TC7497

	Ref : MID Certificates Date : 02/04/2020 Version: 2 Revision 62
Title: MID Certificates: ○ Evaluation Certificate **TC7497** **TQC** Calculator	Checked / Validated: Name : A. Onclin Date : 02/04/2020 Signature :

Date	Author	Revision	Justification	
25/02/2009	Nmi	0	• TQC	
21/04/2009	Nmi	1	• New Software revisions and checksums • Pre processor information • Indicating device name	
10/07/2010	Nmi	2	• New Software revisions and checksums	
20/07/2009	Nmi	3	• New Software revisions and checksums	
28/07/2009	Nmi	4	• New Software revisions and checksums	
26/10/2009	Nmi	5	• EIN interface with software version added • New Software revisions and checksums • New VGA sealing methods	
15/03/2010	Nmi	6	• New software release.	
31/03/2010	Nmi	7	• New software release	
28/04/2010	Nmi	8	• New software release	
07/07/2010	Nmi	9	• New software release	
19/07/2010	Nmi	10	• New software release	

02/09/2010	Nmi	11	• Volume conversion calculations for LPG	
03/11/2010	Nmi	12	• New software release	
29/11/2010	Nmi	13	• UDC communication board	
04/01/2011	Nmi	14	• New software release • SD card	
17/02/2011	Nmi	15	• New software release	
12/05/2011	Nmi	16	• EPS, and ZSR communication interface • New UDC software versions	
08/07/2011	Nmi	17	• New Software release	
05/09/2011	Nmi	18	• New Software release	
19/08/2011	Nmi	19	• New Software release	
10/01/2012	Nmi	20	• Not used. There is an editorial error in the Evaluation Certificate	
27/01/2012	Nmi	21	• TQC or TQC EIO • TQC EST	
16/02/2012	Nmi	22	• Environment class "M1" changed into "M2"	
11/05/2012	Nmi	23	• TQC release V06	
19/06/2012	Nmi	24	• Volume confersion calculations for Bio-fuel.	
13/08/2012	Nmi	25	• New Software release	
24/09/2012	Nmi	26	• New Software release	
07/11/2012	Nmi	27	• Sealings for Italy	
14/01/2013	Nmi	28	• New Software release	

23/01/2013	Nmi	29	• New Software release	
04/03/2013	Nmi	30	• Manufacturers address	
13/03/2013	Nmi	31	• New Software • 1 column extra for Denmark (Description S.W.)	
08/04/2013	Nmi	32	• New Software	
17/04/2013	Nmi	33	• New Software	
22/05/2013	Nmi	34	• New Software	
07/06/2013	Nmi	35	• Version 8	
08/07/2013	Nmi	36	• New Software release	
18/07/2013	Nmi	37	• New Software release	
20/08/2013	Nmi	38	• New Software release	
30/09/2013	Nmi	39	• Version V08.006.03	
29/11/2013	Nmi	40	• New Software release	
16/12/2013	Nmi	41	• New Software release	
23/01/2014	Nmi	42	• New Software release	
31/01/2014	Nmi	43	• New Software release	
07/03/2014	Nmi	44	• New Software release	
04/04/2014	Nmi	45	• New Software release	
08/04/2014	Nmi	46	• New Software release	
17/04/2014	Nmi	47	• New Software release	
29/04/2014	Nmi	48	• New Software release	
26/05/2014	Nmi	49	• New Software release	
13/06/2014	Nmi	50	• New Software release	

