

Planning Information for Fire-fighting Water Systems



Contents

	Page
Foreword	3
1. Standards	4
2. Requirements to be met by fire-fighting water systems	5
2.1 Legal basis	5
2.2 Issues to be clarified	5
2.3 General requirements	6
2.4 Pipes and valves	6
2.5 Pipe sizing	7
2.6 Pressure control valve to DIN 14462 Supplement 1	7
2.7 Flow rate and flow pressure	7
2.8 Drainage	8
2.9 Break tank	8
2.10 Pressure booster systems – Minimum requirements for fire-fighting applications to DIN 14462	8
2.10.1 General	8
2.10.2 Minimum requirements for PBS control	9
2.10.3 PBS connection to power supply	9
3. Overview of fire-fighting water systems	10
3.1 Fire-fighting water hand-over point	10
3.2 Wet-type fire-fighting water systems to DIN 14462	11
3.3 Wet/dry-type fire-fighting water systems to DIN 14462	12
3.4 Drinking water installation with wall hydrant type S (DIN 14462)	13
3.5 Planning and installation to DIN 14462	14
4. Calculating the hydraulic data of a fire-fighting PBS for wall hydrants	15
4.1 Calculation example 1	16
4.2 Calculation example 2	17
4.3 Calculation example 3	18
5. Break tank selection	19
5.1. Break tank with a type AB air gap to DIN EN 1717 and DIN EN 13077	19
6. Selection chart for automatic flushing equipment	20
7. Continued use	
7.1 Excerpt from the Drinking Water Ordinance	21
7.2 Excerpt from DIN 1988-600	21
8. Log book	21
9. Products offered by KSB	21
Appendices	22



Foreword

This brochure is intended for all involved with the planning and design of fire-fighting systems in general and fire-fighting water systems in particular. This brochure specifically deals with wall hydrant systems. Fire-fighting systems and fire-fighting water systems are used in preventive fire protection and are not intended for domestic use (see DIN EN 1717). They serve to save and protect the lives of persons and to fight fires. Their piping systems convey either potable or non-potable water. When directly connected to the drinking water grid, they are subject to strict hygienic requirements to avoid impairment of drinking water quality. Wall hydrant systems are stationary fire-fighting installations equipped with specialised fire hose connections which require manual operation. Their purpose is to be used in the

event of a fire either by building occupants or by professional firefighters, depending on their design. Prior to planning fire-fighting and fire protection systems, it is necessary to consult the fire protection plan and take into account accepted technical rules and regional building regulations including laws, regulations and directives applicable for specific building types (e.g. directives and regulations relating to high-rise buildings, assembly rooms, garages etc.). The fire protection plan provides information on the required fire-fighting water quantity, the location and arrangement of building services installations (piping system in particular) and documentation confirming fire-fighting water supply. Should such a plan not be available, information must be obtained from the bodies responsible, e.g. fire protection authorities, fire service. This brochure offers design guidance

for fire-fighting systems and fire-fighting water systems. KSB's systems comply with all requirements to be met by pressure booster systems for fire-fighting applications in accordance with DIN 14462 and DIN 1988-600.

1. Standards

Fundamental European standard

DIN EN 806 Technical rules for drinking water installations

Part 1: General

Part 2: Planning

Part 3: Calculation of inside pipe diameters

Part 4: Installation

Part 5: Operation and maintenance

Standards for drinking water and fire-fighting installations

- DIN EN 1717

Protection against pollution of potable water installations and general requirements of devices to prevent pollution by backflow

- DIN 14462

Planning, installation, operation and maintenance of fire hose systems and pillar fire hydrant and underground fire systems

National supplements

DIN 1988-100: Protection of drinking water, drinking water quality control

DIN 1988-200: Installation, planning

DIN 1988-300: Pipe sizing

DIN 1988-500: Pressure boosting stations with RPM-regulated pumps

DIN 1988-600: Drinking water installations in connection with fire-fighting and fire protection installations

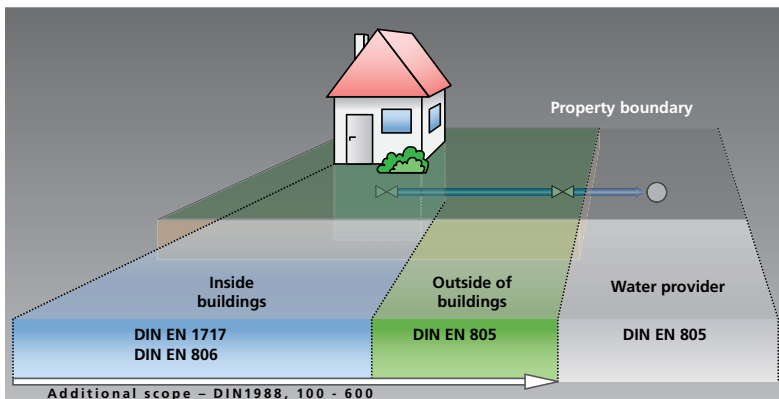


Fig. 1: Scope of standards

2. Requirements to be met by fire-fighting water systems

The fire-fighting water system begins at the interface between the fire-fighting/fire protection system and the drinking water installations. This interface is referred to as the fire-fighting water hand-over point (HOP) in accordance with DIN 1988-600.

No further draw-off points other than those for fire-fighting water extraction are permitted downstream of this hand-over point.

2.1 Legal basis

Prior to planning and constructing fire-fighting and fire protection systems, it is necessary to consult the fire protection plan and take into account accepted technical rules and regional building regulations including laws, regulations and directives applicable for specific building

types (e.g. directives and regulations relating to high-rise buildings, assembly rooms, garages etc.). If a plan is not available, information can be obtained from the bodies responsible for fire protection such as building inspection, fire service or fire protection experts.

Minimum scope of information provided by a fire protection plan:

- Operation: Who is operating the systems?
- Wall hydrants: Where and at which distances?
- Duration of fire-fighting water supply
- Emergency power supply
- Functional integrity
- Redundancy

Issues of liability require that all planners focus not only on compliance with fire protection requirements, but also on compliance with hygienic

standards.

2.2 Issues to be clarified

- Has a fire protection plan been obtained from the responsible body and what information does it provide?
- Type and design of outlet devices
- Fire-fighting water system design
- Number and distribution of outlet devices
- Fire-fighting water draw-off specified

- Max. flow rate when using the outlet device, e.g. 100 l/min per hydrant
- Minimum flow pressure at all outlet devices, e.g. 3 bar
- Number of simultaneously used outlet devices, e.g. 3 units
- Required duration of fire-fighting water provision (DIN 14462: min. 2 hours)
- Performance data of water supply connection
- Max. static pressure
- Nominal supply pipe diameter
- Max. height difference within the fire-fighting water system

- Mechanical filters must not be installed in the pipe used for both drinking and fire-fighting water supply as otherwise the water supply to the wall hydrant system would not be sufficient in the event of a fire.
- Filters must be installed in the piping which branches off to the drinking water supply installation.
- The branch pipe should be fitted immediately downstream of the water meter.
- Strainers installed in the pipe used for fire-fighting water supply must have a mesh size of min. 1.0 mm.

