

OPERATING MANUAL

DRILL-X

Water-powered drill-extinguisher

Version: DX1



**Translation of the original version
of the operating manual**

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Manufacturer

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SYNERGY FROM EXPERIENCE AND INNOVATION

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Our products are intended for all users equally. In order to address them all, we aim to formulate our documents in a gender-neutral manner.

In order to help us improve, we ask you to send us your suggestions about this operating manual. This gives us the chance to provide you with consistent high quality and serves our internal quality management.

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Purpose of the operating manual

Before operating the drill-extinguisher for the first time or if you are assigned to work on the drill-extinguisher, you must read the operating manual.

How to use and handle the drill-extinguisher described below is not self-explanatory and is explained in detail in the operating manual. Pay particular attention to *Section 2 "Safety" on page 19 and the subsequent sections*.

Operating manual

The operating manual helps you properly, effectively and safely use the drill-extinguisher as intended. Therefore, read the following section carefully. Refer to the section that is applicable to you if necessary.

Residual risks

The operating manual informs and warns you of residual risks, against which the design and preventive measures are not or not fully effective.

Target group

The target group for this operating manual are individuals currently trained to use respirators when fighting fires. This target group must have successfully completed at least three training sessions on the drill-extinguisher in accordance with the operating manual. In addition, two practical training sessions must be held each year to ensure safe use during operation.

The user must fully master the drill-extinguisher in the event of use. The user must be physically and mentally suited to use the drill-extinguisher.

Which section is for whom?

Section	Staff qualification
• Company details • Purpose of the operating manual • Orientation in the operating manual	People responsible and users
<i>1 Identification</i>	People responsible and users
<i>2 Safety</i>	People responsible and users
<i>3 Transport and storage</i>	People responsible and users
<i>4 Design and scope of delivery</i>	People responsible and users
<i>5 Use and function</i>	People responsible and users
<i>6 Operation</i>	People responsible, users, trained people
<i>7 Troubleshooting</i>	People responsible, users, trained people
<i>8 Cleaning and maintenance</i>	People responsible, users, trained people
<i>9 Disposal</i>	People responsible, users, trained people
<i>10 Appendix</i>	People responsible, users, trained people

Orientation in the operating manual

Depiction of general pictograms

This operating manual contains the following pictograms (information symbols):

Pictogram	Description
	Important information This pictogram indicates important additional information.
• -	Level 1 and level 2 bullet points Lists without a specific sequence.
	Instruction This pictogram indicates an instruction and precedes an active action that must be taken by the person working. Several instructions in sequence are numbered according to their order.
	Result of an instruction This pictogram indicates the result of an instruction. The action is therefore complete.

NOTICE	
	Read the operating manual carefully prior to using the drill-extinguisher. Keep for future reference.

Depiction of warning notices

When operating the drill-extinguisher, actions that can pose hazards must sometimes be taken. These dangerous actions are prefixed with warning notices that must always be observed.

NOTICE

Observe all warning notices on the drill-extinguisher and in the documentation, and take particular care in these situations. Furthermore, inform other people who are working on or with the drill-extinguisher of all warning notices.

Warning notices such as mandatory actions and prohibitions are for your own safety!

Structure of warning notices in the operating manual

Step	Information	Contents	Example
1	Hazard level	Severity and classification of the hazard using a signal word and a pictogram.	WARNING 
2	Type and source of hazard	Which type of hazard occurs and what causes it.	Risk of injury due to rotating components.
3	Possible consequences of the hazard	What will or may happen if the warning is not heeded?	Fingers and hands may be seriously injured. Hair may be drawn in.
4	Measures to prevent or avoid the hazard	What should you do? What should you not do? Which safety measures are to be taken?	• Do not wear jewellery. • Tie long hair back. • Do not wear loose clothing.

Classification of hazard levels (signal words) in warning notices

Hazard level (signal word)	Meaning and consequences of non-compliance	Warning notice
DANGER	Unavoidable impending hazard that causes severe bodily injury or death .	
WARNING	Potentially hazardous situation that may cause severe bodily injury or death .	
CAUTION	Potentially hazardous situation that may cause minor bodily injury .	
NOTICE	Situation that can cause potential damage to the machine . Helpful user tips .	

Possible symbols in an operating manual

Warning symbols warn of hazard locations, risks and obstacles.

			
Warning of hazard location	Warning of hazardous electrical voltage	Warning of being drawn in	Warning of the risk of being drawn in
			
Warning of a hot surface	Warning of injuries or severed fingers	Warning of a suspended load	Warning of an increased risk of fire

Mandatory action symbols are for accident prevention

				
General mandatory action symbol	Secure equipment to prevent it being switched on	Wear a dust mask	Read the operating manual	Wear safety goggles
				
Wear ear protection	Wear a hard hat	Wear protective gloves	Wear safety shoes	

1 Identification

1.1 Device identification

Machine type: water-powered drilling extinguishing device DRILL-X

Version: DX1

Serial number: _____

1.2 Manufacturer specifications

Company headquarters	SYNEX TECH GmbH
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1.3 Type plate

The type plate uniquely identifies each drill-extinguisher. The drill-extinguisher has one type plate. This is applied to the side of the drill-extinguisher.

Item



Type plate



No	Designation
1	CE mark
2	Maximum pressure
3	Series designation
4	Name and address of the manufacturing company
5	Year of manufacture (the first two numbers of the series designation)
6	Machine designation
7	Revision number

1.4 Declaration of conformity

EC DECLARATION OF CONFORMITY

The manufacturer

SYNEX TECH GmbH, Gschwandt 163, 4822 Bad Goisern, Austria

We hereby declare under our sole responsibility that the machine described below complies with all relevant provisions of the applicable legislation (hereinafter), including any amendments thereto in force at the date of the declaration. The sole responsibility for issuing this declaration of conformity lies with the manufacturer. This declaration relates only to the machine in the condition in which it was placed on the market; parts and/or modifications subsequently fitted by the end user are not taken into account.

Designation: DRILL-X

Characteristic: The drilling-extinguishing device is a hydraulically driven drilling machine in combination with an extinguishing lance.

Series identification: DX1

The following **legal regulations** have been applied:

Machinery Safety Regulation MSV 2010
(Austrian implementation of the Machinery Directive 2006/42/EC)

The following standards were applied:

- EN ISO 12100:2010 - Risk assessment and risk reduction
- EN ISO 13857:2019 - Safety distances
- EN ISO 13854:2020 - Minimum gaps to avoid crushing of parts of the human body
- EN ISO 14120:2015 - Guards and protective devices
- EN ISO 11148-3:2012 - Hand-held non-electric power tools
- EN ISO 5349-1:2001 - Mechanical vibration

Name and address of the authorized department compiling the technical documentation:

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Bad Goisern, 8.5.2024


Wilfried Winterauer, General Manager

2 Safety

2.1 Due diligence



Important information

The drill-extinguisher was planned, designed and built in accordance with current laws, directives, standards and technical specifications. A risk assessment was also performed. The drill-extinguisher is state of the art and provides a high level of safety. You can ensure safety in practice by observing and complying with due diligence, safety regulations and occupational health and safety.

NOTICE

In addition to the safety instructions in this operating manual, comply with the safety, accident prevention and environmental protection regulations for the area of application. These include: national laws, directives and regulations, fire service regulations, specific training regulations from the fire service, personal protective equipment regulations, firefighting service directives, the highway code, as well as fire prevention and disaster control laws.



The owning organization must ensure that the people present read and understand the operating manual.

The owning organization must define competences, responsibilities and monitoring for the users.



The owning organization is responsible for sufficient training, practice and documentation in accordance with the applicable regulations. Ensure that only people with technical knowledge operate the product.

We recommend that the owning organization organizes trainings based on the professional qualifications of the users. Participation in the training, receipt of documents as well as an understanding of them must be confirmed in writing.

Technical condition of the water-powered drill-extinguisher

The operating organization must observe and, if necessary, document the following points in order to operate the drill-extinguisher safely:

- Use the drill-extinguisher as intended.
- Check the drill-extinguisher to ensure that it is in perfect technical condition prior to use.
- Check safety equipment on a monthly basis to ensure that it is functioning.
- Do not alter, modify or change the drill-extinguisher without authorisation.
- The drill-extinguisher must comply with the local fire service regulations.
- Maintain the drill-extinguisher at the prescribed intervals.
- Keep the operating manual complete, legible and freely accessible.

! DANGER**Danger due to missing, illegible operating manual**

This operating manual contains important information regarding safe operation of the drill-extinguisher.

If the operating manual is not available or is illegible, death, injuries or damage to the equipment can occur.

- Store the operating manual so that it is freely accessible.
- Check the operating manual monthly to ensure that it is complete and legible.

! DANGER**Improper use of the drill-extinguisher**

A failure to observe this operating manual can have irreversible and serious effects on health or cause life-threatening injuries up to and including death. Significant damage to property may also occur.

- Read the operating manual prior to start-up.
- Use the drill-extinguisher in accordance with the intended use.
- Comply with personnel qualifications.
- Only operate the drill-extinguisher when the safety equipment is functioning.
- Never interfere with safety equipment.
- Do not make any unauthorized modifications.

! WARNING**Danger due to removal of or interference with safety equipment**

Removal of or interference with safety equipment can cause serious injuries or significant damage to property.

- Do not remove any safety equipment.
- Do not interfere with safety equipment.
- Inspect all safety equipment at least once per month.

2.2 General occupational safety

2.2.1 Personnel qualifications

Target group

The target group for this operating manual are individuals currently trained to use respirators when fighting fires.

People in the target group can be trained to become trained and qualified users.

Trained and qualified users

Individuals in the target group must have completed one theoretical training session and three practical training sessions on the drill-extinguisher prior to using it for the first time. We also recommend at least two practical training sessions per year to ensure safe use during operation. The user must fully master the drill-extinguisher in the event of use. This person must be physically and mentally suited to using the drill-extinguisher.

Trained and qualified people

- Are individuals currently trained to use respirators when fighting fires and who have been instructed and trained on the drill-extinguisher.
- Use and operate the drill-extinguisher for its intended purpose.
- Have received information from the owning organization regarding possible dangers when handling the drill-extinguisher.
- Must have been trained using the operating manual and recurring practical training sessions.
- Must be physically and mentally suitable. Underage people and people without qualified training are not permitted to use the drill-extinguisher in a firefighting situation.
- Have knowledge of the applicable, relevant standards and regulations.
- Are able to evaluate the work assigned to them thanks to their professional training.
- Independently recognise potential dangers and take preventative measures.
- Are permitted to use the drill-extinguisher in a firefighting situation.

Training and qualifications

users must have completed at least three training sessions on the drill-extinguisher prior to using it for the first time. The user must then receive training on the drill-extinguisher at least twice per year.

Training on the drill-extinguisher must comply with the intended usage and must be safely and successfully completed three times according to the firefighting situation (with respirator).

NOTICE

A respirator must be worn in firefighting situations and during training exercises.

A respirator is not prescribed for theoretical training sessions and practical training sessions on the appliance (without extinguishing).

Operating errors due to a lack of qualifications can cause serious accidents and affect the success of the firefighting operation. Qualified training and continuous, consistent exercises in the operating procedures enable safe work in the event of fire. However, using the DRILL-X does not guarantee overall firefighting safety. A single training session is not sufficient!

The owning organization is responsible for sufficient training and practice in accordance with the operating manual and the applicable regulations. Ensure that only people with technical and specialist knowledge and sufficient training operate the drill-extinguisher.

The users must fully master and understand the drill-extinguisher.

2.2.2 Personal protective equipment (PPE)

The users are obliged to wear appropriate personal protective equipment (PPE) in accordance with the applicable directives and regulations. The owning organization must provide any required PPE. The owning organization must ensure that the users use the PPE properly.

