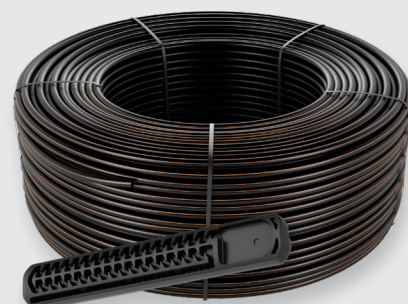


Aries™ HWD

Integral dripper (non-pressure-compensated) with high clogging resistance. Designed for multi-season drip irrigation applications in permanent crops.



Benefits & Features

Hydraulic performance adaptability

Flow rate varies with pressure, following pressure-dependent flow characteristics that enable flexible system design under specific field conditions.

A low exponent (X) allows improved irrigation uniformity and enables longer dripline lengths under similar operating conditions.

Long-lasting, high clogging resistance

Ensures reliable performance even under challenging water quality conditions through a self-cleaning labyrinth that continuously flushes debris during operation.

A large filtration area prevents suspended particles from entering the dripper, maintaining dependable performance across a wide range of water quality levels.

The TurbuNext™ labyrinth features wide, deep flow passages with large cross-sections that significantly enhance clogging resistance. Water is drawn from the center of the flow stream to further minimize suspended particle ingress.

Applications



Open field



Orchards



Protected crops

- Suitable for on-surface and sub-surface installation.
- Delivers uniform hydraulic performance on flat terrain and slightly sloping fields.
- Ideal for irrigation in permanent and semi-permanent row crops and orchards.



Specifications

- Maximum operating pressure: According to dripline wall thickness and diameter. See tables below.
- Filtration requirements: Filtration level depends on the dripper flow rate and must be selected according to the type and concentration of particles in the water. When sand content exceeds 2 ppm, a Hydrocyclone must be installed upstream of the main filter. For sand/silt/clay solids above 100 ppm, apply pre-treatment in line with Netafim™ expert guidelines.
- TurbuNext™ labyrinth with enhanced clogging resistance and superior hydraulic performance.
- Weldable into thick-wall driplines: 0.90, 1.00 and 1.20 mm.
- Injection-molded dripper with very low coefficient of variation (CV) for reliable uniformity.
- High UV resistance and compatible with standard agricultural nutrients and fertilizers.
- Compliant with ISO 9261 international standards.
- Driplines are black with two orange stripes.

Drippers technical data

Flow rate* 1.2 WT (l/h)	Water passages dimensions width-depth-length (mm x mm x mm)	Filtration area (mm²)	Constant K	Exponent X	Recommended filtration (micron)/(mesh)
0.55	0.47 x 0.53 x 65	36	0.191	0.46	130/120
0.85	0.54 x 0.69 x 65	43	0.295	0.46	130/120
1.05	0.60 x 0.74 x 65	49	0.364	0.46	130/120
1.60	0.71 x 0.85 x 65	53	0.554	0.46	200/80
2.10	0.76 x 1.03 x 65	54	0.728	0.46	200/80
3.15	0.90 x 1.20 x 65	54	1.092	0.46	200/80
4.20	0.94 x 1.28 x 33	54	1.455	0.46	200/80
8.40	1.52 x 1.28 x 28	50	2.912	0.46	200/80

* Nominal flow rate at 1.0 bar. WT = dripline wall thickness

Flow rate* 0.9-1.0 WT (l/h)	Water passages dimensions width-depth-length (mm x mm x mm)	Filtration area (mm²)	Constant K	Exponent X	Recommended filtration (micron)/(mesh)
0.55	0.47 x 0.53 x 65	36	0.191	0.46	130/120
0.80	0.54 x 0.69 x 65	43	0.277	0.46	130/120
1.00	0.60 x 0.74 x 65	49	0.347	0.46	130/120
1.50	0.71 x 0.85 x 65	53	0.520	0.46	200/80
2.00	0.76 x 1.03 x 65	54	0.693	0.46	200/80
3.00	0.90 x 1.20 x 65	54	1.040	0.46	200/80
4.00	0.94 x 1.28 x 33	54	1.387	0.46	200/80
8.00	1.52 x 1.28 x 28	50	2.773	0.46	200/80

* Nominal flow rate at 1.0 bar. WT = dripline wall thickness

Both the K constant and the X exponent are fundamental hydraulic parameters used to calculate the actual flow rate of each dripper at a given operating pressure as detailed in the following pages.

