FireDos® Proportioners for Stationary Extinguishing Systems

- Deluge systems
- Seawater extinguishing systems
- Sprinkler systems
- Foam extinguishing systems

www.firedos.com
FireDos® GmbH

We are a dynamic, medium-sized company, and have been engaged for over 25 years in the special field of dosing technology which works without external energy.

For around 15 years, we have been supplying specially developed product variants under the brand name FireDos for fire-fighting applications. Because of its special advantages, FireDos proportioners quickly aroused great interest, with the result that today several thousand proportioners are in service throughout the world to the satisfaction of our customers. Due to this outstanding success, this area of business has developed into a separate company with the name of FireDos GmbH.

We place great value on providing all services to do with our product ourselves: Design and development, handling of approval procedures, production including comprehensive parts manufacture, sales, service, quality and environmental management all remain in our hands. 

We will be happy to work with you!

Based on waterpower

FireDos proportioners work without external energy, and even under changing pressure conditions reliably and at a constant proportioning rate. They are suitable for the proportioning of fluids.

Water motor (1): The drive is provided completely by the extinguishing water flow. The water flows through the water motor (1), which is installed directly in the extinguishing water pipework. The extinguishing water flow is therefore available in full for fire-fighting. Without losses. The speed of the water motor is proportional to the volumetric flow rate of the extinguishing water.
Proportioning pump (2): The water motor (1) and proportioning pump (2) are connected with each other via a coupling (3), and therefore operate at the same speed. A purely mechanical system, which regulates itself automatically: The more extinguishing water that flows through the water motor, the more extinguishing agent is added, and vice versa. The proportioning rate selected by the user always remains constant.

3-way ball-valve “Flushing/Priming” (4): The 3-way ball-valve “Flushing/Priming” can be used to change from proportioning to flushing operation. This directs water from the extinguishing water pipework at over-pressure through the proportioning pump, and switches off the proportioning.

3-way ball-valve “Returning/Admixing” (5): With the aid of the optional connection of the extinguishing agent return line with pressure relief valve, the actual proportioning rate can be determined for test purposes without generating premix.

FireDos proportioners draw the energy required for the proportioning process from the extinguishing water. This results in a low pressure loss, which can be minimised by the optimum dimensioning of the FireDos proportioner.

All components of the FireDos proportioner are assembled as a fixed unit, and tested in the factory for function and leaks. Commissioning can take place directly following installation on site. Adjustment or setting is neither necessary nor possible.
Tailor-made proportioners for every application

FireDos proportioners for stationary extinguishing systems are in successful use throughout the world in thousands of buildings, industrial plants and commercial businesses. They are in service in various types and designs, in all common types of extinguishing systems such as sprinkler systems and deluge systems with foam proportioning and foam extinguishing systems.

For all common extinguishing agents

FireDos proportioners can be used for the proportioning of all common extinguishing agents. The supply to the extinguishing system requires only an unpressurised, atmospheric tank, which can be filled or emptied easily, even during the extinguishing process. The replacement of the extinguishing agent, or switching to another product, is therefore possible without any problem and at any time. The following types of extinguishing agents are used in practice, and can be added to the extinguishing water flow with FireDos proportioners:

- Aqueous film forming foaming agent (AFFF)
- Aqueous film forming foaming agent for polar fluids (AFFF-AR)
- Class A and multi-zone foaming agent (MBS)
- Protein (PS) and fluorine film forming protein foaming agent (FFFP)
- Gel forming extinguishing agents
- Retarders
- Chemical extinguishing agents

FD4000/1-PP-S in a sprinkler system with proportioning for protection of a high rack warehouse

FD8000/3-PP-S in a deluge system with foam proportioning for protection of an aircraft hangar

FD8000/1-PP-S seawater in a foam extinguishing system for protection of an oil loading terminal
Just to make sure

With the use of FireDos proportioners, you ensure that the proportioner used in your extinguishing system complies with the internationally required standards of legislators and insurance companies. Because FireDos proportioners are approved by some of the world’s major institutions, including Factory Mutual (FM), Germanischer Lloyd (GL) and VdS Schadenverhütung.

