



DATACER
MAPLE SAP METER

USER MANUAL
December 2023 | Version 01



Naturally innovative

A leader in equipment and products for the maple syrup industry, LAPIERRE EQUIPMENT distinguishes itself by its ability to innovate and develop high-performance solutions. This is what enables it to make significant changes in production techniques and processes in order to increase crop yield of high quality syrup.

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Honoured to serve your customers

LAPIERRE EQUIPMENT is honoured to actively assist maple syrup producers during the sugar season.

Today you have made a wise choice for at least two good reasons: the superior quality of our products and the exceptional quality of all our expert advisers in the region.

We sincerely appreciate your trust. And we will be happy to serve you again in your future equipment purchases, regardless of the size of your sugar bush.

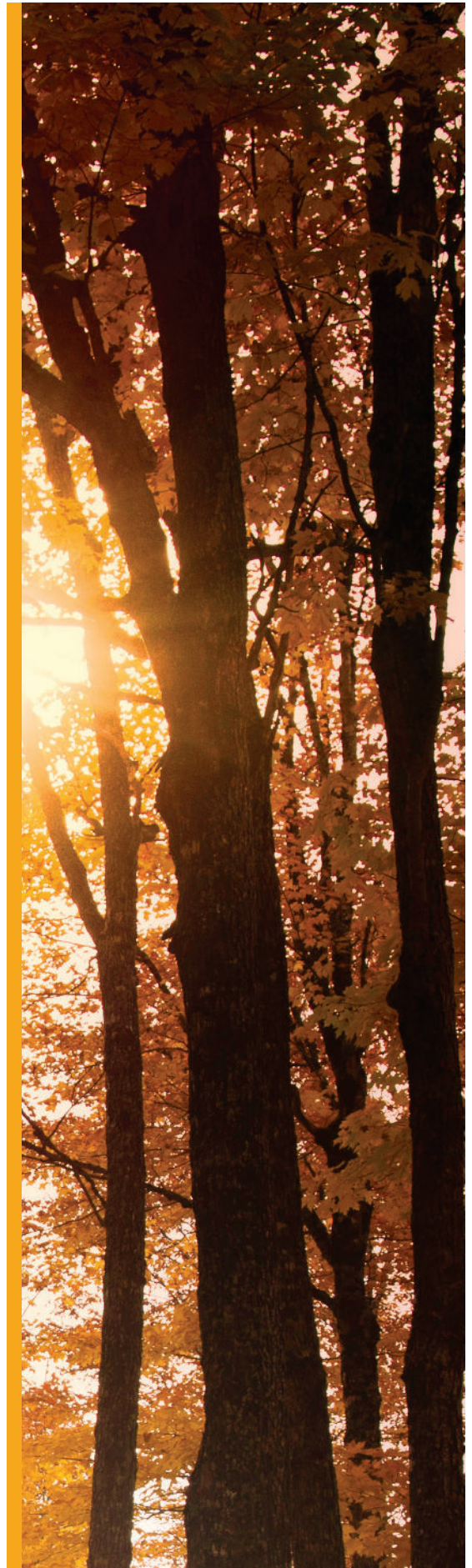
Thank you!

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User sheet
Maple sap meter

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1. Description

The DATACER maple sap meter measures the volume of maple sap at the outlet of a tank or extractor return pump.

In addition to the volume accumulated on the meter itself, the DATACER system generates average flow rates per hour, volume harvested per day, volume harvested per day per tap, and volume harvested since the start of the season.

Interpreting these performance indicators will enable you to better manage the flow of maple sap during the harvest season and make better decisions for your future investments.

Features:

Model	Min. Flow (USG/min.)	Optimal Flow (USG/min.)		Max. Flow (USG/min.)	Dimensions (cm) Length (L) x Width (W) x Height (H)
	D1	D2	D3	D4	
1 ½ in.	0.7	1.1	70	88	40.5 x 12 x 16.5
2 in.	1.1	1.8	110	136	45 x 12 x 16.5
Margin of error	Below D2 = 5%	Between D2 and D3 = 2%		Above D3 = 5%	



Flow rates in excess of the maximum may damage the maple sap meter.

Length of cable supplied: 20 ft.

