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**Full-lift safety valves with
additional loading
type SiZ 1508**



SiZ 1508



Full-lift safety valves with additional loading DN 25 x 40 to 350 x 600

Application

The full-lift safety valve with additional loading is a valve designed for automatic protection of a pressure equipment (steam boilers, pressure pipelines, steam-conditioning stations, pressure vessels, turbine extraction etc.) against unpermitted pressure increase over allowable limit.

Certificate of the valve construction and guaranteed output of the safety valves type SiZ 1508 was issued by Český úřad bezpečnosti práce (The Czech Institute for Safety Work) in Prague, under ref. No. 1699/0.50/69 dated 24th of September 1969. From that moment the valves type SiZ 1508 were involved into the approved equipment of steam boilers according to ČSN 07 0620. The valve output guaranteed in accompanying documents is guaranteed only provided that the pressure loss in pipeline does not exceed 3% of opening pressure in inlet pipeline and 25% in outlet pipeline.

The safety valves SiZ 1508 are designed for water vapour, air, and non-aggressive gases and vapours. The highest temperature of securing medium is up to 575 °C. The valves can operate continuously in dust environment with ambient temperature to 80 °C. After consulting the producer, it is possible to pipe the valve in environment with ambient temperature below zero. The opening pressure range is specified in the "Technical data" table.

The valves are delivered and must be operated together with their accessories, i.e. control unit and aerating system. If these conditions are kept, the users can expect 100% certainty in the safety of the protected equipment, power energy savings and fast return of input costs. Single parts can be delivered only in case of the replacement for previously delivered equipment.

Technical data

| Valve size DN | Seat values | | Opening pressure | | Certified flow coefficient |
|---------------|-------------|-----------------------|---------------------------|---------|----------------------------|
| | d [mm] | A [mm ²] | p _{set} [barg] | | |
| | | | minimal | maximal | K _{dr} [-] |
| 25 x 40 | 16 | 201 | 32 | 400 | 0,86 |
| 40 x 65 | 25 | 491 | 24 | 275 | |
| | 28 | 616 | 24 | 225 | |
| 50 x 80 | 32 | 804 | 24 | 235 | |
| | 36 | 1018 | 24 | 195 | |
| 65 x 100 | 40 | 1257 | 16 | 180 | 0,84 |
| | 46 | 1662 | 16 | 150 | |
| 80 x 125 | 50 | 1964 | 16 | 135 | |
| | 56 | 2463 | 16 | 110 | |
| 100 x 150 | 63 | 3117 | 16 | 100 | |
| | 70 | 3848 | 16 | 86 | |
| 125 x 200 | 77 | 4657 | 12 | 80 | |
| | 85 | 5675 | 12 | 70 | |
| 150 x 250 | 93 | 6793 | 10 | 60 | |
| | 98 | 7543 | 10 | 50 | |
| 175 x 300 | 110 | 9503 | 10 | 42 | |
| | 117 | 10750 | 10 | 38 | |
| 200 x 350 | 125 | 12270 | 6 | 32 | |
| | 140 | 15390 | 6 | 26 | |
| 250 x 400 | 155 | 18870 | 6 | 22 | |
| | 168 | 22170 | 6 | 18 | |
| 300 x 500 | 180 | 25450 | 4 | 16 | |
| | 200 | 31420 | 4 | 13 | |
| 350 x 600 | 220 | 38010 | 3 | 11 | 0,83 |
| | 235 | 43370 | 3 | 10 | |

A - flow seat section in mm²

d - seat inner diameter in mm

Description

Body is angle, with possibility of either flanges on both ports, or weld ends or combined. Inlet port is of a nozzle type, outlet port is extended. There are welded lugs on the valve body for gripping the valve to the load-bearing structure and absorbing reaction forces. Plug, equipped with an additional flat for achieving of stronger lifting force, is pressed by the means of the spring and pressure air cylinder to the seat. There is a double differential piston moving inside of pressure air cylinder to which the lifting and loading airs are supplied through the hoses from the control unit. The valve is set and adjusted by its producer to the opening pressure specified in the customer's order. Such a setting is secured against an unallowable interference. Dimensions of connection flanges and weld ends are specified after the agreement between the producer and customer when the order is being technically cleared. Standard weld ends correspond to ČSN 13 1075 (3/1991), standard flanges correspond to ČSNEN1092-1 (2/2003) possibly ČSN13 1060. The valves SiZ 1508 correspond to ČSN EN ISO 4126-5.