NOTICE

Personal protective equipment (PPE) in accordance with local fire service regulations and European standards (excerpt here):

- EN 469 Clothing
- EN 1486 Protective clothing for fire-fighters
- EN 702 Protective clothing - protection against heat and flame
- EN ISO 15025 Protective clothing - protection against flame
- EN 367 Protective clothing; protection against heat and flames
- ISO 17493:2016 Clothing and equipment for protection against heat
- EN ISO 6942 Protective clothing - protection against heat and fire
- EN 340 Protective clothing
- EN 14052 Helmets
- EN 443 Helmets for fire fighting
- EN 13911 Fire hoods
- EN 659 Protective gloves for firefighters
- EN 420:2003 Protective gloves
- EN 15090 Safety footwear
- EN ISO 20344 PPE - Footwear
- EN ISO 20345 PPE - Safety footwear
- EN 136:1998 Respiratory protective devices
- EN 166:2001 Eye protection
- EN 171:2002 Personal eye protection

must be adhered to.

2.3 Safety in all application phases

 DANGER	
	Danger due to missing, illegible operating manual This operating manual contains important information regarding safe operation of the drill-extinguisher. If the operating manual is not available or is illegible, death, injuries or damage to the equipment can occur. • Store the operating manual so that it is freely accessible. • Check the operating manual monthly to ensure that it is complete and legible.

 DANGER	
	Danger due to failing to comply with safety instructions A failure to comply with safety instructions can have irreversible and serious effects on health or cause life-threatening injuries up to and including death. Significant damage to property may also occur. • Observe safety instructions. • Read the operating manual prior to start-up. • Store the operating manual with the drill-extinguisher. • Clean illegible safety instructions and replace if necessary.

 WARNING	
	Warning of insufficient personnel qualifications There is a risk of serious injuries and significant damage to property if unqualified and unauthorized people remain in the hazard zone or work with the drill-extinguisher. • Only individuals with appropriate training may work with the drill-extinguisher. • Cordon off the hazard zone to prevent unauthorized access.

2.3.1 Start-up

DANGER



Danger due to failing to comply with safety instructions

A failure to comply with safety instructions can have irreversible and serious effects on health or cause life-threatening injuries up to and including death. Significant damage to property may also occur.

- Observe safety instructions.
- Read the operating manual prior to start-up.
- Store the operating manual with the drill-extinguisher.
- Clean illegible safety instructions and replace if necessary.

NOTICE

When starting up the drill-extinguisher, always ensure that there are no unauthorized people in the hazard zone.

The drill-extinguisher may only be started up if the safety equipment is functioning. This must be inspected on a monthly basis and repaired if necessary.

Shut the drill-extinguisher down immediately if there are malfunctions.

WARNING



Hazard when working with water pressure

Water pressure can cause serious injuries.

- Inspect the hose points/connectors at least once per month.
- If there is damage, replace the pressure hoses or pressure lines and the screw connections immediately.
- Cordon off the hazard zone to prevent unauthorized access.

WARNING



Risk of injury to people in the hazard zone

People in the hazard zone can suffer serious injuries when the drill-extinguisher is used.

- Check the hazard zone prior to using the drill-extinguisher.
- Cordon off the hazard zone to prevent unauthorized access.

2.3.2 Operation

 DANGER	
	Explosion hazard The ignition energy generated during drilling can cause heat and sparking to occur. This can lead to explosions. • Use of the DRILL-X drilling function in explosive environments is prohibited!

 DANGER	
	Danger due to failing to comply with safety instructions A failure to comply with safety instructions can have irreversible and serious effects on health or cause life-threatening injuries up to and including death. Significant damage to property may also occur. • Observe safety instructions. • Read the operating manual prior to start-up. • Store the operating manual with the drill-extinguisher. • Clean illegible safety instructions and replace if necessary.

 DANGER	
	Danger due to burns Extinguishing work is dangerous. Burns can cause injuries up to and including death. • The drill-extinguisher may only be operated by trained and qualified individuals or firefighters. • Wear full fireproof clothing in accordance with the applicable standard. • Cordon off the hazard zone to prevent unauthorized access.

 DANGER	
	Danger for people in the fire area Extinguishing work is dangerous. People in the hazard zone can suffer serious injuries up to and including death when the drill-extinguisher is used. The expansion of steam can cause the steam or smoke gases in the fire area and hazard zone to be displaced and suddenly escape. • If there are people in the fire area or hazard zone, use of the drill-extinguisher is not permitted. • Prior to using the drill-extinguisher, ensure that no one is in the fire area or hazard zone. • Cordon off the hazard zone to prevent unauthorized access.

! DANGER**Danger due to slipping or falling**

Extinguishing work is dangerous. Especially due to contaminated, wet or obscured surfaces. There is a high risk of falling when working on roofs. This can cause injuries up to and including death.

- Use fall protection along building edges.
- Use an aerial rescue device if possible when working at heights.
- Use retaining devices.
- Comply with the local fire service regulations.
- Observe the safety instructions.
- Use the prescribed PPE (personal protective equipment).
- Take great care and work with caution.

! DANGER**Danger due to life-threatening electric shock**

Water, extinguishing agents and metal components conduct electricity.

- Do not direct the extinguishing agent jet directly at high voltage lines or other electrical installations.
- Always maintain a safe distance to live parts.
- Never penetrate structures with live components.
- De-electrify objects prior to penetrating with the drill-extinguisher.
- Never use extinguishing foam to fight fires on electrical systems and live objects.
- Do not handle or use metal ladders in the vicinity of live systems.

! WARNING**Risk of injury to people in the hazard zone**

People in the hazard zone can suffer serious injuries when the drill-extinguisher is used.

- Check the hazard zone prior to using the drill-extinguisher.
- Cordon off the hazard zone to prevent unauthorized access.

! WARNING**Warning of insufficient personnel qualifications**

There is a risk of serious injuries and significant damage to property if unqualified and unauthorized people remain in the hazard zone or work with the drill-extinguisher.

- Only individuals with appropriate training may work with the drill-extinguisher.
- Cordon off the hazard zone to prevent unauthorized access.

⚠ WARNING



Warning of pressure surge

A pressure surge occurs when the water is stopped quickly. This sounds like a hammer hitting a pipe. This pressure surge can cause serious injuries when handling extinguishers. There is also a risk of damage to property.

- Regulate the water quantity on nozzles, hydrants, valves, etc. slowly and carefully.
- Hold the nozzles and the drill-extinguisher tight before opening a pressure outflow.
- Relieve the pressure before connecting a hose.
- If there is a risk to people, reduce the pump speed immediately or close the affected pressure outlet.
- Shut the pump system down if necessary.

⚠ WARNING



Poisonous vapor occurrence during fires!

Poisonous vapors can cause suffocation or health risks.

- Wear appropriate protective equipment when fighting fires.
- Wear self-contained breathing apparatus when fighting fires.
- Do not fight fires against the wind.

⚠ WARNING



Injury due to improper and unintended operation

Improper and unintended operation of the drill-extinguisher can cause injuries or damage to property.

- Check safety equipment prior to use.
- Only use the drill-extinguisher when it is in perfect condition.
- Only use the drill-extinguisher in accordance with the intended use.
- Cordon off the hazard zone to prevent unauthorized access.

! WARNING**Danger due to being drawn in**

There is a risk of being drawn in by the rotating drill head. Fingers, hair, clothing or jewellery can be drawn in. This can cause serious injuries.

- Pay attention and take care when working.
- Do not wear loose clothing.
- Do not wear jewellery.
- Tie long hair back.
- The trigger for drilling mode is pre-tensioned using a spring and therefore self-closing.
- Comply with all safety-relevant specifications and regulations.

! WARNING**Warning of hand injuries**

Sharp cutting blades are installed on the drill head. Reaching into these blades can cause serious hand injuries.

- Only touch the drill head when wearing cut-resistant gloves.
- Wait until the drill head has come to a complete stop before reaching in.
- Pay attention and take care when working with the drill head.

! WARNING**Hazard when working with water pressure**

Water pressure can cause serious injuries.

- Inspect the hose points/connectors at least once per month.
- If there is damage, replace the pressure hoses or pressure lines and the screw connections immediately.
- Cordon off the hazard zone to prevent unauthorized access.

! WARNING**Danger due to ejection**

The hose coupling may be ejected if the coupling is not closed completely. This can cause serious injuries.

- Inspect the hose points/connectors/couplings carefully.
- Always close the coupling completely until it stops.
- Cordon off the hazard zone to prevent unauthorized access.

⚠ WARNING



Warning of sudden torque occurrence

When pulling the control lever on the drill-extinguisher down completely, a sudden torque of up to 60 Nm occurs. This can cause injuries, affect your stability and therefore cause you to fall.

- Expect torque to occur suddenly when operating the drill-extinguisher.
- Ensure good, firm and secure footing.
- Always hold the drill-extinguisher in your right hand.
- Use a retaining device and personal protective equipment.
- Use both arms to exert working pressure onto the drill-extinguisher.

NOTICE



Read the operating manual carefully prior to using the drill-extinguisher.

Keep for future reference.

NOTICE



Foaming agents cause increased corrosion

- Clean extinguishing agent residues off the product after each use.
- Clean extinguishing agent residues off the surrounding areas after use.

2.3.3 Malfunctions during operation

DANGER



Danger for people in the fire area

Extinguishing work is dangerous. People in the hazard zone can suffer serious injuries up to and including death when the drill-extinguisher is used. The expansion of steam can cause the steam or smoke gases in the fire area and hazard zone to be displaced and suddenly escape.

- If there are people in the fire area or hazard zone, use of the drill-extinguisher is not permitted.
- Prior to using the drill-extinguisher, ensure that no one is in the fire area or hazard zone.
- Cordon off the hazard zone to prevent unauthorized access.

DANGER



Danger due to slipping or falling

Extinguishing work is dangerous. Especially due to contaminated, wet or obscured surfaces. There is a high risk of falling when working on roofs. This can cause injuries up to and including death.

- Use fall protection along building edges.
- Use an aerial rescue device if possible when working at heights.
- Use retaining devices.
- Comply with the local fire service regulations.
- Observe the safety instructions.
- Use the prescribed PPE (personal protective equipment).
- Take great care and work with caution.

DANGER



Danger due to burns

Extinguishing work is dangerous. Burns can cause injuries up to and including death.

- The drill-extinguisher may only be operated by trained and qualified individuals or firefighters.
- Wear full fireproof clothing in accordance with the applicable standard.
- Cordon off the hazard zone to prevent unauthorized access.

⚠ DANGER



Danger due to life-threatening electric shock

Water, extinguishing agents and metal components conduct electricity.

- Do not direct the extinguishing agent jet directly at high voltage lines or other electrical installations.
- Always maintain a safe distance to live parts.
- Never penetrate structures with live components.
- De-electrify objects prior to penetrating with the drill-extinguisher.
- Never use extinguishing foam to fight fires on electrical systems and live objects.
- Do not handle or use metal ladders in the vicinity of live systems.

⚠ WARNING



Risk of injury to people in the hazard zone

People in the hazard zone can suffer serious injuries when the drill-extinguisher is used.

- Check the hazard zone prior to using the drill-extinguisher.
- Cordon off the hazard zone to prevent unauthorized access.

⚠ WARNING



Danger due to ejection

The hose coupling may be ejected if the coupling is not closed completely. This can cause serious injuries.

- Inspect the hose points/connectors/couplings carefully.
- Always close the coupling completely until it stops.
- Cordon off the hazard zone to prevent unauthorized access.

⚠ WARNING



Danger due to being drawn in

There is a risk of being drawn in by the rotating drill head. Fingers, hair, clothing or jewellery can be drawn in. This can cause serious injuries.

- Pay attention and take care when working.
- Do not wear loose clothing.
- Do not wear jewellery.
- Tie long hair back.
- The trigger for drilling mode is pre-tensioned using a spring and therefore self-closing.
- Comply with all safety-relevant specifications and regulations.

! WARNING**Hazard when working with water pressure**

Water pressure can cause serious injuries.

- Inspect the hose points/connectors at least once per month.
- If there is damage, replace the pressure hoses or pressure lines and the screw connections immediately.
- Cordon off the hazard zone to prevent unauthorized access.

! WARNING**Warning of hand injuries**

Sharp cutting blades are installed on the drill head. Reaching into these blades can cause serious hand injuries.

