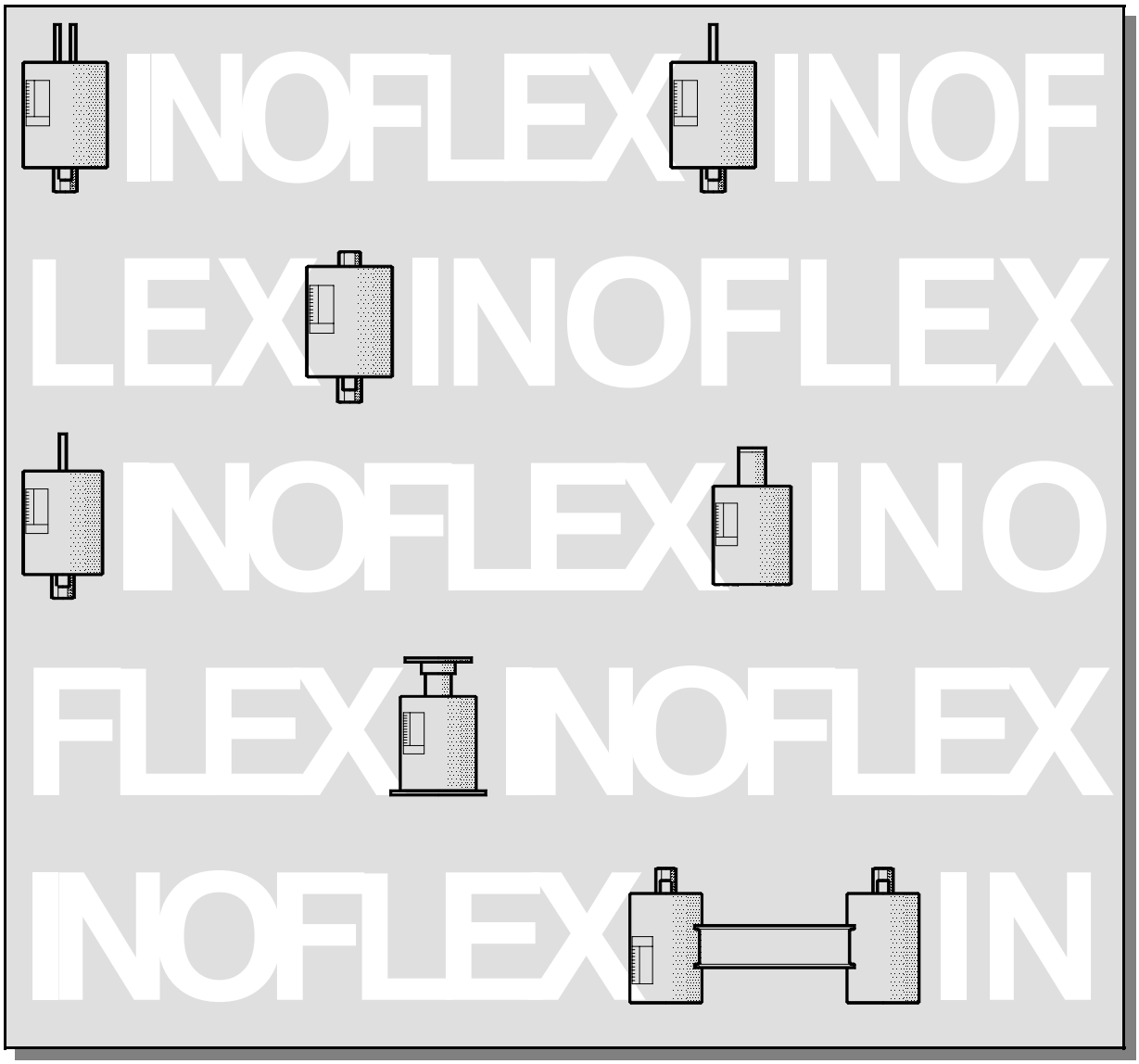



# SUPPORTI ELASTICI A CARICO VARIABILE
# Variable spring hangers

**(Rev. N1)**

# SUPPORTI ELASTICI A CARICO VARIABILE

# *Variable spring hangers*

## INTRODUZIONE

I supporti a carico variabile sono dispositivi a molla impiegati generalmente per sostenere tubazioni e apparecchiature soggette a dilatazioni termiche.
Il carico sostenuto dal supporto varia in funzione della compressione o della estensione della molla causate dallo spostamento del punto di applicazione.
Sono i supporti a molla che vengono maggiormente impiegati in quanto realizzano un ottimo compromesso tra costo, compattezza e funzionalità.

## *INTRODUCTION*

*Variable supports are spring devices generally used to support pipes and equipments, that are subject to thermal expansion.*
*The load born by the supports varies in accordance with the spring compression, caused by the displacement of the application point.*
*Variable supports are those which are more employed, because they realize a good compromise among cost, compactness and functionality.*

## TIPOLOGIA

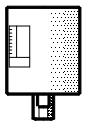
In questo catalogo la INOFLEX presenta una nuova serie di supporti a carico variabile suddivisi in tre modelli ( C, M e L ) in funzione della corsa totale di lavoro ( vedi Tab. 1 ).
Ogni modello comprende sei tipi ( A, H, N, M, I, E e G ) che si differenziano per le diverse modalità di collegamento alla struttura portante ed alla tubazione ( vedi pag. 3, 4 e 5 ) e dieci grandezze che consentono carichi di lavoro da 226 N a 8835 N (vedi pag. 2).
A richiesta e per esigenze particolari possono essere forniti supporti a carico variabile di modello, tipo e grandezza diversi da quelli indicati a catalogo.

## *TYPES*

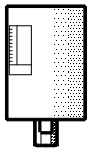
*In this catalogue INOFLEX presents a new series of variable supports, subdivided in three models ( C, M, L ), according to the total working travel ( see Table 1 ).*
*Each model comprises six types ( A, H, N, M, I, E and G ), which differentiate owing to the various ways of connection with the supporting structure and the piping (see page 3, 4 and 5).*
*There are ten sizes allowing working loads from 226 N to 8835 N ( see pag. 2 ).*
*Upon request and for particular needs, variable supports being of type and size other than those shown in the catalogue, can be supplied.*

| **MODELLO**<br>***MODEL*** | **CORSA TOTALE**<br>***TOTAL TRAVEL*** | **CARATTERISTICHE**<br>***FEATURES*** |
|---|---|---|
| **C** | 30 mm | Sono impiegati nel caso in cui la componente verticale dello spostamento termico sia ≤ 10 mm<br>*There are used when the vertical component of the thermal expansion is ≤ 10 mm* |
| **M** | 60 mm | Sono impiegati nel caso in cui la componente verticale dello spostamento termico sia ≤ 20 mm<br>*There are used when the vertical component of the thermal expansion is ≤ 20 mm* |
| **L** | 120 mm | Sono impiegati nel caso in cui la componente verticale dello spostamento termico sia ≤ 40 mm<br>*There are used when the vertical component of the thermal expansion is ≤ 40 mm* |

