

**Pursuant to section 12 of
the Weights and Measures Act 1985
Certificate No 3064**

Issued by:

NMO

In accordance with the provisions of section 12 of the Weights and Measures Act 1985, the Secretary of State for Business, Energy & Industrial Strategy has issued this UK national type-approval certificate to:

**DEZIDATA Transport Vehicle Equipment GmbH
Industriestr. 10,
94469 Deggendorf,
GERMANY**

And hereby certifies as suitable for use for trade the following pattern of an electronic dipstick system or ALG (automatic level gauge), model DIPCHECK 2 or DCSTFL.

The necessary data (principal characteristics, alterations, securing, functioning etc) for identification purposes and conditions (when applicable) are set out in the descriptive annex to this certificate.

Under the provisions of section 12(5) of the said Act, this certificate is subject to the conditions described in the descriptive annex.

Note: This certificate relates to the suitability of the equipment for use for trade only in respect of its metrological characteristics. It does not constitute or imply any guarantee as to the safety of the equipment in use for trade or otherwise.

**Issue Date: 22 September 2016
Valid Until: 21 September 2026
Reference No: T1123/0001**



G Stones
Technical Manager
For and on behalf of the Head of Certification Body

CONTENTS

CERTIFICATION NO 3064

1	INTRODUCTION
2	CONSTRUCTION
3	TECHNICAL DATA
4	DISPLAYS AND LEGENDS
5	OPERATION
6	SECURITY FEATURES AND INTERLOCKS
7	SECURING
8	SOFTWARE VERSION CONTROL
9	AUTHORISED ALTERNATIVES
10	RECOMMENDED TESTS
11	CONDITIONS

ILLUSTRATIONS

Figure 1	System schematic
Figure 2	Example for a Type Plate
Figure 3	Example for Normal Delivery Ticket (Valid Delivery)
Figure 4	Example for Normal Delivery Ticket (Invalid Delivery)
Figure 5	Example for a Metrological Printout
Figure 6	Example for a Diptable Printout
Figure 7	Sealing of Temperature Sensors
Figure 8	Example for Extended Delivery Note
Figure 9	Main Module DD-0100
Figure 10	Dip Controller with sealing method
Figure 11	Display DEZITOUCH with Keypad
Figure 12	Dip Sensor Flange / Level Gauge with sealing method
Figure 13	Dip Tube / Tube of Level Gauge
Figure 14	Floating Bearing Holder
Figure 15	Temperature Sensor and sealing method
Figure 16	Inclination Sensor and sealing method
Figure 17	Product Detector
Figure 18	Optical Wetleg Sensor N17R
Figure 19	Sealing of Main Module DD-0100

Descriptive Annex

1 INTRODUCTION

1.1 This pattern is a "Contents Gauging" system fitted to a road tanker for the transport and delivery of liquids with low viscosity stored at atmospheric pressure and at ambient temperature. It comprises a tank with one or more compartments, each of which is fitted with an electronic level measuring sensor and associated valves for the purpose of loading and unloading its contents.

1.2 The system determines the volume of liquid contained in each compartment and is capable of measuring complete or partial compartment deliveries by calculating the difference between initial volume and final volume left in the compartment. The filling status of the pipework below each compartment is monitored by an empty sensor (wetleg sensor).

1.3 The system interacts with the vehicle by operating electro-pneumatic valves (solenoid valves) and by reading pressure switches for example (see figure 1). This control indirectly has influence on the liquid in the compartments, for example, by opening the foot valve. Most sensors and actuators are connected to what is termed a "multifunction interface". Further sensors may be connected to this interface or, depending on the type of sensor, to the dip controller (temperature sensors for example).

2 CONSTRUCTION

2.1 General

Description	Type / Article No.	Figure
Main Module	DD-0100.xxy or DD-0100y	Figure 9
Dipcontroller	Type 511.xxxxxx	Figure 10
Indicator and keypad	Type 512.xxxxxx DEZITOUCH, containing DD-0120.xxy	Figure 11
Level gauge	Type 301.xxxxxx	Figure 12
Tube of level gauge	302.xxxxxx	Figure 13
Floating bearing holder for tube of level gauge	116.xxxxxx	Figure 14
Temperature Gauge	304.xxxxxx	Figure 15
Inclination Gauge	Type 305.xxxxxx	Figure 16
Product Detector (wetleg sensor based on ultrasonic technology)	306.xxxxxx	Figure 17
Optical wetleg sensor	303.xxxxxx or type N17R	Figure 18
Printer	Any CE-marked compatible printer	

With xxxxxx identifying non metrological modifications.

3 TECHNICAL DATA

3.1 Field of operation

Minimum delivery:	10% of compartment volume
Liquids measured:	gas oil; diesel; kerosene; domestic heating oils; paraffin; petroleum spirit
Product temperature:	-20 °C to +50 °C
Operating temperature:	-20 °C to +60 °C

3.2 Measuring ranges and resolution

Level range:	0 ... 3000 mm
Level resolution:	0,1 mm
Temperature range:	-20 °C to +60 °C
Temperature resolution:	0,1°C
Volume range:	0 to 65000 litres
Volume resolution:	1 litre
Inclination range:	± 5 ° in both roll and pitch axis
Inclination resolution:	0,1 °

3.3 Communication

All metrologically relevant modules of the system are interconnected with two-wire fieldbus or three-wire RS-232 cable:

Field bus standard:	"P-NET" (IEC 61158 Type 4 & EN 50170 Vol. 1)
Field bus layer 1:	RS-485
Point to point communication:	RS-232, 8 bit, 1 stop bit, no parity, if not specified otherwise (used for printer, inclination sensor, GSM, GPS)

