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# **Vacuum Fittings**

**High- and Ultra-High Vacuum Components**

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# Vacuum Fittings

## Specifications

|                      |    |
|----------------------|----|
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## ISO-KF Small Flange Components

|                                   |     |
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|  |     |
|--|-----|
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## Inspection Documents Service

|                      |      |
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| Vacuum Control ..... | A149 |
|----------------------|------|

# Specifications

## Seals

| Seal Material        |    | Temperature | Reusability |
|----------------------|----|-------------|-------------|
| <b>Elastomer</b>     |    |             |             |
| NBR                  | °C | -30 - +90   | Yes         |
| CR                   | °C | -40 - +100  | Yes         |
| FPM                  | °C | -15 - +150  | Yes         |
| <b>Metal</b>         |    |             |             |
| Indium               | °C | -196 - +60  | Yes         |
| Aluminum             | °C | -196 - +200 | No          |
| Copper               | °C | -196 - +200 | No          |
| Silver-plated copper | °C | -196 - +450 | No          |

## Pressure Range

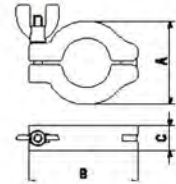
| Code Designation |                 | Pressure Range<br>(mbar - bar) | Tightness<br>(mbar l/s) | Centering | Connection                     |
|------------------|-----------------|--------------------------------|-------------------------|-----------|--------------------------------|
| ISO-KF           | Aluminum        | 10 <sup>-7</sup> - 2           | 10 <sup>-8</sup>        | inside    | Clamping ring                  |
|                  |                 | 10 <sup>-7</sup> - 5           | 10 <sup>-8</sup>        | outside   | Clamping ring                  |
|                  |                 | 10 <sup>-7</sup> - 10          | 10 <sup>-8</sup>        | outside   | Clamping element / chain clamp |
|                  | Stainless steel | 10 <sup>-8</sup> - 2           | 10 <sup>-9</sup>        | inside    | Clamping ring                  |
|                  |                 | 10 <sup>-8</sup> - 5           | 10 <sup>-9</sup>        | outside   | Clamping ring                  |
|                  |                 | 10 <sup>-8</sup> - 10          | 10 <sup>-9</sup>        | outside   | Clamping element / chain clamp |
| ISO-K            | Stainless steel | 10 <sup>-8</sup> - 2           | 10 <sup>-9</sup>        | inside    | Clamping screw, claw grips     |
| CF-F/R           | Stainless steel | 10 <sup>-12</sup> - 1          | 10 <sup>-9</sup>        | ---       | screws                         |

# ISO-KF Small Flange Components

## Connection Elements

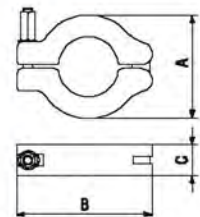
### Clamping Ring Wing Nut

|                     |                          | DN ... ISO-KF | Part No.       | A  | B   | C  |
|---------------------|--------------------------|---------------|----------------|----|-----|----|
| Clamping ring half: | aluminum 380.0           | 10 – 16       | <b>211-001</b> | 45 | 61  | 16 |
| Bolt:               | steel nickel plated      | 20 – 25       | <b>211-002</b> | 55 | 72  | 16 |
| Nut:                | zinc alloy nickel plated | 32 – 40       | <b>211-003</b> | 70 | 90  | 18 |
|                     |                          | 50            | <b>211-004</b> | 95 | 123 | 25 |



### Clamping Ring Hex Nut

|                     |                     | DN ... ISO-KF | Part No.       | A  | B   | C  |
|---------------------|---------------------|---------------|----------------|----|-----|----|
| Clamping ring half: | aluminum 380.0      | 10 – 16       | <b>211-611</b> | 45 | 61  | 16 |
| Bolt and nut:       | steel nickel plated | 20 – 25       | <b>211-612</b> | 55 | 72  | 16 |
|                     |                     | 32 – 40       | <b>211-613</b> | 70 | 90  | 18 |
|                     |                     | 50            | <b>211-614</b> | 95 | 123 | 25 |



## Connection Elements (continued)

### Rapid Fastening Clamp

|                     |                | DN ... ISO-KF | Part No.       | A  | B  | C  |
|---------------------|----------------|---------------|----------------|----|----|----|
| Spring:             | steel          | 10 – 16       | <b>211-005</b> | 52 | 70 | 16 |
| Clamping ring half: | aluminum 380.0 | 20 – 25       | <b>211-006</b> | 61 | 81 | 16 |
| Lever:              | polyamide      | 32 – 40       | <b>211-007</b> | 75 | 98 | 18 |

Temperature ≤80°C



### Rapid Fastening Clamp All Metal

|                     |                   | DN ... ISO-KF | Part No.       | A  | B  | C  |
|---------------------|-------------------|---------------|----------------|----|----|----|
| Spring:             | stainless steel   | 10 – 16       | <b>211-038</b> | 53 | 71 | 16 |
| Clamping ring half: | aluminum 380.0    | 20 – 25       | <b>211-037</b> | 61 | 82 | 16 |
| Lever:              | aluminum -/3.2582 | 32 – 40       | <b>211-038</b> | 78 | 99 | 18 |

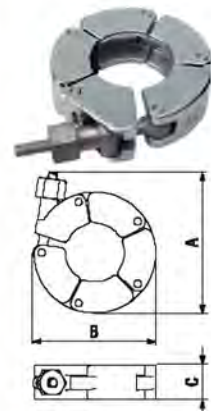
Temperature ≤150°C



### Chain Clamp

|                      |                      | DN ... ISO-KF | Part No.       | A    | B  | C  | D*           |
|----------------------|----------------------|---------------|----------------|------|----|----|--------------|
| Chain link:          | aluminum 6081        | 10 – 16       | <b>211-021</b> | 72   | 52 | 18 | 2.5 / 2.5 Nm |
| Screw & nut & bolts: | steel 1.6582 / nitro | 20 – 25       | <b>211-022</b> | 82.5 | 62 | 18 | 3.5 / 3 Nm   |
|                      | gas carburized       | 32 – 40       | <b>211-023</b> | 88   | 77 | 18 | 5 / 3 Nm     |
|                      |                      | 50            | <b>211-024</b> | 119  | 95 | 20 | 6 / 3 Nm     |


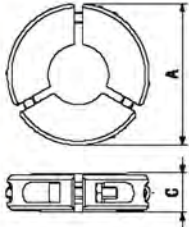
\* aluminum max / elastomer max




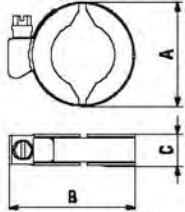


## Connection Elements (continued)


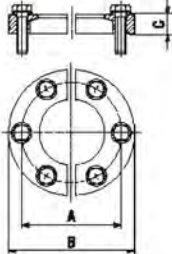
| <b>Clamping Element</b> |                   | DN ... ISO-KF | Part No.       | A   | C  |
|-------------------------|-------------------|---------------|----------------|-----|----|
| Clamping Element:       | aluminum 380.0    | 10 – 16       | <b>211-008</b> | 52  | 18 |
| Bolt:                   | stainless steel   | 20 – 25       | <b>211-009</b> | 75  | 20 |
| Nut:                    | steel zinc plated | 32 – 40       | <b>211-010</b> | 90  | 23 |
|                         |                   | 50            | <b>211-011</b> | 115 | 28 |

| <b>Hose Clip Clamping Ring</b> |                   | DN ... ISO-KF | Part No.       | A  | B  | C  |
|--------------------------------|-------------------|---------------|----------------|----|----|----|
| Clamping ring half:            | aluminum 380.0    | 10 – 16       | <b>211-018</b> | 42 | 54 | 16 |
| Band:                          | stainless steel   | 20 – 25       | <b>211-017</b> | 52 | 64 | 16 |
| Bolt, nut & thread:            | steel zinc plated | 32 – 40       | <b>211-018</b> | 67 | 79 | 16 |

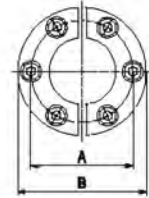
| <b>Bulkhead Clamp with Metric Screws</b> |                     | DN ... ISO-KF | Part No.       | A     | B  | C   | Screws |
|--|---------------------|---------------|----------------|-------|----|-----|--------|
| Clamping Element:                        | aluminum 6082       | 10 – 16       | <b>211-541</b> | 38.1  | 51 | 9.5 | 6 pcs. |
| Bolt:                                    | Hexagon head screw; | 20 – 25       | <b>211-542</b> | 48    | 61 | 9.5 | 6 pcs. |
|  | DIN933, A2, M5x20;  | 32 – 40       | <b>211-543</b> | 62    | 75 | 9.5 | 6 pcs. |
|  | silver plated       | 50            | <b>211-544</b> | 82.55 | 95 | 10  | 8 pcs. |
| Washer:                                  | Washer DIN 125 A    |               |                |       |    |     |        |
|  | A2, 5.3/10x1        |               |                |       |    |     |        |

## Connection Elements (continued)

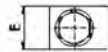
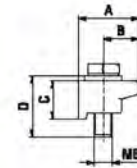
### Bulkhead Clamp with Inch Screws

|                   |                                    | DN ... ISO-KF | Part No.       | A     | B  | C   | Screws |
|-------------------|------------------------------------|---------------|----------------|-------|----|-----|--------|
| Clamping Element: | aluminum 6082                      | 10 – 16       | <b>211-545</b> | 38.1  | 51 | 9.5 | 6 pcs. |
| Bolt:             | Hexagon socket head                | 20 – 25       | <b>211-546</b> | 48    | 61 | 9.5 | 6 pcs. |
|                   | cap screw; Inox,                   | 32 – 40       | <b>211-547</b> | 62    | 75 | 9.5 | 6 pcs. |
|                   | 10-32 UNF x 5/8";<br>silver plated | 50            | <b>211-548</b> | 82.55 | 95 | 10  | 8 pcs. |
| Washer:           | Washer DIN 125 A<br>A2, 5.3/10x1   |               |                |       |    |     |        |



### Claw Grip

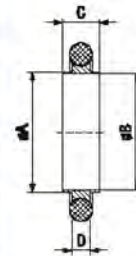
|                 |                 | DN ... ISO-KF | Part No.       | A    | B    | C    | D  | E  | Set of |
|-----------------|-----------------|---------------|----------------|------|------|------|----|----|--------|
| Claw:           | aluminum 6081   | 10 – 50       | <b>211-015</b> | 19.5 | 11.5 | 12.5 | 20 | 14 | 4 pcs. |
| Screw & washer: | stainless steel |               |                |      |      |      |    |    |        |



# ISO-KF Small Flange Components

## Seals

| <b>Centering Ring<br/>Aluminum</b> |  | DN ... ISO-KF | Part No. | A  | B  | C | D   |
|------------------------------------|--|---------------|----------|----|----|---|-----|
| Ring: aluminum 6026                |  | 10            | 211-051  | 12 | 10 | 8 | 3.9 |
| Seal: elastomer CR                 |  | 16            | 211-052  | 17 | 16 | 8 | 3.9 |
|                                    |  | 20            | 211-053  | 22 | 20 | 8 | 3.9 |
|                                    |  | 25            | 211-054  | 26 | 25 | 8 | 3.9 |
|                                    |  | 32            | 211-055  | 34 | 32 | 8 | 3.9 |
|                                    |  | 40            | 211-056  | 41 | 40 | 8 | 3.9 |
|                                    |  | 50            | 211-057  | 52 | 50 | 8 | 3.9 |
| Ring: aluminum 6026                |  | 10            | 211-058  | 12 | 10 | 8 | 3.9 |
| Seal: elastomer FPM                |  | 16            | 211-059  | 17 | 16 | 8 | 3.9 |
|                                    |  | 20            | 211-060  | 22 | 20 | 8 | 3.9 |
|                                    |  | 25            | 211-061  | 26 | 25 | 8 | 3.9 |
|                                    |  | 32            | 211-062  | 34 | 32 | 8 | 3.9 |
|                                    |  | 40            | 211-063  | 41 | 40 | 8 | 3.9 |
|                                    |  | 50            | 211-064  | 52 | 50 | 8 | 3.9 |
| Ring: aluminum 6026                |  | 10            | 211-651  | 12 | 10 | 8 | 3.9 |
| Seal: elastomer NBR                |  | 16            | 211-652  | 17 | 16 | 8 | 3.9 |
|                                    |  | 20            | 211-653  | 22 | 20 | 8 | 3.9 |
|                                    |  | 25            | 211-654  | 26 | 25 | 8 | 3.9 |
|                                    |  | 32            | 211-655  | 34 | 32 | 8 | 3.9 |
|                                    |  | 40            | 211-656  | 41 | 40 | 8 | 3.9 |
|                                    |  | 50            | 211-657  | 52 | 50 | 8 | 3.9 |
| Ring: aluminum 6026                |  | 10            | 211-658  | 12 | 10 | 8 | 3.9 |
| Seal: elastomer EPDM               |  | 16            | 211-659  | 17 | 16 | 8 | 3.9 |
|                                    |  | 20            | 211-660  | 22 | 20 | 8 | 3.9 |
|                                    |  | 25            | 211-661  | 26 | 25 | 8 | 3.9 |
|                                    |  | 32            | 211-662  | 34 | 32 | 8 | 3.9 |
|                                    |  | 40            | 211-663  | 41 | 40 | 8 | 3.9 |
|                                    |  | 50            | 211-664  | 52 | 50 | 8 | 3.9 |
| Ring: aluminum 6026                |  | 10            | 211-665  | 12 | 10 | 8 | 3.9 |
| Seal: elastomer VMQ (silicone)     |  | 16            | 211-666  | 17 | 16 | 8 | 3.9 |
|                                    |  | 20            | 211-667  | 22 | 20 | 8 | 3.9 |
|                                    |  | 25            | 211-668  | 26 | 25 | 8 | 3.9 |
|                                    |  | 32            | 211-669  | 34 | 32 | 8 | 3.9 |
|                                    |  | 40            | 211-670  | 41 | 40 | 8 | 3.9 |
|                                    |  | 50            | 211-671  | 52 | 50 | 8 | 3.9 |

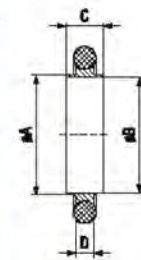




Seals (continued)

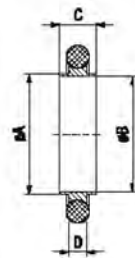
**Centering Ring  
Stainless Steel 303**

|                                  | DN ... | ISO-KF | Part No.       | A  | B  | C | D   |
|----------------------------------|--------|--------|----------------|----|----|---|-----|
| Ring: stainless steel 303/1.4305 | 10     |        | <b>211-672</b> | 12 | 10 | 8 | 3.9 |
| Seal: elastomer CR               | 16     |        | <b>211-673</b> | 17 | 16 | 8 | 3.9 |
|                                  | 20     |        | <b>211-674</b> | 22 | 20 | 8 | 3.9 |
|                                  | 25     |        | <b>211-675</b> | 26 | 25 | 8 | 3.9 |
|                                  | 32     |        | <b>211-676</b> | 34 | 32 | 8 | 3.9 |
|                                  | 40     |        | <b>211-677</b> | 41 | 40 | 8 | 3.9 |
|                                  | 50     |        | <b>211-678</b> | 52 | 50 | 8 | 3.9 |
| Ring: stainless steel 303/1.4305 | 10     |        | <b>211-065</b> | 12 | 10 | 8 | 3.9 |
| Seal: elastomer FPM              | 16     |        | <b>211-066</b> | 17 | 16 | 8 | 3.9 |
|                                  | 20     |        | <b>211-067</b> | 22 | 20 | 8 | 3.9 |
|                                  | 25     |        | <b>211-068</b> | 26 | 25 | 8 | 3.9 |
|                                  | 32     |        | <b>211-069</b> | 34 | 32 | 8 | 3.9 |
|                                  | 40     |        | <b>211-070</b> | 41 | 40 | 8 | 3.9 |
|                                  | 50     |        | <b>211-071</b> | 52 | 50 | 8 | 3.9 |
| Ring: stainless steel 303/1.4305 | 10     |        | <b>211-679</b> | 12 | 10 | 8 | 3.9 |
| Seal: elastomer NBR              | 16     |        | <b>211-680</b> | 17 | 16 | 8 | 3.9 |
|                                  | 20     |        | <b>211-681</b> | 22 | 20 | 8 | 3.9 |
|                                  | 25     |        | <b>211-682</b> | 26 | 25 | 8 | 3.9 |
|                                  | 32     |        | <b>211-683</b> | 34 | 32 | 8 | 3.9 |
|                                  | 40     |        | <b>211-684</b> | 41 | 40 | 8 | 3.9 |
|                                  | 50     |        | <b>211-685</b> | 52 | 50 | 8 | 3.9 |
| Ring: stainless steel 303/1.4305 | 10     |        | <b>211-686</b> | 12 | 10 | 8 | 3.9 |
| Seal: elastomer EPDM             | 16     |        | <b>211-687</b> | 17 | 16 | 8 | 3.9 |
|                                  | 20     |        | <b>211-688</b> | 22 | 20 | 8 | 3.9 |
|                                  | 25     |        | <b>211-689</b> | 26 | 25 | 8 | 3.9 |
|                                  | 32     |        | <b>211-690</b> | 34 | 32 | 8 | 3.9 |
|                                  | 40     |        | <b>211-691</b> | 41 | 40 | 8 | 3.9 |
|                                  | 50     |        | <b>211-692</b> | 52 | 50 | 8 | 3.9 |
| Ring: stainless steel 303/1.4305 | 10     |        | <b>211-693</b> | 12 | 10 | 8 | 3.9 |
| Seal: elastomer VMQ (silicone)   | 16     |        | <b>211-694</b> | 17 | 16 | 8 | 3.9 |
|                                  | 20     |        | <b>211-695</b> | 22 | 20 | 8 | 3.9 |
|                                  | 25     |        | <b>211-696</b> | 26 | 25 | 8 | 3.9 |
|                                  | 32     |        | <b>211-697</b> | 34 | 32 | 8 | 3.9 |
|                                  | 40     |        | <b>211-698</b> | 41 | 40 | 8 | 3.9 |
|                                  | 50     |        | <b>211-699</b> | 52 | 50 | 8 | 3.9 |