- Only touch the drill head when wearing cut-resistant gloves.
- Wait until the drill head has come to a complete stop before reaching in.
- Pay attention and take care when working with the drill head.

! CAUTION**Proceed with caution if the drilling tool is worn**

The drilling function may be limited or impossible if a reversible cutting blade or the centre drill is worn.

Slipping or removing stuck parts can cause minor injuries.

- Wear cut-resistant gloves.
- Replace the damaged part.
- Ensure correct handling.
- Pay attention when working.

NOTICE**Note regarding the tools used**

Only use approved tools (in accordance with the appendix).

Using other tools can cause damage to property.

2.3.4 Maintenance and cleaning

NOTICE

Only perform maintenance work on the drill-extinguisher when the compressed air line is disconnected.

 DANGER	
	Danger due to missing, illegible operating manual This operating manual contains important information regarding safe operation of the drill-extinguisher. If the operating manual is not available or is illegible, death, injuries or damage to the equipment can occur. • Store the operating manual so that it is freely accessible. • Check the operating manual monthly to ensure that it is complete and legible.

 DANGER	
	Danger due to failing to comply with safety instructions A failure to comply with safety instructions can have irreversible and serious effects on health or cause life-threatening injuries up to and including death. Significant damage to property may also occur. • Observe safety instructions. • Read the operating manual prior to start-up. • Store the operating manual with the drill-extinguisher. • Clean illegible safety instructions and replace if necessary.

 WARNING	
	Warning of hand injuries Sharp cutting blades are installed on the drill head. Reaching into these blades can cause serious hand injuries. • Only touch the drill head when wearing cut-resistant gloves. • Wait until the drill head has come to a complete stop before reaching in. • Pay attention and take care when working with the drill head.

NOTICE	
	Note regarding the tools used Only use approved tools (in accordance with the appendix). Using other tools can cause damage to property.

2.4 Machine-specific dangers

2.4.1 Electrical voltage

Water, extinguishing agents and metal components conduct electricity. Always ensure that you do not put yourself in danger.

 DANGER	
	Danger due to life-threatening electric shock Water, extinguishing agents and metal components conduct electricity. • Do not direct the extinguishing agent jet directly at high voltage lines or other electrical installations. • Always maintain a safe distance to live parts. • Never penetrate structures with live components. • De-electrify objects prior to penetrating with the drill-extinguisher. • Never use extinguishing foam to fight fires on electrical systems and live objects. • Do not handle or use metal ladders in the vicinity of live systems.

Safe distance from the drill-extinguisher when fighting fires on low voltage systems

Voltage	Extinguishing equipment	Extinguishing agent	Safety distance
Up to 1 kV	Drill-extinguisher	Water	5 m (16 ft)

Safe distance from the drill-extinguisher when fighting fires on high voltage systems

Voltage	Extinguishing equipment	Extinguishing agent	Safety distance
1 kV - 380 kV	Drill-extinguisher	Water	10 m (32 ft)

NOTICE

The legal and standardised specifications for the country of use may differ from the specifications above. Always adhere to the specifications that apply in your country!

WARNING



Foam extinguishing agents are very good electrical conductors.

- Never extinguish live objects with a foam extinguishing agent.
- Do not use foam extinguishing agents in the vicinity of live objects.
- Always comply with the legal and standardised specifications in this regard.

2.4.2 Water pressure (hydraulics)

The drill-extinguisher is driven by a fire extinguishing pump. The pump output pressure must not exceed 16 bar of inherent pressure and a flow rate of 800 l/min. The drill-extinguisher requires a minimum flow rate of 600 l/min for safe operation.

Work on the hydraulic systems may only be performed by individuals with the required knowledge and experience with hydraulic systems.

Safety regulations to prevent dangers due to water pressure:

- The maximum operating pressure of 16 bar must not be exceeded.
- Pressure hoses must never be pointed at other people or yourself.
- Pressure hoses must be replaced at regular intervals even if no safety-relevant malfunctions are visible. Observe the manufacturer's specifications and regulations.

 WARNING	
	Warning of sudden recoil When pressing the control lever on the drill-extinguisher down completely, a sudden recoil occurs. This can cause a loss of user stability and lead to a fall. • Expect recoil to occur suddenly when using the drill-extinguisher. • Ensure good, firm and secure footing. • Use a retaining device and personal protective equipment.

 WARNING	
	Warning of pressure surge A pressure surge occurs when the water is stopped quickly. This sounds like a hammer hitting a pipe. This pressure surge can cause serious injuries when handling extinguishers. There is also a risk of damage to property. • Regulate the water quantity on nozzles, hydrants, valves, etc. slowly and carefully. • Hold the nozzles and the drill-extinguisher tight before opening a pressure outflow. • Relieve the pressure before connecting a hose. • If there is a risk to people, reduce the pump speed immediately or close the affected pressure outlet. • Shut the pump system down if necessary.

 WARNING	
	Hazard when working with water pressure Water pressure can cause serious injuries. • Inspect the hose points/connectors at least once per month. • If there is damage, replace the pressure hoses or pressure lines and the screw connections immediately. • Cordon off the hazard zone to prevent unauthorized access.

Slipping and falling

! DANGER**Danger due to slipping or falling**

Extinguishing work is dangerous. Especially due to contaminated, wet or obscured surfaces. There is a high risk of falling when working on roofs. This can cause injuries up to and including death.

- Use fall protection along building edges.
- Use an aerial rescue device if possible when working at heights.
- Use retaining devices.
- Comply with the local fire service regulations.
- Observe the safety instructions.
- Use the prescribed PPE (personal protective equipment).
- Take great care and work with caution.

2.4.3 Rotating parts

! WARNING**Danger due to being drawn in**

There is a risk of being drawn in by the rotating drill head. Fingers, hair, clothing or jewellery can be drawn in. This can cause serious injuries.

- Pay attention and take care when working.
- Do not wear loose clothing.
- Do not wear jewellery.
- Tie long hair back.
- The trigger for drilling mode is pre-tensioned using a spring and therefore self-closing.
- Comply with all safety-relevant specifications and regulations.

! CAUTION**Vibration occurrence**

Vibration and incorrect handling can cause user haematoma.

- Only exert force using both hands.
- Hold the device tightly.
- Use the shoulder rest to guide the device. Do not exert any force when doing so.
- Ensure correct handling (right hand).
- Use personal protective equipment (gloves).

2.4.4 Torque occurrence

The resulting torque that occurs can cause injuries in the vicinity of the shoulder rest in the event of improper use. Furthermore, insufficient stability can cause the user to fall due to the torque.

The shoulder rest is only to guide the drill-extinguisher.

Apply force to the drill-extinguisher using your arms and hands.

If you use the shoulder rest to apply force, this can cause painful haematoma on the shoulder.

The drill-extinguisher is only intended to be operated using the right hand!

NOTICE

The drill-extinguisher is only intended to be operated using the right hand!

! WARNING



Warning of sudden torque occurrence

When pulling the control lever on the drill-extinguisher down completely, a sudden torque of up to 60 Nm occurs. This can cause injuries, affect your stability and therefore cause you to fall.

- Expect torque to occur suddenly when operating the drill-extinguisher.
- Ensure good, firm and secure footing.
- Always hold the drill-extinguisher in your right hand.
- Use a retaining device and personal protective equipment.
- Use both arms to exert working pressure onto the drill-extinguisher.

! CAUTION



Torque occurrence

Torque can cause the drill-extinguisher to impact the rib cage.

- Operate the drill-extinguisher with your right hand.
- Guiding the drill-extinguisher with your right hand, compensates for the torque that occurs in the swivel range.

2.4.5 Noise

As the noise level can vary significantly during use, we recommend wearing ear protection.



NOTICE

We recommend to wear ear protection when using the drill-extinguisher.

2.5 Safety devices

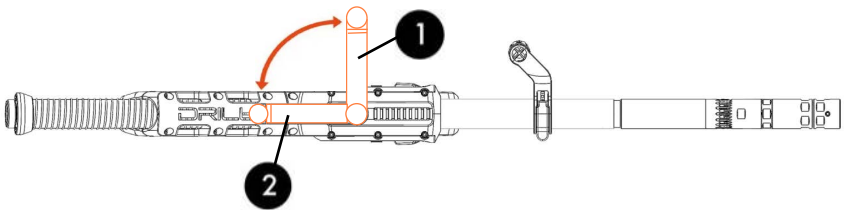
2.5.1 General

The safety equipment on the drill-extinguisher is intended to protect the user from hazards. The drill-extinguisher was built in accordance with applicable legal regulations and is operationally safe. Protective equipment is provided to account for hazards that cannot be excluded by design. The operating manual advises of hazards that cannot be avoided.

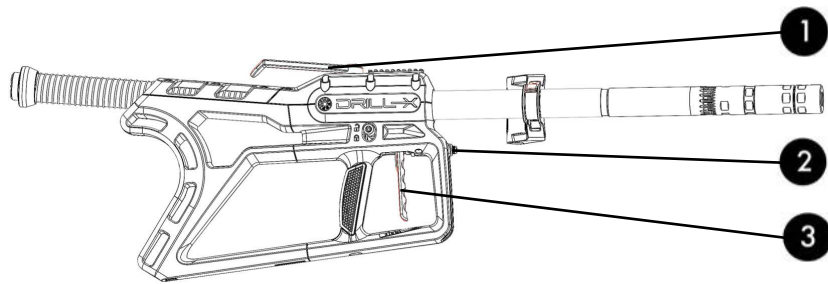
2.5.2 Description

Safety equipment is integrated into the drill-extinguisher.

- The control lever is spring loaded and designed as an enabling lever (dead man's switch). Releasing the lever stops the drill's rotary movement immediately and automatically.
- Fully opening the control lever enables continuous extinguishing with the device. The area is cooled with an extinguishing mist when drilling.
- The drill-extinguisher's torque is limited to 60 Nm due to the hydraulic operating behavior of the turbine.
- The hydraulic damper brakes the control lever's closing mechanism and prevents the permissible operating pressure being exceeded
- The shut-off lever is installed so that it can be closed in one automatic, reflexive movement. The shut-off lever is 90 degrees to the left of the longitudinal axis during operation. Moving the handle away from the body enables the shut-off lever to be pulled backwards automatically. The water supply stops.

No	Designation	Illustration
1	Shut-off lever: open	
2	Shut-off lever: closed	

2.5.3 Safety equipment provided

No	Designation	Illustration
1	Shut-off lever	
2	Hydraulic damper	
3	Control lever - enabling switch	

2.6 Legal regulations

In addition to this manual, the current version of the applicable national laws, directives and regulations must be observed and complied with.

This include (list not exhaustive):

- Directives for personal protective equipment.
- Country-specific training regulations for the fire service.
- Accident prevention regulations.
- Firefighting regulations.
- Fire service operational ordinance.
- Occupational health and safety regulations.
- Laws and standards for environmental protection.
- Fire prevention and disaster control laws.
- Laws and standards for safety distances from electrical systems.

3 Transport and storage

3.1 Requirements

3.1.1 Organization

- Meet the requirements for safe transport.
- Contact trained specialists if necessary.

3.1.2 Users

- Trained, qualified individuals in the target group with applicable experience and specialist knowledge.
- Only perform work for which you are trained.
- Read the relevant section in the operating manual.
- Inform SYNEX TECH GmbH in the event of problems.
- Always comply with the safety instructions in this operating manual and the locally applicable safety regulations.

3.2 Safety

In order to ensure that the drill-extinguisher is transported and stored safely, read *Section 2 "Safety" on page 19* and the subsequent sections, and comply with the requirements in this section.

3.3 Transport damage upon delivery

Check the drill-extinguisher for transport damage immediately after delivery.
If there is transport damage, report this to the manufacturer immediately.
We recommend documenting the transport damage with photos.

After unloading:

1. Remove the transport packaging.
2. Dispose of the transport packaging in accordance with waste disposal legislation.
3. Inspect the drill-extinguisher for transport damage.
4. Check that the delivery is complete.

