# MFD / MFU

## Préhenseurs intérieurs série MFD/MFU

- Nouvelle idée de préhenseur novateur.
- Mouvement vers le bas (MFD), ou vers le haut (MFU).
- La partie élastique peut être en Silicone ou EPDM.
- Diamètre de prise de 8 à 85 mm.
- Cônes de centrage en option.
- Capteurs magnétiques en option.
- Divers accessoires disponibles pour la fixation.

## *ID expansion grippers series MFD/MFU*

- *New concept for innovative air hands.*
- *Downward movement (MFD), or upward movement (MFU).*
- *The elastic part can be in Silicone or EPDM.*
- *Grip diameters from 8 to 85 mm.*
- *Optional nose cones for centering.*
- *Optional proximity magnetic sensors.*
- *Several mounting accessories.*







| M | F | D | 1 | 6 | E | 0 | 2 | C | L |
|---|---|---|---|---|---|---|---|---|---|

### Actuation direction

***Actuation direction***

D - Vers le bas
*D - Downward*
U - Vers le haut
U - *Upward*

### Diamètre nominal

***Base diameter***

08 - 10 - 12 - 14 - 16 - 18 - 20 - 22
27 - 33 - 41 - 47 - 51 - 63

### Alimentation

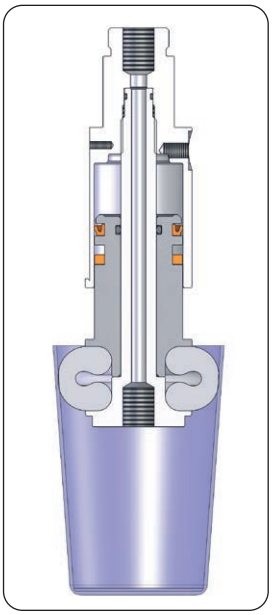
***Air feeding***

C - Avec raccord coaxial
*C - With coaxial air fitting*
H - Avec raccord latéral et trou de passage
*H - With side air fitting and through hole*

### Partie élastique

***Elastic part***

S01 en silicone blanc
*S01 in white Silicone*
E02 en EPDM noir
*E02 in black EPDM*



### Orifice de passage

Les modèles ...HL sont munis d'un orifice de passage permettant d'introduire de l'air comprimé ou de créer le vide pour refroidir des composants ou contrôler leur étanchéité.

### *Through hole*

*The ...HL models have a central through hole. It can be used to blow compressed air, or to provide vacuum, with the purpose to cool a part, or to check the sealing.*

## Silicone ou EPDM?

La partie élastique peut être en silicone blanc ou EPDM noir.
Le Silicone peut être utilisé sur une gamme de températures plus importante et garantit une plus longue durée, mais il ne convient pas à certains secteurs commerciaux, car peindre ou revêtir les parties qu'il touche est difficile.
Au contraire l'EPDM ne laisse pas de signes et assure aussi un plus grand coefficient de frottement.
La partie élastique en Silicone ou EPDM est fournie comme rechange et peut être substituée, quand elle sera usée.
La vie moyenne de la partie élastique en EPDM est à peu près de 0.5 millions de cycles.
La vie moyenne de la partie élastique en Silicone est à peu près de 1 million de cycles.

## *Silicone or EPDM?*

*The elastic part can be in white silicone or black EPDM.*
*Silicone can be used over a wider temperature range and assures a longer life time, but it is not suitable in some industries, because it makes it difficult to paint or to coat the parts that are touched.*
*EPDM is mark-free and provides a higher coefficient of friction.*
*The elastic part in Silicone or EPDM is available as a spare part and can be replaced, when worn out.*
*The expected medium life time of the elastic part in EPDM is about 0.5 million cycles.*
*The expected medium life time of the elastic part in Silicone is about 1 million cycles.*

Pièce de rechange pour la partie élastique
*Spare elastic part*

| | T | MFD / MFU | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ø8 | Ø10 | Ø12 | Ø14 | Ø16 | Ø18 | Ø20 | Ø22 | Ø27 | Ø33 | Ø41 | Ø47 | Ø51 | Ø63 |
|  Silicone Silicone | -70°C +200°C | IF08S01 | IF10S01 | IF12S01U | IF14S01U | IF16S01U | IF18S01 | IF20S01 | IF22S01 | IF27S01 | IF33S01 | IF41S01 | IF47S01 | IF51S01 | IF63S01 |
|  EPDM | -50°C +140°C | IF08E02 | IF10E02 | IF12E02U | IF14E02U | IF16E02U | IF18E02 | IF20E02 | IF22E02 | IF27E02 | IF33E02 | IF41E02 | IF47E02 | IF51E02 | IF63E02 |

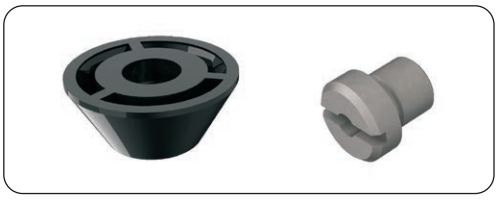
T - Température de fonctionnement de la partie élastique (5÷60°C pour le corps de la pince)
*T - Operating temperature of the elastic part (5÷60 °C for the gripper body)*

## Cônes de centrage

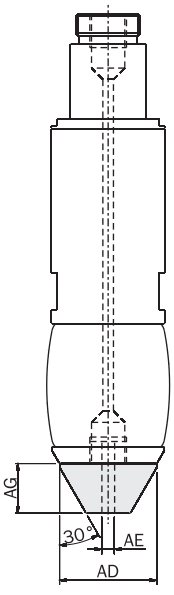
Des cônes de centrage en Nylon avec vis en inox sont disponibles en option.
Pour les tailles supérieures à 33, ils sont aussi dotés d'un trou de passage.

## *Centering cones*

*Centering cones in nylon with the stainless screw, are available as an option.*
*For the sizes larger than 33, they are also provided with a through hole.*



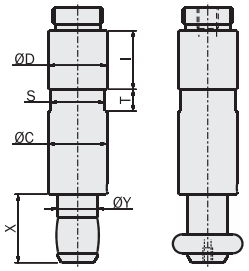
MFD / MFU



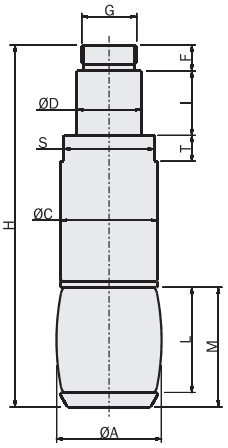

| | MFC10 | MFC12 | MFC14 | MFC18 | MFC22 | MFC27 | MFC33 | MFC41 | MFC51 | MFC63 |
|---|---|---|---|---|---|---|---|---|---|---|
| Poids *Weight* | 0.5 g | 1 g | 1 g | 1.5 g | 2 g | 5 g | 7 g | 12 g | 21 g | 30 g |
| ØAD [mm] | 7.8 | 10 | 11.8 | 15.5 | 18.8 | 21.3 | 28 | 37 | 47 | 56 |
| ØAE [mm] | - | - | - | - | - | - | 4 | 4 | 4 | 4 |
| ØAG [mm] | 2.9 | 3.5 | 4.5 | 6.5 | 8 | 9.5 | 12 | 19 | 26 | 30 |
| MFD MFU | Ø10 | Ø12 | Ø14 Ø16 | Ø18 Ø20 | Ø22 | Ø27 | Ø33 | Ø41 Ø47 | Ø51 | Ø63 |

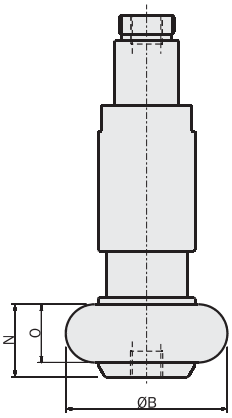
# MFD

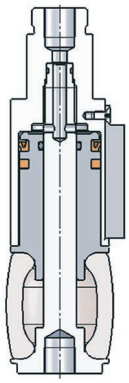
## Dimensions (mm)
***Dimensions (mm)***



