Aquestia
Directing the Flow

Mining Leaching Skid

Air & Fluid Flow Control Unit

The following is a step-by-step narrated description of the Mining Leaching Skid – Air & Flow Control system, installation, operation and maintenance processes.

The Instrumentation & Control Leaching Skid is a portable self-contained unit, designed to be installed at each leaching module entrance to provide precise leaching rate control in the module, as well as the monitoring of the pressure/flow parameters during the leaching process. The Mining Leaching Skid helps increase ore recovery in the heap; optimizing the overall leaching process and maximizing unit production.
The skid protects the control valve unit in the field from impacts of heavy machinery and other possible harms in respect to its operation area, materials in use, the terrain, and the surrounding conditions, therefore the frame is yellow and its assembly materials were chosen with consideration to the corrosive fluids in use in the mining market segment.

System Diameter	Control Valve	Air Release Valve	Stacking Dimensions L x W x H in mm
4”	DOROT S75 4”	A.R.I. D-040 L 1”	1082 x 926 x 701

Aquestia
Directing the Flow

Table of contents

Disclaimer

1. Safety Instructions

General

1. Aquestia products always operate as components in a larger system. It is essential for the system designers, installers, operators and maintenance personnel to comply with all the relevant safety standards.
2. Installation, operation or maintenance of the product should be done only by qualified workers, technicians and/or contractors using only good engineering practices, complying with and observing all conventional safety instructions in order to minimize risk and/or danger and/or hazard to workers, the public or to property in the vicinity in accordance with all relevant local standards.
3. Extra safety considerations should be taken with hot and hazardous liquids or in hazardous environments' applications to avoid bodily/physical harm and damage to public or private property.
4. All individuals installing operating and/or handling the products including all workers should at all times adhere with the occupational safety and health (OSH) instructions and wear safety helmets, goggles, gloves, and any other personal safety equipment required by the local standards and regulations.
5. Use only appropriate standard tools and equipment operated by qualified operators when installing, operating and maintaining the product.
6. Prior to installation, operation, maintenance or any other type of action carried out on the product, read carefully the safety, installation and operation instructions of the product.
7. **Please note**:
    - Pressurized fluid and/or gas may be discharged from the product without prior warning. Make sure that the product's outlet port is not directed toward electrical elements (pumps) or people.
    - The pressurized fluid and/or gas that can be discharged from the product may create high noise levels. Take this into consideration when installing the product in areas sensitive to noise.
8. Always open and close valves slowly and gradually.
9. Please note that the maximum working pressure indicated at the product's specifications table doesn't include pressure changes caused by water hammer and pressure surge effects. Use the product only according to its designated pressure rate specifications.
10. Use the product only for its intended use as designed by Aquestia Any misuse of the product may lead to undesired damages and may affect your warranty coverage. Please consult with Aquestia prior to any non-regular use of this product and make no change or modification to the product without a prior written consent to be provided by Aquestia at Aquestia's sole discretion.
11. Please note that Aquestia shall **NOT** assume any liability with respect to any damage losses and/or expenses caused to any person and/or property whatsoever unless the product has been duly installed and thereafter maintained in strict compliance with its designated maintenance Instructions and/or any other installation and operation manuals provided by Aquestia for the product and/or applicable ordinances and/or codes.

Handling

1. Shipping and handling the product must be done in a safe and stable manner and in accordance with the relevant standards and regulations.
2. For lifting and positioning the product, use only approved lifting equipment operated by authorized employees and contractors.
3. Prior to the installation visually verify that the product was not damaged during shipment to the installation site.

Installation

1. Install the product according to the detailed Installation Instructions provided by Aquestia and according to the description given in this manual.

2. Scope of Supply:

NO.	Part No.	Designation	Materials	Dimensions	Quantity
1	665SKI0002	FRAME ASSEMBLY	FRP		1
2	0055304SKI5	INLET PIPE 1 GROOVED	PP		1
3	0055304SKI3	INLET PIPE 2	PP		1
4	0055304SKI4	OUTLET PIPE	PP		1
5	002460SKI2	TUBE FILTER	PP+SST316		1
6	SIL001159	FLANGE SEAL 4"	EPDM		2
7	BLT001484	HEX. BOLT	SST316	5/8" x 6.5"	8
8	005184000V	CLAMP VICTAULI	P.P	4"	2
9	WSR001052	FLAT WASHER	SST316	UNC 5/8"	16
10	NUT001037	NUT	SST316	5/8"	8
11	53420001	BALL VALVE M/M	PVC+EPDM	2" NPT	2
12	51020001	ADAPTER CAMLOCK M/F	PP	2" NPT	2
13	R-03104401BTPP	PLUG	PP	1" BSPT	1
14	0021802SKI	CLAMPING STRAP	SST316	2in	2
15	0021804SKI	CLAMPING STRAP	SST316	4in	2
16	BLT001303	HEX BOLT	SST316	3/8"x2"	8
17	WSR001074	SPRING WASHER	SST316	UNC 3/8"	8
18	WSR001037	FLAT WASHER	SST316	UNC 3/8"	8
19	NUT001096	NUT 3/8"	SST316	3/8"	8

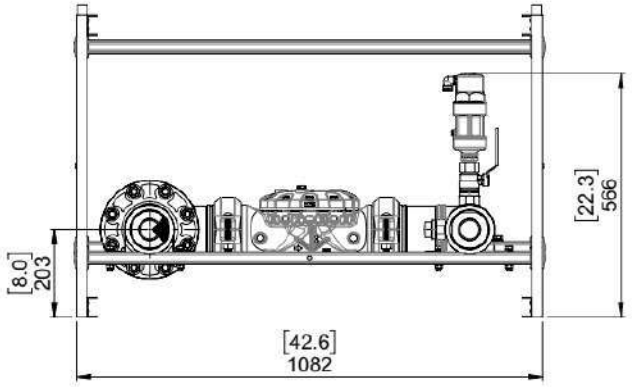
3. Required Tools:

