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BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

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Responsible Committee Secretary: Mrs Susan Revell (BSI)
Direct tel: 020 8996 7195
E-mail: susan.revell@bsigroup.com

Full document details: 25/30501230 DC

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Firefighting and rescue service vehicles - Part 3: Permanently installed equipment - Safety and performance

Véhicules des services de secours et de lutte contre
l'incendie - Partie 3: Equipements installés à demeure -
Sécurité et performances

Feuerwehrfahrzeuge - Teil 3: Fest eingebaute
Ausrüstung - Sicherheits- und Leistungsanforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 192.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 1846-3:2025) has been prepared by Technical Committee CEN/TC 192 “Fire and Rescue Service Equipment”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1846-3:2013.

FprEN 1846-3:2025 includes the following significant technical changes with respect to EN 1846-3:2013:

- scope: the list of permanently installed equipment covered (use of wireless control systems included) and the list of the equipment not covered have been updated;
- all notes recalling Directives and Regulations references have been removed;
- the normative references have been updated and dated;
- term entries 3.1.5 (installed water pump), 3.2 (additive) and 3.6 (bracket assembly for removable equipment) have been updated;
- term entries 3.4 (mixing system), 3.7 (demountable) and 3.8 (demounting system) have been added;
- symbols and abbreviated terms are now in Clause 4 (instead of Annex A);
- the list of significant hazards is now in Annex A (instead of Clause 4);
- Required Performance Levels (PL_r) have been added in 5.2.2 (Water installation), 5.2.4 (Monitor) and 5.2.5 (Bracket assembly for removable equipment) and 5.2.6.14 (Hook arm system);
- ergonomics requirements are now in 5.2 “Safety requirement” instead of 5.3 “Performance requirements”;
- requirements for water installation (5.2.2 and 5.3.2) has been updated;
- requirements for additive installation (5.2.3 and 5.3.3) have been updated;
- 5.2.7 (Lifting system using a crane) has been added;
- 5.2.8 (Extendable equipment) has been added;
- 6.4 (Marking on equipment) has been amended ;
- Annex C (Usable capacity of the water tank) has been updated;
- Annex E (Variation of the suction height) has been updated;
- Annex F (Examples of other demounting systems) has been added;
- Annex ZA now refers to Regulation (EU) 2023/1230;

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA which are an integral part of this document.

Introduction

This document is a type-C standard as stated in EN ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in the case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

While producing this document it was assumed that, due to the European regulations on the approval of vehicles for use on public roads, fire fighting vehicles still comply with:

- EMC requirements;
- cyber security requirements.

Therefore, EMC and cyber security are not further considered in this document.

1 Scope

1.1 This document specifies the minimum requirements for safety and performance of some optional specific permanently installed equipment on firefighting and rescue service vehicles, operated by trained persons, as designated in EN 1846-1:2011 and specified in EN 1846-2:2024.

NOTE 1 Categories and mass classes of these vehicles are given in EN 1846-1:2011.

NOTE 2 Vehicle means ground vehicles which can also drive on rails and amphibious vehicles.

The permanently installed equipment covered by this document is given below:

- water installation;
- additive installation;
- monitor;
- equipment gantries;
- demountable systems.

This document covers also the use of wireless control systems.

NOTE This document is assumed to be read in conjunction with any national regulations in force for vehicles using the public roads and with any EU Directives and associated EFTA regulations in force relevant to vehicles and their equipment.

For the purposes of this document, the normal ambient temperature range is - 15 °C to + 40 °C.

For equipment to be used at temperature outside this temperature range, the particular temperature range is specified by the user. A risk assessment determines any need for additional precautions.

1.2 This document does not deal with the following types of equipment:

- all control systems outside of the cabin related to hook arm system;
- provisions for non-firefighting removable equipment driven by PTO.

1.3 This document deals with the technical requirements to minimize the hazards listed in Annex A which can arise during operational use, routine checking and maintenance of firefighting and rescue service vehicles.

