

# UniRam™ AS

Integral pressure-compensated, continuously self-flushing and anti-siphon mechanism dripper, ideal for deciduous plantations, tree irrigation and permanent sub surface row crops applications. The ultimate solution for sub surface drip irrigation.

→ 16009 - 16010 - 16011 - 16012 - 20010 - 20012



Pressure-compensated



Anti-siphon mechanism



Self-flushing mechanism

## / Benefits & Features

- **Pressure-compensated** Precise and equal amounts of water delivered over a broad pressure range, ensuring 100% uniformity of water and nutrient distribution along the laterals.
- **Anti-siphon mechanism** Prevents contaminants from being drawn into the dripper, making it ideal for sub surface applications.
- **Continuously self-flushing** Flushes debris throughout operation, while ensuring constant dripper operation even in challenging water quality.
- **Physical root barrier** Better protection against root intrusion, utilizing unique dripper design that creates physical barriers protecting the dripper from root growth into its labyrinth.
- **Wide filtration area** Ensures optimal performance even under harsh water conditions, preventing the entrance of sediment into the labyrinths.
- **Wide water passages** TurboNet™ labyrinth ensures wide water passages, large deep and wide cross-section that improves clogging resistance. The water is drawn into the dripper from the stream center, preventing the entrance of sediment into the drippers.
- **Hybrid (optional)**



New patented add-on to UniRam™, features an on line saddle that allows to combine the benefits of an integral dripper to connect Netafim™ press fit adaptors and prevents drop migration on slopes in certain conditions\*.

\*Please contact your Netafim™ local representative to get more information on the drop migration feature.

# / Specifications

- Pressure-compensated range: 0.5 - 4.0 bar.
- Largest filter in the industry. Recommended filtration: depending on dripper flow rate. Filtration method selected based on the kind and concentration of dirt particles contained in the water. Wherever sand exceeding 2 ppm exists in the water, a Hydrocyclone should be installed before the main filter. Where sand/silt/clay solids exceed 100 ppm, pre treatment it should be applied following Netafim™ expert instructions.
- Double TurboNet™ labyrinth with large water passage.
- Weldable into thick wall driplines (0.90, 1.00, 1.10, 1.20 mm).
- Injected dripper, very low CV with injected silicon diaphragm.
- High UV resistant. Resistant to standard nutrients used in agriculture.
- Compliance ISO 9261 international standards.

## → Drippers technical data

| Flow rate* (l/h) | Working pressure range (bar) | Water passages dimensions width-depth-length (mm) | Filtration area (mm²) | Constant K | Exponent* X | Recommended filtration (micron)/(mesh) |
|------------------|------------------------------|---------------------------------------------------|-----------------------|------------|-------------|----------------------------------------|
| 0.70             | 0.5 - 4.0                    | 0.70 x 0.65 x 40                                  | 110                   | 0.70       | 0           | 130/120                                |
| 1.00             |                              | 0.83 x 0.74 x 40                                  | 130                   | 1.00       | 0           | 130/120                                |
| 1.60             |                              | 1.09 x 0.76 x 40                                  | 130                   | 1.60       | 0           | 200/80                                 |
| 2.30             |                              | 1.26 x 0.93 x 40                                  | 130                   | 2.30       | 0           | 200/80                                 |
| 3.50             |                              | 1.59 x 1.07 x 40                                  | 150                   | 3.50       | 0           | 200/80                                 |

\* Within working pressure range

## → Driplines technical data

| Model | Inside diameter (mm) | Wall thickness (mm) | Outside diameter (mm) | Max. working pressure (bar) | Max. flushing pressure (bar) | KD   |
|-------|----------------------|---------------------|-----------------------|-----------------------------|------------------------------|------|
| 16009 | 14.20                | 0.90                | 16.00                 | 3.0                         | 3.9                          | 1.30 |
| 16010 | 14.20                | 1.00                | 16.20                 | 3.5                         | 4.6                          | 1.30 |
| 16011 | 14.20                | 1.10                | 16.40                 | 3.5                         | 4.6                          | 1.30 |
| 16012 | 14.20                | 1.20                | 16.60                 | 4.0                         | 5.2                          | 1.30 |
| 20010 | 17.50                | 1.00                | 19.50                 | 3.5                         | 4.6                          | 0.40 |
| 20012 | 17.50                | 1.20                | 19.90                 | 4.0                         | 5.2                          | 0.40 |

