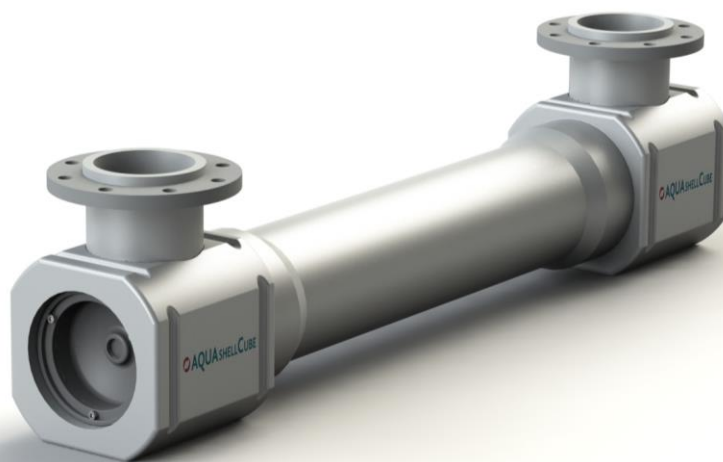


AQUAShell Cube 40-60" High flow cartridge filters vessels

AS80C SERIES

USER MANUAL



All information included in this publication is based on the latest information available at the time of printing. NOWADAYS TECHNOLOGIES reserves the right to make changes at any time without prior notice and without incurring any obligation whatsoever.

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1. Versions and Revisions

Revision 1 – 2017 August.

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2. General information

AQUAshell Cube 40" High flow cartridge filter vessels AS80C Series is a fiberglass pressure vessels designed for the continuous, long-term use as housing for high flow cartridge filter.

The AS80C Series designed to accommodate with 3M, Parker, Pall Water cartridge filter.

The vessel body produced by a continuous filament winding process and the feed and concentrate pipes connections are located on the side of vessel body.

AQUAshell Cube vessels for reverse osmosis membranes are designed for pressure of up to 150 psi (10 bar).

Testing of AQUAshell Cube vessels conforms to all industrial standards, assuring superior technical parameters.

AQUAshell Cube quality is guaranteed by computer-controlled automatic equipment and high-qualified staff. Production quality control is maintained in accordance with ISO 9001 requirements.

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3. Safety precautions

- AQUAshell Cube® pressure vessels are designed for high flow operations. Improper installation, operation service or maintenance may cause severe damage to property, physical injury or death.
- Inspect end closures regularly; replace components that have deteriorated and correct causes of corrosion.
- Regularly inspect the system to verify that head locking components are properly placed and secured. Replace any faulty component.
- It is recommend that only a qualified mechanic, experienced in servicing high-pressure hydraulic systems, should assemble or disassemble vessel.
- Provide overpressure protection in the system safety devices.
- Do not use corroded parts. They may cause difficulties in removing some components.
- Do not operate vessel at temperature over 140°F and do not operate vessel at pressures in excess of specific rating.
- Do not service any component until you verify that vessels and piping are fully depressurized.
- Do not pressurize vessels without element in place.
- Do not tolerate leaks or allow end closures to be routinely wetted in any way.

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4. Installation notes

Carefully study the vessel engineering drawings for key dimensions and technical requirements.

Vessels must be installed correctly to ensure safe use and long service life.

Make sure that the vessel is horizontally installed on support saddles.

Straps should be tightened enough to hold the vessel onto the support pads, but never so tightly as to restrict expansion.

Vessel should not support any other system components.

Ensure enough space is reserved around the two ends of the vessel for installation and removal of the membrane elements.

The piping system must be connected to the ports using victaulics connectors or flanges.

Inspect if all components are in place.

Inspect if all components in as-new condition, clean and free of damage or corrosion.

Inspect if retaining ring is fully seated in the retaining ring groove.

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5. Modifications

AS80C Series modifications:

RS	80	X	. XXX	. C	X
					Color B - Blue W - White C - Custom
					Side-Port Diameter 10 - 1" 15 - 1.5" 20 - 2"
					Side-Port Quantity 1 - 1 side- port 2 - 2 side- port
					Type of Head C - Cube head
					Pressure 150 - 150 Psi
					Cartridge length 40 - 40" 60 - 60"
					Vessel diameter 80 - 8"

Example

8" cube vessel for 60" cartridge filter, 150 Psi, with 2 side-ports, which diameter is 6", color white:

AS8060.150.C260W

AS80C Series 150 psi modifications:

Model	Cartridge filter size	Shell Length L, mm
AS8040.150.C	40"	1571
AS8060.150.C	60"	2088

