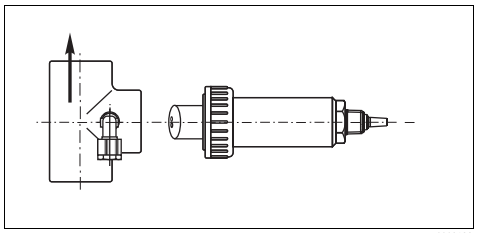
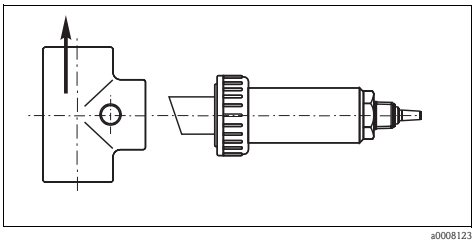
Flow operation

In general

- Install the flow assembly as vertical as possible so that the medium flows to the sensor from below.
- Two sensor orientations are possible for every installation:
  - Parallel to the medium flow
    Orientation parallel to the medium flow is required when using the CUR 3 spray head.
  - Against the medium flow
    Orientation against the medium flow is used to increase the self-cleaning effect in heavily-soiled media (> 15 FNU). The wall reflection is negligible here due to the high absorption.



Parallel to the medium flow

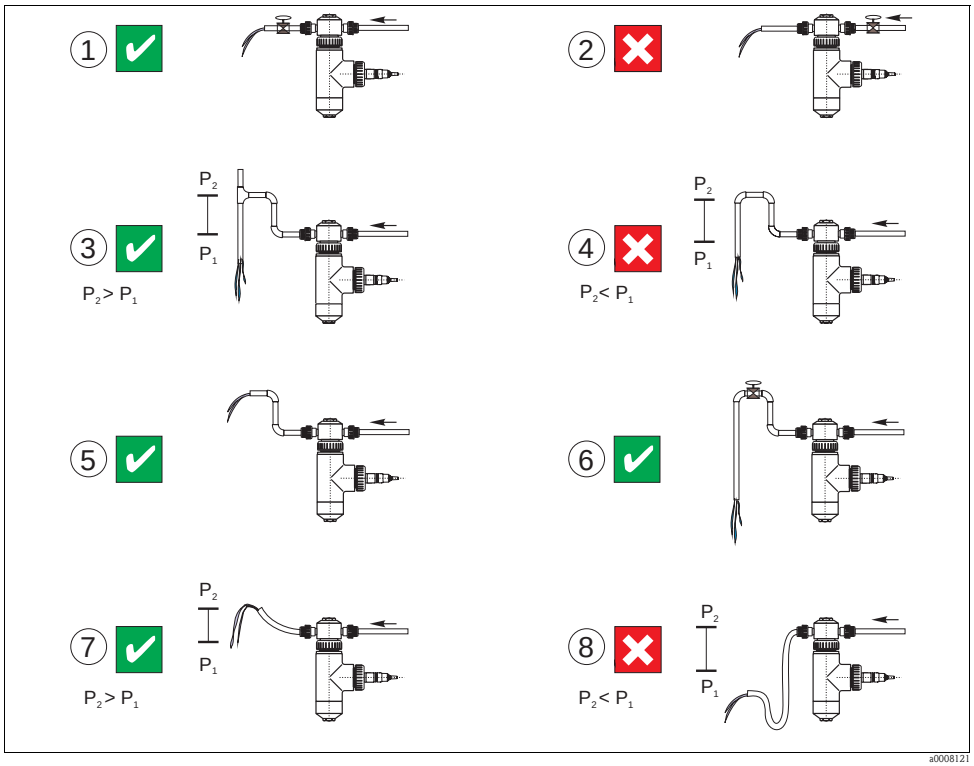


Against the medium flow

Note!
For turbidities < 5 FNU, use the sensor versions CUS31-**E or CUS31-**S.

Flow operation in the drinking water sector (with special calibration)

When the sensor is ordered with assembly E or S, the sensor is **individually calibrated** in the factory with the assembly ordered.
Therefore, no initial calibration on site is necessary.