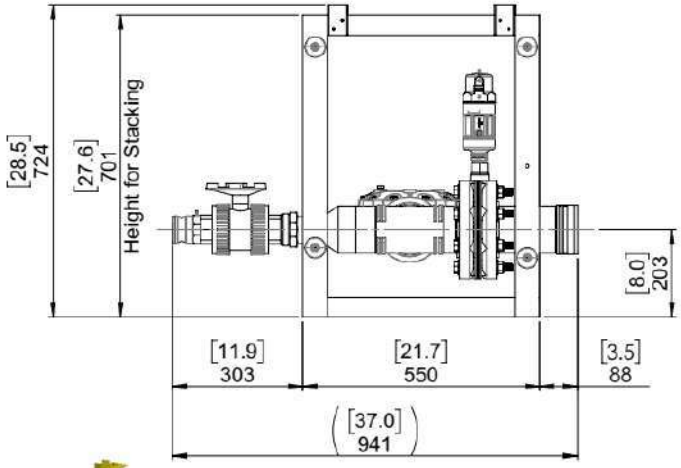
- Plastic Hammer
- 8 mm Allen, L-shape, hex key wrench
- Wrench 5/8”
- Wrench 3/8”
- Wrench for the Vic connectors
- Wrench for the 2” ball valve and camlock

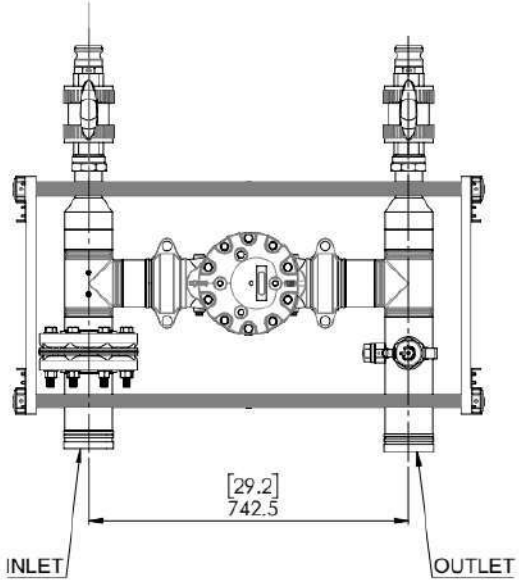
Aquestia
Directing the Flow

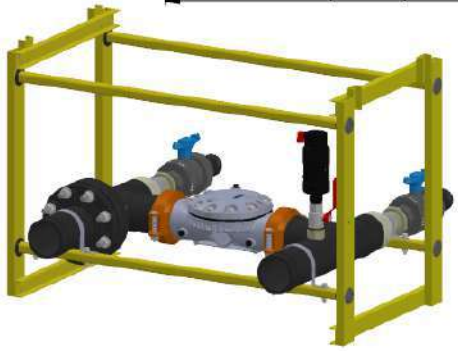
4. GA Drawing

REVISIONS			
REV	No	DATE	APP'D









R&D Approver: Michael F. Date: 07.01.25
APPROVED
ECO Approver: Maor A. Date: 15.01.25

MATERIAL:				
WEIGHT:				
GENERAL TOLERANCE		DATE	NAME	SIGN
	DRAWN	15.01.25	Dafna R.	Digitally signed
SIZE: - REV: -	CHE'D	07.01.25	Michael F.	Digitally signed
SCALE: NO SCALE	APP'D	15.01.25	Maor A.	Digitally signed
FIRST ANGLE DIMENSIONS ARE IN MILLIMETERS				
Drawing No. 665SKI0003				4/4

Aquestia

DESIGNATION: DOROT
Grooved Mining Skid
Assembly Kit

C:\Ari-Vault\Products\Dorot\Mining skid\Grooved Skid\665SKI0003

LAST SAVED DATE 15/01/2025 8:58:11

5. Installation

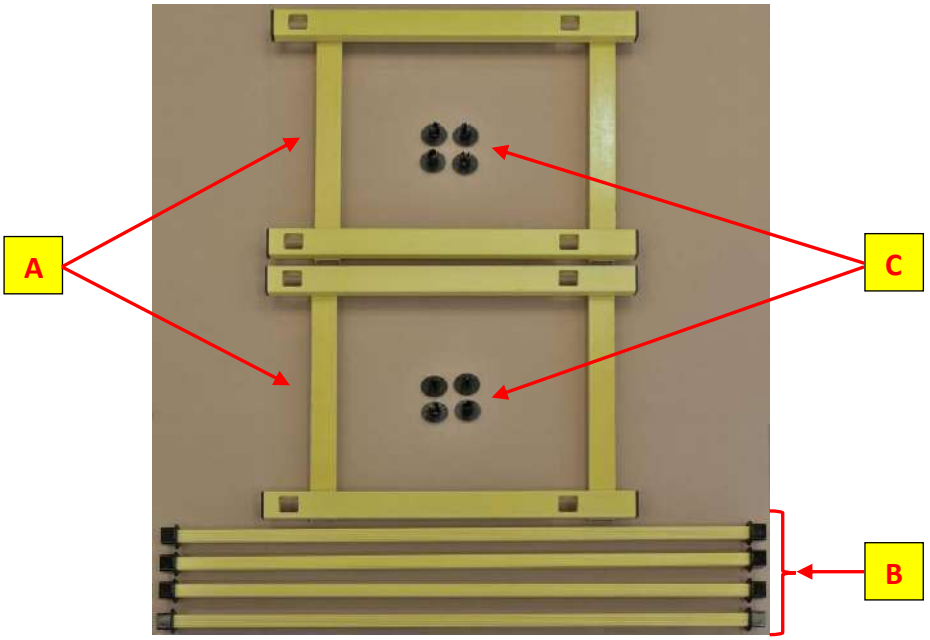
5.1. Pre-Installation Requisites

1. **Important**: Before performing any work on the system make sure that all workers on site are familiar with the safety instructions and the relevant local and general safety instructions and work regulations.
2. Before installing the system, flush the pipeline to remove scale, dirt and other particles that might affect the system performance.
3. Carefully remove the system's components from the shipping package. Unload the components carefully to a sturdy and leveled surface taking care not to drop them.
4. Valves fitted with hoist rings should only be lifted and conveyed using these hoist rings.
5. It is recommended that the system's installation location is easily accessible and clearly marked to prevent damage.