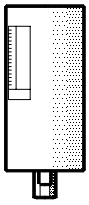
Tab. 1



**C**



**M**



**L**

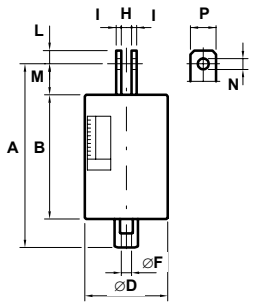
| CAMPO UTILIZZ. *Working range* (mm) | | | GRANDEZZA / *Size* | | | | | | | | | | | CORSA/*Travel* (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | | | |
| | | | CARICO NOMINALE / *Nominal load* (N) | | | | | | | | | | | | L | M | C |
| | | | 185 | 225 | 350 | 455 | 600 | 815 | 1080 | 1430 | 1920 | 2590 | 3350 | 4360 | 0 | 0 | 0 |
| | | | 200 | 292 | 373 | 484 | 642 | 869 | 1152 | 1526 | 2051 | 2767 | 3573 | 4656 | 10 | 5 | 2,5 |
| C | M | L | 213 | 310 | 396 | 514 | 682 | 924 | 1225 | 1622 | 2183 | 2945 | 3799 | 4955 | 20 | 10 | 5 |
| 0 | 0 | 0 | 226 | 329 | 420 | 545 | 723 | 979 | 1298 | 1718 | 2315 | 3122 | 4026 | 5253 | 30 | 15 | 7,5 |
| 2,5 | 5 | 10 | 239 | 347 | 443 | 575 | 764 | 1034 | 1370 | 1813 | 2446 | 3300 | 4251 | 5552 | 40 | 20 | 10 |
| 5 | 10 | 20 | 252 | 365 | 467 | 606 | 804 | 1089 | 1443 | 1908 | 2577 | 3477 | 4478 | 5850 | 50 | 25 | 12,5 |
| 7,5 | 15 | 30 | 265 | 384 | 490 | 636 | 845 | 1144 | 1516 | 2003 | 2709 | 3654 | 4704 | 6149 | 60 | 30 | 15 |
| 10 | 20 | 40 | 278 | 402 | 514 | 667 | 885 | 1199 | 1589 | 2099 | 2840 | 3832 | 4930 | 6447 | 70 | 35 | 17,5 |
| 12,5 | 25 | 50 | 291 | 420 | 537 | 697 | 926 | 1254 | 1662 | 2194 | 2972 | 4009 | 5156 | 6746 | 80 | 40 | 20 |
| 15 | 30 | 60 | 304 | 439 | 561 | 728 | 966 | 1309 | 1735 | 2290 | 3103 | 4187 | 5382 | 7044 | 90 | 45 | 22,5 |
| 17,5 | 35 | 70 | 317 | 457 | 585 | 759 | 1007 | 1364 | 1808 | 2385 | 3235 | 4364 | 5608 | 7343 | 100 | 50 | 25 |
| 20 | 40 | 80 | 330 | 475 | 608 | 789 | 1048 | 1419 | 1880 | 2480 | 3366 | 4541 | 5834 | 7641 | 110 | 55 | 27,5 |
| 22,5 | 45 | 90 | 343 | 494 | 632 | 820 | 1088 | 1474 | 1953 | 2576 | 3497 | 4719 | 6060 | 7939 | 120 | 60 | 30 |
| 25 | 50 | 100 | 356 | 512 | 655 | 850 | 1129 | 1529 | 2026 | 2671 | 3629 | 4896 | 6286 | 8238 | 130 | 65 | 32,5 |
| 27,5 | 55 | 110 | 369 | 531 | 679 | 881 | 1170 | 1584 | 2099 | 2767 | 3760 | 5074 | 6512 | 8536 | 140 | 70 | 35 |
| 30 | 60 | 120 | 382 | 549 | 702 | 911 | 1210 | 1639 | 2172 | 2862 | 3892 | 5251 | 6739 | 8835 | 150 | 75 | 37,5 |
| | | | 395 | 568 | 726 | 942 | 1251 | 1694 | 2245 | 2957 | 4023 | 5428 | 6965 | 9133 | 160 | 80 | 40 |
| | | | 408 | 586 | 750 | 972 | 1291 | 1749 | 2317 | 3053 | 4155 | 5606 | 7191 | 9432 | 170 | 85 | 42,5 |
| | | | 420 | 610 | 785 | 1015 | 1360 | 1825 | 2430 | 3240 | 4340 | 5785 | 7520 | 9830 | 184 | 92 | 46 |
| | | | COSTANTE MOLLA / *Spring costant* (N/mm) | | | | | | | | | | | | | | |
| L | | | 1,3 | 1,8 | 2,3 | 3,0 | 4,0 | 5,5 | 7,3 | 9,5 | 13,1 | 17,7 | 22,6 | 29,8 | L | | |
| M | | | 2,6 | 3,7 | 4,7 | 6,1 | 8,1 | 11,0 | 14,6 | 19,1 | 26,3 | 35,5 | 45,2 | 59,7 | | M | |
| C | | | 5,2 | 7,4 | 9,4 | 12,2 | 16,2 | 22,0 | 29,2 | 38,2 | 52,6 | 71,0 | 90,4 | 119,4 | | | C |

