AlphaDisc™ filter

Netafim

AlphaDisc is Netafim's ultimate open field filtration system, thanks to a combination of precise depth filtration, high dirt-holding capacity, and a unique, scalable design. As standard Netafim Netherlands supplies the 4" XL model with an online connection, which (depending on filtration grade and dirt load) can achieve a maximum capacity of 110 m³/hour.

AlphaDisc contributes to a longer lifespan for the irrigation system and ensures uniform crop irrigation, leading to better return on investment, cost savings, and peace of mind by preventing (partial) clogging. This is mainly due to its unique disc design with a precise filtration grade.

A significant advantage is that no conventional backwash valve is required on the outlet side. As a result, there are lower pressure losses and reduced backwash capacities. During the backflushing process, each disc element can clean itself, with the rinse water produced by the opposing disc element during operation.

CHARACTERISTICS

- Precise depth filtration through grooved discs
- High Dirt Holding Capacity (D.H.C.)
- Unique backwashing method using clean water
- Controlled via smart ADI-BLE controller (Bluetooth)
- Scalable (modular) design
- Variable connection configurations for different pipe orientations

The AlphaDisc filter has a relatively high Dirt Holding Capacity (D.H.C.) compared to other alternatives. Additionally, the filter is quick and easy to install, simple to operate, and requires minimal maintenance.

THE FILTRATION PROCESS

Unfiltered water enters through the inlet side and then passes the outer surface of the disc element, which consists of a large number of discs held together by a so-called "spine."

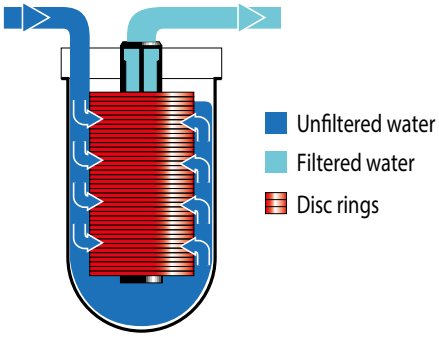
As dirty water is pumped into the filter and the pressure on the outside of the disc element increases, the discs are tightly compressed by the water pressure.
The grooved, compressed plastic discs on the spine enable the depth filtration process.

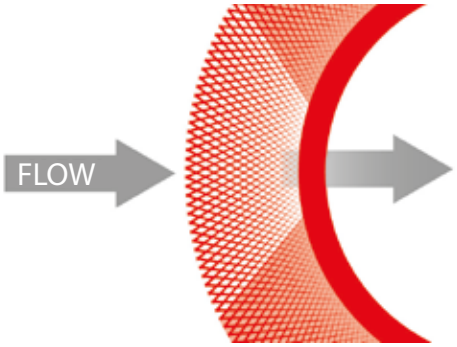
The grooves in the disc rings intersect diagonally, creating a three-dimensional network that captures particles. The number of grooves varies depending on the filtration grade. The turbulence in the different grooves and the numerous intersections of groove lines create a network in which particles are ultimately trapped.

APPLICATION

Primary filtration (open field irrigation systems) or secondary automatic filtration (e.g., hand watering or roof irrigation in greenhouse horticulture) when surface water is used, such as water containing algae and other organic matter. Additionally, applications for groundwater (with a second set of disc rings).

Operating Principle and Disc Structure





OVERVIEW OF TECHNICAL SPECIFICATIONS

Main information

		AlphaDisc 4" XL
Maximum capacity (theoretical)*	m³/h	110
Effective filtration surface	cm²	5240
Filtration degrees	micron	100 (standard), 130, 200 en 400
Dimensions disc-element	mm	170 x 568
Number of discs per element	pieces	appr. 470 - 475
Diameter connection in- and outlet	inch	4" flange ISO (110 mm)
Diameter flushing connection	inch	3" flange ISO (90 mm)
Backflush capacity	m³/h	check table
Minimal working pressure**	bar	1,5 to 2,7
Maximal working pressure***	bar	10
Working temperature***	°C	5 - 60
Weight (empty)	kg	58
Water content	liter	30
Weight (including water)	kg	88

**The maximum capacity of a 110 mm pipe at a flow velocity of 3 m/sec is approximately 90 m³/hour.*

***The pressure differential at the outlet must be at least 1.5 bar during flushing with 200 and 400-micron discs, 2.0 bar with a 130-micron disc, and 2.7 bar with a 100-micron disc.*

****The maximum allowable pressure is 10 bar at 20°C. At higher temperatures, the maximum pressure decreases.*

Materials

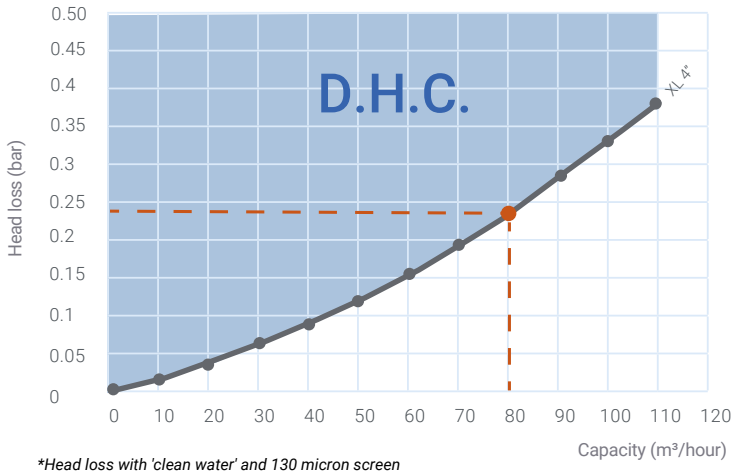
Filter housing	Reinforced Polyamide
Filter discs	PP (Polypropylene)
Flushing mechanism	Polymer
Flushing valve	Polymer
Seal connections	EPDM
Tubing	Polyethylene (LDPE 8x6 mm & 12x10mm)

Application advice (capacity m³/h)

Filtratiegraad	100 micron	130 micron	200 micron	400 micron
	Black*	Red*	Yellow*	Blue*
Rain- or ground water	80	85	90	95
Surface water	70	80	85	90
Drain water	55	70	80	85