5.2. Installation Procedure

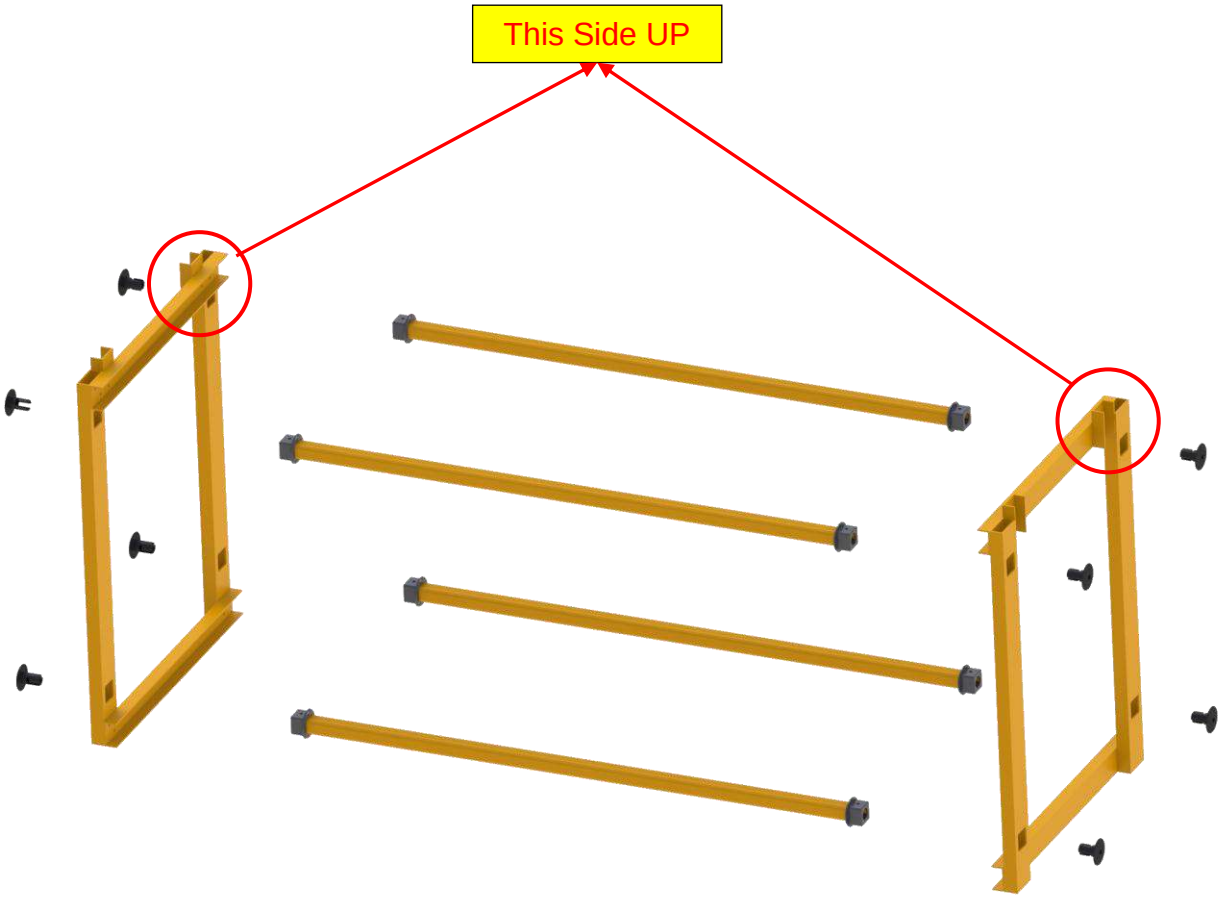
Skid Preparation – Frame Assembly:

1. Open the skid shipping package and verify that it includes the following parts:
    A. 2 frames
    B. 4 connecting rods
    C. 8 plugs

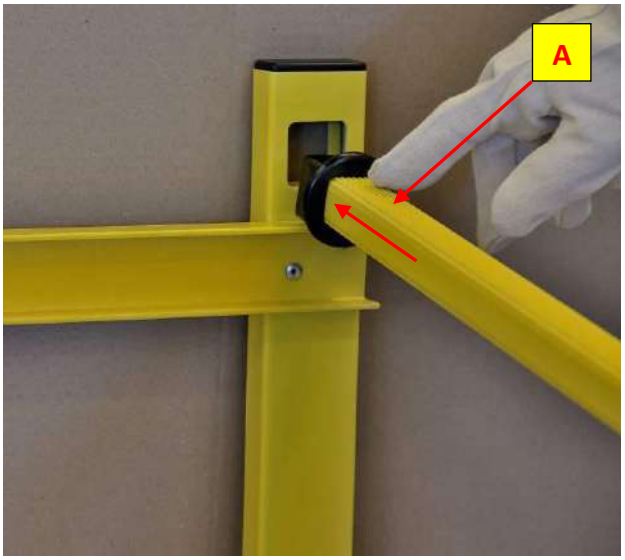


2. General layout of the skid's frame:

3. Note the skid positioning direction (note the location of the connecting rods sockets) and place the first frame it that direction. Note that the right frame is marked with a green sticker, and the left frame is marked with a red sticker.

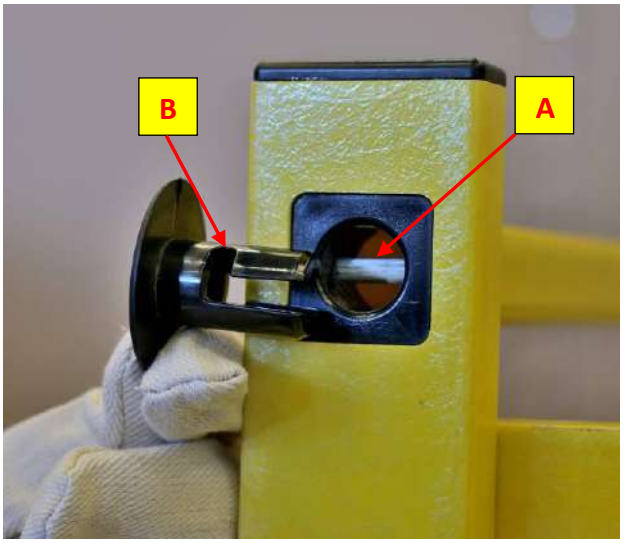


4. Insert the Connecting Rod Flanged End (marked with a yellow sticker) in the lower, forward-facing holes. Place the Connecting Rod Camlock End (marked with a blue sticker) in the lower, backward facing holes. Place the two undrilled Connecting Rods (not marked with a sticker) in the upper holes.
   Note the correct side of the rod's strips (A) they should be facing upward and downward.