**Seals** (continued)

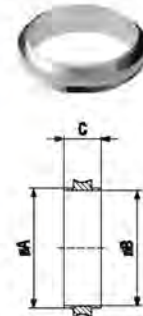
| <b>Centering Ring<br/>Stainless Steel 316L</b> |  | DN ... ISO-KF | Part No.       | A  | B  | C | D   |
|--|--|---------------|----------------|----|----|---|-----|
| Ring: <b>stainless steel 316L/1.4404</b>       |  | 10            | <b>211-735</b> | 12 | 10 | 8 | 3.9 |
| Seal: <b>elastomer CR</b>                      |  | 16            | <b>211-736</b> | 17 | 16 | 8 | 3.9 |
|  |  | 20            | <b>211-737</b> | 22 | 20 | 8 | 3.9 |
|  |  | 25            | <b>211-738</b> | 26 | 25 | 8 | 3.9 |
|  |  | 32            | <b>211-739</b> | 34 | 32 | 8 | 3.9 |
|  |  | 40            | <b>211-740</b> | 41 | 40 | 8 | 3.9 |
|  |  | 50            | <b>211-741</b> | 52 | 50 | 8 | 3.9 |
| Ring: <b>stainless steel 316L/1.4404</b>       |  | 10            | <b>211-742</b> | 12 | 10 | 8 | 3.9 |
| Seal: <b>elastomer FPM</b>                     |  | 18            | <b>211-743</b> | 17 | 16 | 8 | 3.9 |
|  |  | 20            | <b>211-744</b> | 22 | 20 | 8 | 3.9 |
|  |  | 25            | <b>211-745</b> | 26 | 25 | 8 | 3.9 |
|  |  | 32            | <b>211-746</b> | 34 | 32 | 8 | 3.9 |
|  |  | 40            | <b>211-747</b> | 41 | 40 | 8 | 3.9 |
|  |  | 50            | <b>211-748</b> | 52 | 50 | 8 | 3.9 |
| Ring: <b>stainless steel 316L/1.4404</b>       |  | 10            | <b>211-749</b> | 12 | 10 | 8 | 3.9 |
| Seal: <b>elastomer NBR</b>                     |  | 16            | <b>211-750</b> | 17 | 16 | 8 | 3.9 |
|  |  | 20            | <b>211-751</b> | 22 | 20 | 8 | 3.9 |
|  |  | 25            | <b>211-752</b> | 26 | 25 | 8 | 3.9 |
|  |  | 32            | <b>211-753</b> | 34 | 32 | 8 | 3.9 |
|  |  | 40            | <b>211-754</b> | 41 | 40 | 8 | 3.9 |
|  |  | 50            | <b>211-755</b> | 52 | 50 | 8 | 3.9 |
| Ring: <b>stainless steel 316L/1.4404</b>       |  | 10            | <b>211-756</b> | 12 | 10 | 8 | 3.9 |
| Seal: <b>elastomer EPDM</b>                    |  | 16            | <b>211-757</b> | 17 | 16 | 8 | 3.9 |
|  |  | 20            | <b>211-758</b> | 22 | 20 | 8 | 3.9 |
|  |  | 25            | <b>211-759</b> | 26 | 25 | 8 | 3.9 |
|  |  | 32            | <b>211-760</b> | 34 | 32 | 8 | 3.9 |
|  |  | 40            | <b>211-761</b> | 41 | 40 | 8 | 3.9 |
|  |  | 50            | <b>211-762</b> | 52 | 50 | 8 | 3.9 |
| Ring: <b>stainless steel 316L/1.4404</b>       |  | 10            | <b>211-763</b> | 12 | 10 | 8 | 3.9 |
| Seal: <b>elastomer VMQ (silicone)</b>          |  | 18            | <b>211-764</b> | 17 | 16 | 8 | 3.9 |
|  |  | 20            | <b>211-765</b> | 22 | 20 | 8 | 3.9 |
|  |  | 25            | <b>211-766</b> | 26 | 25 | 8 | 3.9 |
|  |  | 32            | <b>211-767</b> | 34 | 32 | 8 | 3.9 |
|  |  | 40            | <b>211-768</b> | 41 | 40 | 8 | 3.9 |
|  |  | 50            | <b>211-769</b> | 52 | 50 | 8 | 3.9 |



**Seals** (continued)

**Centering Ring without O-Ring**

|                             | DN ... ISO-KF | Part No. | A  | B  | C |
|-----------------------------|---------------|----------|----|----|---|
| Aluminum 6026/EN AW-6026 T6 | 10            | 201-301  | 12 | 10 | 8 |
|                             | 16            | 201-302  | 17 | 16 | 8 |
|                             | 20            | 201-303  | 22 | 20 | 8 |
|                             | 25            | 201-304  | 26 | 25 | 8 |
|                             | 32            | 201-305  | 34 | 32 | 8 |
|                             | 40            | 201-306  | 41 | 40 | 8 |
|                             | 50            | 201-307  | 52 | 50 | 8 |
| Stainless steel 303/1.4305  | 10            | 201-308  | 12 | 10 | 8 |
|                             | 16            | 201-309  | 17 | 16 | 8 |
|                             | 20            | 201-310  | 22 | 20 | 8 |
|                             | 25            | 201-311  | 26 | 25 | 8 |
|                             | 32            | 201-312  | 34 | 32 | 8 |
|                             | 40            | 201-313  | 41 | 40 | 8 |
|                             | 50            | 201-314  | 52 | 50 | 8 |
| Stainless steel 316L/1.4404 | 10            | 201-375  | 12 | 10 | 8 |
|                             | 16            | 201-376  | 17 | 16 | 8 |
|                             | 20            | 201-377  | 22 | 20 | 8 |
|                             | 25            | 201-378  | 26 | 25 | 8 |
|                             | 32            | 201-379  | 34 | 32 | 8 |
|                             | 40            | 201-380  | 41 | 40 | 8 |
|                             | 50            | 201-381  | 52 | 50 | 8 |


**External Centering Ring**

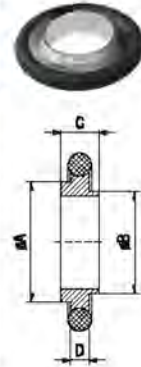
|                                | DN ... ISO-KF | Part No. | A  | B    | C | D   |
|--------------------------------|---------------|----------|----|------|---|-----|
| Ring: aluminum 6026            | 10-16         | 211-081  | 32 | 30.2 | 7 | 3.9 |
| Seal: elastomer CR             | 20-25         | 211-082  | 42 | 40.2 | 7 | 3.9 |
|                                | 32-40         | 211-083  | 57 | 55.2 | 7 | 3.9 |
|                                | 50            | 211-084  | 77 | 75.2 | 7 | 3.9 |
| Ring: aluminum 6026            | 10-16         | 211-085  | 32 | 30.2 | 7 | 3.9 |
| Seal: elastomer FPM            | 20-25         | 211-086  | 42 | 40.2 | 7 | 3.9 |
|                                | 32-40         | 211-087  | 57 | 55.2 | 7 | 3.9 |
|                                | 50            | 211-088  | 77 | 75.2 | 7 | 3.9 |
| Ring: aluminum 6026            | 10-16         | 211-700  | 32 | 30.2 | 7 | 3.9 |
| Seal: elastomer NBR            | 20-25         | 211-701  | 42 | 40.2 | 7 | 3.9 |
|                                | 32-40         | 211-702  | 57 | 55.2 | 7 | 3.9 |
|                                | 50            | 211-703  | 77 | 75.2 | 7 | 3.9 |
| Ring: aluminum 6026            | 10-16         | 211-704  | 32 | 30.2 | 7 | 3.9 |
| Seal: elastomer EPDM           | 20-25         | 211-705  | 42 | 40.2 | 7 | 3.9 |
|                                | 32-40         | 211-706  | 57 | 55.2 | 7 | 3.9 |
|                                | 50            | 211-707  | 77 | 75.2 | 7 | 3.9 |
| Ring: aluminum 6026            | 10-16         | 211-708  | 32 | 30.2 | 7 | 3.9 |
| Seal: elastomer VMQ (silicone) | 20-25         | 211-709  | 42 | 40.2 | 7 | 3.9 |
|                                | 32-40         | 211-710  | 57 | 55.2 | 7 | 3.9 |
|                                | 50            | 211-711  | 77 | 75.2 | 7 | 3.9 |





## Seals (continued)

| <b>Reducing Centering Ring</b> |                            | DN ... ISO-KF | Part No. | A  | B  | C  | D | E   |
|--------------------------------|----------------------------|---------------|----------|----|----|----|---|-----|
| Ring:                          | aluminum 6026              | 10 / 16       | 211-072  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer CR               | 20 / 25       | 211-073  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-074  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | aluminum 6026              | 10 / 16       | 211-075  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer FPM              | 20 / 25       | 211-076  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-077  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | aluminum 6026              | 10 / 18       | 211-712  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer NBR              | 20 / 25       | 211-713  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-714  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | aluminum 6026              | 10 / 18       | 211-715  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer EPDM             | 20 / 25       | 211-716  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-717  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | aluminum 6026              | 10 / 18       | 211-718  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer VMQ (silicone)   | 20 / 25       | 211-719  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-720  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | stainless steel 303/1.4305 | 10 / 16       | 211-721  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer CR               | 20 / 25       | 211-722  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-723  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | stainless steel 303/1.4305 | 10 / 16       | 211-078  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer FPM              | 20 / 25       | 211-079  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-080  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | stainless steel 303/1.4305 | 10 / 16       | 211-724  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer NBR              | 20 / 25       | 211-725  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-726  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | stainless steel 303/1.4305 | 10 / 16       | 211-727  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer EPDM             | 20 / 25       | 211-728  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-729  | 41 | 32 | 34 | 8 | 3.9 |
| Ring:                          | stainless steel 303/1.4305 | 10 / 16       | 211-730  | 17 | 10 | 12 | 8 | 3.9 |
| Seal:                          | elastomer VMQ (silicone)   | 20 / 25       | 211-731  | 26 | 20 | 22 | 8 | 3.9 |
|                                |                            | 32 / 40       | 211-732  | 41 | 32 | 34 | 8 | 3.9 |



| <b>Centering Ring with Filter</b> |                             | DN ... ISO-KF | Part No. | A  | B  | C | D   | E*                    |
|-----------------------------------|-----------------------------|---------------|----------|----|----|---|-----|-----------------------|
| Ring:                             | stainless steel 303/1.4305  | 10            | 211-089  | 12 | 8  | 8 | 3.9 | 0.5m <sup>3</sup> /h  |
| Seal:                             | elastomer FPM               | 16            | 211-090  | 17 | 14 | 8 | 3.9 | 1.2m <sup>3</sup> /h  |
| Filter:                           | stainless steel 316L/1.4404 | 25            | 211-092  | 26 | 23 | 8 | 3.9 | 4.2m <sup>3</sup> /h  |
|                                   |                             | 40            | 211-094  | 41 | 38 | 8 | 3.9 | 11.3m <sup>3</sup> /h |
|                                   |                             | 50            | 211-095  | 52 | 48 | 8 | 3.9 | 18.1m <sup>3</sup> /h |



Pore size: 0.02 mm

\* Air at 20°C, 200 mbar differential pressure

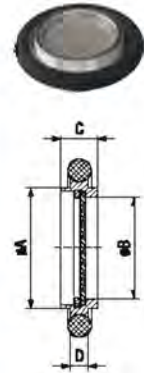


## Seals (continued)

### Centering Ring With Fine Filter

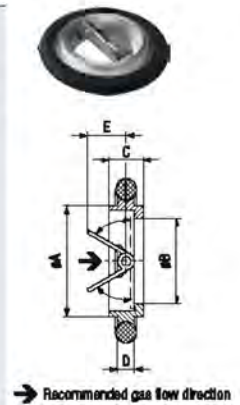
|  | DN ... ISO-KF | Part No.       | A  | B    | C | D   |
|--|---------------|----------------|----|------|---|-----|
| Inner ring: stainless steel 303/1.4305 | 10            | <b>211-096</b> | 12 | 9    | 8 | 3.9 |
| Snub ring: stainless steel 304/1.4301  | 16            | <b>211-097</b> | 17 | 13   | 8 | 3.9 |
| Seal: elastomer FPM                    | 25            | <b>211-098</b> | 26 | 22   | 8 | 3.9 |
| Filter: stainless steel 316L/1.4404    | 40            | <b>211-099</b> | 41 | 35.5 | 8 | 3.9 |
|  | 50            | <b>211-100</b> | 52 | 45.7 | 8 | 3.9 |

Pore size: 0.004 mm  
Degree of asperation at 0.001 mm up to 98%



### Centering Ring With Throttle

|   | DN ... ISO-KF | Part No.       | A  | B  | C | D   | E    |
|---|---------------|----------------|----|----|---|-----|------|
| Ring: aluminum 6082                     | 16            | <b>211-622</b> | 17 | 13 | 8 | 3.9 | 6.2  |
| Inner parts: stainless steel 301/1.4310 | 25            | <b>211-623</b> | 26 | 18 | 8 | 3.9 | 9    |
| stainless steel 303/1.4305              | 40            | <b>211-624</b> | 41 | 30 | 8 | 3.9 | 14.3 |
| Seal: elastomer FPM                     | 50            | <b>211-625</b> | 52 | 42 | 8 | 3.9 | 19.9 |



→ Recommended gas flow direction

### Centering Ring with Baffle

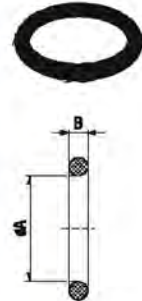
|                                      | DN ... ISO-KF | Part No.       | A  | B  | C |
|--------------------------------------|---------------|----------------|----|----|---|
| Ring: stainless steel 303 / 1.4305   | 20 - 25       | <b>211-113</b> | 28 | 25 | 8 |
| Baffle: stainless steel 301 / 1.4310 |               |                |    |    |   |
| Seal: FPM                            |               |                |    |    |   |



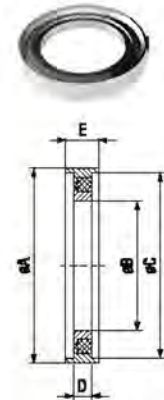
→ Recommended gas flow direction

## Seals (continued)

| <b>O-Ring</b> |    | DN ... ISO-KF | Part No. | A | B       | Set of |
|---------------|----|---------------|----------|---|---------|--------|
| Elastomer CR  | 10 | 211-146       | 15       | 5 | 10 pcs. |        |
|               | 16 | 211-147       | 18       | 5 | 10 pcs. |        |
|               | 20 | 211-148       | 25       | 5 | 10 pcs. |        |
|               | 25 | 211-149       | 28       | 5 | 10 pcs. |        |
|               | 32 | 211-150       | 40       | 5 | 10 pcs. |        |
|               | 40 | 211-151       | 42       | 5 | 10 pcs. |        |
|               | 50 | 211-152       | 55       | 5 | 10 pcs. |        |
| Elastomer FPM | 10 | 211-153       | 15       | 5 | 10 pcs. |        |
|               | 16 | 211-154       | 18       | 5 | 10 pcs. |        |
|               | 20 | 211-155       | 25       | 5 | 10 pcs. |        |
|               | 25 | 211-156       | 28       | 5 | 10 pcs. |        |
|               | 32 | 211-157       | 40       | 5 | 10 pcs. |        |
|               | 40 | 211-158       | 42       | 5 | 10 pcs. |        |
|               | 50 | 211-159       | 55       | 5 | 10 pcs. |        |