Installation situations with flow assembly E resp. S

1. Correct: pressure reduction after measurement
   Degassing is avoided. The gas in the water remains dissolved.
2. Incorrect: Pressure reduction before measurement
   The pressure reduction creates favourable conditions for gas bubble formation.

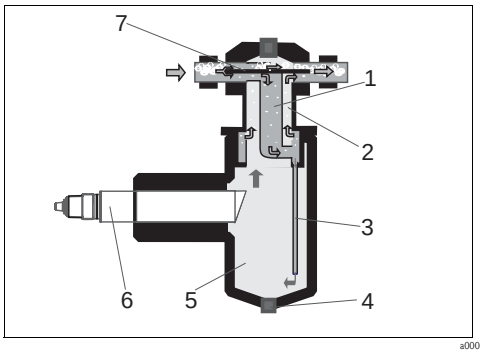
3. Correct: Outlet of the assembly raised and vented
   Gas cannot collect in the upper section of the assembly. The outlet pipe is vented at the highest point. A slight overpressure forms in the assembly as a result of the height difference of the raised outlet.
4. Incorrect: Outlet raised but not vented
   A low pressure forms in the assembly if venting via the downcomer outlet pipe does not take place due to too small a cross-section.
5. Correct: Standard application in event of little initial pressure
   Slight overpressure due to raised outlet level, no gas collecting in the upper section of the assembly.
6. Limited application: The valve reduces the volume flow

   ✎ Note!
   The outlet line may not be too thin or too long as otherwise a low pressure forms in the assembly. A vent for the drain line must be present. The outlet must be completely opened at regular intervals as otherwise the raising of the outlet level would not make any sense.
   If using a tube as the drain line, avoid formation of siphon draw (low points in the tube)! Otherwise venting does not take place.
7. Correct: Tube as outlet line
   Must be raised!
8. Incorrect: Tube not raised
   A low pressure forms in the assembly which favors gas bubble formation. In addition, low points in the tube result in siphon draw and thereby prevent venting. This results in pressure changes in the assembly.

Gas bubble elimination

Conventional turbidity measurements are carried out in an unpressurized sample. When the pressure on a sample (which was pressurized beforehand) is released, fine bubbles are produced which distort the turbidity measurement.

There are several methods of eliminating these gas bubbles:
- Pressurized measurement in the bypass (pressure is not released until after the measurement).
- For measurements without overpressure or with slight overpressure: Free medium flow above the assembly level. The mounting location should be as low as possible to take advantage of the maximum possible pressure.
- Unpressurized measurement and gas bubble elimination using wiper cleaning. The wiping duration and interval can be programmed for optimum results.
- Reduction of the flow to the lowest possible value (50 l/h). Slight flow prolongs the period in which the medium is in the assembly. This means that gas bubbles have more time to rise to the top. The sensor response time increases slightly due to the lower flow.
- Flow assembly S with integrated gas bubble trap (CUS31-**S) Most of the gas bubbles are sent directly to the assembly outlet in the upper half of the separated inlet (7). The other half of the medium flows into a ring channel (1) by means of the central pipe. The remaining bubbles rise here and are conveyed out of the measuring chamber by means of holes in the outlet (2) located in the centre of the assembly. Bubble-free medium (3) is pushed down into the measuring chamber (5). This also leads to a high flow which results in a quick response time. In addition, this almost completely prevents dirt particles settling.



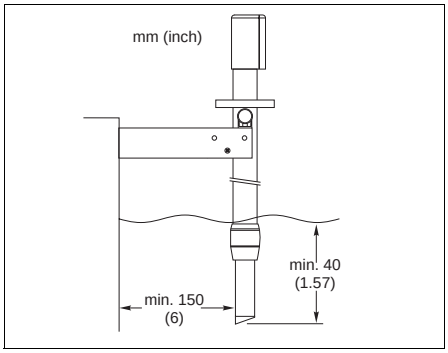
1 Ring channel
2 Outlet
3 Bubble-free medium
4 Drain screw (G1 thread)
5 Measuring chamber
6 Sensor CUS31
7 Separated inlet

Flow assembly S with gas bubble trap

Immersion operation

When installing the sensor in immersion assemblies, please ensure that a sufficient wall distance is observed during operation.