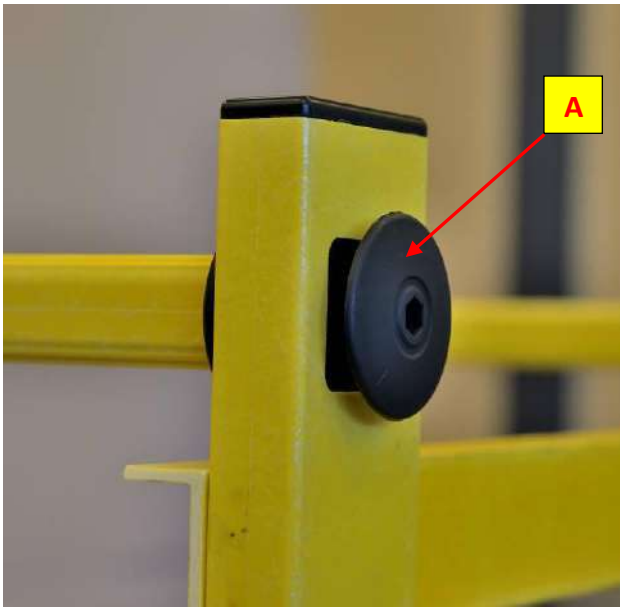


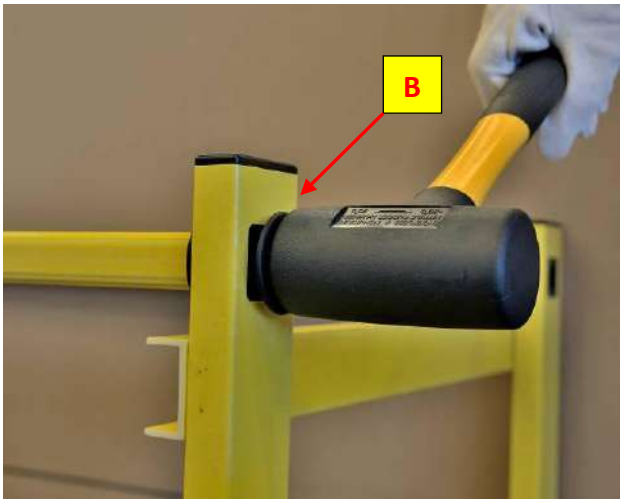
5. Make sure that the four rods are assembled as depicted in the following picture.

6. Connecting the plugs process:
    a. Note the rod's internal connection latch (A) direction, and the direction of the plug insertion position (B).

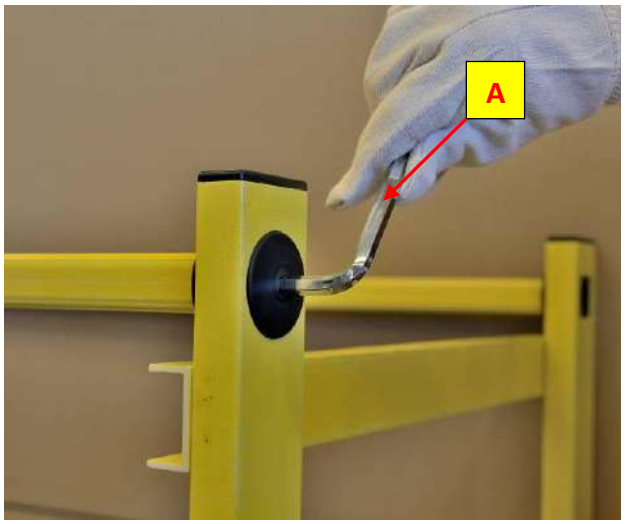


    b. Insert the plug to the rod's socket (A) direction, and press it in using the plastic hammer (B).





c. Using the Allen L-key (A) to lock the plug by turning it 90° clockwise (B).

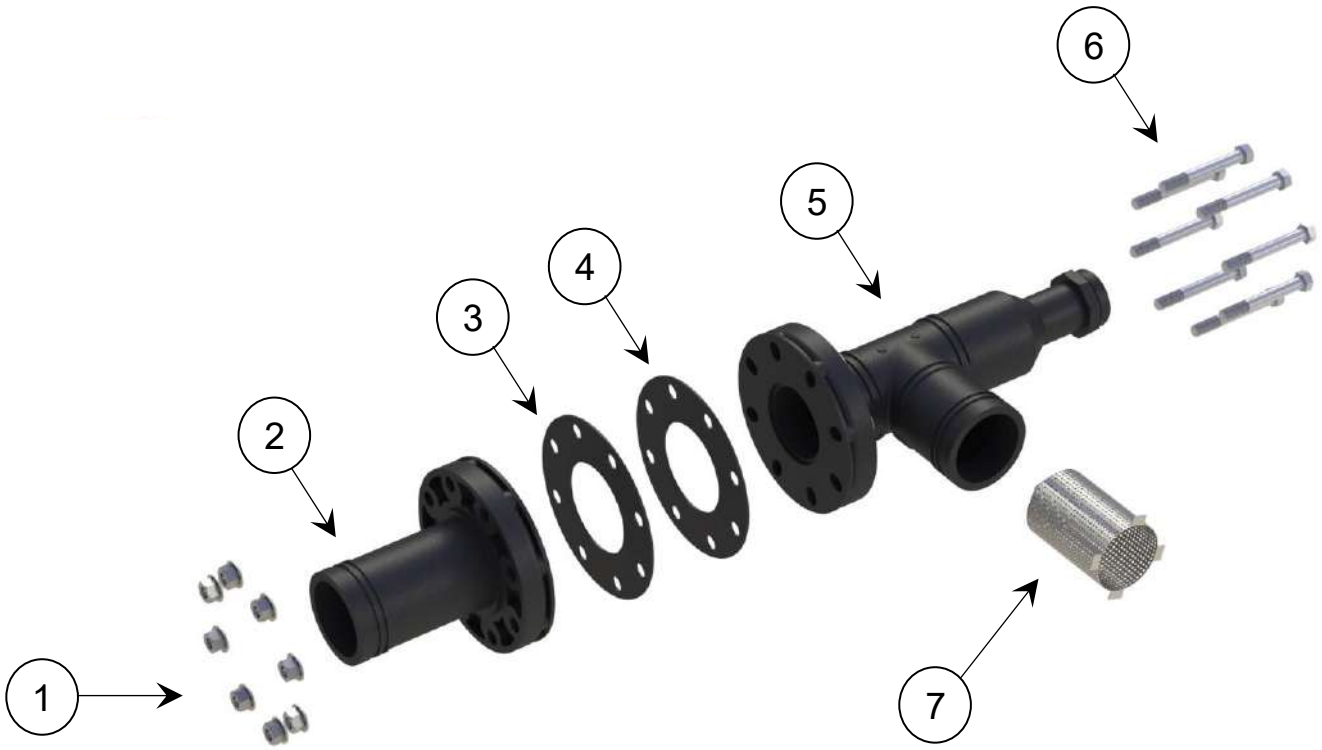


d. Repeat the locking process for the rest 7 rods and plugs.