2.3 General requirements

It must be ensured that only components complying with the applicable standards and other regulations are installed. Any deviations from these stipulations must be agreed with the responsible authorities and documented in a test log. The standards DIN EN 1717 and DIN 1988-100 and 600 must be observed for the connection of fire-fighting water pipes/ wall hydrants to drinking water installations.

2.4 Pipes and valves

The pipes and valves must be selected in accordance with the requirements of DIN 1988-600 and must be laid and used in compliance with this standard and the manufacturer's specifications. Valves intended for fitting into the supply pipe of fire-fighting equipment must be designed in such a way that the fire-fighting equipment's operating function is not impaired. If distribution pipes and risers of drinking water installations are made of flammable materials, it must be ensured that these pipe sections are shut off by valves that close automatically when fire-fighting water is extracted.

All shut-off elements provided for pipes conveying fire-fighting water must be installed as centrally as possible. They must be marked and secured against unauthorised closing.

Except for the inlet valves (breechings) and outlet valves (landing valves), installation of any further shut-off elements into "dry" fire-fighting water pipes, i.e. risers, is not permitted.

Fire-fighting water pipes must be fastened in accordance with DIN 1988-200. When dry- and wet/dry-type riser systems are

used, increased hydraulic forces must be taken into account during the filling process. Fire-fighting water pipes and their valves must be designed for a minimum nominal pressure of PN 10 and "dry" risers for a nominal pressure of PN 16, unless higher internal pressures require a higher nominal pressure.

It must be ensured that impermissible pressures do not occur as a result of high temperatures in the event of a fire. If required, expansion valves for water discharge should be provided; see DIN 4753, DIN 1988-200 and DIN EN 1509.

The pipe materials used must correspond to the table of DIN 14462.

Press-fit, clamp and plug-in connections in dry- and wet/dry-type fire-fighting water systems are only permitted if they are suitable for this use.

If these connection modes have already been inspected and tested for use in fire-fighting water systems (i.e. sprinkler and water spray systems) by an inspection body¹⁾, they are considered suitable for use in dry- and wet/dry-type fire-fighting water systems.

¹⁾ Information on inspection bodies is provided by NA 031 German fire-fighting standards committee (FNFW) at DIN e. V., 10772 Berlin (Address: Burggrafenstraße 6, 10787 Berlin).

2.5 Pipe sizing

When calculating and selecting the wall hydrant system, it is necessary to calculate the pressure loss and determine the required nominal pipe diameters. A suitable method is stipulated in DIN 1988-300. Consult the following table for information on flow rates and minimum flow pressures.

determined. If the pressures are lower than 1.2 bar, a throttling orifice should be installed.

- Pressure reducers should be installed as centrally as possible.
- Adjustable flow pressure: 3 to 8 bar
- They must be capable of covering a flow rate of 300 to 600 litres per minute.

fitted with its own pump system. Alternative: 1 variable speed pump system and a second setpoint.

On the basis of the above information on pressure control, planners must determine whether throttling orifices, pressure reducers or multiple pumping systems should be used.

2.6 Pressure control to DIN 14462, Supplement 1

A pressure reducer is generally not required in a fire-fighting water system. Only in cases where the flow pressure at the wall hydrants exceeds the max. permissible level of 8 bar should pressure control devices be installed and pressure zones

Their design must ensure that fire protection is not impaired.

They must be marked and secured against unauthorised manipulation. They must be serviced at least once a year! Use of pressure booster systems to control the pressure in the pressure zones:
e.g.: every pressure zone is

2.7 Flow rate and flow pressure

Required flow rates and pressures at outlet valve (landing valve)					
Category	Flow rate	Simultaneous use	Minimum flow pressure	Max. flow pressure	Max. static pressure
Wall hydrant type S (for use by building occupants)	24 l/min	2	0.20 MPa	0.8 MPa	1.2 MPa
Wall hydrant type F (for use by firefighters)	100 l/min	3	0.30 MPa		
	200 l/min	3	0.45 MPa		
Surface hydrant DN 80	800 l/min	As per fire protection plan	0.15 MPa	0.8 MPa	1.2 MPa
Surface hydrant DN 100	1,600 l/min				
Underground hydrant DN 80	800 l/min				

Table 1: Required flow rates and pressures at outlet valve (landing valve)

The fire-fighting water available for simultaneous hydrant operation and the required minimum pressure must be agreed with the responsible fire protection authority or specified in the fire protection plan.

2.8 Drainage

Drainage systems must be installed to drain the water required for the equipment's intended use and for inspection, testing and maintenance purposes; they must be sized and built in accordance with DIN 1986-100 or with the standards of the DIN EN 12056 range.

This particularly applies to:

- Low-point drains,
- Fill and drain units,
- Aerators and vents,
- Break tanks,
- Fire-fighting water drain outlet during flow rate measurement.

Discharge of the fire-fighting water volumes required for trial operation must be provided for and performed in compliance with the regulations.

If the system is installed below the flood level, it is necessary to provide a suitable lifting unit in accordance with DIN 1986-100.

2.9 Break tank

The break tank must have a Class A air gap which complies with the requirements of DIN EN 1717, type AB, and DIN EN 13076 or DIN EN 13077. The break tank may be designed to DIN EN 12845, for example. The break tank's design must ensure

sufficient fire-fighting water supply. If the fire-fighting water cannot be supplied in the required quantity, the break tank must be enlarged so that the required amount of water can be provided for a minimum period of two hours.

2.10 Pressure booster systems – Minimum requirements for fire-fighting applications to DIN 14462

2.10.1 General

1. The PBS for fire-fighting applications should be equipped with a single pump set and be exclusively used for supplying fire-fighting equipment. The connection of further consumers is not permitted. The PBS must be selected to ensure reliable operation even if the flow rate falls below the minimum flow.

2. The fire protection plan provides information on the operating reliability requirements (e.g. emergency power supply, functional integrity, redundancy, fault indication).

3. If installation of a redundant pump set to increase operating reliability is stipulated, then two pressure booster systems each capable of providing the required quantity of fire-fighting water must be used, i.e. 2 x 100 %.

4. In the case of indirect connection, it is important to provide for external water supply by means of an inlet device to DIN 14461-2 and an additional check valve for firefighters, to ensure fire-fighting equipment availability at all times. This equipment is not needed for type S wall hydrant systems.

5. After PBS start-up, the flow pressure developing at the opened fire hose connection valves must be within the required limits. (See table "Flow rate and flow pressure")

6. Any devices and controls fitted outside the pressure booster system's control cabinet which may compromise the operational availability/proper functioning of the fire-fighting equipment must be protected against unauthorised operation and may only be operated by authorised persons!

**2.10.2
Minimum requirements for
PBS control**

1. In addition to automatic operation, it must be possible to manually activate the PBS. The use of emergency-OFF switches is not permitted.

2. Faults must be visually indicated at the pump's control cabinet. Volt-free contacts must be provided for the transmission of faults. Fault messages can be transmitted as a general fault message.

3. Motor protection devices in the pump's circuit may trigger fault signals, but must not trip the pump set. The motor protection devices must only be active during trial operation. In the event of a fire or when the PBS is in use, the motor protection device must not be active!

