

Aries™ HWD

Integral non pressure-compensated,
high clogging resistance dripper,
for multi seasonal applications

→ 12010 - 16009 - 16010 - 16012 - 20010 - 20012



High clogging
resistance



Self-cleaning
labyrinth



Wide filtration
area

/ Benefits & Features

- **High clogging resistance** Even with poor quality water, with self-cleaning labyrinth that flushes debris, throughout operation.
- **Wide filtration area** Ensures optimal performance even under harsh water conditions, preventing the entrance of sediments into the drippers.
- **TurbuNext™** Labyrinth ensures wide water passages, large deep and wide cross section that improves clogging resistance.

/ Specifications

- ✓ Maximum system pressure: according to driplines wall thickness.
- ✓ 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 shall be installed before the main filter. Where sand/silt/clay solids exceed 100 ppm, pre treatment shall be applied following Netafim expert instructions.
- ✓ TurbuNext™ labyrinth with superior performance.
- ✓ Weldable into thick wall driplines (0.90, 1.00, 1.20 mm).
- ✓ Injected dripper, very low CV.
- ✓ High UV resistant. Resistant to standard nutrients used in agriculture.
- ✓ Aries™ driplines meet ISO 9261 Standards with Israel Standard Institute (SII)-certified production.

→ DRIPPERS TECHNICAL DATA

12010, 16009, 16010, 20010 - 0.9, 1.0 mm wall thickness driplines

FLOW RATE* (L/H)	MAXIMUM WORKING PRESSURE (BAR)**	WATER PASSAGES DIMENSIONS WIDTH-DEPTH-LENGTH (MM)	FILTRATION AREA (MM ²)	CONSTANT K	EXPONENT X	RECOMMENDED FILTRATION (MICRON)/(MESH)
0.55	3.0 / 3.5	0.47 x 0.53 x 65	39	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	200/80
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

*Flow rate at 1.0 bar pressure **According to driplines wall thickness

16012, 20012 - 1.2 mm wall thickness driplines

FLOW RATE* (L/H)	MAXIMUM WORKING PRESSURE (BAR)	WATER PASSAGES DIMENSIONS WIDTH-DEPTH-LENGTH (MM)	FILTRATION AREA (MM ²)	CONSTANT K	EXPONENT X	RECOMMENDED FILTRATION (MICRON)/(MESH)
0.55	4.0	0.47 x 0.53 x 65	39	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	200/80
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

*Flow rate at 1.0 bar pressure

→ DRIPLINES TECHNICAL DATA

MODEL	INSIDE DIAMETER (MM)	WALL THICKNESS (MM)	OUTSIDE DIAMETER (MM)	MAX. WORKING PRESSURE (BAR)	MAXIMUM FLUSHING PRESSURE (BAR)	KD
12010	10.30	1.00	12.30	4.0	5.2	0.70
16009	14.20	0.90	16.00	3.0	3.9	0.40
16010	14.20	1.00	16.20	3.5	4.6	0.40
16012	14.20	1.20	16.60	4.0	5.2	0.40
20010	17.50	1.00	19.50	3.5	4.6	0.10
20012	17.50	1.20	19.90	4.0	5.2	0.10

*The maximum working pressure is defined by the dripper or by the dripline wall thickness

→ 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)
12010	1.00	500	0.15 to 1.00	20.6	370	185000
16009	0.90	500	0.15 to 1.00	20.7	330	165000
16010	1.00	500	0.15 to 1.00	23.0	330	165000
16012	1.20	400	0.15 to 1.00	22.3	352	140800
20010	1.00	300	0.15 to 1.00	16.7	330	99000
20012	1.20	300	0.15 to 1.00	20.2	330	99000

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

/ 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-regulated 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)

12010, 16009, 16010, 20010 - 0.9 and 1.0 mm wall thickness driplines

FLOW RATE* (L/H)	PRESSURE (BAR)								
	0.2	0.4	0.6	0.8	1.0	1.5	2.0	2.5	3.0
0.55	0.26	0.36	0.44	0.50	0.55	0.66	0.76	0.84	0.91
0.80	0.38	0.52	0.63	0.72	0.80	0.96	1.10	1.22	1.32
1.00	0.48	0.66	0.79	0.90	1.00	1.21	1.38	1.53	1.66
1.50	0.72	0.98	1.19	1.35	1.50	1.81	2.06	2.29	2.49
2.00	0.95	1.31	1.58	1.80	2.00	2.41	2.75	3.05	3.31
3.00	1.43	1.97	2.37	2.71	3.00	3.61	4.13	4.57	4.97
4.00	1.91	2.62	3.16	3.61	4.00	4.82	5.50	6.10	6.63
8.00	3.81	5.25	6.32	7.22	8.00	9.64	11.00	12.19	13.26

*Flow rate at 1.0 bar pressure

Flow rate (l/h) vs. Pressure (bar)