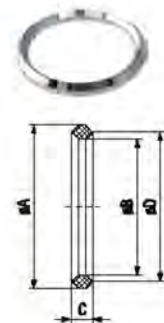


| <b>Indium Seal</b>                     |       | DN ... ISO-KF | Part No. | A  | B  | C   | D | E |
|--|-------|---------------|----------|----|----|-----|---|---|
| Inner ring: stainless steel 304/1.4301 | 10-16 | 211-162       | 32       | 18 | 30 | 3.9 | 7 |   |
| Outer ring: aluminum 5012/-            | 20-25 | 211-163       | 42       | 28 | 40 | 3.9 | 7 |   |
| Seal: Indium                           | 32-40 | 211-164       | 57       | 43 | 55 | 3.9 | 7 |   |
|  | 50    | 211-165       | 77       | 63 | 75 | 3.9 | 7 |   |



Working temperature -196° ... +60°C

| <b>Aluminum Seal</b>   |       | DN ... ISO-KF | Part No. | A    | B   | C    | D       | * |
|------------------------|-------|---------------|----------|------|-----|------|---------|---|
| Aluminum annealed 6082 | 10-16 | 211-167       | 25.6     | 19.6 | 4.5 | 22.6 | 211-171 |   |
|                        | 20-25 | 211-168       | 35.6     | 29.6 | 4.5 | 32.6 | 211-172 |   |
|                        | 32-40 | 211-169       | 50.6     | 44.6 | 4.5 | 47.6 | 211-173 |   |
|                        | 50    | 211-170       | 65.6     | 59.6 | 4.5 | 62.6 | 211-174 |   |

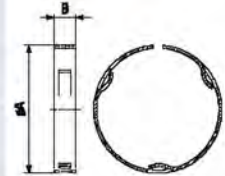


Set of 3 pieces  
\* With support ring

Seals (continued)

**Support for Aluminum Seal**

|                            | DN ... ISO-KF | Part No.       | A  | B | For Aluminum Seal |
|----------------------------|---------------|----------------|----|---|-------------------|
| Stainless steel 301/1.4310 | 10-16         | <b>211-171</b> | 32 | 7 | 211-167           |
|                            | 20-25         | <b>211-172</b> | 42 | 7 | 211-168           |
|                            | 32-40         | <b>211-173</b> | 57 | 7 | 211-169           |
|                            | 50            | <b>211-174</b> | 77 | 7 | 211-170           |



Reusable

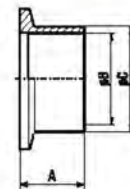
# ISO-KF Small Flange Components

## Flanges

| <b>Blank Flange</b>         | DN ... ISO-KF | Part No. | A |
|-----------------------------|---------------|----------|---|
| Aluminum 6082/-             | 10            | 211-176  | 5 |
|                             | 16            | 211-177  | 5 |
|                             | 25            | 211-178  | 5 |
|                             | 40            | 211-179  | 5 |
|                             | 50            | 211-180  | 6 |
| Stainless steel 304/1.4301  | 10            | 211-181  | 5 |
|                             | 16            | 211-182  | 5 |
|                             | 25            | 211-183  | 5 |
|                             | 40            | 211-184  | 5 |
|                             | 50            | 211-185  | 6 |
| Stainless steel 316L/1.4404 | 10            | 211-791  | 5 |
|                             | 16            | 211-792  | 5 |
|                             | 25            | 211-793  | 5 |
|                             | 40            | 211-794  | 5 |
|                             | 50            | 211-795  | 6 |



| <b>Flange with Tube, Short</b> | DN ... ISO-KF | Part No. | A  | B  | C  |
|--------------------------------|---------------|----------|----|----|----|
| Steel -/1.0037                 | 10            | 211-201  | 20 | 12 | 16 |
|                                | 16            | 211-202  | 20 | 16 | 20 |
|                                | 25            | 211-203  | 20 | 26 | 30 |
|                                | 40            | 211-204  | 20 | 41 | 45 |
|                                | 50            | 211-205  | 20 | 51 | 55 |
| Stainless steel 304/1.4301     | 10            | 211-211  | 20 | 12 | 16 |
|                                | 16            | 211-212  | 20 | 16 | 20 |
|                                | 25            | 211-213  | 20 | 26 | 30 |
|                                | 40            | 211-214  | 20 | 41 | 45 |
|                                | 50            | 211-215  | 20 | 50 | 54 |
| Stainless steel 316L/1.4404    | 10            | 211-826  | 20 | 12 | 16 |
|                                | 16            | 211-827  | 20 | 16 | 20 |
|                                | 25            | 211-828  | 20 | 26 | 30 |
|                                | 40            | 211-829  | 20 | 41 | 45 |
|                                | 50            | 211-830  | 20 | 50 | 54 |

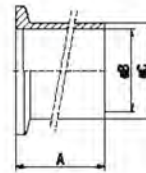




## Flanges (continued)

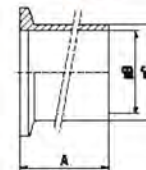
### Flange with Tube, Medium

|                             | DN ... ISO-KF | Part No. | A  | B  | C  |
|-----------------------------|---------------|----------|----|----|----|
| Stainless steel 304/1.4301  | 10            | 211-221  | 30 | 12 | 16 |
|                             | 16            | 211-222  | 30 | 16 | 20 |
|                             | 25            | 211-223  | 30 | 26 | 30 |
|                             | 40            | 211-224  | 30 | 41 | 45 |
|                             | 50            | 211-225  | 30 | 50 | 54 |
| Stainless steel 316L/1.4404 | 10            | 211-831  | 30 | 12 | 16 |
|                             | 16            | 211-832  | 30 | 16 | 20 |
|                             | 25            | 211-833  | 30 | 26 | 30 |
|                             | 40            | 211-834  | 30 | 41 | 45 |
|                             | 50            | 211-835  | 30 | 50 | 54 |



### Flange with Tube, Long

|                             | DN ... ISO-KF | Part No. | A  | B  | C  |
|-----------------------------|---------------|----------|----|----|----|
| Steel -/1.0037              | 10            | 211-206  | 70 | 12 | 16 |
|                             | 16            | 211-207  | 70 | 16 | 20 |
|                             | 25            | 211-208  | 70 | 26 | 30 |
|                             | 40            | 211-209  | 70 | 41 | 45 |
|                             | 50            | 211-210  | 70 | 51 | 55 |
| Stainless steel 304/1.4301  | 10            | 211-216  | 70 | 12 | 16 |
|                             | 16            | 211-217  | 70 | 16 | 20 |
|                             | 25            | 211-218  | 70 | 26 | 30 |
|                             | 40            | 211-219  | 70 | 41 | 45 |
|                             | 50            | 211-220  | 70 | 50 | 54 |
| Stainless steel 316L/1.4404 | 10            | 211-836  | 70 | 12 | 16 |
|                             | 16            | 211-837  | 70 | 16 | 20 |
|                             | 25            | 211-838  | 70 | 26 | 30 |
|                             | 40            | 211-839  | 70 | 41 | 45 |
|                             | 50            | 211-840  | 70 | 50 | 54 |

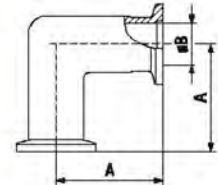


# ISO-KF Small Flange Components

## Pipe Fittings

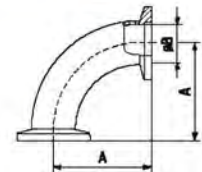
### Elbow 90° Aluminum

| Aluminum 6082/- | DN ... ISO-KF | Part No. | A  | B  |
|-----------------|---------------|----------|----|----|
|                 | 10            | 211-251  | 30 | 12 |
|                 | 16            | 211-252  | 40 | 16 |
|                 | 25            | 211-253  | 50 | 25 |
|                 | 40            | 211-254  | 65 | 39 |



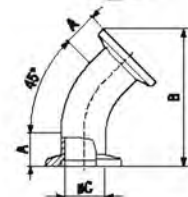
### Elbow 90° Stainless Steel

| Stainless steel 304/1.4301 | DN ... ISO-KF | Part No. | A  | B    |
|----------------------------|---------------|----------|----|------|
|                            | 10            | 211-286  | 30 | 9    |
|                            | 16            | 211-287  | 40 | 15   |
|                            | 25            | 211-288  | 50 | 25   |
|                            | 40            | 211-289  | 65 | 40.5 |
|                            | 50            | 211-290  | 70 | 49   |



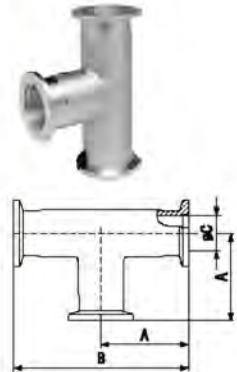
### Elbow 45°

| Stainless steel 304/1.4301 | DN ... ISO-KF | Part No. | A    | B    | C  |
|----------------------------|---------------|----------|------|------|----|
|                            | 16            | 211-307  | 13.6 | 55   | 15 |
|                            | 25            | 211-308  | 16.7 | 68.8 | 25 |
|                            | 40            | 211-309  | 15.1 | 87.7 | 37 |

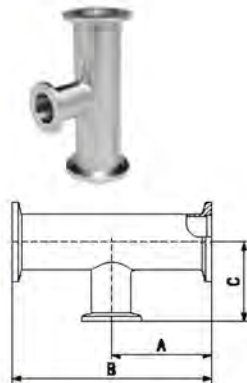


## Pipe Fittings (continued)

| <b>Tee</b>                 | DN ... ISO-KF | Part No. | A  | B   | C    |
|----------------------------|---------------|----------|----|-----|------|
| Aluminum 6082/-            | 10            | 211-261  | 30 | 60  | 12   |
|                            | 16            | 211-262  | 40 | 80  | 16   |
|                            | 25            | 211-263  | 50 | 100 | 25   |
|                            | 40            | 211-264  | 65 | 130 | 39   |
| Stainless steel 304/1.4301 | 10            | 211-291  | 30 | 60  | 12   |
|                            | 16            | 211-292  | 40 | 80  | 16   |
|                            | 25            | 211-293  | 50 | 100 | 25   |
|                            | 40            | 211-294  | 65 | 130 | 40.5 |
|                            | 50            | 211-295  | 70 | 140 | 53   |



| <b>Reducing Tee</b>        | DN ... ISO-KF | Part No. | A  | B   | C  |
|----------------------------|---------------|----------|----|-----|----|
| Stainless steel 304/1.4301 | 25 / 16       | 211-316  | 50 | 100 | 40 |
|                            | 40 / 16       | 211-317  | 65 | 130 | 40 |
|                            | 40 / 25       | 211-318  | 65 | 130 | 50 |
|                            | 50 / 16       | 211-319  | 70 | 140 | 50 |
|                            | 50 / 25       | 211-320  | 70 | 140 | 65 |
|                            | 50 / 40       | 211-321  | 70 | 140 | 65 |



| <b>Cross</b>               | DN ... ISO-KF | Part No. | A  | B   | C    |
|----------------------------|---------------|----------|----|-----|------|
| Aluminum 6082              | 10            | 211-298  | 30 | 60  | 12   |
|                            | 16            | 211-297  | 40 | 80  | 16   |
|                            | 25            | 211-298  | 50 | 100 | 25   |
|                            | 40            | 211-299  | 65 | 130 | 39   |
| Stainless steel 304/1.4301 | 10            | 211-296  | 30 | 60  | 12   |
|                            | 16            | 211-297  | 40 | 80  | 16   |
|                            | 25            | 211-298  | 50 | 100 | 25   |
|                            | 40            | 211-299  | 65 | 130 | 40.5 |
|                            | 50            | 211-300  | 70 | 140 | 53   |

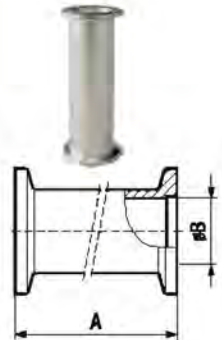


## Pipe Fittings (continued)

| <b>Reducing Cross</b>      |         | DN ... ISO-KF | Part No. | A  | B   | C  | D   | E    | F  |
|----------------------------|---------|---------------|----------|----|-----|----|-----|------|----|
| Aluminum 6082              | 25 / 16 | 25 / 16       | 211-271  | 35 | 70  | 35 | 70  | 25   | 16 |
|                            | 40 / 16 | 40 / 16       | 211-272  | 40 | 80  | 45 | 90  | 39   | 16 |
| Stainless steel 304/1.4301 | 25 / 16 | 25 / 16       | 211-301  | 35 | 70  | 35 | 70  | 25   | 17 |
|                            | 40 / 16 | 40 / 16       | 211-302  | 40 | 80  | 45 | 90  | 40.5 | 16 |
|                            | 50 / 16 | 50 / 16       | 211-303  | 50 | 100 | 50 | 100 | 53   | 16 |



| <b>Intermediate Piece</b>  |    | DN ... ISO-KF | Part No. | A    | B    |
|----------------------------|----|---------------|----------|------|------|
| Aluminum 6082/-            | 16 | 16            | 211-227  | 80   | 16   |
|                            | 25 | 25            | 211-228  | 100  | 25   |
|                            | 40 | 40            | 211-229  | 130  | 40   |
| Stainless steel 304/1.4301 | 16 | 16            | 211-277  | 80   | 16   |
|                            | 25 | 25            | 211-278  | 100  | 25   |
|                            | 40 | 40            | 211-599  | 76.2 | 40.5 |
|                            | 40 | 40            | 211-279  | 130  | 40.5 |
|                            | 50 | 50            | 211-280  | 140  | 53   |



| <b>Reducer</b>             |         | DN ... ISO-KF | Part No. | A  | B  |
|----------------------------|---------|---------------|----------|----|----|
| Aluminum 6082/-            | 25 / 16 | 25 / 16       | 211-231  | 40 | 16 |
|                            | 40 / 16 | 40 / 16       | 211-232  | 40 | 16 |
|                            | 40 / 25 | 40 / 25       | 211-233  | 40 | 25 |
|                            | 50 / 40 | 50 / 40       | 211-234  | 40 | 40 |
| Stainless steel 303/1.4305 | 25 / 16 | 25 / 16       | 211-281  | 40 | 16 |
|                            | 40 / 16 | 40 / 16       | 211-282  | 40 | 16 |
|                            | 40 / 25 | 40 / 25       | 211-283  | 40 | 26 |
|                            | 50 / 18 | 50 / 18       | 211-323  | 40 | 16 |
|                            | 50 / 25 | 50 / 25       | 211-324  | 40 | 26 |
|                            | 50 / 40 | 50 / 40       | 211-284  | 40 | 40 |





# ISO-KF Small Flange Components

## Bellows/Hose With Flanges

### Bellows

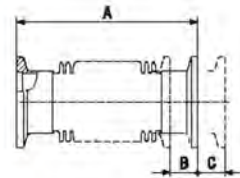
|                                       | DN ... ISO-KF | Part No. | A   | B   | C   | D   | E   |
|---------------------------------------|---------------|----------|-----|-----|-----|-----|-----|
| Flanges: stainless steel 304/1.4301   | 10            | 211-326  | 70  | 3.5 | 3   | 23° | 5   |
| Bellows: stainless steel 316Ti/1.4571 | 16            | 211-327  | 70  | 6.4 | 4.1 | 21° | 4   |
|                                       | 25            | 211-328  | 80  | 8   | 5   | 17° | 3.5 |
|                                       | 40            | 211-329  | 100 | 11  | 7   | 15° | 7   |
|                                       | 50            | 211-330  | 100 | 10  | 6   | 15° | 8   |

Max. internal pressure: 4 bar

A = unstressed length

D = max. deviation from axis

E = lateral displacement



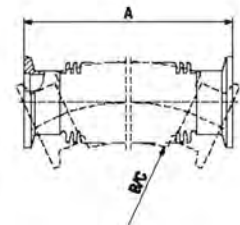
### Metal Hose, High Flexible

|                                      | DN ... ISO-KF | Part No. | A    | B   | C   |
|--------------------------------------|---------------|----------|------|-----|-----|
| Flanges: stainless steel 304/1.4301  | 10            | 211-331  | 250  | 100 | 17  |
| Bellows: stainless steel 316L/1.4404 | 10            | 211-332  | 500  | 100 | 17  |
|                                      | 10            | 211-333  | 750  | 100 | 17  |
|                                      | 10            | 211-334  | 1000 | 100 | 17  |
|                                      | 16            | 211-335  | 250  | 70  | 50  |
|                                      | 16            | 211-336  | 500  | 70  | 50  |
|                                      | 16            | 211-337  | 750  | 70  | 50  |
|                                      | 16            | 211-338  | 1000 | 70  | 50  |
|                                      | 16            | 211-531  | 1500 | 70  | 50  |
|                                      | 16            | 211-532  | 2000 | 70  | 50  |
|                                      | 25            | 211-339  | 250  | 100 | 60  |
|                                      | 25            | 211-340  | 500  | 100 | 60  |
|                                      | 25            | 211-341  | 750  | 100 | 60  |
|                                      | 25            | 211-342  | 1000 | 100 | 60  |
|                                      | 25            | 211-533  | 1500 | 100 | 103 |
|                                      | 25            | 211-534  | 2000 | 100 | 103 |
|                                      | 40            | 211-343  | 250  | 130 | 100 |
|                                      | 40            | 211-344  | 500  | 130 | 100 |
|                                      | 40            | 211-345  | 750  | 130 | 100 |
|                                      | 40            | 211-346  | 1000 | 130 | 100 |
|                                      | 40            | 211-535  | 1500 | 130 | 129 |
|                                      | 40            | 211-536  | 2000 | 130 | 129 |
|                                      | 50            | 211-347  | 250  | 200 | 130 |
|                                      | 50            | 211-348  | 500  | 200 | 130 |
|                                      | 50            | 211-349  | 750  | 200 | 130 |
|                                      | 50            | 211-350  | 1000 | 200 | 130 |