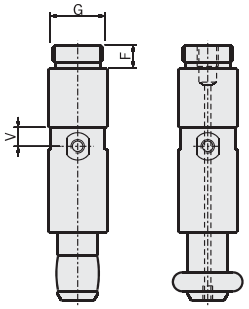

**MFD 08/10/12**



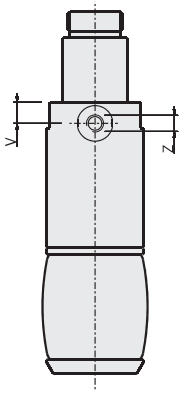



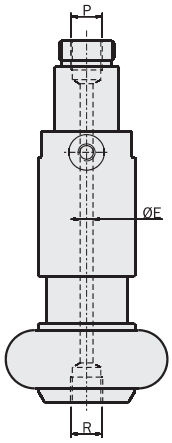



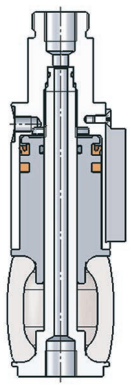
**MFD...E02CL**
**MFD...S01CL**




**MFD 08/10/12**



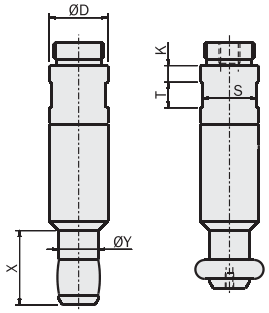



**MFD...E02HL**
**MFD...S01HL**

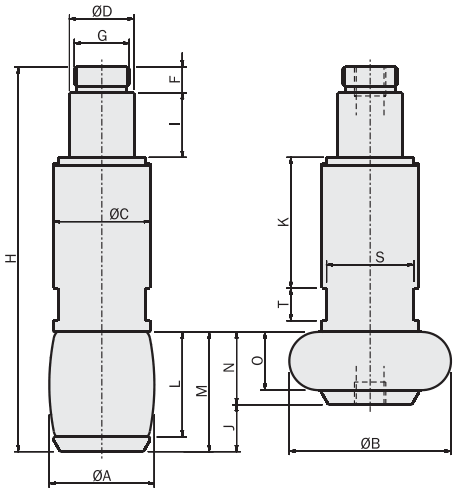
| | m | ØA | ØB | ØC | ØD | ØE | F | G | H | I | L | M | N | O | P | R | S | T | V | Z | X | ØY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MFD08...CL<br>MFD08...HL | 15g | 8 | 11 | 14 | 14 | -<br>1.5 | 5.5 | M12x1 | 59.2 | 14 | 7 | 9.2 | 5.7 | 3.5 | M5 | M2 | 13 | 6 | -<br>4.5 | -<br>M3 | 14.7 | 7.6 |
| MFD10...CL<br>MFD10...HL | 16g | 10.5 | 13.5 | 14 | 14 | -<br>1.5 | 5.5 | M12x1 | 60.7 | 14 | 8.5 | 10.7 | 6.7 | 4.5 | M5 | M2 | 13 | 6 | -<br>4.5 | -<br>M3 | 16.2 | 9.5 |
| MFD12...CL<br>MFD12...HL | 17g | 13 | 17 | 14 | 14 | -<br>2 | 5.5 | M12x1 | 62 | 14 | 10.5 | 13 | 7.5 | 5 | M5 | M3 | 13 | 6 | -<br>4.5 | -<br>M3 | 16.8 | 11.8 |
| MFD14...CL<br>MFD14...HL | 17g | 15 | 19.5 | 14 | 14 | -<br>2 | 5.5 | M12x1 | 62.3 | 14 | 13 | 15.8 | 8.8 | 6 | M5 | M3 | 13 | 6 | -<br>4.5 | -<br>M3 | - | - |
| MFD16...CL<br>MFD16...HL | 17g | 18 | 21.5 | 14 | 14 | -<br>2 | 5.5 | M12x1 | 62.3 | 14 | 13 | 15.8 | 8.8 | 6 | M5 | M3 | 13 | 6 | -<br>4.5 | -<br>M3 | - | - |
| MFD18...CL<br>MFD18...HL | 28g | 19.5 | 24.5 | 18 | 14 | -<br>2.5 | 5.5 | M12x1 | 70.5 | 14 | 16.5 | 19.5 | 12 | 9 | M5 | M3 | 16 | 6 | -<br>5.3 | -<br>M5 | - | - |
| MFD20...CL<br>MFD20...HL | 28g | 22.5 | 26.5 | 18 | 14 | -<br>2.5 | 5.5 | M12x1 | 70.5 | 14 | 16.5 | 19.5 | 12 | 9 | M5 | M3 | 16 | 6 | -<br>5.3 | -<br>M5 | - | - |
| MFD22...CL<br>MFD22...HL | 43g | 24 | 31.5 | 21.5 | 14 | -<br>2.5 | 5.5 | M12x1 | 80 | 14 | 21 | 24.2 | 12.2 | 11 | M5 | M3 | 19 | 7 | -<br>5.5 | -<br>M5 | - | - |
| MFD27...CL<br>MFD27...HL | 79g | 28 | 36 | 25 | 20 | -<br>3 | 8 | M17x1 | 98 | 20 | 26 | 30 | 18 | 14 | G1/8 | M5 | 22 | 8 | -<br>7 | -<br>M5 | - | - |
| MFD33...CL<br>MFD33...HL | 118g | 34 | 44 | 30 | 20 | -<br>4 | 8 | M17x1 | 112 | 20 | 32.5 | 37 | 22.5 | 18 | G1/8 | G1/8 | 28 | 8 | -<br>6.5 | -<br>M5 | - | - |
| MFD41...CL<br>MFD41...HL | 280g | 42 | 54 | 40 | 30 | -<br>4.3 | 11 | M27x1 | 142.5 | 30 | 39.5 | 45 | 29.5 | 24 | G1/8 | G1/8 | 36 | 11 | -<br>7.5 | -<br>M5 | - | - |
| MFD47...CL<br>MFD47...HL | 280g | 50 | 58 | 40 | 30 | -<br>4.3 | 11 | M27x1 | 142.5 | 30 | 39.5 | 45 | 29.5 | 24 | G1/8 | G1/8 | 36 | 11 | -<br>7.5 | -<br>M5 | - | - |
| MFD51...CL<br>MFD51...HL | 490g | 54 | 68 | 50 | 30 | -<br>5.5 | 11 | M27x1 | 168 | 30 | 48 | 55 | 37 | 30 | G1/8 | G1/8 | 45 | 13 | -<br>10.5 | -<br>G1/8 | - | - |
| MFD63...CL<br>MFD63...HL | 800g | 66 | 84 | 60 | 30 | -<br>6 | 11 | M27x1 | 198 | 30 | 61 | 70 | 45 | 36 | G1/8 | G1/8 | 54 | 16 | -<br>14 | -<br>G1/8 | - | - |

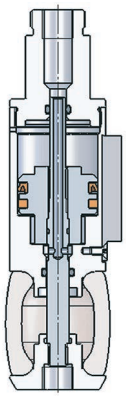
m [Poids]
*[Weight]*

## Dimensions (mm)
*Dimensions (mm)*

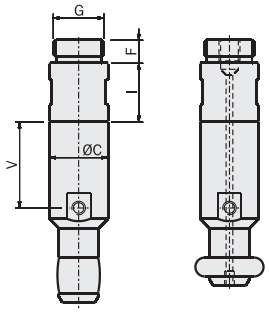



**MFU 08/10/12**

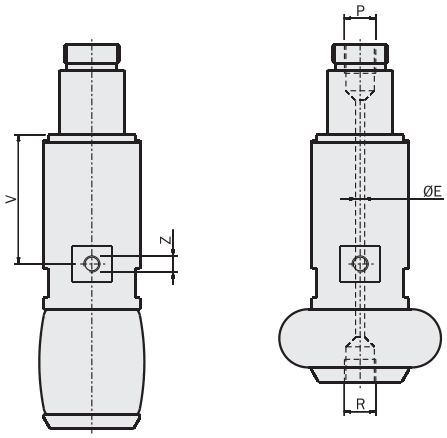


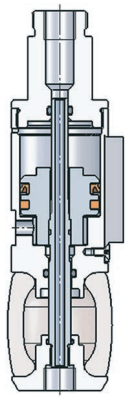



**MFU...E02CL**
**MFU...S01CL**




**MFU 08/10/12**



**MFU...E02HL**
**MFU...S01HL**

| | m | ØA | ØB | ØC | ØD | ØE | F | G | H | I | J | K | L | M | N | O | P | R | S | T | V | Z | X | ØY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MFU08...CL<br>MFU08...HL | 16g | 8 | 11 | 14 | 14 | -<br>1.1 | 5.5 | M12x1 | 61.5 | 14 | 3.5 | 4 | 7 | 9.2 | 5.7 | 3.5 | M5 | M2 | 13 | 6 | -<br>20 | -<br>M3 | 16.3 | 7.6 |
| MFU10...CL<br>MFU10...HL | 17g | 10.5 | 13.5 | 14 | 14 | -<br>1.1 | 5.5 | M12x1 | 62.5 | 14 | 4 | 4 | 8.5 | 10.7 | 6.7 | 4.5 | M5 | M2 | 13 | 6 | -<br>20.5 | -<br>M3 | 17.7 | 9.5 |
| MFU12...CL<br>MFU12...HL | 18g | 13 | 17 | 14 | 14 | -<br>1.3 | 5.5 | M12x1 | 65 | 14 | 5.5 | 4 | 10.5 | 13 | 7.5 | 5 | M5 | M3 | 13 | 6 | -<br>21.5 | -<br>M3 | 20 | 11.8 |
| MFU14...CL<br>MFU14...HL | 20g | 15 | 19.5 | 14 | 14 | -<br>1.3 | 5.5 | M12x1 | 68.5 | 14 | 7 | 24.2 | 13 | 15.8 | 8.8 | 6 | M5 | M3 | 13 | 6 | -<br>23.2 | -<br>M3 | - | - |
| MFU16...CL<br>MFU16...HL | 20g | 18 | 21.5 | 14 | 14 | -<br>1.3 | 5.5 | M12x1 | 68.5 | 14 | 7 | 24.2 | 13 | 15.8 | 8.8 | 6 | M5 | M3 | 13 | 6 | -<br>23.2 | -<br>M3 | - | - |
| MFU18...CL<br>MFU18...HL | 35g | 19.5 | 24.5 | 18 | 14 | -<br>1.3 | 5.5 | M12x1 | 78 | 14 | 7.5 | 29 | 16.5 | 19.5 | 12 | 9 | M5 | M3 | 16 | 7 | -<br>28 | -<br>M5 | - | - |
| MFU20...CL<br>MFU20...HL | 35g | 22.5 | 26.5 | 18 | 14 | -<br>1.3 | 5.5 | M12x1 | 78 | 14 | 7.5 | 29 | 16.5 | 19.5 | 12 | 9 | M5 | M3 | 16 | 7 | -<br>28 | -<br>M5 | - | - |
| MFU22...CL<br>MFU22...HL | 50g | 24 | 31.5 | 21.5 | 14 | -<br>1.8 | 5.5 | M12x1 | 86.5 | 14 | 10 | 31.8 | 21 | 24.2 | 14.2 | 11 | M5 | M3 | 20 | 8 | -<br>31.5 | -<br>M5 | - | - |
| MFU27...CL<br>MFU27...HL | 100g | 28 | 36 | 25 | 20 | -<br>2.5 | 8 | M17x1 | 108 | 20 | 12 | 37.5 | 26 | 30 | 18 | 14 | G1/8 | M5 | 22 | 9 | -<br>37 | -<br>M5 | - | - |
| MFU33...CL<br>MFU33...HL | 130g | 34 | 44 | 30 | 20 | -<br>2.8 | 8 | M17x1 | 119 | 20 | 14.5 | 40.5 | 32.5 | 37 | 22.5 | 18 | G1/8 | G1/8 | 28 | 10 | -<br>40 | -<br>M5 | - | - |
| MFU41...CL<br>MFU41...HL | 300g | 42 | 54 | 40 | 30 | -<br>4.5 | 11 | M27x1 | 147 | 30 | 15.5 | 45 | 39.5 | 45 | 29.5 | 24 | G1/8 | G1/8 | 36 | 12 | -<br>45 | -<br>M5 | - | - |
| MFU47...CL<br>MFU47...HL | 300g | 50 | 58 | 40 | 30 | -<br>4.5 | 11 | M27x1 | 147 | 30 | 15.5 | 45 | 39.5 | 45 | 29.5 | 24 | G1/8 | G1/8 | 36 | 12 | -<br>45 | -<br>M5 | - | - |
| MFU51...CL<br>MFU51...HL | 500g | 54 | 68 | 50 | 30 | -<br>5 | 11 | M27x1 | 169 | 30 | 18 | 54 | 48 | 55 | 37 | 30 | G1/8 | G1/8 | 45 | 14 | -<br>56.5 | -<br>G1/8 | - | - |
| MFU63...CL<br>MFU63...HL | 785g | 66 | 84 | 60 | 30 | -<br>5 | 11 | M27x1 | 194 | 30 | 25 | 62 | 61 | 70 | 45 | 36 | G1/8 | G1/8 | 54 | 16 | -<br>64.5 | -<br>G1/8 | - | - |

m [Poids]
*[Weight]*

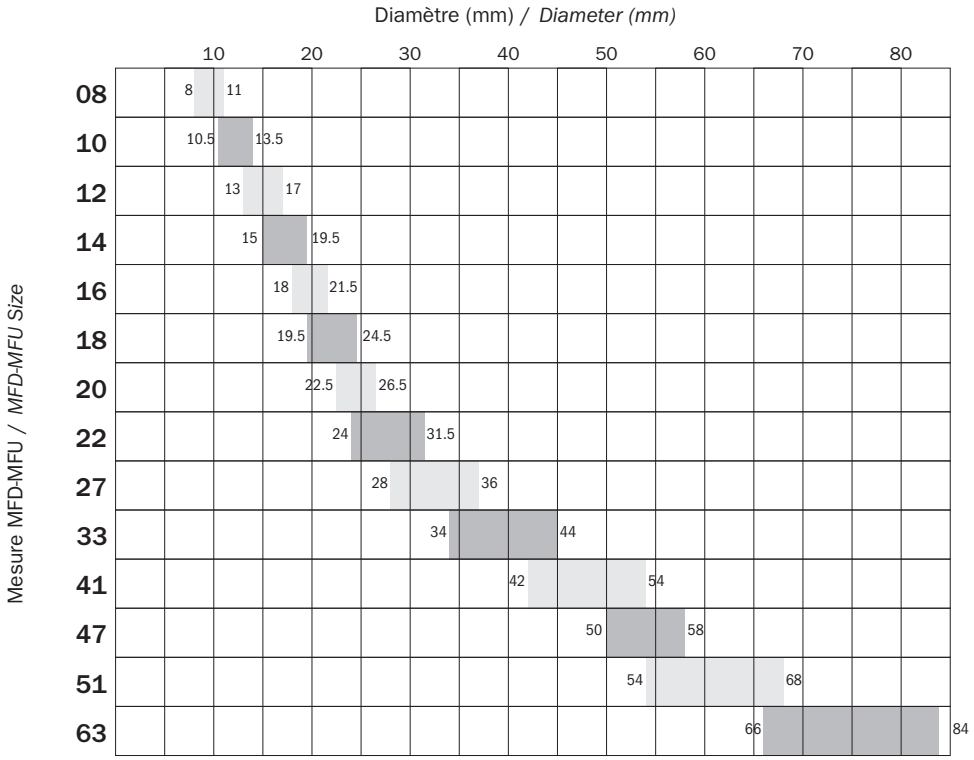
# MFD / MFU

## Diamètre de prise

La dimension est indiquée dans le code avec le diamètre nominal de la partie élastique.
Chaque modèle peut toutefois fonctionner dans les limites comprises entre le diamètre minimum et maximum.