5.3. Skid Preparation – Manifold Assembly:

1. Assemble the inlet manifolds:

   Assemble the flow meter between Inlet Pipe 2 and Inlet Pipe 5, with two 4” flange seals, use 5/8” bolts.



1	Washer and Nuts
2	Inlet manifold
3	Gasket
4	Gasket
5	Inlet manifold
6	5/8” Bolts
7	Strainer

2. Assemble a 2” ball valve to the inlet manifold, and a 2” camlock adaptor to the ball valve.

3. Assemble the outlet manifold: Assemble a 2” ball valve to the Outlet Pipe, and a 2” camlock adaptor to the ball valve.

4. Assemble the control valve to the manifolds:

   Connect the control valve to the inlet and outlet manifolds, using the Victaulic clamps.

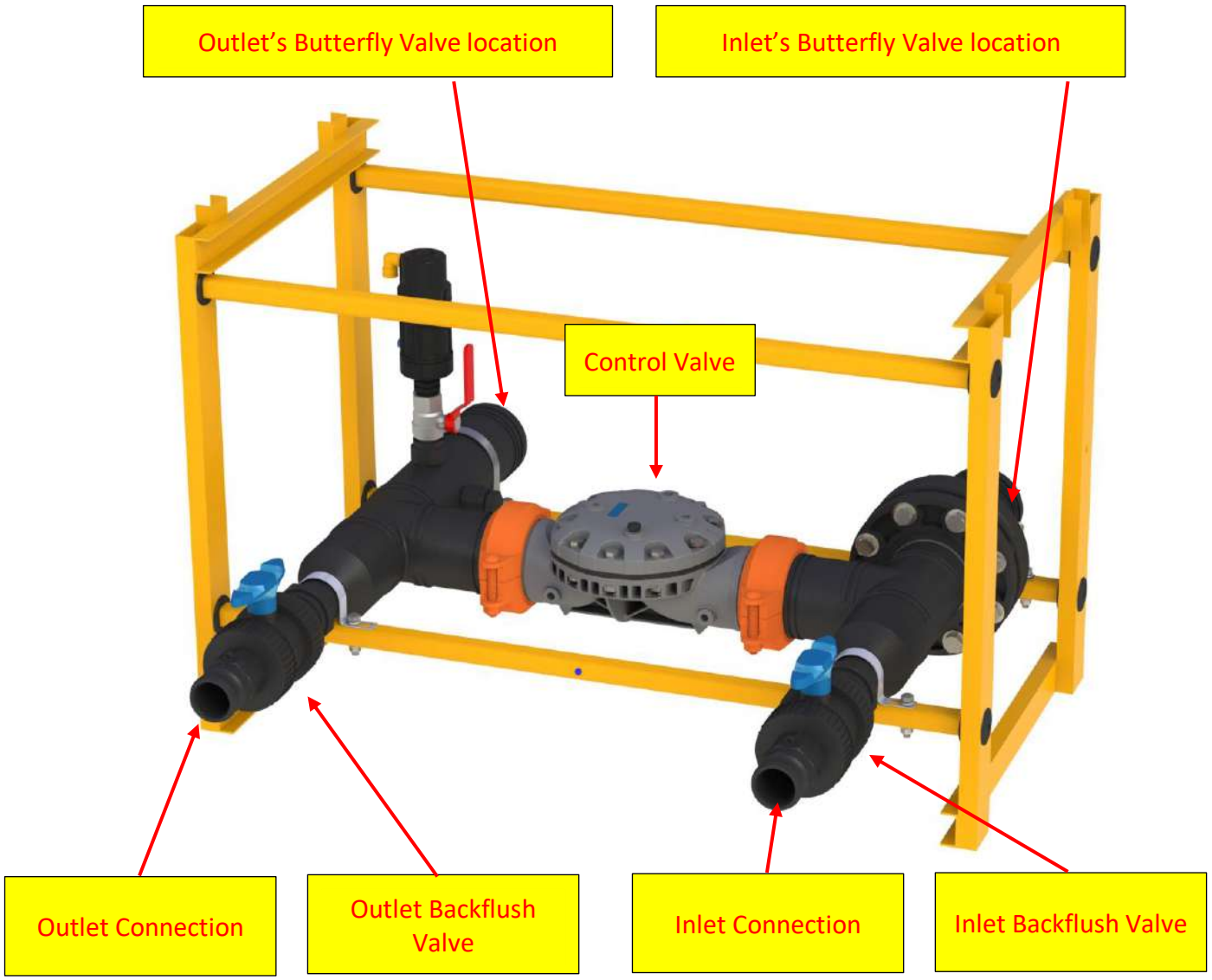
5. Install the air valve: Assemble the 1” ball valve of the air release valve to the outlet manifold and install the air valve on top of it.

The following figure depicts the assembled skid:

6. Connect the control system to the frame: Place the control system on the frame, note that the camlock end and the flanged end are placed correctly. Connect the clamping straps to the frame, 2” clamping straps for the camlock end and 4” clamping straps for the flanged ends, use 3/8x2” bolts. Recommended torque for securing the bolts is 15 [Nm] (11 ft-lb), maximum is 20 [Nm] (15 ft-lb). Note: the connecting rod will start breaking at about 50 [Nm] (37 ft-lb).

Skid Preparation – Instrumentation:

1. Install the Orifice Type Pressure Differential Flowmeter (not included).
2. Install the Pressure Gauge (not included).
3. If needed, attached to the frame any transmitter or additional interface to be used to send pressure or flow information to a control room.