| CAMPO UTILIZZ. *Working range* (mm) | | | GRANDEZZA / *Size* | | | | | | | | | | CORSA/*Travel* (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | |
| | | | CARICO NOMINALE / *Nominal load* (N) | | | | | | | | | | | L | M | C |
| | | | 5810 | 7700 | 10220 | 13840 | 19420 | 25820 | 34015 | 45260 | 60730 | 80145 | 107780 | 0 | 0 | 0 |
| | | | 6198 | 8236 | 10920 | 14776 | 20729 | 27562 | 36343 | 48358 | 64889 | 85559 | 115061 | 10 | 5 | 2,5 |
| C | M | L | 6591 | 8771 | 11620 | 15712 | 22041 | 29307 | 38672 | 51458 | 69048 | 90974 | 122344 | 20 | 10 | 5 |
| 0 | 0 | 0 | 6983 | 9305 | 12320 | 16647 | 23353 | 31051 | 41002 | 54557 | 73208 | 96389 | 129626 | 30 | 15 | 7,5 |
| 2,5 | 5 | 10 | 7375 | 9840 | 13020 | 17582 | 24665 | 32796 | 43332 | 57657 | 77367 | 101804 | 136908 | 40 | 20 | 10 |
| 5 | 10 | 20 | 7767 | 10375 | 13720 | 18517 | 25977 | 34540 | 45661 | 60757 | 81527 | 107220 | 144191 | 50 | 25 | 12,5 |
| 7,5 | 15 | 30 | 8160 | 10910 | 14420 | 19452 | 27288 | 36285 | 47991 | 63857 | 85686 | 112635 | 151473 | 60 | 30 | 15 |
| 10 | 20 | 40 | 8552 | 11444 | 15120 | 20387 | 28600 | 38029 | 50321 | 66957 | 89846 | 118050 | 158755 | 70 | 35 | 17,5 |
| 12,5 | 25 | 50 | 8944 | 11979 | 15820 | 21323 | 29912 | 39774 | 52650 | 70056 | 94005 | 123465 | 166038 | 80 | 40 | 20 |
| 15 | 30 | 60 | 9336 | 12514 | 16520 | 22258 | 31224 | 41518 | 54980 | 73156 | 98165 | 128880 | 173320 | 90 | 45 | 22,5 |
| 17,5 | 35 | 70 | 9729 | 13049 | 17220 | 23193 | 32536 | 43263 | 57310 | 76256 | 102324 | 134295 | 180603 | 100 | 50 | 25 |
| 20 | 40 | 80 | 10121 | 13583 | 17920 | 24128 | 33848 | 45007 | 59639 | 79356 | 106484 | 139710 | 187885 | 110 | 55 | 27,5 |
| 22,5 | 45 | 90 | 10513 | 14118 | 18620 | 25063 | 35160 | 46751 | 61969 | 82456 | 110643 | 145125 | 195167 | 120 | 60 | 30 |
| 25 | 50 | 100 | 10905 | 14653 | 19320 | 25999 | 36472 | 48496 | 64298 | 85555 | 114803 | 150540 | 202450 | 130 | 65 | 32,5 |
| 27,5 | 55 | 110 | 11298 | 15188 | 20020 | 26934 | 37784 | 50240 | 66628 | 88655 | 118962 | 155955 | 209732 | 140 | 70 | 35 |
| 30 | 60 | 120 | 11690 | 15722 | 20720 | 27869 | 39096 | 51895 | 68958 | 91755 | 123122 | 161371 | 217014 | 150 | 75 | 37,5 |
| | | | 12082 | 16257 | 21420 | 28804 | 40407 | 53729 | 71287 | 94855 | 127281 | 166786 | 224297 | 160 | 80 | 40 |
| | | | 12474 | 16792 | 22120 | 29739 | 41719 | 55474 | 73617 | 97955 | 131441 | 172201 | 231579 | 170 | 85 | 42,5 |
| | | | 13010 | 17350 | 23130 | 31230 | 43370 | 57830 | 76955 | 102310 | 135895 | 180710 | 241000 | 184 | 92 | 46 |
| | | | COSTANTE MOLLA / *Spring costant* (N/mm) | | | | | | | | | | | | | |
| L | | | 39,2 | 53,5 | 70,0 | 93,5 | 131,2 | 174,4 | 232,9 | 310,0 | 415,9 | 541,5 | 728,2 | L | | |
| M | | | 78,5 | 107,0 | 140,0 | 187,0 | 262,4 | 348,9 | 465,9 | 620,0 | 831,9 | 1083,0 | 1456,5 | | M | |
| C | | | 157,0 | 214,0 | 280,0 | 374,0 | 524,8 | 697,8 | 931,8 | 1240,0 | 1663,8 | 2166,0 | 2913,0 | | | C |

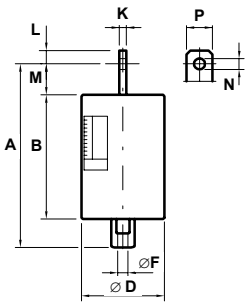
## SUPPORTI ELASTICI A CARICO VARIABILE
## MODELLO C

## *Variable spring hangers*
## *C model*

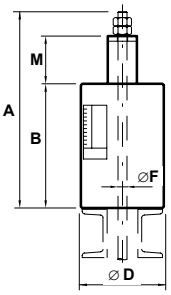
AC



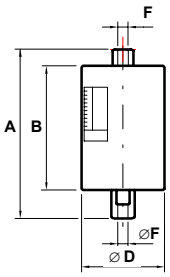

HC



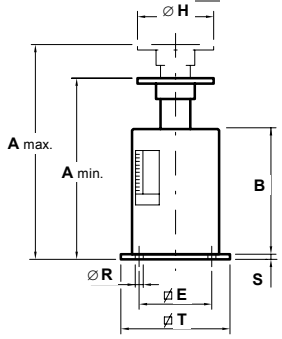

NC




MC

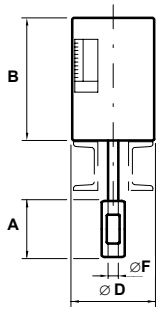



IC

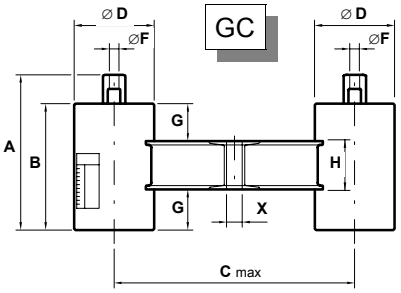



| GR. *Size* | A TIPO / *type* AC-HC | NC | MC | EC | GC | PESO/*Weight* TIPO / *type* AC | HC | NC | MC | IC | EC | GC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | | | | | kg | | | | | | |
| 0 | 261 | 258 | 218 | 125 | 218 | 3,4 | 3,2 | 2,8 | 3 | 5,2 | 2,8 | 15,3 |
| 1 | 253 | 250 | 210 | 125 | 210 | 3,4 | 3,2 | 2,8 | 3 | 5,3 | 2,8 | 15,2 |
| 2 | 273 | 270 | 230 | 125 | 230 | 3,6 | 3,4 | 3 | 3,2 | 5,5 | 3 | 15,7 |
| 3 | 279 | 276 | 236 | 125 | 236 | 5,2 | 5 | 4,6 | 4,8 | 7 | 4,6 | 18,6 |
| 4 | 262 | 259 | 219 | 125 | 219 | 4,9 | 4,7 | 4,3 | 4,5 | 7,6 | 4,3 | 18 |
| 5 | 246 | 243 | 203 | 125 | 203 | 4,9 | 4,7 | 4,3 | 4,5 | 7,7 | 4,3 | 18 |
| 6 | 265 | 262 | 224 | 125 | 224 | 5,3 | 5,1 | 4,7 | 4,9 | 7,8 | 4,7 | 18,8 |
| 7 | 267 | 264 | 226 | 125 | 226 | 5,5 | 5,3 | 4,9 | 5,1 | 8,1 | 4,9 | 19,2 |
| 8 | 280 | 277 | 239 | 125 | 239 | 8,0 | 7,8 | 7,4 | 7,6 | 10 | 7,4 | 24 |
| 9 | 284 | 281 | 247 | 135 | 247 | 15,6 | 15,4 | 14,7 | 15,1 | 19,7 | 14,6 | 44,5 |
| 10 | 302 | 299 | 265 | 135 | 265 | 17,4 | 17,2 | 16,5 | 16,9 | 21,5 | 16,4 | 48,1 |
| 11 | 274 | 271 | 237 | 135 | 237 | 20,8 | 20,6 | 19,9 | 20,3 | 30,3 | 19,8 | 54,5 |
| 12 | 292 | 289 | 255 | 125 | 255 | 23,4 | 23,2 | 22,5 | 22,9 | 32,9 | 22,4 | 67,4 |
| 13 | 341 | 343 | 308 | 170 | 308 | 28,5 | 28,2 | 27,2 | 27,9 | 36,5 | 27,1 | 77,4 |
| 14 | 352 | 346 | 310 | 170 | 310 | 30,5 | 30,1 | 28,5 | 29,6 | 37,6 | 28,7 | 80,9 |
| 15 | 434 | 413 | 373 | 180 | 358 | 40,2 | 39,3 | 36,6 | 38,3 | 43,4 | 36,7 | 98,4 |
| 16 | 475 | 459 | 425 | 195 | 404 | 50,2 | 48,6 | 43,9 | 46,8 | 52,5 | 43,7 | 130 |
| 17 | 511 | 495 | 461 | 195 | 435 | 56 | 54,4 | 49,7 | 52,6 | 58,3 | 49,3 | 141 |
| 18 | 505 | 494 | 461 | 180 | 429 | 111 | 109 | 100 | 105 | 115 | 99 | 276 |
| 19 | 614 | 582 | 550 | 200 | 522 | 145 | 140 | 127 | 135 | 143 | 127 | 336 |
| 20 | 689 | 649 | 620 | 245 | 574 | 156 | 151 | 134 | 146 | 156 | 137 | 358 |
| 21 | 718 | 688 | 662 | 260 | 603 | 193 | 186 | 159 | 178 | 179 | 161 | 446 |
| 22 | 846 | 824 | 730 | 300 | 719 | 245 | 237 | 196 | 227 | 213 | 203 | 547 |