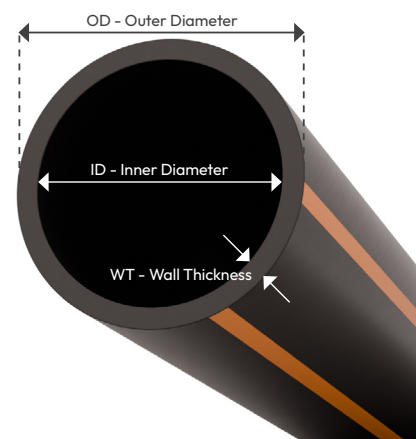


Driplines technical data

Model	Inner diameter (mm)	Wall thickness (mm)	Outer diameter (mm)	Max. working pressure (bar)	Max. flushing pressure (bar)	Kd
12009	10.30	0.9	13.00	3.8	4.9	0.70
12010	10.30	1.0	12.30	4.0	5.2	0.70
16009	14.20	0.9	16.00	3.0	3.9	0.40
16010	14.20	1.0	16.20	3.5	4.6	0.40
16012	14.20	1.2	16.60	4.0	5.2	0.40
20010	17.50	1.0	19.50	3.5	4.6	0.10
20012	17.50	1.2	19.90	4.0	5.2	0.10

Kd: An integral dripper installed inside the dripline creates a localized disturbance in the water flow, generating minor head losses (Kd) as its shape and volume partially obstruct the internal flow path. The lower the Kd value for a given inner diameter, the longer the driplines can be designed under similar operating conditions.

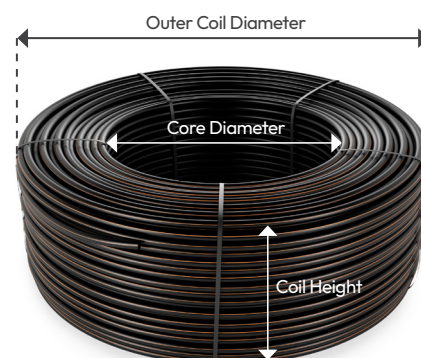
Max. flushing pressure: The maximum permissible flushing pressures shown in the table apply to continuous flushing cycles of up to 30 minutes, with the ends of at least five driplines opened for flushing.



Driplines package data (on bundled coil)

Model	Wall thickness (mm)	Distance between drippers (m)	Coil length (m)	Average* coil weight (kg)	Outer coil diameter (cm)	Core coil diameter (cm)	Coil height (cm)
12009	0.9	0.15 to 1.00	500	16.8	78	41	26
12010	1.0	0.15 to 1.00	500	18.3	78	41	26
16009	0.9	0.15 to 1.00	500	18.5	84	41	27
16010	1.0	0.15 to 1.00	500	20.4	84	41	27
16012	1.2	0.15 to 1.00	400	22.4	78	41	28
20010	1.0	0.15 to 1.00	300	16.8	84	50	27
20012	1.2	0.15 to 1.00	300	20.3	84	50	27

*Values shown are average weights and may vary due to dripper spacing and extrusion tolerances. Refer to the official Netafim™ disclaimers for details.



Driplines package data (on bundled coil) within container

Model	Coil length (m)	Coils in a 40 foot container (units)	Total in a 40 foot container (m)
12009	500	370	185000
12010	500	370	185000
16009	500	330	165000
16010	500	330	165000
16012	400	352	140800
20010	300	330	99000
20012	300	330	99000



A standard 40-foot container has internal dimensions of 12.0 m (L) × 2.35 m (W) × 2.39 m (H). In certain cases, a 40-foot High Cube container may be used, providing an increased internal height of 2.69 m, allowing improved volume utilization depending on product configuration.

Catalog numbers

Because of the wide range of available configurations (different flow rates, emitter spacings, coil lengths and additional specifications), the final catalog number must be confirmed with your local Netafim™ representative after completing the product definition.

Complete the product specification using the options provided in the following flow chart.

How to use: Select one option from each category in the chart to define the most appropriate product configuration for your application.