It does not cover the hazards generated by:

- non-permanently installed equipment i.e. portable equipment carried on the vehicle;
- use in potentially explosive atmospheres;
- commissioning and decommissioning;
- noise (as permanently installed equipment cannot be operated separately from the vehicle, this hazard is covered in EN 1846-2:2024);
- electromagnetic compatibility;
- cyber security;
- cyber safety.

Additional measures not dealt with in this document can be necessary for specific use (e.g. fire in natural environment, flooding, etc.).

1.4 This document is not applicable to the equipment which is manufactured before its date of publication by CEN.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 547-2:1996+A1:2008, *Safety of machinery - Human body measurements - Part 2: Principles for determining the dimensions required for access openings*

EN 659:2003+A1:2008,¹ *Protective gloves for firefighters*

EN 1028-1:2002+A1:2008, *Fire-fighting pumps - Fire-fighting centrifugal pumps with primer - Part 1: Classification - General and safety requirements*

EN 1846-1:2011, *Firefighting and rescue service vehicles - Part 1: Nomenclature and designation*

EN 1846-2:2024, *Firefighting and rescue service vehicles - Part 2: Common requirements - Safety and performance*

EN 12999:2020+A1:2025, *Cranes — Loader cranes*

EN 14710-1:2005+A2:2008, *Fire-fighting pumps - Fire-fighting centrifugal pumps without primer - Part 1: Classification, general and safety requirements*

prEN 15767-1:2025,² *Portable equipment for projecting extinguishing agents supplied and fire fighting support operation — Portable monitors — Part 1: General requirements for portable monitor assemblies*

EN 16327:2014, *Fire-fighting - Positive-pressure proportioning systems (PPPS) and compressed-air foam systems (CAFS)*

EN 60529:1991,³ *Degrees of protection provided by enclosures (IP Code)*

EN ISO 4413:2010, *Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4414:2010, *Pneumatic fluid power - General rules and safety requirements for systems and their components (ISO 4414:2010)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2023, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2023)*

¹ As impacted by EN 659:2003+A1:2008/AC:2009.

² Under preparation.

³ As impacted by EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013, and EN 60529:1991/AC:2016-12, EN 60529:1991/corrigendum May 1993, and EN 60529:1991/A2:2013/AC:2019-02.

EN ISO 13849-2:2012, *Safety of machinery - Safety-related parts of control systems - Part 2: Validation (ISO 13849-2:2012)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1846-1:2011, EN 1846-2:2024 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

water installation

combination of components for the collection, storage and delivery of water and/or water-additive mixture at varying pressures and delivery rates

3.1.1

classification of the water installation

combination of the delivery rate Q_1 specified at pressure p_{a1} and at specified height d

3.1.2

height

d

difference of level between the standing surface of the vehicle and the water surface at the time of a pumping appliance suction operation

3.1.3

standing surface of the vehicle

surface on which the vehicle wheels are resting when it is operating

3.1.4

standing surface of the operator

surface on which the operator stands

3.1.5

installed water pump

pump permanently installed on a vehicle and driven by the power supply of the vehicle or by its own power supply

3.1.6

installed water tank

container for storage of water for fire service purposes

3.1.7

supply and delivery connections for water

inlet and outlet devices for joining hoses to the pipework installation

3.1.8

pipework installation for water

system linking the installed water pump(s), the installed water tank(s) and the supply and delivery connections

3.1.9

operating and control instruments for water

controls and gauges necessary to operate and monitor the water installation system

3.1.10

hosereel system

fixed hose storage system on a rotating drum for semi-rigid hose(s) permanently connected to the pipework installation

3.1.11

wheeled hosereel

hosereel designed for the storage, the transport and the deployment of layflat hose

3.2

additive

addition to water to enhance firefighting capabilities

EXAMPLE foam concentrate, fire retardant, sand

3.2.1

additive installation

combination of components for the collection, storage and delivery of additive at varying pressures and delivery rates before mixing with water

3.2.2

installed additive pump

pump permanently installed on a vehicle and driven by the power supply of the vehicle or by its own power supply