Max. internal pressure: 4 bar

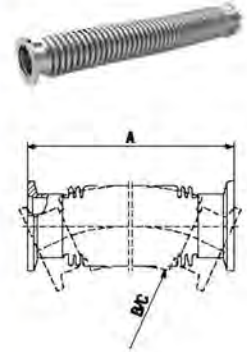
B = radius for multiple bending

C = radius for single bend

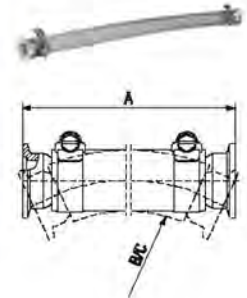


## Bellows/Hose With Flanges (continued)

| <b>Metal Hose, Flexible</b>   |  | DN ... ISO-KF | Part No. | A    | B   |
|-------------------------------|--|---------------|----------|------|-----|
| Flanges: 316/(304)            |  | 10            | 211-851  | 250  | 40  |
| Bellows: 316L/(316Ti)         |  | 10            | 211-852  | 500  | 40  |
|                               |  | 10            | 211-853  | 750  | 40  |
|                               |  | 10            | 211-854  | 1000 | 40  |
|                               |  | 16            | 211-857  | 250  | 60  |
|                               |  | 16            | 211-858  | 500  | 60  |
|                               |  | 16            | 211-859  | 750  | 60  |
|                               |  | 16            | 211-860  | 1000 | 60  |
|                               |  | 16            | 211-861  | 1500 | 60  |
|                               |  | 16            | 211-862  | 2000 | 60  |
|                               |  | 25            | 211-863  | 250  | 115 |
|                               |  | 25            | 211-864  | 500  | 115 |
|                               |  | 25            | 211-865  | 750  | 115 |
|                               |  | 25            | 211-866  | 1000 | 115 |
|                               |  | 25            | 211-867  | 1500 | 115 |
|                               |  | 25            | 211-868  | 2000 | 115 |
|                               |  | 40            | 211-869  | 250  | 149 |
|                               |  | 40            | 211-870  | 500  | 149 |
|                               |  | 40            | 211-871  | 750  | 149 |
|                               |  | 40            | 211-872  | 1000 | 149 |
| Max. internal pressure: 4 bar |  | 40            | 211-873  | 1500 | 149 |
| B = radius for single bend    |  | 40            | 211-874  | 2000 | 149 |



| <b>PVC Hose</b>                     |  | DN ... ISO-KF | Part No. | A    | B   | C   |
|-------------------------------------|--|---------------|----------|------|-----|-----|
| Hose: PVC with cast in steel spiral |  | 16            | 211-406  | 500  | 130 | 65  |
| Nipple: aluminum 6082/-             |  | 16            | 211-407  | 1000 | 130 | 65  |
| Hose clamp: stainless steel 430/-   |  | 16            | 211-509  | 1500 | 130 | 65  |
|                                     |  | 25            | 211-408  | 500  | 200 | 100 |
|                                     |  | 25            | 211-409  | 1000 | 200 | 100 |
|                                     |  | 25            | 211-412  | 2000 | 200 | 100 |
| B = radius for multiple bending     |  | 40            | 211-410  | 500  | 260 | 130 |
| C = radius for single bend          |  | 40            | 211-411  | 1000 | 260 | 130 |



# ISO-KF Small Flange Components

## Transition Pieces

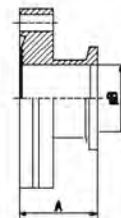
### Adaptor ISO-KF/ISO-K

|                            | ISO-KF/ISO-K | Part No. | A  |
|----------------------------|--------------|----------|----|
| Aluminum 6082/-            | 40 / 63      | 212-171  | 40 |
|                            | 50 / 63      | 212-172  | 45 |
| Stainless steel 303/1.4305 | 40 / 63      | 212-173  | 40 |
|                            | 50 / 63      | 212-174  | 45 |
|                            | 40 / 100     | 212-175  | 40 |
|                            | 25 / 63      | 212-178  | 50 |



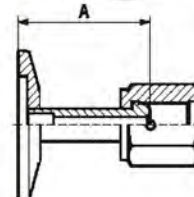
### Adaptor ISO-KF/CF-F

|                             | ISO-KF/CF-F | Part No. | A  | B  |
|-----------------------------|-------------|----------|----|----|
| Stainless steel 304L/1.4306 | 18 / 16     | 213-251  | 35 | 16 |
|                             | 25 / 16     | 213-252  | 35 | 16 |
|                             | 16 / 40     | 213-254  | 30 | 16 |
|                             | 25 / 40     | 213-255  | 30 | 26 |
|                             | 40 / 40     | 213-256  | 50 | 37 |
|                             | 40 / 63     | 213-258  | 35 | 41 |
|                             | 40 / 100    | 213-262  | 50 | 41 |



### Adaptor ISO-KF/VCR Female

|                                    | ISO-KF/VCR   | Part No. | A    |
|------------------------------------|--------------|----------|------|
| Flange: stainless steel 304/1.4301 | 18 / 1/4 in. | 211-359  | 35.8 |
| Nut: stainless steel 316L/1.4435   | 25 / 1/4 in. | 211-480  | 35.8 |
|                                    | 25 / 1/2 in. | 211-360  | 40.6 |
|                                    | 40 / 3/4 in. | 211-361  | 53.3 |



Width across flats in inch

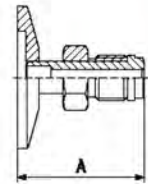


## Transition Pieces (continued)

### Adaptor ISO-KF/VCR Male

|                                    | ISO-KF/VCR   | Part No.       | A    |
|------------------------------------|--------------|----------------|------|
| Flange: stainless steel 304/1.4301 | 16 / 1/4 in. | <b>211-362</b> | 35.8 |
| Nut: stainless steel 316L/1.4435   | 25 / 1/4 in. | <b>211-481</b> | 35.8 |
|                                    | 25 / 1/2 in. | <b>211-383</b> | 40.6 |
|                                    | 40 / 3/4 in. | <b>211-384</b> | 53.3 |

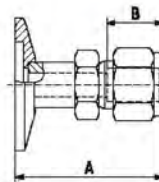
Width across flats In Inch



### Adaptor ISO-KF/Swagelok

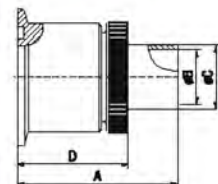
|                                    | ISO-KF/Swagelok | Part No.                     | A  | B    |
|------------------------------------|-----------------|------------------------------|----|------|
| Flange: stainless steel 304/1.4301 | 16 / 6 mm       | <b>211-358</b> <sup>1)</sup> | 37 | 15.3 |
| Nut: stainless steel 316L/1.4435   | 25 / 10 mm      | <b>211-357</b> <sup>1)</sup> | 45 | 17.2 |
|                                    | 40 / 16 mm      | <b>211-358</b> <sup>1)</sup> | 53 | 24.4 |
|                                    | 16 / 1/8 in.    | <b>211-476</b> <sup>2)</sup> | 35 | 12.7 |
|                                    | 25 / 1/4 in.    | <b>211-477</b> <sup>2)</sup> | 37 | 15.5 |
|                                    | 40 / 1/4 in.    | <b>211-478</b> <sup>2)</sup> | 37 | 15.5 |
|                                    | 40 / 1/2 in.    | <b>211-479</b> <sup>2)</sup> | 47 | 23   |

<sup>1)</sup> Width across flats metric (SI)  
<sup>2)</sup> Width across flats In Inch



### Glass Tube Connection

|                         | DN ... ISO-KF | Part No.       | A  | B  | C  | D  |
|-------------------------|---------------|----------------|----|----|----|----|
| Flange: aluminum 6082/- | 10            | <b>211-351</b> | 50 | 8  | 10 | 30 |
| Sealing: elastomer FPM  | 40            | <b>211-353</b> | 65 | 22 | 26 | 45 |
| Tube: glas Pyrex        |               |                |    |    |    |    |





## Transition Pieces (continued)

### Screw-In Flange

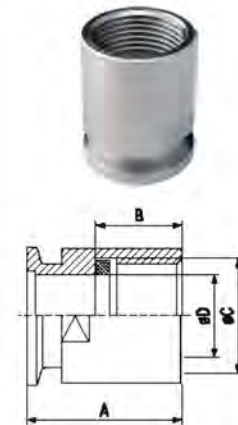
|                                    | ISO-KF/DN        | Part No.       | A  | B    | C           | D    |
|------------------------------------|------------------|----------------|----|------|-------------|------|
| Flange: stainless steel 303/1.4305 | 16 / M16x1.5     | <b>211-372</b> | 42 | 11.5 | M16x1.5     | 10.5 |
| Sealing: elastomer FPM             | 10 / G 3/8 in.   | <b>211-368</b> | 35 | 15   | G 3/8 in.   | 12   |
|                                    | 16 / G 1/2 in.   | <b>211-367</b> | 35 | 15   | G 1/2 in.   | 16   |
|                                    | 25 / G 1 in.     | <b>211-368</b> | 45 | 25   | G 1 in.     | 25   |
|                                    | 40 / G 1 1/2 in. | <b>211-369</b> | 50 | 30   | G 1 1/2 in. | 41   |



Width across flats metric (SI)

### Screw-on Flange

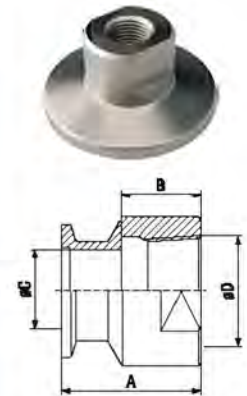
|                                    | ISO-KF/DN        | Part No.       | A  | B  | C           | D  |
|------------------------------------|------------------|----------------|----|----|-------------|----|
| Flange: stainless steel 303/1.4305 | 10 / G 3/8 in.   | <b>211-376</b> | 35 | 15 | G 3/8 in.   | 10 |
| Sealing: elastomer FPM             | 16 / G 1/2 in.   | <b>211-377</b> | 35 | 15 | G 1/2 in.   | 15 |
|                                    | 25 / G 1 in.     | <b>211-378</b> | 45 | 25 | G 1 in.     | 24 |
|                                    | 40 / G 1 1/2 in. | <b>211-379</b> | 50 | 30 | G 1 1/2 in. | 38 |



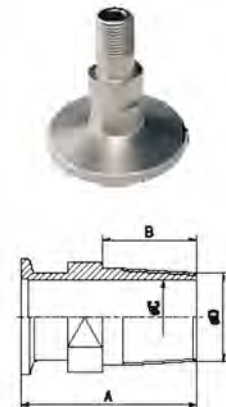
Width across flats metric (SI)

## Transition Pieces (continued)

| <b>Adaptor<br/>ISO-KF/NPT Female</b> |              | ISO-KF/NPT | Part No. | A  | B  | C            | D |
|--------------------------------------|--------------|------------|----------|----|----|--------------|---|
| Stainless steel 303/1.4305           | 16 / 1/8 in. | 211-566    | 19       | 10 | 12 | 1/8-27 NPT   |   |
|                                      | 16 / 1/4 in. | 211-567    | 19       | 13 | 15 | 1/4-18 NPT   |   |
|                                      | 25 / 1/8 in. | 211-569    | 19       | 10 | 12 | 1/8-27 NPT   |   |
|                                      | 25 / 1/4 in. | 211-570    | 19       | 13 | 15 | 1/4-18 NPT   |   |
|                                      | 25 / 1/2 in. | 211-571    | 26       | 18 | 25 | 1/2-14 NPT   |   |
|                                      | 25 / 1 in.   | 211-572    | 42       | 24 | 25 | 1-11 1/2 NPT |   |
|                                      | 40 / 1/4 in. | 211-574    | 19       | 13 | 15 | 1/4-18 NPT   |   |
|                                      | 40 / 1/2 in. | 211-575    | 28       | 18 | 25 | 1/2-14 NPT   |   |
|                                      | 40 / 1 in.   | 211-578    | 26       | 23 | 29 | 1-11 1/2 NPT |   |
| Width across flats in inch           |              |            |          |    |    |              |   |



| <b>Adaptor<br/>ISO-KF/NPT Male</b> |                | ISO-KF/NPT | Part No. | A    | B  | C                | D |
|------------------------------------|----------------|------------|----------|------|----|------------------|---|
| Stainless steel 303/1.4305         | 16 / 1/8 in.   | 211-551    | 40       | 17   | 5  | 1/8-27 NPT       |   |
|                                    | 16 / 1/4 in.   | 211-552    | 40       | 22   | 7  | 1/4-18 NPT       |   |
|                                    | 25 / 1/8 in.   | 211-554    | 40       | 17   | 5  | 1/8-27 NPT       |   |
|                                    | 25 / 1/4 in.   | 211-555    | 40       | 22   | 7  | 1/4-18 NPT       |   |
|                                    | 25 / 1/2 in.   | 211-556    | 50       | 30   | 14 | 1/2-14 NPT       |   |
|                                    | 25 / 1 in.     | 211-557    | 60       | 32   | 25 | 1-11 1/2 NPT     |   |
|                                    | 40 / 1/4 in.   | 211-559    | 40       | 21   | 7  | 1/4-18 NPT       |   |
|                                    | 40 / 1/2 in.   | 211-560    | 50       | 30   | 14 | 1/2-14 NPT       |   |
|                                    | 40 / 1 in.     | 211-561    | 60       | 33   | 25 | 1-11 1/2 NPT     |   |
|                                    | 40 / 1 1/4 in. | 211-562    | 50       | 31.5 | 32 | 1 1/4-11 1/2 NPT |   |
|                                    | 40 / 1 1/2 in. | 211-563    | 50       | 28   | 32 | 1 1/2-11 1/2 NPT |   |
|                                    | 40 / 2 in.     | 211-564    | 50       | 27   | 40 | 2-11 1/2 NPT     |   |
| Width across flats in inch         |                |            |          |      |    |                  |   |

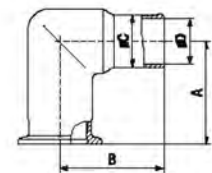


# ISO-KF Small Flange Components

## Hose, Hose Connection

### Hose Adaptor 90°

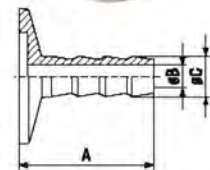
|                 | DN ... ISO-KF | Part No. | A  | B  | C  | D  |
|-----------------|---------------|----------|----|----|----|----|
| Aluminum 6082/- | 16            | 211-257  | 40 | 40 | 16 | 13 |
|                 | 25            | 211-258  | 50 | 50 | 25 | 22 |
|                 | 40            | 211-259  | 65 | 65 | 40 | 37 |



C = nominal connection for sleeves / hose

### Hose Adaptor for Rubber Hose

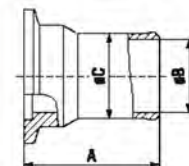
|                            | DN ... ISO-KF | Part No. | A  | B | C  |
|----------------------------|---------------|----------|----|---|----|
| Aluminum 6082/-            | 16            | 211-387  | 40 | 7 | 12 |
|                            | 25            | 211-388  | 40 | 7 | 12 |
|                            | 40            | 211-389  | 40 | 7 | 12 |
| Stainless steel 303/1.4305 | 16            | 211-392  | 40 | 7 | 12 |
|                            | 25            | 211-393  | 40 | 7 | 12 |
|                            | 40            | 211-394  | 40 | 7 | 12 |



C = nominal connection for hose

### Hose Connection

|                 | DN ... ISO-KF | Part No. | A  | B  | C  |
|-----------------|---------------|----------|----|----|----|
| Aluminum 6082/- | 25            | 211-401  | 40 | 13 | 16 |
|                 | 16            | 211-402  | 40 | 13 | 16 |
|                 | 25            | 211-403  | 40 | 22 | 25 |
|                 | 40            | 211-404  | 40 | 37 | 40 |



C = nominal connection for sleeve / hose

## Hose, Hose Connection (continued)

### Sleeve with Hose Clamp

|                             | DN ... ISO-KF | Part No. | A  | B  | C  | D  | E  |
|-----------------------------|---------------|----------|----|----|----|----|----|
| Hose clamp: stainless steel | 16            | 211-417  | 58 | 7  | 14 | 16 | 44 |
| Sleeve: elastomer CR        | 25            | 211-418  | 60 | 9  | 16 | 25 | 50 |
|                             | 40            | 211-419  | 64 | 13 | 20 | 40 | 68 |

