Test Report of the Test Unit ..... to specify the name .....

who is a person carrying out

the test on the prototype of the meter for fuel oil at petrol stations

Trademark ..... **Model** .....

Table 1 Result of Visual Inspection

No.	Characteristics of the Prototype of the Meter for Fuel Oil at Petrol Station as Inspected	Result of Inspection (to mark ✓ or ✘ in the case of inaccuracy, please explain details)		
		Accuracy	Inaccuracy	Details (please specify)
1	A fuel dispenser is fixed at a base, made of good materials, designed and produced in a manner that when it is used as usual, it can operate accurately. The components of the meter can operate continuously without defect, bend or deformation, which affects the accuracy of the meter.			
2	A screen panel has a stable cover (if any).			
3	A cover has no crack (if any).			
4	Oil and a ball or a spinner in a sight glass can be seen clearly (if any).			
5	The indication of a quantity, a price per unit and the total price shall correspond with a nozzle as chosen. A sum of money shall correspond with the quantity of measurement as indicted.			
6	The price indication can be seen clearly in all conditions, both day and night.			
7	The meter has an indicating device that is in a satisfactory manner, in a sufficient number for operation, and does not cause confusion in reading values.			

No.	Characteristics of the Prototype of the Meter for Fuel Oil at Petrol Station as Inspected	Result of Inspection (to mark ✓ or ✘ in the case of inaccuracy, please explain details)		
		Accuracy	Inaccuracy	Details (please specify)
8	The inscriptions of all of the controllers for operation, an indicating device and other equipment, including a switch of the meter shall be legible, clear and indelible.			
9	The following details and data shall be legible, clear and indelible: - the name or trademark of a manufacturer or an importer, - the year of manufacture and the model that is specified the form of the meter, - the maximum flowrate and the minimum flowrate Q_{max}=.....litre/minute Q_{min}=..... litre/minute, - the minimum measured quantity of the system, - the temperature range of the liquid as measured, - the viscosity range or the type of the product as used, - the data of the accuracy class of the dynamic measuring systems of liquids other than water.			
10	There is a main indicating device.			
11	An indicating device shall indicate the name or symbol of a unit of measurement. The principal scale mark shall indicate the value in the form 1×10^k, 2×10^k or 5×10^k, whereby k is a positive or negative integer or zero.			
12	The data of the minimum and maximum pressures of liquid shall be indicated.			

No.	Characteristics of the Prototype of the Meter for Fuel Oil at Petrol Station as Inspected	Result of Inspection (to mark ✓ or ✘ in the case of inaccuracy, please explain details)		
		Accuracy	Inaccuracy	Details (please specify)
13	The ratio of the maximum flowrate to the minimum flowrate is not less than 10 to 1.			
14	In the case where the meter has the maximum flowrate of not exceeding 3.6 cubic metres per hour or the maximum flowrate of not exceeding 60 litres per minute, the minimum quantity as metered shall not exceed 5 litres.			
15	The meter has a space for a tamper-evident seal so as to prevent unauthorized alterations after the inspection and verification. The meter shall be modified or repaired after the seal is destroyed.			

Table 2 Result of Test on Accuracy at Minimum Measured Quantity of the System, Maximum Flowrate and Minimum Flowrate (Accuracy Test)

Minimum Measured Quantity of System (MMQ) =..... Maximum Flowrate (Q_{max}) =.....

Minimum Specified Quantity Deviation (E_{min}) =..... Minimum Flowrate (Q_{min}) =.....

Quantity as Tested (litres)	Quantity as Read from the Meter (litres) (A)	Quantity as Read from the Standard (litres) (B)	Test Result		Quantity as Tested (litres)	Quantity as Read from the Meter (litres) (A)	Quantity as Read from the Standard (litres) (B)	Test Result	
			Pass	Not Pass				Pass	Not Pass
MMQ					50				
1					20				
2					5				
5					2				
20					1				
50					MMQ				

Maximum Permissible Errors for Testing the Meter for Fuel Oil at Petrol Stations

Quantity as Tested	Maximum Permissible Errors (MPE)
1 litre	6 millilitres
2 litres	6 millilitres
5 litres	15 millilitres
20 litres	60 millilitres
50 litres	150 millilitres

Criteria for Consideration

1. B-A $\leq$ MPE

2. In the case where the quantity as tested in Table 2 is equal to MMQ, it is required to consider maximum permissible errors at E_{min} principally.