FireDos proportioners also comply with the following legal directives:

- EU Machinery Directive 2006/42/EG
- DIN EN 13565-1 “Fixed fire-fighting systems – Foam extinguishing systems, Part 1: Requirements and test procedures for components”
- DIN EN 13565-2 “Fixed fire-fighting systems – Foam extinguishing systems, Part 2: Planning, installation and maintenance”
- NFPA11, “Standard for Low-, Medium- and High-Expansion Foam”
- EC Directive 94/9/EG, Appendix 1, “Proper use in areas subject to the risk of explosion” (applies to selected types of FireDos proportioners)

Memberships

We are a member of the following associations and institutions:

- bvfa (Bundesverband Technischer Brandschutz e. V. / National Association of Technical Fire Protection)
- VDMA (Verband Deutscher Maschinen- und Anlagenbau / German Engineering Federation)
- vfdb (Verein zur Förderung des Deutschen Brandschutzes e. V. / German Fire Protection Association)
- NFPA (National Fire Protection Association)
The proportioner which leaves nothing to be desired

*FireDos* proportioners can be individually configured for every extinguishing system, and thereby optimally adapted to its requirements. A selection of the most popular accessory options is given below, although many other variants are also available. Simply give us a call. We will be happy to advise you on the optimum configuration for your planned or existing extinguishing system.

**Alternative flow direction**

*FireDos* proportioners can be supplied with the following alternative flow directions, to take into account the relevant building circumstances:

- **A** Horizontal flow through the water motor, from left to right, with the proportioning pump pointing towards the viewer (standard)
- **B** Horizontal flow through the water motor, from right to left
- **C** Vertical flow through the water motor, from bottom to top
- **D** Vertical flow through the water motor, from top to bottom

**Return connection with pressure relief valve**

The return line to be installed on site serves during tests or acceptance procedures for easy determination of the proportioning rate, without generating premix. By switching the 3-way ball-valve “Return-ing/Admixing”, the extinguishing agent supplied by the proportioning pump is no longer led into the extinguishing water pipework but back to the tank. If a 3-way ball-valve installed in the return line on site is closed, the proportioning pump supplies extinguishing agent via a pressure relief valve, which opens automatically at the same moment. By means of the pressure relief valve adjustable with the aid of a manometer, a back-pressure can be simulated, which corresponds to that in the extinguishing water pipework, so that the operating conditions when determining the proportioning rate for test purposes correspond fully to conditions in practice.
Non-return flap in the suction line
An optionally available non-return flap as an addition to the suction line prevents the return flow of extinguishing water into the extinguishing agent tank. A double nipple is supplied with the non-return flap, in order to be able to connect this to the 3-way ball-valve for switching between flushing of the proportioning pump and suction of the extinguishing agent. The non-return flap can alternatively be installed at another point in the suction line.

Service crank
The service crank attached to the FireDos proportioner by a steel cable is used for moving the water motor by hand for maintenance purposes. It is fitted by a hexagonal drive at the water motor, which is located behind a locking cover. This enables regular maintenance to be carried out without having to start the extinguishing water flow.

Flanges
Up to series FD2500, the connections of the water motors have external threads, for which flanges are optionally available. From series FD4000, the flanges are integrated into the housing of the water motor. All flanges can be designed to DIN or ANSI specifications.

Non-return valve in the proportioning line with increased opening pressure
The non-return valve with increased opening pressure prevents the proportioning pump from running dry. The same applies to an extinguishing agent tank located at a higher level than the FireDos proportioner, in the event of an unpressurised extinguishing water pipework. It can be installed instead of the standard non-return valve.

Additional non-return valve set in the flushing line
If the extinguishing agent tank is located at a higher level than the FireDos proportioner, it can run dry in the event of an unpressurised extinguishing water pipework and simultaneous faulty operation or simultaneous defect in the 3-way ball-valve for switching between suction of the extinguishing agent and flushing of the proportioning pump. This can be prevented by the installation of the optionally available non-return valve.

Additional ball-valve in the flushing line
In order to shut off the flushing line of a FireDos proportioner which is under pressure for a short time, a manually operated ball-valve can be installed. This enables the maintenance/cleaning of the filter installed in the flushing line, without the pressure in the extinguishing water line having to be relieved.
**Options and configurations**

**Electrical monitoring of 3-way ball-valves**
Electrical monitoring of the position of manually operated 3-way ball-valves for switching between “Flushing/Priming” and “Returning/Admixing” (1 opener and 1 closer). The maximum control voltage is 24V DC, and the maximum switching current 3 A. The electrical monitoring is integrated into the 3-way ball-valves, but can also be fitted at a later date without any problem.

**Seawater-resistant version**
If seawater is to be used for extinguishing purposes, every FireDos proportioner is available in a seawater-resistant version. Special materials and surface coatings provide effective protection against corrosion.

**Cylinder switch off**
For stepwise adjustment of the proportioning rate by switching off individual cylinders of the proportioning pump. For example, this enables the generation of extinguishing foam or wetting agent with the same FireDos proportioner.

