

Self operated pressure regulating valves



SR

DIN PN 16 - 40 — ND 15 to 100 mm
 ANSI 125 - 300 — 1/2" to 4"

15R, 25R
 15E, 25E

Application

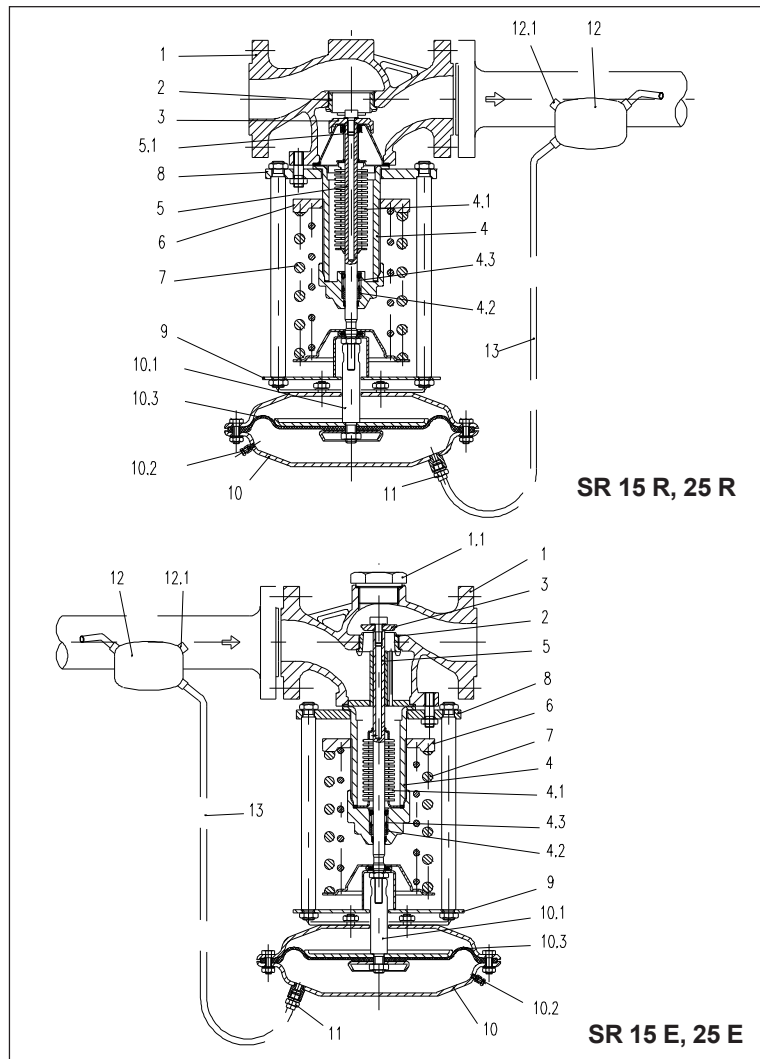
The pressure regulation and reduction SR 15 R and SR 25 R valves are used to control secondary pressures, and the excessive pressure regulating SR 15 E and SR 25 E valves are used to control primary pressures. Applicable to pumping stations, steam generators, heat exchangers and other installations in distilleries, refineries, chemical and petrochemical industry, etc. They operate with steam, water or other liquid or gaseous fluids compatible with the materials used in the valves.

Main Characteristics

- self operated proportional controllers dispensing any auxiliary power.
- Wide regulation ranges.
- Single seat assuring sealing.
- Balancing bellow minimizes the influence of the pressure variations of the flow on the shutter position.
- Interchangeable actuators and springs.
- Compact and sturdy construction.

Construction

Consisting basically of body, single seat, shutter with metal sealing, balancing bellow, springs and SA type S diaphragm actuator. The combination of springs with appropriate actuators for the chosen pressure range is shown in the "Dimensions and Weights" table