Test Result ☐ **Pass** ☐ **Not Pass**

Table 3 Result of Test on Zero Setting for Quantity and Price Indicating Devices (Zero Setting Device Test)

Test No.	Quantity Indicating Device	Price Indicating Device
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Criteria for Consideration

At the time of the beginning of setting zero for quantity and price indicating devices. The “zero” value shall be indicated upon the completion of setting zero.

Test Result ☐ **Pass** ☐ **Not Pass**

Table 4 Result of Price Computing Device Test

Quantity as Tested (litres)	Quantity as Indicated (litres)	Price per Unit (baht)	Price as Computed (baht)	Price as Indicated on Screen (baht)	Test Result	
					Pass	Not Pass
1						
2						
5						
20						
50						

Test Result ☐ **Pass** ☐ **Not Pass**

Criteria for Consideration

Positive or negative errors shall not exceed 0.01 litre x price per unit.

Test Steps

1. In indicating a discharged quantity prior to discharging, the zero value shall be indicated.
2. It is required to discharge the quantity to be tested.
3. It is required to compute the total price, to round up two decimal places.
4. It is required to compare the computed price with the price indicated on a screen.

Table 5 Result of Nozzle Cut-off Device Test

No.	Test Result	
	Cutting Discharge	Not Cutting Discharge
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Test Result ☐ **Pass** ☐ **Not Pass**

Criteria for Consideration

A nozzle shall cut every discharge if its sensor comes into contact with fuel oil or the bubbles of fuel oil.

Test Steps

1. Fuel oil shall be discharged at a medium flowrate.
2. A sensor of a nozzle shall come into contact with the fuel oil or the bubbles of fuel oil.
3. The nozzle shall cut a discharge of the fuel oil.

Table 6 Result of Interlock for Hoses Sharing a Common Indicator Test

No.	Test Result	
	Working Properly	Not Working Properly
1		
2		
3		
4		
5		

Test Result ☐ **Pass** ☐ **Not Pass**

Criteria for Consideration

When the first nozzle is raised and ordered to operate, other nozzles shall not operate when they are raised in succession.

Test Steps

1. It is required to choose one nozzle that shares a common indicator with the nozzle to be tested, then it is required to raise the chosen nozzle to activate.
2. Another nozzle that shall be the one for testing is chosen to activate.
3. It is required to check whether the price and the quantity on a screen still operate as usual.

Table 7 Result of Interlock for Hoses Sharing a Pumping Unit Test

No.	Test Result	
	Working Properly	Not Working Properly
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Test Result ☐ **Pass** ☐ **Not Pass**

Criteria for Consideration

Oil shall not be discharged from a nozzle that is tested.

Test Steps

1. It is required to raise one nozzle that shares a pumping unit with a nozzle to be tested, then it is required to activate the raised nozzle.
2. While the pump is operating, it is required to discharge oil from the nozzle that is tested.
3. The oil shall not be discharged from the nozzle that is tested.

Table 8 Result of Test on Mechanism for Cutting Discharge According to Pre-set Indication (Pre-set Indication Test)

Quantity as Tested (litres)	Test Result	
	Working Properly	Not Working Properly
1		
2		
5		
20		
50		

Price as Tested (baht)	Test Result	
	Working Properly	Not Working Properly
100		
200		
500		
1,000		
1,500		

Test Result ☐ **Pass** ☐ **Not Pass**

Criteria for Consideration

An indication of a value of quantity or price shall correspond with a pre-set value.

Test Steps

1. It is required to adjust a zero value.
2. It is required to set a value of quantity or price by using a pre-set indication device. Make certain that the value as set is indicated on an indicating device.
3. Oil shall be discharged by a maximum flowrate in order that the mechanism for pre-set indication shall operate automatically.
4. It is required to check whether the indication of the value of quantity or price shall correspond with the pre-set value.

Table 9 Result of Test on Achievable Maximum Flowrate

Minimum Flowrate in Plate Q_{min} =.....litres per minute

Maximum Flowrate in Plate Q_{max}=.....litres per minute

Test No.	Quantity as Indicated (litres) (V_{FD})	Time (seconds) (T_s)	Maximum Flowrate (Q_{max}) (litres per minute) $Q_{max} = (V_{FD} \div T_s) \times 60$	Test Result	
				Pass	Not Pass
1		10			
2		10			
3		10			

Test Result ☐ **Pass** ☐ **Not Pass**

Criteria for Consideration

The achievable maximum flowrate shall be in the range of the minimum flowrate to the maximum flowrate as certified, which is indicated in an information plate.

