



## Characteristics

Volume control dampers 150 mm pitch.  
Counter rotating or parallel movement driven by manual control or servomotor.

## Material

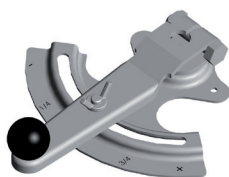
Galvanized steel frame.  
Galvanized steel blades.  
Nylon spindles (on request steel spindles for high temperatures).

## Fixing

By bolts on flanges corners.

## Models

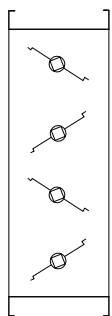
ZR-150/R: opposed blade damper with manual control.  
ZR-150/M: opposed blade damper with pin for servo-motor.  
ZR-150/PP: parallel blade damper with pin for servo-motor.  
ZR-150/PPM: parallel blade damper with manual control.  
T10: veneered blades.



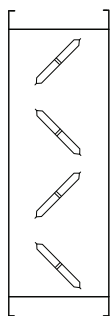
CM 10 - mehanizem za ročno nastavitev loput.

## Configuration

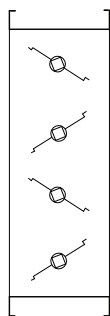
Standard blades



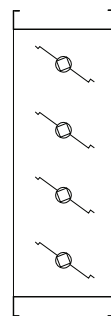
Veneered blades



Opposed blades



Parallel blades



Universal plate (Standard)