In the event of transport damage and an incomplete delivery:

1. Note the details in writing immediately.
2. Note the complaint on the delivery documents.
3. Photograph damaged parts.
4. Send the report to the supplier.

NOTICE

Ensure that the packaging is disposed of properly.

3.4 Transport in the emergency vehicle

- Only transport the drill-extinguisher and associated material in the mobile transport case or
- Transport the drill-extinguisher in an approved vehicle mount in the fire engine.
- Protect the drill-extinguisher from damage using retaining straps, spacers and sufficient distance to other objects.
- Handle the drill-extinguisher with care.
- Ensure weather protection when transporting.
- Ambient temperature for transport:
 - Minimum temperature - 5 °C
 - Maximum temperature + 50 °C
- Do not place any heavy loads on the drill-extinguisher or the mobile transport case.

3.5 Storage

Note the following points to ensure that your drill-extinguisher remains functional:

- Store in a clean and dry place.
- Room temperature: +5 °C to +40 °C.
- Relative air humidity: 5 % to 75 %.
- Store on a level surface.
- Secure to prevent it falling.
- Ensure weather protection.
- Protect from frost, moisture and precipitation.
- Store the dry drill-extinguisher in the transport case if available.

3.5.1 After use

After use, store the drill-extinguisher upright for at least 48 h to 72 h if possible in order to allow any remaining water to escape through the drain holes.

Do not store the wet or damp drill-extinguisher in a closed transport case.

All components in the transport case must be dried before storing.

4 Design and scope of delivery

4.1 Technical data

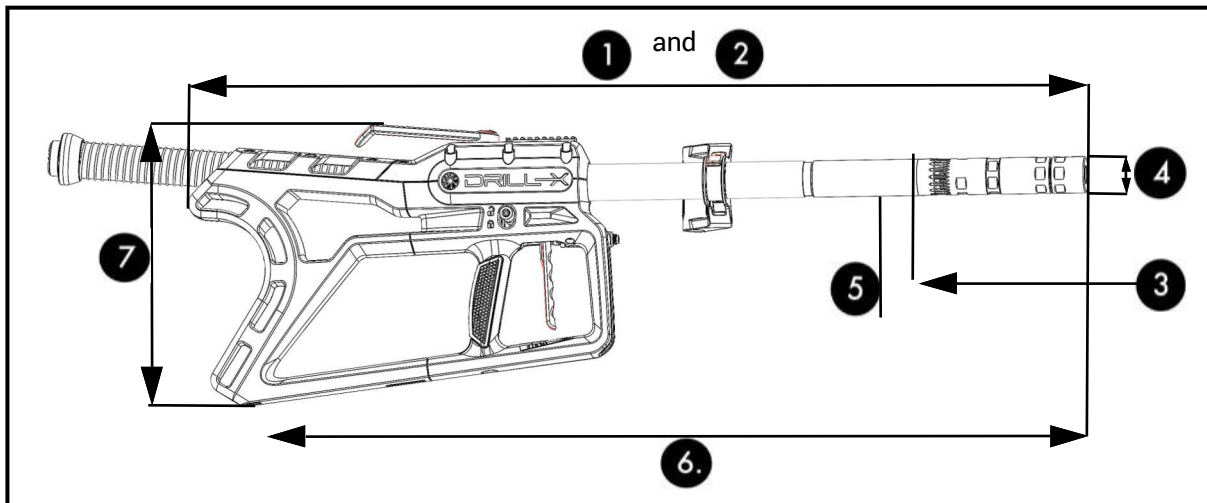
4.1.1 Dimensions and data

	Value	Unit
Length	1 500	mm
Width	116	mm
Height	384	mm
Weight	10.2	kg
Supply medium: water	• Drinking water • Use for extinguishing possible • Drilling function possible	
Supply medium: foam or wetting agent	• Standard mixing ratios • Use for extinguishing possible • Drilling function possible	
Supply medium: CAFS	• Use for extinguishing possible • Drilling function not possible	
Supply line	For the dimensions, see <i>Section 5.8 "Water supply" on page 54.</i>	
Drill bit diameter	56	mm
Drilling depth	425	mm
Penetration duration	20 With a standard (cold) roof design	sec
Minimum operating pressure	10	bar
Maximum operating pressure	16	bar
Water flow rate in drilling mode	min. 600	l / min
Water flow rate in extinguishing mode	180 - 800	l / min
Maximum power at 800 l / min	1 000	W
Daily oscillation load	approx. 1	m/s ²
Extinguishing mean amplitude	0.7	m/s ²
Drilling mean amplitude	19.5	m/s ²

NOTICE

The hazard of vibration/oscillation to the hand-arm system can be eliminated if the drill extinguishing equipment is used as intended.

4.1.2 Illustration of dimensions [mm]



No.	Designation	Value	Unit
1	Total length (with hose)	1 500	mm
2	Stowage dimension (with hose)	1 300	mm
3	Penetration depth	425	mm
4	Drilling depth	Ø 56	mm
5	Drill diameter	Ø 49	mm
6	Shoulder height	1 340	mm
7	Device height	385	mm

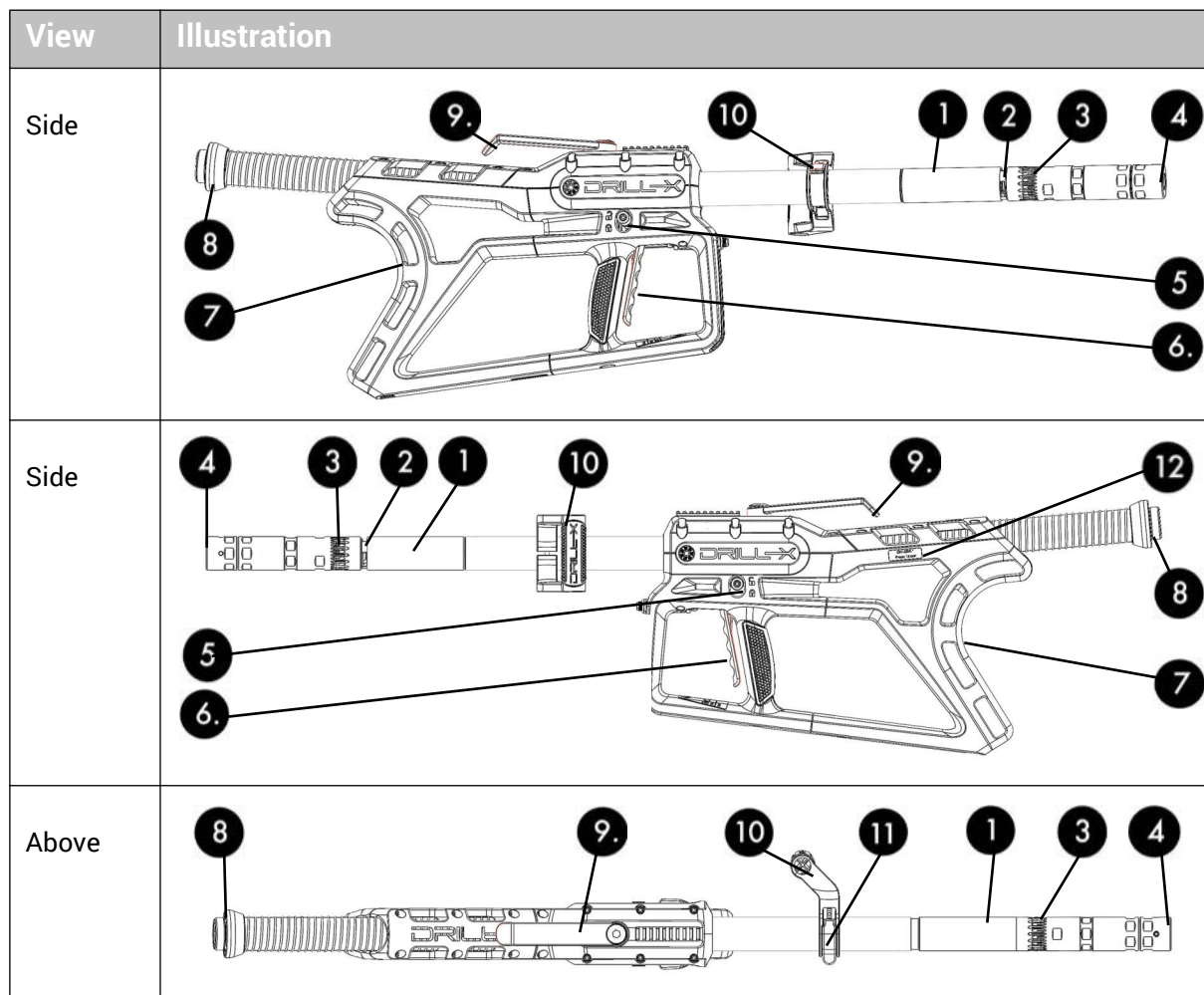
4.2 Scope of delivery

The parts delivered as standard with the drill-extinguisher correspond to the wording in the order confirmation.

The scope of delivery includes the following in particular:

- DRILL-X drill-extinguisher
- Hose coupling in accordance with the order confirmation
- Drilling system in accordance with the order confirmation.

4.3 Drill-extinguisher views



No.	Designation
1	Slide valve
2	Auxiliary nozzles
3	Main nozzles
4	Intake for drilling system / drill carrier
5	Lock
6	Control lever
7	Shoulder rest
8	Hose coupling
9	Shut-off lever
10	Handle
11	Cam lever
12	Type plate

4.4 Jet shapes

The slide valve is changed depending on how far down the control lever is pressed. There are five adjustable jet shapes, see *Sections 4.4.1 "Switch positions / fixation" on page 47.* and *4.4.2 "Jet angle table" on page 47.*

Jet type	Flow rate	Pressure	Jet angle
Main jet ¹⁾	180 l /min	10 bar	40 / 60°
Auxiliary jet ²⁾	180 to 800 l / min	10 bar	120° - 150°

1) Main jet when the slide valve is closed, 60 degrees to the front

2) Auxiliary jet

- In addition to the main jet.
- Second jet due to open slide valve.
- Can be controlled and activated/deactivated using the control lever.
- There are five possible jet angles, see *Section 4.4.2 "Jet angle table" on page 47.*

Main jet	Auxiliary jet
	

4.4.1 Switch positions / fixation

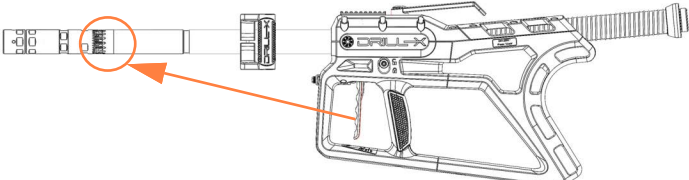
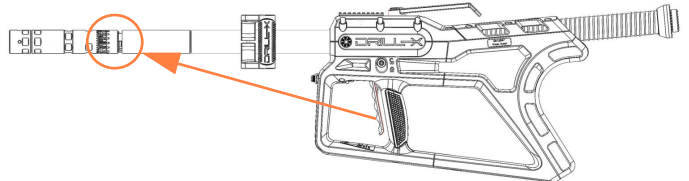
This illustration shows the plate used to set the switch positions on the device.

No	Designation	Illustration
1	Control lever	
2	Scale with angle and flow rate specifications for switch positions	

4.4.2 Jet angle table

Jet angle [degrees]	Flow rate [l/min]
40 / 60 (auxiliary jet closed)	180
100	300
120	500
140	600
150 (auxiliary jet fully open)	800

4.4.3 Control lever

Control-lever position	Slide valve	Illustration
Not pressed / jet angle 40° / 60°	Closed (no auxiliary jet)	
Fully pressed / jet angle 150°	Open (auxiliary jet fully open)	

4.5 Drilling systems

Depending on the respective application, the appropriate drilling system from SYNEX TECH GmbH must be used. Only a drilling system approved by the manufacturer and developed for the material to be penetrated may be used.

The materials that can be penetrated depend on the respective drilling system.