Max. Internal pressure: 1 bar



### Hose Clamp

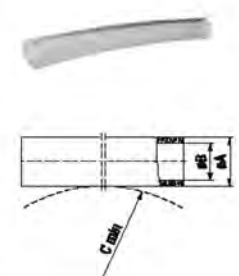
|                       | DN ... ISO-KF | Part No. | A  | B  |
|-----------------------|---------------|----------|----|----|
| Stainless steel 430/- | 16            | 211-461  | 13 | 32 |
|                       | 25            | 211-462  | 19 | 44 |
|                       | 40            | 211-463  | 26 | 76 |



### PVC Hose

|                     | DN ... ISO-KF | Part No. | A  | B  | C   |
|---------------------|---------------|----------|----|----|-----|
| With cast in spiral | 16            | 211-442  | 23 | 16 | 130 |
|                     | 25            | 211-443  | 33 | 25 | 200 |
|                     | 40            | 211-444  | 50 | 40 | 260 |

or vacuum applications  
Indicate length in meters



### Rubber Hose

|                         | DN ... ISO-KF | Part No. | A  | B  |
|-------------------------|---------------|----------|----|----|
| For vacuum applications | 10            | 211-451  | 17 | 7  |
|                         | 16            | 211-452  | 25 | 10 |
|                         | 20            | 211-453  | 32 | 16 |

Indicate length in meters  
Hardness: 45 ± 5 Shore A  
Temperature: -30 ... +75 °C





## Hose, Hose Connection (continued)

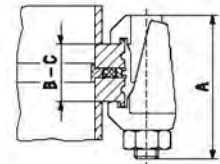
| <b>Protective Lid</b> | <b>DN ... ISO-KF</b> | <b>Part No.</b> | <b>A</b> | <b>B</b> | <b>C</b> |
|-----------------------|----------------------|-----------------|----------|----------|----------|
| Polyethylene          | 10-16                | <b>211-427</b>  | 32       | 28       | 7.5      |
|                       | 20-25                | <b>211-428</b>  | 42       | 38       | 7.5      |
|                       | 32-40                | <b>211-429</b>  | 57       | 54       | 7.5      |
|                       | 50                   | <b>211-430</b>  | 77       | 74       | 7.5      |



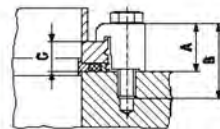
# ISO-K Clamp Flange Components

## Connection Elements

| Clamp                    | DN ... ISO-K | Part No.       | A  | B  | C  | Set of | Thread |
|--------------------------|--------------|----------------|----|----|----|--------|--------|
| Steel zinc plated 1045/- | 63-250       | <b>212-225</b> | 60 | 17 | 27 | 4 pcs. | M10    |
|                          | 320-500      | <b>212-226</b> | 78 | 27 | 39 | 4 pcs. | M10    |
|                          | 630          | <b>212-227</b> | 88 | 31 | 49 | 4 pcs. |        |
| Stainless steel 316/-    | 63-250       | <b>212-228</b> | 61 | 18 | 28 | 4 pcs. |        |
|                          | 320-630      | <b>212-240</b> | 82 | 29 | 47 | 4 pcs. |        |

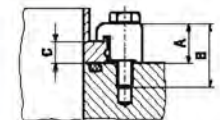


| Clamp Without groove   | DN ... ISO-K | Part No.       | A    | B  | C    | Set of |
|--|--------------|----------------|------|----|------|--------|
| Clamp: aluminum 6082/-<br>Screw: steel zinc plated 1045/-          | 160-250      | <b>212-432</b> | 23   | 35 | 13.9 | 4 pcs. |
| Clamp: steel zinc plated 1045/-<br>Screw: steel zinc plated 1045/- | 63-100       | <b>212-231</b> | 22.5 | 35 | 13.9 | 4 pcs. |
|  | 160-250      | <b>212-232</b> | 23   | 35 | 13.9 | 4 pcs. |
|  | 320-500      | <b>212-233</b> | 36.5 | 50 | 20.6 | 4 pcs. |
|  | 630          | <b>212-234</b> | 41.5 | 55 | 25.6 | 4 pcs. |



Clamping flange and base plate without groove

| Clamp Base plate with groove                                       | DN ... ISO-K | Part No.       | A    | B  | C    | Set of |
|--|--------------|----------------|------|----|------|--------|
| Clamp: steel zinc plated 1045/-<br>Screw: steel zinc plated 1045/- | 63-100       | <b>212-235</b> | 18.6 | 30 | 10   | 4 pcs. |
|  | 160-250      | <b>212-238</b> | 19   | 35 | 10   | 4 pcs. |
|  | 320-500      | <b>212-237</b> | 31   | 45 | 15   | 4 pcs. |
|  | 630          | <b>212-233</b> | 36.5 | 50 | 20.6 | 4 pcs. |

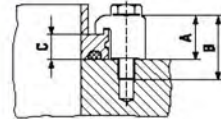


Clamping flange / base plate with groove

## Connection Elements (continued)

| <b>Clamp<br/>Flange with groove</b> | <b>DN ... ISO-K</b> | <b>Part No.</b> | <b>A</b> | <b>B</b> | <b>C</b> | <b>Set of</b> |
|-------------------------------------|---------------------|-----------------|----------|----------|----------|---------------|
| Steel zinc plated 1045/-            | 63-100              | <b>212-247</b>  | 20.6     | 30       | 12       | 4 pcs.        |
|                                     | 160-250             | <b>212-248</b>  | 21.1     | 35       | 12       | 4 pcs.        |
|                                     | 320-500             | <b>212-249</b>  | 33.9     | 45       | 18       | 4 pcs.        |
|                                     | 630                 | <b>212-233</b>  | 36.5     | 50       | 20.6     | 4 pcs.        |

Clamping flange with groove / base plate



# ISO-K Clamp Flange Components

## Seals

| <b>Centering Ring</b> |                       | <b>DN ... ISO-K</b> | <b>Part No.</b> | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|-----------------------|-----------------------|---------------------|-----------------|----------|----------|----------|----------|
| Inner ring:           | aluminum 6082/-       | 63                  | <b>212-251</b>  | 96       | 70       | 3.9      | 8        |
| Outer ring:           | aluminum 6082/-       | 80                  | <b>212-081</b>  | 109      | 83       | 3.9      | 8        |
| Seal:                 | elastomer CR          | 100                 | <b>212-252</b>  | 128      | 102      | 3.9      | 8        |
|                       |                       | 160                 | <b>212-253</b>  | 179      | 153      | 3.9      | 8        |
|                       |                       | 200                 | <b>212-254</b>  | 239      | 213      | 3.9      | 8        |
|                       |                       | 250                 | <b>212-255</b>  | 287      | 261      | 3.9      | 8        |
|                       |                       | 320                 | <b>212-256</b>  | 358      | 318      | 5.6      | 14       |
|                       |                       | 400                 | <b>212-257</b>  | 440      | 400      | 5.6      | 14       |
|                       |                       | 500                 | <b>212-258</b>  | 541      | 501      | 5.6      | 14       |
|                       |                       | 630                 | <b>212-259</b>  | 691      | 651      | 5.6      | 14       |
| Inner ring:           | aluminum 6082/-       | 63                  | <b>212-261</b>  | 96       | 70       | 3.9      | 8        |
| Outer ring:           | aluminum 6082/-       | 80                  | <b>212-082</b>  | 109      | 83       | 3.9      | 8        |
| Seal:                 | elastomer FPM         | 100                 | <b>212-262</b>  | 128      | 102      | 3.9      | 8        |
|                       |                       | 160                 | <b>212-263</b>  | 179      | 153      | 3.9      | 8        |
|                       |                       | 200                 | <b>212-264</b>  | 239      | 213      | 3.9      | 8        |
|                       |                       | 250                 | <b>212-265</b>  | 287      | 261      | 3.9      | 8        |
|                       |                       | 320                 | <b>212-266</b>  | 358      | 318      | 5.6      | 14       |
|                       |                       | 400                 | <b>212-267</b>  | 440      | 400      | 5.6      | 14       |
|                       |                       | 500                 | <b>212-268</b>  | 541      | 501      | 5.6      | 14       |
|                       |                       | 630                 | <b>212-269</b>  | 691      | 651      | 5.6      | 14       |
| 800                   | <b>212-270</b>        | 840                 | 800             | 5.6      | 14       |          |          |
| 1000                  | <b>212-271</b>        | 1040                | 1000            | 5.6      | 14       |          |          |
| Inner ring:           | stainless steel 304/- | 63                  | <b>212-281</b>  | 96       | 70       | 3.9      | 8        |
| Outer ring:           | aluminum 6082/-       | 80                  | <b>212-083</b>  | 109      | 83       | 3.9      | 8        |
| Seal:                 | elastomer FPM         | 100                 | <b>212-282</b>  | 128      | 102      | 3.9      | 8        |
|                       |                       | 160                 | <b>212-283</b>  | 179      | 153      | 3.9      | 8        |
|                       |                       | 200                 | <b>212-284</b>  | 239      | 213      | 3.9      | 8        |
|                       |                       | 250                 | <b>212-285</b>  | 287      | 261      | 3.9      | 8        |



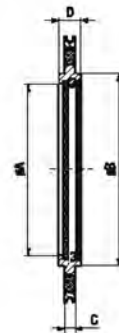


Seals (continued)

**Centering Ring with Fine Filter**

|                                    | DN ... ISO-K | Part No. | A  | B     | C   | D |
|------------------------------------|--------------|----------|----|-------|-----|---|
| Inner ring: stainless steel 304/-  | 63           | 212-281  | 62 | 69.8  | 3.9 | 8 |
| Outer ring: aluminum 6082/-        | 100          | 212-282  | 94 | 101.8 | 3.9 | 8 |
| Seal: elastomer FPM                |              |          |    |       |     |   |
| Snap ring: stainless steel 304/-   |              |          |    |       |     |   |
| Filter grit: stainless steel 304/- |              |          |    |       |     |   |
| Filter: stainless steel 316L/-     |              |          |    |       |     |   |

Pore size 0.004 mm  
Degree of separation at 0.001 mm up to 98%



**O-ring**

|               | DN ... ISO-K | Part No. | A     | B   | Set of |
|---------------|--------------|----------|-------|-----|--------|
| Elastomer CR  | 63           | 212-388  | 75.6  | 5.3 | 5 pcs. |
|               | 80           | 212-387  | 88.3  | 5.3 | 5 pcs. |
|               | 100          | 212-388  | 107.3 | 5.3 | 5 pcs. |
|               | 160          | 212-389  | 158.1 | 5.3 | 5 pcs. |
|               | 200          | 212-390  | 208.9 | 5.3 | 5 pcs. |
|               | 250          | 212-391  | 253.4 | 5.3 | 5 pcs. |
| Elastomer FPM | 63           | 212-392  | 75.6  | 5.3 | 5 pcs. |
|               | 80           | 212-393  | 88.3  | 5.3 | 5 pcs. |
|               | 100          | 212-394  | 107.2 | 5.3 | 5 pcs. |
|               | 160          | 212-395  | 158.1 | 5.3 | 5 pcs. |
|               | 200          | 212-396  | 208.9 | 5.3 | 5 pcs. |
|               | 250          | 212-397  | 253.4 | 5.3 | 5 pcs. |
|               | 320          | 212-398  | 329.6 | 7   | -      |
|               | 400          | 212-397  | 405.3 | 7   | -      |
|               | 500          | 212-398  | 506.9 | 7   | -      |
|               | 630          | 212-399  | 658.9 | 7   | -      |



## Seals (continued)

| <b>Aluminum Seal</b>     |  | DN ... ISO-K | Part No.       | A          | B   | C     | D   | E   |
|--------------------------|--|--------------|----------------|------------|-----|-------|-----|-----|
| Aluminum annealed 6082/- |  | 63           | <b>212-301</b> | 85.6       | 83  | 69.8  | 2.8 | 4.5 |
|                          |  | 100          | <b>212-302</b> | 116.6      | 114 | 101.8 | 2.8 | 4.5 |
|                          |  | 160          | <b>212-303</b> | 166.6      | 164 | 152.8 | 2.6 | 4.5 |
|                          |  | 250          | <b>212-305</b> | 276.6      | 274 | 260.8 | 2.6 | 4.5 |
| Number of                |  | Clamps       |                | Claw Grips |     |       |     |     |
|                          |  | DN 63 ISO -K | 4              |            |     |       |     |     |
|                          |  | DN 100 ISO-K | 6              | 8          |     |       |     |     |
|                          |  | DN 160 ISO-K | 8              | 8          |     |       |     |     |
|                          |  | DN 250 ISO-K | 12             | 12         |     |       |     |     |



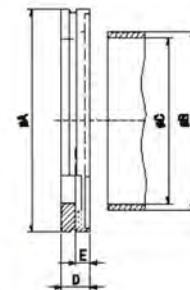
# ISO-K Clamp Flange Components

## Flanges

| <b>Blank Flange</b>        | DN ... ISO-K | Part No. | A   | B  |
|----------------------------|--------------|----------|-----|----|
| Aluminum 6082              | 63           | 212-441  | 95  | 12 |
|                            | 100          | 212-442  | 130 | 12 |
|                            | 160          | 212-443  | 180 | 12 |
|                            | 200          | 212-444  | 240 | 12 |
|                            | 250          | 212-445  | 290 | 12 |
|                            | 320          | 212-446  | 370 | 17 |
| Steel nickel plated A570/- | 63           | 212-001  | 95  | 12 |
|                            | 100          | 212-002  | 130 | 12 |
|                            | 160          | 212-003  | 180 | 12 |
|                            | 250          | 212-005  | 290 | 12 |
| Stainless steel 304/-      | 63           | 212-011  | 95  | 12 |
|                            | 80           | 212-078  | 110 | 12 |
|                            | 100          | 212-012  | 130 | 12 |
|                            | 160          | 212-013  | 180 | 12 |
|                            | 200          | 212-014  | 240 | 12 |
|                            | 250          | 212-015  | 290 | 12 |
|                            | 320          | 212-016  | 370 | 17 |
|                            | 400          | 212-017  | 450 | 17 |
|                            | 500          | 212-018  | 550 | 17 |
|                            | 630          | 212-019  | 690 | 22 |

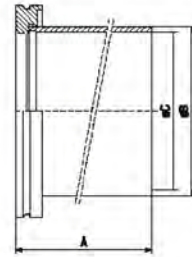


| <b>Welding Flange</b> | DN ... ISO-K | Part No. | A   | B     | C     | D  | E   |
|-----------------------|--------------|----------|-----|-------|-------|----|-----|
| Steel -/1.0831        | 63           | 212-021  | 95  | 76.1  | 70.3  | 12 | 6   |
|                       | 100          | 212-022  | 130 | 108   | 102.2 | 12 | 6   |
| Steel A570/-          | 160          | 212-023  | 180 | 159   | 153.2 | 12 | 6   |
|                       | 250          | 212-025  | 290 | 267   | 261   | 12 | 6   |
| Stainless steel 304/- | 63           | 212-031  | 95  | 76.1  | 71.5  | 12 | 6   |
|                       | 80           | 212-078  | 110 | 88.9  | 84.9  | 12 | 6   |
|                       | 100          | 212-032  | 130 | 108   | 102   | 12 | 6   |
|                       | 160          | 212-033  | 180 | 159   | 155   | 12 | 6   |
|                       | 200          | 212-034  | 240 | 219.1 | 213.1 | 12 | 6   |
|                       | 250          | 212-035  | 290 | 267   | 261   | 12 | 6   |
|                       | 320          | 212-036  | 370 | 324   | 318   | 17 | 8.5 |
| Stainless steel 304/- | 250          | 212-385  | 290 | 254   | 250   | 12 | 6   |
|                       | 250          | 212-505  | 290 | 273   | 261   | 12 | 5   |



## Flanges (continued)

| <b>Flange with Tube</b> | <b>DN ... ISO-K</b>   | <b>Part No.</b> | <b>A</b>       | <b>B</b> | <b>C</b> |
|-------------------------|-----------------------|-----------------|----------------|----------|----------|
| Flange: steel -/1.0831  | 63                    | <b>212-041</b>  | 100            | 76.1     | 70.3     |
| Tube: steel -/1.0308    | 100                   | <b>212-042</b>  | 100            | 108      | 102.2    |
|                         | 160                   | <b>212-043</b>  | 100            | 159      | 153.2    |
|                         | 250                   | <b>212-045</b>  | 100            | 267      | 261      |
|                         | Stainless steel 304/- | 63              | <b>212-051</b> | 100      | 76.1     |
| Stainless steel 304/-   | 100                   | <b>212-052</b>  | 100            | 108      | 104      |
|                         | 160                   | <b>212-053</b>  | 100            | 159      | 155      |
|                         | 200                   | <b>212-054</b>  | 100            | 219.1    | 212.7    |
|                         | 250                   | <b>212-055</b>  | 100            | 267      | 261      |
|                         | 320                   | <b>212-056</b>  | 100            | 324      | 318      |
|                         | 400                   | <b>212-057</b>  | 100            | 406      | 400      |
|                         | 500                   | <b>212-058</b>  | 100            | 508      | 500      |
|                         | 630                   | <b>212-059</b>  | 100            | 660      | 650      |
| Stainless steel 304/-   | 250                   | <b>212-506</b>  | 100            | 273      | 267      |