Manual control

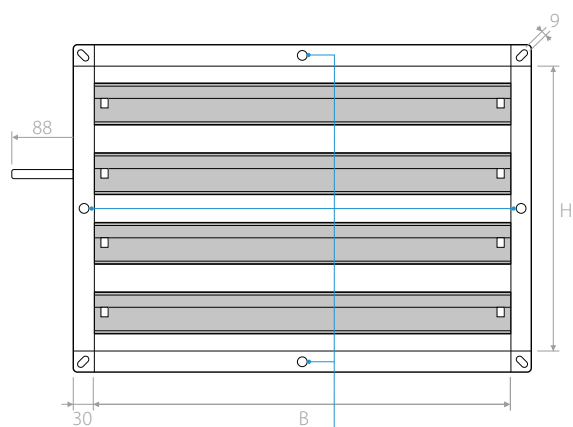


Servomotor



## Construction designs

Standard blades



Hole Ø 9 mm, pitch 300 mm



Pitch 150 mm

## Identification scheme servomotor size

|      | 200  | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 310  | 0,06 | 0,09 | 0,12 | 0,16 | 0,19 | 0,22 | 0,25 | 0,28 | 0,31 | 0,34 | 0,37 | 0,4  | 0,43 | 0,47 |
| 460  | 0,09 | 0,14 | 0,18 | 0,23 | 0,28 | 0,32 | 0,37 | 0,41 | 0,46 | 0,51 | 0,55 | 0,6  | 0,64 | 0,69 |
| 610  | 0,12 | 0,18 | 0,24 | 0,31 | 0,37 | 0,43 | 0,49 | 0,55 | 0,61 | 0,67 | 0,73 | 0,79 | 0,85 | 0,92 |
| 760  | 0,15 | 0,23 | 0,3  | 0,38 | 0,46 | 0,53 | 0,61 | 0,68 | 0,76 | 0,84 | 0,91 | 0,99 | 1,06 | 1,14 |
| 910  | 0,18 | 0,27 | 0,36 | 0,46 | 0,55 | 0,64 | 0,73 | 0,82 | 0,91 | 1    | 1,09 | 1,18 | 1,27 | 1,37 |
| 1060 | 0,21 | 0,32 | 0,42 | 0,53 | 0,64 | 0,74 | 0,85 | 0,95 | 1,06 | 1,17 | 1,27 | 1,38 | 1,48 | 1,59 |
| 1210 | 0,24 | 0,36 | 0,48 | 0,61 | 0,73 | 0,85 | 0,97 | 1,09 | 1,21 | 1,33 | 1,45 | 1,57 | 1,69 | 1,82 |
| 1360 | 0,27 | 0,41 | 0,54 | 0,68 | 0,82 | 0,95 | 1,09 | 1,22 | 1,36 | 1,5  | 1,63 | 1,77 | 1,9  | 2,04 |
| 1510 | 0,3  | 0,45 | 0,6  | 0,76 | 0,91 | 1,06 | 1,21 | 1,36 | 1,51 | 1,66 | 1,81 | 1,96 | 2,11 | 2,27 |
| 1660 | 0,33 | 0,5  | 0,66 | 0,83 | 1    | 1,16 | 1,33 | 1,49 | 1,66 | 1,83 | 1,99 | 2,16 | 2,32 | 2,49 |
| 1810 | 0,36 | 0,54 | 0,72 | 0,91 | 1,09 | 1,27 | 1,45 | 1,63 | 1,81 | 1,99 | 2,17 | 2,35 | 2,53 | 2,72 |
| 1960 | 0,39 | 0,59 | 0,78 | 0,98 | 1,18 | 1,37 | 1,57 | 1,76 | 1,96 | 2,16 | 2,35 | 2,55 | 2,74 | 2,94 |
| 2110 | 0,42 | 0,63 | 0,84 | 1,06 | 1,27 | 1,48 | 1,69 | 1,9  | 2,11 | 2,32 | 2,53 | 2,74 | 2,95 | 3,17 |
| 2260 | 0,45 | 0,68 | 0,9  | 1,13 | 1,36 | 1,58 | 1,81 | 2,03 | 2,26 | 2,49 | 2,71 | 2,94 | 3,16 | 3,39 |
| 2410 | 0,48 | 0,72 | 0,96 | 1,21 | 1,45 | 1,69 | 1,93 | 2,17 | 2,41 | 2,65 | 2,89 | 3,13 | 3,37 | 3,62 |
| 2560 | 0,51 | 0,77 | 1,02 | 1,28 | 1,54 | 1,79 | 2,05 | 2,3  | 2,56 | 2,82 | 3,07 | 3,33 | 3,58 | 3,84 |
| 2710 | 0,54 | 0,81 | 1,08 | 1,36 | 1,63 | 1,9  | 2,17 | 2,44 | 2,71 | 2,98 | 3,25 | 3,52 | 3,79 | 4,07 |
| 2860 | 0,57 | 0,86 | 1,14 | 1,43 | 1,72 | 2    | 2,29 | 2,57 | 2,86 | 3,15 | 3,43 | 3,72 | 4    | 4,29 |
| 3010 | 0,6  | 0,9  | 1,2  | 1,51 | 1,81 | 2,11 | 2,41 | 2,71 | 3,01 | 3,31 | 3,61 | 3,91 | 4,21 | 4,52 |