EC




GC

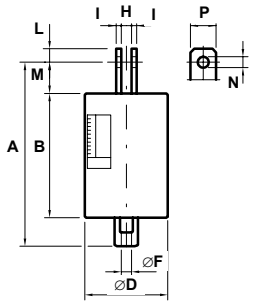



| GR. *Size* | TIPO / *type* AC ÷ GC ØF | | B | ØD | TIPO / *type* AC-HC N | M | L | H | K | I | P | T/ *type* NC M | TIPO / *type* I C Amin | Amax | T | E | ØR | H | S | TIPO / *type* GC Cmax | G | H | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | inch. | mm | mm | | | | | | | | | | | | | | | | | | | |
| 0 | 3/8” | M12 | 183 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 50 | 180 | 193 | 170 | 115 | 18 | 90 | 6 | 2000 | 40 | 60 | 20 |
| 1 | 3/8” | M12 | 175 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 50 | 190 | 203 | 170 | 115 | 18 | 90 | 6 | 2000 | 40 | 60 | 20 |
| 2 | 3/8” | M12 | 195 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 50 | 213 | 226 | 170 | 115 | 18 | 90 | 6 | 2000 | 40 | 60 | 20 |
| 3 | 3/8” | M12 | 201 | 115 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 50 | 205 | 218 | 190 | 140 | 22 | 110 | 6 | 2000 | 50 | 60 | 20 |
| 4 | 3/8” | M12 | 184 | 115 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 50 | 199 | 212 | 190 | 140 | 22 | 110 | 10 | 2000 | 50 | 60 | 20 |
| 5 | 3/8” | M12 | 168 | 115 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 50 | 191 | 204 | 190 | 140 | 22 | 110 | 10 | 2900 | 50 | 60 | 20 |
| 6 | 1/2” | M12 | 182 | 115 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 50 | 200 | 213 | 190 | 140 | 22 | 110 | 10 | 2100 | 50 | 60 | 20 |
| 7 | 1/2” | M12 | 184 | 115 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 50 | 209 | 222 | 190 | 140 | 22 | 110 | 10 | 1600 | 50 | 60 | 20 |
| 8 | 1/2” | M12 | 197 | 168 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 50 | 223 | 236 | 230 | 170 | 22 | 170 | 10 | 1200 | 50 | 60 | 20 |
| 9 | 5/8” | M16 | 196 | 220 | 22 | 38 | 32 | 35 | 8 | 8 | 64 | 50 | 233 | 246 | 336 | 250 | 22 | 170 | 12 | 2300 | 50 | 80 | 30 |
| 10 | 5/8” | M16 | 214 | 220 | 22 | 38 | 32 | 35 | 8 | 8 | 64 | 50 | 259 | 272 | 336 | 250 | 22 | 170 | 12 | 1700 | 50 | 80 | 30 |
| 11 | 5/8” | M16 | 186 | 220 | 22 | 38 | 32 | 40 | 8 | 8 | 64 | 50 | 233 | 246 | 336 | 250 | 22 | 210 | 12 | 1300 | 50 | 80 | 30 |
| 12 | 5/8” | M16 | 204 | 220 | 22 | 38 | 32 | 40 | 8 | 8 | 64 | 50 | 241 | 254 | 336 | 250 | 22 | 210 | 12 | 2300 | 40 | 120 | 30 |
| 13 | 3/4” | M20 | 248 | 220 | 28 | 38 | 32 | 45 | 10 | 10 | 76 | 50 | 271 | 284 | 336 | 250 | 22 | 210 | 12 | 1700 | 75 | 120 | 30 |
| 14 | 1” | M24 | 246 | 220 | 33 | 51 | 38 | 45 | 10 | 10 | 76 | 50 | 269 | 282 | 336 | 250 | 22 | 210 | 12 | 1300 | 75 | 120 | 30 |
| 15 | 1 1/8” | M30 | 298 | 220 | 38 | 76 | 38 | 50 | 16 | 16 | 76 | 50 | 301 | 314 | 336 | 250 | 22 | 210 | 12 | 980 | 75 | 120 | 35 |
| 16 | 1 1/2” | M36 | 334 | 220 | 48 | 76 | 51 | 60 | 20 | 16 | 102 | 50 | 326 | 339 | 336 | 250 | 22 | 210 | 16 | 1700 | 75 | 180 | 55 |
| 17 | 1 1/2” | M36 | 370 | 220 | 48 | 76 | 51 | 70 | 20 | 16 | 102 | 50 | 362 | 375 | 336 | 250 | 22 | 210 | 16 | 1300 | 75 | 180 | 55 |
| 18 | 1 3/4” | M42 | 354 | 324 | 54 | 76 | 64 | 75 | 25 | 20 | 128 | 50 | 335 | 348 | 440 | 340 | 22 | 320 | 20 | 3500 | 40 | 300 | 70 |
| 19 | 2” | M48 | 432 | 324 | 58 | 102 | 77 | 80 | 25 | 20 | 154 | 50 | 402 | 415 | 440 | 340 | 22 | 320 | 20 | 2600 | 50 | 300 | 70 |
| 20 | 2 1/4” | M56 | 484 | 324 | 70 | 115 | 77 | 85 | 25 | 20 | 154 | 50 | 444 | 457 | 440 | 340 | 22 | 320 | 20 | 2000 | 75 | 300 | 70 |
| 21 | 2 1/2” | M64 | 508 | 324 | 78 | 115 | 102 | 90 | 25 | 20 | 204 | 50 | 445 | 458 | 440 | 340 | 22 | 320 | 20 | 2300 | 75 | 380 | 80 |
| 22 | 3” | M80 | 614 | 324 | 96 | 127 | 102 | 100 | 30 | 25 | 204 | 50 | 526 | 539 | 440 | 340 | 22 | 320 | 20 | 1700 | 100 | 380 | 80 |