3.2.3

installed additive tank

container for storage of additive for fire service purposes

3.2.4

supply and delivery connections for additive

inlet and outlet devices for joining hoses to the additive installation

3.2.5

pipework installation for additive

system linking the installed additive pump(s), the installed additive tank(s) and the supply and delivery connections

3.2.6

operating and control instruments for additive

controls and gauges necessary to operate and monitor the additive installation system

3.3

usable capacity

<of a tank> capacity of liquid contained in a tank that can be used by the corresponding pump(s)

3.4

mixing system

system to mix the additive (including foam concentrate) with water (and sometimes air) to produce the required firefighting media

Note 1 to entry: The mixing system is part of the water and/or additive installation.

3.5

monitor

device for projection of extinguishing agents

3.6

bracket assembly for removable equipment

bracket assembly

mechanical system(s), manually or power driven, to assist with the loading, unloading and storage of equipment

3.7

demountable

specially designed frame with superstructure that can be transported by a suitable vehicle and mounted and dismounted by a demounting system

3.8

demounting system

equipment installed on the vehicle used to mount and dismount a *demountable* (3.7) from a vehicle

Note 1 to entry: See examples in Figure 1 and Figure 2.

3.9

hold-to-run control device

control device which initiates and maintains machine functions only as long as the manual control (actuator) is actuated

[SOURCE: EN ISO 12100:2010, 3.28.3]

4 Symbols and abbreviated terms

The following symbols and abbreviated terms are used in this document:

d	height, m
d_{eff}	minimum effective throw of the monitor, m
d_{max}	maximum throw of the monitor, m
p_a	maximum outlet pressure, l/min
P_{a1}	pressure, l/min
$p_{a \text{ lim}}$	maximum working pressure, l/min
n_0	maximum speed, rpm
Q	flowrate of the monitor, l/min
Q_1	delivery rate of the water installation, l/min
FPN	normal-pressure pump
PL _r	required performance level

5 Requirements and verifications

5.1 General

The general conditions for the tests to which this part refers are given in Annex A of EN 1846-2:2024.

Data of the component(s) may be used as part of the verification.

Any permanently installed equipment shall not cause unintended interference to other permanently installed equipment on the vehicle.

Adjustments permitted during the intended use of the vehicle shall be possible without the use of tools.

NOTE Tools means: screwdriver, hammer, etc.

Design and construction of permanently installed equipment shall comply with the requirements and specifications for installation on the chassis.

Verification

By checking compliance with the chassis specification.

5.2 Safety requirements and/or protective/risk reduction measures — Verifications

5.2.1 General

5.2.1.1 Permanently installed equipment shall comply with the general safety requirements and/or protective measures described in EN 1846-2:2024 as well as with the safety requirements and/or measures of 5.2. In addition, the equipment shall be designed according to the principles of EN ISO 12100:2010 for hazards relevant but not significant which are not dealt with in this document.

5.2.1.2 Each operating position for each item of equipment shall have a stop control. This stop control does not have to be an emergency stop control as specified in EN ISO 13850:2015.

Verification

By visual inspection and functional test of the stop control.

5.2.1.3 The design and selection of oil hydraulic components of permanently installed equipment shall conform to the requirements of EN ISO 4413:2010.

Verification

By inspection of the information supplied.

5.2.1.4 The design and selection of oil pneumatic components of permanently installed equipment shall conform to the requirements of EN ISO 4414:2010.

Verification

By inspection of the information supplied.

5.2.1.5 Construction techniques and materials of the permanently installed equipment shall be chosen so that they are protected against corrosion.

Verification*By verification of the attestation of the equipment/material's supplier.*

5.2.1.6 The equipment shall be protected against accumulation of water, dirt and corrosive substances, between and within the construction elements. Particular care shall be taken to avoid electro-chemical corrosion.

Verification*By visual inspection*

5.2.1.7 The design of permanently installed equipment and their mountings shall withstand the physical stresses applied in normal operational use.