Technical Competence, materials and connections

| Models | SR 15 R | SR 15 E | SR 25 R | SR 25 E |
|---|--|---------|--|----------|
| Nominal pressure | DIN PN 16 - ANSI 125 | | DIN PN 40 - ANSI 300 | |
| Flow and noise coefficients | See "Values K_{vs} and z" table | | | |
| Maximum allowable pressure in bar/psi | 16 / 228 | | 40 / 569 | 16 / 228 |
| Maximum Δp differential pressure in bar/psi | 16 / 228 | | 25 / 356 | 16 / 228 |
| Maximum allowable temperature | See "Values K_{vs} and z" table | | | |
| body | See "Values K_{vs} and z" table | | | |
| Actuator | steam and liquid | | 350 °C / 572 °F | |
| | Air and gases | | 80 °C / 176 °F | |
| Body | ASTM A 126 Gr B cast iron | | Aço fundido ASTM A 216 Gr WCB | |
| Seat and shutter | AISI 410 stainless steel | | | |
| Packing | Graphite Teflon | | | |
| Metal bellow | AISI 316 Ti stainless steel | | | |
| Body sealing | Hydraulic paper | | | |
| Diaphragm casing | ASTM A 570 Gr C carbon steel | | | |
| Diaphragm | Synthetic rubber with cloth core | | | |
| Connections | | | | |
| ND 15 - 50 (1/2" - 2") | SP or ANSI B 2.1 (NPT) threads - BW butt weld - SW socket weld | | | |
| ND 15 - 100 (1/2" - 4") | DIN PN 10/16 or ANSI class 125 | | DIN PN 25/40 or ANSI class 150 and 300 | |

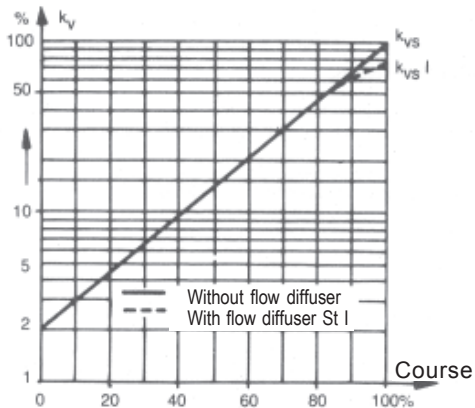
K_{vs} and z values

Basic data for flow calculation according to DIN/IEC 534, parts 2 and 3: Factor for pressure recovery at the valve without intermediate connections $F_L = 0.95$
 Pressure relation of the valve without intermediate connections and with supercritical flow determined by test $X_T = 0.75$

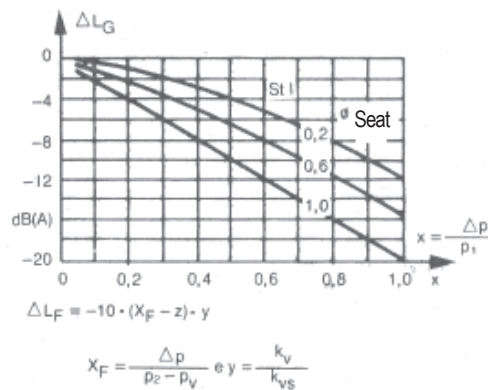
| ND | | Seat diameter mm | k _{vs} | | | Kvsl *Construction with flow diffuser | z* noise coefficient |
|-----|--------|------------------|-----------------|---------|-----|--|-------------------------|
| m | inch | | standard | special | | | |
| 15 | 1/2" | 24 | - | 0,4 | 1 2 | 3 | 0,65 |
| | | | 3,2 | - | | | |
| 20 | 3/4" | 24 | - | 0,4 | 1 2 | 4,5 | 0,6 |
| | | | - | 3,2 | | | |
| 25 | 1" | 24 | - | 0,4 | 1 2 | 7 | 0,55 |
| | | | - | 3,2 | | | |
| 32 | 1 1/4" | 40 | - | 6,3 | | 10,5 | 0,55 |
| | | | 12,5 | - | | | |
| 40 | 1 1/2" | 40 | - | 10 | | 17 | 0,45 |
| | | | 20 | - | | | |
| 50 | 2" | 40 | - | 16 | | 27 | 0,4 |
| | | | 32 | - | | | |
| 65 | 2 1/2" | 65 | - | 25 | | 38 | 0,4 |
| | | | 50 | - | | | |
| 80 | 3" | 65 | - | 40 | | 60 | 0,35 |
| | | | 80 | - | | | |
| 100 | 4" | 68 | - | 63 | | 95 | 0,35 |
| | | | 125 | - | | | |

* Basic values for calculation of noise level according to VDMA 24 422 or ASCA information.