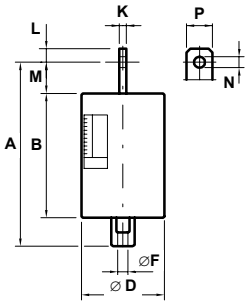
## SUPPORTI ELASTICI A CARICO VARIABILE
## MODELLO M

## *Variable spring hangers*
## *M model*

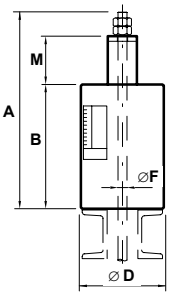
AM



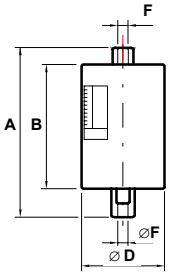

HM



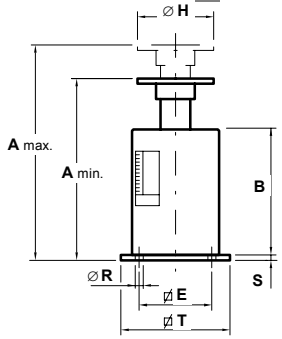

NM




MM

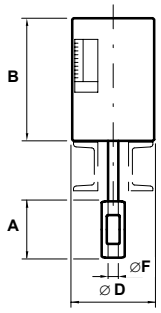



IM

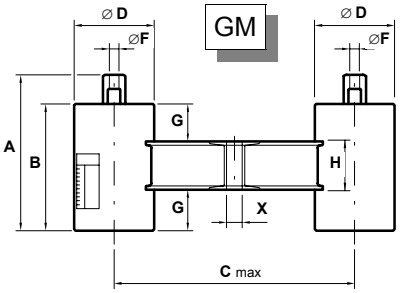



| GR. *Size* | A TIPO / *type* AM-HM | NM | MM | EM | GM | PESO/*Weight* TIPO / *type* AM | HM | NM | MM | IM | EM | GM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | | | | | kg | | | | | | |
| 0 | 277 | 324 | 250 | 125 | 279 | 4,8 | 4,6 | 4,3 | 4,4 | 7,6 | 4,1 | 17,9 |
| 1 | 298 | 345 | 270 | 125 | 300 | 4,9 | 4,7 | 4,4 | 4,5 | 7,6 | 4,2 | 18,1 |
| 2 | 314 | 361 | 278 | 125 | 316 | 5,2 | 5,0 | 4,7 | 4,8 | 8,0 | 4,5 | 18,7 |
| 3 | 334 | 381 | 296 | 125 | 346 | 5,2 | 5,0 | 4,7 | 4,8 | 8,0 | 4,5 | 18,7 |
| 4 | 345 | 392 | 317 | 125 | 357 | 5,8 | 5,6 | 5,3 | 5,4 | 9,8 | 5,1 | 19,9 |
| 5 | 294 | 341 | 266 | 125 | 306 | 5,6 | 5,4 | 5,1 | 5,2 | 9,1 | 4,9 | 19,5 |
| 6 | 305 | 352 | 279 | 135 | 317 | 5,4 | 5,2 | 4,9 | 5,0 | 8,8 | 4,7 | 19,1 |
| 7 | 320 | 367 | 294 | 135 | 332 | 5,6 | 5,4 | 5,1 | 5,2 | 9,1 | 4,9 | 19,5 |
| 8 | 335 | 382 | 309 | 137 | 347 | 6,3 | 6,1 | 5,8 | 5,9 | 9,8 | 5,6 | 20,9 |
| 9 | 389 | 436 | 367 | 170 | 426 | 17,6 | 17,4 | 16,7 | 17,1 | 21,6 | 16,4 | 48,7 |
| 10 | 412 | 459 | 390 | 170 | 449 | 16,9 | 16,7 | 16,0 | 16,4 | 21,3 | 15,7 | 47,3 |
| 11 | 394 | 441 | 372 | 170 | 431 | 18,6 | 18,4 | 17,7 | 18,1 | 26,5 | 17,4 | 50,7 |
| 12 | 392 | 439 | 370 | 170 | 454 | 17,6 | 17,4 | 16,7 | 17,1 | 25,8 | 16,4 | 56,7 |
| 13 | 477 | 529 | 453 | 210 | 535 | 24,5 | 24,2 | 23,2 | 23,9 | 34,0 | 22,7 | 70,4 |
| 14 | 479 | 523 | 456 | 275 | 528 | 50,6 | 50,2 | 23,7 | 24,8 | 33,9 | 23,5 | 72,2 |
| 15 | 567 | 596 | 521 | 295 | 596 | 38,4 | 37,5 | 34,4 | 36,5 | 43,0 | 33,9 | 96,1 |
| 16 | 584 | 618 | 544 | 335 | 618 | 61,3 | 59,7 | 54,1 | 57,9 | 64,7 | 54,3 | 151 |
| 17 | 687 | 732 | 658 | 335 | 732 | 75 | 73,4 | 67,0 | 71,6 | 79,8 | 67,2 | 179 |
| 18 | 639 | 678 | 605 | 380 | 678 | 133 | 130 | 120 | 127 | 142 | 119 | 319 |
| 19 | 815 | 833 | 761 | 413 | 828 | 188 | 184 | 169 | 179 | 194 | 169 | 422 |
| 20 | 928 | 938 | 914 | 355 | 923 | 226 | 221 | 200 | 216 | 237 | 202 | 496 |
| 21 | 987 | 1007 | 936 | 425 | 987 | 264 | 257 | 276 | 250 | 251 | 271 | 590 |
| 22 | 1219 | 1192 | 1117 | 300 | 1157 | 341 | 332 | 359 | 344 | 313 | 361 | 740 |