18/08/2014	Nmi	51	• New Software release	
01/09/2014	Nmi	52	• New Software release	
27/10/2014	NMO	53	• New Software release	
28/11/2014	NMO	54	• TCDU added • New Software release	
17/12/2014	NMO	55	• Version 11	
30/01/2015	NMO	56	• New Software release	
25/02/2015	NMO	57	• New Software release	
13/03/2015	NMO	58	• New Software release	
24/03/2015	NMO	59	• New Software release	
05/05/2015	NMRO	60	• New Software release	
15/05/2015	NMRO	61	• New Software release	
07/07/2015	NMRO	62	• New Software release	
21/07/2015	NMRO	63	• New Software release	
04/08/2015	NMRO	64	• New Software release	
14/09/2015	NMRO	65	• New Software release	
08/10/2015	NMRO	66	• New Software release	
13/11/2015	NMRO	67	• New Software release • New Hardware	
09/12/2015	NMRO	68	• New Software release	
28/01/2016	NMRO	69	• New Software release	
17/02/2016	NMRO	70	• New Software release	
23/03/2016	NMRO	71	• New Software release	
05/05/2016	NMRO	72	• New Software release	

25/07/2016	NMRO	73	• New Software release	
11/08/2016	NMRO	74	• New Software release	
28/09/2016	NMRO	75	• New Software release	
		76	• N/A. There were errors in the revision, so see revision 77	
06/01/2017	NMRO	77	• New Software release • New sealing options for the pulser	
03/02/2017	NMRO	78	• Batteryless • New Software release	
22/03/2017	NMRO	79	• New Software release • Solving error time stamp	
14/06/2017	NMRO	80	• New Software release	
27/07/2017	NMRO	81	• New Software release	
16/08/2017	NMRO	82	• New Software release	
23/11/2017	NMO	83	• New Software release	
14/12/2017	NMO	84	• New Software release	
26/03/2018	NMO	85	• New Software release	
06/04/2018	NMO	86	• New Software release	
28/08/2018 Version 2	NMi	53	• Back to NMi because of BREXIT • New Software release	
06/09/2018	NMi	54	• Editorial changes	
18/10/2018	NMi	55	• New Software release	
03/12/2018	NMi	56	• New Software release	

14/12/2018	NMi	57	• New Software release	
02/04/2019	NMi	58	• New Software release	
24/06/2019	NMi	59	• New Software release	
25/06/2019	NMi	60	• New Software release	
27/11/2019	NMi	61	• New Software release	
02/04/2020	NMi	62	• New Software release	

Evaluation Certificate

Number **TC7497** revision 62
Project number 2431263

Issued by	NMi Certin B.V.
In accordance with	- WELMEC 8.8 "General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments under the MID". - OIML R117-1 Edition 2007 (E) "Dynamic measuring systems for liquids other than water".
Producer	Tokheim Sofitam Applications S.A.S. Part of Dover Fueling solutions Immeuble Le Cézanne Paris Nord, 31-35 Allée des Impressionnistes BP 45027 Villepinte 95912 Roissy Ch de Gaulle Cedex France
Part	An **electronic calculating and indicating device**, intended to be used as a part of a dynamic measuring system for liquids other than water.

Producer's mark or name	:	Tokheim
Type designation	:	TQC or TQC EIO, TQC EST
Accuracy class	:	0.5

Further properties and test results are described in the annexes:
- Description TC7497 revision 62.
- Documentation folder TC7497-10.
- Annex 1 of TC7497 revision 62.

Remarks
- This revision replaces the previous revisions;
- The documentation folder is not changed.

Issuing Authority

NMi Certin B.V.
2 April 2020

Certification Board

NMi Certin B.V.
Thijsseweg 11
2629 JA Delft
The Netherlands
T +31 88 636 2332
certin@nmi.nl
www.nmi.nl

1 General information on the electronic calculating and indicating device

Properties of the electronic calculating and indicating device, whether mentioned or not, shall not conflict with the legislation.

This Evaluation Certificate is the positive result of the applied voluntary, modular approach, for a component of a measuring instrument, as described in WELMEC 8.8.

