Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

Certificate of Approval

NMI 5/6B/230

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

Faure Herman SAS Model Heliflu TLM Turbine Liquid-measuring System

submitted by Oil & Gas Technologies Pty Ltd
58 – 60 Chelmsford Street
Williamstown, Victoria 3016

Australia

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 117 Measuring Systems for Liquids Other than Water, dated June 2011.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants1 approved – certificate issued	05/11/21

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 5/6B/230' and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0B.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.

Darryl Hines
Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 5/6B/230

1. Description of Pattern approved on 05/11/21

A Faure Herman bulk flowmetering system incorporating a Heliflu TLM 80 mm Model TLM 3-150 Turbine Flow meter (Figure 1 and Table 1) with dual magnetic sensors (pick-up/pre amplifier element) for bulk metering of petroleum products other than LPG

1.1 Field of Operation

The field of operation of the measuring system is determined by the following characteristics:

• Minimum measured quantity (*Vmin*)	200 L	(#1)
• Maximum flow rate (*Qmax*)	2500 L/min	
• Minimum flow rate (*Qmin*)	250 L/min	
• Maximum pressure of the liquid (*Pmax*)	1965 kPa	
• Minimum pressure of the liquid (*Pmin*)	200 kPa (nominal)	(#2)
• Range of liquids viscosity	0.4 to 20 mPa.s (at 20°C)	
• Liquid temperature range	0°C to 30°C	
• Ambient temperature range	-25°C to 55°C	
• Accuracy class	0.5	

(#1) When the calculator/indicator is set to indicate volume in 1 L increments.

(#2) Minimum pressure required for effective operation of the gas elimination device.

1.2 Components of Measuring System

(i) Supply tank

The supply tank, which may incorporate a detector for low liquid-level. A positive displacement, centrifugal or submersible turbine type pump may be used to provide flow through one or more flowmeters.

(ii) Pump

The pump is required to have sufficient capacity to allow flow rates at least three times the minimum flow rate specified for the flowmeter. If the pump is not for the exclusive use of the flowmeter, the pump shall be of sufficient capacity to ensure that flow rate through each meter is maintained above its respective specified minimum flow rate and the pressure is maintained above the minimum backpressure recommended for each meter for all combinations of alternative uses of the pump.

A positive displacement type, centrifugal type, or submersible turbine type pump may be installed in a flooded suction configuration. Systems which incorporate submersible turbine type pumps, may in addition include centrifugal type pumps fitted above the liquid level in the supply tank as supplementary pump.

(iii) Non-return Valve

A non-return valve between the pump and the meter, or an arrangement of the components and piping to keep the system (up to the transfer point) full of liquid at all times.

(iv) Gas Elimination Device

A 100 mm (4 inch) Smith Meter Inc model E-40A-40-V-O-O-R2 gas extractor with an integral strainer assembly, or any other equivalent gas elimination device, is fitted as close as practical to the meter inlet (Figure 2).

The gas elimination device assembly may be modified for use as a strainer only where the tank has automatic alarming of low-liquid, or has a float-operated shut-off valve in the pump supply, or has other means to prevent gas entering the system.

(v) Straightening Elements

The meter is factory fitted with an inbuilt flow straightening and conditioning element. Additionally, one may choose to install straightening elements of straight pipe of at least 10 pipe diameters in length upstream of the meter inclusive of a flow conditioner and straight pipe 5 pipe diameters in length downstream of the meter.

(vi) Measurement Transducer

The measurement transducer is a Heliflu TLM 80 mm Model TLM 3-150 80 mm turbine flowmeter (Figure 3) with dual pick-off coils producing an electrical output signal proportional to volume throughput. The pick-off signal is conditioned by a dual signal pre-amplifier to produce a square wave output signal.

(vii) Calculator/Indicator

The signal output from the measurement transducer is interfaced to an approved Technip FMC Smith Meter Accuload IV calculator/ indicator as described in the documentation of approval NMI S742, or any other compatible (#) NMI-approved calculator/indicator.

(#) ‘Compatible’ is defined to mean that no additions/changes to the hardware/software specified in this approval are required for satisfactory operation of the system.

(viii) Transfer Device

A transfer device is located downstream of the meter to define the start and finish of volume measured by the flowmeter and may be in the form of a shut-off valve or a decoupling valve fitted to the end of a hose or loading arm.

The transfer device may also be designed to control the flow rate, or a separate flow control valve may be fitted between the meter and the transfer device, provided that the flow control system maintains the operation of the meter within the approved field of operation.