Valve function

The safety valve is controlled by its control unit. If the control unit is for any reason put out of service, the valve may be shortly operated just exceptionally or in case of emergency (pressure air supply failure, control unit breakdown etc.). Any longer operation or repeated service in such state may lead to a rapid reduction of the valve service life due to vibrations and leakage.

After reaching the opening pressure value, control unit lets the air out of the space above the piston of pressure air cylinder (loading air) Air pressure from below the plug (lifting air) plus securing medium pressure acting on the plug overcome spring force and safety valve then rapidly opens to its full lift. When the pressure drops, then whole action runs reversed. Rapid opening and closing are just two main preferences of the valves. The valve reaches full opening after the pressure of securing medium increases by max. 3% above the value of set opening pressure (p_{set}). The valve becomes tight closed after the pressure of securing medium drops by max. 5% below the value of set opening pressure (p_{set}).

In case of control air pressure supply failure, the force is induced by the securing medium pressure only. The valve opening runs incomparably more slowly than in the previously described state. As a result of it, the seat is excessively stressed and may get worn. The valve becomes fully open when securing medium increases by mx. 5 % above the value of set opening pressure. (p_{set}). The valve becomes tight closed when securing medium pressure drops by max. 10% below the value of set opening pressure (p_{set}).

Accessories

Safety valves make an integral equipment together with their accessories consisting of the following :

- control unit type RP 5330 or. RP 5340
- remote signalisation of stroke value

Remote signalisation

Remote signalisation, fixed on the valve body, consists of micro switch and it serves to control the function of safety valve from a distant operating location where it signals "open" and "close" positions. Sensitivity of micro switch enables to register the plug stroke of 0,5 - 1 mm. Remote signalisation can operate in ambient temperature to 60 C. It is delivered on a special request but a cable is never part of the delivery.



Ordering

ČSN 13 3060, section1, article 5 applies to a certain extent. According to customer's request, producer works out a design for placing the safety valves on securing equipment. Customer must submit all the necessary data. Design contains all the essentials for ordering. Every order is technically cleared and its conclusion is defined in a questionnaire to be confirmed binding by both parties.

Transport and storage

The safety valves including their accessories shall be transported in covered, dry and clean vehicles and other means of transport. They shall be secured against getting damaged by other transported goods. Valves are delivered wrapped separately in PE foil and provided with lathes. Pressure hoses are fixed to the valve body. Control units are wrapped separately in boxes together with their accessories.

The valves shall be stored in dry (max. air humidity of 75%), covered and closed areas with non-aggressive environment. It is recommended to keep the valves in original wrappings. After unwrapping, it is necessary to protect the valve body (spring, needle atc.) as well as control unit from bumping or another damage. Plastic blind flanges are to be removed when installing the valve.

Assembly, maintenance and operation

Instructions for proper assembly of the safety valve into pipeline, its connection to control unit and principles for its operation and maintenance are specified in document PM 087. This document is delivered together with the valve .

Based on our long-time experience, we recommend to carry out inspection and checking of setting the opening pressure periodically once a year. A recommended period for overhaul inspection (checking the state of sealing surface of seat and plug, checking of piston sealing in air cylinder) is every 2 years.