|      | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 | 2400 | 2500 | 2600 | 2700 | 2800 | 2900 | 3000 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 310  | 0,5  | 0,53 | 0,56 | 0,59 | 0,62 | 0,65 | 0,68 | 0,71 | 0,74 | 0,78 | 0,81 | 0,84 | 0,87 | 0,9  | 0,93 |
| 460  | 0,74 | 0,78 | 0,83 | 0,87 | 0,92 | 0,97 | 1,01 | 1,06 | 1,1  | 1,15 | 1,2  | 1,24 | 1,29 | 1,33 | 1,38 |
| 610  | 0,98 | 1,04 | 1,1  | 1,16 | 1,22 | 1,28 | 1,34 | 1,4  | 1,46 | 1,53 | 1,59 | 1,65 | 1,71 | 1,77 | 1,83 |
| 760  | 1,22 | 1,29 | 1,37 | 1,44 | 1,52 | 1,6  | 1,67 | 1,75 | 1,82 | 1,9  | 1,98 | 2,05 | 2,13 | 2,2  | 2,28 |
| 910  | 1,46 | 1,55 | 1,64 | 1,73 | 1,82 | 1,91 | 2    | 2,09 | 2,18 | 2,28 | 2,37 | 2,46 | 2,55 | 2,64 | 2,73 |
| 1060 | 1,7  | 1,8  | 1,91 | 2,01 | 2,12 | 2,23 | 2,33 | 2,44 | 2,54 | 2,65 | 2,76 | 2,86 | 2,97 | 3,07 | 3,18 |
| 1210 | 1,94 | 2,06 | 2,18 | 2,3  | 2,42 | 2,54 | 2,66 | 2,78 | 2,9  | 3,03 | 3,15 | 3,27 | 3,39 | 3,51 | 3,63 |
| 1360 | 2,18 | 2,31 | 2,45 | 2,58 | 2,72 | 2,86 | 2,99 | 3,13 | 3,26 | 3,4  | 3,54 | 3,67 | 3,81 | 3,94 | 4,08 |
| 1510 | 2,42 | 2,57 | 2,72 | 2,87 | 3,02 |      |      |      |      |      |      |      |      |      |      |
| 1660 | 2,66 | 2,82 | 2,99 | 3,15 | 3,32 |      |      |      |      |      |      |      |      |      |      |
| 1810 | 2,9  | 3,08 | 3,26 | 3,44 | 3,62 |      |      |      |      |      |      |      |      |      |      |
| 1960 | 3,14 | 3,33 | 3,53 | 3,72 | 3,92 |      |      |      |      |      |      |      |      |      |      |

Calculated area in square meters [m<sup>2</sup>]

Damper area < 0,4 m<sup>2</sup>

Damper area < 1 m<sup>2</sup>

Damper area < 2 m<sup>2</sup>

Damper area > 2 < 4 m<sup>2</sup>

Damper area > 4 < 8 m<sup>2</sup>

## Servo-motors

### Without spring return

| CODE    | VOLTAGE | COMMAND      | € |
|---------|---------|--------------|---|
| CM24L   | 24 V    | On-Off/3-p   |   |
| CM230L  | 230 V   | On-Off/3-p   |   |
| CM24SRL | 24 V    | proportional |   |



CM  
for dampers up to 0,4 m<sup>2</sup>  
2 Nm

| CODE     | VOLTAGE | COMMAND       | € |
|----------|---------|---------------|---|
| LM24A    | 24 V    | On-Off / 3-t. |   |
| LM24AS   | 24 V    | On-Off / 3-t. |   |
| LM24ASR  | 24 V    | proportional  |   |
| LM230A   | 230 V   | On-Off        |   |
| LM230AS  | 230 V   | On-Off        |   |
| LM230ASR | 230 V   | proportional  |   |



LM  
for dampers up to 1 m<sup>2</sup>  
5 Nm

| CODE    | VOLTAGE | COMMAND       | € |
|---------|---------|---------------|---|
| NM24A   | 24 V    | On-Off / 3-t. |   |
| NM24ASR | 24 V    | proportional  |   |
| NM230A  | 230 V   | On-Off        |   |



NM  
for dampers up to 2 m<sup>2</sup>  
10 Nm

| CODE     | VOLTAGE | COMMAND       | € |
|----------|---------|---------------|---|
| SM24A    | 24 V    | On-Off / 3-t. |   |
| SM24ASR  | 24 V    | proportional  |   |
| SM230A   | 230 V   | On-Off / 3-t. |   |
| SM230ASR | 230 V   | proportional  |   |



SM  
for dampers up to 4 m<sup>2</sup>  
20 Nm

| CODE    | VOLTAGE | COMMAND       | € |
|---------|---------|---------------|---|
| GM24A   | 24 V    | On-Off / 3-t. |   |
| GM24ASR | 24 V    | proportional  |   |
| GM230A  | 230 V   | On-Off / 3-t. |   |



GM  
for dampers up to 8 m<sup>2</sup>  
40 Nm

| CODE | No. of contacts | SWITCHING POWER               | APPLICATION ON               | € |
|------|-----------------|-------------------------------|------------------------------|---|
| S1A  | 1 x SPDT        | 1 mA ... 3 (0,5) A 250 V c.a. | LM - NM - SM - GM / 24-230 V |   |
| S2A  | 2 x SPDT        |                               |                              |   |