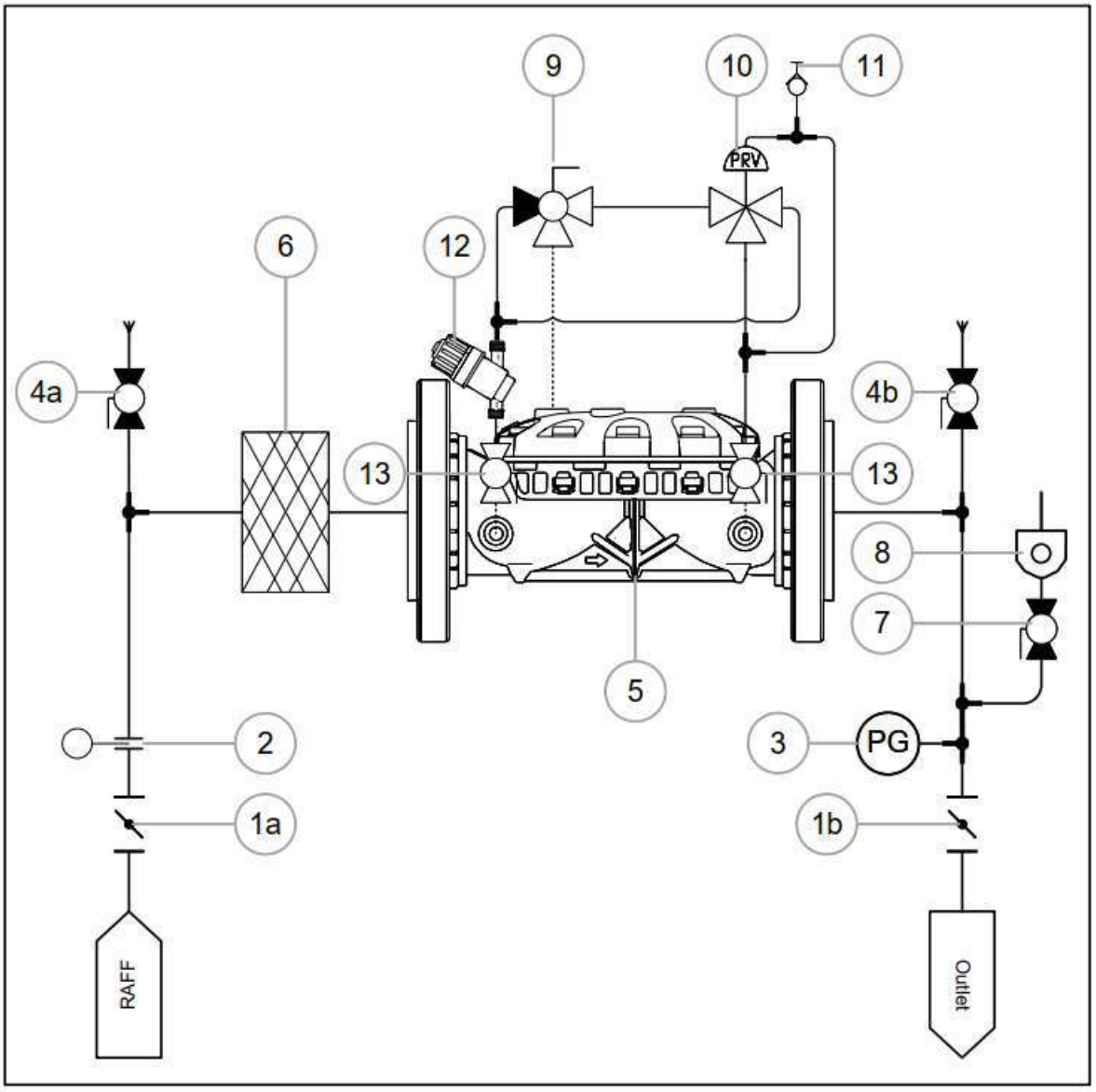
Note that it is possible to mount a second skid unit on top of skid:

Field Installation:

1. The SKID is provided with ANSI flange end connections.
2. The SKID inlet must be connected to the leaching secondary pipeline at the entrance of the leaching sub-module. An isolation valve must be considered for maintenance purposes.
3. The SKID outlet must be connected to the leaching tertiary pipeline inside the leaching sub-module. An isolation valve must be considered for maintenance purposes.

Important: SKIDS must be installed in pairs. Closed enough in a way that a hose can be connected between their flushing valves.

Please refer to the following Control Loop drawing:



Aquestia
Directing the Flow

Included in scope of supply

No.	Part
4a	Backflush outlet 2" – Camlock male connection
4b	Backflush inlet 2" – Camlock male connection
5	Flowrate valve 4"
6	Filter screen 4"

Not included in scope of supply

No.	Part
1a	Butterfly valve inlet 4"
1b	Butterfly valve outlet 4"
2	Flowmeter orifice 4" – ANSI flange connection
3	Pressure gauge 1" – 1" NPT female connection
7	Ball valve 1"
8	Air release valve 1"
9	L-type valve
10	Pressure reducing pilot
11	Pressure test point
12	Large control filter
13	Ball valve

3.3. Initial Start-up – Please refer to the Control Loop Drawing in the previous page.

Preparation:

1. Flow Rate Valve
    a. Both valves, UP and DS (13) must be opened.
    b. Selecting valve (9) must be in its AUTO position.
    c. Loose the bolt on the pilot (10).
2. Air Valve
    a. Isolation valve must be opened.

Initial Operation:

1. Both inlet and outlet butterfly valves (1a and 1b) must be closed.
2. Open inlet valve (1a). The system will be pressurized. Check for any leak. Correct if needed.
3. Verify air has been released through the air valve.
4. Open outlet butterfly valve (1b). Fluid will start filling the sub-module while the rate valve will close after a while.
5. Check for any leak upstream the rate valve. Correct it of needed.

4. Maintenance

Under regular operation, the Mining Leaching Skid requires minimal maintenance and no lubrication, however in freezing climates the system should be dismantled and drained for the winter months.

Important: Before performing any work on the system, make sure that all workers on site are familiar with the safety instructions section of this document and with all the relevant local and general safety instructions, standards and work regulations.

***Warning* –** Do not perform any maintenance while the line is pressurized.

4.1. Periodic Inspection – Control Valve

a. Every 6 months visually inspect the valve's diaphragm for any tears.
b. Every 2 months inspect the valve's operation and clean the Filter.
c. Check the downstream pressure; adjust if required.

4.2. Storing the Control Valve (If removed from the skid)

It is not recommended to store the valve or its spare parts for long periods (years); under improper storage conditions rubber parts can harden, have ozone cracking, grow mold bloom and heat aging.

It is recommended to order new rubber parts when required.

4.3. Periodic Inspection – Air Valve

Please note that the periodic maintenance of the air valve is an integral part of the proper pipeline maintenance regime; it should be maintained at least once a year in accordance with the quality and composition of the fluid in the system.

4.4. Storing the Air Valve (if removed from the skid)

It is not recommended to store the valve or its spare parts for long periods (years); under improper storage conditions rubber parts can harden, have ozone cracking, grow mold bloom and heat aging.

It is recommended to order new rubber parts when required.