Valve complete specification No. for ordering SiZ 1508

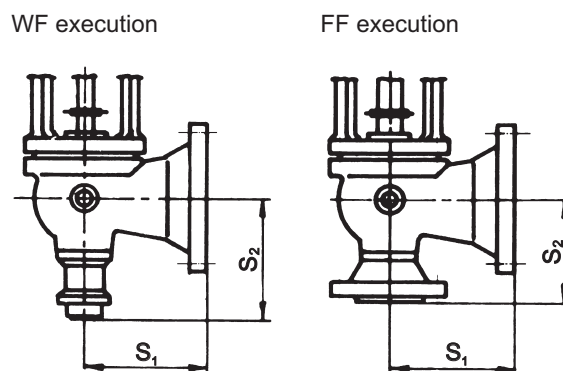
| | | XX | XXXX | XXX | / | XXX | - | XXX | XX | / | X | - | XXX,X | / | X | |
|---------------------|-----------------|-----|------|-----|---|-----|---|-----|----|---|----|---|-------|---|---|---|
| 1. Valve | Safety valve | SiZ | | | | | | | | | | | | | | |
| 2. Series | | | 1508 | | | | | | | | | | | | | |
| 3. Nominal size DN | DN-inlet | | | 065 | | | | | | | | | | | | |
| | DN-outlet | | | | | 100 | | | | | | | | | | |
| | d-seat | | | | | | | 046 | | | | | | | | |
| 4. Connection | weld / weld | | | | | | | | | | SS | | | | | |
| | weld / flange | | | | | | | | | | SP | | | | | |
| | flange / flange | | | | | | | | | | PP | | | | | |
| 5. Body material | to 400°C | | | | | | | | | | | | 1 | | | |
| | to 550°C | | | | | | | | | | | | 2 | | | |
| | to 600°C | | | | | | | | | | | | 3 | | | |
| 6. Opening pressure | barg | | | | | | | | | | | | 120,5 | | | |
| 7. Protected medium | saturated steam | | | | | | | | | | | | | | | 1 |
| | overhoted steam | | | | | | | | | | | | | | | 2 |
| | air | | | | | | | | | | | | | | | 3 |
| | other gasses | | | | | | | | | | | | | | | 4 |

Order example: SiZ 1508 065/100 - 046 PP/1 - 120,5/1

Connection dimensions

| DN | Execution SS | | Execution SP | | Execution PP | |
|---------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | S ₁ mm | S ₂ mm | S ₁ mm | S ₂ mm | S ₁ mm | S ₂ mm |
| 25x40 | 170 | 170 | 130 | 170 | 130 | 130 |
| 40x65 | 200 | 200 | 150 | 200 | 150 | 180 |
| 50x80 | 225 | 225 | 180 | 225 | 180 | 180 |
| 65x100 | 240 | 240 | 180 | 240 | 180 | 185 |
| 80x125 | 260 | 260 | 205 | 260 | 205 | 220 |
| 100x150 | 260 | 260 | 215 | 260 | 215 | 215 |
| 125x200 | 390 | 330 | 320 | 330 | 320 | 300 |
| 150x250 | 340 | 340 | 245 | 340 | 245 | 260 |
| 175x300 | 350 | 390 | 265 | 390 | 265 | 290 |
| 200x350 | 430 | 410 | 320 | 410 | 320 | 310 |
| 250x400 | 450 | 440 | 340 | 440 | 340 | 340 |
| 300x500 | 520 | 510 | 380 | 510 | 380 | 410 |
| 350x600 | 600 | 590 | 450 | 590 | 450 | 490 |