6. Technical data

AQUAshell Cube AS80C high flow cartridge filter vessels are designed to provide safe operation over a long service life if properly installed, operated, and maintained. The operating conditions:

Model: AS80n.150C **Drawing Number:** A80.C.00 **Design Pressure:** 150 Psi/ 10 Bar (at 140°F/60°C)

Min. Operating Temp: 14°F / -10°C

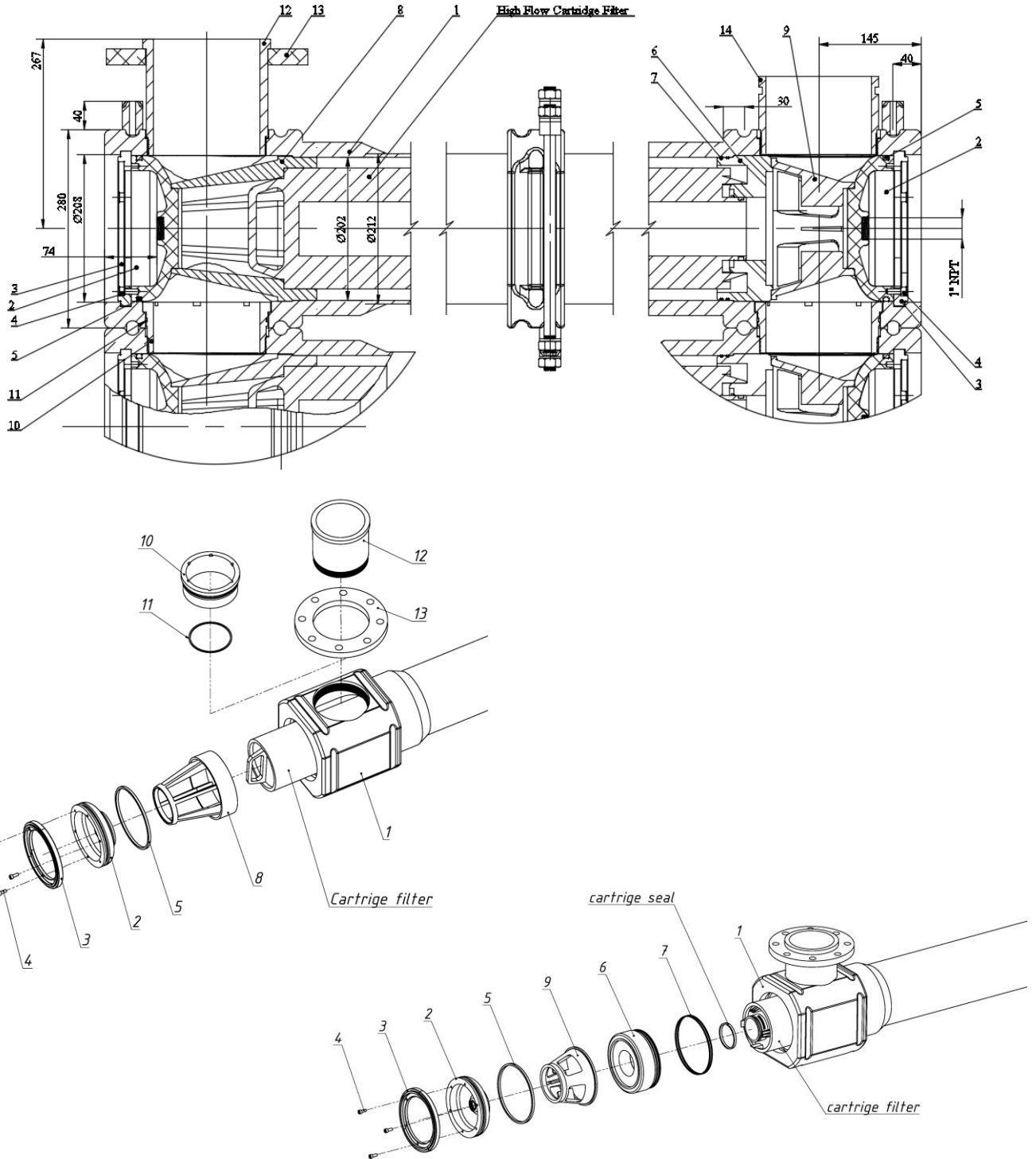
Max. Operating Temp: 140°F / 60°C

Factory Test Pressure: Standard: 1.5x Design Pressure
ASME: 1.1x Design Pressure

The allowable water PH range: 3-11 under normal operating conditions and 2-12 if the vessel is periodically cleaned.

