

Australian Government

Department of Industry, Science, Energy and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval NMI 5/6B/218

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.

Alfons Haar Model PreciPURE C 1350 Liquid-Measuring System

submitted by	HAAR Australia Pty Ltd U1/2 East Circuit		
	Sunshine West	VIC	3020

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.

Rev	Reason/Details	Date
0	Pattern provisionally approved – interim certificate issued	7/02/14
1	Pattern amended (validity date) – interim certificate issued	2/05/14
2	Pattern amended (validity date) – interim certificate issued	21/07/14
3	Pattern & variants 1 & 2 approved – certificate issued	17/11/14
4	Pattern & variants reviewed – Variant 3 approved – certificate	17/12/19
	issued	
5	Variant 4 approved – certificate issued	13/10/20

DOCUMENT HISTORY

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 5/6B/218' and only by persons authorised by the submittor.

Instruments purporting to comply with this approval and currently marked 'NMI P5/6B/218' may be re-marked 'NMI 5/6B/218' but 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 of Approval 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/218

1. Description of Pattern provisionally approved on 16/12/13 approved on 17/11/14

An Alfons Haar model PreciPURE C 1350 (#) bulk flowmetering system (Figures 1 & 2) incorporating an Alfons Haar model TU100 A2/3.5 100 mm turbine flowmeter with an Alfons Haar model IGELZ TU pulse transmitter interfaced to an Alfons Haar model X-Master 4 calculator/indicator for bulk metering of petroleum products other than LPG.

Approved products include various grades of liquid hydrocarbons including petrol/ethanol blends and pure ethanol ('E100') and various grades of pure biodiesel and biodiesel/distillate blends (to Australian government standard). The Alfons Haar PreciPURE C 1350 (#) bulk flowmetering system is approved to dispense both petrol and distillate via a single meter chamber using an automatic purging function.

(#) Abbreviated model number – the full model number of the system may include a number of alphanumeric suffixes which are not metrologically significant, e.g. PreciPURE C 1350 LL 6-300 V2V1L2 G SG M-S.

1.1 Field of Operation

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

•	Minimum measured quantity (V_{min})	1000 L (#1)	
		300 L (#2)	
•	Maximum flow rate (Q_{max})	1000 L/min	
•	Minimum flow rate (Q _{min})	130 L/min	
•	Maximum pressure of the liquid (P_{max})	5100 kPa	
•	Minimum pressure of the liquid (P_{min})	1000 kPa (nominal) (#3)	
•	Range of liquids viscosity	0.4 to 20 mPa.s (at 20°C)	
•	Liquid temperature range	-10°C to 50°C	
•	Ambient temperature range	-25°C to 55°C	
•	Accuracy class	0.5	
•	Applications	May be vehicle-mounted	
(#1)	Dry hose delivery		

- (#2) Wet hose delivery
- (#3) Minimum pressure required for effective operation of the gas elimination device.

1.2 Components of Measuring System

(i) Supply tank

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

(ii) Pump

A positive displacement pump is installed in a flooded suction configuration. 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.

(iii) Non-return Valve

A non-return valve between the pump and the hose reels keeps the hoses (up to the transfer point) full of liquid at all times.

(iv) Gas Elimination Device

An Alfons Haar model PreciNODE SME 'bubble detector' for sensoring gas in the system (Figure 3). The discharge manifold provides the primary gas elimination.

(v) Measurement Transducer

The measurement transducer is Alfons Haar model TU100 A2/3.5 100 mm (4") turbine flowmeter (Figure 4) 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 0 to 5 V square wave output signal.

- Input supply voltage is 15 to 32 V DC
- Nominal k-factor for the turbine meter is 4.77 pulses/litre per channel
- Maximum pulse output is 119.25 Hz per channel (nominal)
- Cyclic volume is 0.419 L

(vi) Calculator/Indicator

For use with an Alfons Haar model X-master 4 calculator/indicator (Figure 5) which has a graphics display and numerical/function soft keys housed in an aluminium enclosure.

(vii) 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 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 Sealing and Verification Provision

Refer to Figure 6 for sealing requirements.

Provision is also made for a verification mark to be applied.

1.4 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 Manufacturer's identification mark or trade mark	NMI No 5/6B/218	
Meter model		
Serial number of the instrument		
Year of manufacture		
Maximum flow rate, Q _{max}	L/min	
Minimum flow rate, Q _{min}	L/min	
Maximum pressure of the liquid, <i>P</i> max	kPa (#1)	
Minimum pressure of the liquid, <i>P_{min}</i>	kPa	
Liquid temperature range	to °C (#2)	
Nominal k-factor	L/pulses	
Type of liquid for which the system is verified	(#3)	
Environmental class	class C, I	
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 (V_{min}) 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

An Alfons Haar model PreciTURBO C 1000 dry hose measuring system (Figure 7) for road tankers or stationary operations.

3. Description of variant 2

An Alfons Haar model PreciPURE C 1350 with dry or wet hose measuring system on road tankers or stationary operation for fluids with gravity discharge (Figure 8).

4. Description of variant 3

An Alfons Haar model PreciPURE C 1200 (Figure 9) which utilizes the same components as the C1350 in a more compact design.

approved on 17/11/14

approved on 17/12/19

approved on 17/11/14

5. Description of variant 4

approved on 13/10/20

With the models having of the pattern or variants having a pump model identified in the full model number e.g. PreciPURE C 1350 LL 6-300 V2V1L2 K SG M-S where K = 700 model pump.