Difference between flow curves of valves with and without St I flow diffuser



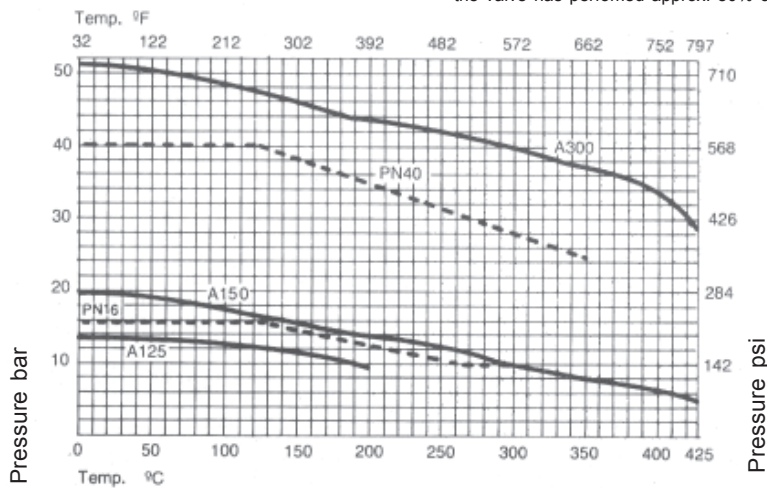
Specific correction of



* Terms to calculate the sound pressure level, according to VDMA 24 422.

z : Acoustical valve coefficient
 K_{vs} l . K_{vs} value of valves equipped with a flow divider St I. In contrast to valves without flow divider this noise reducing component has the effect that deviation from the flow characteristic does not occur until the valve has performed approx. 80% of its travel.

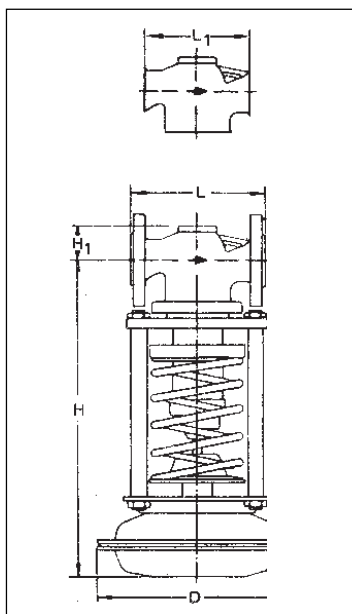
Pressure temperature diagram



Dimensions and Weights

| ND | inch | | 15 | 20 | 25 | 40 | 50 | 65 | 80 | 100 | |
|---|---|---|---|------|-----|--------|-----|--------|-----|-----|--|
| | pol | | 1/2" | 3/4" | 1" | 1.1/2" | 2" | 2.1/2" | 3" | 4" | |
| Dimensions | | mm | | | | | | | | | |
| L length | Flanged body | | 130 | 150 | 160 | 200 | 230 | 290 | 310 | 350 | |
| L ₁ length | Threaded body | | 130 | 140 | 150 | 180 | 210 | - | - | - | |
| H ₁ height | SR 15 R, 25 R | | 44 | | 72 | | | 98 | | 118 | |
| | SR 15 E, 25 E | | 100 | 110 | 115 | 135 | 150 | 165 | 175 | 185 | |
| Regulating pressure ranges | Actuator model | | | | | | | | | | |
| 0,05 ... 0,25 bar 0,71 ... 3,56 psi | SA 65 S | H height mm | 435 | | 490 | | 610 | | 625 | | |
| | | Diaphragm casing | D = 380 mm / Área = 640 cm ² | | | | | | | | |
| | | Spring tension | 1.750 N | | | | | | | | |
| 0,10 ... 0,60 bar 1,42 ... 8,53 psi | SA 65 S | H height mm | 435 | | 490 | | 610 | | 625 | | |
| | | Diaphragm casing | D = 380 mm / Área = 640 cm ² | | | | | | | | |
| | | Spring tension | 4.400 N | | | | | | | | |
| 0,20 ... 1,20 bar 2,84 ... 17,07 psi | SA 45 S | H height mm | 420 | | 475 | | 595 | | 610 | | |
| | | Diaphragm casing | D = 297 mm / Área = 320 cm ² | | | | | | | | |
| | | Spring tension | 4.400 N | | | | | | | | |
| 0,80 ... 2,50 bar 11,38 ... 35,56 psi | SA 25 S | H height mm | 390 | | 445 | | 565 | | 580 | | |
| | | Diaphragm casing | D = 204 mm / Área = 160 cm ² | | | | | | | | |
| | | Spring tension | 4.400 N | | | | | | | | |
| 2,00 ... 5,00 bar 28,45 ... 71,12 psi | SA 15 S | H height mm | 390 | | 445 | | 565 | | 580 | | |
| | | Diaphragm casing | D = 150 mm / Área = 80 cm ² | | | | | | | | |
| | | Spring tension | 4.400 N | | | | | | | | |
| 4,50 ... 10,00 bar 64,00 ... 142,24 psi | SA 05 S | H height mm | 390 | | 445 | | 565 | | 580 | | |
| | | Diaphragm casing | D = 150 mm / Área = 40 cm ² | | | | | | | | |
| | | Spring tension | 4.400 N | | | | | | | | |
| 8,00 ... 16,00 bar 113,79 ... 227,58 psi | SA 05 S | H height mm | 390 | | 445 | | 565 | | 580 | | |
| | | Diaphragm casing | D = 150 mm / Área = 40 cm ² | | | | | | | | |
| | | Spring tension SR 15 R, 25 R SR 15 E, 25 E | 8.000 N 7.000 N | | | | | | | | |
| Approximate weights (in kg) for SR 15 R, 15 E valves DIN PN 16 – ANSI 125 in cast iron* | | | | | | | | | | | |
| With actuators | 0,05 to 0,60 bar 0,71 to 8,53 psi | SR 15 R flanged | 21 | 22 | | | | | 56 | 65 | |
| | | SR 15 E threaded | 19 | 20 | | | | | - | - | |
| | 0,10 to 2,5 bar 1,42 to 35,56 psi | SR 15 R flanged | 15 | 16 | | | | | 51 | 60 | |
| | | threaded | 13 | 14 | | | | | - | - | |
| | 2,00 to 16,00 bar 28,45 to 227,58psi | SR 15 R flanged | 13 | 14 | | | | | 48 | 57 | |
| | | threaded | 11 | 12 | | | | | - | - | |