## *Grip diameters*

*The gripper size is indicated in the gripper code with a nominal diameter of the elastic part.*
*Each model can work in a diameter range between a minimum and a maximum value.*



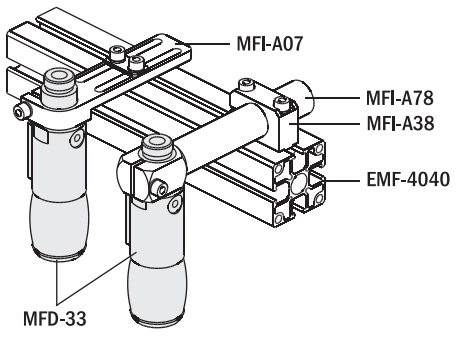

## Fixation

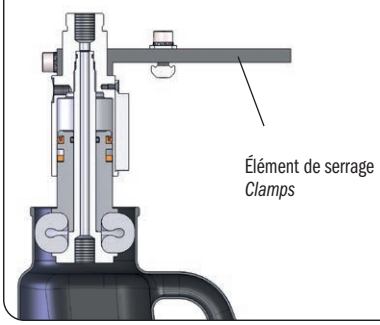
La pince peut être directement montée via le manche au moyen d'un écrou à ailettes [1].
Avec un écrou à ailettes, sur la rallonge en option [2].
Ou bien au moyen des nipples filetés en option [3].

## *Fastening*

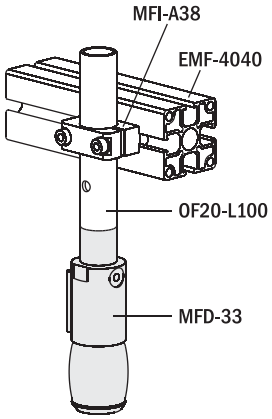
*The gripper can be fitted with a clamp, either directly on its tail [1], or on the optional extension tube [2].*
*Alternatively, it can be fitted through the optional threaded nipples [3].*

**[1]**



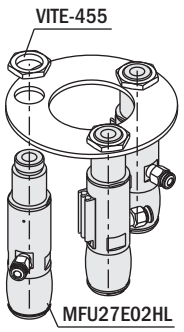



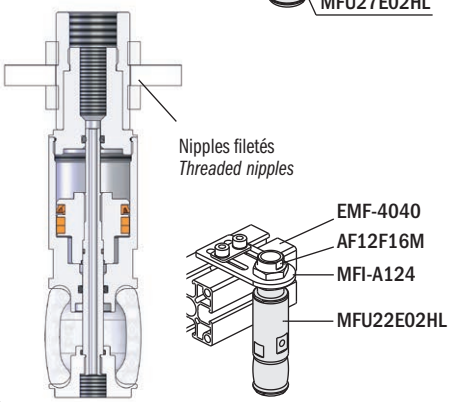

**[2]**




**[3]**

| | |
|---|---|
| VITE-293 | M12x1 |
| VITE-455 | M17x1 |
| VITE-456 | M27x1 |




09/2021

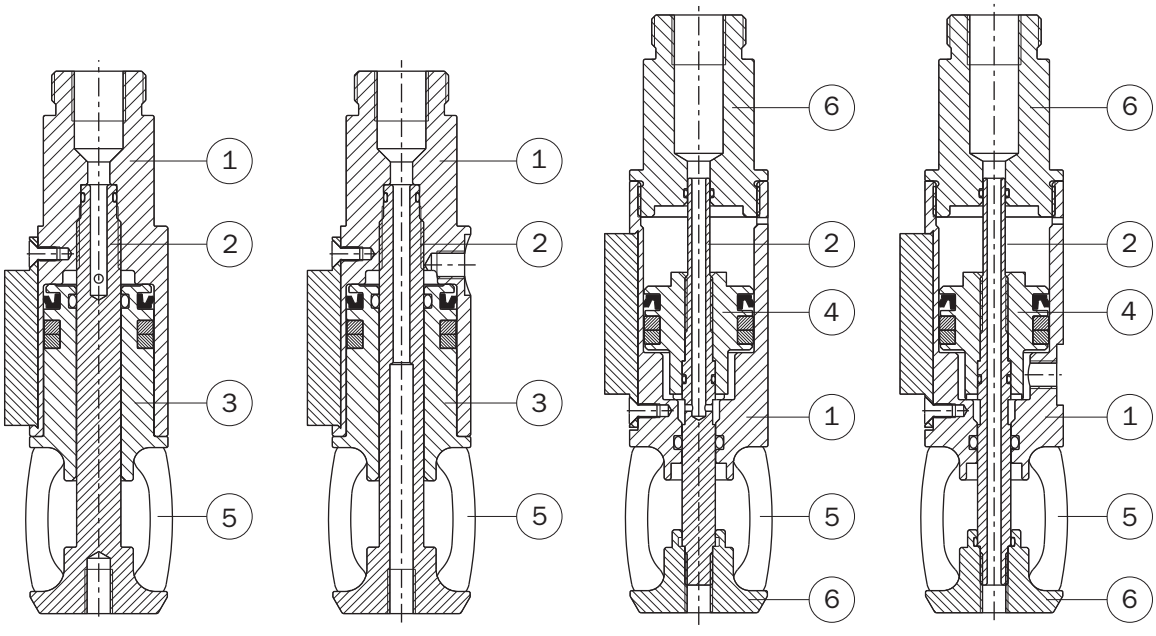
## Applications dans l'industrie alimentaire

Les versions S01 avec la partie élastique en silicone sont adaptées à la majorité des applications de l'industrie alimentaire, les composants prévus pour le contact avec les aliments étant les suivants:

## *Food applications*

*The S01 versions, the ones with the elastic part in Silicone, are suitable for most of the food applications, as the parts intended to come into contact with food are:*

| | | | |
|---|---|---|---|
| 1 | Corps<br>*Housing* | EN AW-6026-T6 | Aluminium oxydé ANSI/NSF 51<br>*Oxidized aluminum ANSI/NSF 51* |
| 2 | Tige<br>*Piston rod* | EN AW-6026-T6 | Aluminium oxydé ANSI/NSF 51<br>*Oxidized aluminum ANSI/NSF 51* |
| 3 | Piston MFD<br>*Piston MFD* | POM-C | Résine acétalique FDA CFR 21 Part. section 177.2470<br>*Acetal FDA CFR 21 Part section 177.2470* |
| 4 | Piston MFU<br>*Piston MFU* | EN AW-6026-T6 | Oxidized aluminum ANSI/NSF 51<br>*Oxidized aluminum ANSI/NSF 51* |
| 5 | Partie élastique<br>*Elastic part* | VMQ | Élastomère silicone FDA CFR 21 Part. section 177.2600<br>*Elastomer Silicone FDA CFR 21 Part section 177.2600* |
| 6 | Chapeau<br>*End cap* | EN AW-6026-T6 | Aluminium oxydé ANSI/NSF 51<br>*Oxidized aluminum ANSI/NSF 51* |
| | Graisse<br>*Grease* | INTERFLON FOOD GREASE LT 2 | Lubrifiant NSF H1 Enregistrement no. 123533<br>*Lubricant NSF H1 Registration no. 123533* |




**MFD...S01CL** **MFD...S01HL** **MFU...S01CL** **MFU...S01HL**

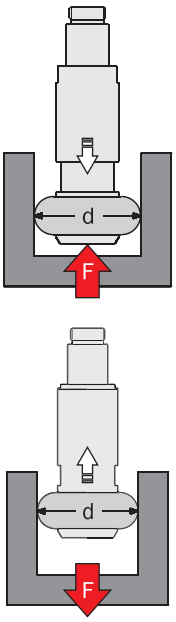
# MFD / MFU

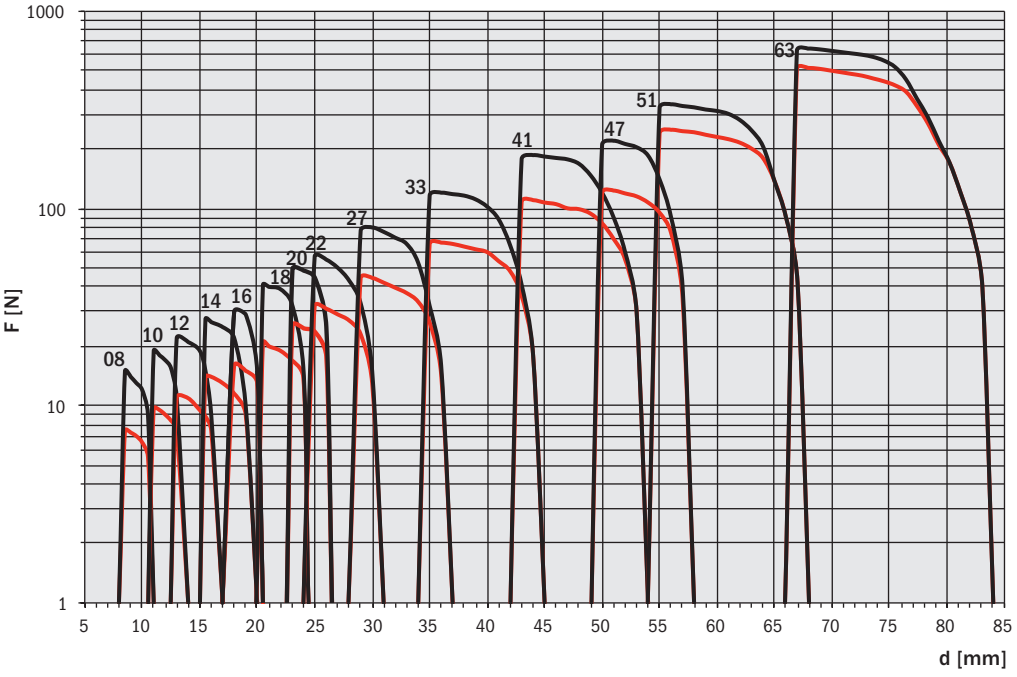
## Force de serrage

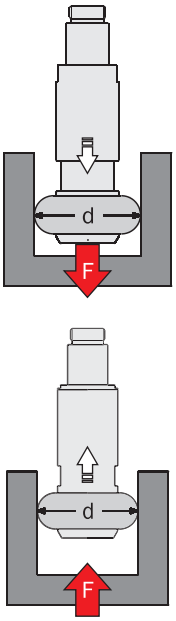
La force exercée par une pince MFD/MFU dépend de plusieurs facteurs, essentiellement du diamètre de l'objet, mais aussi de sa finition de surface, de son coefficient de frottement et de sa pression d'alimentation.
Les graphiques indiquent la force d'extraction (F) d'une charge saisie avec une préhenseur en fonction du diamètre (d).
Des anneaux en aluminium rugosité Ra=0.8 ont été utilisés pour les mesures ; les pinces étaient alimentées à 6 bars.
Les lignes noires représentent les pinces en EPDM et les lignes rouges les pinces en Silicone.