4 DISPLAYS AND LEGENDS

4.1 System Data Plate

The liquid fuel measuring system carries a system data plate which is attached to a support of the system and carries the following inscription:

i)	the certificate number	Cert No 3064
ii)	the manufacturer's name:	Tank truck manufacturer (who has assembled the complete measurement system)
iii)	the serial number:	Serial number of measurement container, as defined by Tank Truck Manufacturer.
iv)	the year of manufacture:	yyyy
v)	the instrument's designation:	DIPCHECK 2 or DCSTFL
vi)	the liquids measured	gas oil; diesel; kerosene; domestic heating oils; paraffin; petroleum spirit

and for each compartment:

vii)	the nominal capacity:	xxxxx Litres
viii)	the minimum delivery (MMQ):	10 % of compartment net volume

Additional information from the tank truck manufacturer may be present, and example of markings is shown in figure 2.

5 OPERATION

5.1 Modes of operation

The following modes of operation are provided (any combination is possible, depending on system configuration):

- a) Loading of products to one or more compartments, either by bottom, or by top loading. The compartments may be partially filled before loading on top of the existing product. Measurements during and directly after loading will not be marked as metrologically valid on the ticket, only deliveries are subject to metrological scrutiny. Loading is possible on the left or on right hand side of the vehicle.
- b) Gravity delivery from one or more compartments. Deliveries may consist of full compartment contents or split deliveries. Depending on the construction deliveries may be possible on the left and/or on the right hand side of the vehicle.
- c) Pumped dry hose delivery. An optional on-board pumping system is provided which may be manually connected to any one compartment.
- d) Dry hose delivery (by gravity or pumped) by optional manifold – same as b) or c), but with a manifold, which may be connected to each compartment's pipe downstream of the foot valve, separated by a pneumatic valve (see figure 1, item 6). The valves are operated “by wire”, i.e. initiated through keyboard commands at the DEZITOUCH and controlled by the metrological part of the system.
- e) Pumped delivery through wet hose – same as c) or d), but through a hose (with hose reel or not) which remains filled at all times.

5.2 Marking of Delivered Quantities

5.2.1 The system is able to detect situations, where the measurement quantity will possibly not be within the allowed error limits. For example:

- Liquid level dropped below minimum measurable height, however, compartment not empty.
- Manifold not empty at initial or final gauging.
- Delivered quantity below MMQ.

5.2.2 When trying to start or to close the transaction under those circumstances, an appropriate warning will be issued on the DEZITOUCH.

5.2.3 The warning gives the driver the possibility to fix the related root cause. However, the transaction can be closed despite the warning, which will cause the warning to be printed on the delivery ticket. In the latter case related quantities will not be marked with asterisk symbols.

5.3 Printed Tickets

Samples of tickets printed for a range of delivery situations are shown in Figures 3 and 4.

Each delivery note ends with the text:

** Data of metr. approved system parts **
*** are surrounded by asterisks ***

Furthermore, DIPCHECK2 marks measured values (volumes, for example) with asterisk only, if they are regarded as metrologically valid (error within tolerances). Otherwise a question mark will be printed instead (see figures 3 and 4 with explanations in red).

6 SECURITY FEATURES AND INTERLOCKS

6.1 Delivery may be stopped at any point and a ticket may be printed after final gauging. Outside a transaction the system keeps the foot valves and other valves required for delivery and loading closed. Most valves on the vehicle are kept closed, except for valves which are required for tasks irrelevant for transactions (valves for activating the printer via pressure switch, for example).

6.2 Fluid level is continuously monitored during initial and final gauging. The systems remains in gauging mode until a settled level has been detected for a pre-set period of time in that compartment.

6.3 Each compartment's pipe has a wet/dry leg sensor monitored by the system. Deliver-to-empty deliveries will not be marked as metrologically valid unless the sensor is dry. Ticket will indicate whether the compartment contents were delivered.

6.4 Each compartment level sensor will detect when the fluid level is below the effective measurement level. During gauging such a situation will lead to an appropriate marking on the ticket.

7 SECURING

7.1 Dipcontroller

The housing shall be sealed with a tamper-evident sealing mark so that it is impossible to open the lid without breaking the seal (Figure 10).

7.2 Level sensing probes

The probe flange shall be sealed with tamper-evident sealing marks in a way so that it is impossible to open the lid or to dismount the sensor without breaking the seal (Figure 12).

7.4 Inclination sensor

The cover of the inclination sensor housing shall be sealed with tamper-evident sealing marks in a way so that it is impossible to open the lid or dismount the housing without breaking the seals (Figure 16).

7.5 Temperature sensors

The sensor shall be secured using lead seals and wire through a hole in the type label of the sensor and a lug close to the sensor flange (see Figure 7)

7.6 Main Module (DD-0100)

The main module shall be secured using two tamper-evident stickers on a seal holder (Figure 19). The sealing method is as follows:

- Dismount seal holder.
- Electronically seal the system on the DEZITOUCH (keys “MORE..” and “Reseal”).
- Mount the seal holder.
- Seal the seal holder.

8 SOFTWARE VERSION CONTROL

8.1 The versions and signatures of the metrologically relevant software and firmware are included in the printer output of the calibration parameters (Figure 5).