The field of operation of the variation is determined by the following characteristics:

40 L/min

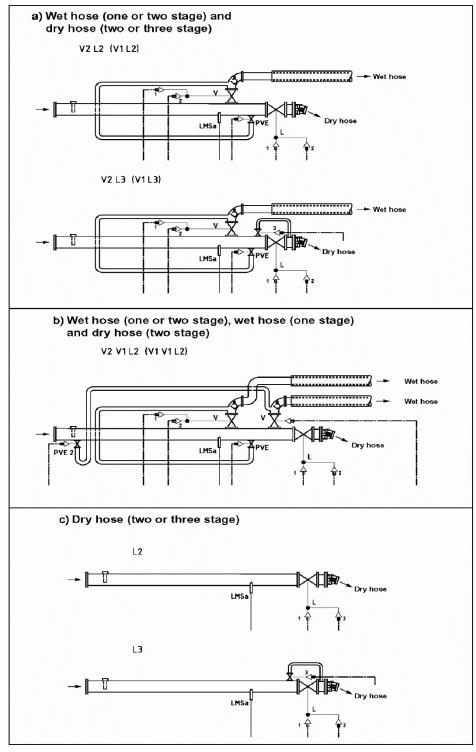
- Minimum measured quantity (*V_{min}*) 500 L (#1) 40 L (#2)
- Maximum flow rate (Q_{max})
 40 L
 500 L/min
- Minimum flow rate (Qmin)
 - (#1) Dry hose delivery
 - (#2) Wet hose delivery

TEST PROCEDURE

Instruments shall be tested and verified in conjunction with any tests specified in the approval documentation for the instruments to which the pattern is connected, as appropriate, and in accordance with any relevant tests specified in the National Instrument Test Procedures, using the type of liquid with which they will be used and which is marked on the instrument.

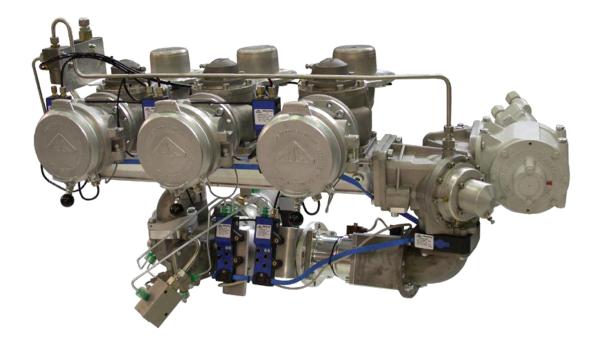
The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

The maximum permissible errors applicable are those applicable to the system to which the instrument approved herein is fitted, as stated in the approval documentation for the system, or in Schedule 1 of the *National Trade Measurement Regulations 2009*.





Alfons Haar Model PreciPURE C 1350 Bulk Flowmetering System



Alfons Haar Model PreciPURE C 1350 Bulk Flowmetering System Hydraulics

Figure 5/6B/218 - 3



Alfons Haar Model PreciNODE SME 'Bubble Detector' Gas Detection Device



Measurement Transducer – Alfons Haar Model TU100 A2/3.5 Turbine Flowmeter

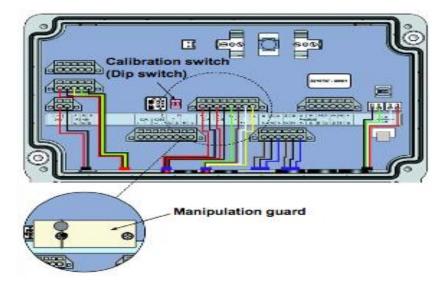
Figure 5/6B/218 – 5



Alfons Haar Model X-master 4 Calculator/Indicator

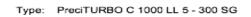
Manipulation guard

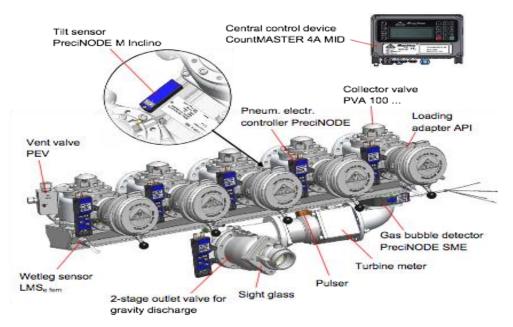
Cover (part no. S001141) to protect the pulser connections and the calibration switch against manipulations. The manipulation guard has to be lead sealed after successful calibration of X-MASTER.



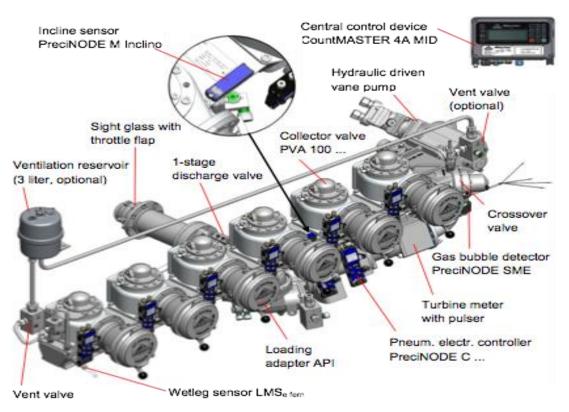
Sealing For Calibration For Calculator/Indicator

Figure 5/6B/218 - 7





Alfons Haar Model PreciTURBO C 1000 Dry Hose Measuring System (Variant 1)



Type: PreciPURE C 1350 LR 6 - 300 V1L2 K SGD A-O oPR

Alfons Haar Model PreciPURE C 1350 Dry or Wet Hose Measuring System (Variant 2)



Alfons Haar Model PreciPURE C1200 Dry Measuring System (Variant 3)

~ End of Document ~