** Note: Disc filtration has a different color coding compared to screen filtration. For example, yellow is 200 microns for disc and 100 microns for screen.*

Head loss*



**Head loss with 'clean water' and 130 micron screen*

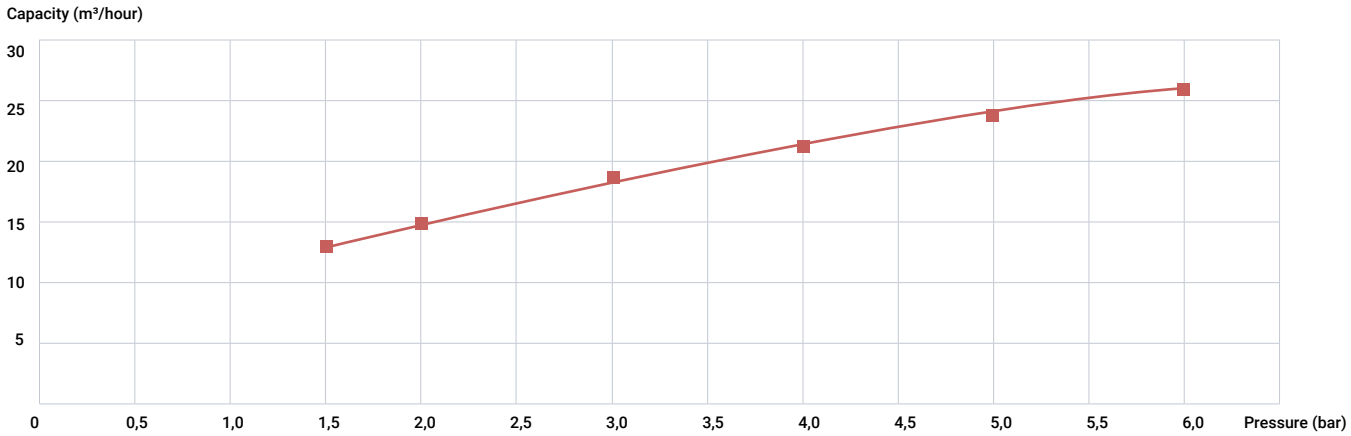
OVERVIEW OF FLUSHING CAPACITY, PRESSURE & FREQUENCY

Flushing time and volume

Flushing time (recommended)*		
Minimal	sec	2x15 = 30
Advice	sec	2x18 = 36
Above average	sec	2x21 = 42
Flushing water per cycle	liter	109 - 304 (depending on time and pressure)

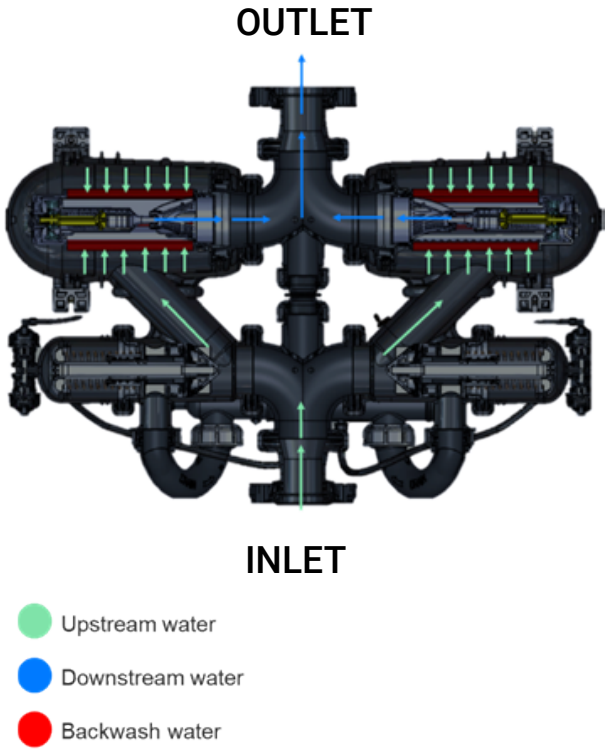
**The mentioned flushing times are indicative; intermediate and longer flushing times are also possible*

Flushing capacity AlphaDisc 4" XL

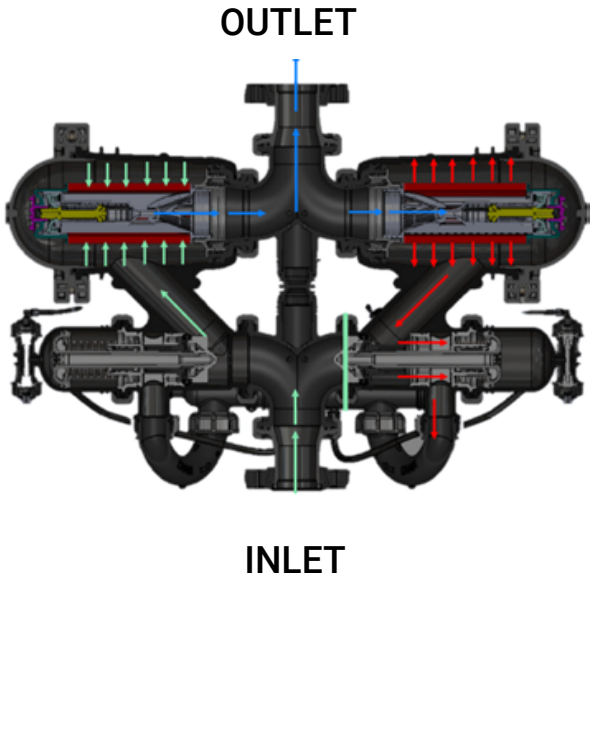


Principle of filtration and backflushing

Flow principle during normal operation



Flow principle during backflushing



Upstream water

Downstream water

Backwash water

Minimal flushing pressure

Filtration degree	micron	100	130	200	400
Minimal flushing pressure	bar	2,7	2,0	1,5	1,5

The flushing pressure is the minimum pressure after the filter during back flushing (minus the backpressure on the flush line, assuming free flow from the flush line). As long as the flushing pressure is at least 1.5 bar but lower than the recommended operating pressure, the flushing process works as expected. However, the pressure indicated in the table above is recommended to properly clean the disc grooves.