The versions and signatures shall be as follows (when applicable, some devices are optional):

Device/Software	Version Number	Signature
CPU Module DD-0100.01 ("coprocessor" on printout)	V1.62	47BB
CPU Module DD-0100.02 ("coprocessor" on printout)	V2.04	D919
Metrological Program DCSTFMET ("software" on printout)	V1.04	F43F
Dip Controller	V2.10 V2.11	-/ -/-
Inclination Sensor DD-0080.01	V1.18	7B9A
Inclination Sensor DD-0080.05	V1.40	9335
Display Unit DEZITOUCH DD-0120	V1.54	9907
Display Unit DEZITOUCH DD-0120.01	V1.63	78BA
Display Unit DEZITOUCH DD-0120.02	V1.89	81CF
Display Unit DEZITOUCH DD-0120.02	V2.10	101E

9 AUTHORISED ALTERNATIVES

There are currently no authorised alternatives.

10 RECOMMENDED TESTS

For initial verification (new fit, or introduction into service) the inclination tests of section 10.1 must be performed. The vehicle must be tested on a flat surface ($\pm 0.3^\circ$) both for the front-to-back level and for the side-to-side level. Means must be provided to tilt the tanker such that the compartments can be pitched by 3° both 'nose up' and 'nose down' and also in roll in each direction.

All compartments must be calibrated before the testing.

For re-calibration of vehicles in service, the inclination test may be omitted and testing should commence with the accuracy tests of section 10.2.

10.1 Inclination testing

10.1.1 Inclination sensor

Verify that the inclination sensor is rigidly mounted on a platform which is directly connected to the tanker shell. Using an accurate level gauge, adjust the position of the tanker to horizontal attitude in both axes (pitch and roll) to within $0 \pm 0.1^\circ$.

Read the pitch and roll angle of the sensor, which shall be within $\pm 0.2^\circ$ in both axes.

10.1.2 Inclination test

10.1.2.1 Each compartment needs to be verified in two steps, at $30\% \pm 5\%$ of full and at $70\% \pm 5\%$ of full.

Example for a vehicle with four compartments:

Step	Comp. 1	Comp. 2	Comp. 3	Comp. 4
1	30%	70%	30%	30%
2	70%	30%	70%	70%

10.1.2.2 In each step six measurements are to be performed:

Measurement #	Pitch Angle	Roll Angle	Direction
1	$0^\circ \pm 0.2^\circ$	$0^\circ \pm 0.2^\circ$	horizontal
2	$+3^\circ \pm 0.5^\circ$	$0^\circ \pm 0.2^\circ$	pitch, nose up
3	$-3^\circ \pm 0.5^\circ$	$0^\circ \pm 0.2^\circ$	pitch, nose down
4	$0^\circ \pm 0.2^\circ$	$+3^\circ \pm 0.5^\circ$	roll, right vehicle side up
5	$0^\circ \pm 0.2^\circ$	$-3^\circ \pm 0.5^\circ$	roll, right vehicle side down
6	$0^\circ \pm 0.2^\circ$	$0^\circ \pm 0.2^\circ$	horizontal

10.1.2.3 For each measurement an empty delivery ticket has to be created by entering and leaving delivery mode. This delivery ticket can be printed in extended form, where gauged volume at ambient temperature in each compartment is visible (Figure 8).

10.1.2.4 After each step use measurements #1 and #6 to verify that no disturbance has occurred. The volumes printed should correspond to each other. The test shall be repeated for each compartment, where the difference exceeds $\pm 0,2\%$ of MMQ.

10.1.2.5 For each compartment and each step, compare the quantities printed in the level state with each of the quantities in tilted positions, pitch and roll. Any differences must not exceed $\pm 0.3\%$ of the MMQ of the compartment.

10.2 Accuracy

Verify the accuracy as follows:

- Fill compartment with fluid (gas-oil, diesel, or kerosene can be used) slightly over the compartment's maximum to allow a forerun of about 50 L to 300 L.
- Perform a forerun of about 50 L to 300 L to reach a convenient 'round' figure near the compartment's maximum.
- Deliver the tank contents in nominal increments (typically MMQ) via a reference meter:
 - Enter delivery mode.
 - Deliver one test quantity (typically MMQ).
 - Exit delivery mode.
 - Print a ticket in extended form, which shows the gauged volumes.
- Verify on the extended delivery tickets (see figure 8) that for each increment, the compartment shows the correct amount within the permitted error when compared with the reference meter.
- Continue until each compartment has been tested throughout its range.

For increments smaller than the MMQ, absolute volume errors of as many succeeding increments have to be added together until the volume sum reaches the MMQ. Example for MMQ of 1000 L:

Delivery #	Dipstick	Reference	Abs. Error	Total Error
1	502 L	500 L	+2 L	
2	499 L	501 L	-2 L	0 L (0 % of MMQ)
3	503 L	502 L	+1 L	-1 L (-0.1 % of MMQ)
4	498 L	497 L	+1 L	+2 L (+0.2 % of MMQ)
...				

10.3 Empty compartment

Each delivery-to-empty comprises an empty test: A compartment is regarded as empty, if wet leg sensor is dry while foot valve is open for a certain amount of time (typically 20 seconds).

The last test delivery in section 10.2 is such a delivery. Therefore, on the delivery ticket the final volume gauging shall look like '0-' (minus sign means 'wet leg sensor dry'). See figures 3, 4 and 8 for examples.

10.5 Verification of metrology software

Verify that the versions and signatures comply with the information in section 8.

11 CONDITIONS

In accordance with the provisions of Section 12(5) of the Weights and Measures Act 1985, this certificate is issued with the following conditions.