* for valves SR 25 R, 25 E DIN PN 40 – ANSI 300, in cast steel: + 15%.



Special Construction

Shutter with Teflon elastic sealing, appropriate for steam and liquids up to 200 °C / 392 °F or air and gases up to 80 °C / 176 °F.

Optional

- connection sleeve for connection of impulse piping.
- 3/8" Impulse piping for temperatures up to 200 °C / 392 °F.
- copper impulse piping, 5 m length and 08 x 1 mm, spiral format for temperatures above 200 °C / 392 °C / 662 °F.
- compensation balloon for steam 350 °C / 662 °F and liquids over 130 °C / 266 °F up to 350 °C / 62 °F.
- concentric reduction to increase the Nominal Diameter of the valve outlet, from DN 15 x 32 mm (1/2" x 1 1/4") up to ND 150 x 200 mm (6" x 8").
- Pulse dampener to reduce process pulses.
- Shutter with St I flow diffuser for additional reduction of the noise level for special service conditions (see "Kvs and z Values" table)
- Piping filter ASCA FY or FS series.
- Steam trap ASCA TB or TM series.

All the optional items are supplied according to special price

Components

| N° | Name | Qty | |
|-------|---------------------------------------|-------------|-------------|
| | | SR 15R, 25R | SR 15E, 25E |
| 1 | Body | 1 | 1 |
| 1.1 | Body plug | - | 1 |
| 2 | Seat | 1 | 1 |
| 3 | Shutter | 1 | 1 |
| 4 | Cover (of bellow) | 1 | 1 |
| 4.1 | Metal bellow | 1 | 1 |
| 4.2* | Packing | 1 | 1 |
| 4.3 | Packing spring | 1 | - |
| 5 | Shutter stem | 1 | 1 |
| 5.1 | Stem spring | 1 | 1 |
| 6 | Hand wheel (for set point adjustment) | 1 | 1 |
| 7** | Valve spring (adjusting) | - | - |
| 8 | Cover flange | 1 | 1 |
| 9 | Support | 1 | 1 |
| 10 | Actuator | 1 | 1 |
| 10.1 | Diaphragm stem | 1 | 1 |
| 10.2 | Vent bolt | 1 | 1 |
| 10.3* | Diaphragm | 1 | 1 |
| 11 | Pulse damper (opt) | 1 | 1 |
| 12 | Compensation ballon (opt) | 1 | 1 |
| 12.1 | Compensation ballon plug (opt) | - | 1 |
| 13 | Impulse piping (opt) | 1 | 1 |

* recommended spare parts

** The amount of springs depends on the chosen pressure range

Installation

Install the valves SR preferably in horizontal piping, with cover and actuator always turned downwards, when the fluid is steam, or turned upwards if the fluid temperature is under 85 °C. The flow shall obey the arrow direction of the body. The pulse intake for SR 15 R or 25 R is done in the piping, after the valve or in the measuring point of the equipment installed upstream and, for SR 15 E or 25 E is done in the piping before the valve or at the measuring point of the equipment installed upstream. The pulse measuring shall be located at approximately 1 m from the valve and connected to the actuator with an impulse piping, eventually equipped with a compensation balloon (see "Installation and maintenance instructions" attached to the apparatus).