Finer grooves require a higher pressure compared to coarser grooves. If the grooves are not cleaned properly, the number of flushing cycles increases, leading to unnecessary wear and a high amount of flushing water.

Indication flushing frequency

- 20 flushing cycles per hour (3 minutes between cycles) is (too) much. With a high frequency of flushing cycles, too much dirt is directed onto the disc elements. Check the intake point of the water to be filtered. The flushing pressure may be too low, causing the filter to continue functioning but not cleaning the disc grooves adequately. If the disc grooves are contaminated with deposits (such as iron or manganese), refer to the AlphaDisc cleaning instructions and clean the discs.
- Commonly, 2 to 6 flushing cycles per hour with 10-15 minutes between cycles is typical.
- 1 flushing cycle per hour (60 minutes between cycles) is low, but can occur in case of good water quality.
- The rule of thumb is: flushing soft particles, such as algae, is more difficult, while flushing harder particles, such as sand grains, is easier.

Flushing time adjustment

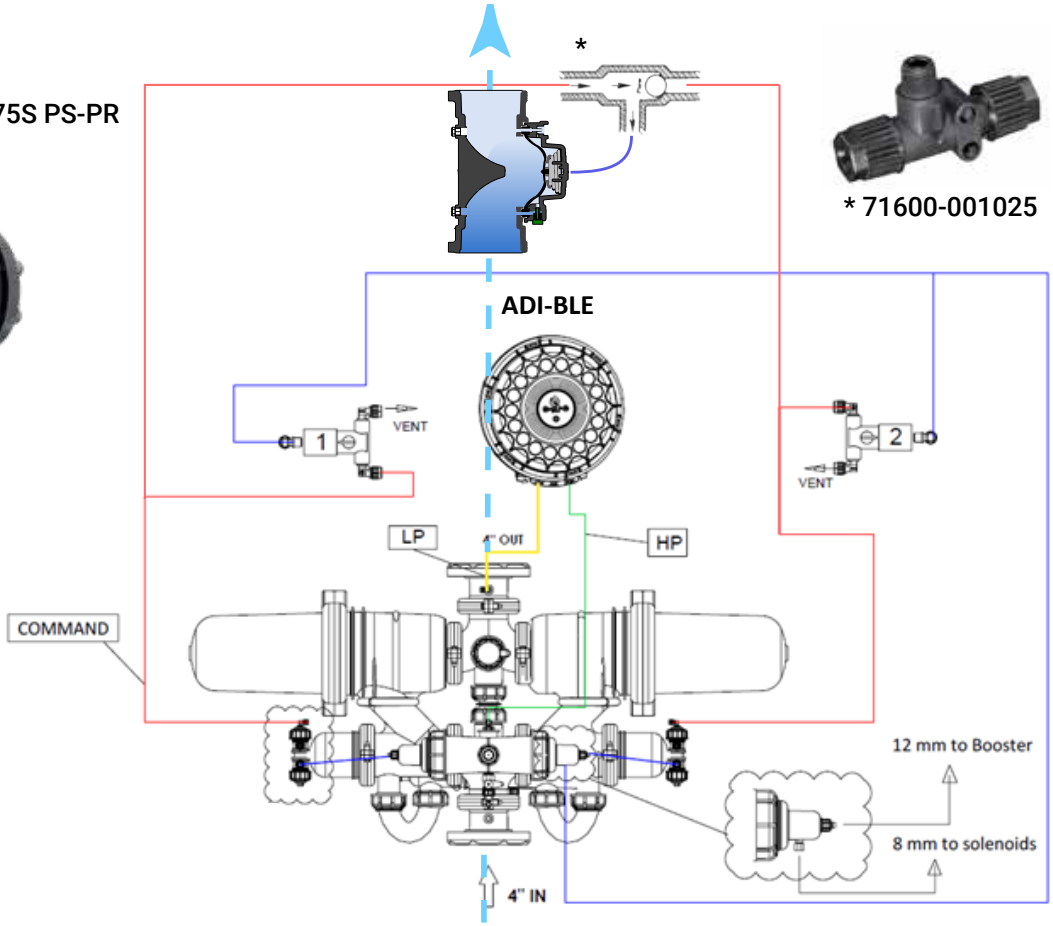
A setting of 15 seconds flushing time is possible, but the standard setting of 18 seconds is usually sufficient. Adjusting is done as follows:

1. Set the flushing time to 15 seconds and wait for the filter to automatically start flushing.
2. Check the ADI-BLE app to see how low the pressure differential has become after the flushing action.
3. Now set the flushing time 3 seconds longer and wait for the filter to flush automatically.
4. Check the ADI-BLE app to see how low the pressure differential has become after this flushing action.
5. If the pressure differentials are (almost) the same, flushing longer was not effective, and 15 seconds is a better setting.
6. If the pressure differential after 15+3=18 seconds is lower, longer flushing was effective. The setting can be kept or...
7. Let the filter flush for a few seconds longer or shorter to see what effect it has and find the optimal flushing time.