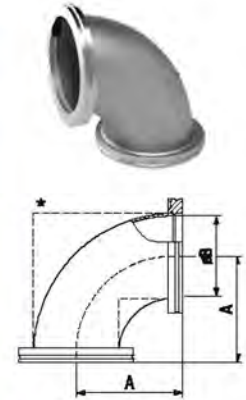




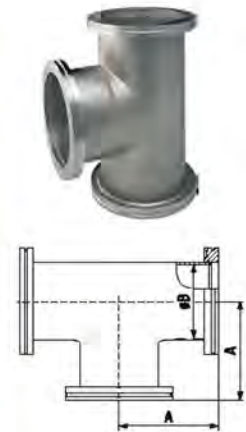
# ISO-K Clamp Flange Components

## Pipe Fittings

| <b>Elbow 90°</b>      | DN ... ISO-K | Part No. | A   | B   |
|-----------------------|--------------|----------|-----|-----|
| Stainless steel 304/- | 63           | 212-101  | 88  | 66  |
|                       | 100          | 212-102  | 108 | 100 |
|                       | 160*         | 212-103  | 138 | 150 |
|                       | 200*         | 212-104  | 178 | 213 |
|                       | 250*         | 212-105  | 208 | 250 |
|                       | 320*         | 212-106  | 250 | 318 |



| <b>Tee</b>            | DN ... ISO-K | Part No. | A   | B   |
|-----------------------|--------------|----------|-----|-----|
| Stainless steel 304/- | 63           | 212-111  | 88  | 66  |
|                       | 100          | 212-112  | 108 | 100 |
|                       | 160          | 212-113  | 138 | 150 |
|                       | 200          | 212-114  | 178 | 213 |
|                       | 250          | 212-115  | 208 | 250 |
|                       | 320          | 212-116  | 250 | 318 |

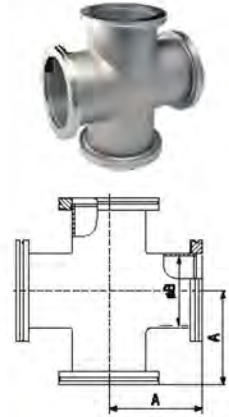


| <b>Reducing Tee</b>   | DN ... ISO-K | Part No. | A   | B   | C   |
|-----------------------|--------------|----------|-----|-----|-----|
| Stainless steel 304/- | 160/63       | 212-196  | 138 | 276 | 130 |
|                       | 180/100      | 212-197  | 138 | 276 | 131 |
|                       | 250/200      | 212-198  | 190 | 380 | 208 |



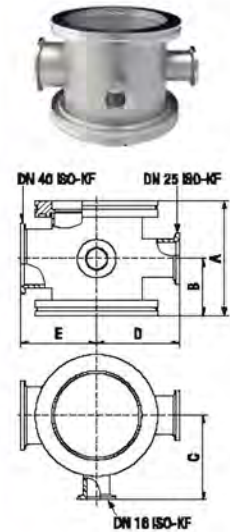
## Pipe Fittings (continued)

| <b>Cross</b>          | DN ... ISO-K | Part No.       | A   | B   |
|-----------------------|--------------|----------------|-----|-----|
| Stainless steel 304/- | 63           | <b>212-121</b> | 88  | 66  |
|                       | 100          | <b>212-122</b> | 108 | 100 |
|                       | 160          | <b>212-123</b> | 138 | 150 |
|                       | 200          | <b>212-124</b> | 178 | 213 |
|                       | 250          | <b>212-125</b> | 208 | 250 |

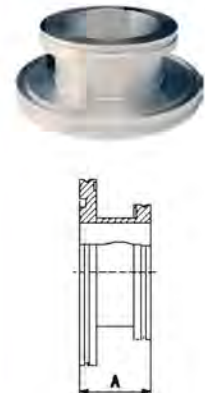


| <b>Reducing Cross</b> | DN ... ISO-K | Part No.       | A   | B  | C   | D   | E   |
|-----------------------|--------------|----------------|-----|----|-----|-----|-----|
| Stainless steel 304/- | 63           | <b>212-131</b> | 88  | 44 | 66  | 64  | 59  |
|                       | 100          | <b>212-132</b> | 100 | 50 | 82  | 80  | 77  |
|                       | 160          | <b>212-133</b> | 100 | 50 | 107 | 107 | 105 |

1 x DN 16 ISO-KF  
1 x DN 25 ISO-KF  
1 x DN 40 ISO-KF

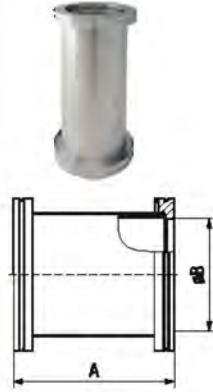


| <b>Reducer</b>        | DN ... ISO-K | Part No.       | A  |
|-----------------------|--------------|----------------|----|
| Stainless steel 303/- | 80/63        | <b>212-084</b> | 50 |
|                       | 100/63       | <b>212-161</b> | 50 |
|                       | 160/100      | <b>212-163</b> | 50 |
|                       | 200/160      | <b>212-166</b> | 50 |
|                       | 250/160      | <b>212-168</b> | 50 |
|                       | 250/200      | <b>212-170</b> | 50 |



Pipe Fittings (continued)

| <b>Intermediate Piece</b> | <b>DN ... ISO-K</b> | <b>Part No.</b> | <b>A</b> | <b>B</b> |
|---------------------------|---------------------|-----------------|----------|----------|
| Stainless steel 304/-     | 63                  | <b>212-191</b>  | 100      | 70       |
|                           | 63                  | <b>212-192</b>  | 176      | 70       |
|                           | 63                  | <b>212-193</b>  | 500      | 70       |



# ISO-K Clamp Flange Components

## Bellows/Hose With Flanges

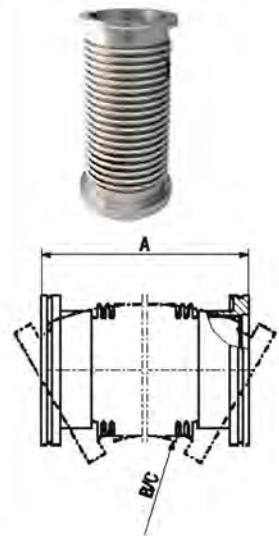
| <b>Bellows</b>                   | DN ... ISO-K | Part No.       | A   | B  | C  | D   | E    |
|----------------------------------|--------------|----------------|-----|----|----|-----|------|
| Flanges: stainless steel 304/-   | 63           | <b>212-201</b> | 132 | 20 | 20 | 66  | 30°  |
| Bellows: stainless steel 316Ti/- | 100          | <b>212-202</b> | 132 | 28 | 28 | 95  | 30°  |
|                                  | 160          | <b>212-203</b> | 150 | 22 | 22 | 153 | 14°  |
|                                  | 200          | <b>212-204</b> | 150 | 20 | 20 | 213 | 12°  |
|                                  | 250          | <b>212-205</b> | 200 | 30 | 30 | 261 | 13°  |
|                                  | 320          | <b>212-206</b> | 250 | 50 | 50 | 313 | 7.5° |

Max. internal pressure 1.5 bar  
 A = unstressed length  
 E = max. deviation from axis



| <b>Metal Hose</b>                | DN ... ISO-K | Part No.       | A    | B    | C   |
|----------------------------------|--------------|----------------|------|------|-----|
| Flanges: stainless steel 304/-   | 63           | <b>212-211</b> | 250  | 330  | 90  |
| Bellows: stainless steel 316Ti/- | 63           | <b>212-212</b> | 500  | 330  | 90  |
|                                  | 63           | <b>212-213</b> | 750  | 330  | 90  |
|                                  | 63           | <b>212-214</b> | 1000 | 330  | 90  |
|                                  | 100          | <b>212-215</b> | 250  | 530  | 130 |
|                                  | 100          | <b>212-216</b> | 500  | 530  | 130 |
|                                  | 100          | <b>212-217</b> | 750  | 530  | 130 |
|                                  | 100          | <b>212-218</b> | 1000 | 530  | 130 |
|                                  | 160          | <b>212-222</b> | 1000 | 1050 | 215 |

Max. internal pressure 1.5 bar  
 B = radius for multiple bending  
 C = radius for single bending





# ISO-K Clamp Flange Components

## Transition Pieces

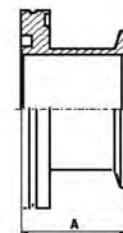
### Adaptor Flange ISO-K/ISO-F

|                       | ISO-K/ISO-F | Part No.       | A  |
|-----------------------|-------------|----------------|----|
| Stainless steel 304/- | 160/63      | <b>212-152</b> | 22 |
|                       | 160/100     | <b>212-153</b> | 25 |
|                       | 200/100     | <b>212-155</b> | 20 |
|                       | 200/160     | <b>212-156</b> | 25 |
|                       | 250/160     | <b>212-159</b> | 22 |



### Adaptor Flange ISO-K/ISO-KF

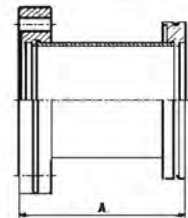
|                       | ISO-K/ISO-KF | Part No.       | A  |
|-----------------------|--------------|----------------|----|
| Aluminum 6082/-       | 63/40        | <b>212-171</b> | 40 |
|                       | 63/50        | <b>212-172</b> | 45 |
| Stainless steel 303/- | 63/25        | <b>212-176</b> | 50 |
|                       | 63/40        | <b>212-173</b> | 40 |
|                       | 63/50        | <b>212-174</b> | 45 |
|                       | 100/40       | <b>212-175</b> | 40 |



## Transition Pieces (continued)

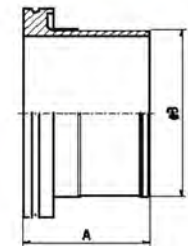
### Adaptor Flange CF/ISO-K

|                             | ISO-CF/ISO-K | Part No.       | A  | B   | C   |
|-----------------------------|--------------|----------------|----|-----|-----|
| Stainless steel 304L/1.4306 | 63/63        | <b>213-271</b> | 90 | 1   | 1   |
|                             | 100/100      | <b>213-272</b> | 90 | 1   | 1   |
|                             | 160/160      | <b>213-273</b> | 90 | 1.5 | 1.5 |



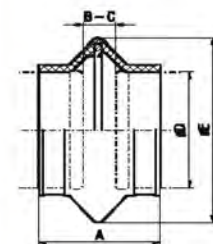
### Adaptor Flange DN/ISO-K

|                 | DN ... ISO-K | Part No.       | A  | B   |
|-----------------|--------------|----------------|----|-----|
| Aluminum 6082/- | 63           | <b>212-181</b> | 51 | 76  |
|                 | 100          | <b>212-182</b> | 56 | 107 |
|                 | 160          | <b>212-183</b> | 56 | 156 |



### Sleeve with Hose Clamp

|                                 | DN ... ISO-KF | Part No.       | A  | B  | C  | D   | E   |
|---------------------------------|---------------|----------------|----|----|----|-----|-----|
| Sleeve: elastomer CR            | 63            | <b>212-188</b> | 70 | 14 | 24 | 75  | 120 |
| Hose clamp: stainless steel 304 | 100           | <b>212-187</b> | 72 | 8  | 26 | 106 | 150 |
|                                 | 160           | <b>212-188</b> | 72 | 8  | 26 | 155 | 200 |



Max. internal pressure: 1 bar

# ISO-K Clamp Flange Components

## Protective Lids

| Protective Lid | DN ... ISO-K | Part No. | A     | B   | C    |
|----------------|--------------|----------|-------|-----|------|
| Polyethylene   | 63           | 212-311  | 102   | 95  | 18   |
|                | 100          | 212-312  | 137   | 130 | 18   |
|                | 160          | 212-313  | 187   | 180 | 18   |
|                | 200          | 212-314  | 248   | 240 | 18.5 |
|                | 250          | 212-315  | 297.5 | 290 | 18.5 |
|                | 320          | 212-316  | 380   | 370 | 23.5 |
|                | 400          | 212-317  | 461   | 450 | 23.5 |
|                | 500          | 212-318  | 557   | 550 | 24   |
|                | 630          | 212-319  | 697   | 690 | 29   |

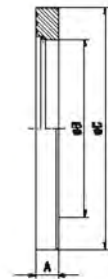


# ISO-F Fixed Flange Components

## Flange Components

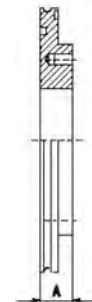
### Collar Flange with Retaining Ring

|  | DN ... ISO-F | Part No.       | A  | B     | C   |
|--|--------------|----------------|----|-------|-----|
| Flange:                                    | 63           | <b>212-061</b> | 12 | 95.5  | 130 |
| DN 63 - 160: steel nickel plated -/1.0831  | 80           | <b>212-081</b> | 12 | 110.5 | 145 |
| DN 200 - 630: steel nickel plated -/1.0037 | 100          | <b>212-062</b> | 12 | 130.5 | 165 |
|  | 160          | <b>212-063</b> | 16 | 180.7 | 225 |
| Retaining ring: steel nickel plated        | 200          | <b>212-064</b> | 16 | 240.7 | 285 |
|  | 250          | <b>212-065</b> | 16 | 290.7 | 335 |
|  | 320          | <b>212-066</b> | 20 | 370.8 | 425 |
|  | 400          | <b>212-067</b> | 20 | 450.8 | 510 |
|  | 500          | <b>212-068</b> | 20 | 550.8 | 610 |
|  | 630          | <b>212-069</b> | 24 | 691   | 750 |



### Adaptor Flange ISO-K / ISO-F

|                            | DN ... ISO-F | Part No.       | A  |
|----------------------------|--------------|----------------|----|
| Stainless steel 304/1.4301 | 160 / 63     | <b>212-152</b> | 22 |
|                            | 160 / 100    | <b>212-153</b> | 25 |
|                            | 200 / 100    | <b>212-155</b> | 20 |
|                            | 200 / 160    | <b>212-158</b> | 25 |
|                            | 250 / 160    | <b>212-159</b> | 22 |

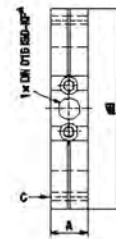




## Flange Components (continued)

### Measurement Flange

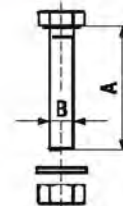
|                            | DN ... ISO-F | Part No. | A  | B   | C    |
|----------------------------|--------------|----------|----|-----|------|
| Aluminum 6082/3.2315       | 100          | 212-142  | 30 | 165 | M 8  |
|                            | 160          | 212-143  | 30 | 225 | M 10 |
| Stainless steel 304/1.4301 | 63           | 212-146  | 30 | 130 | M 8  |
|                            | 100          | 212-147  | 30 | 165 | M 8  |
|                            | 160          | 212-148  | 30 | 225 | M 10 |



\*Claw grip DN 18 ISO-KF included

### Set of Hexagon Bolts

|                   | DN ... ISO-F | Part No. | A  | B   | Set of  |
|-------------------|--------------|----------|----|-----|---------|
| Steel zinc plated | 63-100       | 212-241  | 40 | M8  | 8 pcs.  |
|                   | 160-250      | 212-242  | 50 | M10 | 12 pcs. |
|                   | 320-500      | 212-243  | 70 | M12 | 16 pcs. |
|                   | 630          | 212-244  | 80 | M12 | 20 pcs. |



### Sealing Disk

|                            | DN ... ISO-F | Part No. | A    | B   | C    |
|----------------------------|--------------|----------|------|-----|------|
| Disk: aluminum 6082/3.2315 | 63           | 212-321  | 73   | 3.9 | 98   |
| O-Ring: elastomer CR       | 100          | 212-322  | 107  | 3.9 | 132  |
|                            | 160          | 212-323  | 160  | 3.9 | 185  |
|                            | 250          | 212-325  | 270  | 3.9 | 295  |
|                            | 320          | 212-326  | 330  | 5.6 | 375  |
|                            | 400          | 212-327  | 415  | 5.6 | 460  |
|                            | 500          | 212-328  | 515  | 5.6 | 560  |
|                            | 630          | 212-329  | 656  | 5.6 | 701  |
|                            | 800          | 212-330  | 825  | 5.6 | 870  |
|                            | 1000         | 212-331  | 1025 | 5.6 | 1070 |



## Flange Components (continued)

| <b>O-ring</b> | <b>DN ... ISO-F</b> | <b>Part No.</b> | <b>A</b> | <b>B</b> | <b>Set of</b> |
|---------------|---------------------|-----------------|----------|----------|---------------|
| Elastomer CR  | 63                  | <b>212-345</b>  | 80       | 5        | 5 pcs.        |
|               | 100                 | <b>212-346</b>  | 110      | 5        | 5 pcs.        |
|               | 160                 | <b>212-347</b>  | 165      | 5        | 5 pcs.        |
|               | 250                 | <b>212-348</b>  | 265      | 5        | 5 pcs.        |
|               | 320                 | <b>212-338</b>  | 325      | 8        |               |
|               | 400                 | <b>212-339</b>  | 412      | 8        |               |
|               | 500                 | <b>212-340</b>  | 510      | 8        |               |
|               | 630                 | <b>212-341</b>  | 640      | 8        |               |
|               | 800                 | <b>212-342</b>  | 820      | 8        |               |
|               | 1000                | <b>212-343</b>  | 1023     | 8        |               |