The electronic calculating and indicating device is produced at the following production locations:

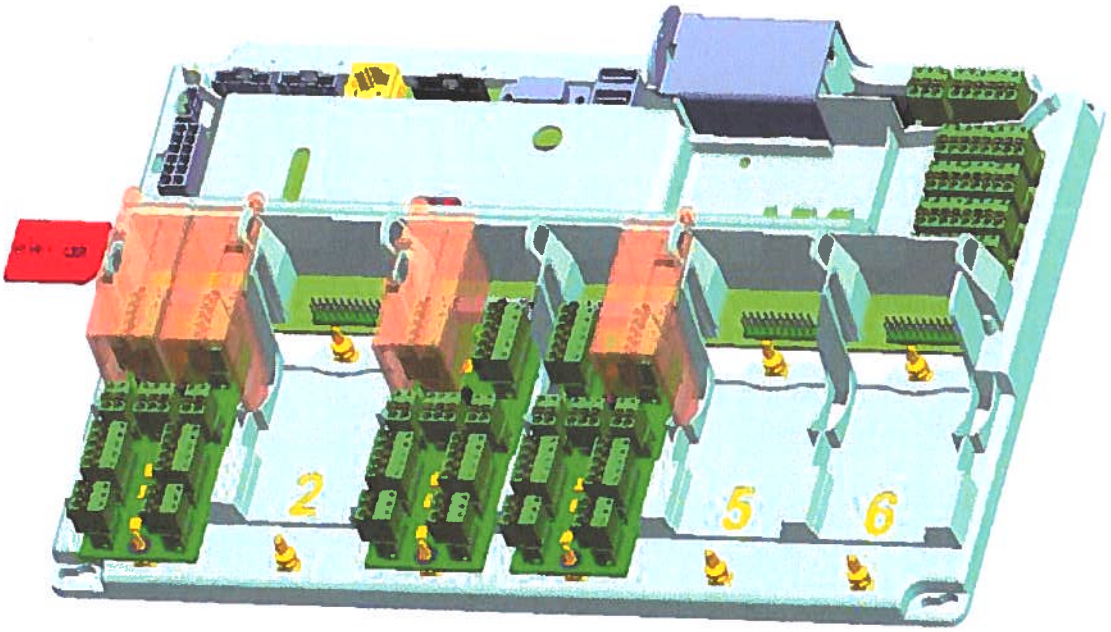
- Dover Fueling Solutions UK LTD - Unit 3 Baker Rd, West Pitkerro Industrial Estate, Dundee DD5-3RT Scotland.
- Tokheim Sofitam Applications SAS, Rue De Soliers, 14540 Grentheville, France.

The complete measuring system must be covered by an EC-type examination certificate or an EU-type examination certificate.

1.1 Physical concept

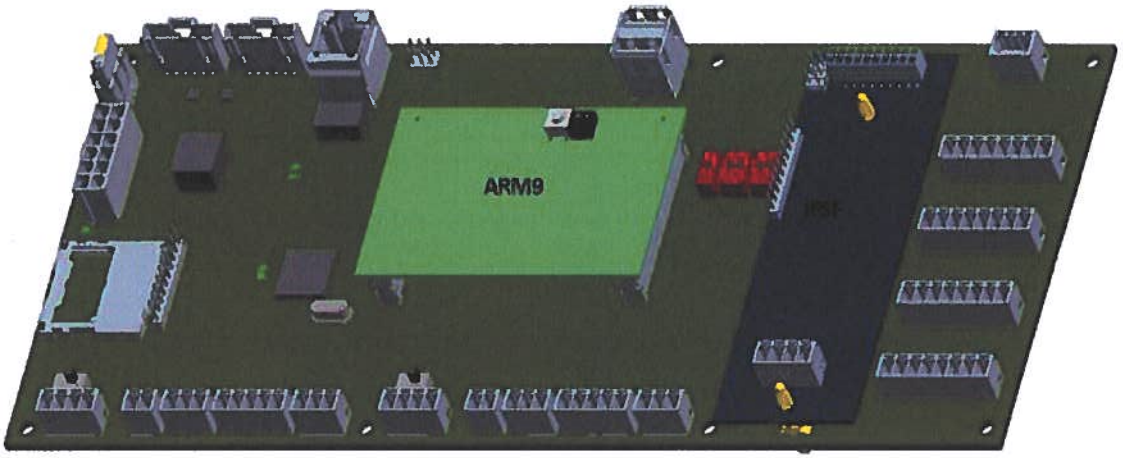
1.1.1 TQC or TQC EIO

As can be seen in the picture below, the processor module, type ARM9 or Sitara, is a piggy-back board on an IO board, which is called EIO (European IO board). On this EIO board are the standard interfaces normally available for the European market. However, to connect the peripherals per fuel product a second piggy-back board, the HYM 9Hydraulic Module) is inserted on the EIO. One board is inserted for each product used on the dispenser.



