

Button and Pot on line dripper

On line non-pressure-compensated dripper, for applications such as greenhouses, nurseries, garden pots.



High clogging resistance



Flexible location



Compact size

/ Benefits & Features

- **High clogging resistance** Even with challenging water quality, with self-cleaning labyrinth that flushes debris throughout operation.
- **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.
- **Flexible location** Drippers can be positioned exactly where required. Number of drippers can be increased to increase the water quantities applied. Allows the installation of "spider assembly", splitting the drip supply to a number of drip outlets.

/ Specifications

- Working pressure up to 2.0 bar.
- Recommended filtration: 130 micron / 120 mesh. 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.
- TurboNet™ labyrinth with large water passage.
- Insertable into thick wall blank PE pipes (0.90, 1.00, 1.20 mm).
- Injected dripper, very low CV.
- High UV resistance. Resistant to standard nutrients used in agriculture.
- Compliance ISO 9261 international standards.
- 3 different outlets: nipple, barb, flat. The Pot model to be threaded into a 3*5 mm micro-tube.

→ Drippers technical data

Button drippers

| Flow rate* (l/h) | Max. working pressure (bar) | Water passages dimensions width-depth-length (mm) | Filtration area (mm ²) | Constant K | Exponent X | Base code color | Cap color code |
|------------------|-----------------------------|---|------------------------------------|------------|------------|-----------------|----------------|
| 2.0 | 2.0 | 0.98 x 0.89 x 50 | 2.0 | 0.662 | 0.48 | Red | Black |
| 3.0 | 2.0 | 1.05 x 0.95 x 50 | 2.0 | 0.993 | 0.48 | Blue | Black |
| 4.0 | 2.0 | 1.27 x 1.20 x 50 | 2.0 | 1.325 | 0.48 | Black | Black |
| 8.0 | 2.0 | 1.55 x 1.55 x 50 | 2.0 | 2.649 | 0.48 | Green | Black |

*Flow rate at 1.0 bar pressure

→ Drippers technical data

Pot drippers

| Flow rate* (l/h) | Max. working pressure (bar) | Water passages dimensions width-depth-length (mm) | Constant K | Exponent X | Base code color | Cap color code |
|------------------|-----------------------------|---|------------|------------|-----------------|----------------|
| 2.0 | 2.0 | 0.98 x 0.89 x 50 | 0.662 | 0.48 | Red | Black |
| 4.0 | 2.0 | 1.27 x 1.20 x 50 | 1.325 | 0.48 | Black | Black |
| 8.0 | 2.0 | 1.55 x 1.55 x 50 | 2.649 | 0.48 | Green | Black |

*Flow rate at 1.0 bar pressure

→ Drippers package data

Button drippers

| Model | Quantity p/box (units) | Box dimensions (cm x cm x cm) | Box weight (kg) |
|---------------|------------------------|-------------------------------|-----------------|
| Flat outlet | 10000 | 57 x 28 x 27 | 12.7 |
| Barb outlet | 9500 | 57 x 28 x 27 | 12.4 |
| Nipple outlet | 8500 | 57 x 28 x 27 | 11.2 |

→ Kd (minor loss), insertion barb within distribution pipe

| Pipe definition | Inside diameter (mm) | Kd |
|-----------------|----------------------|------|
| 12/4 | 9.80 | 1.65 |
| 16/4 | 13.20 | 0.39 |
| 20/4 | 17.00 | 0.13 |
| 25/4 | 21.20 | 0.10 |
| 12010 | 10.60 | 1.61 |
| 16010 - 16012 | 14.20 | 0.37 |
| 20010 - 20012 | 17.50 | 0.12 |

→ Drippers package data

Pot drippers

| Model | Quantity p/box (units) | Box dimensions (cm x cm x cm) | Box weight (kg) | Boxes per pallet (units) | Pallet size (cm x cm x cm) | Pallet weight (kg) |
|---------------|------------------------|-------------------------------|-----------------|--------------------------|----------------------------|--------------------|
| Flat outlet | 10000 | 57 x 28 x 27 | 12.7 | 32 | 114 x 114 x 112 | 410 |
| Nipple outlet | 8500 | 57 x 28 x 27 | 11.2 | 32 | 114 x 114 x 112 | 362 |

/ 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

Non-pressure-compensated drippers provide flow adequate to the pressure it is exposed to, according to the formula presented above. In order to simplify the calculations and understandings of the linkage between the flow and the pressure, a table with the flow rates at different working pressures is presented here for each of the drippers presented in this document.