11.1 Dispensation

Dispensation is given in respect of the requirements of SI 1983 No. 1390:

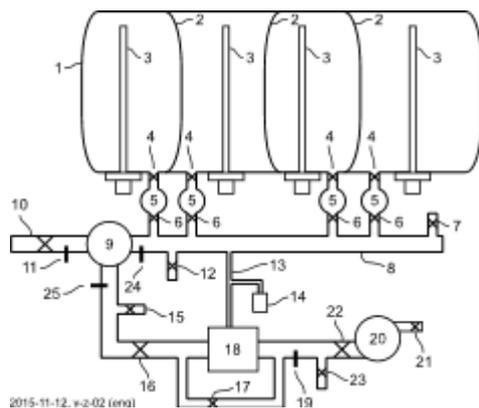
Paragraph 11 – (a) “the indicator is capable of being set to zero before a delivery commences...”.

and

Paragraph 36 – (2) (a) “ the sales indicator shall be set to zero before a delivery commences...”
as these are not applicable to this contents gauging system.

CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
3064	22 September 2016	Certificate first issued.
-	-	No revisions have been issued.



- 1 Container with 1 to 7 Compartments
- 2 Compartment Baffle
- 3 Dip Tube with Sensor and Flange
- 4 Compartment Outlet with Bottom Valve
- 5 Pipe for Unloading and Loading, Each With One or Two Wetleg Sensor, Optionally One Temperature Sensor
- 6 Manifold Valve, if Manifold Present
- 7 Manifold Ventilation (optional)
- 8 Manifold (optional)
- 9 Pump (optional)
- 10 Trailer Suction Line With Valve (optional), Possibly Split into a Small and a Big Suction line.
- 11 Wetleg Sensor in Trailer Suction Line (optional)
- 12 Valve and Coupling of Dry Hose for Delivery by Gravity via Manifold (optional)
- 13 Vapour Recovery Line from Degaser, If Present (optional). Recovery Into Manifold or Into Stop Tank Alternatively
- 14 Stop Tank (optional)
- 15 Valve and Coupling of Dry Hose for Pumped Deliveries (optional)
- 16 Valve for Selection of Flow Meter and/or Wet Hose (optional)
- 17 Bypass with Valve (optional)
- 18 Flow Meter Assembly Acc. to MID Without Own Evaluation Unit (optional)
- 19 Temperature Sensor for Flow Meter (optional)
- 20 Wet Hose Reel (optional)
- 21 Nozzle on Wet Hose (optional)
- 22 Selection of Wet Hose Downstream of Flow Meter (optional)
- 23 Valve and Coupling of Dry Hose Downstream of Flow Meter (optional)
- 24 Wetleg Sensor in Manifold (optional)
- 25 Wetleg Sensor Downstream of Pump (optional)

Figure 1 System schematic

<Tank Truck Manufacturer>			
approval no	Cert No 3064 / DIPCHECK2		
manufact. no	123d54321	test pressure tankshell	0,40 ^b
manufact. date	2015	test pressure comp.	0,30 ^b
material	5186H111/EN	external pressure	0,03 ^b
capacity total	24800	design temperature	21°C
liquids measured	gas oil, diesel, kerosene, domestic heating oils, paraffin, petroleum spirit		
compartment capacities / min. measurable quantities			
1	5750 / 575 L	2	5800 / 580 L
3	7500 / 750 L	4	5750 / 575 L
5		6	

Figure 2 Example for a Type Plate

DELIVERY NOTE *0006* Unloading
 Meas.assembly : *117B1042*
 Haulier XYZ
 Truck : Veh001
 Date: 22.08.16 11:55:14 - 11:58:00

GENERAL ERRORS:
 -*System unsealed*

Co Prod PreG/L FinG/L V15°/L

 4 *DK 6900+ 0- 6914 *

PRODUCT SUMS
 Product Vt/L V15°/L Tmp/°C

 Diesel 6900 6914 12,6

**Wetleg status also visible as sign:
 wet (+) / dry (-)**
 Vol.at.beginning : *0 L*
 Active Profile: Unbranded Stations

** Data of metr. approved system parts **
 *** are surrounded by asterisks ***

Start and end
of delivery

Error, if delivery was performed
while system was unsealed

Marked as metrologically
valid (asterisk)

Delivered quantity
(can be configured
to Vt, V15 or both)

Figure 3 Example for Normal Delivery Ticket (Valid Delivery)

DELIVERY NOTE *0005* Unloading
 Meas.assembly : *117B1042*
 Haulier XYZ
 Truck : Veh001
 Date: 22.08.16 11:49:07 - 11:51:03

Co Prod PreG/L FinG/L V15°/L

 4 ?DK 7628+ 6900 730 ?

PRODUCT SUMS
 Product Vt/L V15°/L Tmp/°C

 Diesel 728 730 12,6

Wetleg status also visible as sign: wet (+) / dry (-)

Status messages comp. 4:
 -*Below min.meas.qty.*
 -*Inexact pre-gauging*
 -*Inexact final gauging*
 - Pipe not fully delivered!

Vol.at.beginning : *0 L*
 Active Profile: Unbranded Stations

** Data of metr. approved system parts **
 *** are surrounded by asterisks ***

Start and end
of delivery

Marked as metrologically
invalid (no asterisk)

Delivered quantity
(can be configured
to Vt, V15 or both)

Collected status/error
messages for each
compartment

Figure 4 Example for Normal Delivery Ticket (Invalid Delivery)

METROLOGICAL PARAMETERS

Print dated : *22.08.16 11:20:51*

Meas.assembly : *117B1042*
Meas.container: *117B1042*
Name of truck : Veh001
Operator : Haulier XYZ
APPROVALS AND MANUFACTURERS
DCSTF(R) : *Cert No 3064*
Manufacturer: *DEZIDATA GmbH*
Meas.contain: *4.512/11.33*
Manufacturer: *TTM GmbH & Co KG*
SW-release date : *21.10.14 14:26:25*
Last resealed : *22.08.16 11:13:56*