Operation

SR valves operate with the force equilibrium principle, where the spring force equilibrates the force resulting from the regulated pressure. Any deviation from this pressure relative to the set point is transmitted immediately to the diaphragm, by impulse measurement, producing a corresponding displacement of the stem with the shutter, opening or closing the valve reestablishing the adjusted pressure. The hand wheel facilitates the adjustment of the spring pressure for the desired set point.

SR 15 R or 25 R valves close when the secondary pressure increases, and SR 15 E or 25 E open when the primary pressure increases.

Sizing Data

ASCA will gladly provide the sizing calculation. For this, please provide:

- Process fluid
- Operation pressure (bar)
- Operation temperature (°C)
- Application (pressure reduction or excessive pressure regulation)
- Desired flow (m³/h)

Standard Specification

Self operated pressure regulating valves
Model SR of ASCA

According to catalog: PR-05.60.10-I

Connection

According to standard

Pressure class

Nominal Diameter

Optional

Coupled to a diaphragm actuator

Model SA ... S of ASCA

Control range

Special execution

Optional

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Optional for self operated pressure regulating valves



SR

Type 39-2, SR and SE

Application

Components for pressure regulating and reducing valves type 39-2, for SR and SE.

Optional Components

- connection sleeves;
- impulse piping;
- compensation balloon;
- conical expansion part.

Description

The perfect operation of the above mentioned control valves requires the use of the following components:

ADJUSTMENT PIN

For driving the set point adjusting hand wheel.

3/8" THREADED CONNECTION SLEEVE
To connect the impulse piping to the diaphragm casing.

FUNNEL

To facilitate filling the diaphragm casing, including the impulse piping and the compensation balloon with cold liquid, according to the passing fluid

IMPULSE PIPING

(WITH 3/8" THREADS)
To transmit pressure (effective value) to the actuator diaphragm. The impulse piping is not provided.

COMPENSATION BALLOON

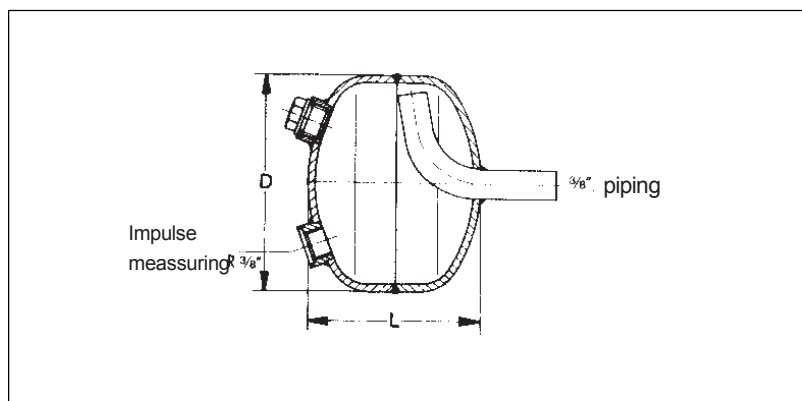
To eliminate the oscillations of the condensate level and protect the diaphragm from elevated temperatures. Shall be used in cases with large pressure oscillations, in order to protect the components of the valve and stabilize the system.

Application Ranges

| Type | Passing fluid | Components |
|----------|---|--|
| SR SE | Air and non flammable gases up to 80 °C, as well as liquids up to 130 °C. | 1 adjustment pin, 1 3/8" threaded connection sleeve, and 1 3/8" threaded connection sleeve with pulse damper (the compensation balloon is indispensable for these application ranges). |
| SR SE | Steam up to 350 °C, as well as liquids from 130 °C to 350 °C. | 1 adjustment pin, 1 funnel, 3/8" threaded connection sleeve, and 1 3/8" threaded connection sleeve with pulse damper |