## → Driplines package data (on bundled coil)

| Model | Wall thickness (mm) | Distance between drippers (m) | Coil length (m) | Average* coil weight (kg) | Coils in a 40 feet container (units) | Total in a 40 feet container (m) |
|-------|---------------------|-------------------------------|-----------------|---------------------------|--------------------------------------|----------------------------------|
| 16009 | 0.90                | 0.15 to 1.00                  | 500             | 20.3                      | 330                                  | 165000                           |
| 16010 | 1.00                | 0.15 to 1.00                  | 500             | 22.2                      | 330                                  | 165000                           |
| 16011 | 1.10                | 0.15 to 1.00                  | 500             | 23.4                      | 330                                  | 165000                           |
| 16012 | 1.20                | 0.15 to 1.00                  | 400             | 21.2                      | 352                                  | 140800                           |
| 20010 | 1.00                | 0.15 to 1.00                  | 300             | 17.4                      | 330                                  | 99000                            |
| 20012 | 1.20                | 0.15 to 1.00                  | 300             | 20.2                      | 330                                  | 99000                            |

\* Calculated weight average. For further details see "Average Coil Weight Disclaimer"

Driplines featuring the Hybrid configuration are supplied in 300 meter coils for 16 mm models and 200 meter coils for 20 mm models.

# / Drippers flow rate vs working pressure

In order to calculate the right flow rate of each dripper, under different working pressures, we use the following formula:

$$Q = K * P^X$$

Where:

Q = Dripper flow rate (liters/hour)

K = Constant (each dripper has his singular constant and must be defined by the dripper producer)

P = Real working pressure (meter)

X = Exponent (each dripper has its singular exponent and must be declared and defined by the dripper producer)

\*ISO 9261 require from the manufacturer to declare the constant K and dripper exponent

In all Netafim™ pressure-compensated drippers - including UniRam™ (shown in this document) – the dripper exponent X is equal to 0 [zero] (within the pressure range defined for each of the drippers), so the right flow rate of the dripper will be always equal (+/- 7% as defined by the international standard: ISO 9261).

Each dripper has a compensation range which includes minimum and maximum pressure; under the minimum pressure defined, the dripper will perform as non-pressure-compensated dripper and provide flow that increases with the pressure increase until reaching the minimum defined limit working pressure.

If the Netafim™ pressure-compensated drippers are exposed to a higher pressure than the defined maximum pressure, the drippers will continue to regulate the flow rate, but become more sensitive to clogging, usually the maximum working pressure of the drippers are determined by the driplines limitations (diameter and wall thickness) and most importantly the pipe and its associated connections.

## / Max. lateral length

Flow Variation (FV) expresses the flow variation between the dripper “sensing” the highest pressure and the one “sensing” the lowest pressure in an irrigation block (zone).

These drippers will not always be the first and last drippers on the dripline.

$$FV \% = (Q_{\max} - Q_{\min}) / Q_{\max} * 100$$

\*International standards define 10% flow variation to be considered as uniform irrigation.

In order to calculate the maximum run lengths that can be planned for specific dripline (considering all the hydraulic factors influencing the flow within the same dripline), we use a calculation software that was developed by Netafim™ based on Darcy-Waisbach formulas + years of design experience and cooperation with academic institutes.

All the tables presented in this document are for initial reference only; the exact run length of the driplines is obtained from design software that considers various hydraulic factors in the entire system.

There might be small variance between the different software's in the market due to the calculation method and assumptions each software is using. For an initial estimate of the dripline length, the data that is presented in this document (within the tables shown) is sufficiently accurate.

As we have already seen, pressure-compensated drippers of Netafim™ will provide equal flow irrespective of the working pressure, therefore, the factors that are affecting the dripline run lengths will be: the dripline inlet pressure, the minimum working pressure set for the dripper and the slope.