Date and time of last sealing

Inp.manif.supervis. : *0*
Num.o.compartm. : *4*
Controller : *4*
Num.o.metr.prods. : *10*
Min.avg.count : *60*
Max.allow.wavehght : *12,0 mm*
Max.dur.interrupt : *5 s*
Max.dur.PowerOff : *120 s*
Pause dur./vol. : *240 s / 50 L*
Min.volume change : *0,0010*

Signature/checksum and seal counter of

Product-Switch-Correction *INACTIVE*
METR. SIGNATURES / SEALS
Software : *F43F / 1*
Coprocesor : *D919 / 14*
Metr.param. : *A2CE / 8*
of ctrl.mod.: *0000 / 0*
Incl.sensor : *7B9A / -*
Display(s) : *78BA / 0000*

- main software (DCSTFMET)
- coprocessor firmware
- all metrologically relevant parameters
- parameters of DCSTFUSR
- inclination sensor firmware
- display firmware

SIGNATURES OF DIPTAB./INCL.CORR.TAB.

* 1:2A0B/F542 2:4A89/76DC 3:E0D6/0405*

* 4:1BA4/1B30*

Signature/checksum of data for each compartment

TABLE OF METR. PRODUCTS

No M Avg. Min. Max.G Tempco. To°C Name

1	2	846,0	810,0	890,0	0,8000	15,0	HEL
2	2	836,0	800,0	870,0	0,8500	15,0	DK
3	2	741,0	700,0	780,0	1,2300	15,0	BFN
4	2	751,0	700,0	800,0	1,2000	15,0	SUV
5	2	749,0	700,0	800,0	1,2000	15,0	BFS
6	2	753,0	700,0	800,0	1,2000	15,0	SUP
7	2	801,0	700,0	900,0	0,9300	15,0	KER
8	2	801,0	750,0	850,0	0,9300	15,0	JET
9	5	831,0	800,0	860,0	0,8600	15,0	BIO
20		11000,0	920,0	1080,0	1,0000	15,0	H2O

M= 1: uncompensated

M= 2: comp.acc.to DIN51757, group B

M= 5: lin.comp. with TC/1000

Metrological products with temperature compensation settings and short name

INCLINATION

Corr.tab.-name : *807691z*

Ref. long./tran: * 0,400 ° / -0,210 °*

Max.std.dev. : *0,300 °*

Calibration of inclination sensor (reference)

FORMATS OF DELIVERY NOTES

Dipstick

disallowed: **

forced : *m=o*

SERIALS AND VERSIONS

Incl.sensor : * 2007092506DD/1,18*

Dipcontroller : * 2016060446DD/2,10*

Coprocesor : * 2015090653DD/2,04*

Metr.program : * 531888/1,04*

Printer : * -----/-----*

Display(s) : * 2013110621DD/1,63*

Metr.data of ctrl.mod.