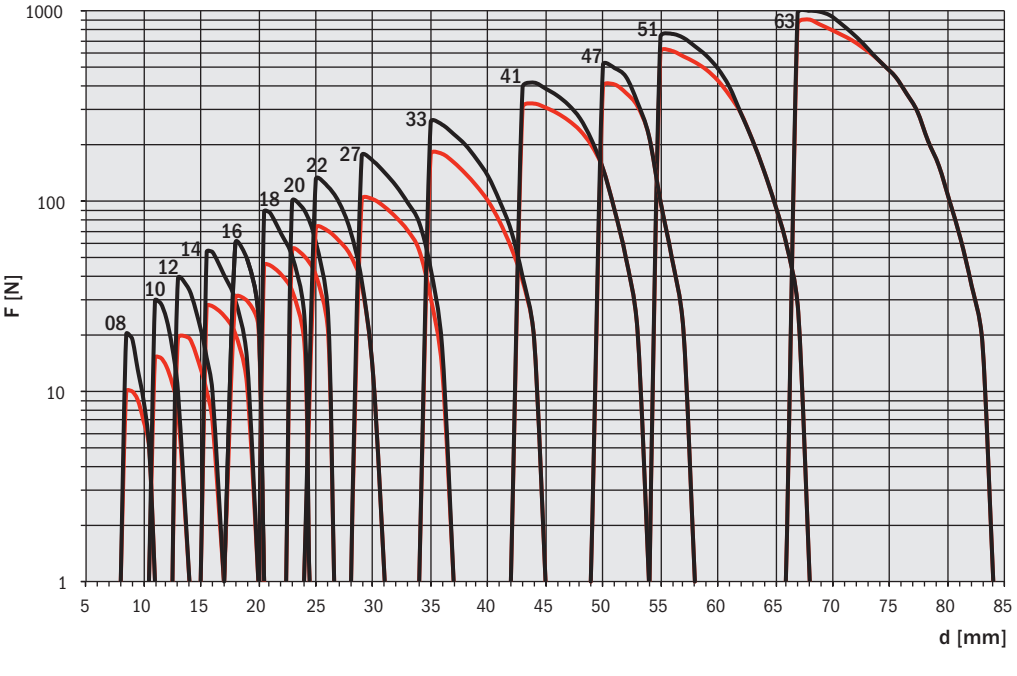
## *Gripping force*

*The force output of an MFD/MFU gripper depends on several variables.*
*Mainly on the diameter of the picked object, but also on the surface finishing, the coefficient of friction and the air pressure.*
*The graphs show the extraction force (F) on the gripped object as a function of its diameter (d).*
*Measurements were performed with aluminum rings, with roughness Ra=0.8 while the grippers were fed with 6 bar compressed air.*
*The black lines refer to the grippers in EPDM, while the red ones to the grippers in Silicone.*



## Alimentation en air comprimé

La pince est actionnée avec de l'air comprimé filtré (5÷40µm) non nécessairement lubrifié.
Le choix initial, lubrifié ou non lubrifié, doit être maintenu pour toute la durée de la pince.

Le circuit pneumatique doit être pressurisé progressivement, pour éviter les mouvements non contrôlés.

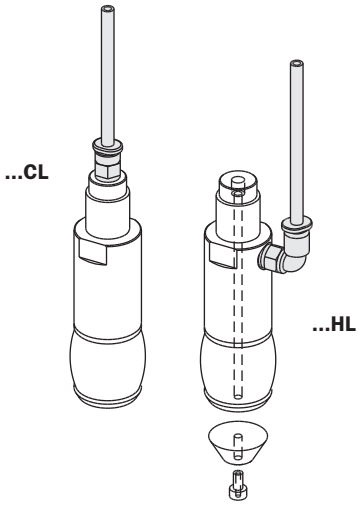
La force de serrage peut être réglée avec la pression d'alimentation.
Plage de pression: 4÷8 bars.

## *Compressed air feeding*

*The compressed air feeding the gripper must be filtered (5÷40 µm) but not necessarily lubricated.*
*The type of medium selected at the start – lubricated or not lubricated – must be kept for the complete service life of the gripper.*

*The pneumatic circuit must be pressurized progressively, to avoid uncontrolled movements.*

*The gripping force can be adjusted by suitably adjusting the air pressure.*
*The pressure range is 4÷8 bar.*







## Circuit pneumatique

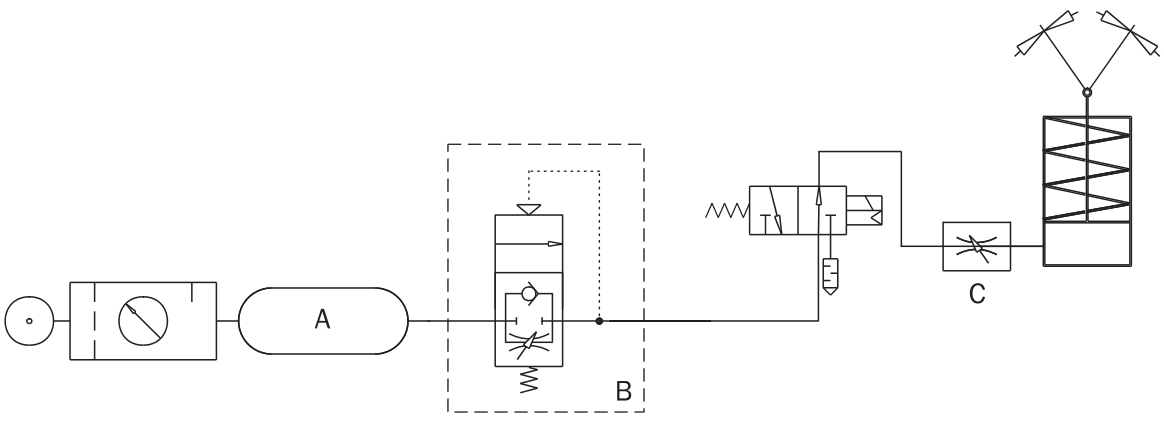
Disfonctionnements possibles sur le circuit d'alimentation de l'air comprimé:
1- Variation de la pression.
2- Mise sous pression trop brusque.
3- Vitesse des mâchoires excessive.

Solutions possibles pour résoudre les problèmes:
1- Réservoir externe (A).
2- Vanne de démarrage progressif (B).
3- Réducteurs de débit (C).

## *Pneumatic circuit*

*Possible problems on a compressed air circuit:*
*1- Pressure variation.*
*2- Pressurizing with empty cylinder.*
*3- Excessive speed of the jaws.*

*Possible solutions:*
*1- Compressed air storage (A).*
*2- Start-up valve (B).*
*3- Flow controller (C).*



## Maintenance

Aucune maintenance périodique n'est nécessaire.
La partie élastique en Silicone ou EPDM est fournie comme pièce de rechange et peut être remplacée une fois usée.
Elle peut être coupée en vue du montage (dans le sens indiqué sur la photo).
La pièce de rechange peut être installée sans démonter la pince.
Ne pas la coller ni la graisser.

## *Maintenance*

*No periodic maintenance is necessary.*
*The elastic part in Silicone or EPDM is available as a spare part and can be replaced, when worn out.*
*It can be cut (direction showed in the photo) to remove it from the gripper body.*
*It is not necessary to dismantle the gripper to fit the new elastic part.*
*It must not be glued nor greased.*



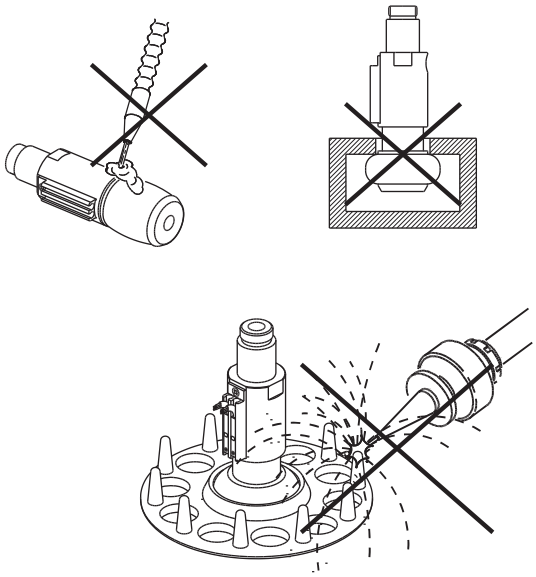


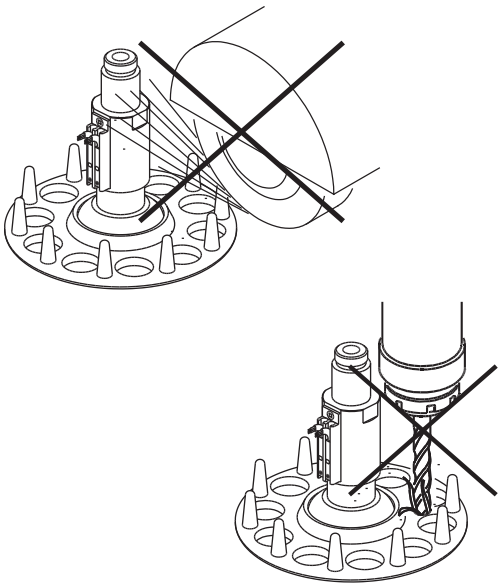
## Avertissements

Éviter tout contact avec des substances corrosives, projections de soudage ou poudres abrasives qui risquent d'endommager la pince.
Aucune personne ou objet ne doit se trouver dans le rayon d'action de la pince.
La pince ne pourra être mise en service qu'après que la machine dont elle fait partie aura été déclarée conforme aux dispositions de sécurité en vigueur.

## *Caution*

*Avoid the gripper coming into contact with the following media: coolants which cause corrosion, grinding dust or glowing sparks.*
*Make sure that nobody can place his/her hand in the working area and there are no objects in the path of the gripper.*
*The gripper must not run before the whole machine, on which it is mounted, complies with the laws or safety norms of your country.*





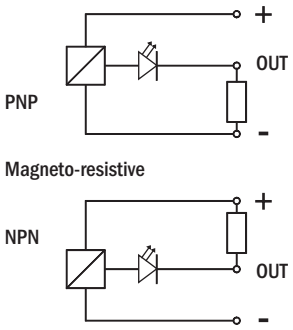
## Capteurs

Sur les grands modèles, un aimant est intégré au piston. Un accessoire permet de monter les capteurs de la série SN.
Il est possible d'installer un ou deux capteurs par préhenseur.

