACTUATOR

Always place the remote actuator in the proximity of the protected enclosure so that it is easily accessible when necessary. Do not place it in the area of expected fire, where manual activation after the fire has started, is not possible.

Label the remote actuator visibly with corresponding label ALA007.

The electric actuator ARA110 is suited for mounting onto a custom bracket, cover, dashboard or wall using the included fastening nuts and washers (see chapter A4.2.1).

The electric actuator ARA120 with a cover is suited to wall mounting through mounting holes. Use suitable and durable screws to firmly secure the cover for the manual actuator (see chapter A4.2.2).

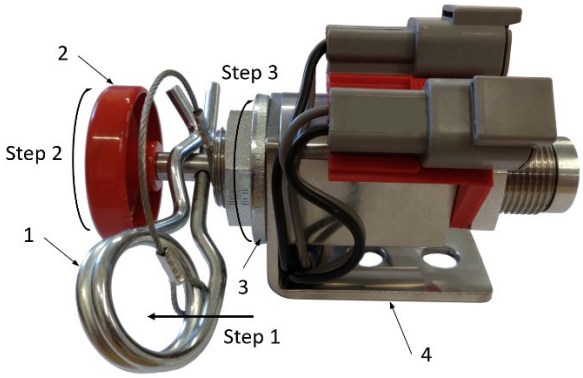
A4.2.1. INSTALLATION OF ARA110

IMPORTANT!

Before mounting in the following position, partial disassembly is required. For the assembly and disassembly of the actuator do not use other tools than mentioned in the procedure, as they can damage functional surfaces of the components.

When mounting the actuator onto a custom bracket, cover, wall etc., follow the installation figures below.

Before mounting in the following position, partial disassembly is required. For the disassembly do not use any tools, as they can damage the surfaces of the components.



Electric actuator ARA110 – front mounting

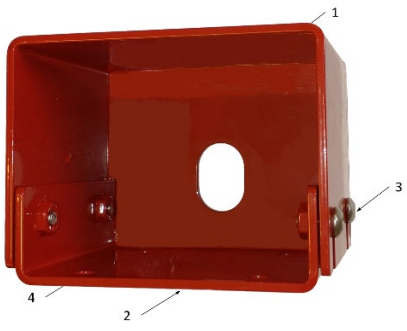
8. Safety pin
9. Red knob
10. Nut and washer – keep the order of components as shown on the figure
11. Bracket (e.g., ANB001) or a solid wall with a hole of Ø 21 mm

Step 1: Put your finger into the safety pin, to use it as a lever;
Step 2: Grab the red knob with hand and unscrew it;
Step 3: Remove the safety pin, securing wire, nut and washer;
Step 4: Install the actuator to the bracket;
Step 5: Reinstall the washer and nut, and tighten them with a 27 mm spanner;
Step 6: Reinstall the securing wire and safety pin;
Step 7: Put your finger into the safety pin, grab the red knob with hand and screw it on the shaft;
Step 8: Install the bundled plastic lock seal ALS001.

A4.2.2. INSTALLATION OF ARA120

ARA120 is designed for a wall mount installations, for fixed installations in interior to mobile equipment in harsh environment due to its robust construction and stainless-steel materials.

Before installation of the actuator to the desired location, partial disassembly is required.

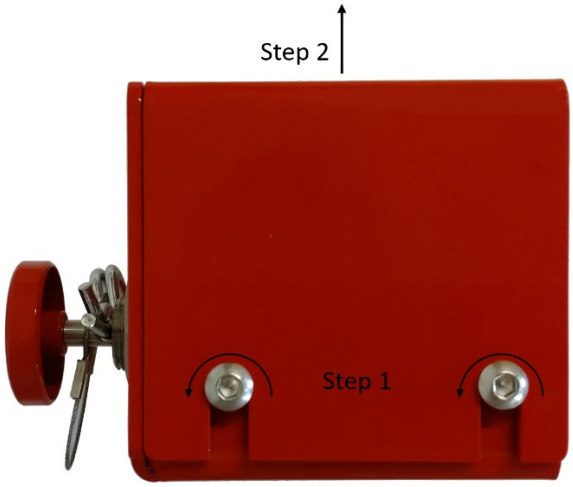


Steel cover of the Actuator ARA120

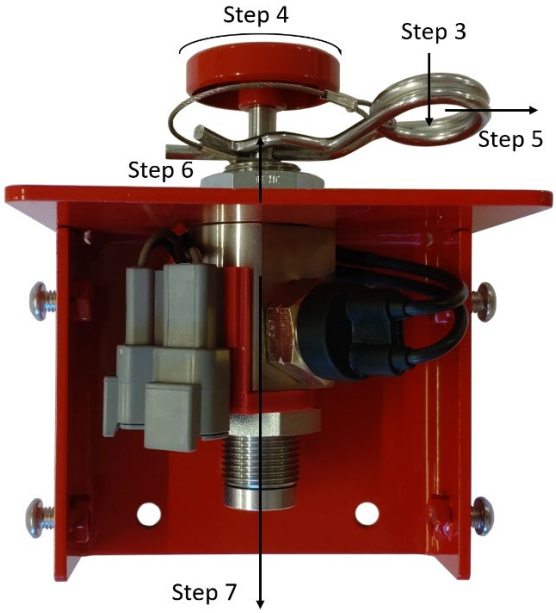
1. Top cover
2. Bottom cover
3. Fasteners for the cover
4. Mounting holes Ø 7 mm (mounting screws are not included)

IMPORTANT!