Press. control valve Dorot-75S PS-PR

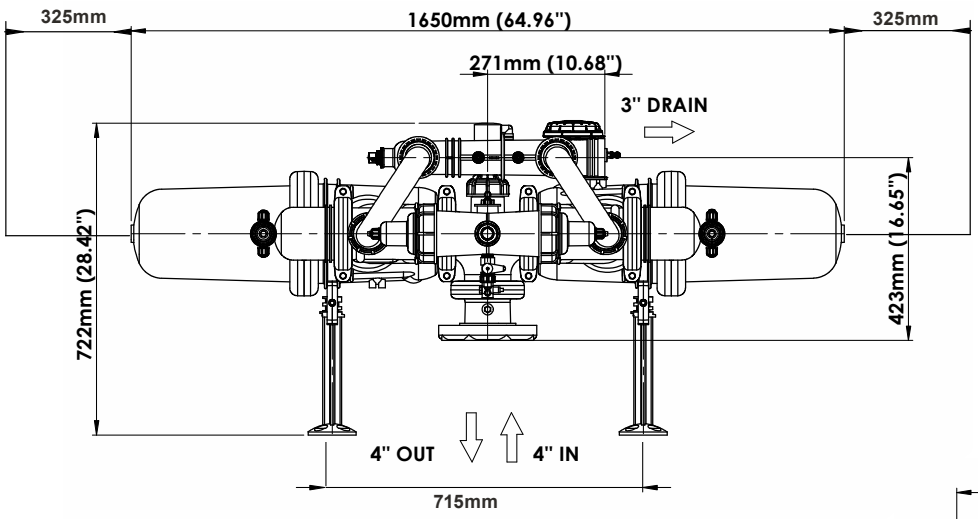
02227-000200

Scheme with main valve + ball selection valve

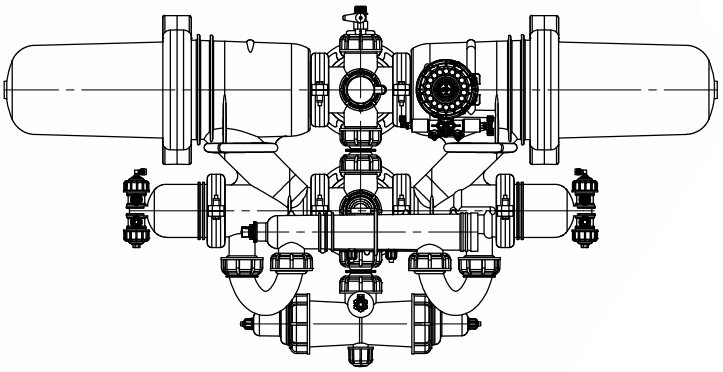


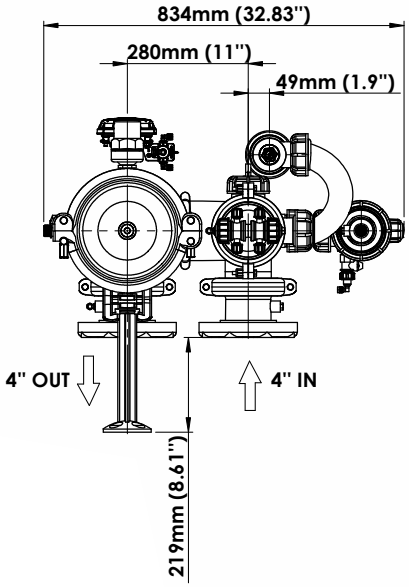
* 71600-001025

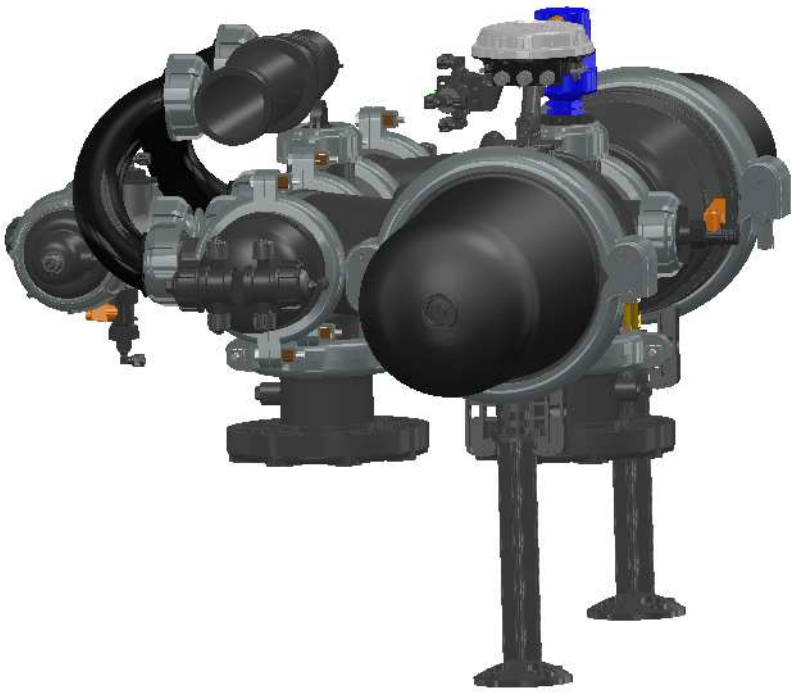
Technical drawing and dimensions



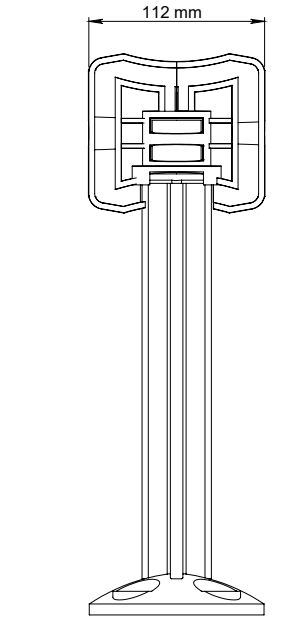
Note the external dimensions of 325 mm on both sides of the filter.



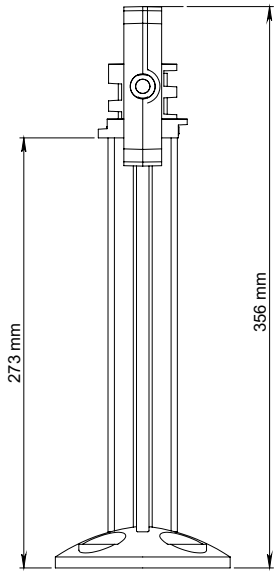




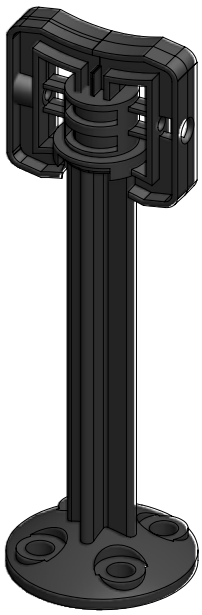
Technical drawing and dimensions of the support leg



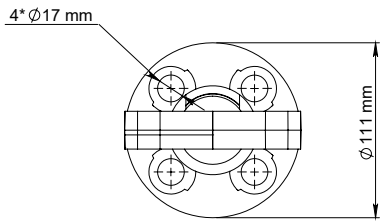
Filler block
height approx. 5 cm



Filler block
height approx. 5 cm

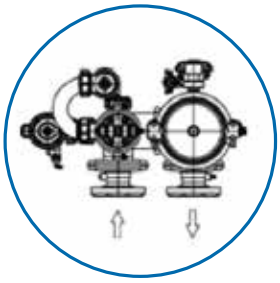


- An elevation of approximately 5 cm below the supplied support legs needs to be implemented in order to create sufficient height for the connection flanges when using PVC elbows.