## *Sensors*

*In the larger sizes a magnet is integrated in the piston.*
*An optional housing for the sensors of the SN series is available.*
*One or two sensors can be fitted on a gripper.*

| SN | | |
|---|---|---|
| SN4N225-G | PNP | Câble 2.5m<br>*2.5m Cable* |
| SN4M225-G | NPN | |
| SN3N203-G | PNP | Connecteur M8<br>*Snap M8 plug connector* |
| SN3M203-G | NPN | |

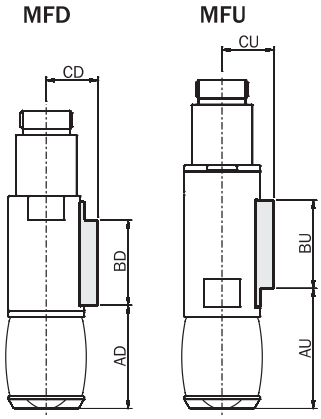


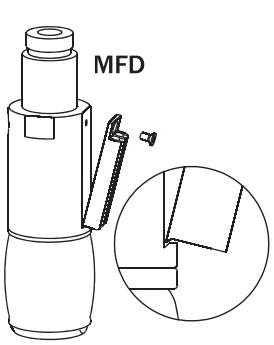


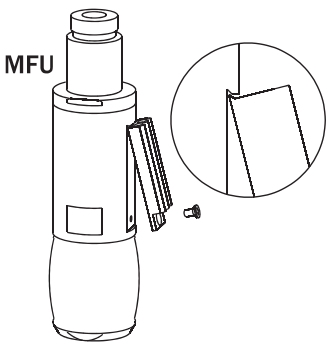


| | MFD27-K | MFD33-K | MFD41-K | MFD51-K | MFD63-K |
|---|---|---|---|---|---|
| Poids<br>*Weight* | 4 g | 5 g | 5 g | 6 g | 7 g |
| AD [mm] | 34 | 41.5 | 52 | 65 | 85.5 |
| BD [mm] | 28 | 34.5 | 40.5 | 49 | 54.5 |
| CD [mm] | 17 | 19.7 | 23.8 | 28.5 | 33.5 |
| MFD | Ø27 | Ø33 | Ø41<br>Ø47 | Ø51 | Ø63 |

| | MFU27-K | MFU33-K | MFU41-K | MFU51-K | MFU63-K |
|---|---|---|---|---|---|
| Poids<br>*Weight* | 4 g | 5 g | 5 g | 6 g | 7 g |
| AU [mm] | 39.5 | 46.5 | 55.5 | 71.5 | 87.5 |
| BU [mm] | 29 | 33 | 36.5 | 39 | 45 |
| CU [mm] | 17 | 19.8 | 23.8 | 28.5 | 33.5 |
| MFU | Ø27 | Ø33 | Ø41<br>Ø47 | Ø51 | Ø63 |



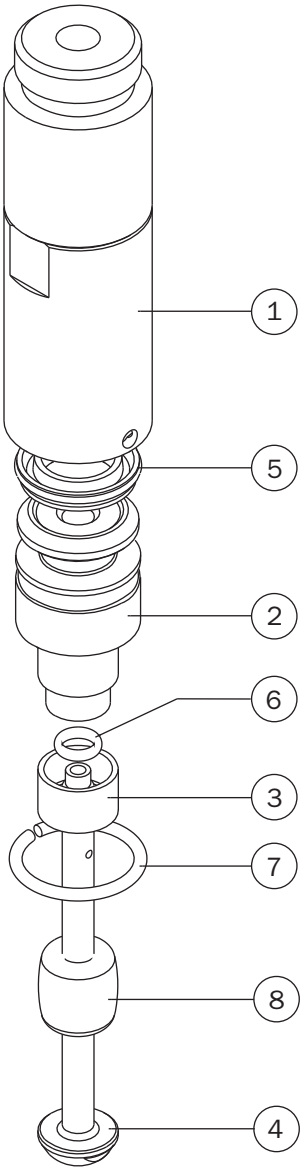





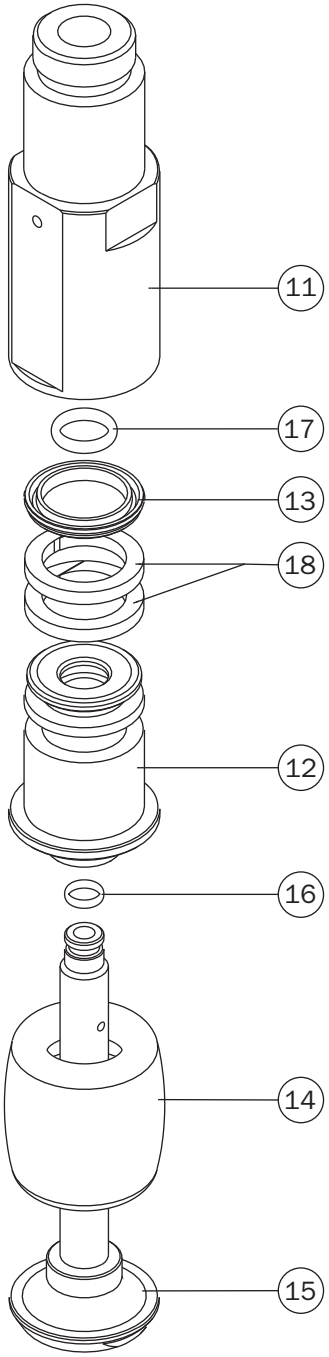

# MFD / MFU

**Vue explosée**
***Exploded view***

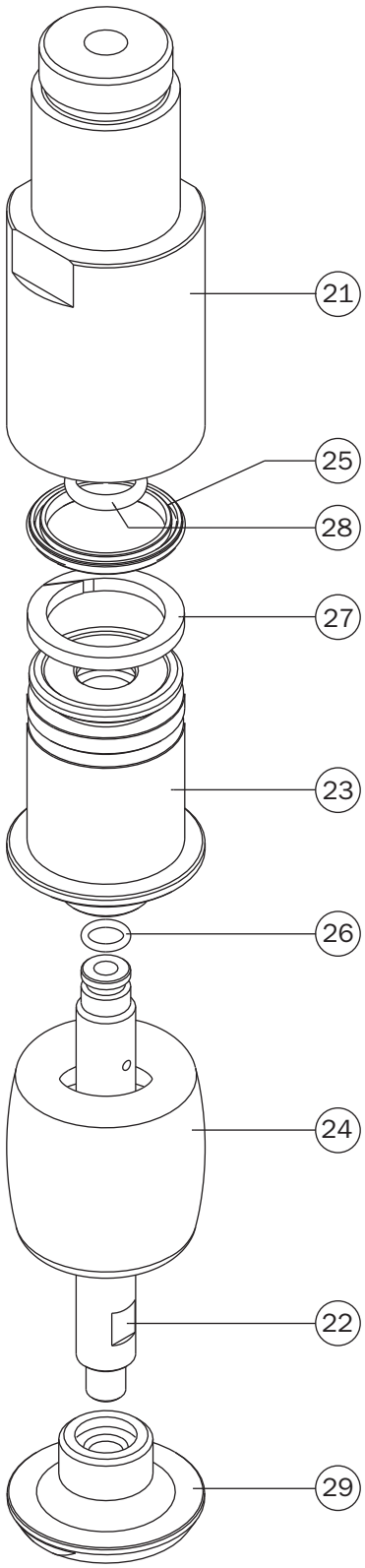
**MFD08CL**
**MFD10CL**




**MFD12CL**
**MFD14CL**
**MFD16CL**
**MFD18CL**
**MFD20CL**
**MFD22CL**
**MFD27CL**
**MFD33CL**




**MFD41CL**
**MFD47CL**
**MFD51CL**
**MFD63CL**



## Liste des pièces
## *Part list*

| | | MFD08CL | MFD10CL | | |
|---|---|---|---|---|---|
| 1 | Corps | MFD08-02 | MFD08-02 | *Body* | *1* |
| 2 | Piston | FFD08-01 | FFD10-02 | *Piston* | *2* |
| 3 | Couvercle | IFD08-02 | IFD10-03 | *Cover* | *3* |
| 4 | Tige piston | FFD08-03 | FFD10-05 | *Piston rod* | *4* |
| 5 | Joint dynamique | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | *Dynamic gasket* | *5* |
| 6 | Joint torique | 1x3 (GUAR-082H) | 1x3 (GUAR-082H) | *O-Ring* | *6* |
| 7 | Bague élastique | D1=12 DIN-7993B (SEEGER-027) | D1=12 DIN-7993B (SEEGER-027) | *Snap-ring* | *7* |
| 8 | Partie élastique | IF08-11 | IF10-11 | *Elastic part* | *8* |

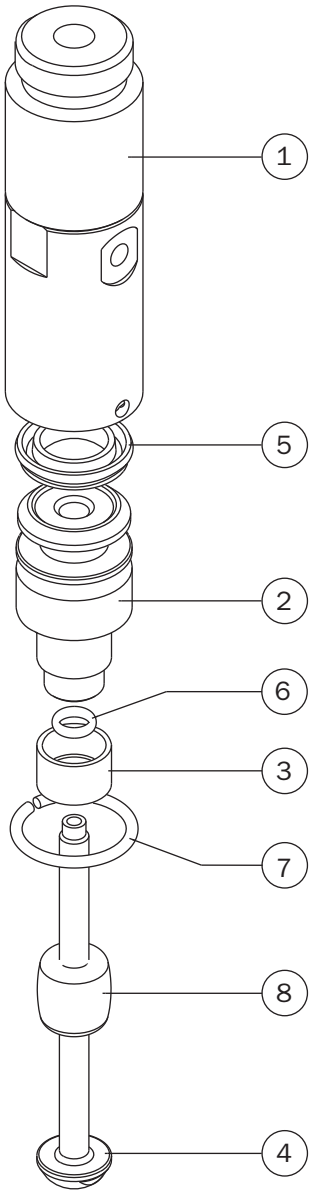
| | | MFD12CL | MFD14CL | MFD16CL | MFD18CL | MFD20CL | MFD22CL | MFD27CL | MFD33CL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Corps | MFD12-02 | MFD12-02 | MFD12-02 | MFD18-02 | | MFD22-02 | MFD27-02 | MFD33-01 | *Body* | *11* |
| 12 | Piston | FFD12-01 | FFD14-02 | FFD14-02 | FFD18-02 | | FFD22-02 | FFD27-03 | FFD33-03 | *Piston* | *12* |
| 13 | Joint dynamique | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | 15x9x3 (GUAR-019) | | 18x12x3 (GUAR-133) | 20x14x3 (GUAR-058) | 25x19x3.5 (GUAR-064) | *Dynamic gasket* | *13* |
| 14 | Partie élastique | IF12-12 | IF14-12 | IF16-12 | IF18-11 | IF20-11 | IF22-12 | IF27-11 | IF33-11 | *Elastic part* | *14* |
| 15 | Tige piston | FFD12-03 | FFD14-05 | FFD14-05 | FFD18-06 | | FFD22-06 | FFD27-06 | FFD33-06 | *Piston rod* | *15* |
| 16 | Joint torique | - | - | - | - | | - | 1x4.5 (GUAR-171) | 1x6 (GUAR-098) | *O-Ring* | *16* |
| 17 | Joint torique | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | 1x5 (GUAR-021H) | | 1x6 (GUAR-098H) | 1.78x7.66 (GUAR-045H) | 1.78x9.25 (GUAR-065H) | *O-Ring* | *17* |
| 18 | Aimant | - | - | - | - | | - | PAR-20-10B | PAR-25-10B | *Magnet* | *18* |