# UHV CF Components

## Connection Elements

### Hexagonal Bolts with Nuts

|         |                            | DN ... CF | Part No. | A  | B   | Set of   | C*     |
|---------|----------------------------|-----------|----------|----|-----|----------|--------|
| Bolt:   | stainless steel 316/1.4401 | 16        | 213-401  | 20 | 3.2 | 25 x M4  | 3.5 Nm |
| Washer: | stainless steel 304/1.4301 | 40        | 213-402  | 35 | 5   | 25 x M6  | 10 Nm  |
| Nut:    | stainless steel 316/1.4401 | 63        | 213-403  | 45 | 6.5 | 25 x M8  | 20 Nm  |
|         |                            | 100       | 213-404  | 50 | 6.5 | 25 x M8  | 20 Nm  |
|         |                            | 160       | 213-405  | 55 | 6.5 | 25 x M8  | 20 Nm  |
|         |                            | 200-250   | 213-406  | 60 | 6.5 | 25 x M8  | 20 Nm  |
|         |                            | 300       | 213-408  | 70 | 8   | 34 x M10 | 30 Nm  |
|         |                            | 350       | 213-409  | 70 | 8   | 38 x M10 | 30 Nm  |

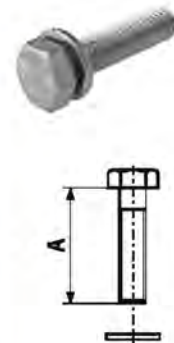
\* Tightening torque



### Hexagonal Bolts without Nuts

|         |                            | DN ... CF | Part No. | A  | Set of  | B*    |
|---------|----------------------------|-----------|----------|----|---------|-------|
| Bolt:   | stainless steel 316/1.4401 | 16        | 213-411  | 16 | 25 x M4 | 4 Nm  |
| Washer: | stainless steel 304/1.4301 | 40        | 213-412  | 25 | 25 x M6 | 10 Nm |
|         |                            | 63-160    | 213-413  | 35 | 25 x M8 | 20 Nm |

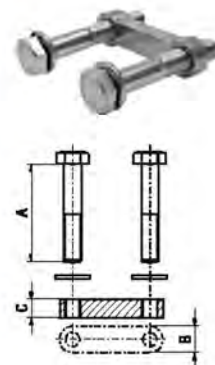
\* Tightening torque



### Hexagonal Bolts with Duo Nuts

|          |                            | DN...CF | Part No. | A  | B  | C | Duo nut    | D*    |
|----------|----------------------------|---------|----------|----|----|---|------------|-------|
| Bolt:    | stainless steel 316/1.4401 | 16      | 213-421  | 20 | 7  | 4 | 6 x M4/3   | 4 Nm  |
| Washer:  | stainless steel 304/1.4301 | 40      | 213-422  | 35 | 10 | 5 | 6 x M6/3   | 10 Nm |
| Duo nut: | stainless steel 316/1.4401 | 63      | 213-423  | 45 | 12 | 8 | 8 x M8/4   | 20 Nm |
|          |                            | 100     | 213-424  | 50 | 12 | 8 | 16 x M8/8  | 20 Nm |
|          |                            | 160     | 213-425  | 55 | 12 | 8 | 20 x M8/10 | 20 Nm |

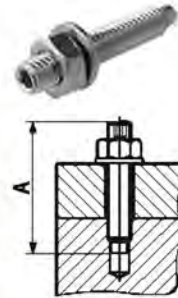
\* Tightening torque



## Connection Elements (continued)

### Set of Stud Screws

|         |                            | DN ... CF | Part No.       | A  | Set of  | B*    |
|---------|----------------------------|-----------|----------------|----|---------|-------|
| Bolt:   | stainless steel 316/1.4401 | 16        | <b>213-431</b> | 20 | 6 x M4  | 4 Nm  |
| Washer: | stainless steel 304/1.4301 | 40        | <b>213-432</b> | 35 | 6 x M6  | 10 Nm |
| Nut:    | stainless steel 316/1.4401 | 63-100    | <b>213-433</b> | 45 | 16 x M8 | 20 Nm |



\* Tightening torque

### Thread Lubricant

|      |     | Part No.       | Temperature resistance |
|------|-----|----------------|------------------------|
| C100 | 28g | <b>214-231</b> | 1000°C                 |

Remains fully effective for at least 10 bakeout cycles





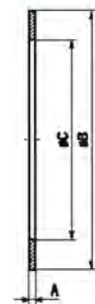
# UHV CF Components

## Seals

Quality copper gaskets and silver plated copper gaskets are strictly designed for use in high-end UHV applications. These gaskets, made of OFHC copper, are inspected, cleaned and individually packed to ensure the highest quality.

| Copper Gasket        | DN ... CF | Part No. | A   | B     | C     | Set of  |
|----------------------|-----------|----------|-----|-------|-------|---------|
| High quality         | 16        | 213-451  | 2.1 | 21.3  | 16.2  | 10 pcs. |
| Copper OFHC -/2.0040 | 40        | 213-452  | 2.1 | 48.1  | 39    | 10 pcs. |
|                      | 63        | 213-453  | 2.1 | 82.4  | 63.6  | 10 pcs. |
|                      | 100       | 213-454  | 2.1 | 120.5 | 101.8 | 10 pcs. |
|                      | 160       | 213-455  | 2.1 | 171.3 | 152.6 | 10 pcs. |
|                      | 200       | 213-456  | 2.1 | 222.1 | 203.4 | 10 pcs. |
|                      | 250       | 213-457  | 2.1 | 272.9 | 254.2 | 5 pcs.  |
|                      | 300       | 213-458  | 2.1 | 326.2 | 307   | 1 pcs.  |
|                      | 350       | 213-459  | 2.1 | 376.5 | 357   | 1 pcs.  |

Individually packed



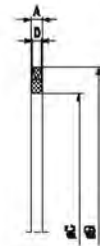
| Copper Gasket Silver Plated | DN ... CF | Part No. | A   | B     | C     | Set of  |
|-----------------------------|-----------|----------|-----|-------|-------|---------|
| High quality                | 16        | 213-461  | 2.1 | 21.3  | 16.2  | 10 pcs. |
| Copper OFHC -/2.0040        | 40        | 213-462  | 2.1 | 48.1  | 39    | 10 pcs. |
| Double silver plated        | 63        | 213-463  | 2.1 | 82.4  | 63.6  | 10 pcs. |
|                             | 100       | 213-464  | 2.1 | 120.5 | 101.8 | 10 pcs. |
|                             | 160       | 213-465  | 2.1 | 171.3 | 152.6 | 5 pcs.  |
|                             | 200       | 213-466  | 2.1 | 222.1 | 203.4 | 5 pcs.  |
|                             | 250       | 213-467  | 2.1 | 272.9 | 254.2 | 5 pcs.  |

Individually packed

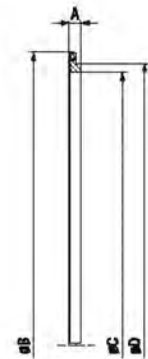


## Seals (continued)

| <b>FPM Seal</b> |     | DN ... CF      | Part No. | A     | B     | C   | D | Set of |
|-----------------|-----|----------------|----------|-------|-------|-----|---|--------|
| Elastomer FPM   | 16  | <b>213-391</b> | 2        | 21    | 16    |     |   | 5 pcs. |
|                 | 40  | <b>213-392</b> | 2.5      | 48.2  | 42    |     |   | 5 pcs. |
|                 | 63  | <b>213-393</b> | 3.2      | 82.7  | 69.7  | 2.5 |   | 2 pcs. |
|                 | 100 | <b>213-394</b> | 3.2      | 119.8 | 107.8 | 2.5 |   | 2 pcs. |
|                 | 160 | <b>213-395</b> | 3.2      | 171.1 | 156   | 2.5 |   | 2 pcs. |
|                 | 200 | <b>213-396</b> | 3.2      | 222.5 | 206   | 2.5 |   | 2 pcs. |



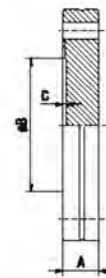
| <b>FPM Seal with Support Ring</b> |  | DN ... CF | Part No.       | A | B     | C     | D     | Set of |
|-----------------------------------|--|-----------|----------------|---|-------|-------|-------|--------|
| Seal: elastomer FPM               |  | 250       | <b>213-397</b> | 5 | 266.5 | 248.3 | 256.2 | 1 pcs. |
| Support ring: aluminum 6082/-     |  |           |                |   |       |       |       |        |



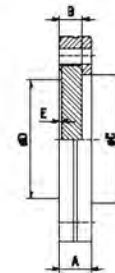
# UHV CF Components

## Flanges

| <b>Blank Flange</b>          |     | DN ... CF-F | Part No. | A   | B   | C |
|------------------------------|-----|-------------|----------|-----|-----|---|
| Stainless steel 304L/1.4306  | 16  | 213-001     | 7.5      | 14  | 1.4 |   |
|                              | 40  | 213-002     | 13       | 38  | 1.4 |   |
|                              | 63  | 213-003     | 17.5     | 66  | 1.4 |   |
|                              | 100 | 213-004     | 20       | 104 | 1.4 |   |
|                              | 160 | 213-005     | 22       | 155 | 1.4 |   |
|                              | 200 | 213-006     | 24.5     | 205 | 1.4 |   |
|                              | 250 | 213-007     | 24.5     | 256 | 1.4 |   |
| Stainless steel 316LN/1.4429 | 16  | 213-101     | 7.5      | 14  | 1.4 |   |
|                              | 40  | 213-102     | 13       | 38  | 1.4 |   |
|                              | 63  | 213-103     | 17.5     | 66  | 1.4 |   |
|                              | 100 | 213-104     | 20       | 104 | 1.4 |   |
|                              | 160 | 213-105     | 22       | 155 | 1.4 |   |
|                              | 200 | 213-106     | 24.5     | 205 | 1.4 |   |
|                              | 250 | 213-107     | 24.5     | 256 | 1.4 |   |

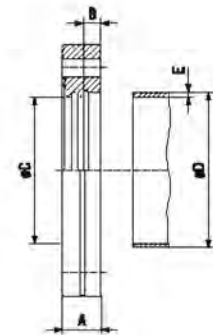


| <b>Blank Flange, Rotatable</b>      |     | DN ... CF-R | Part No. | A    | B    | C   | D   | E |
|-------------------------------------|-----|-------------|----------|------|------|-----|-----|---|
| Stainless steel 304L/1.4306         | 16  | 213-011     | 7.5      | 5.8  | 18.6 | 14  | 1.4 |   |
|                                     | 40  | 213-012     | 13       | 7.6  | 41   | 38  | 1.4 |   |
|                                     | 63  | 213-013     | 17.5     | 12.6 | 71   | 66  | 1.4 |   |
|                                     | 100 | 213-014     | 20       | 14.3 | 109  | 104 | 1.4 |   |
|                                     | 160 | 213-015     | 22       | 15.8 | 160  | 155 | 1.4 |   |
|                                     | 200 | 213-016     | 24.5     | 17.1 | 206  | 205 | 1.4 |   |
|                                     | 250 | 213-017     | 24.5     | 18   | 257  | 256 | 1.4 |   |
| Plate: Stainless steel 316LN/1.4429 | 16  | 213-111     | 7.5      | 5.8  | 18.6 | 14  | 1.4 |   |
| External ring: 304L/1.4306          | 40  | 213-112     | 13       | 7.6  | 41   | 38  | 1.4 |   |
|                                     | 63  | 213-113     | 17.5     | 12.6 | 71   | 66  | 1.4 |   |
|                                     | 100 | 213-114     | 20       | 14.3 | 109  | 104 | 1.4 |   |
|                                     | 160 | 213-115     | 22       | 15.8 | 160  | 155 | 1.4 |   |
|                                     | 200 | 213-116     | 24.5     | 17.1 | 206  | 205 | 1.4 |   |
|                                     | 250 | 213-117     | 24.5     | 18   | 257  | 256 | 1.4 |   |

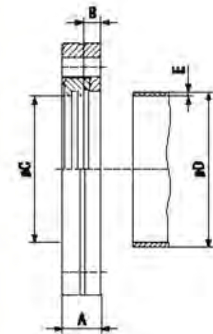


## Flanges (continued)

| <b>Welding Flange</b>        |     | DN ... CF-F    | Part No. | A    | B    | C   | D   | E |
|------------------------------|-----|----------------|----------|------|------|-----|-----|---|
| Stainless steel 304L/1.4306  | 16  | <b>213-021</b> | 7.5      | 3.3  | 17.2 | 18  | 1   |   |
|                              | 40  | <b>213-022</b> | 13       | 7.5  | 39.5 | 40  | 1.5 |   |
|                              | 63  | <b>213-023</b> | 17.5     | 8    | 66   | 70  | 2   |   |
|                              | 100 | <b>213-024</b> | 20       | 9    | 104  | 108 | 2   |   |
|                              | 160 | <b>213-025</b> | 22       | 10   | 155  | 159 | 2   |   |
|                              | 200 | <b>213-026</b> | 24.5     | 12   | 205  | 205 | 2.5 |   |
|                              | 250 | <b>213-027</b> | 24.5     | 12   | 256  | 256 | 3   |   |
| Stainless steel 316L/1.4435  | 300 | <b>213-028</b> | 28.5     | 15.8 | 308  | 308 | 3   |   |
|                              | 350 | <b>213-029</b> | 28.5     | 15.8 | 356  | 356 | 3   |   |
| Stainless steel 316LN/1.4429 | 16  | <b>213-121</b> | 7.5      | 3.3  | 17.2 | 18  | 1   |   |
|                              | 40  | <b>213-122</b> | 13       | 7.5  | 39.5 | 40  | 1.5 |   |
|                              | 63  | <b>213-123</b> | 17.5     | 8    | 66   | 70  | 2   |   |
|                              | 100 | <b>213-124</b> | 20       | 9    | 104  | 108 | 2   |   |
|                              | 160 | <b>213-125</b> | 22       | 10   | 155  | 159 | 2   |   |
|                              | 200 | <b>213-126</b> | 24.5     | 12   | 205  | 205 | 2.5 |   |
|                              | 250 | <b>213-127</b> | 24.5     | 12   | 256  | 256 | 3   |   |



| <b>Welding Flange, Rotatable</b>            |     | DN ... CF-R    | Part No. | A   | B    | C   | D   | E |
|---|-----|----------------|----------|-----|------|-----|-----|---|
| Stainless steel 304L/1.4306                 | 16  | <b>213-041</b> | 7.5      | 3.3 | 17.2 | 18  | 1   |   |
|   | 40  | <b>213-042</b> | 13       | 7.5 | 39.5 | 40  | 1.5 |   |
|   | 63  | <b>213-043</b> | 17.5     | 8   | 66   | 70  | 2   |   |
|   | 100 | <b>213-044</b> | 20       | 9   | 104  | 108 | 2   |   |
|   | 160 | <b>213-045</b> | 22       | 10  | 155  | 159 | 2   |   |
|   | 200 | <b>213-046</b> | 24.5     | 12  | 205  | 205 | 2.5 |   |
|   | 250 | <b>213-047</b> | 24.5     | 12  | 256  | 256 | 3   |   |
| Internal ring: Stainless steel 316LN/1.4429 | 16  | <b>213-141</b> | 7.5      | 3.3 | 17.2 | 18  | 1   |   |
| External ring: 304L/1.4306                  | 40  | <b>213-142</b> | 13       | 7.5 | 39.5 | 40  | 1.5 |   |
|   | 63  | <b>213-143</b> | 17.5     | 8   | 66   | 70  | 2   |   |
|   | 100 | <b>213-144</b> | 20       | 9   | 104  | 108 | 2   |   |
|   | 160 | <b>213-145</b> | 22       | 10  | 155  | 159 | 2   |   |
|   | 200 | <b>213-146</b> | 24.5     | 12  | 205  | 205 | 2.5 |   |
|   | 250 | <b>213-147</b> | 24.5     | 12  | 256  | 256 | 3   |   |

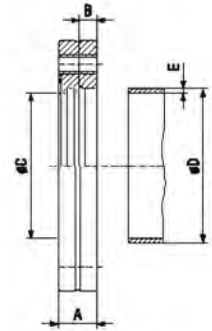




## Flanges (continued)

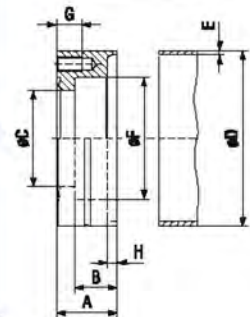
### Welding Flange with Tapped Holes

|                             | DN ... CF-F | Part No. | A    | B   | C    | D   | E   |        |
|-----------------------------|-------------|----------|------|-----|------|-----|-----|--------|
| Stainless steel 304L/1.4306 | 16          | 213-031  | 7.5  | 3.3 | 17.2 | 18  | 1   | 6xM4   |
|                             | 40          | 213-032  | 13   | 7.5 | 39.5 | 40  | 1.5 | 6xM6   |
|                             | 63          | 213-033  | 17.5 | 8   | 66   | 70  | 2   | 8xM8   |
|                             | 100         | 213-034  | 20   | 9   | 104  | 108 | 2   | 16x M8 |