16012, 20012 - 1.2 mm wall thickness driplines

FLOW RATE* (L/H)	PRESSURE (BAR)								
	0.2	0.4	0.6	0.8	1.0	1.5	2.0	2.5	3.0
0.55	0.26	0.36	0.44	0.50	0.55	0.66	0.76	0.84	0.91
0.85	0.41	0.56	0.67	0.77	0.85	1.03	1.17	1.30	1.41
1.05	0.50	0.69	0.83	0.95	1.05	1.27	1.44	1.60	1.74
1.60	0.76	1.05	1.26	1.44	1.60	1.93	2.20	2.44	2.65
2.10	1.00	1.38	1.66	1.89	2.10	2.53	2.89	3.20	3.48
3.15	1.50	2.07	2.49	2.84	3.15	3.80	4.33	4.80	5.22
4.20	2.00	2.75	3.32	3.79	4.20	5.06	5.77	6.40	6.96
8.40	4.01	5.51	6.64	7.58	8.40	10.12	11.55	12.80	13.92

*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-regulated 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-regulated 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

Aries™ HWD • 12010 • ID 10.2 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%	54	70	83	93	101	108	113	118	122
	1%	59	79	96	110	123	134	145	154	162
FLAT TERRAIN	0	63	88	110	130	148	165	182	198	213
DOWNHILL	-1%	67	95	121	145	169	190	212	233	253
	-2%	70	101	130	158	184	210	235	259	283

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

Aries™ HWD • 12010 • ID 10.2 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%	44	59	70	80	88	95	102	106	111
	1%	47	64	78	91	102	112	122	131	138
FLAT TERRAIN	0	50	69	86	103	117	131	145	157	168
DOWNHILL	-1%	52	73	93	112	130	147	163	180	196
	-2%	54	78	100	122	143	165	185	205	225

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

Aries™ HWD • 12010 • ID 10.2 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	52	63	72	79	86	92	97	102
	1%	41	56	69	80	90	99	107	115	123
FLAT TERRAIN	0	43	60	75	89	101	113	125	136	146
DOWNHILL	-1%	44	63	80	96	110	125	139	153	166
	-2%	46	66	85	103	121	138	155	172	188

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

Aries™ HWD • 12010 • ID 10.2 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	41	50	58	65	71	77	82	86
	1%	32	44	54	63	71	79	86	93	99
FLAT TERRAIN	0	33	46	58	69	79	88	97	105	113
DOWNHILL	-1%	34	48	60	72	83	95	105	114	124
	-2%	35	50	64	77	89	102	114	126	137

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

Aries™ HWD • 12010 • ID 10.2 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%	27	36	44	51	57	62	68	72	77
	1%	27	38	47	55	62	69	75	81	86
FLAT TERRAIN	0	28	40	50	59	67	75	82	90	97
DOWNHILL	-1%	29	41	51	61	71	80	89	97	105
	-2%	30	42	54	65	75	85	95	105	114

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

Aries™ HWD • 12010 • ID 10.2 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%	21	28	35	41	46	50	55	59	63
	1%	21	29	36	43	49	55	59	65	69
FLAT TERRAIN	0	22	30	38	45	52	58	64	70	75
DOWNHILL	-1%	22	31	39	47	54	61	67	74	80
	-2%	22	32	40	49	56	64	71	78	85

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

Aries™ HWD • 12010 • ID 10.2 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	23	29	34	38	43	46	50	53
	1%	17	24	30	36	40	45	50	53	57
FLAT TERRAIN	0	18	25	31	37	42	48	52	57	61
DOWNHILL	-1%	18	25	31	38	43	48	54	59	64
	-2%	18	26	32	39	45	50	56	62	67

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

Aries™ HWD • 12010 • ID 10.2 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	25	28	31	33	36
	1%	11	15	19	23	26	29	32	35	38
FLAT TERRAIN	0	11	16	20	24	27	30	34	37	39
DOWNHILL	-1%	11	16	20	24	28	31	34	37	40
	-2%	11	16	20	25	28	32	35	39	42

Max. lateral length (meters) at different slopes - 10% 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%	85	104	116	125	131	136	139	142	144
	1%	98	128	152	171	186	199	210	220	228
FLAT TERRAIN	0	113	156	194	229	261	291	320	347	373
DOWNHILL	-1%	125	178	227	274	319	362	404	445	485
	-2%	135	195	252	307	360	410	453	503	553

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

aries™ • 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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%	85	104	116	125	131	136	139	142	144
	1%	98	128	152	171	186	199	210	220	228
FLAT TERRAIN	0	113	156	194	229	261	291	320	347	373
DOWNHILL	-1%	125	178	227	274	319	362	404	445	485
	-2%	135	195	252	307	360	410	453	493	530

Max. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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%	113	128	136	142	145	147	149	149	151
	1%	146	179	202	220	234	244	254	260	266
FLAT TERRAIN	0	185	246	300	349	394	437	478	516	553
DOWNHILL	-1%	215	299	376	449	519	587	653	716	778
	-2%	239	337	236	229	201	191	186	184	182

Max. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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. lateral length (meters) at different slopes - 10% 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%	113	128	136	142	145	147	149	149	151
	1%	146	179	202	220	234	244	254	260	266
FLAT TERRAIN	0	185	246	300	349	394	437	478	516	553
DOWNHILL	-1%	215	299	376	449	519	587	653	716	778
	-2%	239	337	236	229	201	191	186	184	182

Max. lateral length (meters) at different slopes - 10% 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	188	176	170	166

Max. lateral length (meters) at different slopes - 10% 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	201	183	175

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