EM




GM

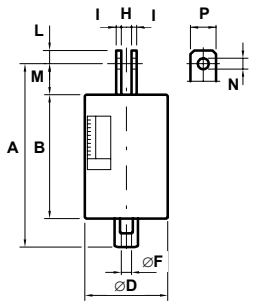



| GR. *Size* | TIPO / *type* AM ÷ GM ⌀F | | B | ⌀D | TIPO / *type* AM-HM N | M | L | H | K | I | P | T/ *type* NM M | TIPO / *type* IM Amin | Amax | T | E | ⌀R | H | S | TIPO / *type* GM Cmax | G | H | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | inch. | mm | mm | | | | | | | | | | | | | | | | | | | |
| 0 | 3/8” | M12 | 199 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 100 | 240 | 265 | 190 | 140 | 18 | 100 | 6 | 2000 | 40 | 60 | 20 |
| 1 | 3/8” | M12 | 220 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 100 | 251 | 276 | 190 | 140 | 18 | 100 | 6 | 2000 | 40 | 60 | 20 |
| 2 | 3/8” | M12 | 236 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 100 | 277 | 302 | 190 | 140 | 18 | 100 | 6 | 2000 | 40 | 60 | 20 |
| 3 | 3/8” | M12 | 256 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 100 | 297 | 322 | 190 | 140 | 22 | 100 | 6 | 2000 | 50 | 60 | 20 |
| 4 | 3/8” | M12 | 267 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 100 | 312 | 337 | 190 | 140 | 22 | 100 | 10 | 2000 | 50 | 60 | 20 |
| 5 | 3/8” | M12 | 216 | 115 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 100 | 279 | 304 | 190 | 140 | 22 | 110 | 10 | 2900 | 50 | 60 | 20 |
| 6 | 1/2” | M12 | 222 | 115 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 100 | 272 | 297 | 190 | 140 | 22 | 110 | 10 | 2100 | 50 | 60 | 20 |
| 7 | 1/2” | M12 | 237 | 115 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 100 | 277 | 302 | 190 | 140 | 22 | 110 | 10 | 1600 | 50 | 60 | 20 |
| 8 | 1/2” | M12 | 252 | 115 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 100 | 292 | 317 | 190 | 140 | 22 | 110 | 10 | 1200 | 50 | 60 | 20 |
| 9 | 5/8” | M16 | 301 | 168 | 22 | 38 | 32 | 35 | 8 | 8 | 64 | 100 | 324 | 349 | 230 | 175 | 22 | 170 | 12 | 2300 | 75 | 80 | 30 |
| 10 | 5/8” | M16 | 324 | 168 | 22 | 38 | 32 | 35 | 8 | 8 | 64 | 100 | 332 | 357 | 230 | 175 | 22 | 170 | 12 | 1700 | 75 | 80 | 30 |
| 11 | 5/8” | M16 | 306 | 168 | 22 | 38 | 32 | 40 | 8 | 8 | 64 | 100 | 354 | 379 | 230 | 175 | 22 | 170 | 12 | 1300 | 75 | 80 | 30 |
| 12 | 5/8” | M16 | 304 | 168 | 22 | 38 | 32 | 40 | 8 | 8 | 64 | 100 | 352 | 377 | 230 | 175 | 22 | 170 | 12 | 2300 | 100 | 120 | 30 |
| 13 | 3/4” | M20 | 384 | 168 | 28 | 38 | 32 | 45 | 10 | 10 | 64 | 100 | 418 | 443 | 230 | 175 | 22 | 170 | 12 | 1700 | 100 | 120 | 30 |
| 14 | 1” | M24 | 373 | 168 | 33 | 51 | 38 | 45 | 10 | 10 | 76 | 100 | 407 | 432 | 230 | 175 | 22 | 170 | 12 | 1300 | 100 | 120 | 30 |
| 15 | 1 1/8” | M30 | 431 | 178 | 38 | 76 | 38 | 50 | 16 | 16 | 76 | 100 | 444 | 469 | 336 | 250 | 22 | 210 | 12 | 980 | 100 | 120 | 35 |
| 16 | 1 1/2” | M36 | 443 | 220 | 48 | 76 | 51 | 60 | 20 | 16 | 102 | 100 | 445 | 470 | 336 | 250 | 22 | 210 | 16 | 1700 | 100 | 180 | 55 |
| 17 | 1 1/2” | M36 | 557 | 220 | 48 | 76 | 51 | 70 | 20 | 16 | 102 | 100 | 559 | 584 | 336 | 250 | 22 | 210 | 16 | 1300 | 100 | 180 | 55 |
| 18 | 1 3/4” | M42 | 488 | 324 | 54 | 76 | 64 | 75 | 25 | 20 | 128 | 100 | 478 | 503 | 440 | 340 | 22 | 320 | 20 | 3500 | 100 | 300 | 70 |
| 19 | 2” | M48 | 633 | 324 | 58 | 102 | 77 | 80 | 25 | 20 | 154 | 100 | 613 | 638 | 440 | 340 | 22 | 320 | 20 | 2600 | 100 | 300 | 70 |
| 20 | 2 1/4” | M56 | 723 | 324 | 70 | 115 | 77 | 85 | 25 | 20 | 154 | 100 | 693 | 718 | 440 | 340 | 22 | 320 | 20 | 2000 | 100 | 300 | 70 |
| 21 | 2 1/2” | M64 | 777 | 324 | 78 | 115 | 102 | 90 | 25 | 20 | 204 | 100 | 724 | 749 | 440 | 340 | 22 | 320 | 20 | 2300 | 100 | 380 | 80 |
| 22 | 3” | M80 | 932 | 324 | 96 | 127 | 102 | 100 | 30 | 20 | 228 | 100 | 854 | 879 | 440 | 340 | 22 | 320 | 20 | 1700 | 100 | 380 | 80 |