Product name		Commercial diameter (mm)		Wall thickness (mm)		Flow rate (l/h) 1.2 mm WT		Distance between drippers (m)		Coil length (m)		Special features	
Aries™ HWD	ARIES	12	12	0.9	009	0.55	0.55L/H	0.2	0.20M	Model 16009	500M	No added	-
		16	16	1.0	010	0.85	0.85L/H	0.3	0.30M	Model 16010	500M	Other	XXX
		20	20	1.2	012	1.05	1.05L/H	0.4	0.40M	Model 16012	400M	*Other features available upon request. Consult your local Netafim™ distributor.	
						1.60	1.60L/H	0.5	0.50M	Model 20010	300M		
						2.10	2.10L/H	0.6	0.60M	Model 20012	300M		
						3.15	3.15L/H	0.7	0.70M				
						4.20	4.20L/H	*Other distances between drippers can be ordered.					
						8.40	8.40L/H						
						Flow rate (l/h) 0.9-1.0 mm WT							
						0.55	0.55L/H						
						0.80	0.80L/H						
						1.00	1.00L/H						
						1.50	1.50L/H						
						2.00	2.00L/H						
						3.00	3.00L/H						
						4.00	4.00L/H						
						8.00	8.00L/H						

ARIES 16012 1.60L/H 0.30M 400M

Catalog description example

Drippers flow rate vs working pressure

To determine the actual flow rate of a dripper under different operating pressures, the following equation is applied:

$$Q = K \times P^X$$

Where:

Q = Dripper flow rate (liters per hour)

K = Dripper-specific flow constant (manufacturer-defined)

P = Actual working pressure (meters of water column)

X = Dripper-specific exponent (manufacturer-defined)

In accordance with ISO 9261, manufacturers must declare both the K constant and the X exponent for each dripper model.

Non-pressure-compensated drippers deliver a flow rate that varies with operating pressure, following the relationship defined by the formula presented above.

To provide a general understanding of how flow rate responds to changes in operating pressure, tables are provided showing the dripper flow rate at different working pressures for each model in this document.

Aries™ HWD flow (l/h) vs pressure (bar)

Dripper	Flow rate* (l/h)	Working pressure (bar)									
		0.40	0.60	0.80	1.00	1.50	2.00	2.50	3.00	3.50	4.00
Aries™ HWD 1.2 mm WT	0.55	0.36	0.44	0.50	0.55	0.66	0.76	0.84	0.91	0.98	1.04
	0.85	0.56	0.67	0.77	0.85	1.03	1.17	1.30	1.41	1.51	1.61
	1.05	0.69	0.83	0.95	1.05	1.27	1.44	1.60	1.74	1.87	1.99
	1.60	1.05	1.26	1.44	1.60	1.93	2.20	2.44	2.65	2.84	3.02
	2.10	1.38	1.66	1.89	2.10	2.53	2.89	3.20	3.48	3.74	3.97
	3.15	2.07	2.49	2.84	3.15	3.80	4.33	4.80	5.22	5.60	5.96
	4.20	2.75	3.32	3.79	4.20	5.06	5.77	6.40	6.96	7.47	7.94
	8.40	5.51	6.64	7.58	8.40	10.12	11.55	12.80	13.92	14.94	15.89

* Nominal flow rate at 1.0 bar.

Dripper	Flow rate* (l/h)	Working pressure (bar)									
		0.20	0.40	0.60	0.80	1.00	1.50	2.00	2.50	3.00	3.50
Aries™ HWD 0.9 - 1.0 mm WT	0.55	0.26	0.36	0.44	0.50	0.55	0.66	0.76	0.84	0.91	0.98
	0.80	0.38	0.52	0.63	0.72	0.80	0.96	1.10	1.22	1.32	1.42
	1.00	0.48	0.66	0.79	0.90	1.00	1.21	1.38	1.53	1.66	1.78
	1.50	0.72	0.98	1.19	1.35	1.50	1.81	2.06	2.29	2.49	2.67
	2.00	0.95	1.31	1.58	1.80	2.00	2.41	2.75	3.05	3.31	3.56
	3.00	1.43	1.97	2.37	2.71	3.00	3.61	4.13	4.57	4.97	5.34
	4.00	1.91	2.62	3.16	3.61	4.00	4.82	5.50	6.10	6.63	7.12
	8.00	3.81	5.25	6.32	7.22	8.00	9.64	11.00	12.19	13.26	14.23

* Nominal flow rate at 1.0 bar.