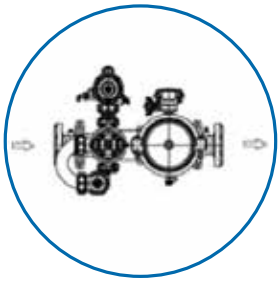


Pipe orientation AlphaDisc

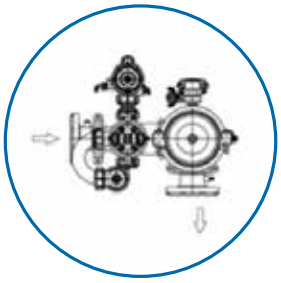
ONLINE (STANDARD)



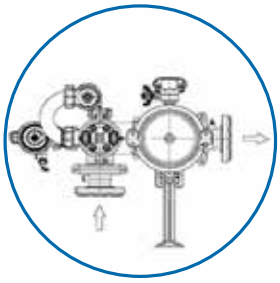
INLINE



ANGLE



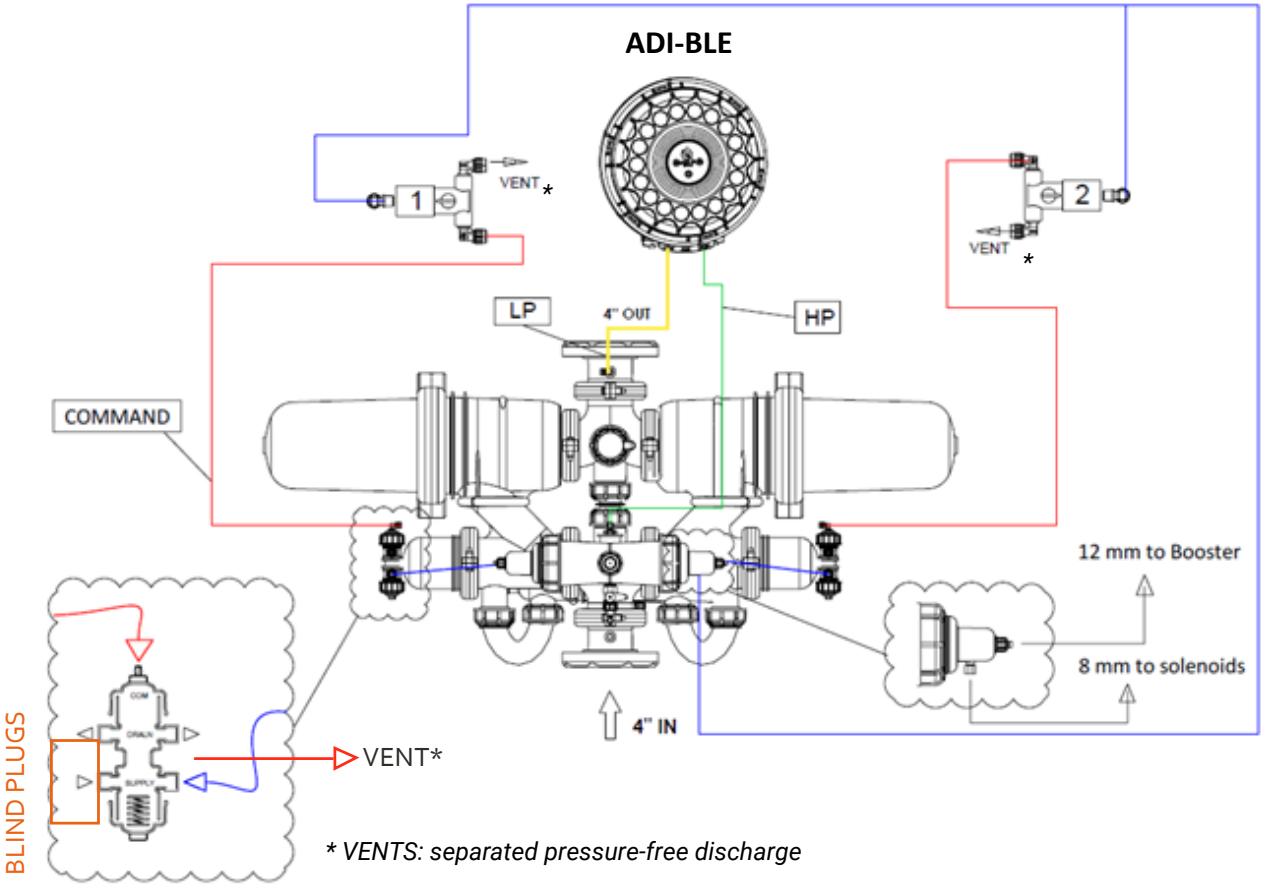
REVERSED ANGLE



- Each AlphaDisc filter can be converted into one of the above configurations. The online model is supplied as standard.