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 16009/16010/16011/16012 • ID 14.2 mm • Kd 1.3 • Flow rate 0.70 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |     |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| Uphill 2%    | 1.0                               | 83  | 112 | 135 | 153 | 168 | 180 | 190 | 197 | 204 |
|              | 1.5                               | 111 | 154 | 190 | 221 | 248 | 271 | 291 | 310 | 326 |
|              | 2.0                               | 130 | 182 | 227 | 267 | 302 | 334 | 362 | 388 | 411 |
|              | 2.5                               | 145 | 204 | 256 | 303 | 345 | 383 | 418 | 449 | 478 |
|              | 3.0                               | 158 | 223 | 281 | 333 | 380 | 424 | 463 | 500 | 534 |
|              | 3.5                               | 169 | 239 | 302 | 359 | 412 | 459 | 503 | 545 | 583 |
|              | 4.0                               | 179 | 254 | 321 | 383 | 439 | 491 | 539 | 584 | 626 |
| Flat terrain | 1.0                               | 96  | 137 | 176 | 213 | 247 | 279 | 310 | 340 | 369 |
|              | 1.5                               | 121 | 174 | 224 | 270 | 314 | 356 | 395 | 434 | 471 |
|              | 2.0                               | 139 | 200 | 257 | 311 | 361 | 410 | 456 | 500 | 543 |
|              | 2.5                               | 153 | 221 | 284 | 343 | 400 | 453 | 504 | 554 | 600 |
|              | 3.0                               | 165 | 239 | 306 | 371 | 431 | 489 | 545 | 598 | 649 |
|              | 3.5                               | 176 | 254 | 326 | 395 | 460 | 522 | 581 | 637 | 692 |
|              | 4.0                               | 185 | 268 | 344 | 417 | 485 | 550 | 613 | 673 | 731 |
| Downhill 2%  | 1.0                               | 108 | 163 | 219 | 275 | 331 | 387 | 443 | 500 | 557 |
|              | 1.5                               | 131 | 195 | 258 | 321 | 382 | 444 | 505 | 565 | 626 |
|              | 2.0                               | 148 | 218 | 288 | 355 | 422 | 488 | 553 | 617 | 681 |
|              | 2.5                               | 161 | 238 | 312 | 384 | 455 | 524 | 593 | 661 | 727 |
|              | 3.0                               | 173 | 254 | 332 | 409 | 483 | 557 | 628 | 698 | 768 |
|              | 3.5                               | 183 | 269 | 351 | 431 | 509 | 585 | 659 | 733 | 805 |
|              | 4.0                               | 192 | 281 | 368 | 451 | 532 | 610 | 688 | 763 | 838 |

Minimum considered pressure 0.5 bar. Max. working pressure according the dripline wall thickness definition  
Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 16009/16010/16011/16012 • ID 14.2 mm • Kd 1.3 • Flow rate 1.00 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |     |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| Uphill 2%    | 1.0                               | 68  | 93  | 113 | 131 | 145 | 158 | 167 | 176 | 184 |
|              | 1.5                               | 90  | 125 | 156 | 183 | 207 | 228 | 247 | 265 | 280 |
|              | 2.0                               | 105 | 147 | 185 | 219 | 249 | 277 | 302 | 326 | 347 |
|              | 2.5                               | 116 | 164 | 208 | 247 | 282 | 315 | 345 | 373 | 399 |
|              | 3.0                               | 126 | 179 | 227 | 270 | 310 | 347 | 381 | 412 | 442 |
|              | 3.5                               | 135 | 192 | 243 | 291 | 334 | 375 | 412 | 447 | 480 |
|              | 4.0                               | 142 | 203 | 258 | 309 | 355 | 399 | 439 | 478 | 514 |
| Flat terrain | 1.0                               | 76  | 109 | 140 | 169 | 196 | 222 | 246 | 270 | 293 |
|              | 1.5                               | 96  | 138 | 177 | 214 | 249 | 282 | 314 | 345 | 374 |
|              | 2.0                               | 110 | 158 | 204 | 246 | 286 | 325 | 362 | 397 | 431 |
|              | 2.5                               | 121 | 175 | 225 | 272 | 317 | 359 | 400 | 439 | 477 |
|              | 3.0                               | 131 | 189 | 243 | 294 | 342 | 388 | 432 | 474 | 515 |
|              | 3.5                               | 139 | 201 | 258 | 313 | 364 | 414 | 461 | 506 | 549 |
|              | 4.0                               | 147 | 212 | 272 | 330 | 384 | 436 | 486 | 534 | 580 |
| Downhill 2%  | 1.0                               | 83  | 125 | 166 | 208 | 248 | 290 | 330 | 372 | 412 |
|              | 1.5                               | 102 | 151 | 199 | 246 | 292 | 337 | 382 | 428 | 472 |
|              | 2.0                               | 115 | 170 | 223 | 274 | 325 | 374 | 422 | 471 | 518 |
|              | 2.5                               | 126 | 185 | 242 | 298 | 352 | 404 | 456 | 507 | 556 |
|              | 3.0                               | 135 | 198 | 259 | 318 | 374 | 430 | 484 | 537 | 590 |
|              | 3.5                               | 144 | 210 | 274 | 336 | 395 | 453 | 510 | 565 | 620 |
|              | 4.0                               | 151 | 221 | 287 | 352 | 413 | 474 | 533 | 590 | 647 |

