Tank sampler series

1.Product Introduction

In order to solve the problem of tedious liquid sampling in storage tanks, our company has developed the HCYG series of tank down samplers based on the inspection regulations of the national standard GB/T4756-2015 "Manual Sampling Method for Petroleum Liquids" and years of practical experience in sampler production. The tank down samplers have the following advantages: 1. High accuracy of oil samples taken; 2. Simple and convenient operation: Sampling workers do not need to fill the tank, which not only reduces their labor intensity but also ensures safety, especially in harsh weather conditions, demonstrating its superiority.

1) High degree of automation, saving sampling time and improving work efficiency.

2) The integrated design of the operation box facilitates user operation, installation, and maintenance.

4) There is no residue in the sampling and no dripping from the sampling nozzle.

5)The benzene and other toxic medium tanks are all sealed and pressure resistant glass bottles for sampling, ensuring the health of the sampling workers and no safety concerns.

2 .Scope of Application

Applicable media range: naphtha, gasoline, kerosene, diesel, crude oil, wax oil, asphalt, chemical raw materials, etc.

Adopting forms: relative point, fixed-point sampling, homogeneous sampling of mixed liquids at relative points or fixed-point.

Environmental temperature: -30 ℃~90 ℃ (with additional insulation and heat tracing depending on the specific situation).

Sample flow into the sampling bottle: self flowing into the bottle or pump driven into the bottle.

Drive mode: Pneumatic pump (requires 0.3MPa~0.8MPa air source), manual pump, electric pump.

3.Structural Form and Characteristics

（1） HCYG-I type single arm tank sampler

1. Technical features:

Advantage 1: Strict proportional operation ensures sampling accuracy, especially suitable for dome shaped tanks with a diameter greater than their maximum filling height.

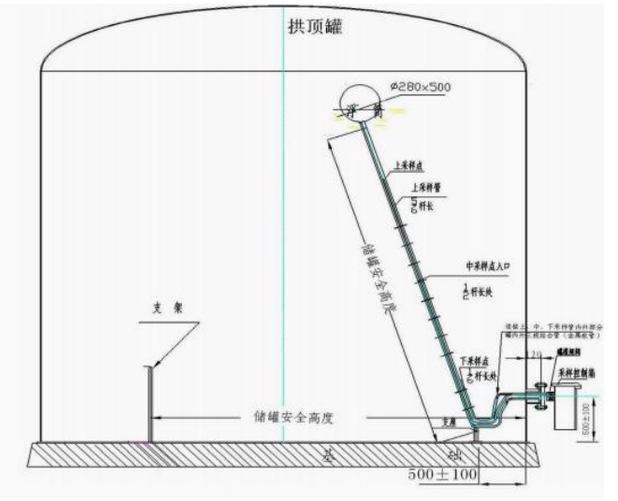
Advantage 2: The sampling support rod adopts a closed large tube technology, which greatly increases the relative rigidity of the sampler in the oil, and can avoid the traditional sampling support rod from bending in an arch shape due to gravity, which can cause the sampling point position to deviate from the theoretical position and improve the sampling accuracy.

Advantage 3: The upper, middle, and lower sampling points are completely synchronized

according to the liquid height and rise and fall at sampling ratios of 5/6, 1/2, and 1/6. The sampling error is only 1%, which is more accurate than traditional methods.

Advantage 4: Sampling can also be done within a height of 2-4 meters, with a sampling error within the 5% range specified in SH/T3414-2017.

2. Structural features and installation diagram:



3. Working principle:

The bottom of the single arm support rod of the sampler is hinged on the support shaft, and the floating ball is hung on the top of the rod. The up sampling point, middle sampling point, and down sampling point are fixed at positions 5/6, 3/6, and 1/6 of the single arm support rod according to Figure 1. When the floating ball on the top of the rod rises and falls with the liquid surface, according to the geometric principle of proportional similarity triangle edge length, the relative height of the up sampling point, middle sampling point, and down sampling point to the floating ball remains unchanged at values 5/6, 1/2, and 1/6. And the height of the float is always equal to the height of the oil level, so that the sampler can automatically obtain samples in strict accordance with the sampling standards.

2） HCYG-K type folding arm tank bottom sampler

1. Technical features:

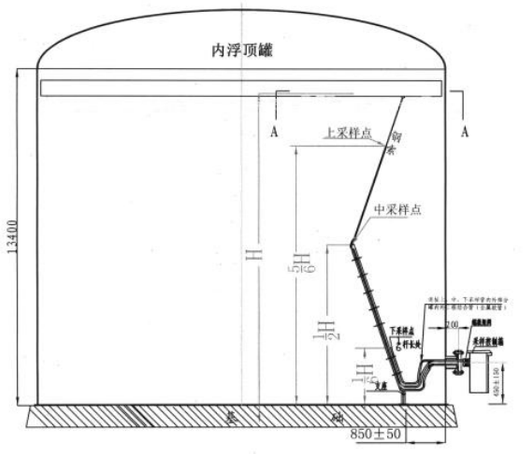
Advantage 1: Using steel cables instead of the upper folding arm, the weight of the sampler's internal components is about half lighter, and its own buoyancy offsets 84% -92% of the tension caused by gravity on the floating plate, so that the force borne by the floating plate does not exceed 20Kg, which is less than 10% of the traditional folding arm type. In addition, the horizontal force does not exceed 10Kg, which is less than 5% of the traditional folding arm type, avoiding the phenomenon of tilting and jamming of the floating plate caused by the action of the traditional folding arm type on the floating plate.