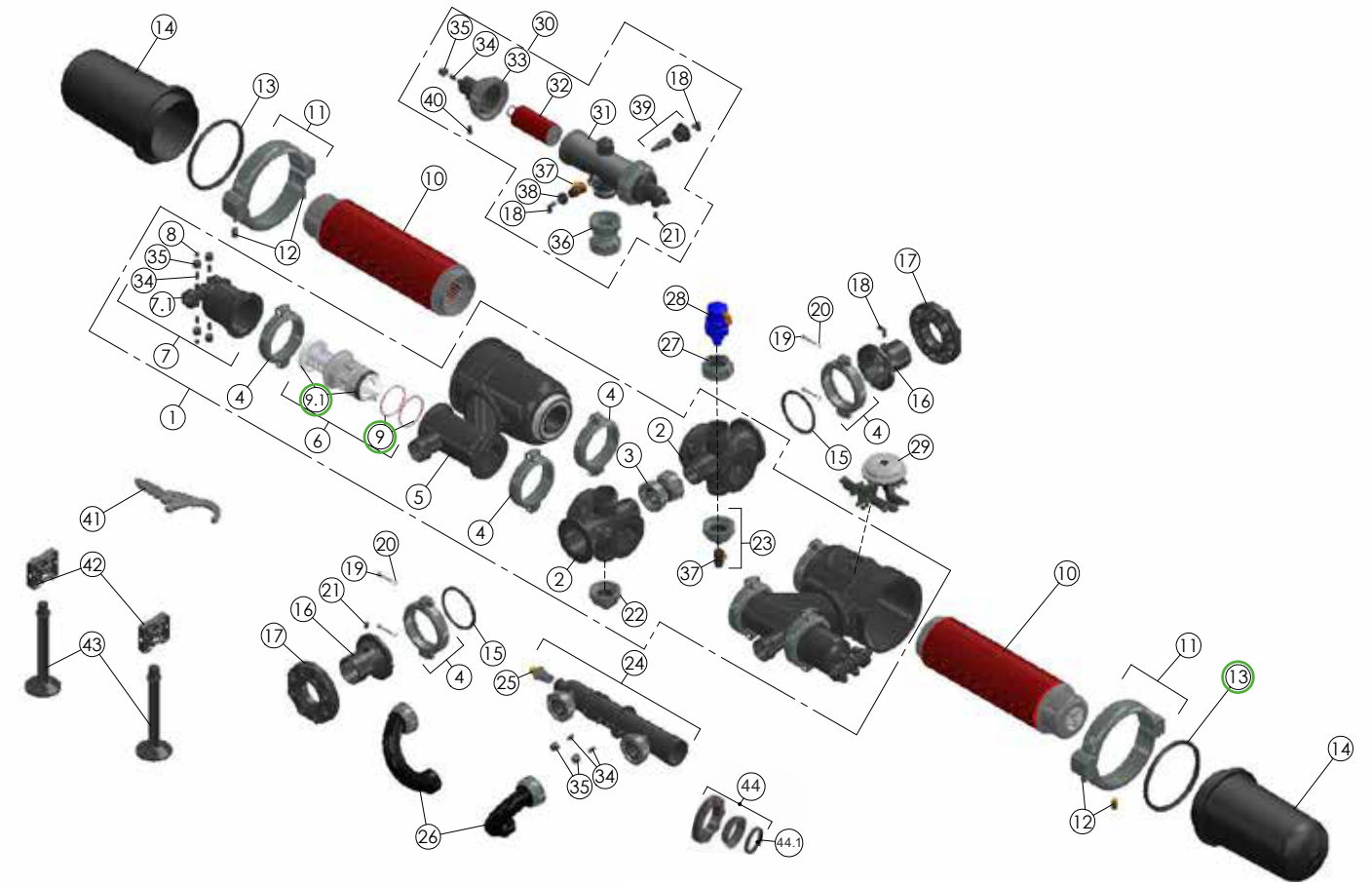
Control diagram with ADI-BLE Controller

Color tube	Diameter tube	Location
Blue	8 x 6 mm	solenoid and flushing valve
Yellow	8 x 6 mm	low pressure measurement
Green	8 x 6 mm	high pressure measurement
Red	12 x 10 mm	control filter and vent



** VENTS: separated pressure-free discharge*

AlphaDisc parts



Item	AlphaDisc parts	Netafim art.nr.
1	AD housing and flushing valves	n/a
2	AD housing cross	70607-000144
3	AD housing cross coupling	70607-000126
4	AD small clamp ring assy	70607-000131
5	AD housing flushing valve + disc-element	70607-000137
6	AD flushing valve assy	70607-000125
7	AD housing flushing valve cover assy	70607-000124
7.1	AD/M100 accelerator (hydraulic relais)	74480-000025
8	AD blind plug 12 mm	70607-000148
9	AD flushing valve o-ring	70607-000154
9.1	AD flushing valve seal	70607-000015
10	Disc element: consult portfolio overview	n/a
11	AD large clamp ring	70607-000135
12	AD large clamp ring bolt M10X30mm	70607-000152
13	AD large clamp ring seal	70607-000155
14	AD housing disc element cover	70607-000142
15	AD small clamp ring seal	70607-000156
16	AD collar bushing 4"XL	70607-000145
17	AD/Mini Sigma 4" AKF flange set	70620-004860
18	AD/Mini Sigma 2-3-4" elbow ¼" - 8 mm	70665-000129
19	AD small clamp ring bolt M8x50mm St.St.	70607-000151
20	AD Clamp ring small, washer M8 St.St.	70607-000153
21	Tefen plug ¼"ext.	71610-000800
22	AD housing screw cap blind	70607-000133
23	AD housing screw cap ¾" ext. BSPT + ball valve ¾"	70607-000132