- For this reason, select an installation location in which **a minimum wall distance of 150 mm (6")** is observed even with varying levels or altered flow profiles.
  Mounting in a suspended assembly with chain must therefore be avoided.
- The sensor must immerse at least 40 mm (1.5") into the medium.



CYA611 with pendulum frame

Environment

Storage temperature

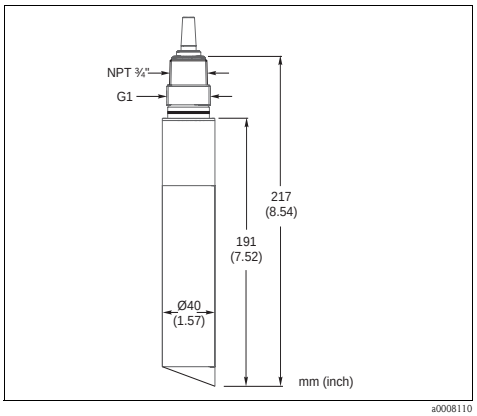
-20 to 60°C (-4 to 140°F)

Ingress protection

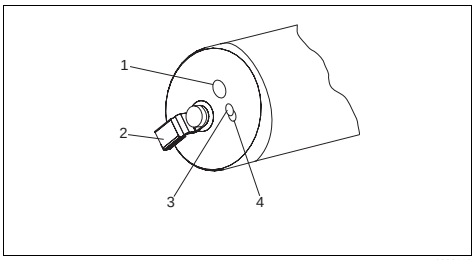
IP 68 (similar to NEMA 6P)

Mechanical construction

Dimensions

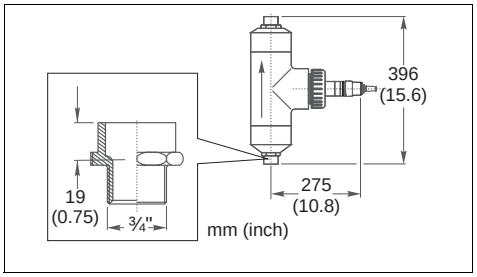


CUS31

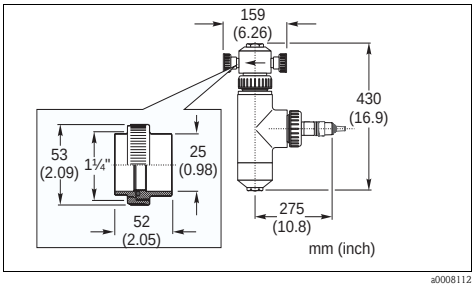


Sensor optics

1 Photodiode (receiver)
2 Wiper (optional)
3 Photodiode (receiver)
4 LED (IR transmitter)



CUS31-**E (with assembly E)



CUS31-**S (with assembly S)

Weight

with cable length 7 m (23 ft): 0.7 kg (1.5 lbs.)
with cable length 15 m (49 ft): 1.1 kg (2.4 lbs.)

Material

Sensor carrier plate, shaft	PVC / PPS GF 40 (polyphenylene sulfide with 40% glass-fibre)
Optical windows	Sapphire
Flow assemblies E and S	PE
Wiper (CUS31-W** only)	Rubber
Cable	TPEO (polyolefine based elastomer), -40 to 130°C (-40 to 260°F)

Process connection

G1 and NPT ¾"

Temperature sensor

NTC resistor 30K at 25°C (77°F)

Ordering information

Product structure

	Sensor				
	A	Standard sensor			
	W	Sensor with integr. wiper			
		Cable length			
		2	Connecting cable 7 m (23 ft)		
		4	Connecting cable15 m (49 ft)		
		9	Special cable length		
			Assembly		
			A	Without assembly	
			E	Assembly for bubblefree media	
			S	Assembly with integr. debubbling system	
CUS31-					complete order code

Scope of delivery

The scope of delivery comprises:
- Turbidity sensor acc. to the version:
  - CUS31-**A factory-calibrated sensor, without assembly
  - CUS31-**E installed and factory-calibrated in assembly for bubble-free media, with fixing bracket
  - CUS31-**S installed and factory-calibrated in assembly with gas bubble trap, with fixing bracket
- Operating Instructions BA176C/07/en

Certificates, approvals

Quality certificate

Each sensor has an individual quality certificate with information on the sensor identification and calibration according to ISO 7027 / EN 27027.