Maximum driplines length

To determine the maximum feasible run length for a given dripline, considering all hydraulic factors that influence flow within the dripline, Netafim™ uses proprietary design software based on the Darcy-Weisbach equations, supported by decades of engineering expertise and long-standing collaboration with leading academic institutions.

The precise maximum run length for any installation must be calculated using this dedicated design software, which evaluates all relevant hydraulic parameters across the system.

Minor differences may occur between design tools available on the market, due to variations in calculation methodologies and underlying design assumptions.

To calculate the maximum feasible dripline length, taking into account the required variables, such as flow rate and emitter spacing, pipe inner diameter, field slope, inlet pressure and other parameters, Netafim™ HydroCalc design software can be used.



The following tables present the maximum dripline lengths that can be used in driplines to achieve optimal performance.

The values provided here are intended to offer a preliminary reference. The actual maximum dripline length must be calculated by a hydraulic engineer responsible for designing the complete system, in order to account for additional constraints and site-specific limitations.

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 12009/12010 • ID 10.3 mm • Kd 0.70 • Flow rate 0.55 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	55	72	85	96	104	111	117	122	126
	1%	60	80	98	113	126	138	149	158	166
Flat terrain	0	64	89	112	132	151	169	186	202	217
Downhill	-1%	68	96	123	148	172	196	218	241	263
	-2%	72	104	135	166	196	225	255	284	314

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 12009/12010 • ID 10.3 mm • Kd 0.70 • Flow rate 0.80 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	45	60	71	81	89	96	102	108	112
	1%	48	65	79	92	103	113	123	131	140
Flat terrain	0	51	70	88	104	119	133	146	159	171
Downhill	-1%	53	74	94	114	132	149	166	183	199
	-2%	55	79	102	125	146	167	189	209	230

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 12009/12010 • ID 10.3 mm • Kd 0.70 • Flow rate 1.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	39	53	64	73	80	87	93	98	103
	1%	42	57	70	81	91	100	109	117	124
Flat terrain	0	44	61	76	90	103	115	126	138	149
Downhill	-1%	45	64	81	97	112	127	142	156	169
	-2%	47	67	86	105	123	141	158	175	192

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 12009/12010 • ID 10.3 mm • Kd 0.70 • Flow rate 1.50 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	31	42	51	59	66	72	78	83	87
	1%	32	44	55	64	73	81	88	95	100
Flat terrain	0	34	47	59	70	80	90	98	107	114
Downhill	-1%	34	48	61	74	85	96	106	117	127
	-2%	35	50	65	78	91	104	116	128	140

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 12009/12010 • ID 10.3 mm • Kd 0.70 • Flow rate 2.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	26	36	44	51	56	62	67	72	76
	1%	27	37	46	54	61	68	74	80	85
Flat terrain	0	28	39	49	58	66	74	82	89	96
Downhill	-1%	28	40	50	61	70	78	87	95	104
	-2%	29	41	53	64	74	84	94	104	113

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 12009/12010 • ID 10.3 mm • Kd 0.70 • Flow rate 3.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	20	28	34	40	46	50	54	59	62
	1%	21	29	36	43	48	54	59	64	68
Flat terrain	0	21	30	38	45	51	57	63	69	74
Downhill	-1%	22	31	38	46	53	60	66	73	79
	-2%	22	31	40	48	56	63	70	77	84

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 12009/12010 • ID 10.3 mm • Kd 0.70 • Flow rate 4.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	17	24	29	35	39	43	47	50	54
	1%	18	24	30	36	41	46	50	54	58
Flat terrain	0	18	25	31	38	43	48	53	58	62
Downhill	-1%	18	25	32	38	44	50	54	59	65
	-2%	18	26	33	40	46	52	58	63	68

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 12009/12010 • ID 10.3 mm • Kd 0.70 • Flow rate 8.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	11	15	19	23	26	29	31	34	37
	1%	11	16	20	23	26	29	33	35	38
Flat terrain	0	11	16	20	24	28	31	34	37	40
Downhill	-1%	11	16	20	24	28	32	34	38	41
	-2%	12	16	21	25	29	32	36	40	42