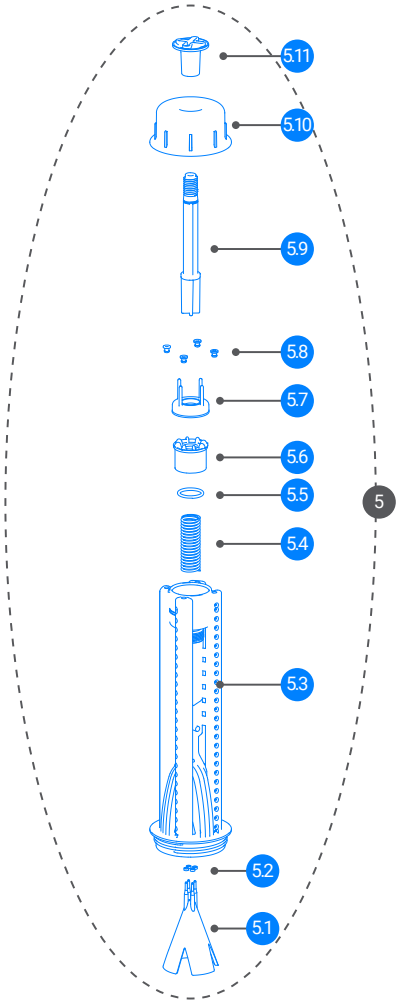
Item	AlphaDisc parts	Netafim art.nr.
24	AD drain collector + vacuum breaker assy	70607-000128
25	AD vacuum breaker	70607-000140
26	AD drain collector elbow	70607-000129
27	AD housing screw cap ¾" int. BSPT for DG-10	70607-000134
28	Air valve DG-10 PL combination ¾"	70500-000520
29	ADI-BLE contr. 2xsolenoid 12VDC 3W latch	70607-000090
29.1	AD/Mini Sigma/M100 solenoid 12VDC 3W latch	74480-000064
29.2	AD/Mini Sigma/M100 power 230VAC - 7-14VDC	74480-018444
30	AD control filter + disc element assy	70607-000130
31	AD control filter housing	70607-000138
32	AD control filter disc element 130 mic red	70620-002530
33	AD control filter cover	70607-000139
34	AD control filter nipple 3/8"x12mm	70607-000149
35	AD control filter nut 12mm	70607-000147
36	AD control filter coupling assy	70607-000127
37	Am ball valve ¾"	70607-000121
38	AD/SAF Raccord conn. nut	74480-060800
38.1	AD/SAF Raccord conn. nipple T1346	74480-060700
39	AD/Mini Sigma 2-3-4" reducer 1"-1/4"+seal	70620-008305
40	Tefen nipple 8x¼"ext.	76400-002300
41	AD Multi-tool	70607-000136
42	AD support leg adapter	70607-000150
43	AD support leg PP black 4xM16	70040-008010
44	AD/Mini Sigma 3" AKF flange set	70620-004810
44.1	AD/Mini Sigma 3" AKF flange set gasket	70620-004900

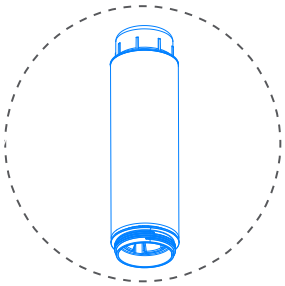
Item	AlphaDisc sets	Netafim art.nr.
	AlphaDisc 4" XL Maintenance set	70607-000035
	AlphaDisc 4" XL Installation set	02227-000022

Item	AlphaDisc lubricants	Netafim art.nr.
	Tube silicone grease PG-21 65 gram*	74480-012650

AlphaDisc Spine parts and Multi- and extraction tool

Item	AlphaDisc Spine parts	Netafim art.nr.
5	AD Spine complete w/o discs	70620-007422
5.1	AD Spine membrane	n/a
5.2	AD Spine ring St.St.	70620-004330
5.3	AD Spine housing	n/a
5.4	AD Spine spring	70620-019440
5.5	AD Spine o-ring 2-327 EPDM	74480-000042
5.6	AD Spine nut	70620-004640
5.7	AD Spine piston PE	70620-004650
5.8	AD Spine plug	n/a
5.9	AD Spine screw for spring	70620-007476
5.10	AD Spine cilinder cover grey	70620-004680
5.11	AD Spine nut cilinder cover	70620-019455





AlphaDisc Multi-tool (70607-000136)

AlphaDisc spine extraction tool (70620-019445)

INSTALLATION & MAINTENANCE

Installation and supplies: general items

- It is important that these filters are connected with flat flange adapters (not grooved). No other sealing rings should be used. Installation sets are available for connecting an AlphaDisc filter.
- Before installation, read the included manual. It contains the necessary installation instructions.
- The inlet and outlet pipe dimensions for the Alpha-Disc should be 4" (110 mm). The flush pipe should be at least 3" (90 mm).
- Flushing water should be discharged at least 10 meters downstream from the intake point to prevent the flushing water from causing additional contamination at the intake point.
- The AlphaDisc filter must always be installed horizontally.
- The included AlphaDisc Multi-tool is available for assembling and disassembling filter fittings, nuts from the clamp rings, and the cover of the disc holder.
- **Note:** A minimum of 32.5 cm of clearance space is required on both sides of the filter for removing and replacing the housings of the disc elements.
- An elevation of approximately 5 cm below the included support legs should be created to achieve the required height for the connection flanges when using PVC elbows.
- **Note:** The filter is equipped standardly with a 100-micron disc element. The appropriate disc element of choice can be ordered separately.
- **Note:** The piping must be strong enough to support the total weight of the filter. If the piping is able to rotate or bend, the filter may be damaged. The AlphaDisc filter should be supported at four points: both with the two support legs and two supports (fixations) from the piping.
- Use the EC or pump start signal to monitor the flushing frequency, ensuring there are neither too many nor too few flushing actions.
- It is possible to convert the filter to an inline, angled, or reversed angled model.

Commissioning

- The control filter contains a small valve designed for cleaning the control filter during operation; open this valve during commissioning.
- Check the disc set during commissioning. The disc holder comes with a few extra discs by default.
- Ensure that the volume of the disc set is adjusted to the indicated marking on the disc holder. Store the remaining discs carefully in proximity of the filter.

Installation and supplies: control and drainage

- A separate drainage pipe of 32 mm (non-pressurized drainage) must be installed for the discharge of the control water from the filter.
- **Note:** By default, the filter is not equipped with a drainage pipe for flushing. Depending on the orientation of the filter, this can be added later to prevent flushing water from reaching the filter. This water should be drained without pressure.
- For modifying or extending the PE tubes, Netafim recommends using the following products: 02058-250051 LDPE 8X6 100m (control tubes) and 02057-250055 LDPE 12x10 100m (tubes for accelerator feeding).