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7. Construction and component identification AQUAshell Cube 8" cartridge filter vessel assembly



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Nr.	PART NUMBER	DESCRIPTION	REF.	QTY	MATERIAL
1	AS__C.150	Cartridge housing	1	4*'	GRE
2	A80.03.00	End plate	2	2'	GRE
3	C80.04.00	Locking kit segments	3	2'	GRE
4	DIN 912	Hex socket cap screw M8x20	4	6'	A2
5	80.18.00	Quad-ring 189,97x6,99	5	2'	EPDM
6	A80.11.00	Adaptor	6	1'	PVC
7	06-262-19017	Adaptor seal (O-ring)	7	2'	EPDM
8	A80.08.00	Support ring	8	1'	PVC
9	S80.13.00	Thrust ring	9	1'	PET
10	A80.05.00	6" threaded flange	10	1"	GRE
11	06-353-15834	Connection seal (O-ring)	11	1"	EPDM
12	A80.07.00	Threaded lapped port for loose flange	12	1*"	GRE
13	EN 1092-1/T02	EN 1092-1/T02	13	1*"	GRE
14	A80.09.00	Threaded Victaulic port	14	1*"	GRE
15	C80.10.01	Symmetric support beam	15	4*'	GRE
16	DIN 975	Threaded rod M16x1208	16	4*'	A2
17	DIN 985	M16 Lock nut	17	8*'	A2

'Qty for a single cartridge housing

"Qty for a single inter-housing connection

*'Qty for "Example of an Aquashell Cube Assembly"

*"Qty for a single port

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8. Technical service

8.1. Instruction for assembling vessels

Check all the components of vessel visually before assembling it. The components must not have a visible damage, which may have an effect during the operation (chips in the places for rubber rings, thread breakage in threaded connections, dents on the internal surface and rents of concentrate channel or cracked rubber rings).

1. Inspect vessel for a mechanical damage in the inner surface of the place, where is installed O-ring (pos. 5).
2. Take the inter-housing connection (pos. 10) and insert the rubber O-ring (pos.11).
3. Take the inter-housing connection (pos. 10), and put them into the concentrate holes in the vessel. Use the key to well tighten screw.
4. During the installation lubricate all rubber rings with silicone oil (111 Compound Molykote).
5. Put the O-ring (pos.5) around the end plate (pos. 2).
6. Put the O-ring (pos.7) around the Adaptor (pos. 6).
7. Put the support ring (pos. 6) into vessel.
8. Put the Thrust ring into vessel.
9. Insert end plate into the vessel. Lubricate seating surface of the vessel with silicone grease.
10. Secure the assembled construction in the vessel with the locking kit (pos. 3) and screws M8 (pos.4).
11. On over side put the support ring into vessel.
12. Insert end plate (pos.2) into the vessel. Lubricate seating surface of the vessel with silicone grease.
13. Secure the assembled construction in the vessel with the locking kit (pos. 3) and screws M8 (pos.4).

8.2. Instruction for opening vessels

1. Shut off all sources of pressure and relieve pressure from the vessel
2. Inspect the vessel at each end for corrosion which may interfere with head assembly removal. If corrosion is evident, proceed as follows:
 - Clean any rusts with a small wire brush
 - Flush away loosened rusts with clean water.
 - Open vessel.
3. Before removing the assembled construction (head) from the vessel, unscrew screws M8 (pos.4) and remove the locking kit (pos. 3).
4. Gently tap the assembled construction with a rubber mallet.
5. Thread a 1" NPT Male threaded piece of PVC (or similar material) pipe into the head to hand tightness.
6. Carefully move head assembly back on forth to release the seal.
7. If the head seal remains in the vessel bore, it should be removed at this time.

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8.3. Head disassembling/assembling

.3.1. Head disassembling

Inspection: Make sure all pressure has been relieved from the vessel, following system manufacturer's recommendations. Make sure that the head is removed from the vessel according to "Instruction for opening vessels".

- Remove the seals from the end plate.

8.3.2. Head reassembling

- Install the head O-ring. Lubricate the O-ring and seat it into the groove located on the outside diameter of the sealing plate.

8.4. Vessel cleaning and inspection

When the head have been removed, perform a visual inspection of the vessel head and fittings, to locate any signs of corrosion or salt concentrations. If corrosion or salt concentrations are found, follow the following steps:

- Use a small wire brush to loosen any large deposits.
- Put the components in a soapy water and wash their surfaces until all corrosion is removed.
- Rinse components with clear water.
- Blow components dry with compressed air.
- Examine components for damage that may affect structural strength or sealing properties.
- Clean the inner surface and groove of the vessel by removing the residue or corrosions with a mild soap solution and then flush with clean water.