Max. pressure: 232 PSI

Storage and operating temperature: Between 0.1 and 50°C

Stainless steel meter 304

MPT mesh

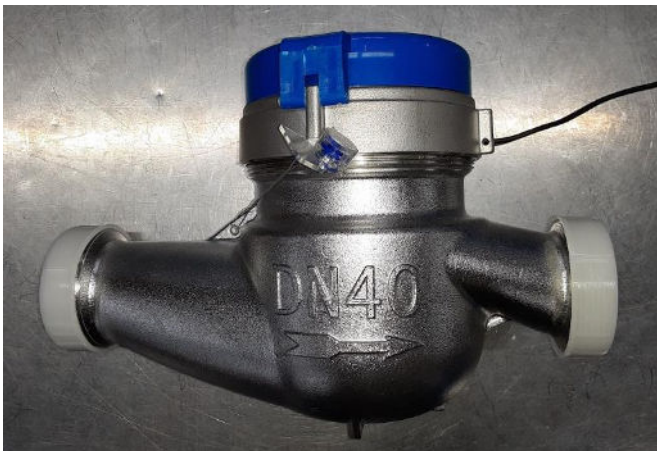


Figure 1: DATACER maple sap meter side view

2. Installation

Requirements:

- Thoroughly rinse maple sap meter with water before installation
 - Use Teflon for all screw connections
1. Install the meter horizontally, with the dial facing up and parallel to the ground (see Figure 2 below)

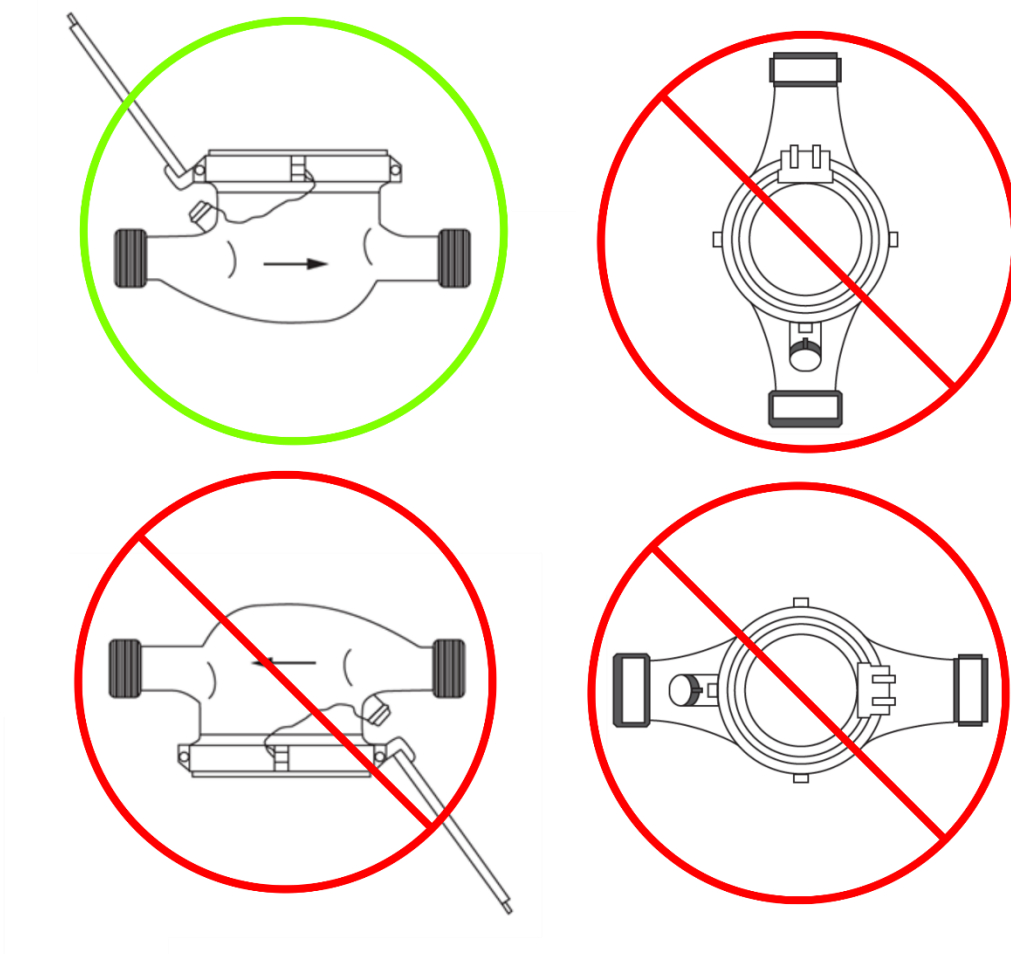
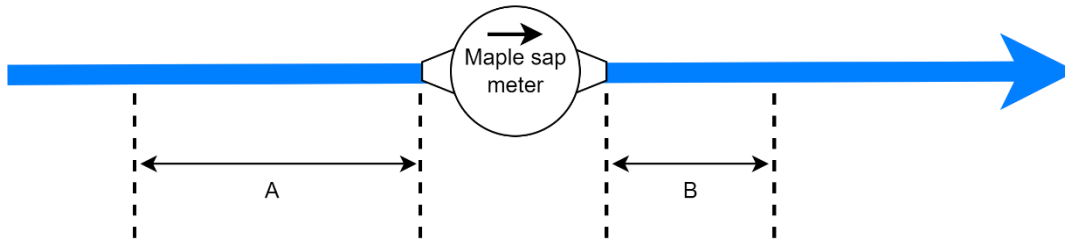