1.1.2 TQC EST

As can be seen in the picture below, the ARM9 or Sitara processor module is a piggyback board on the I/O board. On this board, the IFSF Interface board is connected as a piggyback board as well.



1.2 Essential parts

1.2.1 Hardware-components

Description	Identification	Document number
Basic I/O board	TQC-EST1 / TQC 030L1	7497/20-05, -06
Basic I/O board	TQC-EST2 / TQC 030L2	7497/35-01, -02
Basic I/O board	TQC-EIO4 / TQC 001L4	7497/20-07, -08
Basic I/O board	TQC-EIO5 / TQC 001L5	7497/35-03, -04
Basic I/O board	TQC-EIO6 / TQC 001L6	7497/35-05, -06
Basic I/O board	TQC-EIO7 / TQC 001L7	
Basic I/O board	TQC-EIO8 / TQC 001L8	
Pre-processor module (with TQC and TQC-EIO)		See folder TC7497-1
ARM9 processor board	TQC-APB3 / TQC 011L3	7497/20-09, -10
Sitara processor board	TQC-APB5 / TQC 011L5	7497/35-07, -08
Sitara processor board (class E2)	TQC-APB6 / TQC 011L6	
Hydraulic Module Board	TQC-HYM	See folder TC7497-1
Hydraulic Module Board (Cortex based)	TQC - HYM6 / TQC 002L6	7497/20-23, -24
Hydraulic Module Board	TQC - HYM7 / TQC 002L7	7497/35-17, -18
Display board	TQC - CSD3 / TQC 014L3	7497/20-21, -22

Description	Identification	Document number
Display board	TQC - CSD4 / TQC 014L4	7497/35-13, -14
Display board	TQC - CSD1 - PPU / TQC 027L1	7497/20-19, -20
Display board	TQC - CSD - 664 - PPU4 / TQC 027L4	7497/35-11, -12
Display board	TQC - 775 - CSD2 / TQC 206L2	7497/35-15, -16
Display board	TQC - 775 - CSD3 / TQC 206L3	7497/35-15, -16
VGA display device	VGA based Customer Sales Display with appertaining single board computer, type iBASE MI910E(F) or type Avalue EMX-GM45.	-
TCDU	TFT Display 21 inch AOUG215HVNO1.0 Single board computers: SBCMSI Media Pole 21" MID 956342-001 SBC MSI MS98E3	-
VFZ-CAN interface board	TQC - VFZ4 / TQC 003L4	7497/20-27, -28
Power supply board	TQC - PSU 2 / TQC 005L2	7497/20-29, -30
Power supply board	TQC - PSU 3 / TQC 005L3	7497/20-29, -30
Power supply board	TQC - PSU 5 / TQC 005L5	7497/20-31, -32
Power supply board	TQC - SMP3 / TQC 208L3	7497/35-19, -20
Power supply board	TQC - SMPS ADA / ELC 209L4	
Power supply board	TQC - SMPS BMS / ELC 206L7	
Impulse encoder	TQC - MPL3 / PUR 010L3	See folder TC7497-1
Impulse encoder	TQC - MPL4 / PUR 010L4	See MPL3
Impulse encoder	TQC - MPL5 / PUR 010L5	7497/20-33, -34
Impulse encoder	TQC - MPL6 / PUR 010L6	See MPC6
Impulse encoder	TQC - MPC3 / PUR 010L3	See folder TC7497-1
Impulse encoder	TQC - MPC4 / PUR 010L4	See MPC3
Impulse encoder	TQC - MPC5 / PUR 010L5	7497/20-33, -34
Impulse encoder	TQC - MPC6 / PUR 010L	7497/35-21, -22
PT100 Temperature sensor	Atexis 909545	-
Power supply (class E2)	Tokheim TDK-Lambda LS75 - 24	-

