



Liquidtool Onboarding Kick-Off

AutoPilot



Manager

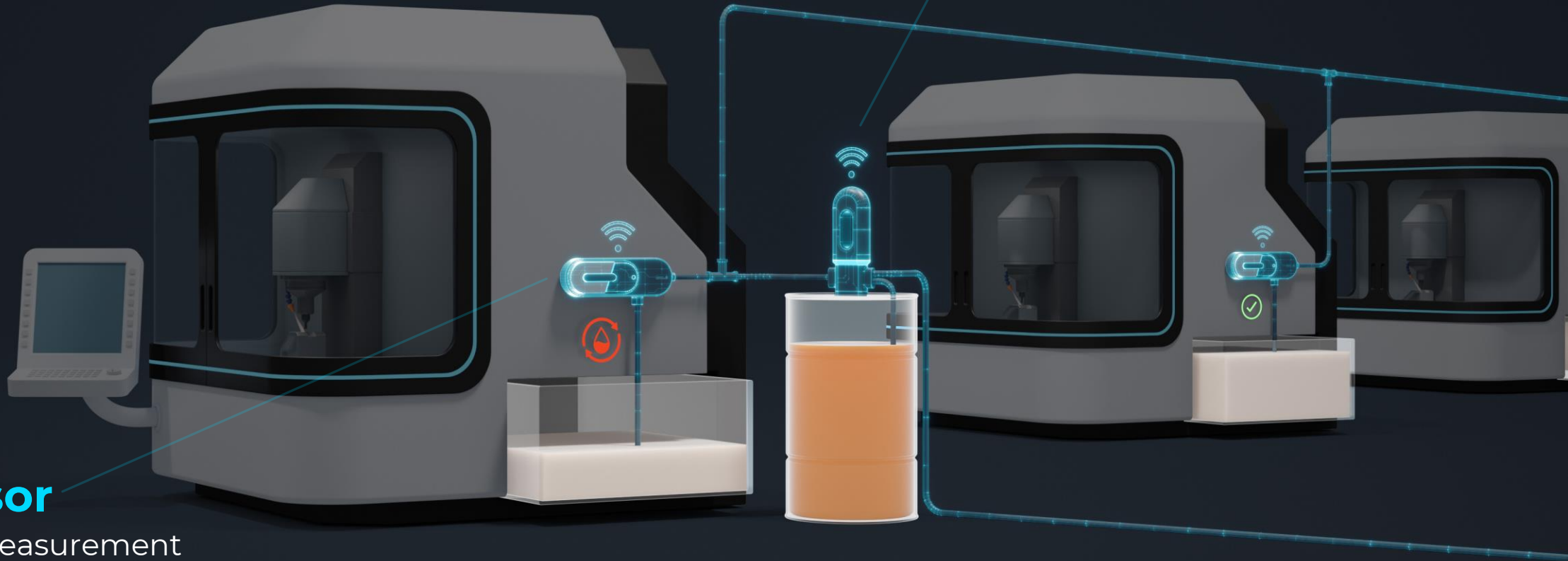
- Control System
- Data Tracking
- Coolant Analytics