Figure 2: Maple sap meter positioning

2. Adhere to the direction of flow indicated by the arrow on the meter.
3. Provide a length of rigid pipe (PVC or stainless steel) A (downstream) and B (upstream) with the same diameter as the maple sap meter to avoid turbulence (see diagram and table below).



Sap Meter Diameter (in.)	Section A		Section B	
	Min. Length (in.)	Diameter (in.)	Min. Length (in.)	Diameter (in.)
1.5	15	1.5	7.5	1.5
2	20	2	10	2

Figure 3: Lengths and diameters of sections upstream and downstream of the maple sap meter



Please install a standard check valve after the maple sap meter to prevent maple sap from flowing back when the sap pump is switched off. The maple sap meter also records maple sap flowing in the opposite direction from the normal flow.



We recommend installing a banjo filter upstream of the maple sap meter. This makes it easier to remove any debris that may accumulate upstream of the meter.



Use clear tubing to observe the presence of any air bubbles that might distort the volume counted. If you notice air bubbles, please refer to the problems and solutions section on page 10.

If you plan to drain your transfer pipe, the volume of maple sap returning to the tank will be counted again by the maple sap meter the next time the pump is started. This is why we recommend installing an air injection system to limit the amount of maple sap backflow caused by draining. Please refer to our recommendations in the appendix on page 12.



If there is no drainage, you can install the maple sap meter directly at the pumping station. See figures 4 and 5 below.

Here are the main installation configurations that may be encountered on site. They include a reminder of the required and recommended equipment (check valves and filter) and any DATACER peripherals (drain valve, pressure sensor, and air valve).

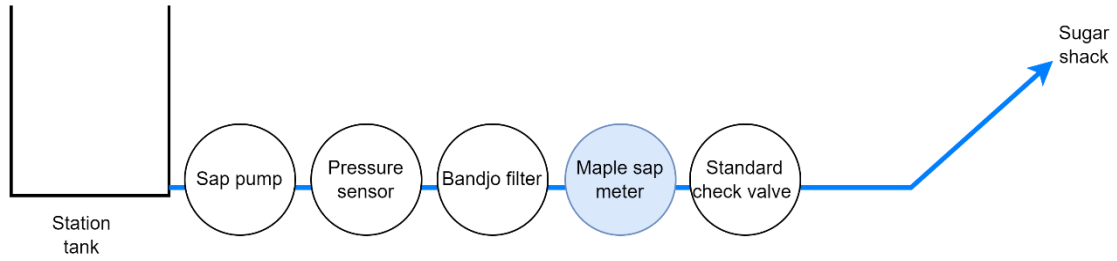


Figure 4: Installation of a maple sap meter in a pumping station on the return pipe of a tank in the absence of drainage

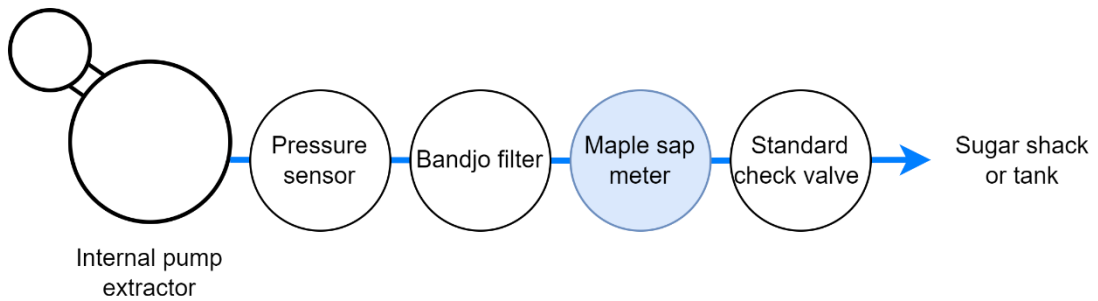


Figure 5: Installation of a maple sap meter in a pumping station on the return pipe of an internal pump extractor

4. Connect maple sap meter to DATACER station.

Please use one of the two diagrams below that corresponds to your physical version of the DATACER station.