If a non-approved drilling system is used, additional hazards may occur:

- Unpredictable dynamic forces may occur.
- The drilling time may be altered.
- The drill may be unable to penetrate the respective material.
- The drill or the drill-extinguisher may be damaged or destroyed.

All drilling systems must be used in accordance with the respective defined descriptions.

NOTICE

Improper use can lead to personal injuries or damage to property.

5 Use and function

5.1 Intended use

The drill-extinguisher is only to be used for the intended use described here.

The drill-extinguisher described in this operating manual is intended to be used to drill through various materials in order to be able to fight fires using the same device.

The main application is drilling through roof, wall and ceiling structures in order to be able to fight fires effectively in rooms and within the structure.

The drilling depth is 425 mm.

- The drill-extinguisher may only be operated with the defined operating media.
- The drill-extinguisher may only be operated within the defined range of applications.
- The drill-extinguisher may only be operated within the defined ambient conditions.
- The drill-extinguisher must be connected in accordance with the regulations.
- The drill-extinguisher may only be used and cleaned by instructed and trained individuals.
- Maintenance may only be performed by trained specialists.
- Only the recommended tools may be used for work on the drill-extinguisher.

5.2 Reasonably foreseeable misuse

The drill-extinguisher is not intended for any purpose other than the intended use described here.

Any use other than the intended use is considered improper use. Safe operation is no longer guaranteed in such cases. The user and not the manufacturer is liable for any personal injury and damage to property caused by improper use.

Foreseeable misuse includes the following in particular:

- Using an extinguishing agent other than that defined.
- A failure to observe the operating manual.
- Operating the drill-extinguisher with attachments that are not tailored to the drill-extinguisher.
- Not using the drill-extinguisher to hammer or penetrate structures.
- Using the drill-extinguisher if people remain in the fire area.
- Using tools that are not recommended.
- Usage in explosive atmospheres and environments.

5.3 Conversions and changes

Conversions and changes to the drill-extinguisher are not permitted for safety reasons. This can cause personal injury and damage to property.

Do not make any changes or conversions to the drill-extinguisher or its accessories.

Written approval from SYNEX TECH GmbH is required to perform work on the drill-extinguisher.

Only individuals authorized by the manufacturer are permitted to make changes or conversions, or perform repairs. Unauthorized changes, conversions or improper use always relieve the manufacturer of any liability for any damages resulting from such actions.

5.4 Requirements for use

The requirements for using the drill-extinguisher for firefighting are:

- The drill-extinguisher is in a technically perfect condition.
- The firefighters have the required safety and hazard awareness.
- The firefighters follow the instructions in the operating manual.
- The firefighters have been trained and are qualified to fight fires.
- The user has current respirator protection.
- The user has received theoretical training on the drill-extinguisher and has completed at least three practical training sessions.
- The drill-extinguisher is only used with the permitted extinguishing media / extinguishing agents.
- The drill-extinguisher is used within the defined usage range (pressure, extinguishing media, connected load, safety, connection).
- The firefighters wear the legally prescribed personal protective clothing in accordance with the local firefighting guidelines, regulations and laws.
- The firefighters comply with all applicable safety regulations.
- The firefighters comply with the national and local firefighting regulations.

NOTICE

During training and exercises that do not involve fire extinguishing, the drill-extinguisher can also be used without respiratory protection training.

All safety precautions and the prescribed PPE must be used.

5.5 Usage conditions

5.5.1 Environment

The area of application of the drill-extinguisher is fires in closed or inaccessible structures.

With a suitable drilling system designed for this purpose, the outer skin of structures can be penetrated quickly and safely. The subsequent extinguishing of the fire is possible in a shorter time and with less extinguishing agent. After the drilling process, the spray pattern can be adjusted by changing the water flow rate. Subsequently injecting the extinguishing agent into the structure should have a fast extinguishing effect if the firefighting tactical recommendations are adhered to correctly. The jet modifications can be adjusted to the local conditions.

NOTICE

No one is permitted to be in the fire area. Verification prior to use is mandatory!

Use in explosive atmospheres is prohibited!

5.5.2 Temperature

In order to guarantee malfunction-free operation, the ambient temperature must be between 5 °C and 80 °C. If the ambient temperature is below 5 °C, the drill-extinguisher must be operated for at least 30 seconds without load in idle mode with water. The drill-extinguisher is then ready for use.

5.6 Function and system description

The drill-extinguisher described in this operating manual has the following purpose

- building structures,
- vehicle shells,
- roof, wall and ceiling structures

can be drilled through and

- fires in the room or
- within the structure

can be extinguished.

Suitable drilling media:

- water
- foam and wetting agents

Suitable extinguishing agents:

- water
- foam and wetting agents
- CAFS

The areas of application for the drill-extinguisher are fires that are difficult to access behind and in building shells, walls and inside other structures. The areas of application are therefore not actually limited. The drill-extinguisher can penetrate structures quickly and inject extinguishing agent into the fire area behind. As no ambient air is added when accessing these areas, flashovers due to smoke gas can be prevented.

When extinguishing with water, the finest water droplets enable efficient vaporization and therefore fast cooling. This results in fast, successful firefighting and ensures minimal water damage thanks to the low amount of extinguishing water used.

The steam that occurs aids firefighting by filling the space with the expanding, non-flammable vapor thus creating an almost inert atmosphere.

When extinguishing with foam, small fire areas, which are difficult to access such as suspended ceilings, walls and cavities, can be filled very well. The extinguishing agent is injected in a targeted manner.

The materials for which the relevant drilling system is intended can be drilled. In drilling mode, an operating pressure of around 10 bar is sufficient for most applications as long as the hose diameter is not less than 52 mm.

The system should always be positioned at the hottest part of the fire area. Ideally, this is the middle of the area and the fire area is completely filled by the spray jet. Adjusting the jet angle to the fire area is essential for obtaining the best results. To do this, the jet angle is adjusted so that the entire area is filled as much as possible. The ventilation effect of the escaping water jet mixes the steam with the fire smoke and cools it down quickly. The target temperature in the fire area should be below 100 °C.

5.7 Operating media

5.7.1 Media for the drilling function

5.7.1.1 Water

- Suitable water: Drinking quality
- Maximum operating temperature: 50 °C
- Maximum operating pressure: 16 bar
- Clean and washed hoses
- Water removal from open bodies of water:
 - a suction strainer is obligatory when extracting from open bodies of water,
 - a suction strainer with a maximum mesh width of 4 mm,
 - sediment separation is always operated via a tank,
 - we recommend using a suction strainer floating on the surface.

NOTICE

When removing water from open bodies of water, there is a risk of the nozzles on the drill-extinguisher becoming clogged by sediment that has been sucked in. This can impede the operating process and even cause the total loss of the equipment. A suction strainer is therefore obligatory.

5.7.1.2 Water with foam or wetting agent

- Comply with the standard mixing ratios of the relevant agent.
- The standard foaming attributes can be achieved in cavities.

NOTICE

Check whether the mixing system can provide the required operating pressure and flow rate.

5.7.2 Media for extinguishing

5.7.2.1 Water

- Suitable water: Drinking quality
- Maximum operating temperature: 50 °C
- Maximum operating pressure: 16 bar
- Clean and washed hoses
- Water removal from open bodies of water:
 - a suction strainer is obligatory when extracting from open bodies of water,
 - a suction strainer with a maximum mesh width of 4 mm,
 - sediment separation is always operated via a tank,
 - we recommend using a floating suction strainer floating on the surface.

5.7.2.2 Water with foam or wetting agent

- Comply with the standard mixing ratios of the relevant agent.
- The standard foaming attributes can be achieved in cavities.

5.7.2.3 Compressed air foam system (CAFS)

- When operating with CAFS, first drill with pure water, as there is no drilling function with CAFS.
- Switch over to any CAFS foaming after reaching the required level for discharging the extinguishing agent.

NOTICE

After using foam or wetting agent, flush the device for 5 minutes with an operating pressure of at least 6 bar. Rinse all switching positions carefully with clean water.

5.8 Water supply

Correct connection to the water supply and ensuring the correct operating pressure on the drill-extinguisher are essential to use the drill-extinguisher properly.
Since firefighting conditions change, we recommend allowing sufficient time for adjustments and preparation during training sessions.

Specifications for adjusting the operating pressure on the target system:

- The minimum flow rate for the drilling function when both nozzles are open (control lever actuated to the maximum) is 600 l/min.
- Based on experience, the required operating pressure for this is between 8 and 14 bar.

5.8.1 Preparations

Prior to using the drill-extinguisher, we recommend adjusting the operating pressure rating and testing it out in the training session. To do this, proceed as follows:

- **Variant 1:**
 - Attach the hose line intended for the application to the system.
 - Use a flow measurement device to set the target operating pressure to at least 600 l/min.
- **Variant 2:**
 - Build the structural layout intended for the application and drill through this.
 - Adjust the operating pressure and/or the hose line so that satisfactory drilling behavior is achieved.

5.8.2 Recommendations for adjusting the operating pressure:

5.8.2.1 On the aerial rescue device (up to 30 meters):

- Use the in-house tanker vehicle for the supply.
- Establish a water supply of at least 800 l/min to the tanker vehicle.
- Use a 75 mm hose (similar to Storz B) to supply the aerial device.
- Do not operate any other extinguishing device from this water supply (cage nozzles, nozzle pipes, etc.).
- Use a short (2 - 5 m) working hose with a minimum diameter of 42 mm (similar to Storz C42).
- In this configuration: 10 bar pump output pressure (with pressure regulation!).

5.8.2.2 On the tanker vehicle:

- Establish a water supply of at least 800 l/min to the tanker.
- Use a 75 mm hose (similar to Storz B) as the supply line to the work area.
- Do not operate any other extinguishing device from this water supply.
- Switch to a compact fire hose in the close working range.
- Recommended fire hose: 52 mm (similar to Storz C52):
 - Recommended hose length: < 30 m
 - **NOTICE:** use a short 42 mm hose (2 - 5 m) on the device (ergonomics)
 - In this configuration: 10 bar pump output pressure (with pressure regulation!).
- Possible: 42 mm fire hose (similar to Storz C52):
 - Recommended hose length: <<30 m
 - In this configuration: 12 bar pump output pressure (with pressure regulation!).

NOTICE

Due to deviations in the relevant pump systems and fire service equipment, the operating pressure must always be checked prior to first use!

5.9 Situational assessment

NOTICE

Familiarize yourself with the specifics of the situational assessment prior to using the drill-extinguisher. This is the only way to be able to proceed correctly and quickly in the event of a fire.

NOTICE

This section contains the basic information for using the “DRILL-X” drill-extinguisher. Current and important updates to the procedure and use are provided on the website at **www.drill-x.at**

As with all fire service interventions, careful and comprehensive situational assessment is required before the planned action. The following appraisal criteria are recommended at the time of compiling this document:

- Can the fire be fought safely and effectively using a standard intervention?
- Is the fire accessible using a standard intervention without a significant delay?
- Can the thermal power be dampened or extinguished by the cooling output of handheld nozzle pipes?

If the situational assessment results in negative answers to these three questions, using the drill-extinguisher may be effective.

After this basic decision, the central safety questions regarding electrical hazards on the object or a potential risk of falling must be clarified!

Prior to using the drill-extinguisher, the design of the structure that is to be drilled through must be checked carefully. Ensure that a suitable drilling system is used for the structural design! Furthermore, you must check whether the fire is in a room or in a structural element. The procedure differs for these two fire situations.

5.9.1 Structural firefighting

In the event of fires in superstructures, the drill-extinguisher can be used to inject water into the affected cavities or insulation layers. Due to the complexity of these fires, each fire must be assessed with particular care.

We recommend locating the fire using signs of combustion or with the aid of thermal imaging cameras and performing a short and powerful intervention (maximum jet angle, e.g. 10 seconds) in the affected structural area. To do this, insert the extinguishing nozzles into the required structural area. Thus the local area and the penetration point should be extinguished in a targeted manner depending on the structural design. If no further signs of combustion can be identified, an immediate subsequent inspection of the scene of the fire is required based on experience.