Advantage 2: The sampling support rod adopts a closed large tube technology, which greatly increases the relative rigidity of the sampler in the oil, and can avoid the traditional sampling support rod from bending in an arch shape due to gravity, which can cause the sampling point position to deviate from the theoretical position and improve the sampling accuracy.

Advantage 3: The upper, middle, and lower sampling points are completely synchronized according to the liquid height and rise and fall at sampling ratios of 5/6, 1/2, and 1/6. The sampling error is only 1%, which is more accurate than traditional methods.

Advantage 4: Sampling can also be done within a height of 2-4 meters, with a sampling error within the 5% range specified in SH/T3414-2017.

2. Structural features and installation diagram:



3. Working principle:

The sampling mechanism inside the HCYG-K sampler tank is an isosceles triangle: the upper arm is composed of steel cables, and the lower arm is composed of reinforced steel pipes. The up sampling point, middle sampling point, and down sampling point are fixed on the steel cable in the positions shown in the above figure. When the hanging point of the floating disc rises and falls vertically with the liquid level, regardless of how the liquid level height changes, according to the principle of isosceles triangle geometry, the relative heights of the upper sampling point, middle sampling point, and lower sampling point remain unchanged, always maintaining the values of 5/6H, 1/2H, and 1/6H. Thus, the sampler can automatically obtain samples in strict accordance with the sampling standards.

3） HCYG-X Cross arm Tank Bottom Sampler

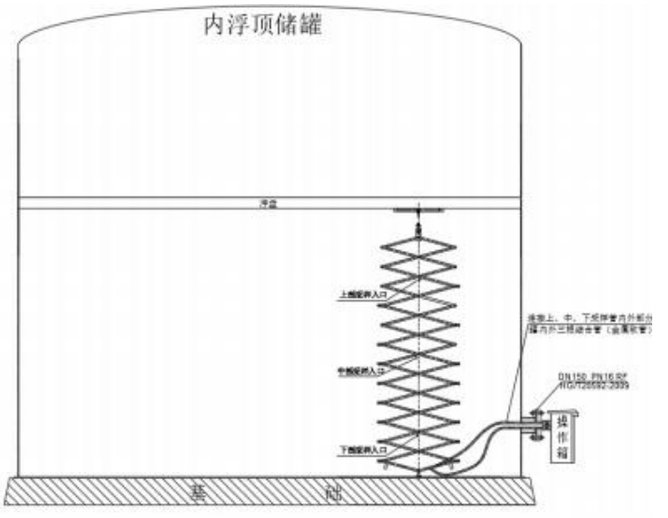
1. Technical features:

Extremely high sampling accuracy: Due to the strict operation of the X-shaped component according to the diamond rule, any liquid level height is exactly the same, so the sampling accuracy can ensure that the sampling position error does not exceed 1%; Easy installation, maintenance, and upkeep: Due to the installation of root valves in the pipelines outside the tank, it is very convenient for users to control, which improves its safety performance and makes installation, maintenance, and upkeep extremely easy;

2. Based on the viscosity difference of the sample and the characteristics of the pump, the opening degree of the upper, middle, and lower root valves can be adjusted at any time for limit verification, ensuring that the sampling flow rate of the upper, middle, and lower reaches a 1:1:1 configuration, and ensuring that the mixed sample of the upper, middle, and lower reaches a precise combination of 1:1:1. The operation box is designed with a stainless steel 304 structure; When used

for crude oil, residual oil, asphalt and other easily condensable and crystalline media, a double-layer stainless steel 304 structure with insulation and steam heating is adopted, and insulation steam is connected for insulation. Composite samples (routine samples) can be directly sampled without the need for separate samples to be mixed and prepared in the laboratory.

2. Structural features and installation diagram:



3. Working principle:

The inlet of the upper, middle, and sampling tubes, that is, the upper and middle sampling points, move up and down with the float or floating disc in a ratio of 5/6 and 1/2, ensuring that the upper and middle sampling points always strictly follow the regulations of "manual sampling of liquid petroleum products" and achieve accurate and error free sampling. Because the liquid level at the downsampling point changes relatively little, it can be set to the middle value within its range of variation.