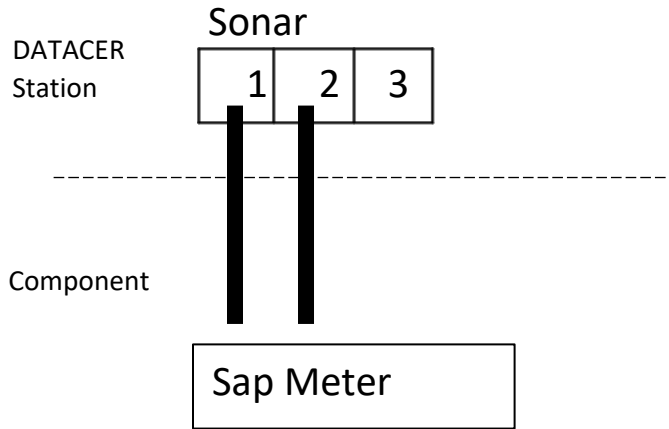


Figure 6: Maple sap meter connection diagram to DATACER station version 1.7 (blue or white card)

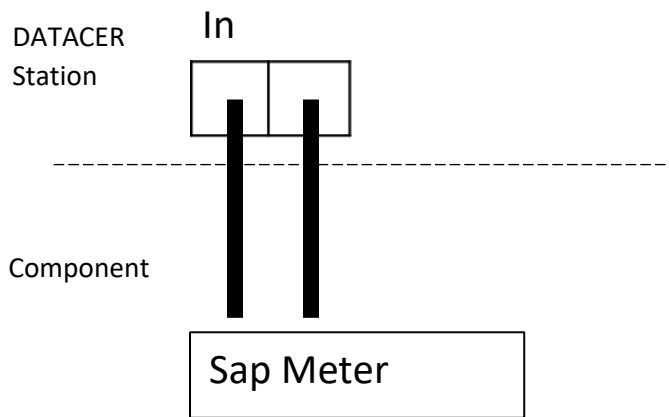


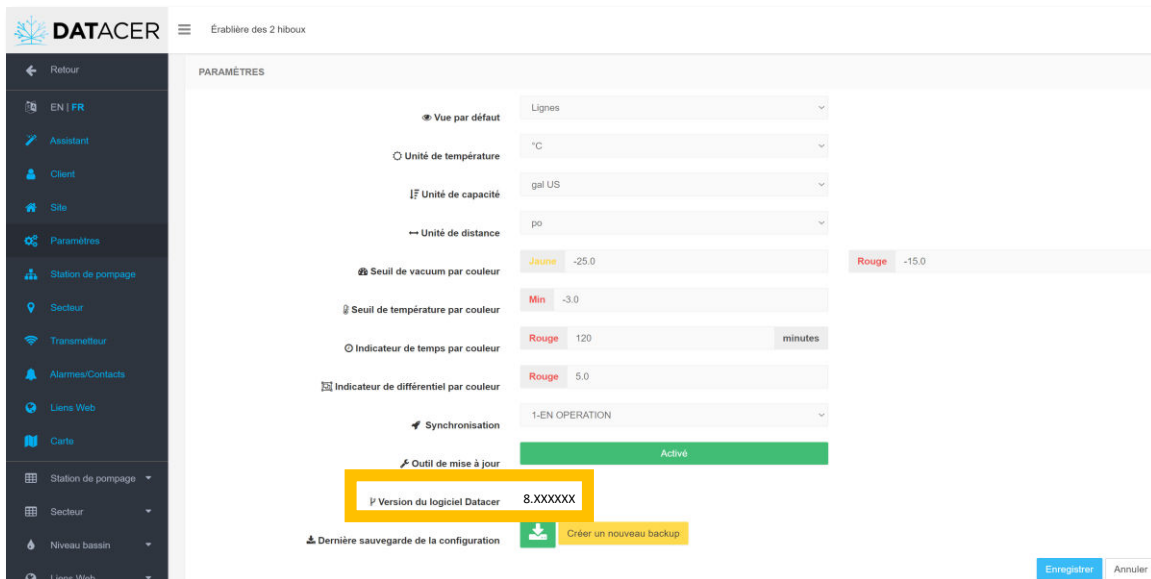
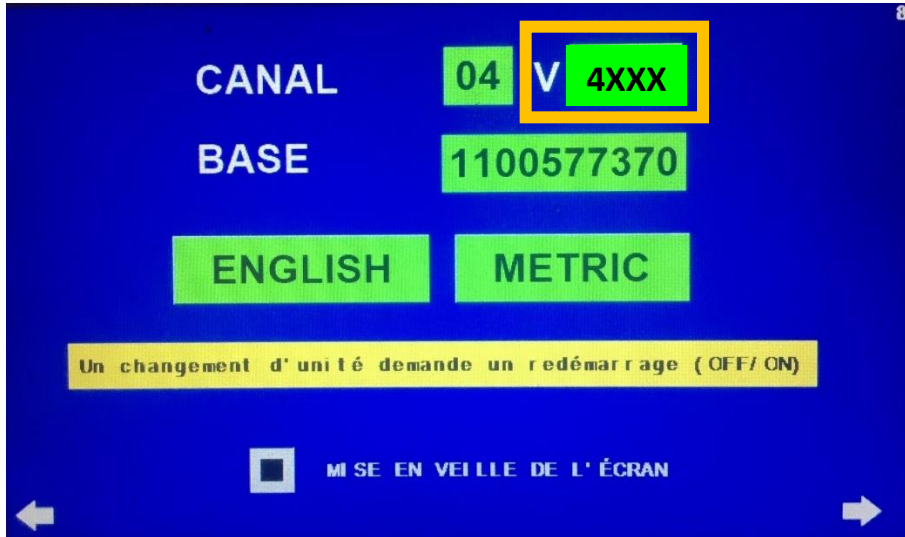
Figure 7: Maple sap meter connection diagram to DATACER station version 1.7 (red card)



The colour of the wires is irrelevant when connecting the maple sap meter to the DATACER station.






The DATACER station software version should be greater than or equal to **04XX**, and the DATACER base software version should be greater than or equal to **8.XXXXXX**.



3. Settings

Specify the number of taps connected to the maple sap meter using the following path:

1. Admin
2. Transmitters
3. Click the blue eye  of the DATACER station connected to the maple sap meter
4. Activate maple sap meter
5. Click the yellow pencil 
6. Indicate number of taps


DATACER

☰
TESTS 269

Bienvenue lapierre!
🔗 Se déconnecter

📶
Transmetteur **2**

📊
Gestion de données

🔔
Alarmes/Contacts

🌐
Liens Web

🗺️
Carte

📄
Vue globale

🏠
Station de pompage ▾

6725	Secteur Passerelle	-	1097356725	VAC3	5 👁️	✏️ 🗑️
9668	Secteur Passerelle	-	1099469668	VAC3	5 👁️	✏️ 🗑️
0738	Secteur Passerelle	-	1099470738	VAC3	5 👁️	✏️ 🗑️
STA 1316 1.7	-	Station test	1102501316	CTL1.7	14 👁️ 3	✏️ 🗑️
STA 1.5 0220	-	Station test	1102160220	CTL1.5	11 👁️	✏️ 🗑️
7852	Sect-1	-	1086507852	VAC1	3 👁️	✏️ 🗑️
7607	Sect-1	-	1090907607	VAC3	5 👁️	✏️ 🗑️