4. Transmission paths between the system and external commands triggering pump start-up when fire-fighting water supply is required, must be monitored for broken wire and short circuits. Broken wire and short circuits must be indicated as a fault and must result in the pump being started up.

**2.10.3
PBS connection to power
supply**

1. The power cable to the pump's control cabinet must be used for power supply to the PBS only; it must be separated from all other connections.

2. Connection to power supply must be performed in such a way that the power supply to the pump's control cabinet is not cut off when other consumers are disconnected.

3. A residual current device must not be installed in the circuit. The power cable leading to the PBS control cabinet must be protected via the low-voltage distribution board.

4. The electrical cables to the motor's terminal board or to the power cable of submersible borehole pumps must consist of a single length of cable. Only one consumer (control cabinet, motor etc.) may be connected to one cable.

5. Electrical cables for PBS power supply must remain fully functional in the event of a fire.

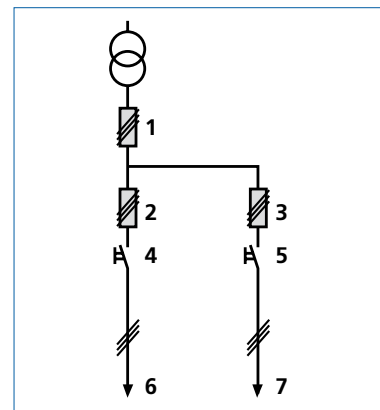


Fig. 2: Example for the connection of a hydrant system at the low-voltage distribution board

Key:

- 1. Main fuse
- 2. Fuse for hydrant connection
- 3. Main fuse for other consumers
- 4. Load-break switch for hydrant systems
- 5. Master switch for other consumers
- 6. To control cabinet/hydrant connection
- 7. To other consumers

3. Overview of fire-fighting water systems

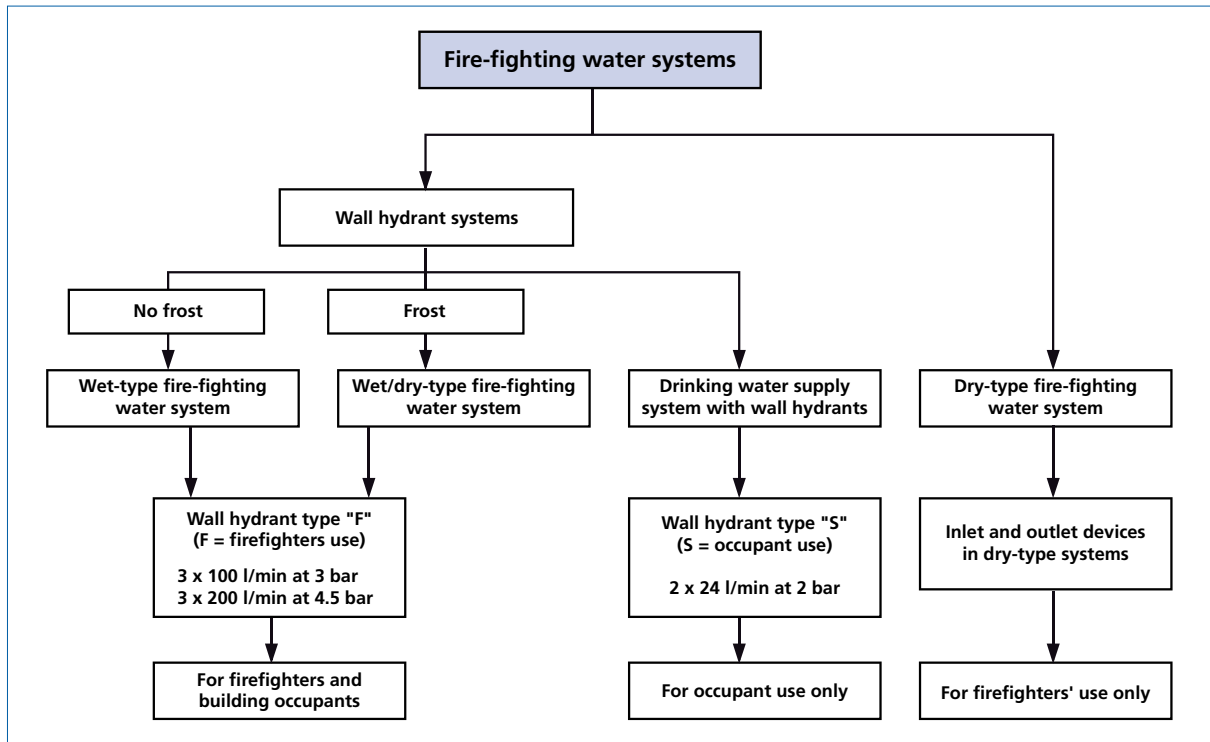


Fig. 3: Overview of fire-fighting water systems

3.1 Fire-fighting water hand-over point

The fire-fighting water hand-over point should be located as close to the water meter as possible. The fire-fighting water hand-over point starts with a shut-off valve. The fire-fighting water hand-over point must not be located in rooms liable to flooding. Individual supply pipes to the fire-fighting water hand-over point must not exceed a length of $10 \times \text{DN}$ and a volume of 1.5 litres. If this requirement cannot be met, it is necessary to

provide appropriate automatic flushing devices at the fire-fighting water hand-over point to ensure that sufficient water flows through the pipe. The flushing devices must be sized to ensure that a flow velocity of min. 0.2 m/s is reached at DN 50 (referred to nominal diameter) and 0.1 m/s in pipes greater than DN 50.

The automatic flushing device must be operated in such a way that at least 3 times the water volume of the individual supply pipe is exchanged once a week. The peak flow in the individual

supply pipe to the fire-fighting water hand-over point must not exceed the calculated flow velocity of 5 m/s. The common supply pipe must be sized in accordance with the drinking water peak flow rate.

3.2

Wet-type fire-fighting water systems to DIN 14462

Wet-type fire-fighting water systems may only be indirectly connected to the drinking water grid

- Wall hydrants type F, with semi-rigid hose
- Water supply to break tank: Class A air gap, vertical (downward) inflow, minimum distance 2 cm or 2 x inside diameter to the water surface F
- The tank must be selected to ensure sufficient fire-fighting water supply.