Minimum considered pressure 0.5 bar. Max. working pressure according the dripline wall thickness definition

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 16009/16010/16011/16012 • ID 14.2 mm • Kd 1.3 • Flow rate 1.60 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |     |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| Uphill 2%    | 1.0                               | 51  | 71  | 88  | 103 | 116 | 127 | 138 | 147 | 155 |
|              | 1.5                               | 67  | 95  | 119 | 141 | 160 | 179 | 195 | 210 | 224 |
|              | 2.0                               | 78  | 110 | 140 | 166 | 191 | 214 | 234 | 254 | 272 |
|              | 2.5                               | 86  | 123 | 156 | 187 | 214 | 241 | 265 | 288 | 309 |
|              | 3.0                               | 93  | 133 | 170 | 204 | 235 | 263 | 290 | 316 | 340 |
|              | 3.5                               | 100 | 143 | 182 | 218 | 251 | 284 | 313 | 341 | 367 |
|              | 4.0                               | 105 | 151 | 192 | 231 | 267 | 301 | 333 | 363 | 391 |
| Flat terrain | 1.0                               | 56  | 80  | 103 | 124 | 144 | 163 | 182 | 200 | 216 |
|              | 1.5                               | 70  | 101 | 130 | 158 | 184 | 208 | 231 | 254 | 276 |
|              | 2.0                               | 81  | 116 | 150 | 181 | 211 | 239 | 266 | 293 | 318 |
|              | 2.5                               | 89  | 128 | 165 | 200 | 233 | 265 | 294 | 324 | 352 |
|              | 3.0                               | 96  | 139 | 178 | 216 | 252 | 286 | 318 | 350 | 380 |
|              | 3.5                               | 102 | 147 | 190 | 230 | 268 | 305 | 339 | 373 | 405 |
|              | 4.0                               | 108 | 155 | 200 | 243 | 283 | 321 | 358 | 393 | 428 |
| Downhill 2%  | 1.0                               | 60  | 89  | 117 | 145 | 173 | 200 | 228 | 255 | 282 |
|              | 1.5                               | 74  | 108 | 142 | 175 | 206 | 238 | 269 | 299 | 329 |
|              | 2.0                               | 84  | 122 | 160 | 197 | 232 | 266 | 300 | 333 | 365 |
|              | 2.5                               | 92  | 134 | 175 | 214 | 252 | 289 | 325 | 360 | 395 |
|              | 3.0                               | 98  | 144 | 187 | 229 | 269 | 309 | 346 | 384 | 421 |
|              | 3.5                               | 104 | 152 | 198 | 242 | 285 | 326 | 366 | 405 | 444 |
|              | 4.0                               | 110 | 160 | 208 | 254 | 299 | 342 | 384 | 425 | 464 |

Minimum considered pressure 0.5 bar. Max. working pressure according to the dripline wall thickness definition

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 16009/16010/16011/16012 • ID 14.2 mm • Kd 1.3 • Flow rate 2.30 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |     |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| Uphill 2%    | 1.0                               | 41  | 58  | 72  | 85  | 97  | 106 | 116 | 124 | 132 |
|              | 1.5                               | 53  | 76  | 96  | 114 | 130 | 146 | 160 | 174 | 186 |
|              | 2.0                               | 62  | 88  | 112 | 134 | 154 | 173 | 190 | 207 | 222 |
|              | 2.5                               | 68  | 98  | 124 | 150 | 172 | 194 | 214 | 233 | 251 |
|              | 3.0                               | 74  | 106 | 135 | 163 | 188 | 211 | 234 | 256 | 276 |
|              | 3.5                               | 79  | 113 | 145 | 174 | 202 | 228 | 251 | 275 | 297 |
|              | 4.0                               | 83  | 119 | 153 | 184 | 214 | 241 | 267 | 292 | 315 |
| Flat terrain | 1.0                               | 44  | 63  | 81  | 98  | 114 | 130 | 144 | 158 | 171 |
|              | 1.5                               | 55  | 80  | 103 | 125 | 145 | 165 | 183 | 201 | 218 |
|              | 2.0                               | 64  | 92  | 118 | 143 | 167 | 189 | 210 | 231 | 251 |
|              | 2.5                               | 70  | 101 | 130 | 158 | 184 | 209 | 233 | 256 | 278 |
|              | 3.0                               | 76  | 109 | 141 | 171 | 199 | 226 | 252 | 276 | 301 |
|              | 3.5                               | 80  | 116 | 150 | 182 | 212 | 241 | 268 | 294 | 320 |
|              | 4.0                               | 85  | 122 | 158 | 192 | 223 | 253 | 283 | 311 | 338 |
| Downhill 2%  | 1.0                               | 46  | 68  | 90  | 111 | 132 | 153 | 173 | 193 | 212 |
|              | 1.5                               | 57  | 84  | 110 | 135 | 160 | 183 | 206 | 230 | 252 |
|              | 2.0                               | 65  | 95  | 124 | 153 | 179 | 206 | 231 | 257 | 281 |
|              | 2.5                               | 72  | 105 | 136 | 167 | 196 | 224 | 252 | 279 | 305 |
|              | 3.0                               | 77  | 113 | 146 | 179 | 209 | 240 | 270 | 298 | 326 |
|              | 3.5                               | 82  | 119 | 155 | 189 | 222 | 254 | 285 | 315 | 344 |
|              | 4.0                               | 86  | 125 | 163 | 199 | 233 | 267 | 298 | 330 | 361 |