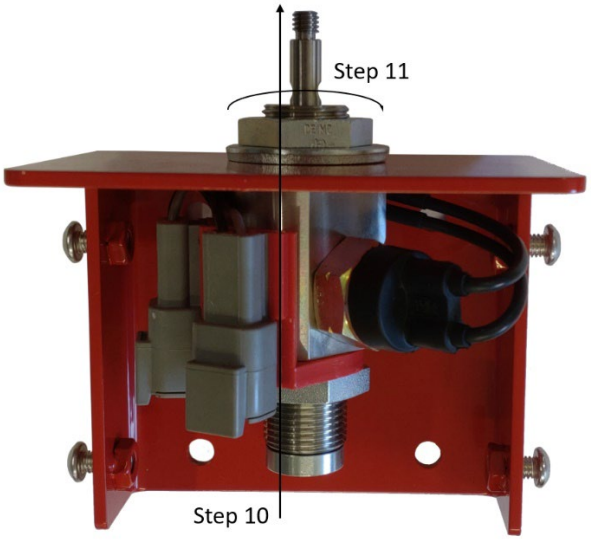
When following Step 3, Step 4 and Step 5, for assembly or disassembly, do not use any tools as they can damage functional surfaces of the components.



Step 1: Loosen the four screws on the actuator steel cover;
Step 2: Remove the top cover;



Step 3: Put your finger into the safety pin, to use it as a lever;
Step 4: Grab the red knob with hand and unscrew it;
Step 5: Remove the safety pin and securing wire;
Step 6: Remove the nut and the washer;
Step 7: Take out the actuator body from the cover;
Step 8: Make holes to the wall on the desired location, following the pattern on the bottom cover;
Step 9: Secure the bottom cover to the wall (mounting screws are not included);



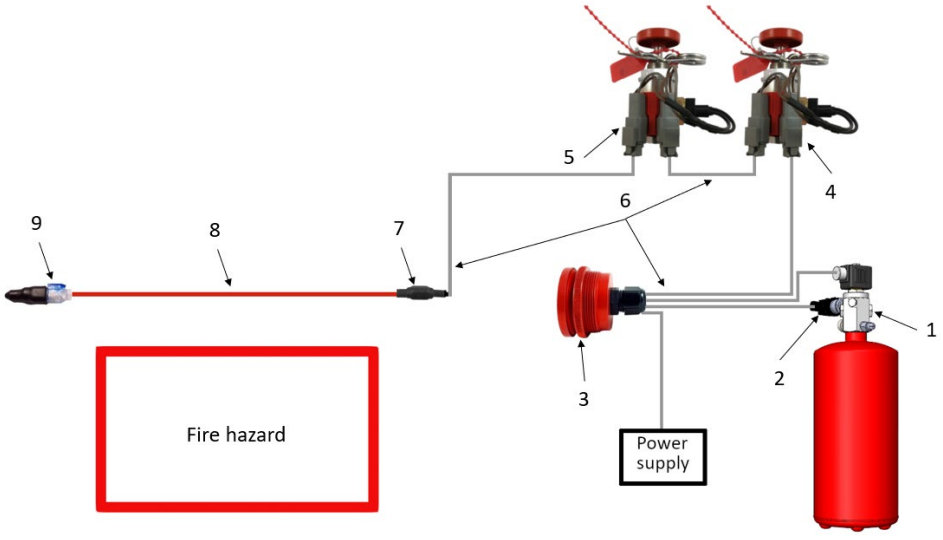
Step 10: Put the actuator body back to the cover;
Step 11: Reinstall the washer and nut, and tighten them with a 27 mm spanner
Step 12: Reinstall the securing wire and safety pin;
Step 13: Put your finger into the safety pin, grab the red knob with hand and screw it on the shaft;
Step 14: Put on the top cover and tighten the for screw on the cover;
Step 15: Install the bundled plastic lock seal ALS001.

A4.2.3. INSTALLATION OF ARA110 OR ARA120 INTO A SYSTEM

The remote electric actuator can be installed in several ways to work in the desired configuration. It can be installed at the end of the LHD line, or in between the end-of-line resistor and the cylinder valve. Using multiple actuators in series and combination of ARA110 with ARA120 is possible.

Table 77: Remote pneumatic actuator configurations

Configuration №	Valve type	Number of LHD lines or el. cables	Number of electric actuators	Method of connection between electric actuators
1.	21x	1	1	-
2.	21x	1	2	serial
3.	21x	2	2	separate



Configuration № 2 of a detection system with electric actuators

1. BlazeCut C Series system with 211 or 212 valve
2. Pressure Switch APS001/Pressure Transducer ATA100
3. Alarm panel
4. Electric actuator ARA110
5. Optional secondary Electric actuators ARA110 or ARA120
6. Electrical cable
7. Electrical splice AES3550-2
8. BlazeWire or detector
9. End-of-line resistor AER001

Other configuration options are possible. Contact your supplier of the BlazeCut system for more information.

A4.3. ACTIVATION OF THE REMOTE ACTUATOR

It operates on the principle of press/release of a ball in a ball switch, which sends a signal to the solenoid, when the strike knob is pressed. Description of the activation is shown on the figure below.

Procedure of manual activation

Step 1. Pull the safety pin from the actuator
Step 2. Strike the red knob

Do not manually activate the system without reason. Use manual activation only in case of reasonable suspicion of fire in the protected enclosure.

Do not manually activate the system if persons are present in the protected enclosures.

If the system is activated wait for its activity to finish. Do not enter the protected enclosures and do not open the covers of the protected enclosure during the activity of the system.

ADDITIONAL NOTES

Please note any suggestions for BlazeCut to improve our manuals and email us at technical@blazecutgroup.com