Wall hydrants type F

1. Wall hydrant to DIN 14461-1, DIN 14461-6 and DIN EN 671-1 (with valve to DIN 14461-3)
2. Fire-fighting water pipe to DIN 1988-600 and in accordance with this standard
3. Water supply (optional) is permitted with indirect connection
4. PBS, e.g. to new DIN 14462 (fire-fighting PBS)
5. Continuous consumers
6. Domestic water filter
7. Water meter

8. Break tank with a type AB air gap to DIN EN 1717
9. Strainers
10. Flushing equipment, if necessary

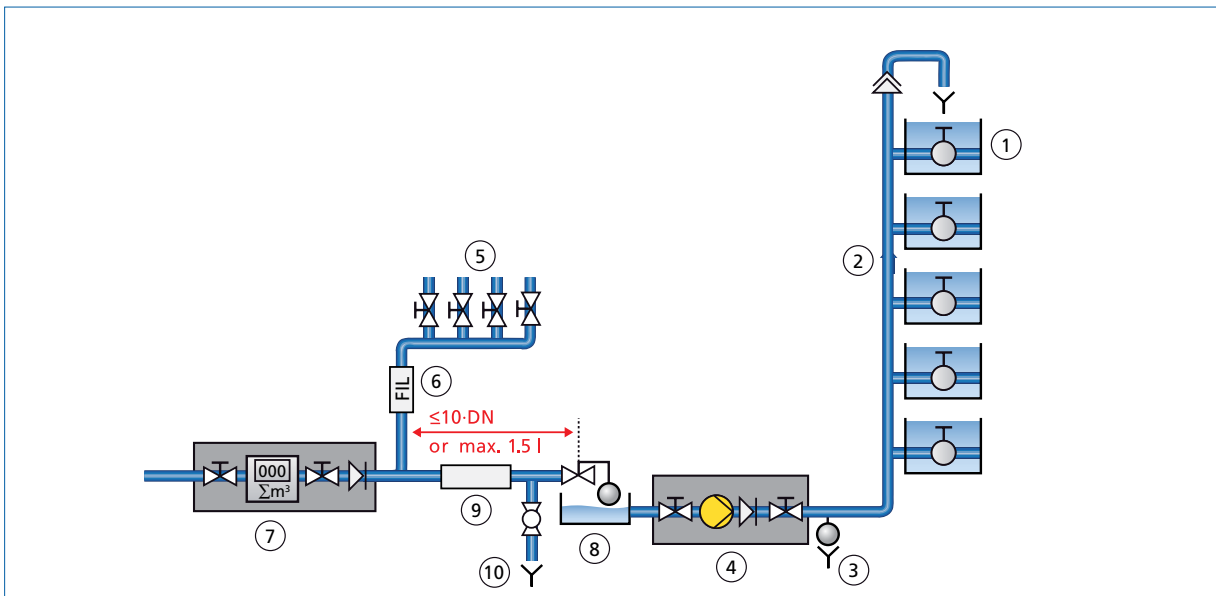


Fig. 4: Wet-type fire-fighting water system with type F wall hydrant; fire-fighting water hand-over point; air gap

3.3

Wet/dry-type fire-fighting water systems to DIN 14462

Wet/dry-type fire-fighting water systems may be directly or indirectly connected to the drinking water grid. In the case of direct connection, external water supply, e.g. by firefighters, is not permitted via

- a fire-fighting water inlet device
- wall hydrants with foaming additives.

- Wall hydrants type F, with semi-rigid hose
- Fire-fighting water with Q_{fww} and p supplied after a maximum of 60 s
- Maximum pressure $p = 8$ bar (holding pressure)
- If the pipe length between the continuous consumers and the centre of the solenoid valve is $\leq 10 \cdot \text{DN}$ or $\leq 1.5\text{l}$ of pipe content, no flushing equipment is necessary.
- If this distance is $> 10 \cdot \text{DN}$, then flushing equipment is necessary: flush once a week, 3 times the pipe content at a flow rate of
0.2 m/s up to DN 50
0.1 m/s above DN 50

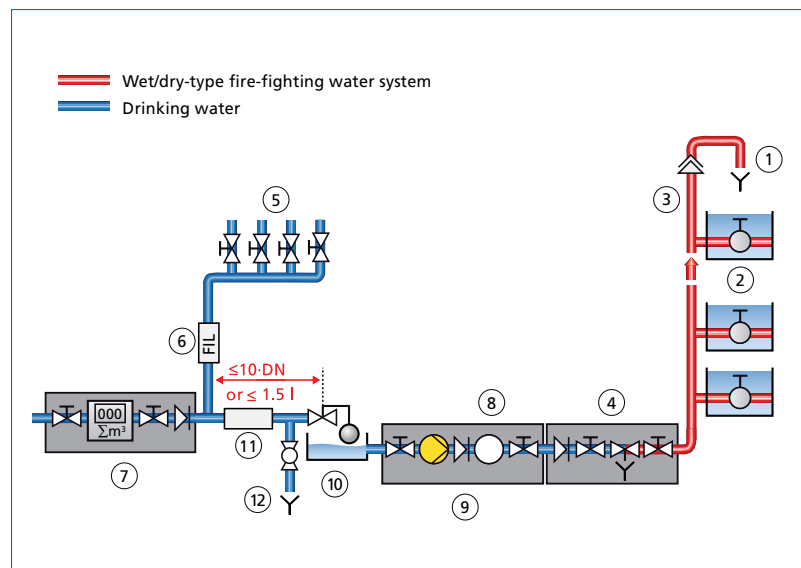


Fig. 5: Directly connected wet/dry-type fire-fighting water system; fire-fighting water hand-over point: fill and drain unit

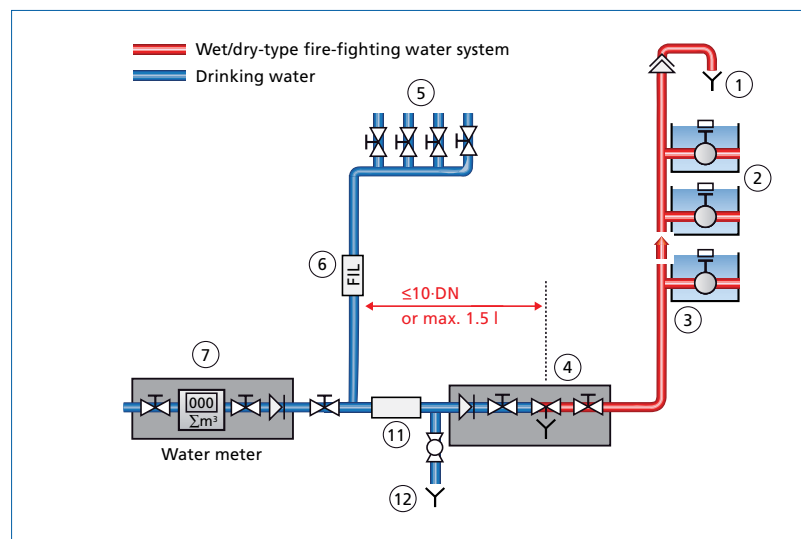


Fig. 6: Indirectly connected wet/dry-type fire-fighting water system; fire-fighting water hand-over point: air gap

Key:

- | | |
|---|--|
| 1. Pipe aerators and vents to DIN 14463-3 | 5. Continuous consumers |
| 2. Wall hydrant to DIN 14461-1, DIN 14461-6 and DIN EN 671-1 (fire hose valve to DIN 14461-3 with limit switch) | 6. Domestic water filter |
| 3. Fire-fighting water pipe to DIN 14463-1, DIN 1988-600 and in accordance with this standard | 7. Water meter |
| 4. Fill and drain unit, e.g. to DIN 14463-1 | 8. E.g. membrane-type accumulator (optional) |
| | 9. Pressure booster system (PBS) |
| | 10. Break tank with a type AB air gap to DIN EN 1717 |
| | 11. Strainer |
| | 12. Flushing equipment, if necessary |

3.4 Drinking water installation with wall hydrant type S (DIN 14462)

If the drinking water demand is higher than the demand for fire-fighting water, direct connection is permitted under the condition that piping $\leq 10 \times$ DN or max. 1.5 l pipe content is observed.