Test Steps

1. It is required to discharge fuel oil at a maximum flowrate over a period of 10 seconds, then it is required to cut a discharge of the fuel oil.
2. It is required to record an indicated quantity on an indicating device.
3. It is required to calculate the maximum flowrate by using a formula $Q_{max} = (V_{FD} \div T_s) \times 60$
4. It is required to compare the maximum flowrate as calculated with the maximum flowrate as indicated in an information plate.
5. It is required to consider the test result.
6. It is required to record the test result.

Table 10 Result of Repeatability Test

Quantity as Tested (litres)	Quantity being Read from the Meter (litres) (V_{FD})	Quantity being Read from the Standard (litres) (V_{REF})	Value of Error (%) (E_{FD})
5			
5			
5			
Repeatability			

Test Result of Value of Accuracy ☐ **Pass** ☐ **Not Pass**

Test Result of Repeatability ☐ **Pass** ☐ **Not Pass**

Criteria for Considering Value of Accuracy

$$\frac{E_{FD} = V_{REF} - V_{FD} \quad X\ 100}{V_{REF}}$$

Criteria for Considering Repeatability

E_{FD} maximum value - E_{FD} minimum value not exceeding 2 out of 5 of MPE (0.3%) = 0.12%

E_{FD} means the value of error.

V_{FD} means the quantity that is read from the meter.

V_{REF} means the quantity that is read from the standard.

Maximum Permissible Error for Value of Accuracy of the Meter for Fuel Oil at Petrol Stations

Accuracy Class	in the case where the meter has not been installed in the system
0.5	0.3%

Table 11 Result of Test of Error in the Same Side or Range of Error of the Meter System (Range of Error Test)

Quantity as Tested	Quantity as Read from the Meter (litres) (V_{FD})	Quantity as Read from the Standard (litres) (V_{REF})	Value of Error (%) (E_{FD})
5 litres			
10 litres			
20 litres			

Test Result ☐ **Pass** ☐ **Not Pass**

Criteria for Consideration

1. As for the value of error of the meter in every flowrate that is error in the same side, there shall be at least one value not exceeding half of maximum permissible error.

Range of maximum permissible error (0.3%) --> (0.3%)/2 = 0.15%

2. In the case where it does not comply with clause 1, it is required to consider the range of error of the dynamic measuring systems for liquids other than water which shall not exceed half of the range of maximum permissible error.

Range of maximum permissible error (0.6%) --> (0.6%)/2 = 0.3%

Table 12 Result of Test on Accuracy and Precision of the Meter by Presetting Values (Accuracy of Pre-set Test)

Quantity as Tested	Quantity as Read from the Meter (litres) (V_{FD})	Quantity as Read from the Standard (litres) (V_{REF})	Value of Error (%) (E_{FD})
1 litre			
2 litres			
5 litres			
20 litres			
50 litres			

Test Result ☐ **Pass** ☐ **Not Pass**

Criteria for Consideration

$$E_{FD} = \frac{V_{REF} - V_{FD}}{V_{REF}} \times 100$$

E_{FD} means the value of error.

V_{FD} means the quantity that is read from the meter.

V_{REF} means the quantity that is read from the standard.

Maximum Permissible Error for Value of Accuracy of the Meter for Fuel Oil at Petrol Stations

Accuracy Class	in the case where the meter has not been installed in the system
0.5	0.3%

Remark In the case where the quantity as tested is less than 2 litres, the maximum permissible errors, both positive and negative sides, shall be equal to 6 millilitres by calculating from $E_{FD} = V_{REF} - V_{FD}$.

Table 13 Summary of Test Result

No.	Checklist of Testing	Test Result	
		Pass	Not Pass
1	Visual Inspection		
2	Test on Accuracy of Minimum Measured Quantity of System, Maximum Flowrate and Minimum Flowrate (Accuracy Test)		
3	Test on Zero Setting for Quantity and Price Indicating Devices (Zero Setting Device Test)		
4	Price Computing Device Test		
5	Nozzle Cut-off Device Test		
6	Interlock for Hoses Sharing a Common Indicator Test		
7	Interlock for Hoses Sharing a Pumping Unit Test		
8	Test on Mechanism for Cutting Discharge According to Pre-set Indication (Pre-set Indications Test)		
9	Test on Achievable Maximum Flowrate		
10	Repeatability Test		
11	Test on Error in the Same Side or Range of Error of the Meter System (Range of Error Test)		
12	Test on Accuracy and Precision of the Meter by Presetting Values (Accuracy of Pre-set Test)		

I hereby certify that the aforementioned test results are correct and true in all respects.

(Signed).....Tester

(.....)

Position .....

Date ..... Month ..... B.E. .....

(Signed).....Authorized person to bind a juristic person

(a juristic person's seal to be stamped (if any)) (.....)

Position.....

Date ..... Month ..... B.E.....