4.5. Flushing the Screen Strainer (Please refer to the Control Loop Drawing.)

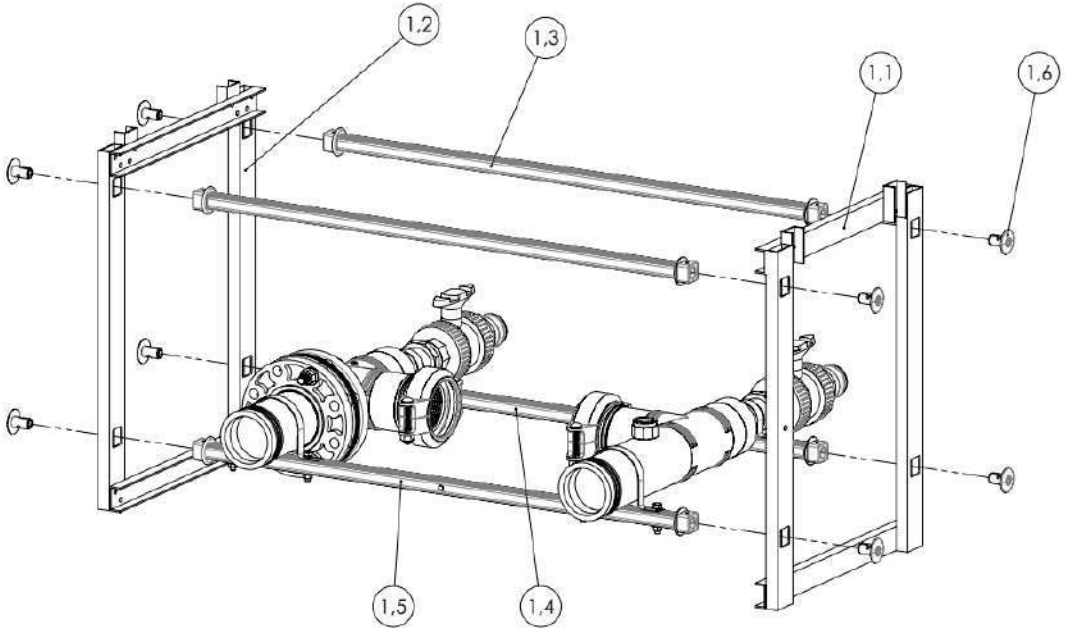
1. To backflush skid #1, close both the inlet and the outlet butterfly valves (1a and 1b).
2. Be sure the flow-rate control valve (5) of skid#1 in its AUTO position through its selecting valve (9)
3. Open both the inlet and the outlet backflushing valves in Skid#1 (4a-S1 and 4b-S1) to release any residual pressure inside the Skid#1
4. Connect a hose, using the camlock connections, between the inlet back flushing valve (4b-S1) of skid #1 and the inlet backflushing valve (4b-S2) of skid#2 (which needs to be under normal operation).
5. Open the inlet backflush valve (4b-S2) on Skid#2 to start a backflush process on skid #1. Any trapped material in the filer's screen (6-1) of skid #1 will be released through 4a-1 valve.
6. After no more than 30 seconds, close the inlet backflush valve (4b-S2) on Skid#2.
7. Close both inlet backflush valve (4b-S1) and outlet backflush valve (4a-S1) on skid#1.
8. Remove the hose between the skids.
9. Open both inlet and outlet butterfly valves (1a and 1b) of Skid#1.
10. Skid#1 is back to its normal operation. There is no need to recalibrate the flowrate control valve of Skid#1.

Aquestia
Directing the Flow

4.6. GA Drawing & Bill of Materials

REVISIONS			
REV	No	DATE	APP'D

No	PART No	DESIGNATION	MATL	QTY.	NOTES
1,1	00501SKI0R	FRAME RIGHT	FRP	1	MARKING: GREEN STICKER
1,2	00501SKI0L	FRAME LEFT	FRP	1	MARKING: RED STICKER
1,3	00501SKI01	CONNECTING ROD	FRP+ABS	2	NO MARKING
1,4	00501SKI02	CONNECTING ROD CAMLOCK END	FRP+ABS	1	MARKING: BLUE STICKER
1,5	00501SKI03	CONNECTING ROD FLANGED END	FRP+ABS	1	MARKING: YELLOW STICKER
1,6	00501SKI04	PLUG	NYLON 6	8	NO MARKING



R&D Approver: Michael F. Date: 07.01.25
APPROVED
ECO Approver: Maor A. Date: 15.01.25

MATERIAL:				
WEIGHT:				
GENERAL TOLERANCE				
		DATE	NAME	SIGN
	DRAWN	15.01.25	Dafna R.	Digitally signed
SIZE: - REV: -	CHED	07.01.25	Michael F.	Digitally signed
SCALE: NO SCALE	APP'D	15.01.25	Maor A.	Digitally signed
FIRST ANGLE / DIMENSIONS ARE IN MILLIMETERS				
Drawing No. 665SKI0003				1/4