| | | MFD41CL | MFD47CL | MFD51CL | MFD63CL | | |
|---|---|---|---|---|---|---|---|
| 21 | Corps | MFD41-02 | MFD41-02 | MFD51-02 | MFD63-02 | *Body* | *21* |
| 22 | Tige piston | FFD41-09 | FFD41-09 | FFD51-07 | FFD63-07 | *Piston rod* | *22* |
| 23 | Piston | FFD41-03 | FFD41-03 | FFD51-03 | FFD63-03 | *Piston* | *23* |
| 24 | Partie élastique | IF41-11 | IF47-11 | IF51-11 | IF63-11 | *Elastic part* | *24* |
| 25 | Joint dynamique | 32x24x3.5 (GUAR-063) | 32x24x3.5 (GUAR-063) | 40x32x3.5 (GUAR-092) | 50x42x3.5 (GUAR-114E) | *Dynamic gasket* | *25* |
| 26 | Joint torique | 1.5x7 (GUAR-115) | 1.5x7 (GUAR-115) | 1.78x8.73 (GUAR-013) | 1.78x9.25 (GUAR-065) | *O-Ring* | *26* |
| 27 | Aimant | FES-32-3-5 | FES-32-3-5 | RAD-40-10 | FES-50-3-6 | *Magnet* | *27* |
| 28 | Joint torique | 2.62x11.91 (GUAR-033H) | 2.62x11.91 (GUAR-033H) | 2.62x15.08 (GUAR-105H) | 2.62x15.88 (GUAR-169H) | *O-Ring* | *28* |
| 29 | Chapeau | FFD41-04 | FFD41-04 | FFD51-04 | FFD63-05 | *Rod cap* | *29* |

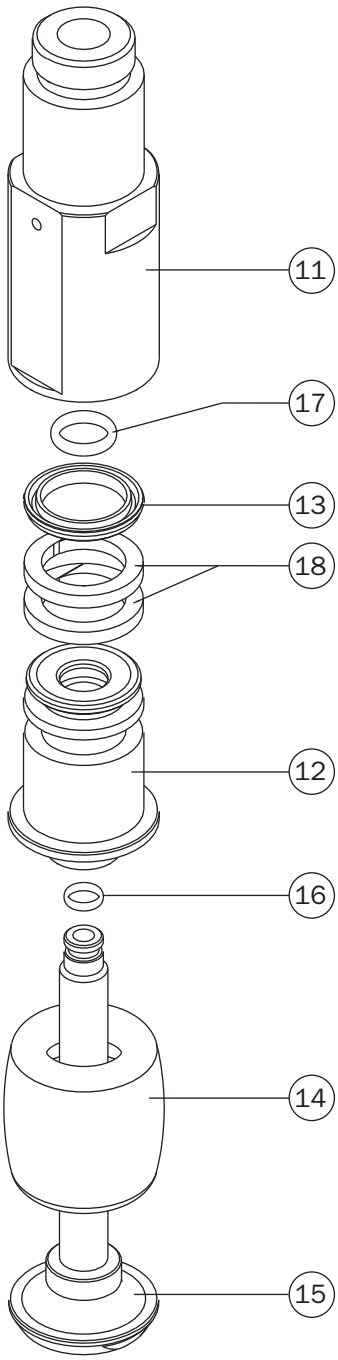
# MFD / MFU

**Vue explosée**
***Exploded view***

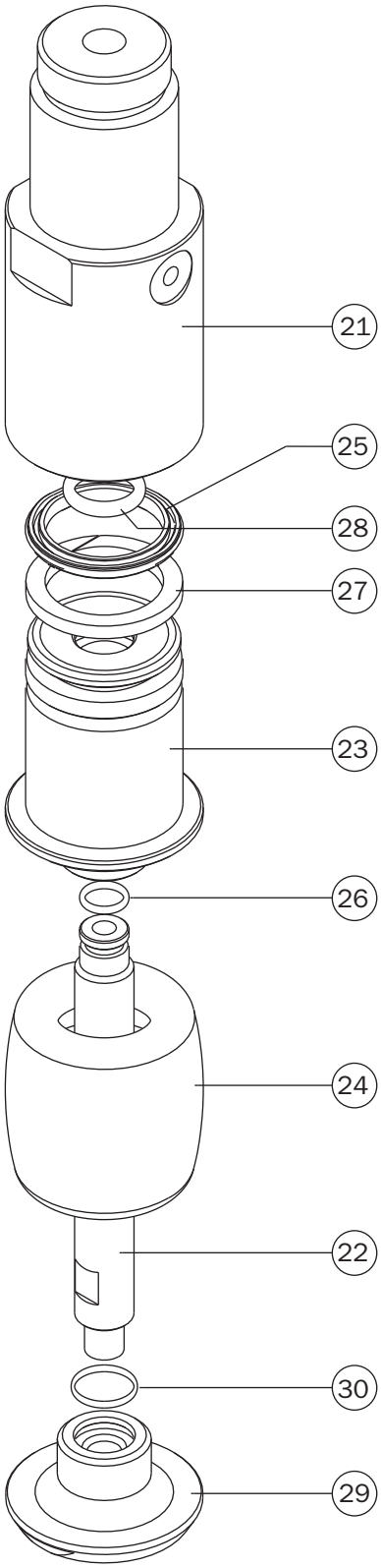
**MFD08HL**
**MFD10HL**




**MFD12HL**
**MFD14HL**
**MFD16HL**
**MFD18HL**
**MFD20HL**
**MFD22HL**
**MFD27HL**
**MFD33HL**




**MFD41HL**
**MFD47HL**
**MFD51HL**
**MFD63HL**




09/2021

## Liste des pièces
## *Part list*

| | | MFD08HL | MFD10HL | | |
|---|---|---|---|---|---|
| 1 | Corps | MFD08-01 | MFD08-01 | *Body* | *1* |
| 2 | Piston | MFD08-01 | FFD10-02 | *Piston* | *2* |
| 3 | Couvercle | IFD08-02 | IFD10-03 | *Cover* | *3* |
| 4 | Tige piston | FFD08-02 | FFD10-03 | *Piston rod* | *4* |
| 5 | Joint dynamique | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | *Dynamic gasket* | *5* |
| 6 | Joint torique | 1x3 (GUAR-082H) | 1x3 (GUAR-082H) | *O-Ring* | *6* |
| 7 | Bague élastique | D1=12 DIN-7993B (SEEGER-027) | D1=12 DIN-7993B (SEEGER-027) | *Snap-ring* | *7* |
| 8 | Partie élastique | IF08-11 | IF10-11 | *Elastic part* | *8* |

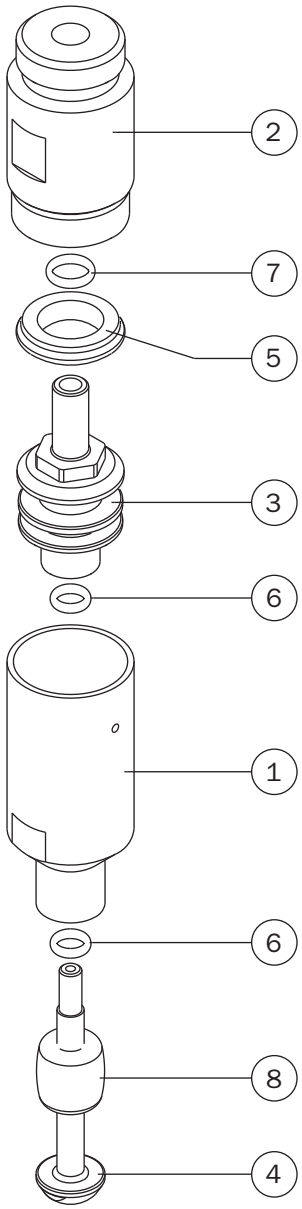
| | | MFD12HL | MFD14HL | MFD16HL | MFD18HL | MFD20HL | MFD22HL | MFD27HL | MFD33HL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Corps | MFD12-01 | MFD12-01 | MFD12-01 | MFD18-01 | | MFD22-01 | MFD27-01 | MFD33-03 | *Body* | *11* |
| 12 | Piston | FFD12-01 | FFD14-02 | FFD14-02 | FFD18-02 | | FFD22-02 | FFD27-03 | FFD33-03 | *Piston* | *12* |
| 13 | Joint dynamique | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | 15x9x3 (GUAR-019) | | 18x12x3 (GUAR-133) | 20x14x3 (GUAR-058) | 25x19x3.5 (GUAR-063) | *Dynamic gasket* | *13* |
| 14 | Partie élastique | IF12-12 | IF14-12 | IF16-12 | IF18-11 | IF20-11 | IF22-12 | IF27-11 | IF33-11 | *Elastic part* | *14* |
| 15 | Tige piston | FFD12-02 | FFD14-03 | FFD14-03 | FFD18-03 | | FFD22-03 | FFD27-02 | FFD33-02 | *Piston rod* | *15* |
| 16 | Joint torique | - | - | - | - | | - | 1x4.5 (GUAR-171) | 1x6 (GUAR-098) | *O-Ring* | *16* |
| 17 | Joint torique | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | 1x5 (GUAR-021H) | | 1x6 (GUAR-098H) | 1.78x7.66 (GUAR-045H) | 1.78x9.25 (GUAR-065H) | *O-Ring* | *17* |
| 18 | Aimant | - | - | - | - | | - | PAR-20-10B | PAR-25-10B | *Magnet* | *18* |

| | | MFD41HL | MFD47HL | MFD51HL | MFD63HL | | |
|---|---|---|---|---|---|---|---|
| 21 | Corps | MFD41-01 | MFD41-01 | MFD51-01 | MFD63-01 | *Body* | *21* |
| 22 | Tige piston | FFD41-02 | FFD41-02 | FFD51-02 | FFD63-02 | *Piston rod* | *22* |
| 23 | Piston | FFD41-03 | FFD41-03 | FFD51-03 | FFD63-03 | *Piston* | *23* |
| 24 | Partie élastique | IF41-11 | IF47-11 | IF51-11 | IF63-11 | *Elastic part* | *24* |
| 25 | Joint dynamique | 32x24x3.5 (GUAR-063) | 32x24x3.5 (GUAR-063) | 40x32x3.5 (GUAR-092) | 50x42x3.5 (GUAR-114E) | *Dynamic gasket* | *25* |
| 26 | Joint torique | 1.5x7 (GUAR-115) | 1.5x7 (GUAR-115) | 1.78x8.73 (GUAR-013) | 1.78x9.25 (GUAR-065) | *O-Ring* | *26* |
| 27 | Aimant | FES-32-3-5 | FES-32-3-5 | RAD-40-10 | FES-50-3-6 | *Magnet* | *27* |
| 28 | Joint torique | 2.62x11.91 (GUAR-033H) | 2.62x11.91 (GUAR-033H) | 2.62x15.08 (GUAR-105H) | 2.62x15.88 (GUAR-169H) | *O-Ring* | *28* |
| 29 | Chapeau | FFD41-04 | FFD41-04 | FFD51-04 | FFD63-05 | *Rod cap* | *29* |
| 30 | O-Ring | 1x2 (GUAR-071) | 1x2 (GUAR-071) | 1.78x14 (GUAR-007) | 1.78x15.6 (GUAR-023) | *O-Ring* | *30* |