Key:

1. Continuous consumers
2. Wall hydrant type S to DIN 14461-1 (fire hose connection valve to DIN 14461-3 with safety combination)
3. Drinking water pipe to DIN 1988 and DIN EN 806
4. Drain
5. Domestic water filter
6. Water meter
7. PBS to DIN 1988-500

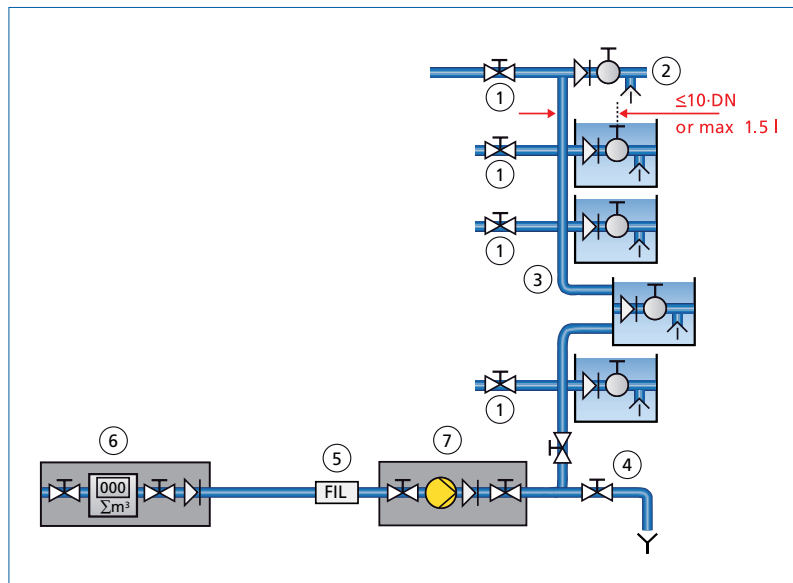


Fig. 7: Drinking water installation with wall hydrant type S; fire-fighting water hand-over point: wall hydrant type S with safety combination

3.5 Planning and installation to DIN 14462

DIN 14462: Wall hydrant systems

According to DIN 14462, wall hydrants for occupant use must be provided in conjunction with wet/dry-type fire-fighting water systems. The wall hydrants installed for this purpose should preferably be equipped with semi-rigid hose types to DIN 14461-1.

Wall hydrants with a flat hose may only be used where specially trained personnel are continuously available.

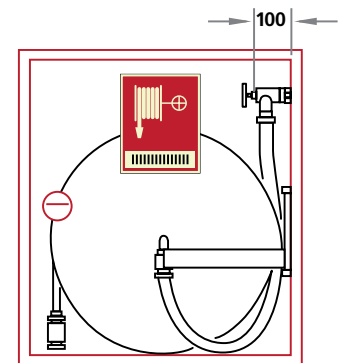
Wall hydrants type S to DIN 14461-1

Occupant use, not intended for use by firefighters

Fire-fighting water flow rate:
2 x 24 l/min (= 2.88 m³/h) at a flow pressure of 2 bar



Fig. 8: Type S wall hydrant



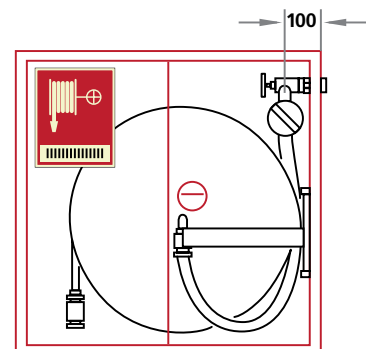
Wall hydrants type F to DIN 14461-1

Firefighter use (may also be used by occupants to combat incipient fires)

Fire-fighting water flow rate:
3 x 100 l/min (= 18 m³/h) at a minimum flow pressure of 3 bar



Fig. 9: Type F wall hydrant



Fire-fighting water flow rate:
3 x 200 l/min (= 36 m³/h) at a minimum flow pressure of 4.5 bar

The max. permissible flow pressure or holding pressure of 8 bar must not be exceeded!

4. Calculating the hydraulic data of a fire-fighting PBS for wall hydrants

The peak flow (\dot{V}_{peak}) for a fire-fighting water supply application is exclusively calculated on the basis of the design flow rate per wall hydrant x simultaneous-use factor (f).

For a type F wall hydrant, the design flow rate per wall hydrant is as follows:

$$\dot{V}_{design} = 100 \text{ l/min} = 6 \text{ m}^3/\text{h} \text{ or}$$

$$\dot{V}_{design} = 200 \text{ l/min} = 12 \text{ m}^3/\text{h}$$

The simultaneous-use factor defined by DIN 14 462 is $f = 3$ wall hydrants.

$$\dot{V}_{peak} = \dot{V}_{design,hydr} \cdot f = Q_D \text{ [m}^3/\text{h]} \tag{1}$$

Key:

- \dot{V}_{peak} = Peak flow rate of a PBS
- $\dot{V}_{design,hydr}$ = Design flow rate of a wall hydrant
- f = Simultaneous-use factor
- Q_D = PBS design flow rate

Based on the head calculation for drinking water, the discharge pressure and head of the fire-fighting PBS is established as follows:

$$\Delta p_p = \Delta p_{geo} + \Sigma(R \cdot l + Z)_{discharge} + p_{min,hydr} \tag{2}$$

Key:

- Δp_{geo} = Pressure loss from geodetic head difference
- $\Sigma(P \cdot l + Z)_{discharge}$ = Pipe friction and individual losses downstream of PBS
- $p_{min,hydr}$ = Minimum flow pressure at the hydraulically least favourable hydrant