S1A



S2A

| CODE  | VOLTAGE    | SIMULTANEOUS REGULATION | APPLICATION ON               | € |
|-------|------------|-------------------------|------------------------------|---|
| SGA24 | AC/DC 24 V | max 10 motors           | LM - NM - SM - GM / 24-230 V |   |
| SGF24 |            |                         |                              |   |



SGA24



SGF24

### With spring return

| CODE   | VOLTAGE | COMMAND      | € |
|--------|---------|--------------|---|
| TF24   | 24 V    | On-Off       |   |
| TF24S  | 24 V    | On-Off       |   |
| TF230  | 230 V   | On-Off       |   |
| TF230S | 230 V   | On-Off       |   |
| TF24SR | 24 V    | proportional |   |



TF  
for dampers up to 0,4 m<sup>2</sup>  
2 Nm

| CODE   | VOLTAGE | COMMAND      | € |
|--------|---------|--------------|---|
| LF24   | 24 V    | On-Off       |   |
| LF24S  | 24 V    | On-Off       |   |
| LF230  | 230 V   | On-Off       |   |
| LF230S | 230 V   | On-Off       |   |
| LF24SR | 24 V    | proportional |   |



TF  
for dampers up to 0,8 m<sup>2</sup>  
4 Nm

| CODE      | VOLTAGE   | COMMAND      | € |
|-----------|-----------|--------------|---|
| NFA       | 230 VAC   | On-Off       |   |
| NFAS2     | 230 VAC   | On-Off       |   |
| NFA       | 24 VAC/DC | On-Off       |   |
| NFAS2     | 24 VAC/DC | On-Off       |   |
| NF24ASR   | 24 VAC/DC | proportional |   |
| NF24ASRS2 | 24 VAC/DC | proportional |   |



NF  
for dampers up to 2 m<sup>2</sup>  
10 Nm

| CODE      | VOLTAGE   | COMMAND      | € |
|-----------|-----------|--------------|---|
| SFA       | 230 VAC   | On-Off       |   |
| SFAS2     | 230 VAC   | On-Off       |   |
| SFA       | 24 VAC/DC | On-Off       |   |
| SFAS2     | 24 VAC/DC | On-Off       |   |
| SF24ASR   | 24 VAC/DC | proportional |   |
| SF24ASRS2 | 24 VAC/DC | proportional |   |