SmartFiller

- Coolant Mixing
- Concentrate Level

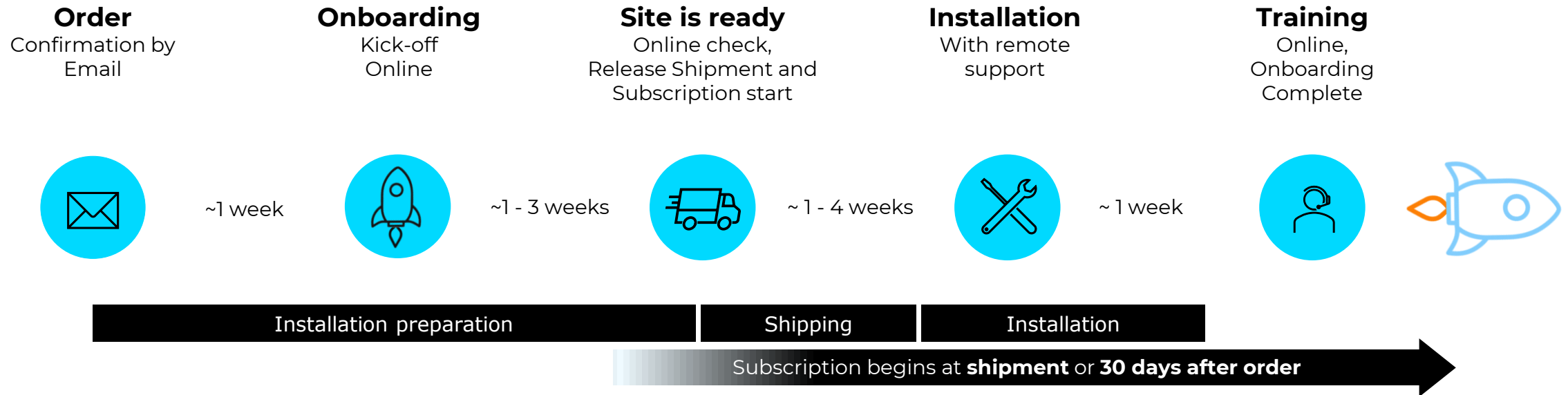
Sensor

- % measurement
- °C/F measurement
- Tank level measurement



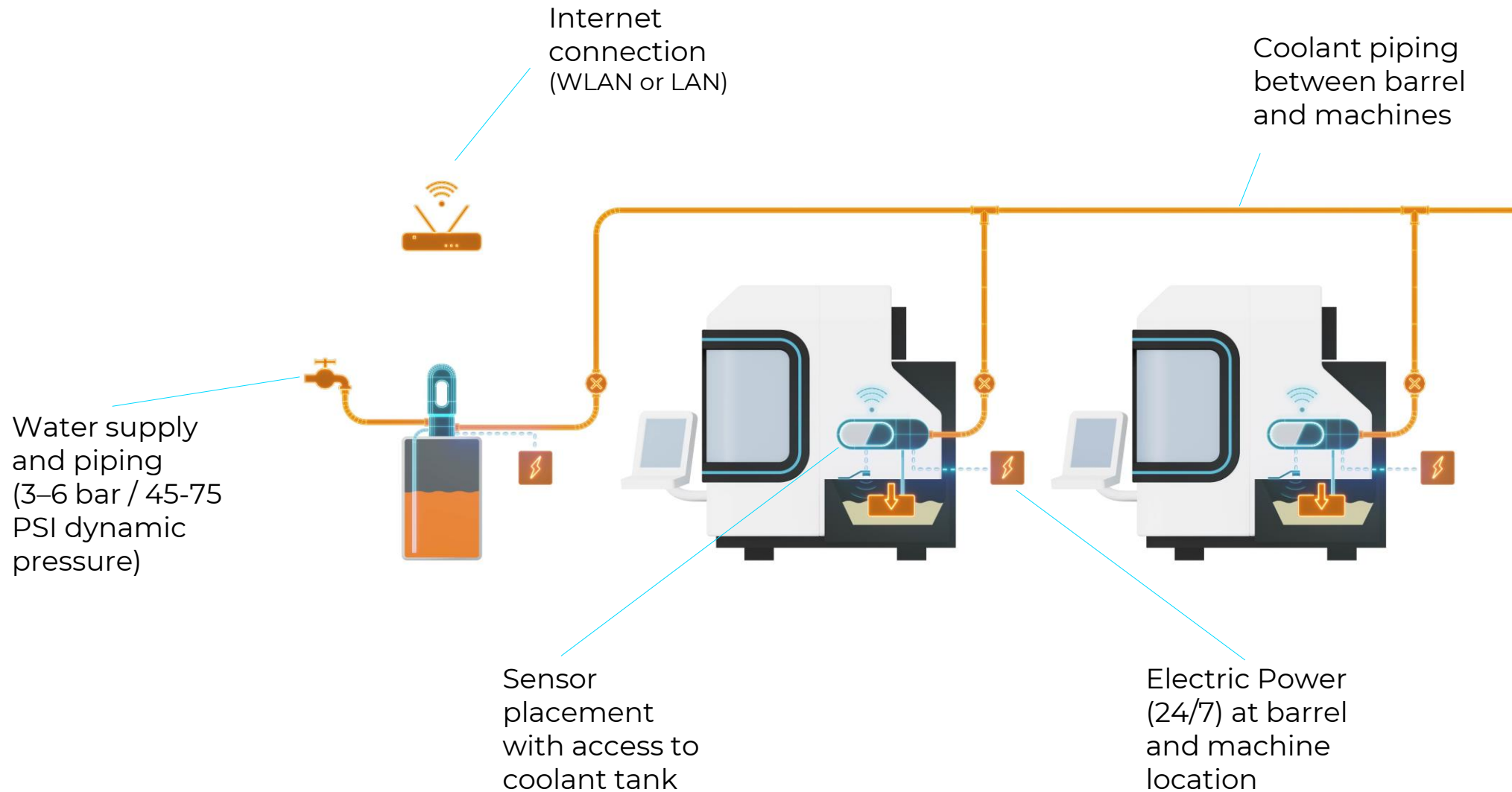
AutoPilot Onboarding Process

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What You'll Need On-Site

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Internet Connection Requirements

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Network

- Stable internet access for registration and operation
- All devices on the same local network
- Devices only communicate with each other

LAN or WLAN

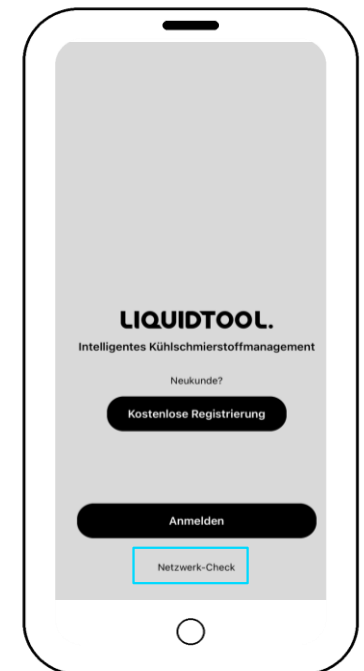
- Recommendation: LAN (1 cable per device)
- Alternative: WLAN

Preparation

- Whitelist MAC addresses (if necessary)
- VPN required for remote support
- Network password min. 8 characters
- Firewall must allow communication between devices and Liquidtool Manager
- WPA3 is not supported

Test

- Check network with "Network Check" with the Liquidtool App on your phone



Internet Connection – Mandatory Network Settings

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API	Protocol	Host name /net mask	Postfix	Port(s)
Data Telemetry (AMQP)	AMQPS	mq.iiot.liquidtool.com, (net 20.50.116.0/24)		5671
Device to device (AMQP)	AMQPS (TCP), SSL	<u>mqd2d.iiot.liquidtool.com</u> (net 20.50.116.0/24)		5671
Authentication server	HTTPS (TCP)	identity.liquidtool.com (net 20.50.116.0/24)	/auth/ realms/ lts	443
Firmware Updates	HTTPS	deb.iiot.liquidtool.com (net 213.136.80.0/24) <u>deb.iiot.prod.liquidtool.com.packages.liquidtool.com</u> (172.205.132.203) deb repository (20.82.13.59, 20.82.22.191) <u>keyserver.ubuntu.com</u> (185.125.188.0/24);	/	443, 11371
NTP	UDP	ntp.liquidtool.com (ip: 52.143.133.0/24) ntp.ubuntu.com		123
OpenVPN	UDP	20.50.116.192 (net 20.50.116.0/24, 52.236.162.198, 52.143.133.246)		1194
DNS (optional)*	UDP	8.8.8.8, 1.1.1.1		53