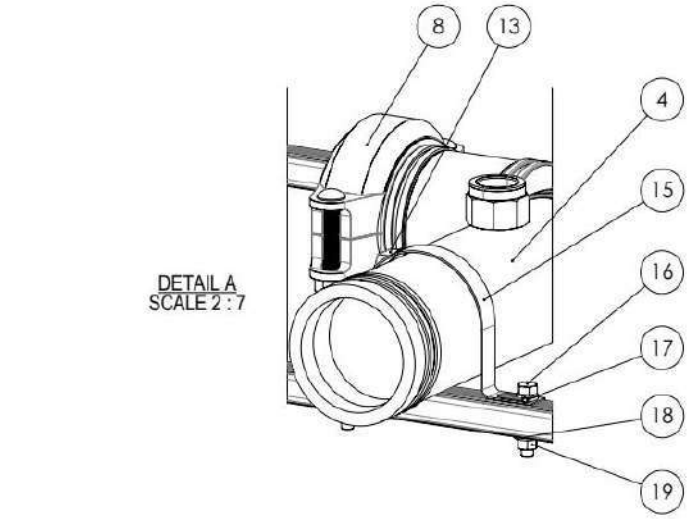
Aquestia

DESIGNATION: DOROT
Grooved Mining Skid
Assembly Kit

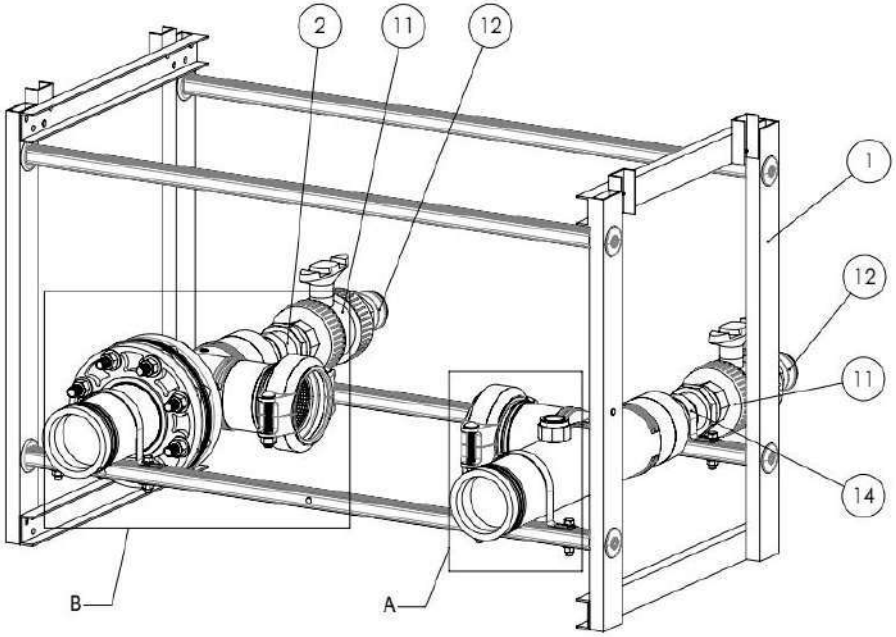
C:\Ari-Vault\Products\Dorot\Mining skid\Grooved Skid\665SKI0003
LAST SAVED DATE 15/01/2025 8:58:11

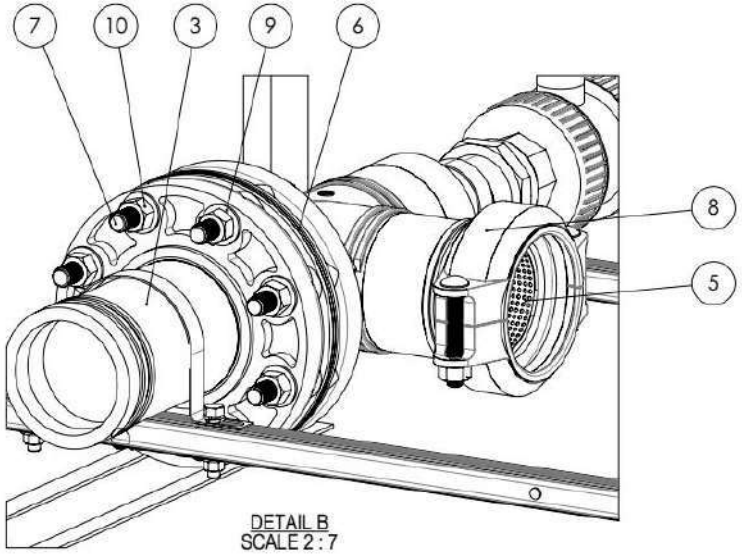
Aquestia
Directing the Flow

REVISIONS			
REV	No	DATE	APP'D



DETAIL A
SCALE 2 : 7





DETAIL B
SCALE 2 : 7

R&D Approver: Michael F. Date: 07.01.25
APPROVED
ECO Approver: Maor A. Date: 15.01.25

MATERIAL:				
WEIGHT:				
GENERAL TOLERANCE		DATE	NAME	SIGN
	DRAWN	15.01.25	Dafna R.	Digitally signed
SIZE: - REV: -	CHE'D	07.01.25	Michael F.	Digitally signed
SCALE: NO SCALE	APP'D	15.01.25	Maor A.	Digitally signed
FIRST ANGLE DIMENSIONS ARE IN MILLIMETERS				
Drawing No. 665SKI0003				2/4

Aquestia

DESIGNATION: DOROT
Grooved Mining Skid
Assembly Kit

C:\Ari-Vault\Products\Dorot\Mining skid\Grooved Skid\665SKI0003

LAST SAVED DATE 15/01/2025 8:56:11

Aquestia
Directing the Flow

REVISIONS			
REV	No	DATE	APP'D

NO.	PART No	DESIGNATION	MATL	DIM	QTY.	NOTES
1	665SKI0002	FRAME ASSEMBLY			1	
2	0055304SKI5	INLET PIPE 1 GROOVED	PP		1	
3	0055304SKI3	INLET PIPE 2	PP		1	
4	0055304SKI4	OUTLET PIPE	PP		1	
5	002460SKI2	TUBE FILTER	PP+SST316		1	
6	SIL001159	FLANGE SEAL 4"	EPDM		2	
7	BLT001484	HEX. BOLT	SST316	5_8in x 6.5in	8	
8	005184000V	CLAMP VICTAULI	P.P	4"	2	
9	WSR001052	FLAT WASHER	SST316	UNC 5/8in	16	
10	NUT001037	NUT	SST316	5/8"	8	
11	0053420001	BALL VALVE M/M	PVC+EPDM	2" NPT	2	
12	0051020001	ADAPTER CAMLOCK M/F	PP	2" NPT	2	
13	R-03104401BTPP	PLUG	PP	1" BSPT	1	
14	0021802SKI	CLAMPING STRAP	SST316	2in	2	
15	0021804SKI	CLAMPING STRAP	SST316	4in	2	
16	BLT001303	HEX BOLT	SST316	3/8"x2"	8	
17	WSR001074	SPRING WASHER	SST316	UNC 3/8"	8	
18	WSR001037	FLAT WASHER	SST316	UNC 3/8"	8	
19	NUT001096	NUT 3/8"	SST316	3/8"	8	

R&D Approver: Michael F. Date: 07.01.25
APPROVED
ECO Approver: Maor A. Date: 15.01.25

MATERIAL:
WEIGHT:
GENERAL TOLERANCE

	DATE	NAME	SIGN
DRAWN	15.01.25	Dafna R.	Digitally signed
CHE'D	07.01.25	Michael F.	Digitally signed
APP'D	15.01.25	Maor A.	Digitally signed

SIZE: - REV: -
SCALE: NO SCALE
FIRST ANGLE | DIMENSIONS ARE IN MILLIMETERS
Drawing No. 665SKI0003 3/4

Aquestia

DESIGNATION: DOROT
Grooved Mining Skid
Assembly Kit

C:\Ari-Vault\Products\Doro\Mining skid\Grooved Skid\665SKI0003