4） HCYG-H vertical tank bottom sampler

1. Technical features:

Advantage 1: The upper, middle, and lower sampling points are completely synchronized according to the liquid height and rise and fall at a sampling ratio of 5/6 and 1/2. Sampling is accurate to 98.5-101.5% of the sample liquid level, which is more precise than traditional methods.

Advantage 2: The lower part is the outlet liquid level sample or the bottom fixed-point sampling (usually at a distance of 150-300mm from the tank bottom).

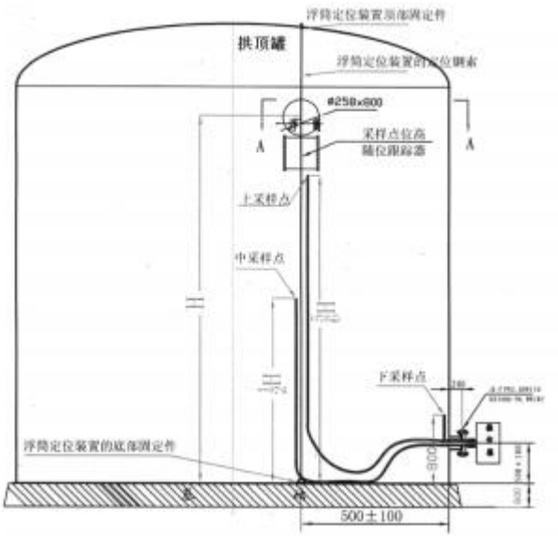
Advantage 3: It occupies minimal space and does not pose potential hazards to other accessories inside the tank, nor is it affected by the equipment inside the tank and reduces sampling accuracy;

Advantage 4: No vulnerable parts, long lifespan;

Advantage 5: Easy installation and maintenance, facilitating the construction progress of the tank area. Without being limited by the shape of the float, installing the inner part of a sampler tank only takes a few hours, and with the installation tools in place, the outer part of the tank only takes

one hour.

2.Structural features and installation diagram:



3. Working principle:

The inlet of the upper, middle, and sampling tubes, that is, the upper and middle sampling points, move up and down with the float or floating disc in a ratio of 5/6 and 1/2, ensuring that the upper and middle sampling points always strictly follow the regulations of "manual sampling of liquid petroleum products" and achieve accurate and error free sampling. Because the liquid level at the downsampling point changes relatively little, it can be set to the middle value within its range of variation.

5） HCYG-D fixed point tank bottom sampler

1. Technical features:

1) The sampler takes a fixed-point oil sample every meter, not a three-point tank sampler. Samples must be taken every one meter in accordance with the latest national standard GB/T4756-2015.

2) The sampler is a fixed device. It will not reduce its service life due to the impact of mixing or blending equipment inside the tank, and will not exert any force on the floating disc.

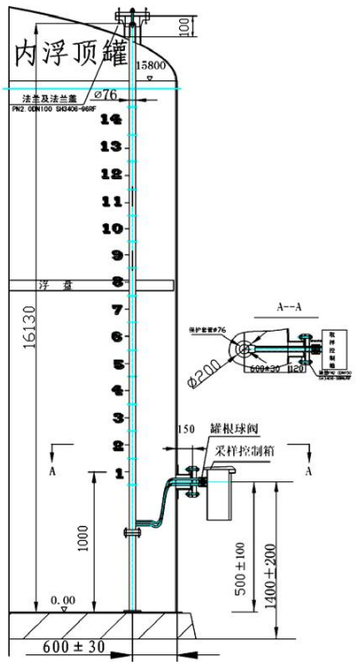
3) All materials in contact with the medium are made of stainless steel, which is corrosion-resistant, has a long service life, and has a beautiful appearance.

4) Easy to install, only one hole needs to be opened in the tank body, connected with a flange, and installed without hot work.

5) Rainproof and windproof design, making it easy to take samples in both rainy and windy conditions.

6) Easy to operate, accurate and rapid sampling.

2. Structural features and installation diagram:



3. Working principle:

Install a DN40-DN80 steel pipe as a fixed bracket for the sampling pipe from the bottom to the top of the tank at the highest liquid level. According to the viscosity of the oil product, the sampling tube is configured with an inner diameter ranging from φ 6 to φ 14. The larger the viscosity, the larger the corresponding inner diameter of the sampling tube. Install a pipe at intervals of one meter along each fixed bracket. If the maximum liquid level in the tank is 18 meters high, set up 19 sampling points. Install a sampling pipe at a height of 0.2-0.6 meters below the maximum liquid level, set one at a height of 0.2-0.6 meters at the bottom according to user requirements, and set one at every other meter. To ensure that the samples are in the freshest state, a circuit is set up inside the operating box outside the tank. After the pump has pumped all the liquid in the sampling tube, fresh samples must continue to be transported. If a 5-meter high liquid level is selected as the sampling point, open the sampling valve of the external operation box corresponding to that point, and the 5-meter point sample can be obtained in the external sampling operation box.