*Settings are mandatory if DNS blocks or spoofs IP addresses

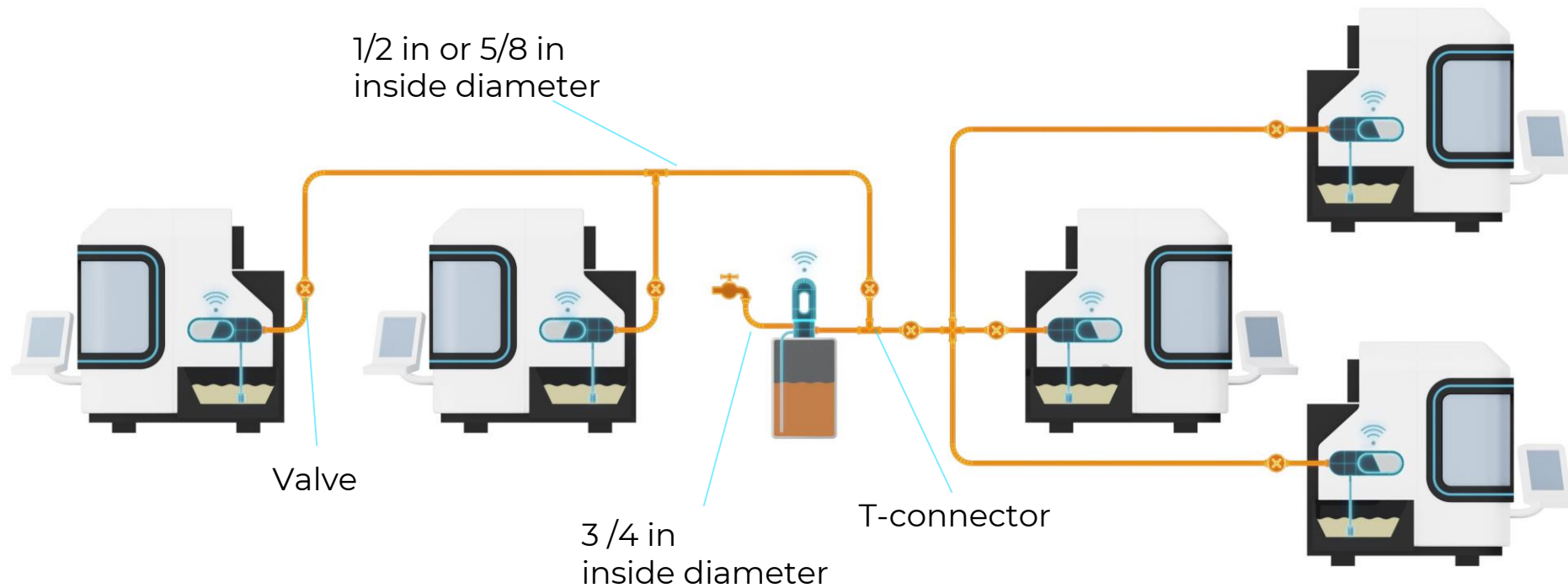
- Outbound communication

Coolant Piping Options Between Barrel and Machine Tank

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Option 1: Branch line

Option 2: Single lines



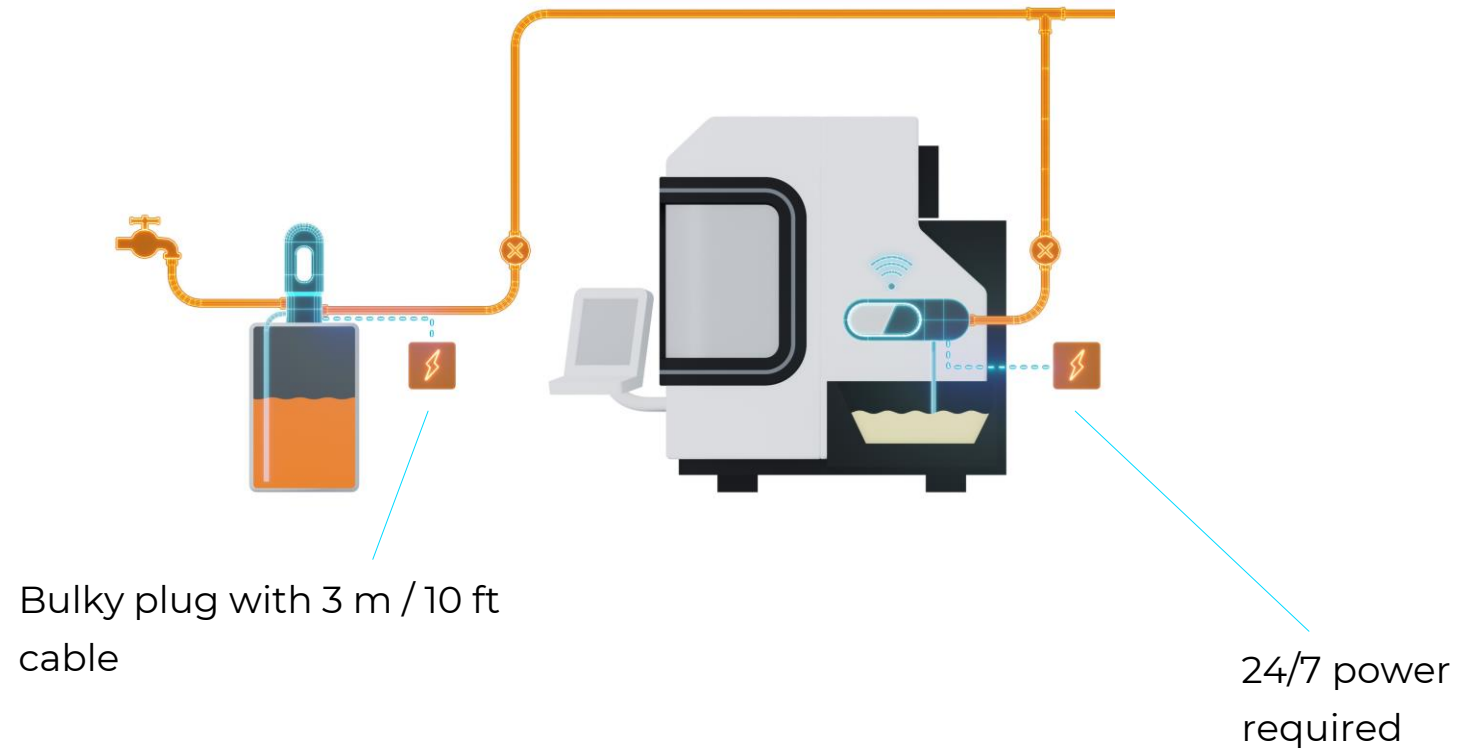
Piping length and installation limits