Ajouter Composants ✕

LISTE COMPOSANTS

Nom	Type	No.	Nom radio	Description	Activer?	Est Ref?	Action
VPRC-STA 1316 1.	VPRC	1	STA 1316 1.7	Pompe Vac (ON/OFF)	<input checked="" type="checkbox"/>		✏️
Prs1-STA 1316 1.	Prs	2	STA 1316 1.7	Capteur Pression	<input checked="" type="checkbox"/>		✏️
Vac3-STA 1316 1.	Vac	3	STA 1316 1.7	Capteur Vacuum	<input checked="" type="checkbox"/>		✏️
VPSC-STA 1316 1.	VPSC	4	STA 1316 1.7	Vitesse Pompe Vac (VFD)	<input checked="" type="checkbox"/>		✏️
VLV-STA 1316 1.7	VLV	5	STA 1316 1.7	Valve Modulante	<input checked="" type="checkbox"/>		✏️
TMPX-STA 1316 1.	TMPX	6	STA 1316 1.7	Température Extérieure			✏️
HUM-STA 1316 1.7	HUM	7	STA 1316 1.7	Trappe Humidité	<input checked="" type="checkbox"/>		✏️
SPS-STA 1316 1.7	SPS	8	STA 1316 1.7	Sélecteur AUTO/OFF/MAN			✏️
VLVDR-STA 1316 1	VLVDR	9	STA 1316 1.7	Valve de Drainage	<input checked="" type="checkbox"/>		✏️
Lev2-STA 1316 1.	Lev	10	STA 1316 1.7	Capteur de Niveau	<input checked="" type="checkbox"/>		✏️
Temp-STA 1316 1.	Temp	11	STA 1316 1.7	Température			
SAP-STA 1316 1.7	SAP	12	STA 1316 1.7	Contrôle Pompe à Eau	<input checked="" type="checkbox"/>		✏️
MOD-STA 1316 1.7	MOD	13	STA 1316 1.7	Modulation Vac (ON/OFF)	<input checked="" type="checkbox"/>		✏️
CE-1316	CE	14	STA 1316 1.7	Compteur d'eau	<input checked="" type="checkbox"/> 4		✏️ 5

Fermer



If you have several maple sap meters in your pumping station, we recommend that you create one pumping station per maple sap meter in the DATACER.

4. Use

1.1 First use at the beginning of the season

- Follow the installation recommendations above.
- Fill the meter with water before the first start-up. This can be done via the upstream banjo filter.

1.2 Local maple sap meter reading



1 Displays the number of m³. 1 m³ = 1000 L = 264 US gal

Maximum reading before resetting to 0: 99 999 m³

Dots 2 to 5 indicate the value of the digits after the decimal point.

Example:

If the number displayed in 1 = 00025 2 = 3 3 = 4 4 = 6 5 = 8

Then the total volume flowing through the maple sap meter is 25.3468 m³ or 25,346.8 L or 6691.6 US gal.

Calculation breakdown:

$$25.3468 \times 264 = 6691.6 \text{ US gal}$$

1.3 Reading on the DATACER system

You will be able to view:

- Volume in the last hour (L/hr. or US gal/hr.)
- Total volume accumulated during the day (L or US gal)
- Total volume accumulated during the day divided by the number of taps
- Flow chart for the current day (L/hr. or US gal/hr.)
- Volume per day for the last 7 days (L or US gal)
- Volume since the start of the harvest season (L or US gal)

1.4 End-of-season storage

- Clean with soap, then disinfect the inside of the meter.
- Drain the meter to prevent residual maple sap from freezing.

5. Problems and solutions

1.5 Volume count appears inconsistent

Problem description:

The volume recorded does not seem to reflect reality.

Causes:

- The maple sap flow is not within the maple sap meter's optimum flow range
- Incorrect maple sap meter positioning
- Failure to adhere to pipe diameters and lengths upstream and downstream of the meter
- Flow direction is inverted
- No check valve on the transfer pipe
- Drainage volumes are accounted for
- Air bubbles upstream of the meter

Solutions:

- Please check that the maple sap meter model is suitable for the maple sap flow generated by the pump.
- Please adhere to the installation procedure described in the installation section above.
- Install a compressor with an air valve to reduce drainage volume.
- Avoid air bubbles at the pump suction as much as possible. Here are a few tips to improve your installation:

- Add an angled bend in the extractor to prevent maple sap from running off at the pump suction (see figure 8 below)