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16009/16010 • ID 14.2 mm • Kd 0.40 • Flow rate 0.55 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	87	107	120	130	136	141	145	148	150
	1%	101	131	155	175	191	205	217	227	235
Flat terrain	0	115	159	198	233	266	297	326	354	380
Downhill	-1%	127	182	235	286	335	384	432	481	528
	-2%	140	208	276	344	413	483	496	180	173

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16009/16010 • ID 14.2 mm • Kd 0.40 • Flow rate 0.80 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	73	92	106	116	124	130	134	139	141
	1%	81	108	129	147	162	176	186	197	207
Flat terrain	0	90	125	155	184	209	234	257	279	300
Downhill	-1%	98	139	178	216	251	287	322	356	390
	-2%	106	155	203	251	298	346	394	443	492

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16009/16010 • ID 14.2 mm • Kd 0.40 • Flow rate 1.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	65	83	97	107	115	122	127	131	135
	1%	71	95	114	131	145	158	170	179	188
Flat terrain	0	78	108	134	159	181	203	222	241	260
Downhill	-1%	83	118	151	183	212	242	270	299	326
	-2%	89	130	169	208	247	285	324	362	401

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16009/16010 • ID 14.2 mm • Kd 0.40 • Flow rate 1.50 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	52	68	80	91	99	106	112	117	121
	1%	56	75	92	106	118	130	139	149	157
Flat terrain	0	60	83	104	123	140	156	171	186	201
Downhill	-1%	63	89	113	136	158	179	200	220	240
	-2%	66	96	124	151	178	204	230	257	282

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16009/16010 • ID 14.2 mm • Kd 0.40 • Flow rate 2.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	44	59	70	80	88	95	101	106	110
	1%	47	64	78	90	101	111	121	130	136
Flat terrain	0	50	69	86	102	116	130	143	155	167
Downhill	-1%	52	73	93	111	128	146	162	178	194
	-2%	54	78	100	122	142	163	183	203	223

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16009/16010 • ID 14.2 mm • Kd 0.40 • Flow rate 3.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	35	47	56	65	72	78	85	90	94
	1%	37	50	61	72	81	89	97	104	111
Flat terrain	0	38	53	66	79	90	100	110	121	129
Downhill	-1%	39	56	70	84	97	109	122	133	144
	-2%	41	58	74	90	105	119	134	148	161

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16009/16010 • ID 14.2 mm • Kd 0.40 • Flow rate 4.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	30	40	48	56	63	69	74	78	83
	1%	31	42	52	61	68	76	82	88	94
Flat terrain	0	32	44	55	66	75	84	91	100	107
Downhill	-1%	32	46	58	69	79	90	99	109	118
	-2%	33	47	60	73	85	97	108	119	129

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16009/16010 • ID 14.2 mm • Kd 0.40 • Flow rate 8.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	19	26	33	38	43	48	52	56	59
	1%	20	27	34	40	46	51	55	60	64
Flat terrain	0	20	28	36	42	48	54	59	65	70
Downhill	-1%	21	29	36	43	50	56	62	68	73
	-2%	21	29	38	45	52	59	66	72	78

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16012 • ID 14.2 mm • Kd 0.40 • Flow rate 0.55 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	87	107	120	130	136	141	145	148	150
	1%	101	131	155	175	191	205	217	227	235
Flat terrain	0	115	159	198	233	266	297	326	354	380
Downhill	-1%	127	182	235	286	335	384	432	481	528
	-2%	140	208	276	344	413	483	496	580	673

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16012 • ID 14.2 mm • Kd 0.40 • Flow rate 0.85 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	71	89	103	114	121	127	133	136	140
	1%	78	104	125	143	157	170	182	193	202
Flat terrain	0	87	120	149	177	201	225	247	268	289
Downhill	-1%	93	133	170	206	240	274	306	338	371
	-2%	101	147	193	238	283	328	373	419	464

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16012 • ID 14.2 mm • Kd 0.40 • Flow rate 1.05 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	63	81	94	105	113	120	126	130	134
	1%	69	93	112	128	142	155	166	176	185
Flat terrain	0	76	105	130	154	176	196	215	234	252
Downhill	-1%	81	114	146	176	205	233	261	288	314
	-2%	86	125	163	201	237	274	310	347	384