- Maximum pipe length between SmartFiller and Sensor: 60 m / 200 ft
- Pressure loss if SmartFiller is below machine level

Electric Power at Barrel and CNC Machine Location

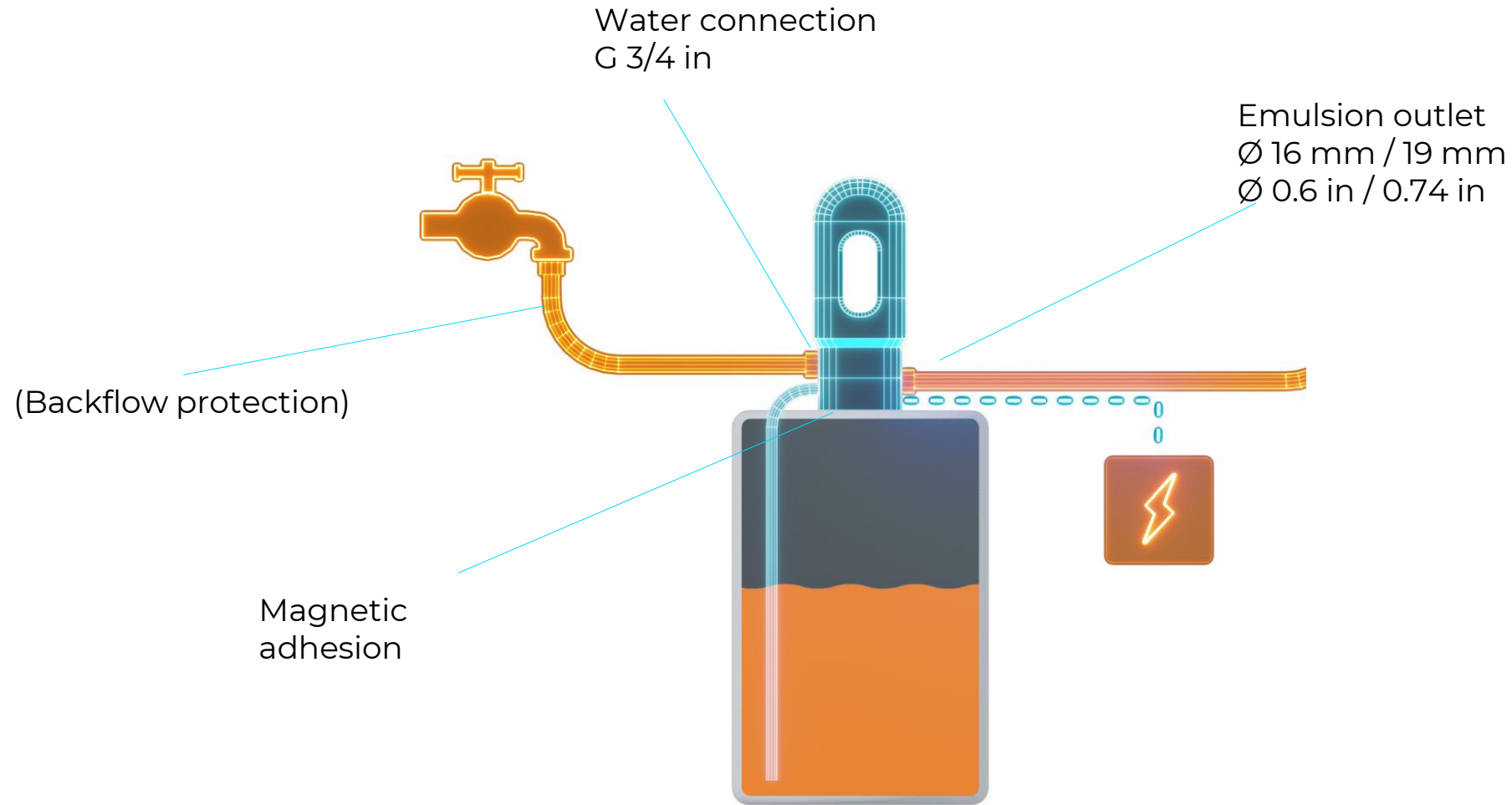
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One power outlet per device
(100–230 V / 120 V North America)