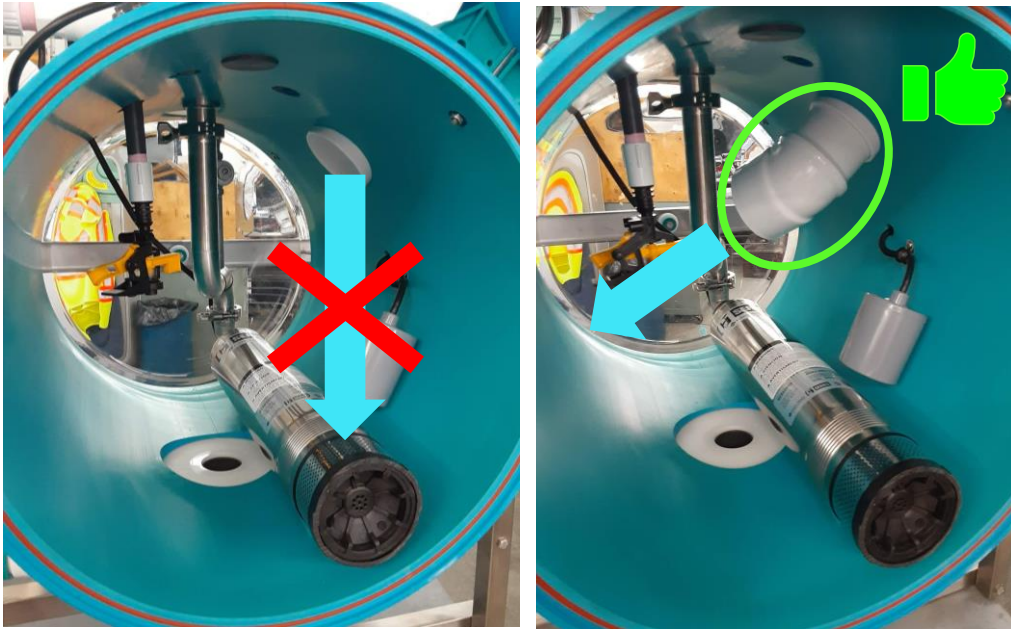


Figure 8: Installation of an angled bend inside the extractor to divert the maple sap flow to reduce air bubbles near the pump suction

- Relocate the maple sap inlet to prevent it from flowing into the suction side of the tank sap pump at the tank outlet (see figure 9 below).

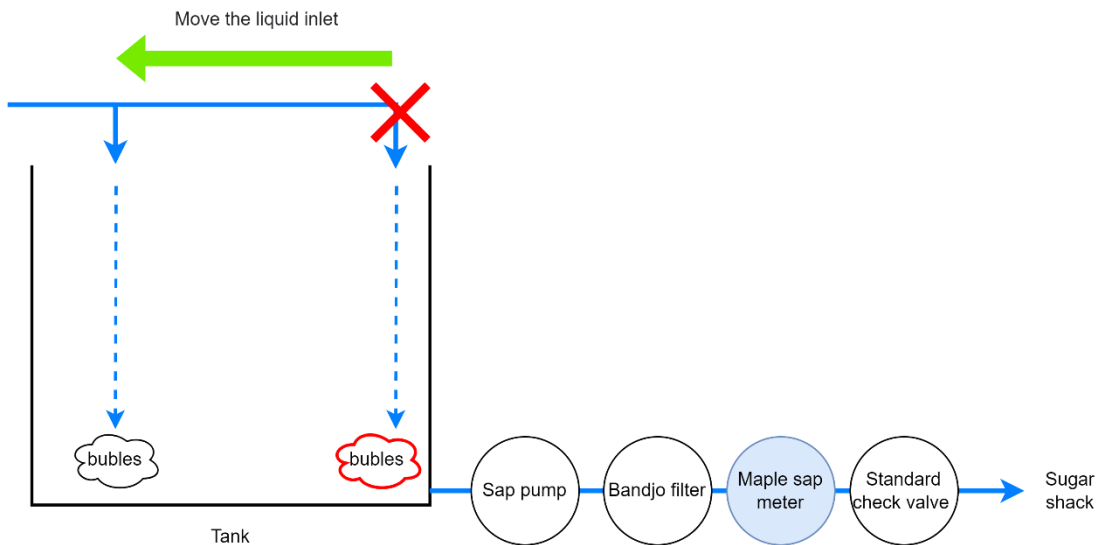


Figure 9: Move the maple sap inlet to prevent bubble formation at the pump suction.

- If the tank sap pump generates a vortex at the suction, you can install an anti-syphon (BA415-00000XX) in the tank to reduce it.

6. Appendix: Compressed air injection

The addition of a compressor and an air valve allows most of the maple sap in a return pipe to be drained off after the pump has stopped. This minimizes the error of double-counting the volume drained.

6.1 Choosing a compressor

The compressor should have the following features:

- Food grade
- Dry (oil-free)
- If the compressor runs on oil, replace with food-grade oil and change the oil filter.
- Install an air filter at the compressor outlet and change it when necessary.

Here are some examples of compressors used by different customers, depending on the volume to be drained and the height difference.