Description	Identification	Document number
Communication		
IFSF LON interface	TQC - LON3 / TQC 007L3	7497/20-11, -12
IFSF LONC interface (Cortex based)	TQC - LON4 / TQC 007L4	7497/20-13, -14
IFSF LONC interface (Cortex based)	TQC - LON5 / TQC 007L5	7497/35-09, -10
IFSF LONC interface (Cortex based)	TQC - LON6 / TQC 007L6	
EIN interface	TQC - EIN1 / TQC 008L1	TC7497-2, page 35
EIN interface	TQC - EIN2 / TQC 008L2	
EIN interface	TQC - EIN3 / TQC 008L3	
UDC interface	TQC - TOK1 / TQC 012L1	TC7497-3, pages 37, 38
UDC interface	TQC - TOK2 / TQC 012L2	
Logitron interface	TQC - LOG1 / TQC 009L1	TC7497-4, pages 01, 02
Logitron interface	TQC - LOG2 / TQC 009L2	
EPS / Dresser interface	TQC - EPS1 / TQC 010L1	7947/16-01, -02
EPS / Dresser interface	TQC - EPS2 / TQC 010L2	
ZSR / Dunclare interface	TQC - ZSR0 / TQC 029L0	7497/16-03, -04
ZSR / Dunclare interface	TQC - ZSR1 / TQC 029L1	7497/16-03, -04
ZSR / Dunclare interface	TQC – ZSR2 / TQC 029L2	
GIL interface	TQC - MTT2 / TQC 031L2	7497/25-01, -02
Kienzle interface	TQC - KLZ0 / TQC 035L0	7497/34-01, -02
Nuovo Pignone interface	TQC - NUP0 / TQC 037L	7497/34-03, -04
DART interface	TQC - DAR2 / TQC 022L2	7497/43-01, -02
DART interface	TQC – DAR3 / TQC 022L3	

1.2.2 Additional information about the essential parts.

1.2.2.1 Operating modes

The TQC has two operational modes.

1. Battery back-up operation
   The power supply contains one of the boards PSU2, PSU3 or PSU5, with a separate transformer and a rechargeable back-up battery. Alternatively, a switched mode power supply is used with a rechargeable back-up battery controlled by the battery management system.
2. Super-cap (Battery-less) operation
   The power supply component is a power supply without battery back-up. The safeguarding of transaction data is guaranteed by storing this data before shutdown of the calculator. Pre-requisite for this is the use of the APB6 (or later) CPU board, which incorporates a super-capacitor providing the CPU with power to store running transaction data and totals. After reinstating mains-power, any running transaction will be recovered and finalized with the point-of-sales.

Note: For operation with VGA displays, the batteries are mandatory in order to fulfil requirements regarding visibility of the last delivery data.

1.2.2.2 Pre-processor (PP) module

The Pre-processor module is a processor added to the EIO board for handling real-time constraints during a delivery. This concerns the following basic real-time requirements:

1. Receive every 10ms from every pulser involved a net volume update message. In case more than one pulser is used during the delivery then the pre-processor adds the volume info from all pulsers and forward a message every 50ms to the Hydraulic Manager.
2. Diagnostic info from pulser is stored:
   - Raw volume: not really volume but info from sensors without any correction.
   - EC volume: the sensor info (raw volume) multiplied by the K-factor.
   - Net volume: this is the EC volume corrected with temperature.
   - Flow rate.
   - Temperature.
3. Pre-set control: As soon as the pre-set amount is reached, the pre-processor sends a message to HYM module to shut down the valve.
4. Hose expansion correction is obviously done on the net volume.
5. Pulse hide functionality at the start of a transaction.
6. Gallus interface.