Minimum considered pressure 0.5 bar. Max. working pressure according to the dripline wall thickness definition

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 16009/16010/16011/16012 • ID 14.2 mm • Kd 1.3 • Flow rate 3.50 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |     |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| Uphill 2%    | 1.0                               | 32  | 45  | 56  | 67  | 77  | 85  | 94  | 101 | 108 |
|              | 1.5                               | 41  | 58  | 74  | 89  | 102 | 114 | 126 | 137 | 147 |
|              | 2.0                               | 47  | 68  | 86  | 104 | 119 | 134 | 149 | 162 | 175 |
|              | 2.5                               | 52  | 75  | 96  | 115 | 133 | 151 | 166 | 182 | 196 |
|              | 3.0                               | 56  | 81  | 104 | 125 | 145 | 164 | 182 | 198 | 215 |
|              | 3.5                               | 60  | 86  | 111 | 134 | 155 | 175 | 194 | 213 | 230 |
|              | 4.0                               | 63  | 91  | 117 | 142 | 164 | 186 | 206 | 226 | 244 |
| Flat terrain | 1.0                               | 33  | 48  | 62  | 75  | 87  | 99  | 110 | 121 | 131 |
|              | 1.5                               | 42  | 61  | 78  | 95  | 110 | 125 | 139 | 153 | 166 |
|              | 2.0                               | 48  | 70  | 90  | 109 | 127 | 144 | 161 | 176 | 192 |
|              | 2.5                               | 53  | 77  | 99  | 120 | 140 | 159 | 178 | 195 | 212 |
|              | 3.0                               | 57  | 83  | 107 | 130 | 151 | 172 | 192 | 211 | 229 |
|              | 3.5                               | 61  | 88  | 114 | 138 | 161 | 183 | 204 | 224 | 244 |
|              | 4.0                               | 64  | 93  | 120 | 146 | 170 | 193 | 215 | 237 | 258 |
| Downhill 2%  | 1.0                               | 35  | 51  | 67  | 82  | 97  | 112 | 126 | 140 | 154 |
|              | 1.5                               | 43  | 63  | 82  | 101 | 119 | 136 | 153 | 169 | 186 |
|              | 2.0                               | 49  | 72  | 94  | 114 | 134 | 153 | 173 | 191 | 209 |
|              | 2.5                               | 54  | 79  | 102 | 125 | 147 | 168 | 188 | 208 | 228 |
|              | 3.0                               | 58  | 85  | 110 | 134 | 158 | 180 | 202 | 223 | 244 |
|              | 3.5                               | 62  | 90  | 117 | 143 | 167 | 191 | 214 | 236 | 258 |
|              | 4.0                               | 65  | 95  | 123 | 150 | 176 | 200 | 225 | 248 | 271 |

Minimum considered pressure 0.5 bar. Max. working pressure according to the dripline wall thickness definition