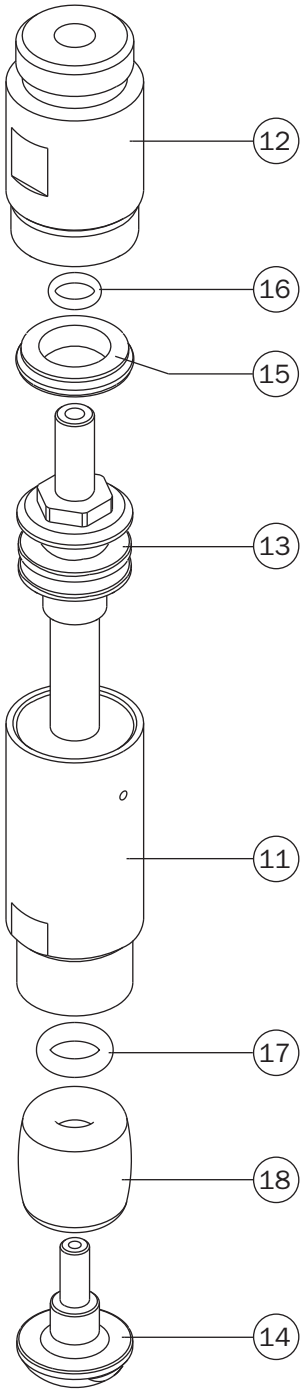
# MFD / MFU

**Vue explosée**
***Exploded view***

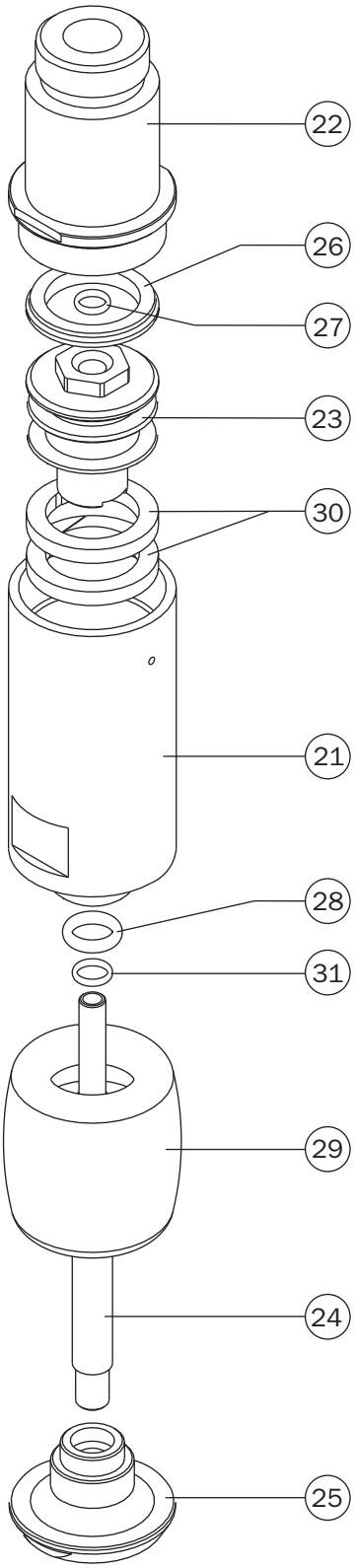
**MFU08CL**
**MFU10CL**




**MFU12CL**
**MFU14CL**
**MFU16CL**
**MFU18CL**
**MFU20CL**




**MFU22CL**
**MFU27CL**
**MFU33CL**
**MFU41CL**
**MFU47CL**
**MFU51CL**
**MFU63CL**




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## Liste des pièces
## *Part list*

| | | MFU08CL | MFU10CL | | |
|---|---|---|---|---|---|
| 1 | Corps | FFU08-06 | FFU10-04 | *Body* | *1* |
| 2 | Tête | MFU08-01 | MFU08-01 | *Head* | *2* |
| 3 | Piston | FFU08-02 | FFU08-02 | *Piston* | *3* |
| 4 | Tige piston | FFU08-05 | FFU10-03 | *Piston rod* | *4* |
| 5 | Joint dynamique | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | *Dynamic gasket* | *5* |
| 6 | Joint torique | 1x3 (GUAR-082H) | 1x3 (GUAR-082H) | *O-Ring* | *6* |
| 7 | Joint torique | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | *O-Ring* | *7* |
| 8 | Partie élastique | IF08-11 | IF10-11 | *Elastic part* | *8* |

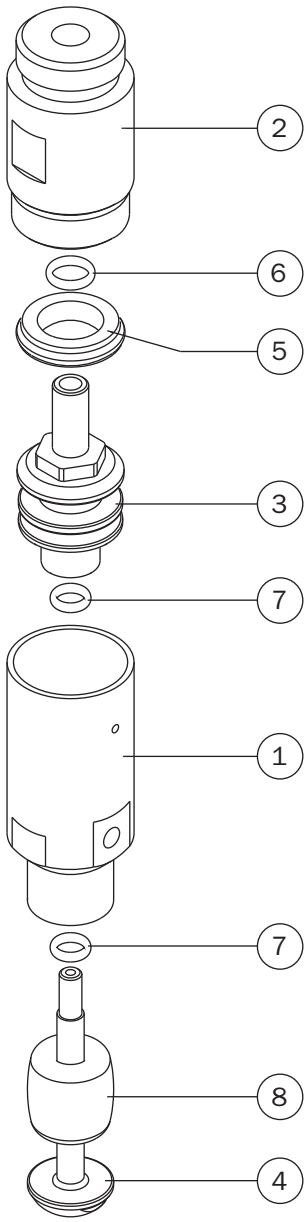
| | | MFU12CL | MFU14CL | MFU16CL | MFU18CL | MFU20CL | | |
|---|---|---|---|---|---|---|---|---|
| 11 | Corps | FFU12-04 | FFU14-04 | FFU14-04 | FFU18-05 | | *Body* | *11* |
| 12 | Tête | MFU08-01 | MFU08-01 | MFU08-01 | MFU18-01 | | *Head* | *12* |
| 13 | Piston | FFU12-05 | FFU14-05 | FFU14-05 | FFU18-06 | | *Piston* | *13* |
| 14 | Chapeau | FFU12-03 | FFU14-03 | FFU14-03 | FFU18-04 | | *Rod cap* | *14* |
| 15 | Joint dynamique | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | 15x9x3 (GUAR-019) | | *Dynamic gasket* | *15* |
| 16 | Joint torique | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | | *O-Ring* | *16* |
| 17 | Joint torique | 1x4.48 (GUAR-029H) | 1x4.48 (GUAR-029H) | 1x4.48 (GUAR-029H) | 1x4.48 (GUAR-029H) | | *O-Ring* | *17* |
| 18 | Partie élastique | IF12-12 | IF14-12 | IF16-12 | IF18-11 | IF20-11 | *Elastic part* | *18* |

| | | MFU22CL | MFU27CL | MFU33CL | MFU41CL | MFU47CL | MFU51CL | MFU63CL | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 21 | Corps | FFU22-07 | FFU27-07 | FFU33-07 | FFU41-07 | FFU41-07 | FFU51-07 | FFU63-07 | *Body* | *21* |
| 22 | Tête | MFU22-01 | MFU27-01 | MFU33-01 | MFU41-01 | MFU41-01 | MFU51-01 | MFU63-01 | *Head* | *22* |
| 23 | Piston | FFU22-03 | FFU27-03 | FFU33-03 | FFU41-03 | FFU41-03 | FFU51-03 | FFU63-03 | *Piston* | *23* |
| 24 | Tige piston | FFU22-06 | FFU27-08 | FFU33-08 | FFU41-08 | FFU41-08 | FFU51-08 | FFU63-08 | *Piston rod* | *24* |
| 25 | Chapeau | FFU22-05 | FFU27-05 | FFU33-05 | FFU41-05 | FFU41-05 | FFU51-05 | FFU63-05 | *Rod cap* | *25* |
| 26 | Joint dynamique | 18x12x3 (GUAR-133P) | 20x14x3 (GUAR-058) | 25x19x3.5 (GUAR-064) | 32x24x3.5 (GUAR-063) | 32x24x3.5 (GUAR-063) | 40x32x3.5 (GUAR-092) | 50x42x3.5 (GUAR-114E) | *Dynamic gasket* | *26* |
| 27 | Joint torique | 1x3 (GUAR-082H) | 1x4 (GUAR-091H) | 1x4.48 (GUAR-029H) | 2.62x7.6 (GUAR-060H) | 2.62x7.6 (GUAR-060H) | 2.62x7.6 (GUAR-060H) | 2.62x7.6 (GUAR-060H) | *O-Ring* | *27* |
| 28 | Joint torique | 1x5 (GUAR-021) | 1.78x6.07 (GUAR-039H) | 1.78x6.75 (GUAR-012H) | 1.78x10.82 (GUAR-080H) | 1.78x10.82 (GUAR-080H) | 2.62x11.91 (GUAR-033H) | 2.62x13.95 (GUAR-141H) | *O-Ring* | *28* |
| 29 | Partie élastique | IF22-12 | IF27-11 | IF33-11 | IF41-11 | IF47-11 | IF51-11 | IF63-11 | *Elastic part* | *29* |
| 30 | Aimant | - | PAR-20-10B | PAR-25-10B | FES-32-3-5 | FES-32-3-5 | RAD-40-10 | FES-50-3-6 | *Magnet* | *30* |
| 31 | Joint torique | 1x4.48 (GUAR-029H) | 1x4 (GUAR-091H) | 1x5 (GUAR-021) | 1x9 (GUAR-168) | 1x9 (GUAR-168) | 1x10 (GUAR-089) | 1x12 (GUAR-071) | *O-Ring* | *31* |