Other functions are:

1. Test Pulsers on request of HM manager before start of the delivery.
2. Receive Pulser configuration.

1.2.2.3 Main Processor Board, type TQC-APB (ARM9 or Sitara processor board)

The TQC-APB module is able to:

1. Manage four deliveries independently (two on each roadside).
2. Controls the deliveries.
3. Maintains the volume an amount counters.
4. Controls the transaction display.
5. Controls the hydraulic units.
6. Communicates with the self-service-device.

1.2.2.4 Hydraulic Module Board, type TQC-HYM / TQC-HYM6 / TQC-HYM7
This board controls the I/O for motor(s), valve(s and nozzle(s), and it is used to physically connect and seal the impulse cables. This board is physically essential for legal aspects (because of the sealing). But the applicable software on this board does only control the motors and valves; the software does not have impact on pulses or any other means of the measurement. The software is therefore not legally essential.

1.2.2.5 The LON Board, type TQC-LON3, TQC-LON4 or TQC_LON5 (used for LON-IFSF communication)
This board takes care of the physical LON interface layers, including the software for the LON communication interface.

1.2.2.6 Transaction Displays
Being indicators for the transactions on each side, shows the volume, the amount and the fuel price of the actual delivery. On each side of the calculator module, two transaction displays may be present.

1.2.2.7 The Impulse Encoder
There are three variations available:

1. TQC-MPC3, TQC-MPC4, TQC-MPC5 or TQC-MPC6: pulse encoder supporting temperature compensation.
2. TQC-MPL3, TQC-MPL4, TQC-MPL5 or TQC-MPL6: basically, identical to the TQC-MPC, but without temperature compensation.
3. Impulse encoder software: there is only 1 software version available, which is applicable for both hardware versions.

1.3 Essential characteristics

1.3.1 Temperature range ambient: -40 ... +55 °C, condensing

1.3.2 Environment classes: M2 / E1

1.3.3 The impulse encoders make Tokheim, types TQC-MPC3 through TQC-MPC6 and types TQC-MPL3 through TQC-MPL6 determine the volume at delivery conditions.

1.3.4 The following functions are performed by the impulse encoder make Tokheim, type TQC-MPC3 through TQC-MPC6 only.

- From the volume and measured temperature at delivery conditions, calculating the volume at standard reference conditions and outputting a corresponding number of impulses. Thus, the calculating and indicating device presents the converted volume. During a delivery, the reference volume and the product temperature can also be seen on a connected hand terminal.
- Calculation of converted volumes. The calculation uses either fixed reference product density values, or a manually input density value. Input can be performed with a hand terminal, after breaking a Weights & Measures seal.
  The following calculation methods are supported:
  - Calculation of the converted volume of oil products with the calculation method in conformity with ASTM D1250-04, table 54B. The minimum and maximum product temperature and the minimum and maximum product density are according to the ranges specified in the calculation method.
  - Calculation of the converted volume of LPG with the calculation method in conformity with the document GPA TP27, table 54E. The density is equal to 537 kg/m3. The minimum product temperature is equal to –40 °C and the maximum product temperature is equal to +55 °C.

Note: Product temperature sensors have been tested for a product temperature range of –25 °C / +55 °C.

- Volume conversion calculations for Biodiesel and Petrol-Ethanol mixtures. The volume at reference conditions is calculated with the formula:
  Vref = Vt * (1 – k * (t – 15))
  In which Vref = volume at reference conditions, Vt = volume at measured conditions.
  For the value of k see paragraph 1.3.17 of this description.

1.3.5 Setting of the parameters, including those for the impulse encoders TQC-MPC3 and TQC-MPL3, is carried out using an external source, i.e. a handheld terminal or a computer with a dedicated program.

1.3.6 Use of the TQC-MPC3 through TQC-MPC6 and TQC-MPL3 through TQC-MPL6 impulse encoders' calibration facility is carried out using a handheld terminal.

1.3.7 TQC-MPC3 through TQC-MPC6 and TQC-MPL3 through TQC-MPL6 impulse encoders' internal watchdog functionality is automatically enabled in the software.

1.3.8 Software identifications (the software version of TQC and its peripherals software can be visualized with the aid of the handheld terminal).