E.g.	Drainage tube				Compressor			Observed outcome
	Length (ft.)	Diameter (in.)	Volume of maple sap to drain (ft. ³)	Height difference between pump and highest point of return pipe (ft.)	Compressed air flow (ft. ³ /min. to 90 PSI)	Max. pressure (PSI)	Volume (US gal)	% residual maple sap returning to station following air injection
1	2500	1.25	21	250	11.5	150	60	30
2	1200	1	7	20	2.6	150	6	20



Ensure that the air pressure generated by the compressor does not exceed the pressure that the piping can withstand.



For more information and to finalize your choice, please contact a professional specializing in compressor sales.

6.2 Installing the compressor and air valve at the pumping station



Install a spring check valve between the air valve and the return pipe to prevent maple sap from flowing back into the compressor.



Never inject compressed air upstream of the maple sap meter, as this could damage it.

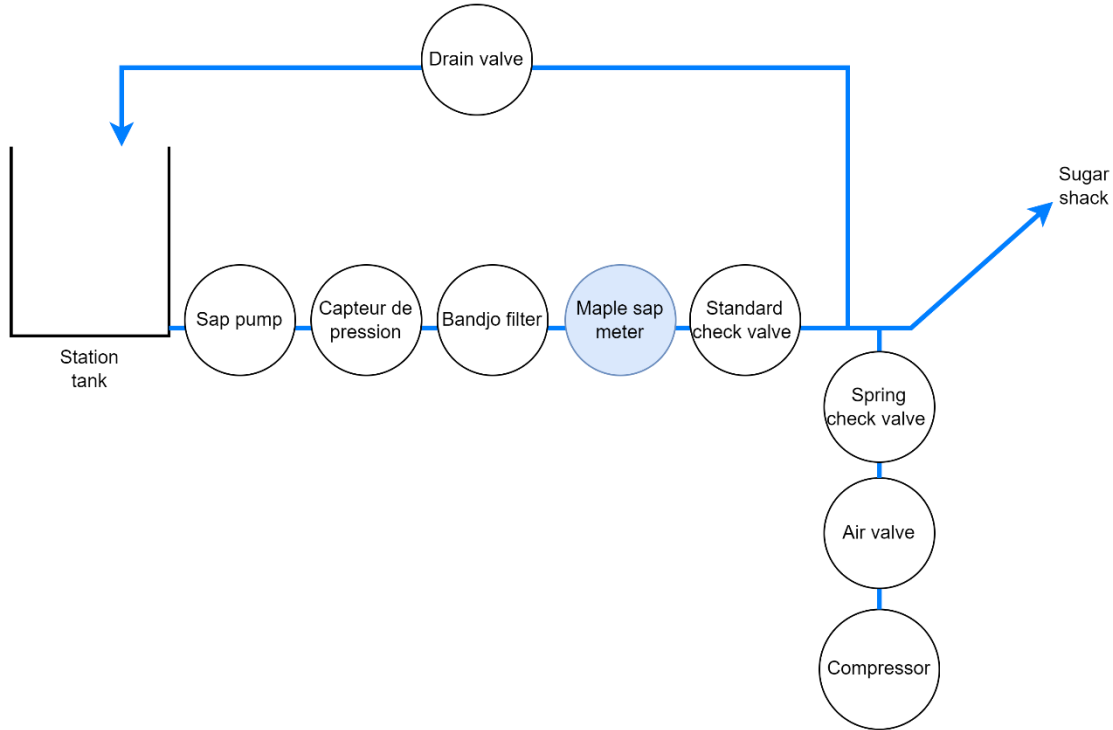


Figure 10: Installation of a maple sap meter in a pumping station on the return pipe of a tank during drainage

6.3 Automated air injection sequence with the DATACER station

The DATACER station automates this function after each pump stop in the following sequence:

- 1- The sap pump starts up because the tank has reached a high level (starting electrode).
- 2- The sap pump stops because the tank level is low (stop electrode).
- 3- The air valve opens for a user-determined period of time.
- 4- At the end of the delay, the air valve closes and the drain valve opens for a user-determined period of time.
- 5- The drain valve closes and the sap pump waits for an automatic start via the start electrode or a remote control.

If the last pump of the day option is selected, here is the sequence offered by the DATACER station:

- 1- The sap pump starts automatically if the cold temperature threshold is reached.
- 2- The return pump stops because the tank level is low (stop electrode).
- 3- The air valve opens for a user-determined period of time.
- 4- At the end of the delay, the air valve closes and the drain valve opens.
- 5- Sap contact with the start electrode closes the drain valve and starts the sap pump.



We sincerely appreciate your trust.

Thank you!



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