Flow rate (l/h) vs pressure (bar)

Button drippers

| Flow rate* (l/h) | Pressure (bar) | | | | | | | | | |
|---------------------|----------------|------|------|------|------|------|------|-------|-------|-------|
| | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 |
| 2.0 | 0.92 | 1.29 | 1.56 | 1.80 | 2.00 | 2.18 | 2.35 | 2.51 | 2.65 | 2.79 |
| 3.0 | 1.38 | 1.93 | 2.35 | 2.69 | 3.00 | 3.27 | 3.52 | 3.76 | 3.98 | 4.18 |
| 4.0 | 1.85 | 2.58 | 3.13 | 3.60 | 4.00 | 4.37 | 4.70 | 5.01 | 5.31 | 5.58 |
| 8.0 | 3.69 | 5.15 | 6.26 | 7.19 | 8.00 | 8.73 | 9.40 | 10.02 | 10.61 | 11.16 |

*Nominal flow rate at 1.0 bar pressure

Flow rate (l/h) vs pressure (bar)

Pot drippers

| Flow rate* (l/h) | Pressure (bar) | | | | | | | | | |
|---------------------|----------------|------|------|------|------|------|------|-------|-------|-------|
| | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 |
| 2.0 | 0.92 | 1.29 | 1.56 | 1.80 | 2.00 | 2.18 | 2.35 | 2.51 | 2.65 | 2.79 |
| 4.0 | 1.85 | 2.58 | 3.13 | 3.60 | 4.00 | 4.37 | 4.70 | 5.01 | 5.31 | 5.58 |
| 8.0 | 3.69 | 5.15 | 6.26 | 7.19 | 8.00 | 8.73 | 9.40 | 10.02 | 10.61 | 11.16 |

*Nominal flow rate at 1.0 bar pressure

/ 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.

Non-pressure-compensated drippers of Netafim™ will provide different flow according to the real working pressure, therefore, the influencing factors will be: the pressure that each dripper in the dripline is exposed to, and the allowed flow variation the dripline is designed to, which in most cases is defined as 10% difference in flow, according to the international standards, and / or any other limitation that the customer / planner will prefer to design while considering the crop needs and area topography.

The following tables are only displayed at one inlet pressure for each dripline, since in non-pressure-compensated drippers the flow varies according to the pressure. There might be differences in run lengths with different inlet pressures; however for an initial estimate of the dripline length, the data that is presented in this document (within the tables shown) is sufficiently accurate.

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 16/4 • ID 13.2 mm • Kd 0.39 • Flow rate 2.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 45 | 69 | 86 | 97 | 113 | 132 | 140 |
| | 1% | 48 | 78 | 101 | 118 | 146 | 198 | 235 |
| Flat terrain | 0 | 52 | 87 | 117 | 143 | 188 | 297 | 415 |
| Downhill | -1% | 55 | 96 | 132 | 166 | 228 | 399 | 615 |
| | -2% | 58 | 104 | 147 | 189 | 269 | 204 | 155 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button drippers • On PE pipe 16/4 • ID 13.2 mm • Kd 0.39 • Flow rate 3.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 36 | 57 | 71 | 82 | 98 | 123 | 135 |
| | 1% | 38 | 62 | 80 | 95 | 120 | 168 | 210 |
| Flat terrain | 0 | 40 | 68 | 90 | 110 | 146 | 231 | 325 |
| Downhill | -1% | 42 | 73 | 100 | 124 | 170 | 291 | 440 |
| | -2% | 43 | 78 | 108 | 137 | 194 | 354 | 175 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 16/4 • ID 13.2 mm • Kd 0.39 • Flow rate 4.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 30 | 49 | 62 | 72 | 87 | 114 | 130 |
| | 1% | 32 | 52 | 68 | 81 | 104 | 150 | 190 |
| Flat terrain | 0 | 33 | 56 | 75 | 92 | 122 | 192 | 270 |
| Downhill | -1% | 34 | 60 | 82 | 101 | 138 | 234 | 350 |
| | -2% | 36 | 63 | 88 | 111 | 155 | 276 | 440 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 16/4 • ID 13.2 mm • Kd 0.39 • Flow rate 8.0 l/h • Inlet pressure 1.5 Ba