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 20010/20012 • ID 17.5 mm • Kd 0.4 • Flow rate 0.70 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |      |      |      |      |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|------|------|------|------|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7  | 0.8  | 0.9  | 1.0  |
| Uphill 2%    | 1.0                               | 130 | 162 | 184 | 199 | 209 | 217  | 223  | 228  | 231  |
|              | 1.5                               | 182 | 238 | 280 | 313 | 340 | 361  | 378  | 393  | 406  |
|              | 2.0                               | 218 | 289 | 346 | 393 | 432 | 466  | 494  | 518  | 539  |
|              | 2.5                               | 246 | 329 | 398 | 456 | 505 | 548  | 586  | 618  | 648  |
|              | 3.0                               | 269 | 363 | 442 | 509 | 566 | 617  | 662  | 703  | 739  |
|              | 3.5                               | 289 | 392 | 479 | 554 | 620 | 678  | 730  | 777  | 819  |
|              | 4.0                               | 307 | 419 | 513 | 595 | 667 | 732  | 790  | 842  | 890  |
| Flat terrain | 1.0                               | 168 | 233 | 292 | 347 | 397 | 445  | 489  | 532  | 573  |
|              | 1.5                               | 213 | 297 | 373 | 443 | 507 | 568  | 626  | 681  | 734  |
|              | 2.0                               | 245 | 343 | 430 | 511 | 586 | 656  | 722  | 787  | 848  |
|              | 2.5                               | 271 | 379 | 476 | 565 | 648 | 727  | 801  | 871  | 939  |
|              | 3.0                               | 293 | 409 | 514 | 611 | 701 | 786  | 866  | 943  | 1017 |
|              | 3.5                               | 312 | 436 | 548 | 652 | 748 | 839  | 925  | 1006 | 1085 |
|              | 4.0                               | 329 | 460 | 579 | 688 | 790 | 886  | 977  | 1063 | 1146 |
| Downhill 2%  | 1.0                               | 207 | 309 | 412 | 514 | 616 | 718  | 817  | 905  | 990  |
|              | 1.5                               | 245 | 359 | 471 | 581 | 689 | 796  | 900  | 995  | 1087 |
|              | 2.0                               | 273 | 397 | 517 | 634 | 748 | 860  | 969  | 1068 | 1166 |
|              | 2.5                               | 296 | 429 | 556 | 678 | 797 | 914  | 1027 | 1132 | 1235 |
|              | 3.0                               | 316 | 456 | 589 | 717 | 841 | 962  | 1079 | 1189 | 1295 |
|              | 3.5                               | 334 | 480 | 619 | 752 | 880 | 1005 | 1126 | 1239 | 1350 |
|              | 4.0                               | 350 | 503 | 646 | 784 | 916 | 1045 | 1170 | 1287 | 1400 |

Minimum considered pressure 0.5 bar. Max. working pressure according to the dripline wall thickness definition  
Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 20010/20012 • ID 17.5 mm • Kd 0.4 • Flow rate 1.00 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |      |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0  |
| Uphill 2%    | 1.0                               | 109 | 140 | 162 | 178 | 190 | 200 | 208 | 214 | 219  |
|              | 1.5                               | 149 | 198 | 236 | 268 | 295 | 316 | 335 | 352 | 366  |
|              | 2.0                               | 177 | 238 | 288 | 331 | 367 | 398 | 426 | 451 | 473  |
|              | 2.5                               | 199 | 269 | 328 | 380 | 424 | 463 | 498 | 530 | 558  |
|              | 3.0                               | 217 | 296 | 362 | 420 | 472 | 517 | 558 | 596 | 630  |
|              | 3.5                               | 233 | 318 | 392 | 456 | 512 | 564 | 610 | 653 | 692  |
|              | 4.0                               | 247 | 338 | 418 | 487 | 549 | 606 | 657 | 704 | 748  |
| Flat terrain | 1.0                               | 133 | 185 | 232 | 276 | 316 | 353 | 389 | 423 | 456  |
|              | 1.5                               | 169 | 236 | 296 | 352 | 403 | 452 | 498 | 542 | 583  |
|              | 2.0                               | 194 | 272 | 341 | 406 | 465 | 522 | 574 | 626 | 674  |
|              | 2.5                               | 215 | 300 | 378 | 449 | 515 | 577 | 636 | 693 | 747  |
|              | 3.0                               | 232 | 325 | 408 | 485 | 557 | 624 | 689 | 750 | 809  |
|              | 3.5                               | 247 | 346 | 435 | 518 | 594 | 666 | 734 | 800 | 863  |
|              | 4.0                               | 260 | 365 | 459 | 546 | 627 | 704 | 776 | 845 | 911  |
| Downhill 2%  | 1.0                               | 157 | 233 | 308 | 382 | 455 | 528 | 601 | 673 | 745  |
|              | 1.5                               | 189 | 275 | 358 | 439 | 518 | 596 | 674 | 750 | 826  |
|              | 2.0                               | 212 | 306 | 396 | 483 | 568 | 650 | 731 | 812 | 891  |
|              | 2.5                               | 230 | 332 | 428 | 520 | 609 | 696 | 781 | 864 | 947  |
|              | 3.0                               | 247 | 354 | 455 | 552 | 645 | 736 | 824 | 911 | 996  |
|              | 3.5                               | 261 | 374 | 480 | 581 | 677 | 771 | 863 | 953 | 1041 |
|              | 4.0                               | 274 | 392 | 502 | 607 | 707 | 804 | 898 | 991 | 1082 |