NOTICE

Please be advised that structural fires can result in complex and lengthy extinguishing work due to the fire behavior and that the recommended actions are not always valid for every individual situation. A precise and careful procedure along with continual re-evaluation and inspection are particularly important in this case.

5.9.2 Fighting room fires

Room fires have high thermal loads and large room volumes. When starting to fight the fire, a tactical decision must be made between extinguishing the room fire or protecting a structure that has not yet been affected by the fire.

5.9.2.1 Extinguishing

If the aim of the intervention is to fight the room fire directly, the hottest point in the room must be found or approximated. Thermal imaging cameras, signs of combustion or knowledge of the room contents can help here. We also recommend always drilling through the highest point in the middle of the room, as the highest temperature is present here.

After drilling through the structure, the jet must be adjusted according to the room volume. We recommend selecting a jet angle that fills the room best. (For example: roof structure fire – wide jet angle).

After drilling through the structure, inserting the drill-extinguisher into the room that is on fire and applying water to the very hot environment, a visible change to the situation should occur immediately or after no more than one minute. This means that the smoke gas color and intensity changes. The steam itself is normally visible. If an extinguishing effect cannot be seen, we recommend looking for a new penetration point that is slightly offset, as there may be building structures that prevent an extinguishing effect at the current penetration point. We recommend re-appraising the situation after a maximum of three failed interventions and determining why the extinguishing effect is unsuccessful.

As soon as an extinguishing effect is visible, the existing hole should be used to inject water until no further signs of combustion are visible. Using temperature probes is important here. We recommend injecting water for a maximum of one minute and then checking the temperature in the room that is on fire.

An intervention below 100 °C on the ceiling of the room that is on fire will probably no longer have a reliable extinguishing effect. If further signs of combustion remain at a lower temperature in the room that is on fire, we recommend looking for another penetration point that is slightly offset. This procedure should be repeated until the desired extinguishing result is achieved. Subsequent actions to check the room that is on fire must always be performed, as the intervention with the drill-extinguisher cannot guarantee complete extinguishing success (pockets of embers).

5.9.2.2 Protection

If the drill-extinguisher is used to protect structures, select a limit line on the object that is to be protected. As soon as the drill-extinguisher is used to inject water, the protective effect must be continually monitored. If the required protection effect is not present, the situation must be re-assessed and re-positioning must be considered. In the event of continual use over an extended period, it is essential to consider the consequences of the water quantities injected, as you cannot assume that the water will evaporate completely when protecting!

6 Operation

6.1 Requirements

6.1.1 Organization

- Train users on the drill-extinguisher.
- Train users on safety.
- Keep a usage log.
- Comply with maintenance schedules.
- Assign individuals with applicable experience and specialist knowledge.
- Assign individuals with current training for respirators.
- Ensure that users are physically and mentally capable.
- Only use tools that are recommended according to the appendix.

6.1.2 Users

- User training received.
- Safety training received.
- Trained and practised respirator user.
- Solid knowledge of fall protection and a good head for heights.
- Instructed and practised on the device.
- Standardised documentation for use.
- Full physical and mental suitability.
- Valid, regional medical fitness to use respirators.
- No impairments due to medicines or drugs.
- Minimum age: 18.
- Observe the safety requirements.
- Read the relevant section in the operating manual.

NOTICE

Only perform work for which you are trained.

6.2 Safety

DANGER



Danger due to failing to comply with safety instructions

A failure to comply with safety instructions can have irreversible and serious effects on health or cause life-threatening injuries up to and including death. Significant damage to property may also occur.

- Observe safety instructions.
- Read the operating manual prior to start-up.
- Store the operating manual with the drill-extinguisher.
- Clean illegible safety instructions and replace if necessary.

DANGER



Danger due to slipping or falling

Extinguishing work is dangerous. Especially due to contaminated, wet or obscured surfaces. There is a high risk of falling when working on roofs. This can cause injuries up to and including death.

- Use fall protection along building edges.
- Use an aerial rescue device if possible when working at heights.
- Use retaining devices.
- Comply with the local fire service regulations.
- Observe the safety instructions.
- Use the prescribed PPE (personal protective equipment).
- Take great care and work with caution.

DANGER



Danger due to falling

When drilling through, resistance disappears suddenly. Falling or slipping are possible. This can cause injuries up to and including death.

- Use fall protection along building edges.
- Use an aerial rescue device if possible when working at heights.
- Use retaining devices.
- Ensure secure footing.
- Comply with local fire service regulations
- Use prescribed PPE (personal protective equipment).
- Take great care and work with caution.

! DANGER



Danger due to life-threatening electric shock

Water, extinguishing agents and metal components conduct electricity.

- Do not direct the extinguishing agent jet directly at high voltage lines or other electrical installations.
- Always maintain a safe distance to live parts.
- Never penetrate structures with live components.
- De-electrify objects prior to penetrating with the drill-extinguisher.
- Never use extinguishing foam to fight fires on electrical systems and live objects.
- Do not handle or use metal ladders in the vicinity of live systems.

! DANGER



Danger due to burns

Extinguishing work is dangerous. Burns can cause injuries up to and including death.

- The drill-extinguisher may only be operated by trained and qualified individuals or firefighters.
- Wear full fireproof clothing in accordance with the applicable standard.
- Cordon off the hazard zone to prevent unauthorized access.

! DANGER



Danger for people in the fire area

Extinguishing work is dangerous. People in the hazard zone can suffer serious injuries up to and including death when the drill-extinguisher is used.

The expansion of steam can cause the steam or smoke gases in the fire area and hazard zone to be displaced and suddenly escape.

- If there are people in the fire area or hazard zone, use of the drill-extinguisher is not permitted.
- Prior to using the drill-extinguisher, ensure that no one is in the fire area or hazard zone.
- Cordon off the hazard zone to prevent unauthorized access.

! DANGER



Explosion hazard

The ignition energy generated during drilling can cause heat and sparking to occur. This can lead to explosions.

- Use of the DRILL-X drilling function in explosive environments is prohibited!

! WARNING**Danger due to removal of or interference with safety equipment**

Removal of or interference with safety equipment can cause serious injuries or significant damage to property.

- Do not remove any safety equipment.
- Do not interfere with safety equipment.
- Inspect all safety equipment at least once per month.

! WARNING**Injury due to improper and unintended operation**

Improper and unintended operation of the drill-extinguisher can cause injuries or damage to property.

- Check safety equipment prior to use.
- Only use the drill-extinguisher when it is in perfect condition.
- Only use the drill-extinguisher in accordance with the intended use.
- Cordon off the hazard zone to prevent unauthorized access.

! WARNING**Warning of pressure surge**

A pressure surge occurs when the water is stopped quickly. This sounds like a hammer hitting a pipe. This pressure surge can cause serious injuries when handling extinguishers. There is also a risk of damage to property.

- Regulate the water quantity on nozzles, hydrants, valves, etc. slowly and carefully.
- Hold the nozzles and the drill-extinguisher tight before opening a pressure outflow.
- Relieve the pressure before connecting a hose.
- If there is a risk to people, reduce the pump speed immediately or close the affected pressure outlet.
- Shut the pump system down if necessary.

! WARNING**Warning of insufficient personnel qualifications**

There is a risk of serious injuries and significant damage to property if unqualified and unauthorized people remain in the hazard zone or work with the drill-extinguisher.

- Only individuals with appropriate training may work with the drill-extinguisher.
- Cordon off the hazard zone to prevent unauthorized access.

⚠ WARNING



Warning of sudden torque occurrence

When pulling the control lever on the drill-extinguisher down completely, a sudden torque of up to 60 Nm occurs. This can cause injuries, affect your stability and therefore cause you to fall.

- Expect torque to occur suddenly when operating the drill-extinguisher.
- Ensure good, firm and secure footing.
- Always hold the drill-extinguisher in your right hand.
- Use a retaining device and personal protective equipment.
- Use both arms to exert working pressure onto the drill-extinguisher.

⚠ CAUTION



Vibration occurrence

Vibration and incorrect handling can cause user haematoma.

- Only exert force using both hands.
- Hold the device tightly.
- Use the shoulder rest to guide the device. Do not exert any force when doing so.
- Ensure correct handling (right hand).
- Use personal protective equipment (gloves).

6.3 Water supply

A correctly-sized and stable water supply must be established to use the drill-extinguisher for drilling and extinguishing. The system's operating pressure depends on the supply line's hydraulic resistance.

Requirements:

- Perform a visual inspection of the surroundings (hazards, people, objects).
- Wear personal protective equipment in accordance with fire service guidelines.
- Have an appropriately-sized hydraulic fire hose to hand.
- Ensure the water supply in accordance with *Section 5.8 "Water supply" on page 54*.
- Ensure the water supply in accordance with *Section 5.7 "Operating media" on page 52*.
- Have the drill-extinguisher to hand.
- Drinking water quality.



Connecting the water supply

1. Establish the hose connection.
 - drill-extinguisher, shut-off valve, fire extinguishing pump
2. Establish the water supply with a correctly-sized fire hose and the corresponding operating pressure.
3. Use the coupling to connect the fire hose to the standpipe.
4. Use the coupling to connect the fire hose to the drill-extinguisher.



The drill-extinguisher is connected to the water supply.

NOTICE

Always observe *Section 5.8 "Water supply" on page 54*!

6.4 Firefighting

This section contains the basic information for using the “DRILL-X” drill-extinguisher. Current and important updates to the procedure and use are provided on the website at **www.drill-x.at**.

NOTICE

You must perform a visual inspection of the drill-extinguisher before you start drilling or extinguishing.

NOTICE

Prior to using the system, the object that is on fire must always be checked for live components or wires. If the presence of live components can be ruled out, the object does not always have to be de-electrified. If in doubt, we recommend de-electrifying the object.

Take particular care in the event of a supply line above the roof. Safety distances to the lines must be adhered to or the power must be switched off.

NOTICE

A situational assessment must be carried out prior to use.

To do this, proceed as described in *Section 5.9 “Situational assessment” on page 55*.

6.4.1 Situational assessment

A comprehensive situational assessment must be carried out on-site. Based on the available information, there are three basic indicators that favour the use of the drill-extinguisher:

1. Firefighting from inside is not possible:
 - Source of the fire is not accessible.
 - Approach is too long and too complex.
 - Interior dangers are too significant.
 - Firefighting is not practical.
2. Dynamic fire development:
 - Very high thermal load
 - Signs of flashovers due to smoke
 - High rate of spread
3. Generally closed structures:
 - Roof structure fires.
 - Hall fires.
 - Wall and ceiling structures.
 - Similar application environments.

DANGER Fatal injuries due to spray



The spray in closed rooms or smoke gas can cause fatal injuries.

- Check that no one is in the hazard zone.

NOTICE

The drill-extinguisher must be operated at idle for 30 seconds prior to use at temperatures below -5° Celsius. After this procedure, the drill-extinguisher can be used for drilling.

See Section 5.9 “Situational assessment” on page 55.

6.4.2 Positioning the drill-extinguisher

NOTICE

Always consider the recommendations in *Section 5.9 "Situational assessment" on page 55!*

The tactical position should be selected based on the following factors:

- What is the spatial layout of the fire area?
- Is it a structural fire or a room fire?
- Which thermal loads are to be expected?
- How can I achieve my desired position?
- Is the fire to be extinguished?
- Is there an object to be protected?
- Can the officers' safety be guaranteed?

For effective firefighting, the DRILL-X should reach the smoke gas layer or the source of the fire. The extinguisher has the best effect if the fire area is filled with spray as much as possible.

On roof surfaces, a thermal imaging camera is used to detect the hottest part of the fire area, which is then selected as the penetration point for the DRILL-X if possible.

For room fires, the drill extinguisher should be positioned at the intersection of the upper third of the wall and the centre of the room. If the fire is to be fought through the ceiling or the floor, the middle of the area considered must be selected as the position.

If the drill-extinguisher is used to protect areas that are not yet affected by the fire, the drill-extinguisher must be positioned at a sufficient distance from the source of the fire.