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 20 | 33 | 43 | 51 | 65 | 90 | 110 |
| | 1% | 21 | 35 | 46 | 55 | 71 | 105 | 140 |
| Flat terrain | 0 | 21 | 36 | 48 | 59 | 78 | 126 | 175 |
| Downhill | -1% | 22 | 38 | 51 | 63 | 86 | 141 | 210 |
| | -2% | 22 | 39 | 53 | 67 | 92 | 159 | 245 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 20/4 • ID 17.0 mm • Kd 0.13 • Flow rate 2.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 69 | 96 | 112 | 121 | 132 | 144 | 145 |
| | 1% | 78 | 118 | 145 | 166 | 197 | 246 | 270 |
| Flat terrain | 0 | 87 | 142 | 187 | 226 | 296 | 462 | 645 |
| Downhill | -1% | 96 | 165 | 227 | 284 | 396 | 717 | 360 |
| | -2% | 104 | 187 | 267 | 345 | 212 | 153 | 150 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button drippers • On PE pipe 20/4 • ID 17.0 mm • Kd 0.13 • Flow rate 3.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 56 | 82 | 97 | 108 | 122 | 138 | 145 |
| | 1% | 62 | 95 | 119 | 138 | 168 | 219 | 250 |
| Flat terrain | 0 | 67 | 109 | 144 | 174 | 228 | 357 | 500 |
| Downhill | -1% | 72 | 123 | 168 | 209 | 288 | 507 | 790 |
| | -2% | 77 | 137 | 191 | 245 | 350 | 165 | 150 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 20/4 • ID 17.0 mm • Kd 0.13 • Flow rate 4.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 48 | 72 | 86 | 98 | 113 | 132 | 140 |
| | 1% | 52 | 81 | 102 | 120 | 147 | 198 | 235 |
| Flat terrain | 0 | 56 | 91 | 120 | 145 | 191 | 300 | 415 |
| Downhill | -1% | 59 | 101 | 137 | 170 | 231 | 402 | 615 |
| | -2% | 63 | 110 | 152 | 194 | 273 | 201 | 155 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 20/4 • ID 17.0 mm • Kd 0.13 • Flow rate 8.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 33 | 50 | 63 | 73 | 89 | 114 | 130 |
| | 1% | 34 | 54 | 70 | 83 | 105 | 150 | 190 |
| Flat terrain | 0 | 36 | 59 | 77 | 94 | 123 | 192 | 270 |
| Downhill | -1% | 37 | 63 | 84 | 104 | 140 | 234 | 350 |
| | -2% | 39 | 67 | 91 | 114 | 156 | 279 | 440 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 25/4 • ID 21.2 mm • Kd 0.10 • Flow rate 2.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 90 | 117 | 129 | 135 | 141 | 147 | 150 |
| | 1% | 108 | 157 | 188 | 209 | 237 | 273 | 285 |
| Flat terrain | 0 | 127 | 207 | 272 | 330 | 431 | 678 | 940 |
| Downhill | -1% | 145 | 256 | 358 | 456 | 650 | 345 | 310 |
| | -2% | 163 | 306 | 449 | 175 | 158 | 150 | 145 |

Due to lateral filling time and flushing effectiveness it is not recommended to exceed 800 meters lateral length

Max. lateral length (meters) at different slopes - 10% flow variation

Button drippers • On PE pipe 25/4 • ID 21.2 mm • Kd 0.10 • Flow rate 3.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 75 | 103 | 118 | 126 | 135 | 144 | 150 |
| | 1% | 86 | 129 | 158 | 180 | 210 | 255 | 275 |
| Flat terrain | 0 | 98 | 160 | 210 | 255 | 333 | 522 | 730 |
| Downhill | -1% | 109 | 189 | 261 | 330 | 462 | 849 | 330 |
| | -2% | 119 | 218 | 314 | 409 | 174 | 153 | 145 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 25/4 • ID 21.2 mm • Kd 0.10 • Flow rate 4.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 66 | 93 | 108 | 118 | 129 | 141 | 145 |
| | 1% | 73 | 112 | 139 | 159 | 191 | 240 | 265 |
| Flat terrain | 0 | 81 | 133 | 175 | 212 | 278 | 435 | 605 |
| Downhill | -1% | 89 | 153 | 210 | 264 | 366 | 657 | 390 |
| | -2% | 96 | 173 | 245 | 317 | 461 | 156 | 150 |

Max. lateral length (meters) at different slopes - 10% flow variation

Button & Pot drippers • On PE pipe 25/4 • ID 21.2 mm • Kd 0.10 • Flow rate 8.0 l/h • Inlet pressure 1.5 Bar

| | Distance between drippers (meter) | | | | | | | |
|--------------|-----------------------------------|------|------|------|------|------|------|------|
| | Slope | 0.25 | 0.50 | 0.75 | 1.00 | 1.50 | 3.00 | 5.00 |
| Uphill | 2% | 46 | 68 | 83 | 94 | 110 | 132 | 140 |
| | 1% | 49 | 77 | 97 | 114 | 141 | 192 | 230 |
| Flat terrain | 0 | 52 | 86 | 113 | 137 | 179 | 282 | 390 |
| Downhill | -1% | 56 | 94 | 128 | 158 | 215 | 372 | 570 |
| | -2% | 58 | 102 | 142 | 179 | 252 | 468 | 160 |