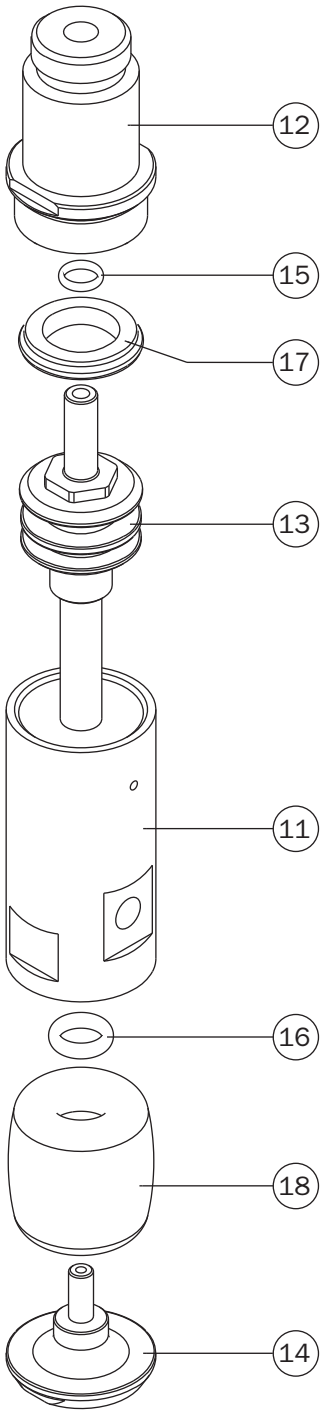
# MFD / MFU

## Vue explosée
***Exploded view***

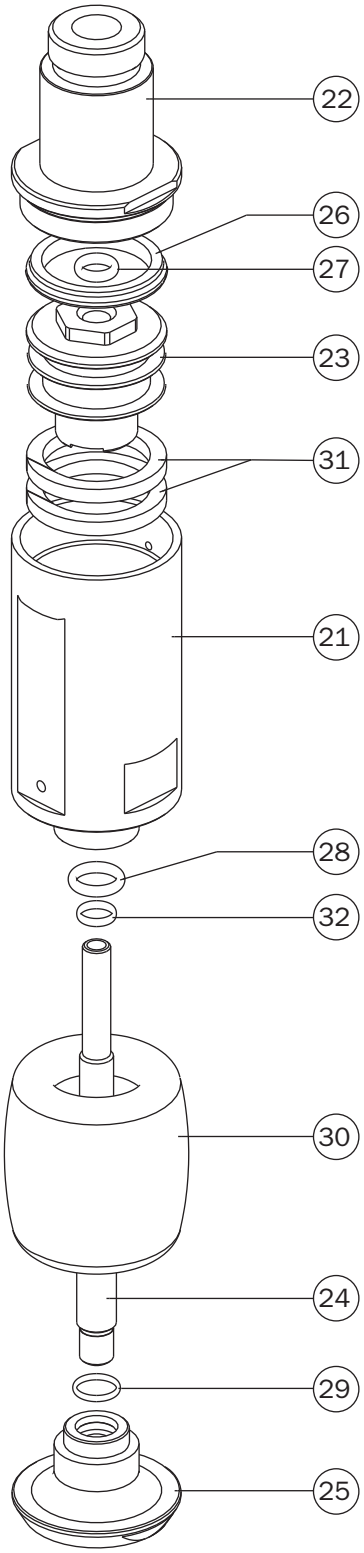
**MFU08HL**
**MFU10HL**




**MFU12HL**
**MFU14HL**
**MFU16HL**
**MFU18HL**
**MFU20HL**




**MFU22HL**
**MFU27HL**
**MFU33HL**
**MFU41HL**
**MFU47HL**
**MFU51HL**
**MFU63HL**




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## Liste des pièces
## *Part list*

| | | MFU08HL | MFU10HL | | |
|---|---|---|---|---|---|
| 1 | Corps | FFU08-03 | FFU10-01 | *Body* | *1* |
| 2 | Tête | MFU08-01 | MFU08-01 | *Head* | *2* |
| 3 | Piston | FFU08-02 | FFU08-02 | *Piston* | *3* |
| 4 | Tige piston | FFU08-04 | FFU10-02 | *Piston rod* | *4* |
| 5 | Joint dynamique | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | *Dynamic gasket* | *5* |
| 6 | Joint torique | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | *O-Ring* | *6* |
| 7 | Joint torique | 1x3 (GUAR-082H) | 1x3 (GUAR-082H) | *O-Ring* | *7* |
| 8 | Partie élastique | IF08-11 | IF10-11 | *Elastic part* | *8* |

| | | MFU12HL | MFU14HL | MFU16HL | MFU18HL | MFU20HL | | |
|---|---|---|---|---|---|---|---|---|
| 11 | Corps | FFU12-01 | FFU14-01 | FFU14-01 | FFU18-01 | | *Body* | *11* |
| 12 | Tête | MFU08-01 | MFU08-01 | MFU08-01 | MFU18-01 | | *Head* | *12* |
| 13 | Piston | FFU12-02 | FFU14-02 | FFU14-02 | FFU18-03 | | *Piston* | *13* |
| 14 | Chapeau | FFU12-03 | FFU14-03 | FFU14-03 | FFU18-04 | | *Rod cap* | *14* |
| 15 | Joint torique | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | 1x4 (GUAR-091H) | | *O-Ring* | *15* |
| 16 | Joint torique | 1x4.48 (GUAR-029H) | 1x4.48 (GUAR-029H) | 1x4.48 (GUAR-029H) | 1x4.48 (GUAR-029H) | | *O-Ring* | *16* |
| 17 | Joint dynamique | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | 12x7x3 (GUAR-018) | 15x9x3 (GUAR-019) | | *Dynamic gasket* | *17* |
| 18 | Partie élastique | IF12-12 | IF14-12 | IF16-12 | IF18-11 | IF20-11 | *Elastic part* | *18* |

| | | MFU22HL | MFU27HL | MFU33HL | MFU41HL | MFU47HL | MFU51HL | MFU63HL | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 21 | Corps | FFU22-01 | FFU27-01 | FFD33-01 | FFU41-01 | FFU41-01 | FFU51-01 | FFU63-01 | *Body* | *21* |
| 22 | Tête | MFU22-01 | MFU27-01 | MFU33-01 | MFU41-01 | MFU41-01 | MFU51-01 | MFU63-01 | *Head* | *22* |
| 23 | Piston | FFU22-03 | FFU27-03 | FFU33-03 | FFU41-03 | FFU41-03 | FFU51-03 | FFU63-01 | *Piston* | *23* |
| 24 | Tige piston | FFU22-04 | FFU27-04 | FFU33-04 | FFU41-04 | FFU41-04 | FFU51-04 | FFU63-04 | *Piston rod* | *24* |
| 25 | Chapeau | FFU22-05 | FFU27-05 | FFU33-05 | FFU41-05 | FFU41-05 | FFU51-05 | FFU63-05 | *Rod cap* | *25* |
| 26 | Joint dynamique | 18x12x3 (GUAR-133P) | 20x14x3 (GUAR-058) | 25x19x3.5 (GUAR-064) | 32x24x3.5 (GUAR-063) | 32x24x3.5 (GUAR-063) | 40x32x3.5 (GUAR-092) | 50x42x3.5 (GUAR-114E) | *Dynamic gasket* | *26* |
| 27 | Joint torique | 1x3 (GUAR-082H) | 1x4 (GUAR-091H) | 1.78x4.48 (GUAR-029H) | 2.62x7.6 (GUAR-060H) | 2.62x7.6 (GUAR-060H) | 2.62x7.6 (GUAR-060H) | 2.62x7.6 (GUAR-060H) | *O-Ring* | *27* |
| 28 | Joint torique | 1x5 (GUAR-021) | 1.78x6.07 (GUAR-039H) | 1.78x6.75 (GUAR-012H) | 1.78x10.82 (GUAR-080H) | 1.78x10.82 (GUAR-080H) | 2.62x11.91 (GUAR-033H) | 2.62x13.95 (GUAR-141H) | *O-Ring* | *28* |
| 29 | Joint torique | - | 1x6 (GUAR-098) | 1x7 (GUAR-136) | 1.78x10.82 (GUAR-080) | 1.78x10.82 (GUAR-080) | 2x12 (GUAR-088) | 1.78x14 (GUAR-007) | *O-Ring* | *29* |
| 30 | Partie élastique | IF22-12 | IF27-11 | IF33-11 | IF41-11 | IF47-11 | IF51-11 | IF63-11 | *Elastic part* | *30* |
| 31 | Aimant | - | PAR-20-10B | PAR-25-10B | FES-32-3-5 | FES-32-3-5 | RAD-40-10 | FES-50-3-6 | *Magnet* | *31* |
| 32 | Joint torique | 1.78x4.48 (GUAR-029H) | 1x4 (GUAR-091H) | 1x5 (GUAR-021) | 1x9 (GUAR-168) | 1x9 (GUAR-168) | 1x10 (GUAR-089) | 1x12 (GUAR-071) | *O-Ring* | *32* |

## Micro doigt de préhension à expansion série IFU

- Nouvelle idée de préhenseur novateur.
- Mouvement vers le haut.
- La partie élastique peut être en silicone ou NBR.
- Diamètre de préhension de 4.5 a 8.7 mm.

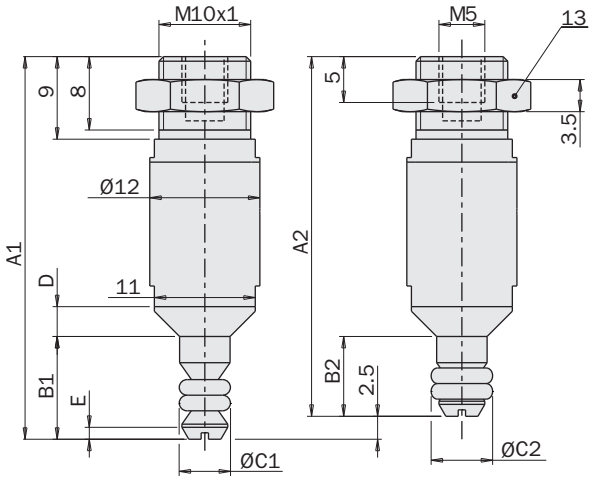
## *ID expansion micro grippers series IFU*

- *New concept for innovative air hands.*
- *Upward movement.*
- *The elastic part can be in Silicone or NBR.*
- *Grip diameters from 4.5 to 8.7 mm.*



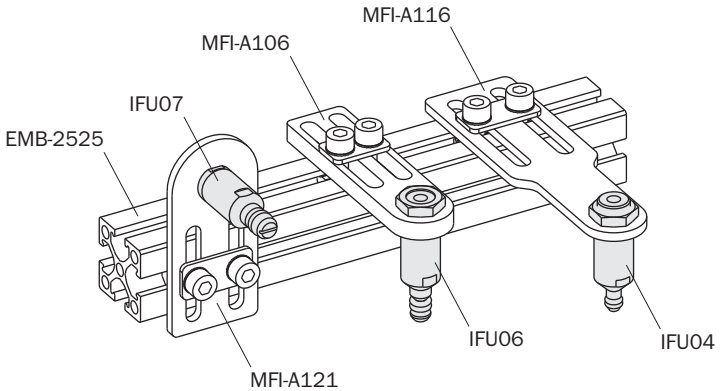







| | IFU04S01RT<br>IFU04N03RT | IFU05S01RT<br>IFU05N03RT | IFU06S01RT<br>IFU06N03RT | IFU07S01RT<br>IFU07N03RT |
|---|---|---|---|---|
| A1 | 40.9 | 41.7 | 42 | 42 |
| A2 | 38.4 | 39.2 | 39.5 | 39.5 |
| B1 | 9.9 | 11.2 | 11.5 | 11.5 |
| B2 | 7.4 | 8.7 | 9 | 9 |
| C1 | Ø4.5 | Ø5.6 | Ø6.6 | Ø7.6 |
| C2 | Ø5.4 | Ø6.7 | Ø7.6 | Ø8.7 |
| X1 | 3 | 3.4 | 3.4 | 3.4 |
| X2 | 2.7 | 3.4 | 3.4 | 3.4 |
| W1 | 4 | 4.8 | 5.1 | 5.1 |
| W2 | 2.7 | 3.6 | 3.8 | 3.9 |
| D | 3.75x45° | 3.25x45° | 2.75x45° | 2.4x45° |
| E | 1x60° | 1.3x60° | 1.4x60° | 1.5x60° |
| Poids<br>*Weight* | 7g | 7g | 8g | 9g |

## Exemple d'application
## *Application examples*



**Notes**
***Notes***