Minimum considered pressure 0.5 bar. Max. working pressure according the dripline wall thickness definition  
Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 20010/20012 • ID 17.5 mm • Kd 0.4 • Flow rate 1.60 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |     |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| Uphill 2%    | 1.0                               | 85  | 111 | 132 | 148 | 161 | 173 | 182 | 190 | 196 |
|              | 1.5                               | 114 | 153 | 186 | 214 | 237 | 258 | 277 | 293 | 308 |
|              | 2.0                               | 134 | 182 | 222 | 258 | 289 | 317 | 342 | 365 | 386 |
|              | 2.5                               | 149 | 204 | 252 | 293 | 330 | 363 | 394 | 421 | 447 |
|              | 3.0                               | 162 | 223 | 276 | 323 | 364 | 402 | 437 | 469 | 499 |
|              | 3.5                               | 174 | 240 | 297 | 348 | 394 | 436 | 474 | 510 | 544 |
|              | 4.0                               | 184 | 254 | 316 | 371 | 420 | 466 | 508 | 547 | 583 |
| Flat terrain | 1.0                               | 98  | 137 | 171 | 203 | 233 | 261 | 287 | 313 | 337 |
|              | 1.5                               | 124 | 174 | 218 | 260 | 298 | 333 | 368 | 401 | 431 |
|              | 2.0                               | 143 | 200 | 252 | 299 | 343 | 385 | 425 | 463 | 498 |
|              | 2.5                               | 158 | 221 | 278 | 331 | 380 | 426 | 470 | 512 | 552 |
|              | 3.0                               | 170 | 239 | 301 | 358 | 411 | 461 | 509 | 554 | 598 |
|              | 3.5                               | 181 | 255 | 321 | 382 | 439 | 492 | 542 | 591 | 638 |
|              | 4.0                               | 191 | 269 | 338 | 403 | 463 | 519 | 574 | 625 | 674 |
| Downhill 2%  | 1.0                               | 111 | 163 | 212 | 262 | 310 | 357 | 404 | 451 | 498 |
|              | 1.5                               | 135 | 195 | 252 | 307 | 361 | 412 | 464 | 515 | 564 |
|              | 2.0                               | 152 | 219 | 281 | 341 | 399 | 455 | 510 | 564 | 617 |
|              | 2.5                               | 166 | 238 | 306 | 370 | 431 | 491 | 549 | 606 | 661 |
|              | 3.0                               | 178 | 255 | 326 | 394 | 459 | 522 | 582 | 642 | 700 |
|              | 3.5                               | 189 | 270 | 345 | 416 | 484 | 550 | 613 | 674 | 735 |
|              | 4.0                               | 199 | 283 | 362 | 436 | 506 | 574 | 640 | 704 | 767 |

Minimum considered pressure 0.5 bar. Max. working pressure according the dripline wall thickness definition