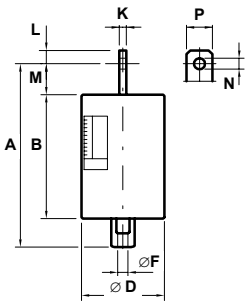
## SUPPORTI ELASTICI A CARICO VARIABILE
## MODELLO L

## *Variable spring hangers*
## *L model*

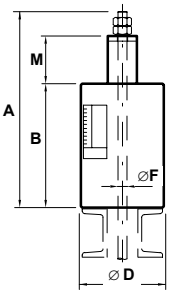
AL



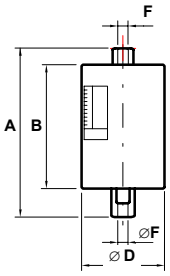

HL



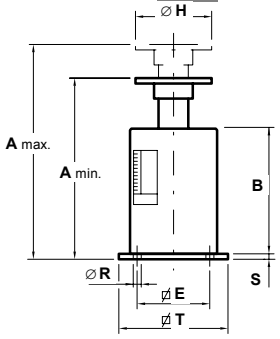

NL




ML

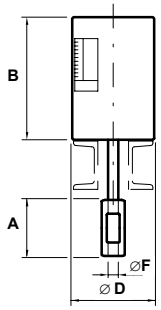



IL

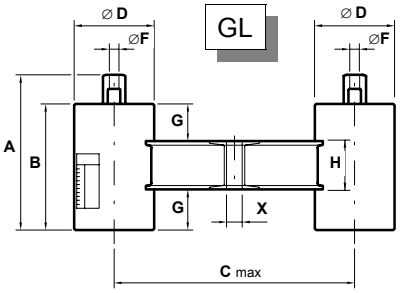



| GR. *Size* | A | | | | | PESO/Weight | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TIPO / *type* | | | | | TIPO / *type* | | | | | | |
| | AL-HL | NL | ML | EL | GL | AL | HL | NL | ML | IL | EL | GL |
| | mm | | | | | kg | | | | | | |
| 0 | 466 | 613 | 438 | 125 | 428 | 7,5 | 7,3 | 7,2 | 7,1 | 11,6 | 6,7 | 23,3 |
| 1 | 508 | 655 | 480 | 125 | 470 | 7,5 | 7,3 | 7,2 | 7,1 | 11,6 | 6,7 | 23,3 |
| 2 | 541 | 688 | 513 | 125 | 503 | 8,2 | 8,0 | 7,9 | 7,8 | 12,4 | 7,4 | 24,7 |
| 3 | 580 | 727 | 552 | 125 | 542 | 8,2 | 8,0 | 7,9 | 7,8 | 12,4 | 7,4 | 24,7 |
| 4 | 602 | 749 | 574 | 125 | 564 | 9,4 | 9,2 | 9,1 | 9,0 | 14,7 | 8,6 | 27,1 |
| 5 | 471 | 618 | 443 | 125 | 433 | 9,0 | 8,8 | 8,7 | 8,6 | 13,7 | 8,2 | 26,4 |
| 6 | 482 | 629 | 456 | 135 | 444 | 8,6 | 8,4 | 8,3 | 8,2 | 13,1 | 7,7 | 25,5 |
| 7 | 512 | 659 | 486 | 135 | 474 | 8,9 | 8,7 | 8,6 | 8,5 | 13,5 | 8,0 | 26,1 |
| 8 | 542 | 689 | 516 | 135 | 504 | 10,3 | 10,1 | 9,9 | 9,9 | 15 | 9,3 | 28,9 |
| 9 | 632 | 779 | 610 | 170 | 594 | 27,7 | 27,5 | 27,1 | 27,2 | 33,3 | 26,2 | 68,9 |
| 10 | 678 | 825 | 656 | 170 | 640 | 26,6 | 26,4 | 25,9 | 26,1 | 32,5 | 25,0 | 66,7 |
| 11 | 641 | 788 | 619 | 170 | 603 | 29,8 | 29,6 | 29,2 | 29,3 | 41,2 | 28,3 | 73,2 |
| 12 | 638 | 785 | 616 | 170 | 600 | 27,9 | 27,7 | 27,2 | 27,4 | 39,5 | 26,3 | 77,3 |
| 13 | 784 | 936 | 766 | 200 | 753 | 40,0 | 39,7 | 38,7 | 39,4 | 54,4 | 37,5 | 101 |
| 14 | 774 | 918 | 747 | 255 | 723 | 41,7 | 41,3 | 39,7 | 40,8 | 54,4 | 38,5 | 104 |
| 15 | 902 | 1031 | 856 | 255 | 826 | 62,1 | 61,2 | 57,7 | 60,2 | 71,6 | 55,4 | 144 |
| 16 | 912 | 1046 | 872 | 295 | 836 | 96,7 | 94,1 | 87,9 | 92,3 | 103 | 85,6 | 222 |
| 17 | 1140 | 1274 | 1100 | 295 | 1064 | 123 | 122 | 114 | 120 | 132 | 111 | 275 |
| 18 | 986 | 1125 | 952 | 330 | 910 | 204 | 201 | 190 | 198 | 218 | 185 | 460 |
| 19 | 1297 | 1415 | 1243 | 355 | 1195 | 306 | 302 | 284 | 297 | 320 | 280 | 660 |
| 20 | 1491 | 1601 | 1432 | 355 | 1376 | 376 | 372 | 344 | 366 | 402 | 341 | 799 |
| 21 | 1578 | 1698 | 1527 | 425 | 1463 | 430 | 423 | 380 | 415 | 435 | 377 | 921 |
| 22 | 1886 | 2014 | 1839 | 300 | 1753 | 590 | 576 | 509 | 566 | 558 | 495 | 1225 |

EL




GL




| GR. *Size* | TIPO / *type* | | | | TIPO / *type* AL-HL | | | | | | | T/ *type* NL | TIPO / *type* IL | | | | | | | TIPO / *type* GL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ⌀F | | B | ⌀D | N | M | L | H | K | I | P | M | Amin | Amax | T | E | ⌀R | H | S | Cmax | G | H | X |
| | inch. | mm | mm | | | | | | | | | | | | | | | | | | | | |
| 0 | 3/8” | M12 | 388 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 200 | 479 | 529 | 190 | 140 | 18 | 100 | 6 | 2000 | 40 | 60 | 20 |
| 1 | 3/8” | M12 | 430 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 200 | 521 | 571 | 190 | 140 | 18 | 100 | 6 | 2000 | 40 | 60 | 20 |
| 2 | 3/8” | M12 | 463 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 200 | 554 | 604 | 190 | 140 | 18 | 100 | 6 | 2000 | 40 | 60 | 20 |
| 3 | 3/8” | M12 | 502 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 200 | 593 | 643 | 190 | 140 | 22 | 100 | 6 | 2000 | 50 | 60 | 20 |
| 4 | 3/8” | M12 | 524 | 102 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 200 | 619 | 669 | 190 | 140 | 22 | 100 | 10 | 2000 | 50 | 60 | 20 |
| 5 | 3/8” | M12 | 393 | 115 | 14 | 38 | 32 | 25 | 6 | 6 | 64 | 200 | 511 | 561 | 190 | 140 | 22 | 110 | 10 | 2900 | 50 | 60 | 20 |
| 6 | 1/2” | M12 | 399 | 115 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 200 | 489 | 539 | 190 | 140 | 22 | 110 | 10 | 2100 | 50 | 60 | 20 |
| 7 | 1/2” | M12 | 429 | 115 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 200 | 519 | 569 | 190 | 140 | 22 | 110 | 10 | 1600 | 50 | 60 | 20 |
| 8 | 1/2” | M12 | 459 | 115 | 18 | 38 | 32 | 30 | 6 | 6 | 64 | 200 | 549 | 599 | 190 | 140 | 22 | 110 | 10 | 1200 | 50 | 60 | 20 |
| 9 | 5/8” | M16 | 544 | 168 | 22 | 38 | 32 | 35 | 8 | 8 | 64 | 200 | 583 | 633 | 230 | 175 | 22 | 170 | 12 | 2300 | 75 | 80 | 30 |
| 10 | 5/8” | M16 | 590 | 168 | 22 | 38 | 32 | 35 | 8 | 8 | 64 | 200 | 608 | 658 | 230 | 175 | 22 | 170 | 12 | 1700 | 75 | 80 | 30 |
| 11 | 5/8” | M16 | 553 | 168 | 22 | 38 | 32 | 40 | 8 | 8 | 64 | 200 | 652 | 702 | 230 | 175 | 22 | 170 | 12 | 1300 | 75 | 80 | 30 |
| 12 | 5/8” | M16 | 550 | 168 | 22 | 38 | 32 | 40 | 8 | 8 | 64 | 200 | 648 | 698 | 230 | 175 | 22 | 170 | 12 | 2300 | 100 | 120 | 30 |
| 13 | 3/4” | M20 | 691 | 168 | 28 | 38 | 32 | 45 | 10 | 10 | 76 | 200 | 777 | 827 | 230 | 175 | 22 | 170 | 12 | 1700 | 100 | 120 | 30 |
| 14 | 1” | M24 | 668 | 168 | 33 | 51 | 38 | 45 | 10 | 10 | 76 | 200 | 754 | 804 | 230 | 175 | 22 | 170 | 12 | 1300 | 100 | 120 | 30 |
| 15 | 1 1/8” | M30 | 766 | 220 | 38 | 76 | 38 | 50 | 16 | 16 | 76 | 200 | 830 | 880 | 250 | 180 | 22 | 170 | 12 | 980 | 100 | 120 | 35 |
| 16 | 1 1/2” | M36 | 771 | 220 | 48 | 76 | 51 | 60 | 20 | 16 | 102 | 200 | 823 | 873 | 336 | 250 | 22 | 210 | 16 | 1700 | 100 | 180 | 55 |
| 17 | 1 1/2” | M36 | 999 | 220 | 48 | 76 | 51 | 70 | 20 | 16 | 102 | 200 | 1051 | 1101 | 336 | 250 | 22 | 210 | 16 | 1300 | 100 | 180 | 55 |
| 18 | 1 3/4” | M42 | 835 | 324 | 54 | 76 | 64 | 75 | 25 | 20 | 128 | 200 | 876 | 926 | 440 | 340 | 22 | 320 | 20 | 3500 | 100 | 300 | 70 |
| 19 | 2” | M48 | 1115 | 324 | 58 | 102 | 77 | 80 | 25 | 20 | 154 | 200 | 1146 | 1196 | 440 | 340 | 22 | 320 | 20 | 2600 | 100 | 300 | 70 |
| 20 | 2 1/4” | M56 | 1286 | 324 | 70 | 115 | 77 | 85 | 25 | 20 | 154 | 200 | 1306 | 1356 | 440 | 340 | 22 | 320 | 20 | 2000 | 100 | 300 | 70 |
| 21 | 2 1/2” | M64 | 1368 | 324 | 78 | 115 | 102 | 90 | 25 | 20 | 204 | 200 | 1365 | 1415 | 440 | 340 | 22 | 320 | 20 | 2300 | 100 | 380 | 80 |
| 22 | 3” | M80 | 1654 | 324 | 96 | 127 | 102 | 100 | 30 | 25 | 204 | 200 | 1626 | 1676 | 440 | 340 | 22 | 320 | 20 | 1700 | 100 | 380 | 80 |