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16012 • ID 14.2 mm • Kd 0.40 • Flow rate 1.60 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	50	66	78	89	97	103	110	114	119
	1%	54	73	88	103	114	125	135	144	153
Flat terrain	0	58	80	100	118	134	150	165	179	193
Downhill	-1%	60	85	108	130	151	171	190	210	228
	-2%	64	92	118	144	169	194	219	243	268

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16012 • ID 14.2 mm • Kd 0.40 • Flow rate 2.10 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	43	57	68	78	86	92	99	104	108
	1%	46	62	76	88	99	109	118	125	133
Flat terrain	0	48	67	84	99	113	126	138	150	162
Downhill	-1%	50	71	90	108	124	141	156	172	187
	-2%	52	75	96	117	137	157	176	195	214

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16012 • ID 14.2 mm • Kd 0.40 • Flow rate 3.15 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	34	46	55	64	71	77	82	88	93
	1%	36	48	60	70	79	87	94	102	108
Flat terrain	0	37	51	64	76	87	97	107	117	126
Downhill	-1%	38	54	68	81	94	106	118	129	139
	-2%	39	56	72	87	101	115	129	142	155

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16012 • ID 14.2 mm • Kd 0.40 • Flow rate 4.20 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	29	39	47	55	61	67	72	77	81
	1%	30	41	50	59	67	74	80	86	92
Flat terrain	0	31	43	54	64	73	81	89	96	104
Downhill	-1%	31	44	56	67	77	87	96	105	114
	-2%	32	46	58	71	82	93	104	114	125

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 16012 • ID 14.2 mm • Kd 0.40 • Flow rate 8.40 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	19	26	32	37	42	46	50	54	58
	1%	19	27	33	39	44	49	54	59	63
Flat terrain	0	20	27	34	41	47	53	58	63	68
Downhill	-1%	20	28	35	42	48	54	60	66	71
	-2%	20	29	36	44	50	57	63	69	75

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20010 • ID 17.5 mm • Kd 0.10 • Flow rate 0.55 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	117	133	142	147	151	153	155	156	157
	1%	150	184	208	227	241	253	262	270	277
Flat terrain	0	188	251	306	356	401	445	486	526	563
Downhill	-1%	222	313	400	485	569	652	737	821	905
	-2%	260	382	507	180	169	165	162	159	158

Due to considerations related to dripline filling time and flushing effectiveness, it is not recommended to exceed a dripline length of 800 meters.

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20010 • ID 17.5 mm • Kd 0.10 • Flow rate 0.80 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	102	120	131	139	143	147	150	152	153
	1%	124	155	178	198	213	225	236	246	253
Flat terrain	0	148	197	241	280	317	351	384	415	444
Downhill	-1%	169	236	298	359	419	477	536	594	652
	-2%	191	277	362	448	208	182	173	167	164

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20010 • ID 17.5 mm • Kd 0.10 • Flow rate 1.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	93	111	123	132	137	141	146	148	150
	1%	110	139	161	180	195	207	219	229	236
Flat terrain	0	128	171	209	243	275	304	333	360	385
Downhill	-1%	143	199	251	302	350	398	445	491	538
	-2%	160	230	298	367	435	505	192	179	172

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20010 • ID 17.5 mm • Kd 0.10 • Flow rate 1.50 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	78	95	108	117	124	130	134	138	141
	1%	88	113	132	149	163	176	186	196	205
Flat terrain	0	99	132	161	188	212	235	257	278	298
Downhill	-1%	108	148	186	222	256	290	322	356	387
	-2%	117	166	213	260	305	351	397	443	489

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20010 • ID 17.5 mm • Kd 0.10 • Flow rate 2.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	67	84	96	106	113	119	125	130	133
	1%	75	96	114	129	142	154	164	174	182
Flat terrain	0	82	110	134	156	177	195	214	231	248
Downhill	-1%	88	121	151	180	207	233	259	284	309
	-2%	95	133	170	205	240	274	309	343	377

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20010 • ID 17.5 mm • Kd 0.10 • Flow rate 3.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	54	69	80	90	97	104	110	114	119
	1%	59	77	91	105	116	125	135	144	152
Flat terrain	0	63	85	104	121	136	151	166	179	192
Downhill	-1%	67	91	113	134	154	173	191	210	227
	-2%	71	98	124	149	173	197	221	244	267