The effectiveness of the actions being taken must be checked repeatedly.

6.4.3 Drilling

Requirements:

- Perform a visual inspection (hazards, people, objects).
- Use fall protection - use an aerial rescue device if possible.
- Ensure that the person and the drill-extinguisher are well positioned.
- Ensure that the user has secure footing.
- Wear personal protective equipment in accordance with fire service guidelines.
- The water connection has been established.
- Select the pump output pressure that is suitable for the hose system in use.



Drilling

1. Attach the drill bit.

WARNING



Risk of falling due to torque occurrence!

Torque occurs suddenly at the start of the drilling procedure.

- Prepare for the torque that will occur!
 - Ensure secure footing!
 - Use retaining devices!
 - Operate the drill-extinguisher with your right hand!
2. Person and drill-extinguisher positioning
 - Position the handle.
 - Put your right shoulder into the shoulder rest.
 - Leave your right hand in the recessed grip.
 3. Open the shut-off lever with your left hand
 - Then place your left hand on the handle.

WARNING



Risk of falling due to water pressure occurrence!

Water pressure occurs suddenly at the start of the drilling procedure.

- Prepare for the water pressure that will occur.
 - Ensure secure footing.
 - Use retaining devices.
4. Fully press the control lever.
 - Maximum output
 5. Use both arms to exert feed pressure onto the drill-extinguisher.
 - Shift your body weight onto the drill-extinguisher.
 - Ensure that you are at a right angle to the structure.
 - Do not twist the device.
 - Use the entire drilling depth.
 - The drill penetrates through the material in a few revolutions and the resistance drops.
 - Once the drill bit has penetrated the structure, the device loses its centering and can twist.



Drilling

DANGER



Risk of falling due to loss of resistance.

During drilling, resistance disappears suddenly.

- Prepare for the loss of resistance.
 - Ensure secure footing.
 - Use retention devices.
6. Insert the drill-extinguisher into the structure as far as possible.
 7. Release the control lever.
 8. Close the shut-off lever.



Drilling is complete.

NOTICE

Re-evaluate the roof's stability once you have drilled through the roof.

Leave the drill-extinguisher in the structure if required.

Remove the drill-extinguisher from the hole if the water does not flow.

6.4.4 Extinguishing with water

Start the extinguishing procedure as soon as the drilling procedure is complete.
The drill-extinguisher can be used for extinguishing without drilling.

Requirements:

- Perform a visual inspection for hazards.
- Ensure that no one is in the immediate vicinity of the fire area.
- Ensure that no one is in the fire area.
- Ensure secure footing.
- Wear personal protective equipment in accordance with fire service guidelines.
- Water is supplied to the system.
- Access is available through the structure,
- For drilling information, see *Section 6.4.3 "Drilling" on page 66*.



Extinguishing

1. Insert the drill-extinguisher into the fire area.
2. Open the shut-off lever.
 - The control lever remains closed.
3. Push the handle towards the shoulder rest.
4. Insert the drill-extinguisher as far as possible into the fire area.
5. Use the control lever to modify the spraying angle if required.
6. Assess the actions being taken.
7. Monitor changes to the smoke pattern.
 - Wait for up to 2 minutes.

7.1 No change

- The drill-extinguisher has not reached the fire area.
- Drill again!

7.2 Significant change

- The drill-extinguisher has reached the fire area.

8. Measure the temperature if possible.

8.1 Temperature < 100 °C

- Start subsequent actions.
- Firefighting successful.

8.2 Temperature > 100 °C

- Repeat the extinguishing procedure.
- Repeated drilling is not necessary.

➡ Extinguishing procedure is complete.

NOTICE

Perform assessments and subsequent extinguishing work in the fire area after each extinguishing procedure.

NOTICE

If the extinguishing effect is no longer achieved in the current position, stop the extinguishing procedure at this point. Drill again in a different potential fire source and start another extinguishing procedure.

NOTICE

For more explanations and information, see the firefighting tactics standards online at www.DRILL-X.com.

6.4.4.1 Adjusting the jet shape

Set the predefined jet angle and flow rate.

Always select the jet angle so that the fire area is filled as much as possible.

**Adjusting and locking**

1. Press the control lever according to the scale in *Section 4.4 "Jet shapes" on page 46*.
2. Select the position on the scale.
3. Press the lock down.
 - It should engage audibly.
4. Release the control lever.
5. Release the lock.

➞ The jet angle is set and locked.

**Releasing the lock
Variant 1**

1. Pull the control lever.
 - The lock releases.

➞ The lock is released.

**Releasing the lock
Variant 2**

1. Pull the control lever.
 - The lock does not release.
2. Press the lock up.

➞ The lock is released.

NOTICE

For more explanations and information, see the firefighting tactics standards at www.DRILL-X.at.

6.4.5 Extinguishing using wetting agents and foam

There are no different regulations or recommendations for extinguishing using wetting agents and foam. The appropriate standard mixing ratios must be used. Comply with the area of application for the foam and wetting agent according to the manufacturer's specifications.

6.4.6 Generating low-expansion foam by mixing in a foaming agent

If the main and auxiliary nozzles are inserted into a cavity, low-expansion foam is generally generated when mixing in a foaming agent. This is to be used for cavities depending on the application.

6.4.7 Extinguishing using the compressed air foam system (CAFS)

The drill-extinguisher can also be operated with compressed air foam. The drilling function is not available in this case. Compressed air foam can basically be used in any fire situation. Note that the cooling effect is significantly reduced when compared to water.

NOTICE

Foams can harm the environment.

- Dispose of foams properly.
- Do not dispose of them into bodies of water or the sewer system.

7 Troubleshooting

7.1 Requirements

7.1.1 Organization

- Train users on the drill-extinguisher.
- Train users on safety.
- Keep an operating log.
- Comply with maintenance schedules.
- Assign people with applicable experience and specialist knowledge.
- Call trained specialists if necessary.
- Only use tools that are recommended according to the appendix.

7.1.2 Users

- Training on the drill-extinguisher received.
- Safety training received.
- Only perform work for which you are trained.
- No impairments due to medicines or drugs.
- Minimum age: 18 years.
- Read the relevant section in the operating manual.
- Observe the safety requirements.
- Only use tools that are recommended according to the appendix.

7.2 Safety

WARNING



Warning of insufficient personnel qualifications

There is a risk of serious injuries and significant damage to property if unqualified and unauthorized people remain in the hazard zone or work with the drill-extinguisher.

- Only individuals with appropriate training may work with the drill-extinguisher.
- Cordon off the hazard zone to prevent unauthorized access.

WARNING



Injury due to improper and unintended operation

Improper and unintended operation of the drill-extinguisher can cause injuries or damage to property.

- Check safety equipment prior to use.
- Only use the drill-extinguisher when it is in perfect condition.
- Only use the drill-extinguisher in accordance with the intended use.
- Cordon off the hazard zone to prevent unauthorized access.

NOTICE



Note regarding the tools used

Only use approved tools (in accordance with the appendix).
Using other tools can cause damage to property.

7.3 Troubleshooting

NOTICE

Only have malfunctions rectified by qualified and trained people.
Only use tools and spare parts that are recommended according to the appendix.



WARNING

Risk of injury due to water pressure

Serious injuries can result.

- Close the water supply prior to working on the drill-extinguisher.
- Perform a visual inspection to establish that no one is in the hazard zone.

7.3.1 Handle clamping

The clamping force for positioning the handle may weaken with use. If twisting or slippage of the handle is noticed during use, the handle adjustment screw must be corrected. If it is too loose, the clamping force only begins after the neutral position and must be corrected.

Prerequisites:

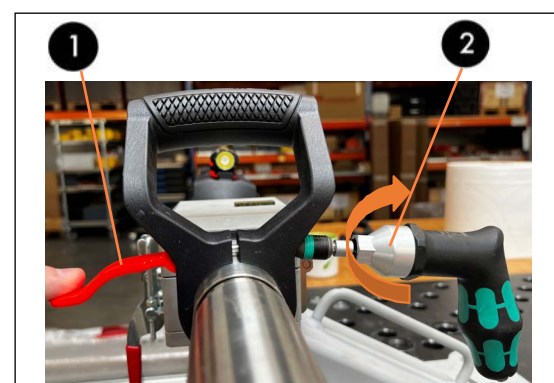
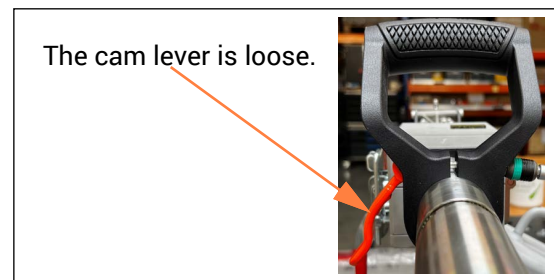
- Close water supply to drill extinguisher.
- Close shut-off valve..



Tighten the handle clamping

1. Open the cam lever and use a torque screwdriver to adjust the screw.
2. Tighten the screw until the cam lever does not exert any clamping force on the handle at maximum opening.
 - The handle must be moveable in the open position.
 - An overtightening of the cam lever in open or closed position is not authorized. This can cause damage to the handle.

➞ The handle is tightened.



7.3.2 Drilling system



Troubleshooting the drilling system

1. Check the drilling system.
 - The functionality of the drilling system used must be guaranteed at all times..
2. Rectify malfunctions in the drilling system as necessary.
 - Observe the operating instructions for the drilling system.

➡ Troubleshooting started.

7.3.2.1 Drill head contaminated



Cleaning the drilling system

1. Check the drill head for contamination.
 - Observe the DRILL-X operating instructions for the drilling system.
2. Remove contamination caused by building material residue.
 - Use PPE! Safety gloves!

➡ Drilling system cleaned.

NOTICE

Ensure that the drilling system used is functional and ready for use.

7.3.3 Drill bit does not rotate

NOTICE

The drill bit does not rotate when dry. If there has been an extended shutdown, the drive unit may restart for the first time with a slight delay. This is not a problem and is also normal due to the sealing system used.

If the drill-extinguisher does not function after more than 20 seconds, troubleshoot as follows:

Causes:

- 1 Operating pressure is too low, see *Section 7.3.3.1 "Operating pressure too low" on page 75.*
- 2 Sediment load, see *Section 7.3.3.2 "Sediment load" on page 75.*
 - *5.7 "Operating media" on page 52.*
- 3 Drill is stuck, see *Section 7.3.5.1 "Torque too low" on page 78.*

7.3.3.1 Operating pressure too low



Drill bit does not rotate

1. Increase the operating pressure to max. 14 bar.
2. Ensure that the water flow is 600 l/min.
3. Fully press the control lever for approx. 30 seconds.



Drill bit rotates again.

7.3.3.2 Sediment load



Drill bit does not rotate

1. Check for sediment in the extinguishing water.
2. Reduce sediment load (suction strainer).
 - see *5.7 "Operating media" on page 52.*



Drill bit rotates again.

7.3.3.3 Drill is jammed

Requirements

A drilling system must be securely attached.



Drill bit does not rotate

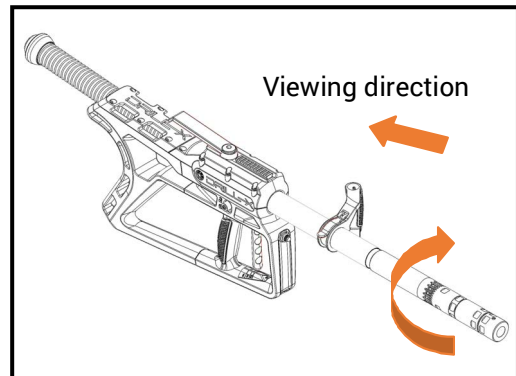
1. Close water supply to the drill-extinguisher.
2. Close shut-off valve.

WARNING!



Risk of injury due to water pressure!

- Close water supply to drill-extinguisher.
 - Close shut-off valve.
2. Apply a simple wrench to the tool clamping system.
 3. Rotate the drill bit clockwise.
 - Opposite to the direction of rotation from the front.
 4. The drill bit should be able to turn using the wrench.
 5. Connect the water supply to the drill-extinguisher.
 6. Re-establish the water flow.
 - With the slide completely open.
 7. The drill bit should rotate away on its own.