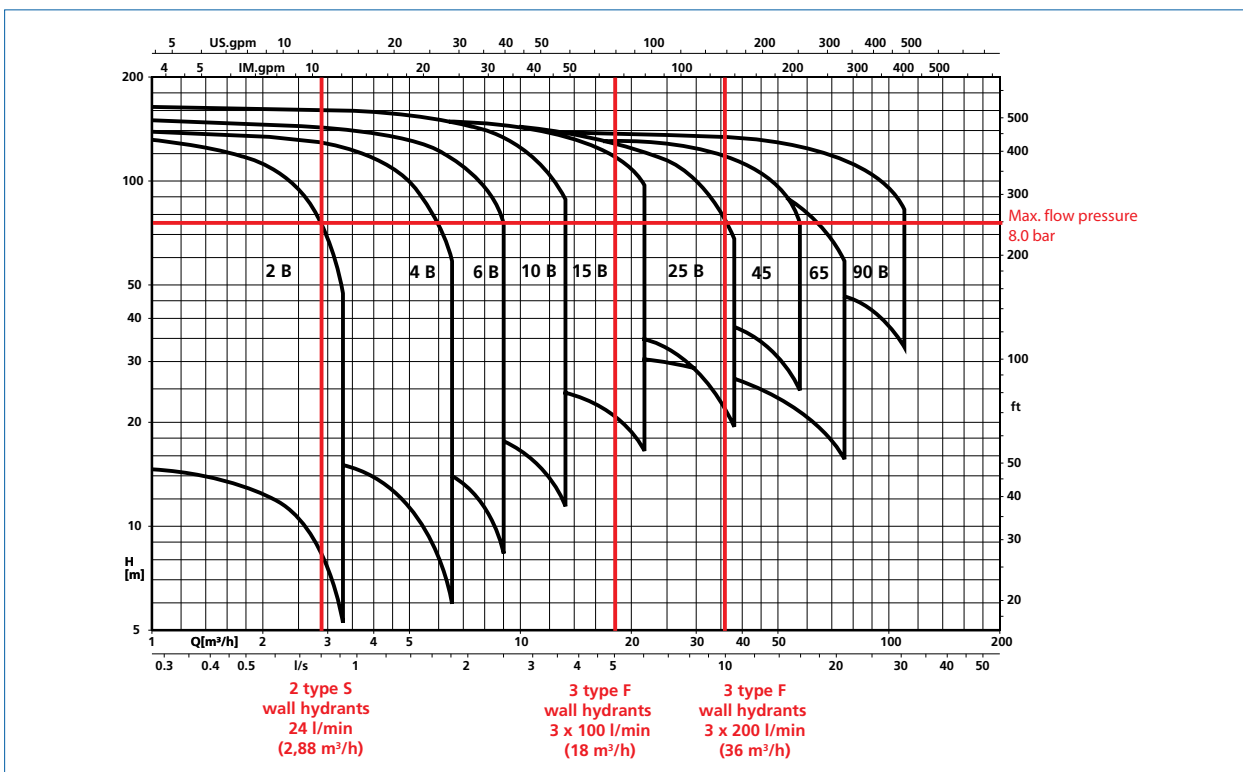


Fig. 10: Performance chart of Hya-Solo and Hya-Duo D FL

4.1 Calculation example 1

Office and administration building

- 5 floors, each with a height of 3.0 m
- Type F wall hydrants
 - 100 l/min at 3 bar
- Remotest hydrant 40 m (15 mbar/m)
- Single-pump PBS

$$\Delta p_p = \Delta p_{geo} + \Sigma(R \cdot l + Z)_{discharge} + p_{min,hydr} \quad (3)$$

$$= 1.5 \text{ bar} + 0.6 \text{ bar} + 3.0 \text{ bar}$$

$$= 5.1 \text{ bar}$$

$$\dot{V}_{peak} = \dot{V}_{design,hydr} \cdot f \quad (4)$$

$$\dot{V}_{peak} = 100 \text{ l/min} \times 3$$

$$= 300 \text{ l/min}$$

$$\hat{=} 18 \text{ m}^3/\text{h}$$

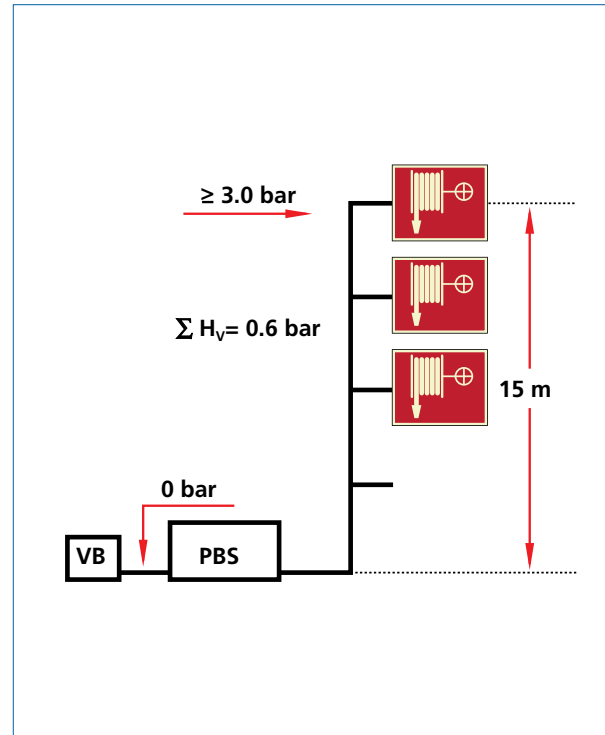


Fig. 11: System diagram

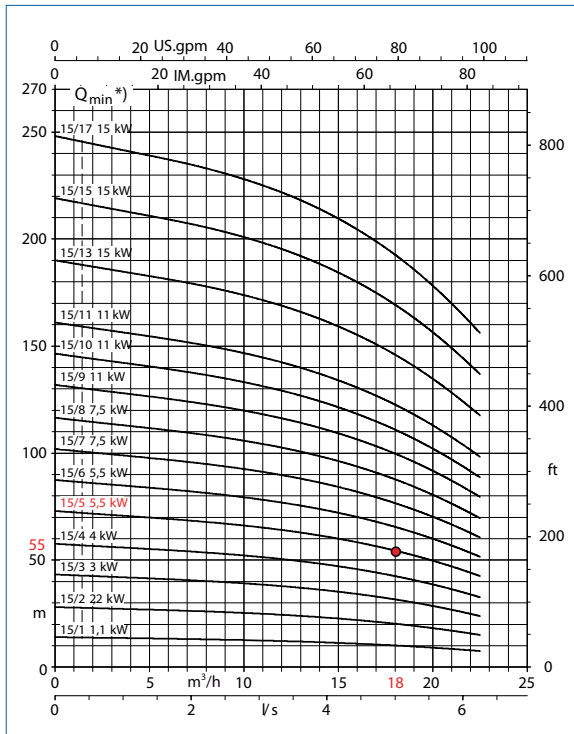


Fig. 12: Characteristic curve of Hya-Solo D FL 1/1505



Fig. 13: Hya-Solo D FL

4.2
Calculation example 2

Office building

- Building height > 22 m; directives and regulations relating to standard high-rise buildings are applied
- Type F wall hydrant
200 l/min at 4.5 bar
- Simultaneous-use factor: 3 wall hydrants
- Dual-pump PBS 2 x 100%

$$\Delta p_p = \Delta p_{geo} + \Sigma(R \cdot l + Z)_{discharge} + p_{min,hydr} \quad (5)$$

$$= 3.0 \text{ bar} + 0.3 \text{ bar} + 4.5 \text{ bar}$$

$$= 7.8 \text{ bar}$$

$$\dot{V}_{peak} = \dot{V}_{design,hydr} \cdot f \quad (6)$$

$$\dot{V}_{peak} = 200 \text{ l/min} \times 3$$

$$= 600 \text{ l/min}$$

$$\hat{=} 36 \text{ m}^3/\text{h}$$

When one or two wall hydrants are opened at the lower floors, the max. permissible flow pressure of 8 bar is exceeded. The following separate solutions are available:

- Installation of a variable speed pressure booster system with a fixed setpoint of below 8 bar.
- Reduction of the flow pressure through the installation of throttling orifices at the lower floors.