**Remote proportioning**
In the standard case, the proportioning line is integrated into the FireDos proportioner. As an alternative, the remote proportioning of the extinguishing agent offers the possibility of supplying individual extinguishing zones specifically with premix, independently of other extinguishing zones, without the need for a separate FireDos proportioner for every extinguishing zone.

On actuation of the relevant extinguishing zone, an extinguishing agent control valve opens, making the connection between the proportioning line and the admixing point. The proportioning line can be designed as a simple pipe connection with non-return valve.

**Proportional control valve operating on differential pressure for parallel installation or as a by-pass opener**
In case of an increasing volumetric flow rate of the extinguishing water, a further, parallel installed FireDos proportioner can be switched in by means of a proportional control valve operating on differential pressure.
In a FireDos proportioner which is initially intended to work alone at low volumetric flow rates of the extinguishing water, the pressure difference is measured between the inlet and outlet of the water motor. This increases with an increasing volumetric flow rate of the extinguishing water. The pressure difference corresponding to the maximum volumetric flow rate of the extinguishing water of the FireDos proportioner, when initially working alone, is set as the threshold value at the proportional control valve. As soon as this pressure is reached, a further, parallel installed FireDos proportioner is switched in by the proportional control valve. The proportional control valve can be used in the same way in order to open a by-pass around a FireDos proportioner. The part of the volumetric flow rate of the extinguishing water which would overload a FireDos proportioner is directed via the by-pass. This protective device is advisable particularly when starting up dry extinguishing systems.

**Indication of the volumetric flow rate of the extinguishing water**

The speed of the FireDos proportioner is detected with the aid of a proximity switch fitted at the coupling between the water motor and the proportioning pump. The volumetric flow rate of the extinguishing water is calculated from the speed, and shown on an LED display in litres per minute. The display is intended for installation in an optionally available plastic housing or switch cabinet already available on site.

**Magnetic inductive flow meter for the on-site return line**

Magnetic inductive flow meters are available to register the volumetric flow rate of extinguishing agent returned to the tank by the return line. These have the necessary stabilisation stretches with flange connections for integration into the on-site return line. The delivery also includes seals, bolts, nuts and washers for the flange connections.
Options and configurations

Reduction of the minimum volumetric flow rate of the extinguishing water

Reduction of the volumetric flow rate of the extinguishing water from which the FireDos proportioner can be used to about 1/3 of the level without the reduction device. A higher volumetric flow rate of the extinguishing water than required is initially directed through the water motor, in order to ensure reliable starting. After the water motor, a constant amount of the volumetric flow rate is led back into the extinguishing water tank. The reduction device switches itself on automatically at the start of the extinguishing process. If the actual volumetric flow rate of the extinguishing water being used increases to the point where stable proportioning is ensured without the reduction device, it switches itself off again hydraulically. This option is only possible in combination with a connection of the extinguishing agent return line with pressure relief valve.

FireDos proportioner with reduction of the minimum volumetric flow rate of the extinguishing water

1 Extinguishing water supply
2 Extinguishing water centrifugal pump
3 Strainer
4 Test line
5 Orifice in test line
6 Shut-off valve for test operation of extinguishing water centrifugal pump
7 External extinguishing water supply
8 Proportional control valve operating on differential pressure
9 Control line “high pressure”
10 Control line “low pressure”
11 Shut-off valve of the reduction of the minimum volumetric flow rate
12 Pressure reducer
13 Manometer as setting aid for pressure reducer
14 Hydraulic valve (opener)
15 Restrictor orifice
20 Water motor
21 Proportioning pump
22 Flushing line filter
23 3-way ball valve “Flushing/Priming”
24 Air bleeding
25 Manometer as setting aid for pressure relief valve
26 3-way ball valve “Returning/Admixing”
27 Non-return valve of proportioning line
28 Extinguishing agent tank
29 Pressure relief valve
30 Volumetric flow rate measurement in return line
31 Suction line
32 Shut-off valve for test operation
33 Extinguishing water line
40 Extinguishing agent control valve
41 Remote proportioning line
42 Test outlets
43 Shut-off valve in remote proportioning line
44 Manual actuation of the extinguishing agent control valve
45 Pressure-actuated membrane valve
46 Non-return flap
47 Test outlet
48 Control line for automatic actuation of remote proportioning
49 Extinguishing agent measurement tank
50 Alarm valves
51 Alarm bell
52 Signal line to fire alarm centre

(Possible scope of delivery of FireDos proportioners)
Expert advice and comprehensive service

We will be happy to advise you on what type of equipment and which configuration is most suitable for your extinguishing system. Benefit from our complete service, starting with planning support through to the care of FireDos proportioners in existing extinguishing systems. Our service offer applies irrespective of the age of the FireDos proportioner, and includes:

- Consultation during the production of our quotation
- Training in various key subjects
- Commissioning on site
- Repairs
- Supply of spare parts

Every FireDos proportioner supplied is clearly identifiable by a serial number, which documents its history. Please let us know your requirements.