Device Overview: SmartFiller

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Device Overview: Sensor

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Sensor

(37 x 20 x 17 cm / 15 x 8 x 7 in)
Measures %, °C / °F, tank level

Ultrasonic sensor

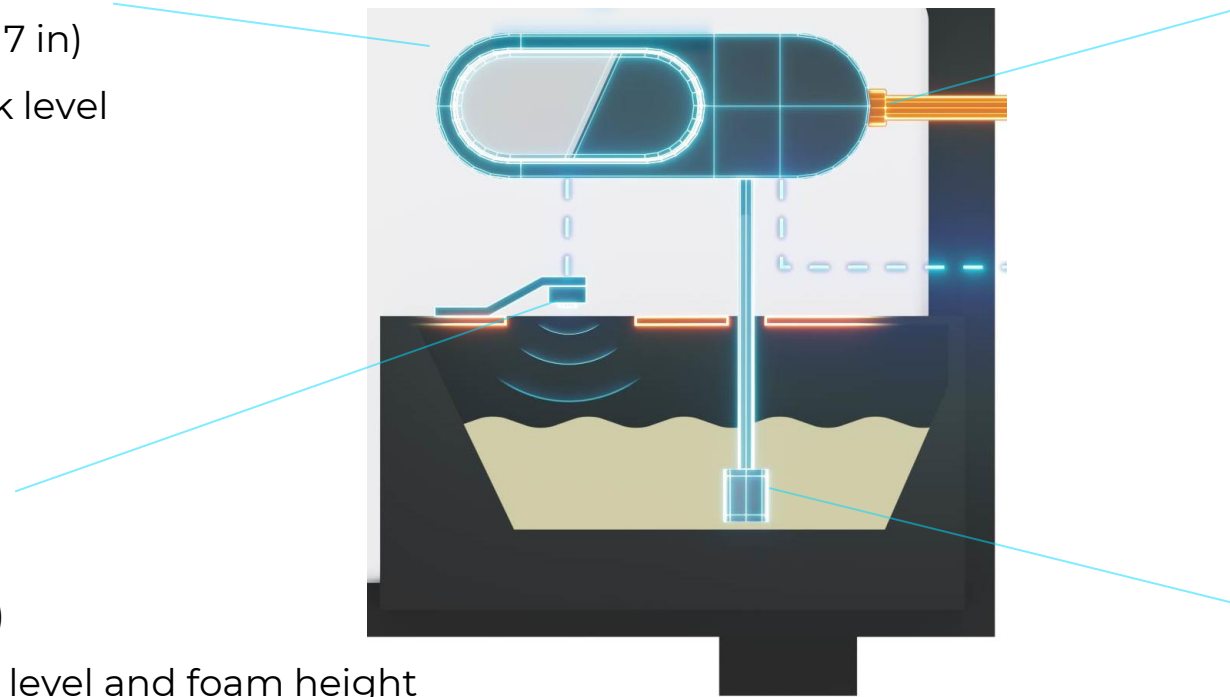
(15 x 2 x 2 cm / 6 x 1 x 1 in)
Measures distance to fill level and foam height

Connection 3/4 in
thread

Tank adapter

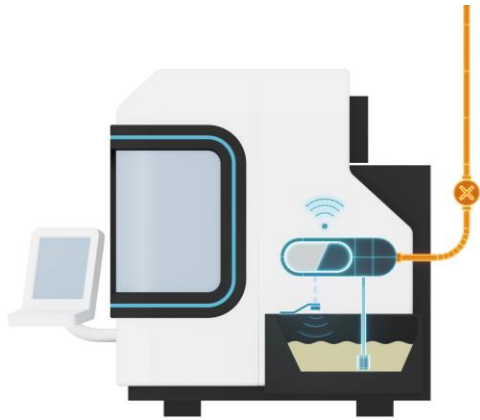
(10 x 6 x 7 cm / 4 x 2.5 x 3 in)
Coolant inlet/outlet

Magnetic mounting for all components

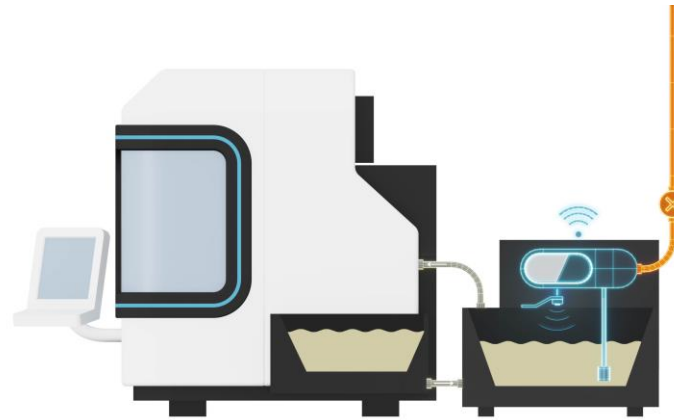


Where Is the AutoPilot Installed?

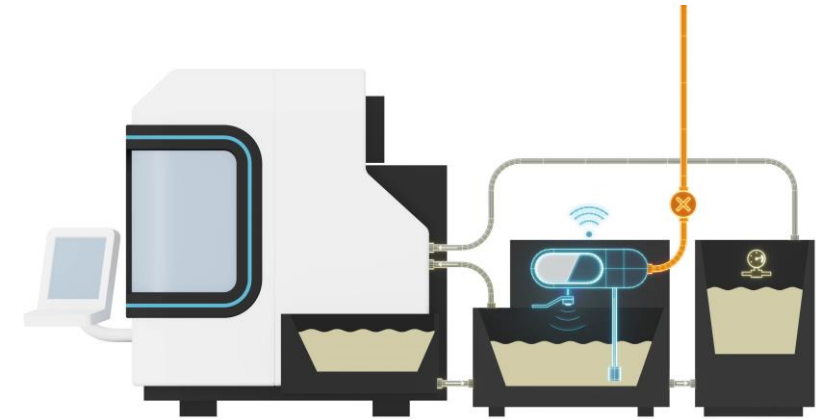
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Standard tank