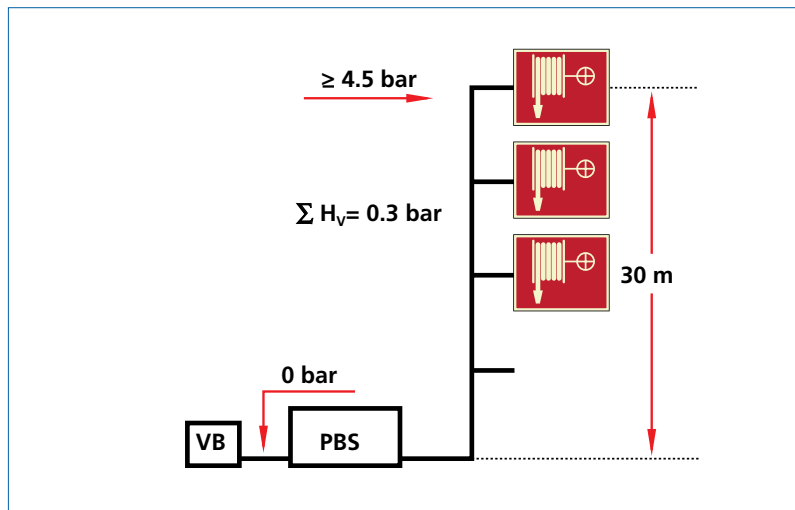


Fig. 14: System diagram



Fig. 15: Hya-Duo D FL Compact

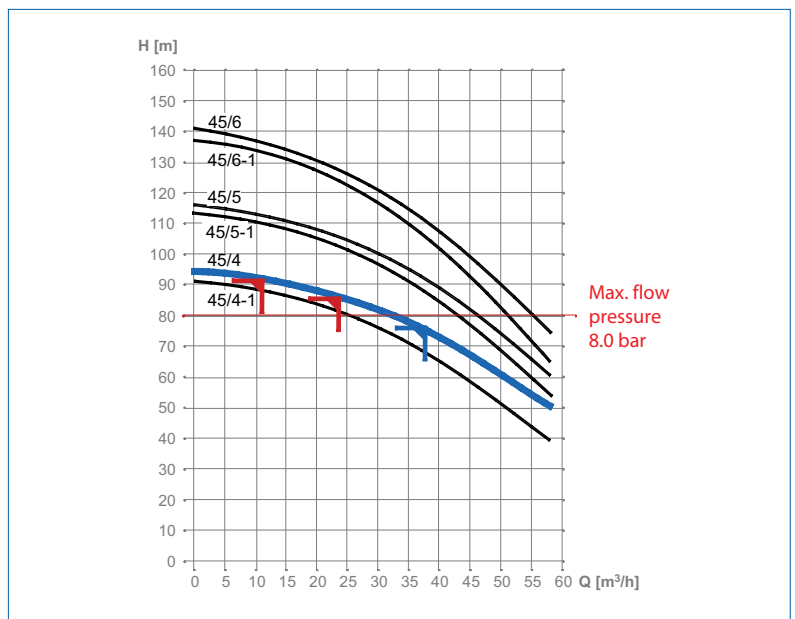


Fig.16: Characteristic curve of Hya-Duo D FL 2/4504

4.3

Calculation example 3

Office building

- Building height > 22 m; directives and regulations relating to standard high-rise buildings are applied
- Type F wall hydrant
200 l/min at 4.5 bar
- Simultaneous-use factor: 3 wall hydrants
- Dual-pump PBS 2 x 100%

$$\Delta p_p = \Delta p_{\text{geo}} + \Sigma(R \cdot l + Z)_{\text{discharge}} + p_{\text{min,hydr}} \quad (7)$$

$$= 4.0 \text{ bar} + 0.5 \text{ bar} + 4.5 \text{ bar}$$

$$= 9.0 \text{ bar}$$

$$\dot{V}_{\text{peak}} = \dot{V}_{\text{design,hydr}} \cdot f \quad (8)$$

$$\dot{V}_{\text{peak}} = 200 \text{ l/min} \times 3$$

$$\hat{=} 600 \text{ l/min}$$

$$\hat{=} 36 \text{ m}^3/\text{h}$$

When wall hydrants are opened, the max. permissible flow pressure of 8 bar is generally exceeded. To prevent this, the following options are available:

- Installation of a variable speed pressure booster system with two fixed setpoints, e.g. high pressure via pressure control and low pressure via limit switch
- Throttling orifices at the lower floors.

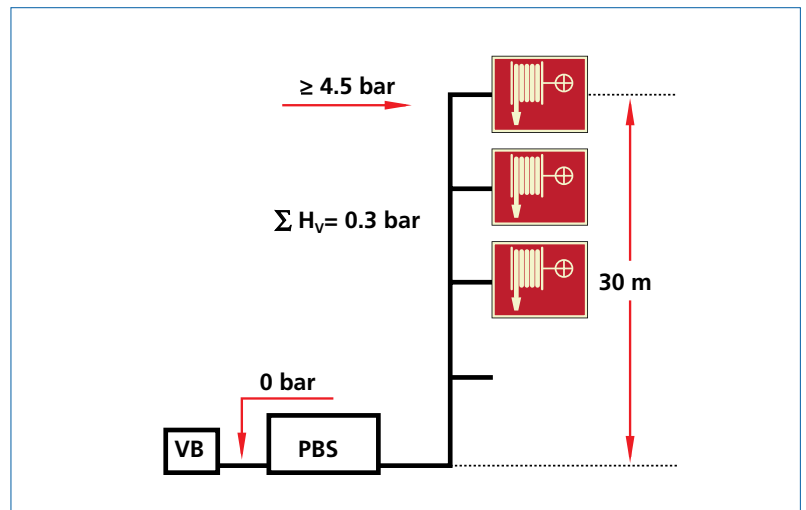


Fig. 17: System diagram



Fig. 18: Hya-Duo DV FL Compact

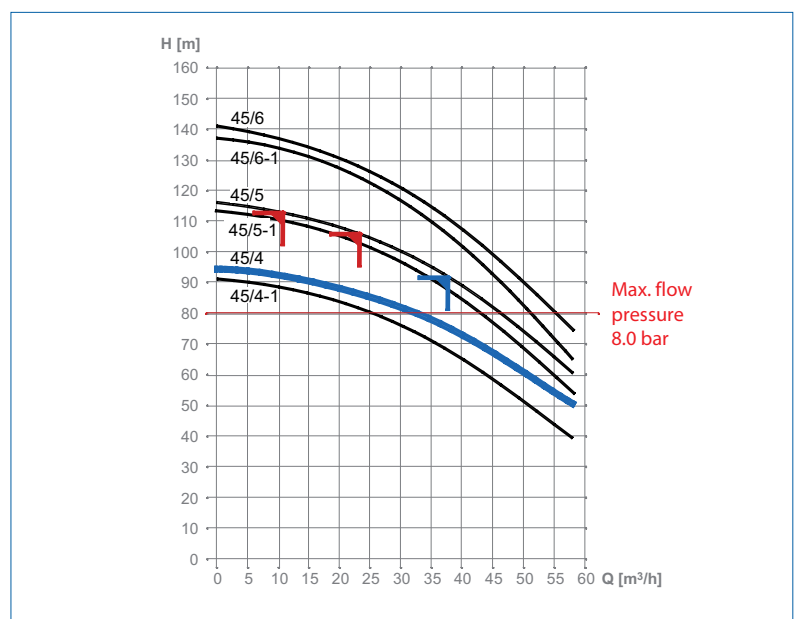


Fig. 19: Characteristic curve of Hya-Duo D FL 2/4505

5. Break tank selection

As per DIN 14462, the effective volume must be established in accordance with DIN 1988-500 or its operating reliability must be demonstrated individually.