Equipment types and technical data

<table>
<thead>
<tr>
<th>Water motor diameter</th>
<th>Water motor diameter</th>
<th>Volumetric flow rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>FD130 DN32 ca.</td>
<td>10–130 l/min</td>
<td></td>
</tr>
<tr>
<td>FD200 DN40 ca.</td>
<td>15–200 l/min</td>
<td></td>
</tr>
<tr>
<td>FD500 DN50 ca.</td>
<td>60–500 l/min</td>
<td></td>
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<tr>
<td>FD1000 DN65 ca.</td>
<td>150–1,000 l/min</td>
<td></td>
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<tr>
<td>FD1600 DN100 ca.</td>
<td>150–1,600 l/min</td>
<td></td>
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<tr>
<td>FD2500 DN100 ca.</td>
<td>250–2,500 l/min</td>
<td></td>
</tr>
<tr>
<td>FD4000 DN150 ca.</td>
<td>400–4,000 l/min</td>
<td></td>
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<tr>
<td>FD6000 DN200 ca.</td>
<td>500–6,000 l/min</td>
<td></td>
</tr>
<tr>
<td>FD8000 DN250 ca.</td>
<td>500–8,000 l/min</td>
<td></td>
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<tr>
<td>FD10000 DN300 ca.</td>
<td>500–10,000 l/min</td>
<td></td>
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<tr>
<td>FD15000 DN350 ca.</td>
<td>650–15,000 l/min</td>
<td></td>
</tr>
<tr>
<td>FD20000 DN400 ca.</td>
<td>1,000–20,000 l/min</td>
<td></td>
</tr>
</tbody>
</table>

* without additional equipment (reduction of the minimum volumetric flow rate)

Fixed proportioning rates:
1%; 3%; 6%

Special proportioning:
0.3%; 0.5%; 2%; 5%

Stepwise adjustable proportioning rates:
e. g. from 3% to 1%, please ask for further details.

Maximum pressure:
PN16, further pressure limits on request.

FD10000/3-PP-S and FD8000/3-PP-S in a sprinkler system with proportioning for protection of a painting line and painting preparation of an automotive manufacturer.
The major advantages for your extinguishing system:

- **FireDos** proportioners are driven only by the extinguishing water.
- **FireDos** proportioners work proportionally with the flow of extinguishing water, and are automatically self-regulating systems. No further components are required to produce the proportional relationship between extinguishing water and extinguishing agent.
- **FireDos** proportioners enable the easy and quick checking of the proportioning rate, without the generation of premix.
- **FireDos** proportioners enjoy many approvals, including Factory Mutual (FM), Germanischer Lloyd (GL) and VdS Schadenverhütung (VdS).
- **FireDos** proportioners require only an unpressurised, atmospheric tank for the supply of the extinguishing agent.
- **FireDos** proportioners work without water loss.
- **FireDos** proportioners can be used without time restriction because the extinguishing agent tank can also be refilled during operation.
- **FireDos** proportioners maintain the selected proportioning rate irrespective of the pressure conditions or pressure fluctuations.
- **FireDos** proportioners are modular proportioners with set proportioning rates, or adjustable proportioning rates if required (stepwise or continuously adjustable).
- **FireDos** proportioners are easy to install and operate. Setting or adjustment is not necessary, which also makes commissioning a correspondingly simple matter.
- **FireDos** proportioners are suitable for the proportioning of all common extinguishing agents.
- **FireDos** proportioners cover wide ranges of volumetric flow rates of the extinguishing water and proportioning rates with their various equipment variants; volumetric flow rates of 10–20,000 l/min and proportioning rates of 0.1–6%.
- **FireDos** proportioners enable the admixing point to be located at a great distance from the proportioner (remote proportioning).
- **FireDos** proportioners with special materials can also be used with seawater in offshore applications.
- **FireDos** proportioners offer high operating reliability due to the comprehensive service facilities available to users.
- **FireDos** proportioners are in successful service in thousands of extinguishing systems throughout the world. For many years now, users have placed their confidence in the quality and durability of our products.