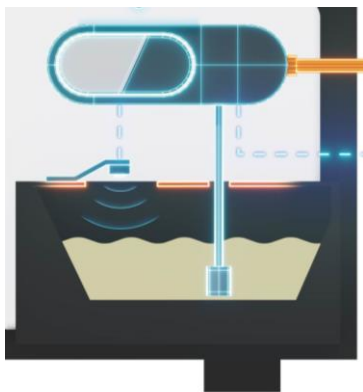


Additional tank



Additional tank with high-pressure tank

Sensor Installation



- Magnetic surface (machine/tank)
- Options:
 - Horizontal
 - Vertical → Emulsion inlet at top
- Hose length: 1.5 m / 5 ft

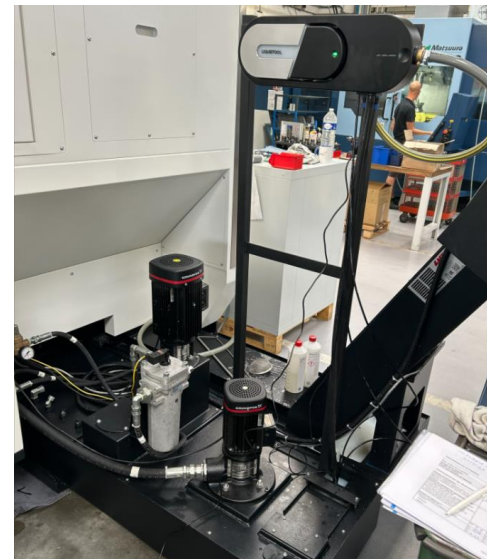
Horizontal on machine



Horizontal on tank



Horizontal on stand

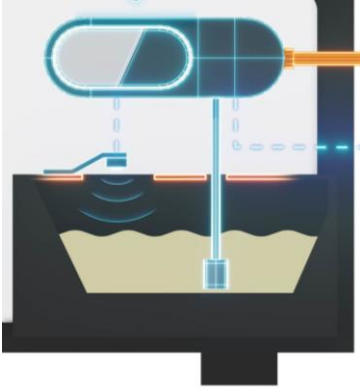


Vertical on machine
(Emulsion inlet at top)



Tank Adapter Installation

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- Tank opening: min. $\varnothing$ 200 mm / 8 in
- Not next to pump
- Not next to backflow
- Do not point hose openings towards the tank wall
- Mount securely to the tank floor
- Hoses must not be kinked or pinched
- For chip conveyors and large debry, mount higher on the side wall (prepare stand)



Tank height
 $\geq$ 30 cm / 11.8 in
Vertical



Tank height
 $\leq$ 30 cm / 11.8 in
Horizontal

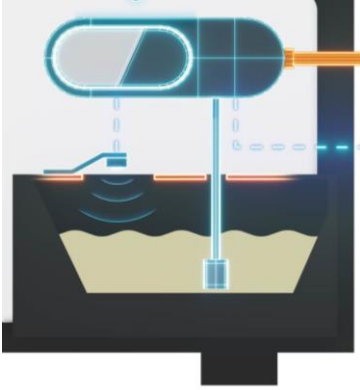


Metal plate directly
on the wall



Ultrasonic Sensor Installation

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- Measuring angle: 60 degrees
- Tank opening: min. Ø 200 mm / 8 in
- Install outside the tank using the bracket (included) to ensure that the sensor has a clear view and is protected from splashes and condensation



Ultrasonic sensor
can measure freely



Ultrasonic sensor
measures hose



Without bracket
contamination due to
splashes and condensation



Installation Pictures

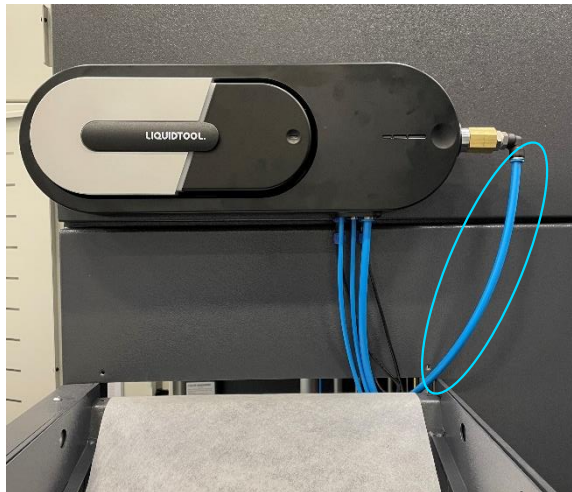
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Upside down

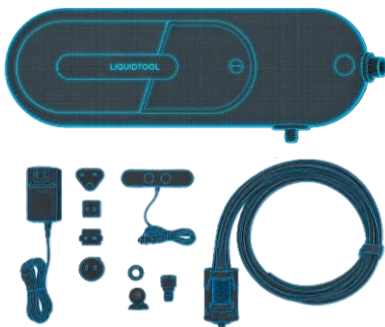
Hose too thin

Opening for ultrasonic sensor
too small



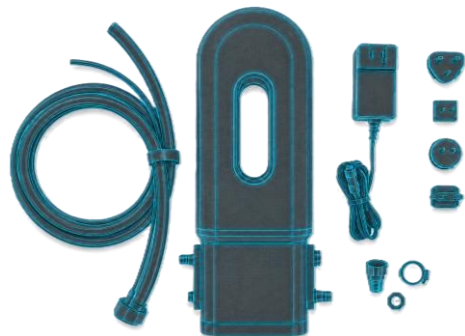
Delivery scope Liquidtool

SENSOR



1	Liquidtool SENSOR
3	Hoses
	1x 12mm trailing
	1x 6mm measuring outlet
	1x 6mm level sensor
1	NFC Token
1	Ultrasonic sensor
1	Tank adapter
1	Power cable 3m long
4	Plugs
1	Hose connection kit for 3/4-inch and 5/8-inch inner diameters
1	Ultrasonic sensor holder