1.3 Verification Provision

Provision is made for the application of a verification mark.

1.4 Sealing Provision

The flowmeter is not required to be sealed. The calibration adjustment provided by the calculator/indicator should be sealed as described in its approval documentation.

1.5 Descriptive Markings and Notices

Each measuring system shall bear the following information, placed together either on the indicating device or on a data plate:

Pattern approval number	NMI Nº 5/6B/230	
Manufacturer's identification mark or trade mark	…..	
Meter model	…..	
Serial number of the instrument	…..	
Year of manufacture	…..	
Maximum flow rate, *Qmax*	….. L/min	
Minimum flow rate, *Qmin*	….. L/min	
Maximum pressure of the liquid, *Pmax*	….. kPa	(#1)
Minimum pressure of the liquid, *Pmin*	….. kPa	
Liquid temperature range	... to ... °C	(#2)
Nominal k-factor	…..pulse/L	
Type of liquid for which the system is verified	…..	(#3)
Environmental class	class C	
Accuracy class	0.5	

(#1) Required for systems with flexible outlet pipework.

(#2) Required if temperature converted volume to 15°C is reported.

(#3) This may be located separately, e.g. on a metal tag sealed to the instrument.

The minimum measured quantity (*Vmin*) is clearly visible on the indicating device, e.g. 'Minimum Delivery 200 L', or the pre-set of the controller is limited to deliveries equal to or greater than the minimum delivery specified for the flowmeter.

2. Description of Variant 1 approved on 05/11/21

With certain other TLM series flowmeters as listed below in Table 1. The specifications for the meter of the pattern are in **bold** type.

TABLE 1 (Figure 1)

Meter Type	Diameter (mm)	Maximum Flow Rate *(Qmax)* (L/min)	Minimum Delivery *(Vmin)* (L)
TLM 3-30	80	500	50
TLM 3-50	80	833	100
TLM 3-70	80	1166	100
TLM 3-110	80	1833	200
TLM 3-150	**80**	**2500**	**200**
TLM 4-70	100	1166	200
TLM 4-110	100	1833	200
TLM 4-150	100	2500	200
TLM 4-200	100	3333	200
TLM 4-300	100	5000	500

TEST PROCEDURE

Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

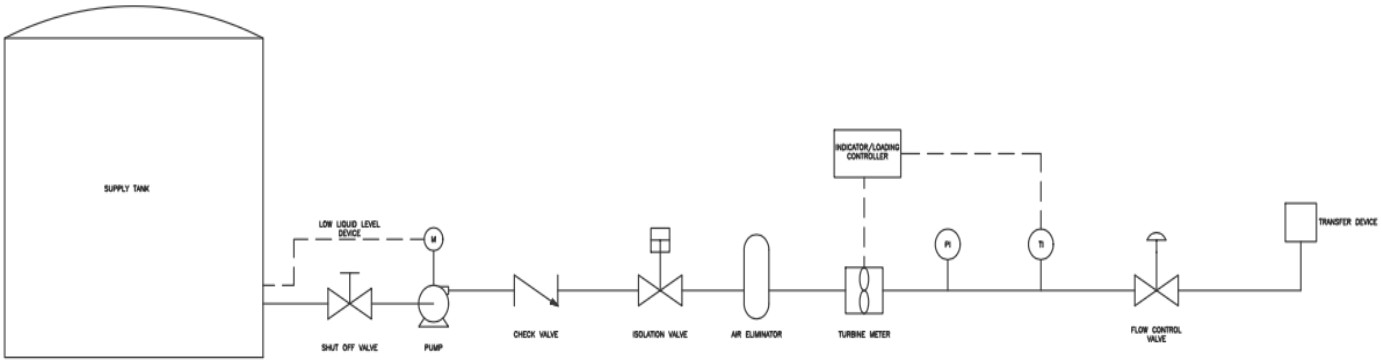
Tests should be conducted in conjunction with any tests specified in the approval documentation for any controller/indicator and/or any conversion device, etc. used.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

Maximum Permissible Errors

The maximum permissible errors are specified in the *National Trade Measurement Regulations 2009*.

FIGURE 5/6B/230 – 1



Typical Horizontal Flow Metering System

FIGURE 5/6B/230 – 2

TFMC Smith Meter Model E-40A-40-B-O-O-R1 with Air Release Head

FIGURE 5/6B/230– 3

Faure Herman Heliflu TLM series Flow Meter

FIGURE 5/6B/230 – 4

TFMC Smith Meter Accuload IV Flow Computer

~ End of Document ~