Installation and supplies: additions

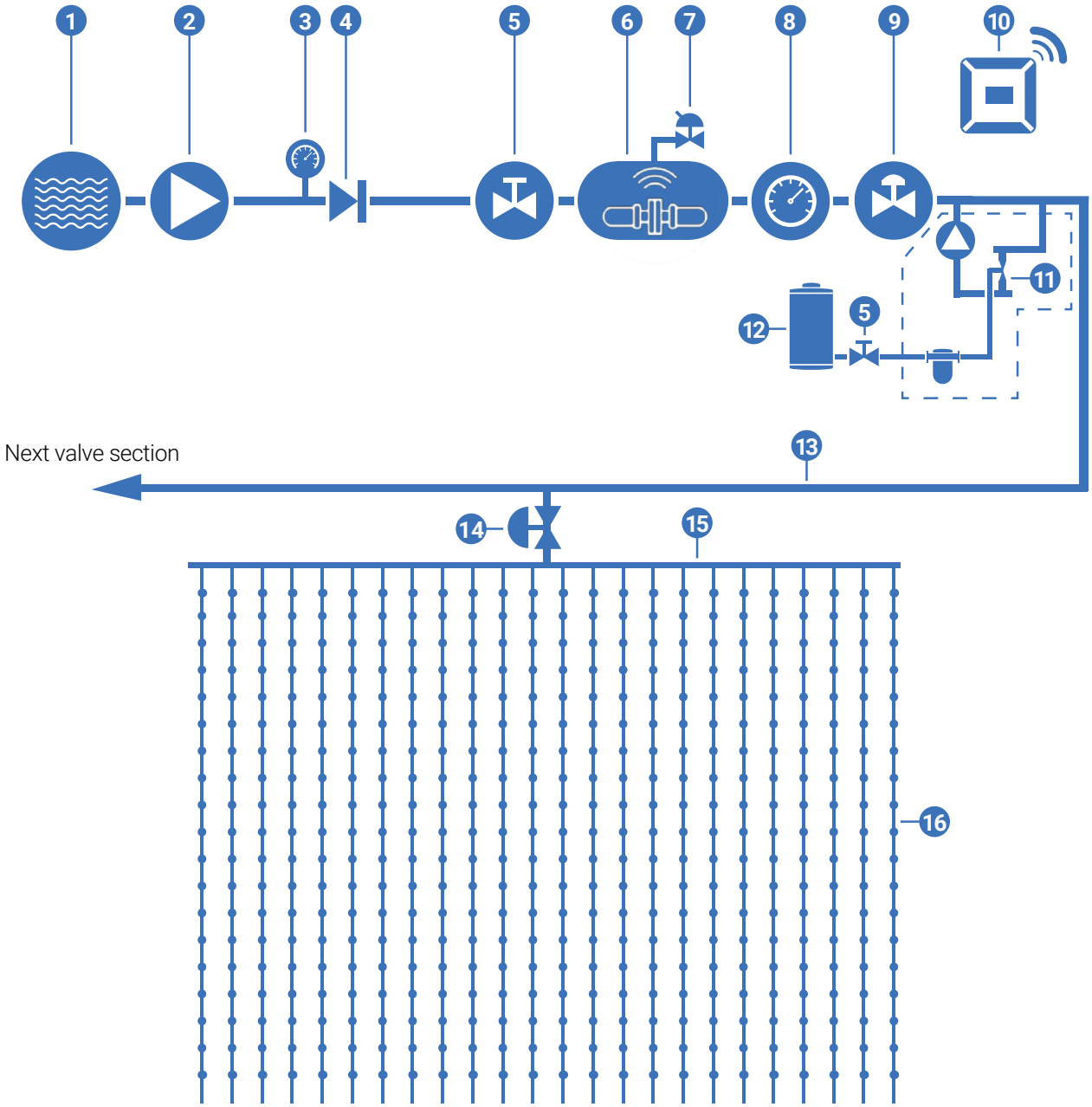
- It is recommended to use a ¾" Amiad ball valve (70607-000121) at the location of the drain/vent. This valve prevents unintended draining of the filter.
- For most applications, it is necessary to install a Dorot-75S PS-PR valve 4"/110mm (02227-000200). This valve ensures sufficient flushing pressure, prevents the filter from draining, and also prevents cavitation, which could damage the pump.
- Additionally, a main shut-off valve with a ball check valve (71600-001025) can be installed after the filter, which will close the main flow during flushing to generate sufficient flushing capacity. Please refer to the schematic overview.

Installation: electrical considerations

- It is advisable to link the alarm contact to a visual or audible alert, ensuring that alarm signals are noticeable outside operating hours. This alarm should be externally resettable. Note: the batteries in the controller do not have enough power to activate the alarm contact for an extended period, so it is advised to provide the controller with an external continuous power supply.
- When installing two or more AlphaDisc filters in a system, they should also be electronically connected. Please refer to the ADI-BLE controller manual.

INSTALLATION SCHEME (RECOMMENDED)

Installation of AlphaDisc in combination with drip irrigation and fertigation



Legend

1. Water source
2. Pumping station
3. Pressure gauge
4. Check valve
5. Manual valve
6. Filter (AlphaDisc/Mini-Sigma)
7. Flushing valve
8. Water meter (WST Bayonet)
9. Automatic main valve or PS-valve
10. Irrigation controller (Growsphere)
11. Dosing unit (FertiKit)
12. Fertilizer tank
13. Main line (FlexNet)
14. Automatic pressure reducing valve
15. Distribution line (FlexNet)
16. Dripline (Streamline-X ReGen)

INSTALLATION & MAINTENANCE

Maintenance

- It is advised to regularly check the operation of the AlphaDisc filter (depending on the application, but at least annually).
- For maintenance: refer to the AlphaDisc manual and also the YouTube instructional videos on the Netafim channel.

Winterizing

- To prevent the AlphaDisc filter from being damaged by freezing residual water, drain all the water from the filter, the control filter, and the flushing system, then open the drainage valve.
- To ensure the disc element is clean before the shut down period, we recommend performing a manual flush first.
- Remove the batteries from the ADI-BLE controller if it is not running on mains power.

Cleaning disc element

- For manual cleaning of the disc element, refer to the AlphaDisc cleaning advice for disc elements on our website.
- The 130-micron control filter is a standard disc filter without automatic back flushing. If the filter is not functioning properly or allowing too little water through, the filter should be cleaned manually. The control filter includes a small valve designed for cleaning the control filter during operation.
- **Note:** Follow the indicated marking when replacing the discs on the disc holder (spine). Check the photo below. Replacing too many or too few discs may cause the filter to malfunction.

Removal of the spine (disc holder)

In exceptional cases where it is necessary to remove the entire spine from the housing, a special tool is available: 70620-019445. Do not use a hook wrench or chain pliers for removal!

Note: Photo for illustration purposes, the spine (disc holder) contains two ridges, no colored lines.