*** END OF METR.PARAMETERS ***

Figure 5 Example for a Metrological Printout

```

*DIPTABLE N02* ← Compartment number
Print dated : *22.08.16 11:33:18*

Meas.assembly : *117B1042*
Meas.container : *117B1042*
Signat.o.diptable : *4A89*
Incl.corr.table : *76DC* ← Signature/checksum
Min.deliv.qty : *900 L* ← - over all metrological data here
Pipeworkvol. : *15 L* ← - inclination correction table
OF-volume : 4230 L
No of sensor : *2/0*
PNET address : *16* ← MMQ
Pos.o.sens:*( 78,0; 17,0) h= 542,0mm*
*Z= 0,0 ( 75,0; 30,0) h= 1695,0mm*
Incl.range long./trans.:
* -5,0° .. 5,0° / -5,0° .. 5,0°* ← Range of inclination, in which
Incl.caused residual : *200 L* ← compartment can be emptied
Safety stop volume : 0 L
Wet / dry volume : *35 L/15 L*

No. Heig[mm] Volume[L] Drv[L/mm]
-----
* 1 37,3 55,9 *
* 2 58,8 75,1 0,89*
* 3 97,4 107,9 0,85*
* 4 139,8 154,1 1,09*
* 5 178,4 206,2 1,35*
* 6 220,9 272,9 1,57*
* 7 259,0 338,8 1,73*
* 8 299,9 414,7 1,86*
* 9 340,5 494,1 1,96*
* 10 380,1 574,7 2,03*
* 11 420,0 658,7 2,11*
* 12 460,0 745,1 2,16*
* 13 496,1 824,5 2,20*
* 14 542,8 928,6 2,23*
* 15 580,5 1015,0 2,29*
* 16 619,6 1105,3 2,31*
* 17 660,1 1200,1 2,34*
* 18 699,9 1293,8 2,36*
* 19 740,8 1390,9 2,37*
* 20 780,2 1485,3 2,40*
* 21 819,5 1580,1 2,41*
* 22 859,7 1677,3 2,42*
* 23 900,3 1775,8 2,43*
* 24 940,2 1873,1 2,44*
* 25 980,3 1971,0 2,44*
* 26 1020,1 2068,5 2,45*
* 27 1060,2 2167,0 2,45*
* 28 1099,1 2262,4 2,45*
* 29 1140,5 2363,8 2,45*
* 30 1180,6 2461,9 2,45*
* 31 1219,6 2556,7 2,43*
* 32 1260,4 2656,2 2,44*
* 33 1299,4 2751,3 2,43*
* 34 1339,4 2848,2 2,43*
* 35 1379,9 2946,8 2,43*
* 36 1420,7 3045,5 2,42*
* 37 1460,3 3141,3 2,42*
* 38 1500,2 3237,5 2,41*
* 39 1539,1 3330,7 2,39*
* 40 1580,8 3429,9 2,38*
* 41 1620,0 3522,6 2,36*
* 42 1659,9 3616,1 2,35*
* 43 1700,4 3710,0 2,32*
* 44 1740,1 3800,9 2,29*
* 45 1778,6 3887,6 2,25*
* 46 1820,7 3981,8 2,23*
* 47 1859,2 4064,2 2,15*
* 48 1900,3 4151,5 2,12*
* 49 1940,2 4234,1 2,07*
* 50 1980,6 4314,4 1,99*
* 51 2016,8 4383,5 1,91*
* 52 2070,9 4480,0 1,79*
-----

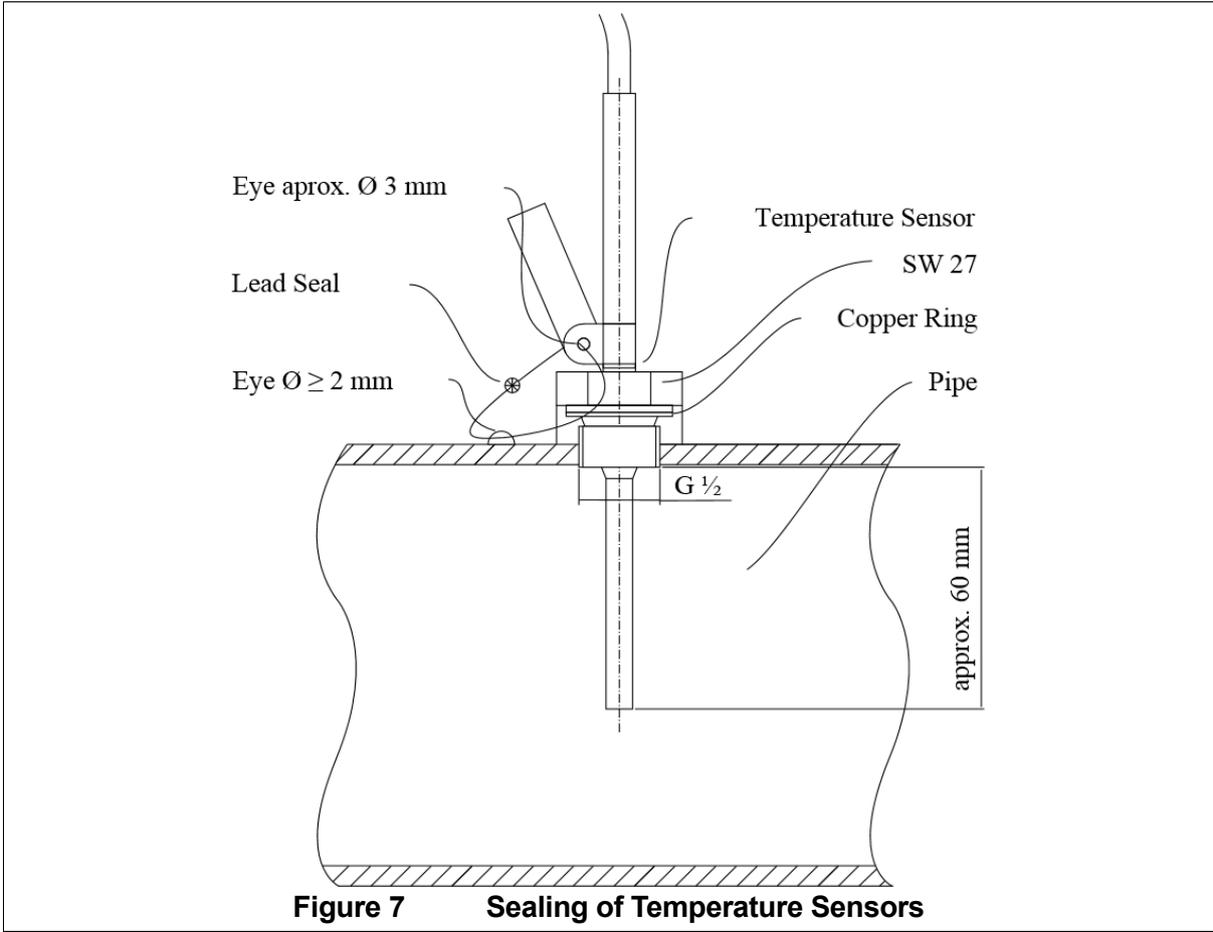
```

```

*Metr.data of ctrl.mod.*
*** END OF DIPTABLE ***

```

Figure 6 Example for a Diptable Printout



EXT.DELIVERY NOTE *0006* Unloading
 1. Copy of document
 Meas.assembly : *117B1042*
 ContainerID : *117B1042*
 Manufacturer : *TTM GmbH & Co *
 Metr.seal.ctr. : *15*
 Change o.metr.header: *22.08.16 11:11:40*
 Haulier XYZ
 Truck : Veh001
 No.o.driver : 0
 Totalizer Vt (end) : 29757 L
 Totalizer V15 (end) : 29822 L
 Date: 22.08.16 11:55:14 - 11:58:00

System seal counter at the time of delivery

Start and end of delivery

GENERAL ERRORS: [400h]
 -*System unsealed*

Error, if delivery was performed while system was unsealed

GENERAL STATUS MESSAGES: [C0Ch]
 -*Manifold wet before*
 -*Manifold wet after*
 -*Final gauging started*
 -*Final gauging finished*

Block for each compartment

COMP1: Pr=DK (up=10,ip=10,pp=2)
 Status messages comp. 1: [5Bh/0h]
 -*Wetleg dry before*
 -*Wetleg dry after*
 -*No volume change*
 -*Below min.meas.qty.*
 Height/mm Volum/L HS M# Snd/mps Grav/gpL
 b* 0,0- 0,0 1 100 1234,8 763*
 a* 0,0- 0,0 1 100 1234,8 763*
 R1/mps R2/mps R3/mps
 b 1234,8 1234,5 0,0
 a 1234,8 1234,5 0,0
 Vt/L Tm°C V15°/L F/Lpm CS Byp AS
 ? 0,0 12,3 0,0 0 0 x00 0?