SMARTFILLER



1	Liquidtool SMARTFILLER
	Hoses
2	1x 12mm concentrate suction side
	1x 6mm level sensor
1	Hose clamp
1	Power cable 3m long
4	Plug adapter
1	Hose connection kit

Piping & Hose Material Recommendation

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Recommended materials for coolant piping and hoses

👉 For maximum flexibility and cost efficiency, 5/8 in (inner diameter) **polymer hoses** are recommended*

Suitable materials (VDI 3035):

- Fluoroelastomer $\geq$ 68% fluorination (FKM)
- Polyamide (PA)
- Polycarbonate (PC)
- Polyethylene (PE)
- Polypropylene (PP)

👉 1/2 in **stainless steel** is also possible for **highest durability** and chemical resistance

👉 Final 1 m must be a 5/8 in hose to every device

* Always verify coolant and additive compatibility with your coolant specialist.

Water Connection



👉 Any pressure-rated water hose (SmartFiller side: 3/4 male thread)

Examples of local solutions and sources



Required Machine Information

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Installation preparation

Machine information:

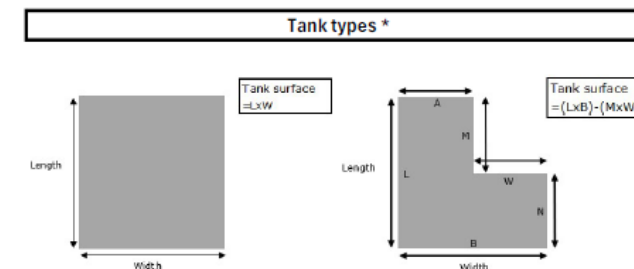
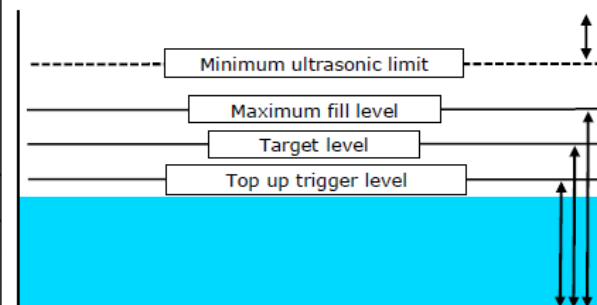
	Machine 1	Machine 2	Machine 3	Machine 4	Machine 5
Unique machine name					
Machine brand					
Machine model					
Approximate tank size	l:	l:	l:	l:	l:

Tank information:

	Machine 1	Machine 2	Machine 3	Machine 4	Machine 5
Volume in circulation (cooling lubricant located outside the tank in the machine system, e.g. additional tank with chip conveyor)	l:	l:	l:	l:	l:
Volume of cooling lubricant that flows back into the tank If this figure is not known, the following steps can be taken to determine the figure: 1. measure the cooling lubricant level in the tank during operation 2. switch off the machine and wait 30 minutes 3. measure the cooling lubricant level in the tank again	l:	l:	l:	l:	l:
Tank surface * (tank to be filled)	sq m:	sq m:	sq m:	sq m:	sq m:
Height	m:	m:	m:	m:	m:
Length	m:	m:	m:	m:	m:
Width	m:	m:	m:	m:	m:

Top up settings:

	Machine 1	Machine 2	Machine 3	Machine 4	Machine 5
Minimum ultrasonic limit (Filling stop with foam)	mm:	mm:	mm:	mm:	mm:
Maximum fill level (Filling abort)	mm:	mm:	mm:	mm:	mm:
Target level (optimum cooling lubricant height in the tank)	mm:	mm:	mm:	mm:	mm:
Top up trigger level (filling start)	mm:	mm:	mm:	mm:	mm:
Coolant level minimum (if the machine falls into an error mode)	mm:	mm:	mm:	mm:	mm:
Coolant level maximum (if the machine falls into an error mode)	mm:	mm:	mm:	mm:	mm:
Length of the hoses/ piping (from the SmartFiller to the extender of the machine that is furthest away)	m:	m:	m:	m:	m:



Installation Preparation - Acceptance Checklist

Pre-Installation Checklist

1. Company Information				
Company name:				
Contact person:				

2. Network Requirements				
	YES	NO	Comment	
Have you done the Network Check in the Liquidtool App and sent the results to your Liquidtool Customer Success Manager?				
Stable internet connection is available (speed tested)?				
Have the required ports been opened?				
API	Protocol	Host name / net mask	Postfix	Port(s)
* Data Telemetry (AMQP)	AMQPS (TCP), SSL	mq.iot.liquidtool.com, (net 20.50.116.0/24)		5671
* Device to device (AMQP)	AMQPS (TCP), SSL	mqd2d.iot.liquidtool.com, (net 20.50.116.0/24)		5671
* Authentication Server	HTTPS (TCP)	identity.liquidtool.com (net 20.50.116.0/24)	/auth/realms/its	443
Firmware Updates	HTTPS	deb.iot.prod.liquidtool.com, m.packages.liquidtool.com (172.205.132.203) deb repository (20.82.13.59, 20.82.22.191) keyserver.ubuntu.com (185.125.188.0/24);	*	443, 11371
* NTP	UDP	ntp.liquidtool.com (ip: 52.143.133.0/24) ****ntp.ubuntu.com		123
** OpenVPN	UDP	20.50.116.192 (net 20.50.116.0/24, 52.236.162.198, 52.143.133.246)		1194
*** DNS (optional)	UDP	8.8.8.8, 1.1.1.1		53
* - require, without this device doesn't work				
** - is required when the LTF and LTE device are on different local networks				
*** - is required when your DNS blocks or spoofs IP addresses.				
Is the VPN port open on installation day?				
Is the network password at least 8 characters long?				
Have the MAC-Addresses been whitelisted? (if required)?				
Have ethernet cables been installed and tested (if required)?				