Correlation and measures of compensation balloons

| Type | SR | | SR | | | SR | |
|----------------|------------------|-----------|-------------|-----------|-----------|-------------|------------|
| | SE | SE | SE | SE | SE | SE | |
| ND | 15-50 | 15-100 | 15-50 | 65-150 | 125-150 | 65-100 | |
| Control ranges | 0,2...1,2 | 0,8...2,5 | 0,05...0,25 | 0,2...1,2 | 0,8...2,5 | 0,02...0,25 | |
| | | 2...5 | | | 2...5 | | |
| | | 4,5...10 | | | 4,5...10 | | 0,02...0,6 |
| | | 8...16 | | | 8...16 | | |
| bar | 127 | | | | | | |
| φ D | 105 | | 195 | | | 285 | |
| mm | 1080 - 1071 | | 1080 - 1072 | | | 1080 - 1073 | |
| L length | ASTM A 570 Gr. C | | | | | | |



Compensation balloon

If the operation conditions demand the installation of a compensation balloon, the appropriate size and model number shall be selected from the following table,

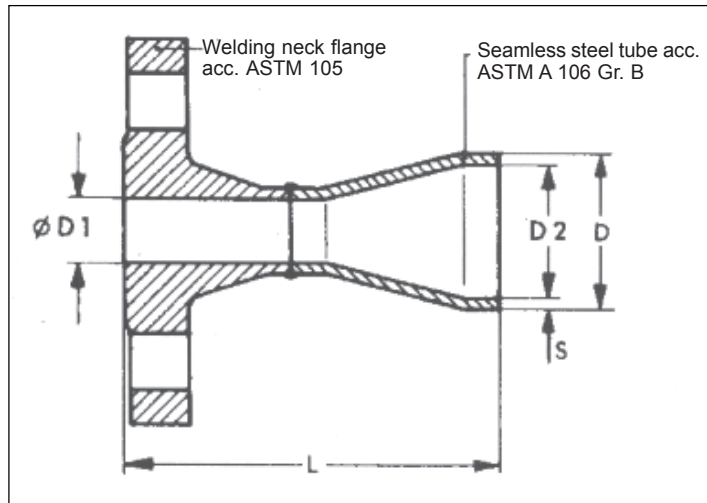
according to the Nominal Diameter and application range.

Conical Expansion Part

To double the Nominal Diameter (quadruplicate the cross section) of the piping at the outlet of pressure regulation and reduction valves, and excessive pressure regulation valves, when used for steam and gases.

Standard Specification

Pressure control and reduction valves without auxiliary power
 Model SRof ASCA
 According to catalog: PR-05.60.10-I
 Opening pressurembar
 Nominal Diameter



Dimensions and weights of conical expansion parts

| $\phi D1$ | $\phi D2$ | PN (bar) | L (mm) | S (mm) | D (mm) | Weight (kg) | Prod. n° 1090 - |
|-----------|-----------|----------|--------|--------|--------|-------------|-----------------|
| | | 16 / 40 | 88 | 2,6 | 38,0 | | |
| ND 15 | ND 32 | 16 / 40 | 104 | 2,6 | 44,5 | 0,7 | 7430 |
| ND 20 | ND 40 | 16 / 40 | 116 | 2,9 | 57,0 | 1,2 | 7431 |
| ND 25 | ND 50 | 16 / 40 | 132 | 2,9 | 76,1 | 1,5 | 7432 |
| DN 32 | ND 65 | 16 / 40 | 135 | 3,2 | 88,9 | 2,2 | 7433 |
| ND 40 | ND 80 | 16 / 40 | 148 | 3,6 | 108,0 | 2,5 | 7434 |
| ND 50 | ND 100 | 16 | 172 | 4,0 | 133,0 | 3,5 | 7435 |
| ND 65 | ND 125 | 40 | 179 | 4,0 | 133,0 | 4,7 | 7436 |
| ND 65 | ND 125 | 16 / 40 | 198 | 4,5 | 159,0 | 5,4 | 7437 |
| ND 80 | ND 150 | 16 | 204 | 5,9 | 219,1 | 7,1 | 7438 |
| ND 100 | ND 200 | 40 | 217 | 5,9 | 219,1 | 9,4 | 7439 |
| ND 100 | ND 200 | 16 | 233 | 6,3 | 267,0 | 11,3 | 7440 |
| ND 125 | ND 250 | 40 | 248 | 6,3 | 267,0 | 13,6 | 7441 |
| ND 125 | ND 250 | 16 | 258 | 7,1 | 323,9 | 16,3 | 7442 |
| ND 150 | ND 300 | 40 | 278 | 7,1 | 323,9 | 19,0 | 7443 |
| ND 150 | ND 300 | | | | | 23,0 | 7444 |

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