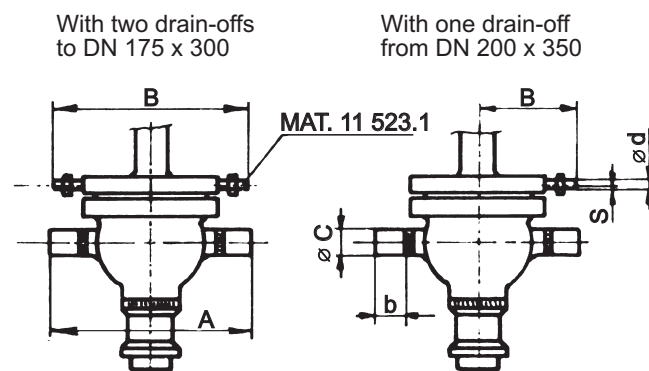
Connection dimensions



Drain-off piping connection dimensions

| DN | A | B | ∅C | b | ∅d | s |
|---------|------|-------|-----|-----|------|------|
| | mm | mm | mm | mm | mm | mm |
| 25x40 | 230 | 259 | 30 | 45 | 17,2 | 2,9 |
| 40x65 | 290 | 289 | 30 | 60 | 17,2 | 2,9 |
| 50x80 | 330 | 321 | 45 | 65 | 21,3 | 3,25 |
| 65x100 | 370 | 336 | 51 | 75 | 21,3 | 3,25 |
| 80x125 | 440 | 381 | 60 | 90 | 26,9 | 3,25 |
| 100x150 | 500 | 426 | 64 | 100 | 26,9 | 3,25 |
| 125x200 | 530 | 466 | 64 | 90 | 26,9 | 3,25 |
| 150x250 | 600 | 466 | 76 | 110 | 26,9 | 3,25 |
| 175x300 | 660 | 476 | 76 | 110 | 26,9 | 3,25 |
| 200x350 | 750 | 285 | 95 | 120 | 26,9 | 3,25 |
| 250x400 | 790 | 285 | 95 | 120 | 26,9 | 3,25 |
| 300x500 | 930 | 356,5 | 125 | 140 | 33,7 | 4,05 |
| 350x600 | 1120 | 356,5 | 135 | 160 | 33,7 | 4,05 |

Detail of drain-off piping connection



Material of main parts

| Name | Material (class - quality) | | |
|------------------------------------|--------------------------------------|------------------------------------|--|
| | up to 400°C DN 100x150 to 350x600 | up to 550°C DN 25x40 to 350x600 | up to 600°C DN 25 x 40 to 350 x 600 |
| 1 Body | 1.0619 | 1.7357 | 1.4931 |
| 2 Insertion with seat Seat weld | 1.0426 | 1.7335 | 1.4903 |
| 3 Plug Seat weld | 1.4923 (1.7335) STELIT 6 | | 1.4903 |
| 4 Plug guide | 42 2942 | | 1.4923 |
| 5 Needle | 17 027 | | 1.4923 |
| 6 Main spring | 50CrV4 / 51CrV4 | | |
| 7 Cylinder liner | 42 3119 | | |
| 8 Yoke - lower bonnet | 1.0619 / 1.0425 | 1.7357 / 1.7335 | 1.4931 / 1.7380 |
| 9 Dumping spring | 50CrV4 / 51CrV4 | | |
| 10 Yoke extension piece | 1.0619 | | |
| 11 Upper bonnet | 1.0619 | | |
| 12 Piston | 1.0619 | | |
| 13 Adjusting screw | 17 021 | | |
| 14 Extension piece | 1.0426 | 1.7335 | 1.4903 |

Face to face lengths, dimensions, weights

| DN | h_1 | h_2 | h_3 | H | D | m |
|---------|-------|-------|-------|------|-----|------|
| | mm | mm | mm | mm | mm | kg |
| 25x40 | 75 | 450 | 535 | 685 | 240 | 62 |
| 40x65 | 85 | 525 | 615 | 785 | 305 | 80 |
| 50x80 | 95 | 630 | 620 | 905 | 305 | 120 |
| 65x100 | 110 | 680 | 795 | 1010 | 335 | 170 |
| 80x125 | 125 | 720 | 835 | 1060 | 335 | 210 |
| 100x150 | 130 | 740 | 855 | 1090 | 335 | 240 |
| 125x200 | 160 | 990 | 1125 | 1245 | 405 | 490 |
| 150x250 | 165 | 815 | 930 | 1175 | 450 | 310 |
| 175x300 | 180 | 940 | 1115 | 1210 | 450 | 400 |
| 200x350 | 210 | 950 | 1165 | 1290 | 450 | 600 |
| 250x400 | 225 | 950 | 1225 | 1460 | 450 | 800 |
| 300x500 | 270 | 1100 | 1320 | 1690 | 450 | 1200 |
| 350x600 | 315 | 1100 | 1320 | 1910 | 450 | 1450 |