Initial gauging

Final gauging

Speed to references

Marked as metrologically invalid (no asterisk)

COMP2: Pr=DK (up=10,ip=10,pp=2)
 Status messages comp. 2: [5Bh/0h]
 -*Wetleg dry before*
 -*Wetleg dry after*
 -*No volume change*
 -*Below min.meas.qty.*
 Height/mm Volum/L HS M# Snd/mps Grav/gpL
 b* 0,0- 0,0 1 100 1234,9 763*
 a* 0,0- 0,0 1 100 1234,9 763*
 R1/mps R2/mps R3/mps
 b 1234,9 1234,6 0,0
 a 1234,9 1234,6 0,0
 Vt/L Tm°C V15°/L F/Lpm CS Byp AS
 ? 0,0 12,4 0,0 0 0 x00 0?

COMP3: Pr=DK (up=10,ip=10,pp=2)
 Status messages comp. 3: [5Bh/0h]
 -*Wetleg dry before*
 -*Wetleg dry after*
 -*No volume change*
 -*Below min.meas.qty.*
 Height/mm Volum/L HS M# Snd/mps Grav/gpL
 b* 0,0- 0,0 1 100 1235,0 763*
 a* 0,0- 0,0 1 100 1235,0 763*
 R1/mps R2/mps R3/mps
 b 1235,0 1234,7 0,0
 a 1235,0 1234,7 0,0
 Vt/L Tm°C V15°/L F/Lpm CS Byp AS
 ? 0,0 12,5 0,0 0 0 x00 0?

Wetleg status also visible as sign:

- wet (+)
 - dry (-)

Marked as metrologically valid (asterisk)

COMP4: Pr=DK (up=2,ip=2,pp=2)
 Status messages comp. 4: [46h/0h]
 -*Wetleg dry after*
 Height/mm Volum/L HS M# Snd/mps Grav/gpL
 b*1143,0+ 6899,6 4 100 1234,8 763*
 a* 0,0- 0,0 1 12 1235,1 763*
 R1/mps R2/mps R3/mps
 b 1235,1 1234,8 0,0
 a 1235,1 1234,8 0,0
 Vt/L Tm°C V15°/L F/Lpm CS Byp AS
 * 6899,6 12,6 6913,4 3972 2 xC7 0*

Delivered quantity

Inclination during gauging:
 FH = front/nose up
 RH = right side up

Meas.dur. bef/aft : 0 s / 0 s
 Manif.WL TBA bef/aft: #+/ / #++
 Missing additiv.vol.: 0 ml
 Incl.bef/aft:FH=0,19/0,19 RH=-0,19/-0,20
 GPS-coordin.: NO POSITION DATA AVAIL
 Active Profile: Unbranded Stations