### Welding Flange for Gauges

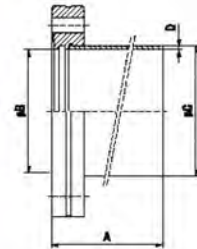
|                             | DN ... CF-F | Part No. | A  | B  | C  | D    | E    | F  | G  | F    |
|-----------------------------|-------------|----------|----|----|----|------|------|----|----|------|
| Stainless steel 304L/1.4306 | 40          | 213-092  | 24 | 17 | 38 | 69.5 | 1.75 | 48 | 10 | 6xM6 |



## Flanges (continued)

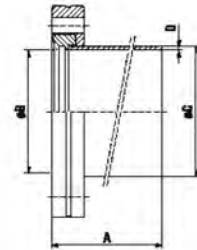
### Flange with Tube

|                             | DN ... CF-F | Part No.       | A   | B    | C   | D   |
|-----------------------------|-------------|----------------|-----|------|-----|-----|
| Stainless steel 304L/1.4306 | 16          | <b>213-051</b> | 38  | 17.2 | 18  | 1   |
|                             | 40          | <b>213-052</b> | 63  | 39.5 | 40  | 1.6 |
|                             | 63          | <b>213-053</b> | 105 | 66   | 70  | 2   |
|                             | 100         | <b>213-054</b> | 135 | 104  | 108 | 2   |
|                             | 160         | <b>213-055</b> | 167 | 155  | 159 | 2   |



### Flange with Tube, Rotatable

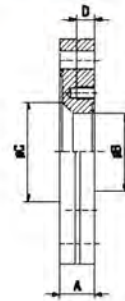
|                             | DN ... CF-R | Part No.       | A   | B    | C   | D   |
|-----------------------------|-------------|----------------|-----|------|-----|-----|
| Stainless steel 304L/1.4306 | 16          | <b>213-061</b> | 38  | 17.2 | 18  | 1   |
|                             | 40          | <b>213-062</b> | 63  | 39.5 | 40  | 1.6 |
|                             | 63          | <b>213-063</b> | 105 | 66   | 70  | 2   |
|                             | 100         | <b>213-064</b> | 135 | 104  | 108 | 2   |
|                             | 160         | <b>213-065</b> | 167 | 155  | 159 | 2   |



## Flanges (continued)

### Reducing Flange CF-F/CF-F

|                              | DN ... CF-F | Part No. | A    | B   | C   | D   |       |
|------------------------------|-------------|----------|------|-----|-----|-----|-------|
| Stainless steel 304L/1.4306  | 40/16       | 213-071  | 13   | 16  | 22  | 5.5 | 6xM4  |
|                              | 63/40       | 213-073  | 17.5 | 39  | 50  | 9   | 6xM6  |
|                              | 100/40      | 213-075  | 20   | 39  | 55  | 9   | 6xM6  |
|                              | 100/63      | 213-076  | 20   | 66  | 85  | 11  | 8xM8  |
|                              | 160/40      | 213-078  | 22   | 39  | 60  | 9   | 6xM6  |
|                              | 160/63      | 213-079  | 24   | 66  | 85  | 13  | 8xM8  |
|                              | 160/100     | 213-080  | 22   | 104 | 120 | 11  | 16xM8 |
| Stainless steel 316LN/1.4429 | 40/16       | 213-171  | 13   | 16  | 22  | 5.5 | 6xM4  |
|                              | 63/40       | 213-173  | 17.5 | 39  | 50  | 9   | 6xM6  |
|                              | 100/40      | 213-175  | 20   | 39  | 55  | 9   | 6xM6  |
|                              | 100/63      | 213-176  | 20   | 66  | 85  | 11  | 8xM8  |
|                              | 160/40      | 213-178  | 22   | 39  | 60  | 9   | 6xM6  |
|                              | 160/63      | 213-179  | 24   | 66  | 85  | 13  | 8xM8  |
|                              | 160/100     | 213-180  | 22   | 104 | 120 | 11  | 16xM8 |

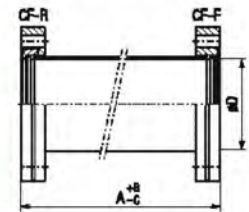


# UHV CF Components

## Pipe Fittings

### Intermediate Piece

|                             | DN ... CF | Part No. | A   | B   | C   | D   |
|-----------------------------|-----------|----------|-----|-----|-----|-----|
| Stainless steel 304L/1.4306 | 16        | 213-201  | 76  | 0.5 | 0.5 | 16  |
|                             | 40        | 213-202  | 126 | 1   | 1   | 37  |
|                             | 63        | 213-203  | 210 | 1   | 1   | 66  |
|                             | 100       | 213-204  | 270 | 1   | 1   | 104 |
|                             | 160       | 213-205  | 334 | 1.5 | 1.5 | 155 |



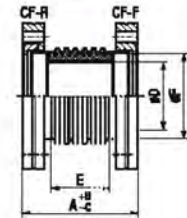
### Intermediate Piece, Insulated

|   | DN ... CF | Part No. | A  | B | C | D  | E  | F    | G  |
|---|-----------|----------|----|---|---|----|----|------|----|
| Flanges: stainless steel 304L/1.4306              | 40        | 213-212  | 70 | 1 | 1 | 25 | 30 | 34.5 | 44 |
| Insulator: ceramic Al <sub>2</sub> O <sub>3</sub> | 63        | 213-213  | 90 | 1 | 1 | 53 | 45 | 66   | 65 |

Transition insulator/flange: FeNi

Bakeout temperature: 350°C

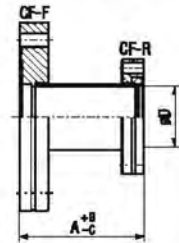
G = Surface leakage 20 kV at 10<sup>-4</sup> mbar



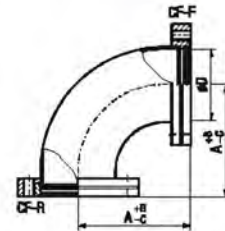


## Pipe Fittings (continued)

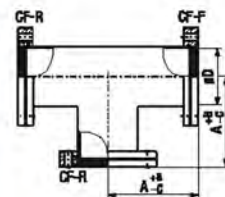
| <b>Reducer CF-F/CF-R</b>    |         | DN ... CF      | Part No. | A   | B   | C   | D |
|-----------------------------|---------|----------------|----------|-----|-----|-----|---|
| Stainless steel 304L/1.4306 | 40/16   | <b>213-221</b> | 45       | 1   | 1   | 16  |   |
|                             | 63/40   | <b>213-223</b> | 75       | 1   | 1   | 37  |   |
|                             | 100/40  | <b>213-225</b> | 75       | 1   | 1   | 37  |   |
|                             | 100/63  | <b>213-226</b> | 95       | 1   | 1   | 66  |   |
|                             | 160/100 | <b>213-230</b> | 105      | 1.5 | 1.5 | 104 |   |



| <b>Elbow 90°</b>            |     | DN ... CF      | Part No. | A   | B   | C   | D |
|-----------------------------|-----|----------------|----------|-----|-----|-----|---|
| Stainless steel 304L/1.4306 | 16  | <b>213-301</b> | 38       | 0.5 | 0.5 | 15  |   |
|                             | 40  | <b>213-302</b> | 63       | 0.5 | 0.5 | 38  |   |
|                             | 63  | <b>213-303</b> | 105      | 1   | 1   | 66  |   |
|                             | 100 | <b>213-304</b> | 135      | 1   | 1   | 100 |   |
|                             | 160 | <b>213-305</b> | 167      | 1.5 | 1.5 | 150 |   |

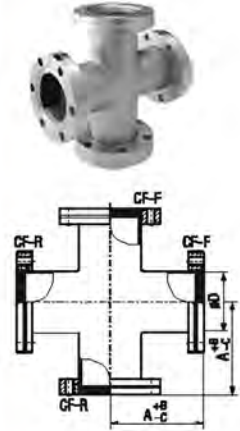


| <b>TEE</b>                  |     | DN ... CF      | Part No. | A   | B   | C   | D |
|-----------------------------|-----|----------------|----------|-----|-----|-----|---|
| Stainless steel 304L/1.4306 | 16  | <b>213-311</b> | 38       | 0.5 | 0.5 | 15  |   |
|                             | 40  | <b>213-312</b> | 63       | 0.5 | 0.5 | 38  |   |
|                             | 63  | <b>213-313</b> | 105      | 1   | 1   | 66  |   |
|                             | 100 | <b>213-314</b> | 135      | 1   | 1   | 100 |   |
|                             | 160 | <b>213-315</b> | 167      | 1.5 | 1.5 | 150 |   |



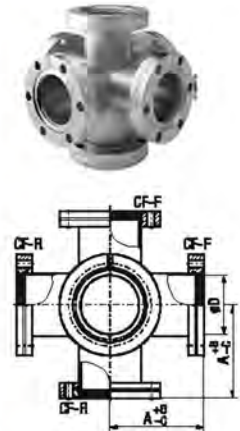
## Pipe Fittings (continued)

| <b>Cross</b>                | DN ... CF | Part No. | A   | B   | C   | D   |
|-----------------------------|-----------|----------|-----|-----|-----|-----|
| Stainless steel 304L/1.4306 | 16        | 213-321  | 38  | 0.5 | 0.5 | 15  |
|                             | 40        | 213-322  | 63  | 0.5 | 0.5 | 38  |
|                             | 63        | 213-323  | 105 | 1   | 1   | 66  |
|                             | 100       | 213-324  | 135 | 1   | 1   | 100 |
|                             | 160       | 213-325  | 167 | 1.5 | 1.5 | 150 |



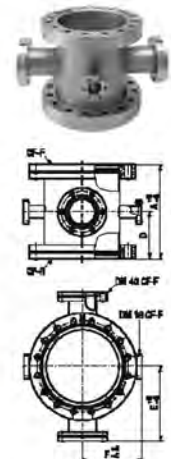
| <b>Double Cross Piece</b>   | DN ... CF | Part No. | A   | B   | C   | D   |
|-----------------------------|-----------|----------|-----|-----|-----|-----|
| Stainless steel 304L/1.4306 | 40        | 213-332  | 63  | 0.5 | 0.5 | 38  |
|                             | 63        | 213-333  | 105 | 1   | 1   | 66  |
|                             | 100       | 213-334  | 135 | 1   | 1   | 100 |
|                             | 160       | 213-335  | 167 | 1.5 | 1.5 | 150 |

3 × rotatable flanges  
3 × fix flanges



| <b>Reducing Cross</b>       | DN ... CF | Part No. | A   | B | C | D    | E   | F  |
|-----------------------------|-----------|----------|-----|---|---|------|-----|----|
| Stainless steel 304L/1.4306 | 100       | 213-342  | 135 | 1 | 1 | 67.5 | 106 | 84 |

2 × DN 16 CF-F  
2 × DN 40 CF-F



# UHV CF Components

## Bellows/Hose With Flanges, Compensator

### Compensator

|                                       | DN...CF | Part No.       | A   | B  | C | D    | E   | F  | G   |
|---------------------------------------|---------|----------------|-----|----|---|------|-----|----|-----|
| Flanges: stainless steel 304L/1.4306  | 40      | <b>213-348</b> | 120 | 10 | 0 | 36.8 | 100 | 10 | 10° |
| Bellows: stainless steel 316Ti/1.4571 | 63      | <b>213-347</b> | 130 | 20 | 0 | 62   | 154 | 13 | 12° |
|                                       | 100     | <b>213-348</b> | 127 | 30 | 0 | 92   | 192 | 13 | 12° |

Max. internal pressure for DN 40: 4 bar  
 Max. internal pressure for DN 63/100: 1.5 bar



### Bellows

|                                       | DN...CF | Part No.       | A   | B   | C   | D   | E   | F    | G    |
|---------------------------------------|---------|----------------|-----|-----|-----|-----|-----|------|------|
| Flanges: stainless steel 304L/1.4306  | 16      | <b>213-351</b> | 76  | 1.5 | 1.5 | 15  | 22  | 16   | 21°  |
| Bellows: stainless steel 316Ti/1.4571 | 40      | <b>213-352</b> | 126 | 2   | 2   | 40  | 55  | 36.8 | 7.5° |
|                                       | 63      | <b>213-353</b> | 139 | 2   | 2   | 62  | 80  | 66   | 37°  |
|                                       | 100     | <b>213-354</b> | 142 | 2   | 2   | 92  | 116 | 102  | 28°  |
|                                       | 160     | <b>213-355</b> | 250 | 3   | 3   | 154 | 187 | 153  | 16°  |

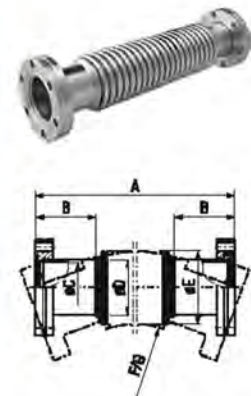
A = unstressed length  
 Max. internal pressure for DN 40: 4 bar  
 Max. internal pressure for DN 63 ... 100: 1.5 bar



### Flexible Metal Hose

|                                       | DN...CF | Part No.       | A    | B  | C    | D    | E    | F   | G   |
|---------------------------------------|---------|----------------|------|----|------|------|------|-----|-----|
| Flanges: stainless steel 304L/1.4306  | 16      | <b>213-361</b> | 250  | 23 | 16   | 15   | 22.5 | 70  | 50  |
| Bellows: stainless steel 316Ti/1.4571 | 16      | <b>213-362</b> | 500  | 23 | 18   | 15   | 22.5 | 70  | 50  |
|                                       | 16      | <b>213-363</b> | 750  | 23 | 16   | 15   | 22.5 | 70  | 50  |
|                                       | 16      | <b>213-364</b> | 1000 | 23 | 16   | 15   | 22.5 | 70  | 50  |
|                                       | 40      | <b>213-365</b> | 250  | 46 | 36.8 | 40.5 | 53   | 130 | 100 |
|                                       | 40      | <b>213-368</b> | 500  | 46 | 36.8 | 40.5 | 53   | 130 | 100 |
|                                       | 40      | <b>213-367</b> | 750  | 46 | 36.8 | 40.5 | 53   | 130 | 100 |
|                                       | 40      | <b>213-368</b> | 1000 | 46 | 36.8 | 40.5 | 53   | 130 | 100 |

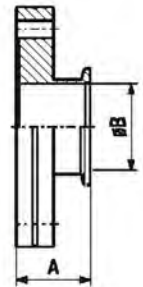
F = radius for multiple bending  
 G = radius for single bending  
 Max. internal pressure: 5 bar



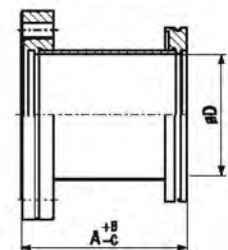
# UHV CF Components

## Transition Pieces

| <b>Adaptor CF-F/ISO-KF</b>  |  | DN...CF-F/ISO-KF | Part No.       | A  | B  |
|-----------------------------|--|------------------|----------------|----|----|
| Stainless steel 304L/1.4306 |  | 16/16            | <b>213-251</b> | 35 | 16 |
|                             |  | 16/25            | <b>213-252</b> | 35 | 16 |
|                             |  | 40/16            | <b>213-254</b> | 30 | 16 |
|                             |  | 40/25            | <b>213-255</b> | 30 | 28 |
|                             |  | 40/40            | <b>213-258</b> | 50 | 37 |
|                             |  | 63/40            | <b>213-259</b> | 35 | 41 |
|                             |  | 100/40           | <b>213-262</b> | 50 | 41 |



| <b>Adaptor CF-F/ISO-K</b>   |  | DN ... CF-F/ISO-K | Part No.       | A  | B   | C   | D   |
|-----------------------------|--|-------------------|----------------|----|-----|-----|-----|
| Stainless steel 304L/1.4306 |  | 63/63             | <b>213-271</b> | 90 | 1   | 1   | 66  |
|                             |  | 100/100           | <b>213-272</b> | 90 | 1   | 1   | 104 |
|                             |  | 160/160           | <b>213-273</b> | 90 | 1.5 | 1.5 | 155 |





# UHV CF Components

## Protective Lids

| Protective Lids | DN ... CF | Part No. | A     | B     | C    |
|-----------------|-----------|----------|-------|-------|------|
| Polyethylene    | 16        | 213-441  | 36    | 34    | 9.5  |
|                 | 40        | 213-442  | 71.5  | 69.5  | 17.5 |
|                 | 63        | 213-443  | 115.5 | 113.5 | 22   |
|                 | 100       | 213-444  | 154   | 152   | 24.5 |
|                 | 160       | 213-445  | 205   | 202.5 | 27   |
|                 | 200       | 213-446  | 262   | 253   | 26.5 |
|                 | 250       | 213-447  | 308.5 | 303.5 | 30.9 |