Accessories

Connection accessories

CYK81 measuring cable
- Non-terminated measuring cable for extension of sensor cables of e.g. Memosens sensors, CUS31/CUS41
- 2 wires, twisted pair with shield and PVC-sheath (2 x 2 x 0.5 mm^2 + shield)
- Sold by the meter, order no. 51502543

Junction box VBM
- For cable extension
- 10 terminals
- Cable entries: 2 x Pg 13.5 or 2 x NPT ½"
- Material: aluminum
- Ingress protection: IP 65 (≙ NEMA 4X)
- Order numbers:
  - cable entries Pg 13.5: 50003987
  - cable entries NPT ½": 51500177

Junction box RM
- For cable extension (e.g. for Memosens sensors or CUS31/CUS41)
- 5 terminals
- Cable entries: 2 x Pg 13.5
- Material: PC
- Ingress protection: IP 65 (≙ NEMA 4X)
- Order no.: 51500832

Installation accessories

Immersion assembly holder CYH101
- For pH, ORP, oxygen, conductivity assemblies and for oxygen and turbidity sensors;
- Ordering acc. to product structure (Technical Information TI092C/07/en)

Immersion assembly Dipfit W CYA611
- For sensor immersion in basins, open channels and tanks, PVC
- Ordering acc. to product structure, see Technical Information TI166C/24/ae

Flange adapter CUA120
- for CUS31/CUS41
- Ordering information:
  - CUA120-A for welding flange, h=47 mm (1.85")
  - CUA120-B for welding flange, h=93 mm (3.66")

Flow assembly Flowfit CUA250
- for CUS31/CUS41
- ordering acc. to product structure (Technical Information TI096C/24/ae)

Retractable assembly Cleanfit CUA451
- retractable assembly with ball valve; for turbidity sensors; material: stainless steel
- ordering acc. to product structure (Technical Information TI369C/24/ae)

Welding rinse socket DN 65
- order no. 51500912

Welding rinse socket DN 50 / PN 16
- order no. 55001306

Transmitter

Liquisys M CUM 223/253
- Turbidity transmitter
- Panel mounting or field housing
- Optional with Hart® or Profibus communication
- Ordering acc. to product structure, see Technical Information TI200C/24/ae

Cleaning

Chemoclean
- Injector CYR10 and program sequencer CYR20
- Ordering acc. to product structure, see Technical Information (TI046C/07/en)

Chemoclean CUR3
- Spray head for flow assemblies CUA250 and COA250
- order no. CUR3-1

Monitoring, service kit, recalibration

CUY22
- Check unit for CUS31 for checking the sensor
- order no. 51504477

Service kit CUY31
- 3 spare wiper arms
- order no. 50089252

Recalibration CUS31
- Calibration as per ISO 7027 / EN 27027
- order no. 50081264

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Endress+Hauser

People for Process Automation

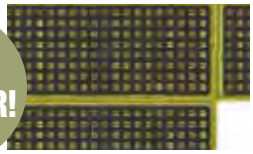
TI176C/24/ae/02.08

NESTABLE 2-DRUM POLY-SPILLPALLET™

TO NEST IS BEST

Maximize space by minimizing storage! Capture drips and spills within the Nestable 2-Drum Poly-Spillpallet™ sump. The 20.75" height design and 2,000 lb. load capacity keep your drums at an easy reach and a secure level. The unit provides chemical, UV, rust and corrosion resistance while the textured removable grate keeps drums from sliding and provides unrestricted and hassle-free sump. Optional drain available.

LINK TOGETHER!



Store multiple Poly-pallets in a minimal amount of space with a 4" nest height! Links together for customization and security.