## SUPPORTI ELASTICI A CARICO VARIABILE

## *Variable spring hangers*

I supporti a carico variabile **INOFLEX** sono costruiti, ad eccezione dei materiali, in conformità alle seguenti normative :

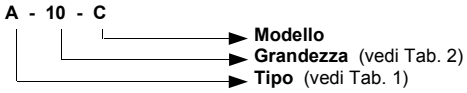
- ANSI B31.1 - Power Piping
- MSS SP-58 - Material, Design and Manufacture
- MSS SP-69 - Selection and Application

### ORDINAZIONE

In caso di ordinazione specificare quanto segue:

- Codice supporto

Il codice per i supporti a carico variabile INOFLEX è il seguente :




- Valore del carico da sostenere ( compreso eventuale peso carpenteria )
- Valore e direzione dello spostamento termico verticale dalla posizione a freddo alla posizione a caldo
- Eventuale bloccaggio in corrispondenza della posizione a freddo

### INSTALLAZIONE

L' installazione dei supporti a carico variabile INOFLEX dovrà essere eseguita in conformità a quanto previsto dai disegni di sistemazione e dalle specifiche.
Per rientrare nel limite di 4° previsto dalle norme MSS SP-69, effettuare i seguenti interventi :

- **Tipi A, H, N, M, E** e **G**

Disassare la posizione del punto di attacco alla struttura rispetto al punto di sospensione.

- **Tipo I**

Adottare rulli, pattini, ecc. ( Richiedere i relativi cataloghi ).

### REGOLAZIONE DEL CARICO DOPO L'INSTALLAZIONE

1 - Prima di effettuare la prova idraulica controllare che tutti i supporti siano in grado di sostenere i carichi richiesti.

2 - Prima di rimuovere le spine di bloccaggio, completata la prova idraulica e l'eventuale coibentazione, eliminare tutti i supporti temporanei.

3 - Dopo aver rimosso le spine di bloccaggio con la procedura indicata al paragrafo seguente e prima dell'avviamento dell'impianto, controllare che tutti gli indici della corsa siano nella posizione a freddo prevista. Se ciò non fosse avvenuto agire sui sistemi di regolazione del carico come indicato al paragrafo seguente, controllando che non vi siano carichi accidentali gravanti sulla tubazione.

4 - Ricontrollare tutti i supporti e quindi bloccare i controdadi.

### RIMOZIONE DELLE SPINE DI BLOCCAGGIO

**Tipi A, H, N, M, E** e **G**
Ruotare opportunamente il tenditore in modo da bilanciare il carico da sostenere con la reazione della molla.
A questo punto le spine di bloccaggio possono essere rimosse facilmente.

**Tipo I**
Per evitare la rotazione del piattello che sostiene il carico rimuovere la copiglia di sicurezza.
Quindi ruotare opportunamente il puntone filettato, in modo da bilanciare il carico da sostenere con la reazione della molla.
A questo punto le spine di bloccaggio possono essere rimosse facilmente.

### REGOLAZIONE DURANTE IL FUNZIONAMENTO

Raggiunte le condizioni di funzionamento verificare che l'indice della corsa si sia portato in prossimità della posizione a caldo prevista.
Se venisse riscontrata una differenza eccessiva effettuare la messa a punto agendo per ogni tipo di supporto sui dispositivi di regolazione descritti al paragrafo precedente.

### MANUTENZIONE

I supporti a carico variabile INOFLEX non richiedono alcuna manutenzione particolare, salvo lubrificazioni periodiche delle parti filettate per facilitare eventuali smontaggi.

*The **INOFLEX** variable support are built (excluding materials) in accordance with the following norms :*

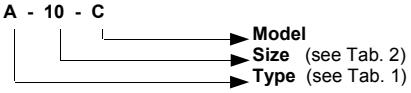
- *ANSI B31.1 - Power Piping*
- *MSS SP-58 - Material, Design and Manufacture*
- *MSS SP-69 - Selection and Application*

### *ORDERING*

*In case of order please specify what follows:*

- *Code of the support*

*The code for INOFLEX variable supports is, for example :*




- *Value of the hot load (including the weight of the components, if any)*
- *Value and displacement direction from the cold position to the hot position*
- *Eventual locking in correspondence of the cold position*

### *INSTALLATION*

*The installation of the INOFLEX variable supports shall be carried out in conformity of what has been indicated by the drawings and specifications.*
*In order to fall within the limit of 4 degrees imposed by the norms MSS SP-69, carry out the following operations:*

- ***Type A, H, N, M, E** and **G***

*The position of the connection point shall be properly misaligned as to the suspension point*

- ***Type I***

*Rolls, sliding supports, etc. (see the relevant catalogues) should be used.*

### *LOAD REGULATION AFTER THE INSTALLATION*

*1 - Before the hydraulic test is carried out, one has to check that all the supports are capable to bear the requested loads.*

*2 - When the hydraulic test and the eventual insulation are completed, one has to get rid of all temporary supports, before removing the locking pins.*

*3 - After removing the locking pins according to the procedure shown at the following paragraph and before starting the plant, one has to check that all the travel indexes are in the foreseen cold position. Should it not be so, act on the load regulation systems as shown at following paragraph, checking that there are no accidental loads on the piping.*

*4 - Check once again all the supports and then lock the nuts.*

### *REMOVING THE LOCKING PINS*

***Types A, H, N, M, E** and **G***
*Suuitably rotate the turnbuckle in such a way to balance, with the spring reaction, the load to be born.*
*Now the locking pins can be easily removed.*

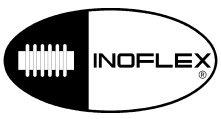
***Type I***
*To avoid the rotation of the load plate, remove the safety split pin.*
*Then suitably rotate the threaded load column in such a way to balance, with the spring reaction, the load to be born.*
*Now the locking pins can be easily removed.*

### *REGULATION DURING THE OPERATION*

*When the operating conditions are reached, verify the travel index, that should be situated near the foreseen hot position.*
*If one finds an excessive difference, carry out the setting up, acting for each type of support, on the regulation devices described at previous paragraph.*

### *MAINTENANCE*

*The INOFLEX variable supports request no particular maintenance, except periodical lubrication on the threaded parts to facilitate possible disassemblies.*




Compensatori di dilatazione

20090 Milano San Felice - Via Anulare, 2
Tel. 02 753.36.41 Ric. Aut.
Telefax : 02 7532580

Stabilimento : Vignate (MI)