Inspect vessel, if there are scratches on the inner surface of the vessel up to 20 µm depth, grind the area carefully with sand paper until it is smooth.

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9. Troubleshooting

1. If locking kit segment's screw is too tight to thread out, proceed as follows:
 - Apply penetrating fluid (such as WD-40 similar) onto the locking kit segment and gently tap it with a mallet until the screw can be threaded off. Please take care not to contaminate the membrane elements.

2. If there is leakage, the possibilities can be:
 - Deteriorated head seals after running for over 2 years
 - Seals are deformed due to the pH of the medium
 - Seals are deformed due to the high temperature of the medium
 - Seals are damaged due to improper installationProceed as follows:
 - Check the temperature, and pH of the medium.
 - Replace the seals.

3. Body damage of the vessel, the possibilities can be:
 - During transportation.
 - During installation.

4. If damage is serious, replace the vessel.

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10. Transportation and storage

10.1. Vessel Handling Precautions

- **DO NOT** drop vessel or allow it to hit hard on the ground or against other objects.
- Use padding to protect the vessels during handling to prevent damage.
- **DO NOT** Scratch or damage to the inner surface of the vessel.
- **DO NOT** lift the vessel from the Feed/Concentrate ports or permeate ports.
- **DO NOT** impose excessive external force on the vessel.
- **DO NOT** climb on the vessel.
- Damaged vessel must not be used.

10.2. Storage Requirements

- Vessel storage area shall be well leveled, clean and dry.
- Vessels shall not be stored outdoors. Long term exposure to outdoor environment would accelerate aging of FRP and also discoloring and peeling of paint. Vessels placed outdoors for a short period of time shall be covered with oilcloth.
- Make a list of product and spare parts before storage.
- Store vessels in their original packaging.
- Vessel storage area shall be far away from heat source.
- Store in a safe area to keep the vessel from shaking or falling.
- Height: not exceeding 3 packing units. Do not stack any other articles on top of vessels.

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11. Limited warranty

The warranty obligations of Nowadays Technologies are limited to the terms set forth below:

What is Covered:

ROShell vessel (Product) and parts (Parts) are warranted to the original owner to be free of defects in material and/or workmanship under normal use for a period of five (5) year from date of Invoice.

What is Not Covered:

This warranty does not cover:

- defects resulting from improper or unreasonable use or maintenance;
- defects not reported to Nowadays Technologies within the above described warranty period;
- failure to follow operating instructions;
- damage caused by acts of nature or problems resulting from abuse, misuse, negligence or accident;
- unauthorized alteration or modification or attempted repair of Product or Parts;
- damages caused by inadequate packing or shipping procedures;
- Normal wear of replaceable components, including elastomeric Seals, Spacers etc. These parts require maintenance as part of a yearly service schedule.
- Products purchased from unauthorized dealers.
- What Nowadays Technologies will do:
- During the warranty period, Nowadays Technologies will, at its sole option, issue a credit in the amount of the original purchase price of the product, or repair or replace any defective parts within a reasonable period of time.

How to Obtain a Remedy under this Limited Warranty:

If the buyer discovers within this period a failure of the product to conform to specifications, or a defect in material or Workmanship, the buyer must promptly notify Nowadays Technologies in writing. In no event may that notification be received by Nowadays Technologies more than 30 days after the end of the warranty period. Any goods that the buyer believes to be defective are to be returned to Nowadays Technologies factory for examination. However, upon request of the buyer, Nowadays Technologies may, at its discretion, agree to examine the goods in the field. If, upon examination by Nowadays Technologies, any goods sold under this agreement or purchase order do fail to conform to Product specifications, or prove to be defective in material or workmanship, Nowadays Technologies will supply an identical or substantially similar part F.O.B., Nowadays Technologies factory; or Nowadays Technologies, at its option, will repair such part or give credit to the buyer for the original cost of such goods.

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Other conditions:

THE PROVISIONS OF THIS LIMITED WARRANTY ARE IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NOWADAYS TECHNOLOGIES MAXIMUM LIABILITY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT.

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Disclaimers:

No dealer or other person has any authority to make any warranties or representations concerning Nowadays Technologies or its Products. Accordingly, Nowadays Technologies is not responsible for any such warranties or representations.

Other legal rights:

This limited warranty gives you specific legal rights, and you also may have other rights that vary from state to state or country to country. Some places do not allow limitations on implied warranties or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

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