Verification*By visual inspection and functional verification after transportation tests.*

5.2.1.8 Controls at the pump operating position shall include:

- pump speed control device;
- stop control (see 5.2.1.2).

Indicators at the pump operating position shall include:

- pump pressure indicator according to 5.2.5.2 of EN 1028-1:2002+A1:2008;
- pump vacuum indicator (where priming system fitted) according to 5.2.5.2 of EN 1028-1:2002+A1:2008;
- critical vehicle malfunction warning device (e.g. oil pressure or water temperature);
- water tank level indicator.

Supplementary controls at the pump operating position may include, for example:

- pump engaging device;
- suction valve control;
- priming device control;
- delivery valve(s) control(s).

Supplementary indicators at the pump operating position may include, for example:

- pump engaged indicator;
- speed indicator of pump;
- speed indicator of pump engine;
- priming device engaged indicator;

- hour metre(s);
- energy storage indicator.

If other operating position is provided, e.g. for monitor, controls and indicators shall be agreed at the time of enquiry and order.

Verification

By visual and functional verification of controls and indicators except where the function of the component is outside normal operating use, in which case verification shall be by checking the wiring circuit.

The same method of verification should be applied to the optional indicators and/or controls, where used.

5.2.2 Water installation

5.2.2.1 General

5.2.2.1.1 The required performance level (PL_r), in accordance with EN ISO 13849-1:2023, of the safety related parts of the control system for regulation of the pressure and opening of pressure outlet(s) shall comply with PL_r a.

Verification

In accordance with EN ISO 13849-2:2012.

5.2.2.1.2 All parts of the water installation designed to work at a pressure higher than 0,5 bar shall withstand the designed maximum working pressure ($p_{a\ lim}$) specific to that part of the installation plus 5,5 bar without any permanent deformation, damage or leakage.

Verification

By hydrostatic test for 1 min. The pump may be excluded from this test.

5.2.2.1.3 The maximum outlet pressure p_a shall not exceed the limit pressure ($p_{a\ lim}$) as defined in EN 1028-1:2002+A1:2008 or EN 14710-1:2005+A2:2008 at the maximum inlet pressure of the pump.

Verification

By calculation or dynamic test.

5.2.2.1.4 The maximum speed of the installed water pump shall be less than the maximum speed n_0 as defined in 3.6.3 of EN 1028-1:2002+A1:2008 or 3.6.2 of EN 14710-1:2005+A2:2008.

Verification

By measuring the maximum speed of the pump.

5.2.2.1.5 The deviation of the outlet pressure of the pump shall meet the requirements of Table 1 when operating at p_{a1} and Q_1 .

Table 1 — Allowed pressure deviation

Pump	Flowrate variation	Allowable pressure deviation
Pump with $Q_1 < 3\,000$ l/min	Q_1 to $0,7 Q_1$	p_{a1} to $1,25 p_{a1}$
Pump with $Q_1 \geq 3\,000$ l/min	Q_1 to $0,85 Q_1$	p_{a1} to $1,25 p_{a1}$

Verification

By measuring the pressure deviations. During the test, manual adjustment of the speed of the pump shall not be allowed. The variation of flow rate shall be achieved within 3 s.

5.2.2.2 Water tank

Installations in water tanks (e.g. baffles) shall be designed in such a way that the inner walls of the water tank are accessible for maintenance (servicing, inspection, repair).

Verification

Visual verification.

In addition to compliance with the stability requirements given in EN 1846-2:2024, the design and mounting of the water tank and the location and the installation of baffles, if necessary, shall prevent any excessive dynamic force that may cause vehicle instability under anticipated operational conditions.

NOTE Manufacturers have developed several different methods of designing machines which are stable under the conditions of intended use, and experience has shown that they can be equally effective. These can be based upon analytical computer software, physical testing, or designs which have been proven over several years of use. With the present state of knowledge, it is not possible to describe a single standardized method of design and of verification.

Verification

By visual verification and attestation or documentation.

A water tank level indicator shall be fitted and visible from the installed pump operating position.