 The drill bit rotates again.

NOTICE

If the problem cannot be resolved by rotating away, please contact customer service.

NOTICE

Remove the drill-extinguisher from the source of the fire (hole) if the water does not flow!

7.3.4 No drilling procedure when drill bit is rotating

Causes:

- Observe the DRILL-X operating instructions for the drilling system.
- "Defective cutting plates", see *operating manual for universal drilling system*.
- "Drill head contaminated", see *Section 7.3.2.1 "Drill head contaminated" on page 74*.
- Contact pressure is too low.

7.3.4.1 Increase contact pressure



No drilling with rotating drill bit

1. Ensure that the drill bit or drill head is intact and clean.
2. Increase contact pressure.
3. Troubleshooting for contact pressure:
 - Find a new position for the drill-extinguisher.
 - Change footing.
 - Apply more body weight or adjust body weight application.
 - Consider adding additional user to increase contact pressure.

➡ Drilling is possible again.

7.3.5 Torque

The drill-extinguisher does not reach the required power or the torque is too low.

7.3.5.1 Torque too low

The most common cause is the hydraulic working power on the device.



Torque too low

1. Inspect the supply line.
 - Supply line dimensions.
 - Supply line interruption.
 - Kinks in the supply line.
 - Operating pressure set incorrectly.
 - 1.1. Remove obstructions if necessary.
 2. Check fire extinguishing pump's conveyance output.
 - 2.1. Increase the conveyance output if necessary.
 3. Inspect valves.
 - All valves fully open.
 - 3.1. Open valves if necessary.
 4. Check filter screen on the coupling.
 - 4.1. Clean filter screen if necessary.
-  The torque increases.

7.3.6 Drill bit does not centre

Causes:

- The centre drill is damaged.
- The pressing force is too low.

Troubleshooting:

- Observe the DRILL-X operating instructions for the drilling system.
- Increase contact pressure, see 7.3.4.1 *"Increase contact pressure"* on page 77.

8 Cleaning and maintenance

8.1 Requirements

8.1.1 Organization

- Comply with maintenance intervals.
- Document maintenance work.
- Comply with safety regulations.
- Assign qualified, trained individuals.
- Prevent unauthorized access.
- Only use approved spare parts and equipment.
- Only use tools that are recommended according to the appendix.
- Ensure that all equipment complies with the applicable standards.

8.1.2 Users

- Individuals with applicable experience and specialist knowledge.
- Read the relevant section in the operating manual.
- Rectify all damage and malfunctions immediately.
- Contact SYNEX TECH GmbH if malfunctions cannot be rectified.

NOTICE	
	Notice regarding potential damage to the device due to missing maintenance or cleaning Lack of maintenance and cleaning can cause damage and contamination. This shortens the service life of the drill-extinguisher. • Keep the drill-extinguisher clean and maintain it consistently.

8.2 Safety

8.2.1 Occupational safety

- Users know all functions and working methods of the drill-extinguisher.
- Check that safety equipment is functioning.
- Tools and other aids are in good condition.
- Do not wear any loose clothing, rings, chains and other jewellery in the vicinity of moving parts (drill bits).
- Tie long hair back.
- Re-install any safety equipment that was removed prior to operation.
- Only perform maintenance and cleaning when the compressed air line is disconnected.

8.2.2 Warning notices

 WARNING	Hand injuries There is a risk of serious hand injuries. • Take great care when working. • Wear cut-resistant gloves.
 WARNING	Risk of burns There is a risk of burns! • The drill-extinguisher must cool down before starting maintenance and servicing work.
 CAUTION	Environmental damage and adverse health effects Pay attention to environmental damage due to extinguishing or cleaning agents that are disposed of or stored incorrectly. • Ensure correct storage and disposal.

NOTICE

	Note regarding the tools used Only use approved tools (in accordance with the appendix). Using other tools can cause damage to property.
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8.3 Tasks and cycles

Prescribed cleaning and servicing work, deadlines and specifications for replacing parts and components must always be complied with.

Before performing the work, ensure that you have the required tools as recommended in the appendix and the relevant components to hand.

Intervals

- Monthly
- Every six months
- Yearly
- After 10 years or 100 operating hours
- After 200 operating hours

NOTICE

A failure to comply with the maintenance intervals can cause personal injuries or damage to property.

8.4 After completing maintenance and cleaning work

Actions after completing maintenance and cleaning work

Before using again, check all safety equipment and functions to ensure that they are working properly.

The drill-extinguisher may only be approved for use once the check is complete.

The following sections describe maintenance work required for optimized and fault-free operation. If inspections reveal increased wear, the required maintenance intervals must be adjusted for the signs of wear.

Contact SYNEX TECH GmbH if you have any questions regarding maintenance work and intervals.

8.5 General cleaning and maintenance

Regular care of the drill-extinguisher is required for permanent, fault-free operation.

NOTICE

Protect the drill-extinguisher from heavy contamination.

8.5.1 Cleaning

The aim of this action is to clean the drill-extinguisher.

Requirements:

- Lukewarm water
- Soft cloth
- Penetrating oil as corrosion protection



Cleaning

1. Always clean the drill-extinguisher with clean, lukewarm water.
2. Allow the water to flow in and out in a vertical position.
3. Dry with a soft cloth.
4. Oil the core, drill bit and cutting tip.
 - This prevents corrosion.



The drill-extinguisher is clean.

NOTICE

Always dry the drill-extinguisher completely on the outside and inside!

The drying duration when the shut-off lever and slide are open is approx. 48 h to 72 h.

8.5.2 Cleaning if heavily contaminated

The aim of this action is to clean heavy contamination from the drill-extinguisher.

Requirements:

- Lukewarm water with washing-up liquid
- Lukewarm water
- Soft cloth
- Penetrating oil as corrosion protection



Cleaning if heavily contaminated

1. First clean the drill-extinguisher with lukewarm water and washing-up liquid.
2. Then rinse with clean, lukewarm water.
3. Allow the water to flow in and out in a vertical position.
4. Dry with a soft cloth.
5. Oil the core, drill bit and cutting tip.
 - This prevents corrosion.



The drill-extinguisher is clean.

NOTICE

Always dry the drill-extinguisher completely on the outside and inside!

The drying duration when the shut-off lever and slide are open is approx. 48 h to 72 h.

Do not use harsh cleaning agents such as brake cleaners.

8.5.3 Cleaning the main nozzles

Carry out a visual check with the slide valve closed and the control lever not pressed.
If the spray pattern is faulty, the main nozzles must be cleaned .

The aim of this action is to clean the main nozzles.

Requirements:

- Disconnect the drill extinguisher from the water supply.
- Drain residual water.
- Tool for cleaning out nozzles, such as a flexible metal wire (e.g. welding rod).
- Compressed air.



Cleaning the main noozles

1. Slide valve fully open.
2. Set lever position at fully open.
3. Clean out main nozzles with an appropriate tool.
 - To do this, use the tool to penetrate the main nozzle holes from the front. This loosens and removes foreign matter.
4. Blow through the main nozzles and the auxiliary nozzles with compressed air.
 - Ensure that the foreign matter is removed via the secondary nozzles.
5. Using a tool, check all main nozzles to ensure that foreign matter has been removed.
6. Connect the drill-extinguisher to the water supply.
7. Fully open the slide valve. Set level position at fully open.
8. Flush the drill-extinguisher using low water pressure.
 - Any foreign matter still found in the drill-extinguisher is removed via the open slide valve.
9. If the removal is unsuccessful and the spray pattern is still faulty, this process must be repeated.



The main nozzles are cleaned.

8.5.4 Idle test

The drill-extinguisher must be started up and an idle test performed before using it for firefighting for the first time and at least once every 6 months.



WARNING

Risk of injuries for bystanders

- Ensure that there is no one in the hazard zone.
- Do not point the drill-extinguisher at people.

Requirements:

- Perform a visual inspection (hazards, people, objects).
- Drinking quality water 5.7 "Operating media" on page 52 .
- Temperature above + 5 degrees Celsius.
- Ensure secure footing.
- Wear personal protective equipment.



Performing the idle test

1. Water supply with fire hose
 - 52 mm diameter and
 - 10 bar pressure must be established.
2. Start with the lowest operating pressure (10 bar).
3. Open the shut-off lever to max.
4. Press the control lever all the way to max.
5. Check whether the drill bit rotates.
- 6.1. The turbine does not start up automatically:
 - Increase the operating pressure to a maximum of 14 bar.
 - 7.3.3 "Drill bit does not rotate" on page 75
- 6.2. The turbine still does not start up:
 - Use a wrench to turn the turbine away.
 - 7.3.3 "Drill bit does not rotate" on page 75
7. Allow the device to run for 1 - 2 minutes with the drill bit rotating.
8. Release the control lever.
 - The slide valve must close automatically.
9. Close the shut-off lever.



Idle test complete.

8.6 Maintenance schedules

8.6.1 Monthly maintenance schedule

Task	Additional information
Perform visual inspection.	
Inspect safety equipment.	
Check cutting tip for damage.	
Check the handle clamping.	7.3.1 "Handle clamping" on page 73

8.6.2 Semi-annual maintenance schedule (every 6 months)

Task	Additional information
Perform idle test.	8.5 "General cleaning and maintenance" on page 82

8.6.3 Annual maintenance schedule (every 12 months)

Task	Additional information
Perform idle test.	8.5 "General cleaning and maintenance" on page 82
Perform visual inspection.	
Spray sealing surface and rear of the slide valve with silicone spray.	
Check pressure with shut-off lever closed. Apply 16 bar operating pressure to drill-extinguisher for 2 minutes. Pay attention to leaks at the integration point, shoulder rest and spray nozzles.	• Comply with safety distances and PPE. • Danger due to bursting hose. • Document pressure check. • If water escapes, do not replace the hose yourself. Contact the manufacturer.

8.6.4 10-yearly maintenance schedule or after 100 operating hours

Task	Additional information
Maintenance and inspection by the manufacturer	Recommended

8.6.5 Maintenance schedule after 200 operating hours

Task	Additional information
Complete service and drive unit replacement by the manufacturer	Recommended

9 Disposal

9.1 Requirements

9.1.1 Organization

- Comply with safety regulations.
- Comply with environmental regulations.

9.1.2 Users

- Read the relevant section in the operating manual.
- Inform SYNEX TECH GmbH in the event of problems.
- Only perform work for which you are trained.

9.2 Safety

- Pay attention to your own safety when you come into contact with hazardous materials and chemicals.
- Pay attention to the manufacturer's material safety data sheets.
- Comply with local safety and environmental protection regulations.
- Comply with local fire service regulations.

9.3 Proper and environmentally-friendly disposal

Waste materials occur during individual maintenance or cleaning work, or when disposing of the drill-extinguisher. Dispose of these properly and in an environmentally friendly manner.

As the owning organization, you are obliged to acquaint yourself with the waste disposal regulations that are applicable to your region and follow them.

9.4 Disposal points

Responsible disposal points can be found in your region.

10 Appendix

10.1 Wear and spare parts

List of wear and spare parts with SYNEX TECH part number (Part No.) and description.

Part No.	Description
107664	Clamp screw PU 10
107660	Handle

Information on wear and spare parts for the respective drilling system can be found in the corresponding operating manuals or directly from SYNEX TECH GmbH.

10.2 Tools

List of necessary tools with SYNEX TECH part number (Part No.), description and alternative tools.

Part No.	Description	Alternative
106395	Wrench WS46	
105939	Hexagon socket screwdriver	• Torque indicator 300 Hex 4.0 • Torque 8 Nm

Information on tools for the respective drilling system can be found in the corresponding operating manuals or directly from SYNEX TECH GmbH.

10.3 Drilling system

Information regarding the available drilling systems can be obtained from SYNEX TECH GmbH.

10.4 Accessories

Information regarding available accessories can be obtained from SYNEX TECH GmbH.