3. Physical Preparation			
	YES	NO	Comment
Are Piping/hoses prepared for connecting to the Liquidtool devices?			
Is the water hose (3/4 inch) prepared?			
Is a coolant concentrate container (e.g. drum, IBC/Tote) placed at the defined spot and available for use?			
Are all necessary machines accessible and ready for the installation of the Liquidtool solution?			
Have the tank access opening for the placement of the sensors been prepared?			
Is the tank area free of debris where the magnetic filter support will be placed?			
Are tanks partially empty for refill testing?			

4. Power Supply			
	YES	NO	Comment
Have power sockets been prepared?			
Is an extension cable available if needed?			

5. Machine Settings Information			
	YES	NO	Comment
Has the document for the machine information been filled out and sent to your Liquidtool Customer Success Manager?			

6. Personnel Availability			
	YES	NO	Comment
Is someone from the IT available on installation day?			
Is a machine operator available on installation day?			
Is someone from maintenance available on installation day?			

7. Tools and Accessories			
	YES	NO	Comment
Are required tools available (e.g., wrenches, screwdrivers)?			
Are hoses and hose clamps available?			

! Additional costs incurred due to incorrect information or insufficient preparation on site may be charged by the installation partner.

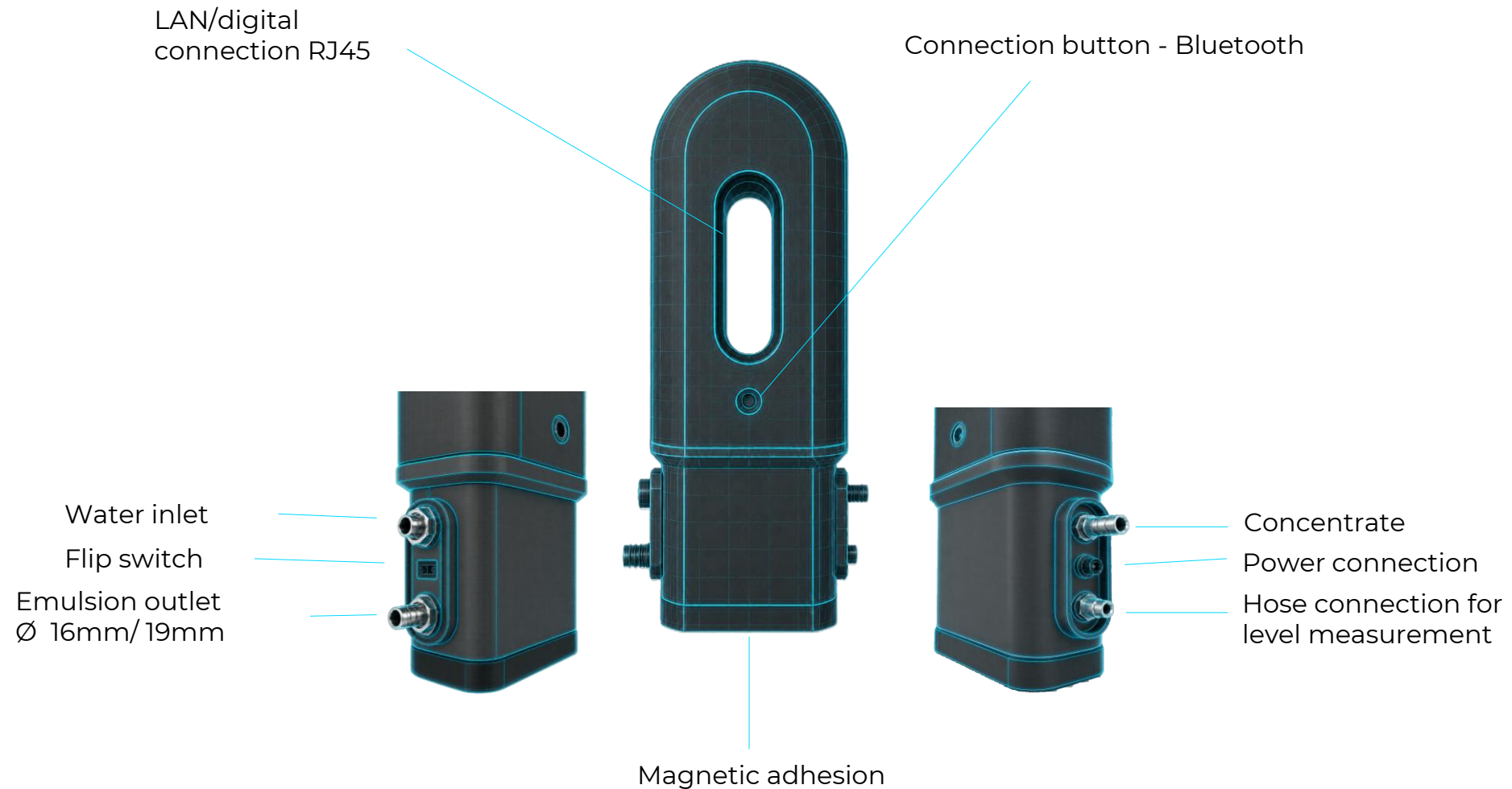
Date

Signature

Appendix

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SMARTFILLER



Appendix

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SENSOR