Verification

By visual verification of the tank level indicator.

If personnel access holes are installed, the minimum clearance dimension shall be 450 mm and shall be accessible without removing major fixed components.

Verification

By visual verification and measurement and by functional verification for access holes.

A tank filling valve shall be fitted. A tank level indicator shall be visible at or near to the control position of the tank filling valve.

NOTE A single tank level indicator can be used if it is visible from both the control position of the tank filling valve and from the installed pump operating position.

Verification

By visual verification

5.2.2.3 Access to supply and delivery connections for water or water with additive

5.2.2.3.1 The maximum height from the lowest point of the final supply and delivery connection(s) to the standing surface of the operator shall not exceed 1,5 m at unladen mass (see 3.1 of EN 1846-2:2024). Hosereel systems shall comply with requirements of 5.3.2.7.

Verification

By visual verification and measurement.

5.2.2.3.2 The final supply and delivery connection(s) shall be angled downwards at an angle between 10° and 30° from the horizontal when they are higher than 0,5 m from the standing surface of the vehicle.

If it is technically impossible to reach these angles, a device shall be provided to be inserted between the delivery or supply connection and the related hoses to achieve the required angle. It shall not be possible to connect hoses without this device.

Verification

By measurement and functional test.

5.2.2.3.3 It shall be possible to relieve any pressure build up between the delivery connection and any blank cap fitted.

When hoses are stored in a locker in which the delivery connections are located, it shall not be possible to pressurize the hoses with the locker closed.

Verification

By visual inspection and functional test.

5.2.2.4 Pipework installation for water

The final delivery shall be equipped with valve(s) to shut off the water.

Verification

By visual inspection.

5.2.2.5 Operating and control instruments

5.2.2.5.1 Operating and control instruments shall conform to EN ISO 12100:2010, third dash of 6.2.8.f and 4.1.4.1 of EN 1846-2:2024. When operating and control instruments are installed outside they shall have a minimum degree of protection of IP65 in accordance with EN 60529:1991⁴.

Verification

In accordance with 4.1.4.1 of EN 1846-2:2024.

5.2.2.5.2 Operating controls shall be accessible, adjustable without the use of tools and not deviate from their set position.

⁴ As impacted by EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013, and Corrigenda EN 60529:1991/AC:2016-12, EN 60529:1991/corrigendum May 1993, and EN 60529:1991/A2:2013/AC:2019-02.

Verification

By visual and functional verification of the operation of controls.

5.2.2.6 Hosereel system

5.2.2.6.1 The operation of a powered rewind hosereel, if fitted, shall be controlled by a hold to run control.

Verification

By visual inspection and functional test.

5.2.2.6.2 When rewinding, the hosereel shall be visible by the operator of the hold to run control.

Verification

By visual inspection of the location.

5.2.2.6.3 The hosereel system shall be fitted with a means which prevents unintended unwinding.

Verification

By functional test and visual verification for unintended unwinding following the tests of 4.1.1.5 of EN 1846-2:2024.

5.2.3 Additive installation**5.2.3.1 General**

5.2.3.1.1 When positive pressure proportioning systems (PPPS) or compressed air foam systems (CAFS) are installed, they shall comply both with EN 16327:2014 and with the requirements of 5.2.3 and 5.3.3.

The other types of systems shall comply with the requirements of 5.2.3 and 5.3.3.

All parts of the additive installation designed to work at a pressure higher than 0,5 bar shall withstand the designed maximum working pressure specific to that part of the installation plus 5,5 bar without any permanent deformation, damage or leakage.

Verification

By hydrostatic test for 1 min.

5.2.3.1.2 The design and materials used shall take into account the nature of the additive, especially concerning corrosion.

Verification

By attestation of the construction methods and materials.

5.2.3.2 Additive tank

In addition to compliance with the stability requirements given in EN 1846-2:2024, the design and mounting of the additive tank and the location and the installation of baffles, if necessary, shall prevent any dynamic force that may cause vehicle instability under anticipated operational conditions.