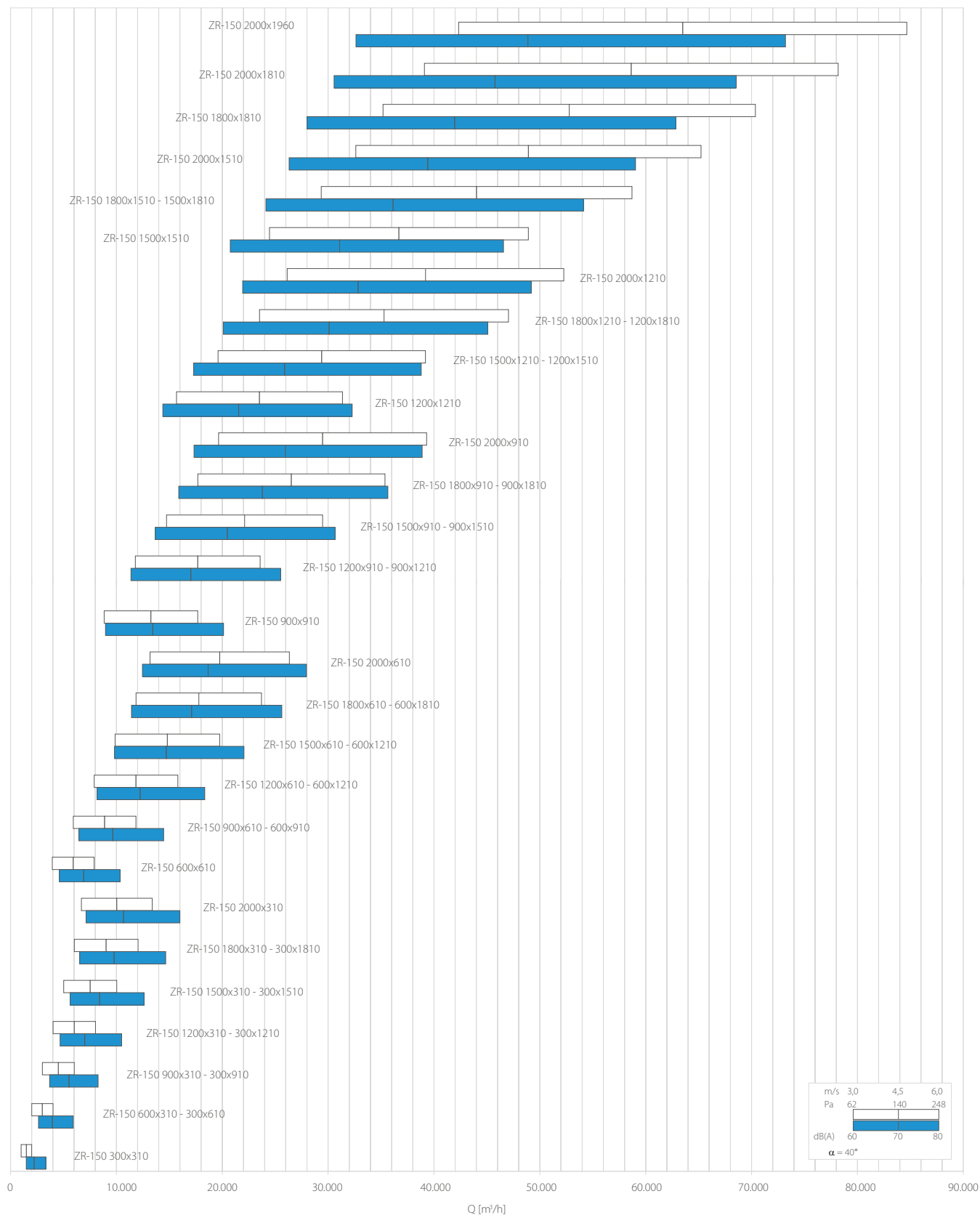
SF  
for dampers up to 4 m<sup>2</sup>  
20 Nm

| CODE      | VOLTAGE   | COMMAND      | € |
|-----------|-----------|--------------|---|
| EF230A    | 230 VAC   | On-Off       |   |
| EF230AS2  | 230 VAC   | On-Off       |   |
| EF24A     | 24 VAC/DC | On-Off       |   |
| EF24AS2   | 24 VAC/DC | On-Off       |   |
| EF24ASR   | 24 VAC/DC | proportional |   |
| EF24ASRS2 | 24 VAC/DC | proportional |   |