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 20010/20012 • ID 17.5 mm • Kd 0.4 • Flow rate 2.30 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |     |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| Uphill 2%    | 1.0                               | 69  | 92  | 110 | 126 | 139 | 150 | 159 | 167 | 175 |
|              | 1.5                               | 91  | 124 | 152 | 176 | 197 | 216 | 233 | 248 | 263 |
|              | 2.0                               | 107 | 146 | 181 | 211 | 238 | 262 | 284 | 304 | 323 |
|              | 2.5                               | 119 | 164 | 203 | 238 | 269 | 298 | 324 | 348 | 371 |
|              | 3.0                               | 129 | 179 | 222 | 261 | 296 | 328 | 358 | 385 | 411 |
|              | 3.5                               | 138 | 192 | 238 | 281 | 319 | 354 | 386 | 417 | 446 |
|              | 4.0                               | 146 | 203 | 253 | 299 | 340 | 377 | 413 | 446 | 477 |
| Flat terrain | 1.0                               | 77  | 108 | 136 | 161 | 184 | 207 | 228 | 248 | 267 |
|              | 1.5                               | 98  | 137 | 173 | 205 | 235 | 264 | 291 | 317 | 342 |
|              | 2.0                               | 113 | 158 | 199 | 237 | 272 | 305 | 336 | 366 | 395 |
|              | 2.5                               | 124 | 175 | 220 | 262 | 301 | 337 | 372 | 405 | 437 |
|              | 3.0                               | 134 | 189 | 238 | 283 | 325 | 365 | 402 | 439 | 473 |
|              | 3.5                               | 143 | 201 | 254 | 302 | 347 | 389 | 430 | 468 | 505 |
|              | 4.0                               | 151 | 212 | 268 | 319 | 366 | 411 | 454 | 494 | 534 |
| Downhill 2%  | 1.0                               | 85  | 124 | 161 | 197 | 232 | 267 | 302 | 335 | 369 |
|              | 1.5                               | 105 | 150 | 194 | 235 | 275 | 314 | 351 | 389 | 425 |
|              | 2.0                               | 119 | 170 | 217 | 263 | 307 | 349 | 390 | 430 | 469 |
|              | 2.5                               | 130 | 185 | 237 | 286 | 332 | 378 | 422 | 464 | 506 |
|              | 3.0                               | 139 | 199 | 254 | 306 | 355 | 403 | 449 | 494 | 537 |
|              | 3.5                               | 148 | 210 | 268 | 323 | 375 | 425 | 474 | 520 | 566 |
|              | 4.0                               | 155 | 221 | 282 | 339 | 393 | 445 | 495 | 545 | 592 |

Minimum considered pressure 0.5 bar. Max. working pressure according the dripline wall thickness definition

## Max. lateral length (meter) at different inlet pressure and different slopes

UniRam™ AS 20010/20012 • ID 17.5 mm • Kd 0.4 • Flow rate 3.50 l/h

|              | Distance between drippers (meter) |     |     |     |     |     |     |     |     |     |
|--------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|              | Inlet pressure (bar)              | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| Uphill 2%    | 1.0                               | 54  | 73  | 89  | 102 | 114 | 124 | 133 | 141 | 149 |
|              | 1.5                               | 71  | 97  | 120 | 140 | 157 | 174 | 188 | 202 | 214 |
|              | 2.0                               | 82  | 114 | 141 | 166 | 187 | 207 | 226 | 243 | 259 |
|              | 2.5                               | 92  | 127 | 158 | 186 | 211 | 235 | 256 | 276 | 295 |
|              | 3.0                               | 99  | 138 | 172 | 203 | 231 | 257 | 281 | 303 | 325 |
|              | 3.5                               | 106 | 148 | 184 | 218 | 248 | 277 | 302 | 328 | 351 |
|              | 4.0                               | 112 | 156 | 196 | 231 | 263 | 294 | 322 | 349 | 374 |
| Flat terrain | 1.0                               | 59  | 82  | 103 | 123 | 141 | 158 | 174 | 189 | 204 |
|              | 1.5                               | 75  | 104 | 132 | 157 | 179 | 202 | 222 | 242 | 261 |
|              | 2.0                               | 86  | 120 | 152 | 181 | 207 | 232 | 257 | 280 | 302 |
|              | 2.5                               | 95  | 133 | 168 | 200 | 229 | 258 | 284 | 310 | 334 |
|              | 3.0                               | 102 | 144 | 181 | 216 | 248 | 279 | 307 | 335 | 361 |
|              | 3.5                               | 109 | 153 | 193 | 230 | 265 | 297 | 328 | 357 | 386 |
|              | 4.0                               | 115 | 161 | 204 | 243 | 279 | 314 | 346 | 377 | 407 |
| Downhill 2%  | 1.0                               | 63  | 92  | 118 | 144 | 169 | 193 | 217 | 240 | 264 |
|              | 1.5                               | 78  | 112 | 144 | 174 | 202 | 230 | 258 | 284 | 310 |
|              | 2.0                               | 89  | 127 | 162 | 196 | 227 | 258 | 288 | 317 | 345 |
|              | 2.5                               | 98  | 139 | 177 | 214 | 248 | 281 | 313 | 344 | 374 |
|              | 3.0                               | 105 | 149 | 190 | 229 | 265 | 300 | 334 | 367 | 399 |
|              | 3.5                               | 111 | 158 | 202 | 243 | 281 | 318 | 354 | 388 | 421 |
|              | 4.0                               | 117 | 167 | 212 | 255 | 295 | 333 | 370 | 406 | 441 |

Minimum considered pressure 0.5 bar. Max. working pressure according the dripline wall thickness definition