The effective volume must therefore be calculated as follows:

$$V_{BT} \geq 0.03 \cdot Q_{peak} \tag{9}$$

where

V_{BT} = Effective volume in m³

Q_{peak} = Peak flow rate in m³/h

Calculation:

$V_{BT} = 0.03 \cdot 18 \text{ m}^3/\text{h} = 540 \text{ l}$ or

$V_{BT} = 0.03 \cdot 36 \text{ m}^3/\text{h} = 1080 \text{ l}$

Selected:

5.1 Break tank with a type AB air gap to DIN EN 1717 and DIN EN13077

The break tanks and their accessories must comply with the hygienic standards regarding the following:

- Non-circular overflow to DIN EN 1717, type AB
- Optional: automatic flushing device with timer to DIN 14462

Volume flow rate	Total volume in l	Effective volume in l	Inlet valve connection	Outlet pipe connection
18 m ³ /h	850	600	R1 1/2"	DN 50
36 m ³ /h	1800	1080	2 x R2"	DN 80

Up to an effective volume of 600 l = round tank

From an effective volume of 800 l = rectangular tank

Fig. 20: Break tank selection



Fig. 21: Hya-Duo D FL with break tank

6. Selection chart for automatic flushing device

In order to comply with the requirements for drinking water hygiene, an automatic flushing device must be provided for a branch pipe larger than 10x DN or a 1.5 l pipe content.

Selection chart for solenoid valves

Nominal diameter	Flow velocity
\geq DN 50	min. 0.2 m/s
< DN 50	min. 0.1 m/s

At least 3 times the pipe content must be flushed once a week!

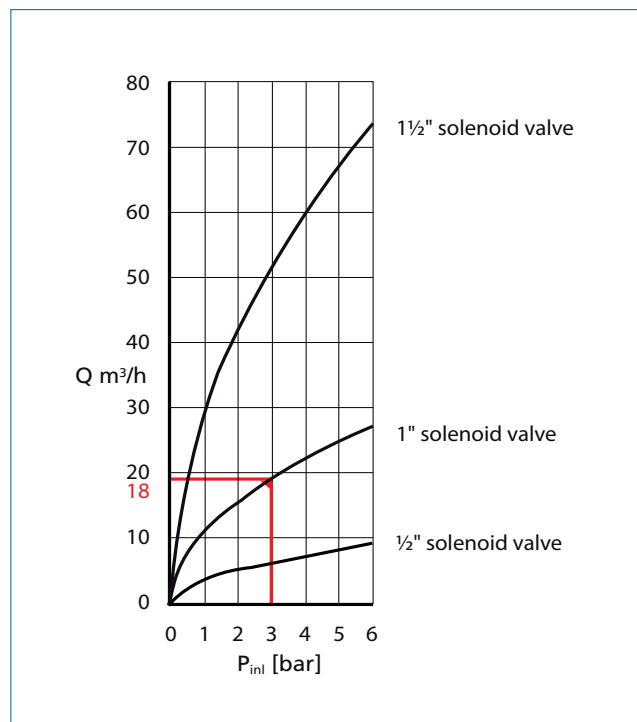


Fig. 22: Selection diagram for flushing device

7. Continued use

7.1 Excerpt from the Drinking Water Ordinance

§ 4 The Drinking Water Ordinance requirements are complied with if the generally accepted technical rules and the values as per §§ 5-7 are heeded. §§ 5 -6 Microbiological and chemical concentrations must be kept as low as possible in accordance with the accepted technical rules. (§ 7 Indicator parameters)

If the drinking water in the network is stagnating it is not possible to meet the permissible microbiological and chemical concentration requirements.

7.2 Excerpt from DIN 1988-600 (translation)

Dealing with fire-fighting systems and fire protection systems in combination with existing drinking water installations in accordance with DIN 1988-600.

If the Drinking Water Ordinance requirements are not met, the continued-use right for a drinking water installation used in combination with a fire-fighting/fire protection system will cease.

If existing systems which do not comply with the regulations are expanded, refurbished or

repaired these systems must not only comply with the Drinking Water Ordinance, but also meet the fire protection requirements.

8. Log book

A log book must be kept which documents the fire-fighting water system.

The following should be documented:

a) **Property description:** property's name and address, owner(s), operator(s), system installation contractor, authorities, i.e. approval authority/fire protection authority, water and electricity providers.

b) **Building requirements and planning fundamentals:**

- Design of fire-fighting water pipes and their fire hose connection equipment:
- Wet-type, wet-/dry-type, dry-type fire-fighting water systems; drinking water installations with wall hydrants.
- Fire-fighting water supply

c) **Technical documentation:** plan of wall hydrants installed; acceptance testing result; maintenance and inspection/ test certificates; evidence of measures taken for drinking water protection.

9. Products offered by KSB

The following KSB systems can be used for these applications:

Hya-Solo D FL

- Fully automatic single-pump fire-fighting system
- Ready-to-connect package system on a common baseplate

Hya-Solo D FL Compact

- Fully automatic single-pump break tank packaged booster set for fire fighting, modular design

Hya-Duo D FL

- Fully automatic dual-pump fire-fighting system with redundant function
- Ready-to-connect package system on a common baseplate

Hya-Duo D FL Compact

- Fully automatic dual-pump break tank packaged booster set for fire-fighting, with redundant function, modular design

If the fire-fighting water system calculations reveal that the max. permissible flow pressure of 8 bar will be exceeded, the above systems can be equipped with a frequency inverter.

Annex

Selection of KSB break tank packaged booster set for fire-fighting

DW pressure pipe Flammable material?

Yes	No
-----	----

Please tick where applicable

High-rise building

Yes	No
-----	----

> 22m from the ground floor to the highest occupied floor
< 22m from the ground floor to the highest occupied floor

Number of floors:

Floor height: m

Number from location of fire-fighting system

Hydrant flow rate: l/min (100 l/min or 200 l/min) at bar

Min. flow pressure: bar (3.0bar or 4.5bar) at the remotest hydrant

Number of hydrants: simultaneous

Pipe length: m

Inlet pressure: bar

Location of fire-fighting system:

above flood level	below flood level
-------------------	-------------------

Please tick where applicable

Emergency drainage

above flood level: sewer

below flood level: lifting unit

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PO number	Subject	Available languages
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• 0101.55	“Water Hammer”	DE, EN-UK
• 0508.023	“BOA-Systronic®”	DE, EN-UK
• 2300.02	“Planning Information for Drainage Installations”	DE, EN-UK
• 2300.024	“Pump Control / System Automation”	DE, EN-UK, FR
• 2300.025	“Planning Information for Pressure Booster Systems”	DE, EN-UK
• 0118.55	“Planning Information Amacan® Submersible Pumps in Discharge Tubes”	DE, EN-UK, EN-US, ES
• 2554.025	“KRT Planning Information”	DE, EN-UK, EN-US, ES
• 2300.023	“Planning Information for Fire-Fighting Systems”	DE, EN-UK



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