SuperShipper*

*Patents Pending

NESTABLE 2-DRUM POLY-SPILLPALLET

Part #	Description	Ext. Dimensions L x W x H in. (cm)	Weight lb. (kg)	Spill Cap. gal. (L)	Load Cap. lb. (kg)
5222-YE 5222-YE-D	2-Drum (w/Drain)	51 x 26 x 21 (130 x 66 x 53)	45 (20)	66 (250)	2,000 (907)

Regulations: EPA 40 CFR 264.175, SPCC, UFC and NPDES

2-DRUM POLY-SPILLPALLET™ 2000

This secondary containment system is engineered to meet the rigors of today's regulatory environment. Made with 100% polyethylene, it provides excellent chemical resistance. Optional drain with plug.

- Meets EPA 40 CFR 264.175
- Holds up to 2,000 lb. Handling Capacity
- Forkliftable
- Removable grate for easy cleaning

Optional tarp available (Part # 5253-TARP, p. 13)

Available in ECO

2-DRUM POLY-SPILLPALLET™ 2000

Part #	Description	Dimensions L x W x H in. (cm)	Weight lb. (kg)	Spill Cap. gal. (L)	Load Cap. lb. (kg)
5253-YE 5253-YE-D	2-Drum (w/drain)	53.5 x 29 x 17 (136 x 74 x 43)	55.5 (25.1)	58 (219.5)	2,000 (907)

Regulations: EPA 40 CFR 264.175, SPCC and NPDES

LOW-PROFILE IN-LINE POLY-SPILLPALLET™ 3000

WHERE NO DRUM STORAGE HAS GONE BEFORE.

Store drums in-line near a wall, between columns, and in all those spaces once thought to be unusable. Optional drain.

- Holds four (4) 55-gallon drums
- Low 12" profile
- Holds up to 3,000 lb Handling Capacity weight
- Raised edge on back and sides helps orient barrels on pallet
- Non-skid, removable grates
- 66-gallon sump capacity meets EPA 40 CFR 264.175
- 100% polyethylene

Optional tarp available (Part # 5102-TARP, p. 13)