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20010 • ID 17.5 mm • Kd 0.10 • Flow rate 4.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	46	59	70	79	86	92	98	103	107
	1%	49	65	78	89	99	109	117	124	131
Flat terrain	0	53	71	86	101	113	126	138	149	159
Downhill	-1%	55	75	93	110	125	141	155	170	184
	-2%	58	80	100	120	139	157	175	194	211

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20010 • ID 17.5 mm • Kd 0.10 • Flow rate 8.00 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	31	41	48	56	62	67	71	76	80
	1%	32	43	52	60	67	74	80	86	91
Flat terrain	0	34	45	56	65	73	81	89	95	103
Downhill	-1%	35	47	58	68	78	87	96	104	113
	-2%	36	49	61	73	83	94	104	113	123

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20012 • ID 17.5 mm • Kd 0.10 • Flow rate 0.55 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	117	133	142	147	151	153	155	156	157
	1%	150	184	208	227	241	253	262	270	277
Flat terrain	0	188	251	306	356	401	445	486	526	563
Downhill	-1%	222	313	400	485	569	652	737	821	905
	-2%	260	382	507	618	732	846	960	1074	1188

Due to considerations related to dripline filling time and flushing effectiveness, it is not recommended to exceed a dripline length of 800 meters.

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20012 • ID 17.5 mm • Kd 0.10 • Flow rate 0.85 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	100	118	129	136	142	146	148	151	152
	1%	120	150	174	193	208	221	232	240	249
Flat terrain	0	142	190	232	270	304	337	369	398	427
Downhill	-1%	161	225	284	342	398	454	508	563	617
	-2%	182	263	343	424	505	586	667	748	829

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20012 • ID 17.5 mm • Kd 0.10 • Flow rate 1.05 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	91	109	121	130	136	140	144	147	149
	1%	107	135	158	176	191	204	215	224	233
Flat terrain	0	124	166	202	236	266	295	322	348	373
Downhill	-1%	139	192	242	291	337	383	428	473	517
	-2%	154	221	286	352	416	482	547	613	678

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20012 • ID 17.5 mm • Kd 0.10 • Flow rate 1.60 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	75	92	105	115	122	127	133	136	139
	1%	85	109	128	145	159	171	182	192	200
Flat terrain	0	95	127	154	180	203	225	246	267	286
Downhill	-1%	103	142	178	212	244	276	307	338	368
	-2%	112	158	202	246	289	332	375	418	461

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20012 • ID 17.5 mm • Kd 0.10 • Flow rate 2.10 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	66	82	94	104	112	118	123	128	131
	1%	73	94	111	126	139	150	161	170	179
Flat terrain	0	79	107	130	152	171	190	207	224	241
Downhill	-1%	85	117	146	173	199	225	250	274	298
	-2%	91	128	163	197	230	263	296	329	361

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20012 • ID 17.5 mm • Kd 0.10 • Flow rate 3.15 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	53	67	78	88	95	102	107	113	117
	1%	57	74	89	102	112	123	132	140	148
Flat terrain	0	61	82	100	117	132	146	160	174	186
Downhill	-1%	65	88	110	130	149	167	185	203	219
	-2%	68	95	120	144	167	190	212	234	256

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20012 • ID 17.5 mm • Kd 0.10 • Flow rate 4.20 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	45	58	68	77	84	91	96	101	105
	1%	48	63	76	87	97	106	114	122	128
Flat terrain	0	51	68	84	98	110	123	134	144	155
Downhill	-1%	53	72	90	106	121	136	150	164	178
	-2%	56	77	97	116	134	151	169	186	203

Max. dripline length (meters) at different slopes - 10.0% flow variation

Aries™ HWD 20012 • ID 17.5 mm • Kd 0.10 • Flow rate 8.40 l/h • Inlet pressure 1.5 Bar

	Distance between drippers (meter)									
	Slope	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Uphill	2%	30	40	47	54	60	65	70	74	78
	1%	31	42	50	59	65	71	78	83	89
Flat terrain	0	33	44	54	63	71	78	86	93	100
Downhill	-1%	33	45	56	66	75	84	93	101	109
	-2%	34	47	59	70	80	90	100	110	119