EF  
for dampers up to 6 m<sup>2</sup>  
30 Nm

## Quick selection diagram



## Selection table

| Model                        | A <sub>1</sub> [m <sup>2</sup> ] | v [m/s] |     | Q [m <sup>3</sup> /h] |       | Dp (α=40°) [Pa] |     | L <sub>WA</sub> (α=40°) [dB(A)] |     |
|------------------------------|----------------------------------|---------|-----|-----------------------|-------|-----------------|-----|---------------------------------|-----|
|                              |                                  | min     | max | min                   | max   | min             | max | min                             | max |
| ZR-150 300x310               | 0,0930                           | 3       | 6   | 1000                  | 2010  | 62              | 248 | 50                              | 67  |
| ZR-150 600x310 - 300x610     | 0,1860                           | 3       | 6   | 2010                  | 4020  | 62              | 248 | 53                              | 70  |
| ZR-150 900x310 - 300x910     | 0,2790                           | 3       | 6   | 3010                  | 6030  | 62              | 248 | 55                              | 72  |
| ZR-150 1200x310 - 300x1210   | 0,3720                           | 3       | 6   | 4020                  | 8040  | 62              | 248 | 56                              | 73  |
| ZR-150 1500x310 - 300x1510   | 0,4650                           | 3       | 6   | 5020                  | 10040 | 62              | 248 | 57                              | 74  |
| ZR-150 1800x310 - 300x1810   | 0,5580                           | 3       | 6   | 6030                  | 12050 | 62              | 248 | 58                              | 75  |
| ZR-150 2000x310              | 0,6200                           | 3       | 6   | 6700                  | 13390 | 62              | 248 | 58                              | 76  |
| ZR-150 600x610               | 0,3660                           | 3       | 6   | 3950                  | 7910  | 62              | 248 | 56                              | 73  |
| ZR-150 900x610 - 600x910     | 0,5490                           | 3       | 6   | 5930                  | 11860 | 62              | 248 | 58                              | 75  |
| ZR-150 1200x610 - 600x1210   | 0,7320                           | 3       | 6   | 7910                  | 15810 | 62              | 248 | 59                              | 76  |
| ZR-150 1500x610 - 600x1210   | 0,9150                           | 3       | 6   | 9880                  | 19760 | 62              | 248 | 60                              | 77  |
| ZR-150 1800x610 - 600x1810   | 1,0980                           | 3       | 6   | 11860                 | 23720 | 62              | 248 | 61                              | 78  |
| ZR-150 2000x610              | 1,2200                           | 3       | 6   | 13180                 | 26350 | 62              | 248 | 61                              | 79  |
| ZR-150 900x910               | 0,8190                           | 3       | 6   | 8850                  | 17690 | 62              | 248 | 60                              | 77  |
| ZR-150 1200x910 - 900x1210   | 1,0920                           | 3       | 6   | 11790                 | 23590 | 62              | 248 | 61                              | 78  |
| ZR-150 1500x910 - 900x1510   | 1,3650                           | 3       | 6   | 14740                 | 29480 | 62              | 248 | 62                              | 79  |
| ZR-150 1800x910 - 900x1810   | 1,6380                           | 3       | 6   | 17690                 | 35380 | 62              | 248 | 63                              | 80  |
| ZR-150 2000x910              | 1,8200                           | 3       | 6   | 19660                 | 39310 | 62              | 248 | 63                              | 80  |
| ZR-150 1200x1210             | 1,4520                           | 3       | 6   | 15680                 | 31360 | 62              | 248 | 62                              | 79  |
| ZR-150 1500x1210 - 1200x1510 | 1,8150                           | 3       | 6   | 19600                 | 39200 | 62              | 248 | 63                              | 80  |
| ZR-150 1800x1210 - 1200x1810 | 2,1780                           | 3       | 6   | 23520                 | 47040 | 62              | 248 | 64                              | 81  |
| ZR-150 2000x1210             | 2,4200                           | 3       | 6   | 26140                 | 52270 | 62              | 248 | 64                              | 82  |
| ZR-150 1500x1510             | 2,2650                           | 3       | 6   | 24460                 | 48920 | 62              | 248 | 64                              | 81  |
| ZR-150 1800x1510 - 1500x1810 | 2,7180                           | 3       | 6   | 29350                 | 58710 | 62              | 248 | 65                              | 82  |
| ZR-150 2000x1510             | 3,0200                           | 3       | 6   | 32620                 | 65230 | 62              | 248 | 65                              | 82  |
| ZR-150 1800x1810             | 3,2580                           | 3       | 6   | 35190                 | 70370 | 62              | 248 | 66                              | 83  |
| ZR-150 2000x1810             | 3,6200                           | 3       | 6   | 39100                 | 78190 | 62              | 248 | 66                              | 83  |
| ZR-150 2000x1960             | 3,9200                           | 3       | 6   | 42340                 | 84670 | 62              | 248 | 66                              | 84  |