** Data of metr. approved system parts **
 *** are surrounded by asterisks ***

Figure 8 Example for Extended Delivery Note



Figure 9 **Main Module DD-0100**



Sicherungsstempel
(Klebumarke)
Sealing Mark



Figure 10 **Dip Controller with sealing method**

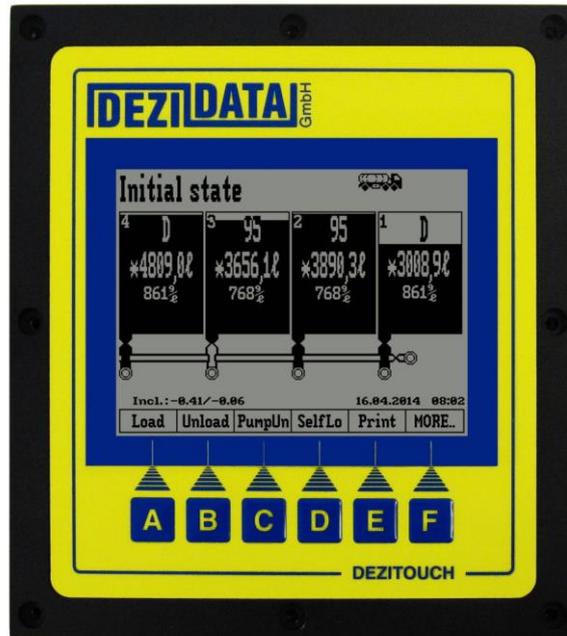


Figure 11 Display DEZITOUCH with Keypad



Figure 12 Dip Sensor Flange / Level Gauge with sealing method



Figure 13 Dip Tube / Tube of Level Gauge

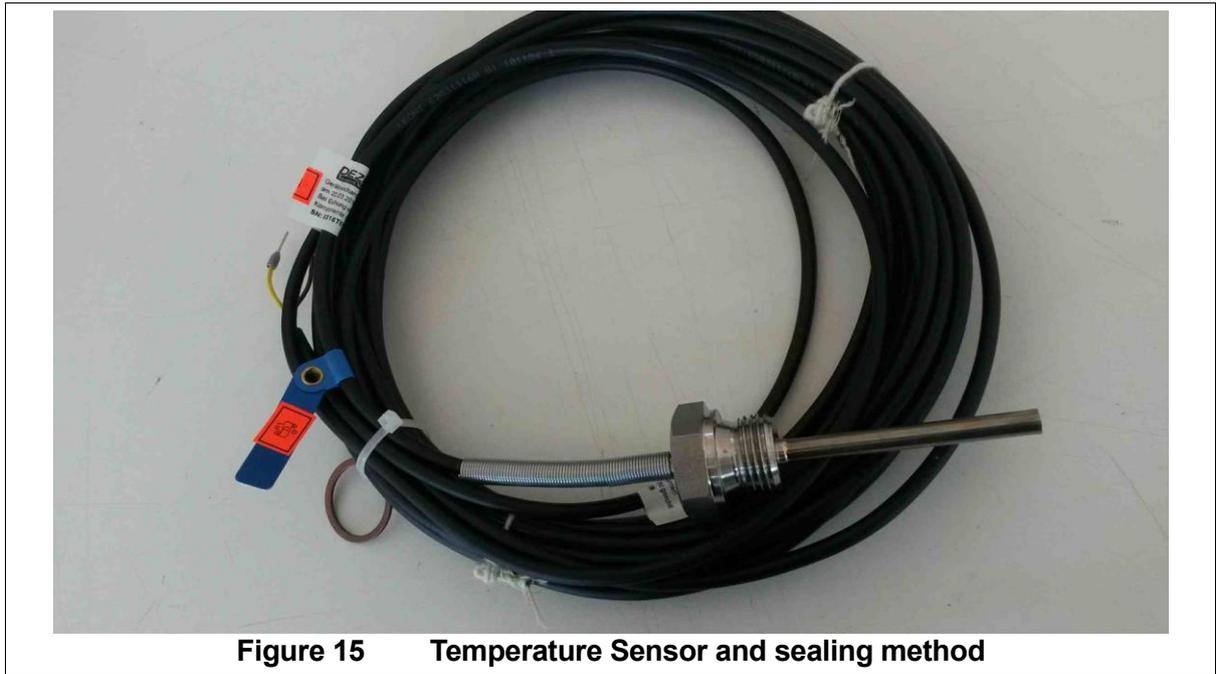
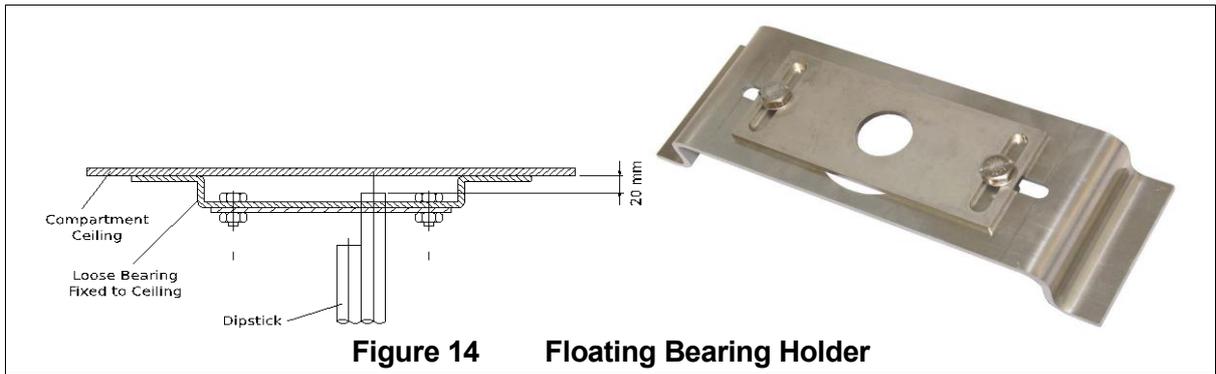




Figure 17 Product Detector



Figure 18 Optical Wetleg Sensor N17R

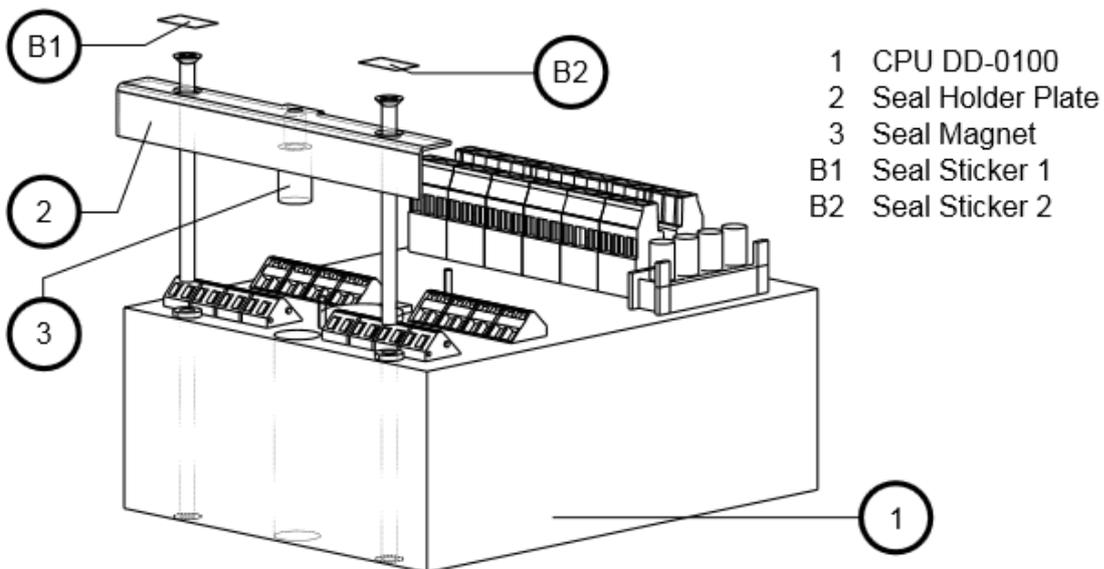


Figure 19 Sealing of Main Module DD-0100