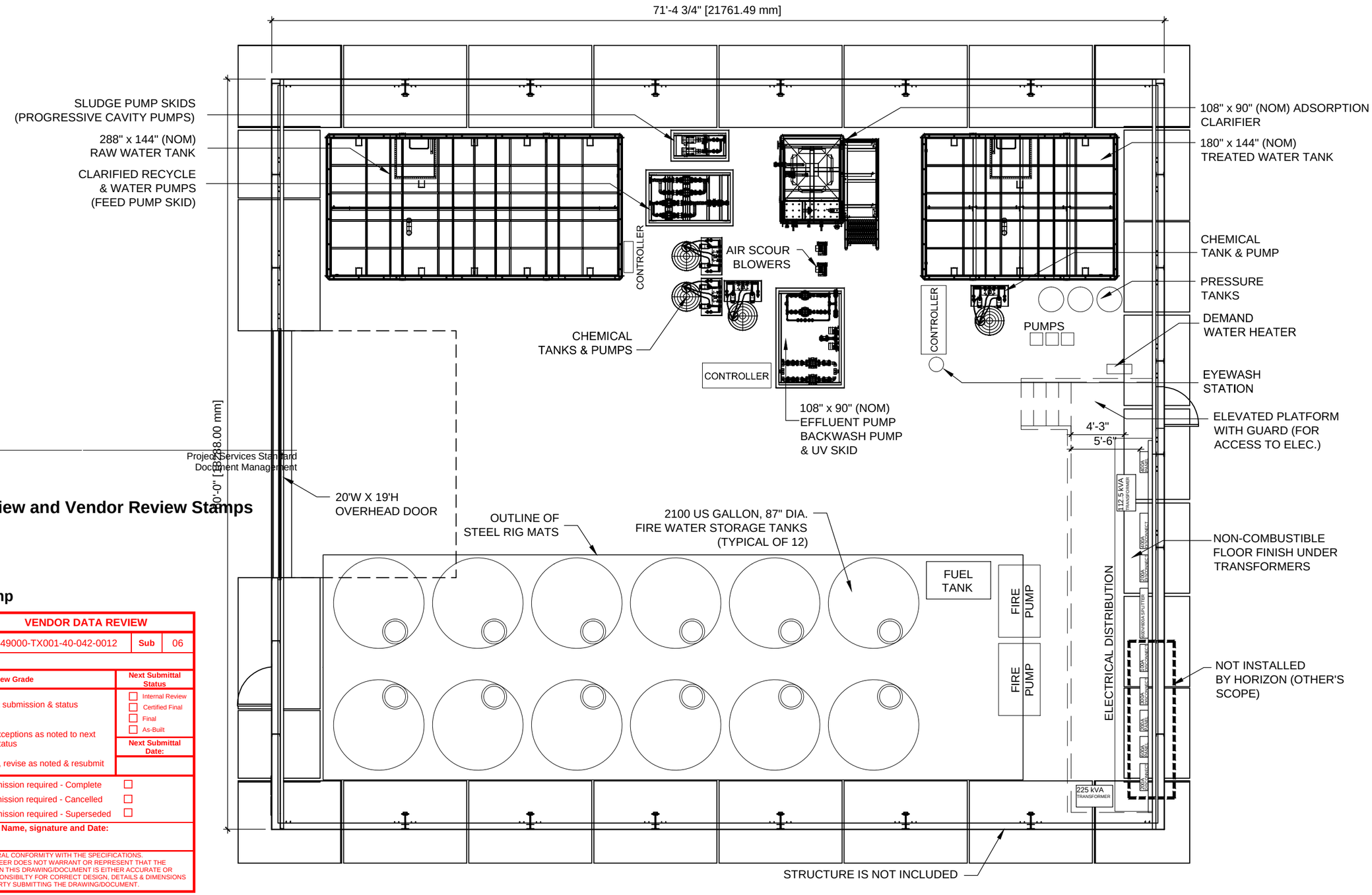
IN-LINE POLY-SPILLPALLET™ 3000

Part #	Description	Dimensions L x W x H in. (cm)	Weight lb. (kg)	Spill Cap. gal. (L)	Load Cap. lb. (kg)
5102-YE 5102-YE-D	4-Drum (w/drain)	98 x 25.25 x 12 (249 x 64 x 30)	83.7 (37.9)	66 (249.8)	3,000 (1,361)

Regulations: EPA 40 CFR 264.175, SPCC, NPDES and UFC

DID YOU KNOW?

Many establishments are required by government standards to have a 'Spill Plan' to help prevent toxic and hazardous materials from damaging the environment.



HATCH™

Project Services Standard
Document Management

Internal, Client Review and Vendor Review Stamps

Vendor Review Stamp

HATCH — VENDOR DATA REVIEW

Doc Number	E349000-TX001-40-042-0012	**Sub**	06
Date Received			

Review Grade	**Next Submittal Status**
☐ **C1** – Proceed to next submission & status	☐ Internal Review ☐ Certified Final ☐ Final ☐ As-Built
☐ **C2** – Proceed with exceptions as noted to next submission & status	**Next Submittal Date:**
☐ **C3** – Do not proceed, revise as noted & resubmit	
☐ No further submission required - Complete	
☐ **C4** - No further submission required - Cancelled	
☐ No further submission required - Superseded	

Package Coordinator: Name, signature and Date:

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REVISIONS

No.	DATE	DESCRIPTION	BY	CHKD
3	14.10.27	UPDATED FOR AS-BUILT	CC	
2	13.08.28	RE-ISSUED FOR CLIENT ACCEPTANCE	CC	
1	13.03.21	ISSUED FOR CLIENT REVIEW	AM	AM

HORIZON NORTH
Camp & Catering Partnership

DATE :	13.03.21
PROP # :	P21163
JOB # :	J21163
TN # :	
SCALE :	1/8"=1'-0"
DRAWN BY :	AM
CHECKED :	JM

HATCH BAFFINLAND

MILNE PORT - WATER BUILDING
BAFFIN ISLAND, NUNAVUT
FLOOR PLAN

DWG No.:

AF1600