1.3.9 Calculator
Identification: TQC or TQC EIO or TQC EST ("TQC" is identical to "TQC EIO")

The calculator software fulfils the parts P, L, T, S and D of the WELMEC guide 7.2. Part U is not applicable. When the system is at rest, Part L is applicable only to the information of the latest delivery and to the totalizers. When a delivery is pending, Part L is applicable only to the last but one delivery.

1.3.10 The TQC can add impulses from two impulse encoders and present the result as one volume.

1.3.11 Characteristics with respect to the remote software download facility.

- TQC is leading; it checks four times a day (every six hours) if new software is available. Downloading of new software cannot be forced. If no connection can be made, it will not be possible to perform a remote update for the next 6 hours.

  Remark: local software needs physical access to the TQC.
- An illegal software version or a disturbed software version is not accepted by TQC.
- After receiving the new software version TQC checks whether or not it is valid. An invalid software version is rejected. A rejected software package is removed and can therefore not be used in any way.
- After installing the new software package both the running software and the new software are available on the flash memory. As long as the new software is not activated by a restart, the current software remains running in RAM. Restart of the TQC is only possible if TQC is idle and doing no deliveries
- Enabling or disabling the possibility of software download can only be done in the setup menu. It is a Weights & Measures parameter.
- Configuration parameter values are never affected by a software download. The fact that new software is programmed in such a way that when activating new software, the legal data within the system will not be affected is guaranteed by the manufacturer's quality system.
- All software update handlings are stored in a separate log database. The data from this log-file can be retrieved with the Handheld Terminal or can be downloaded via a remote terminal.

1.3.12 Software
All software fulfils the applicable requirements of WELMEC guide 7.2, Risk Class C, see chapter 1.3.9.

The software version of TQC and its peripheral software can be visualized with the aid of the handheld terminal or can be downloaded via a remote terminal.

The integrity check procedure implies that the MID version and time stamp correlate with the listed version numbers in section 1.3.13. If this is not the case, then the embedded software integrity check mechanism will:

- Block new deliveries
- Indicate error on the display
- Log this event in the journal loggings

1.3.12.1 The following releases have been issued because of changes in Weights & Measures properties.

Software versions	Software versions	Software versions
00.006.00	00.006.13	02.000.00
00.006.03	00.008.08	02.000.04
00.006.04	00.008.12	02.002.00
00.006.06	01.000	02.003.00
00.006.08	01.002	02.005.00
03.000.07	04.000.18	04.007.00
03.001.00	04.005.03	04.008.02

Software versions	Time stamp		Software versions	Time stamp
05.000.00	2011/07/11		09.013	2014/06/06
05.003.01	2011/12/13		09.015	2014/07/16
05.006.08	2012/09/06		09.019	2014/10/08
05.008.00	2012/02/17		09.020	2014/10/24
05.008.08	2012/02/17		09.021	2014/11/13
06.001.12	2012/04/27		09.022	2014/12/11
06.002.01	2012/07/02		09.026	2015/04/02
07.005.00	2013/01/14		09.029	2015/07/15
07.006.00	2013/03/11		09.030	2015/09/16
07.007.01	2013/04/03		10.001	2014/08/12
08.000.08	2013/05/14		11.000	2014/12/08

Software versions	Time stamp		Software versions	Time stamp
08.001.00	2013/31/05		11.001	2015/01/09
08.006.00	2013/09/20		11.003	2015/04/10
08.009.00	2013/12/06		11.004	2015/07/13
08.013	2014/04/04		11.007	2015/09/23
08.014	2014/05/06		11.008	2015/11/02
08.015	2014/06/02		11.010	216/01/11
09.001.01	2013/11/01		12.000	2015 Oct 09
09.002.00	2013/11/13		12.001	2015 Nov 27
09.005.01	2014/01/15		12.002	Mar 4 2016
09.010.09	2014/01/10		12.003	Apr 07 2016
09.011	2014/04/02		12.005.01	Jun 23 2016
12.006	Oct 31 2016		16.002	Feb 06 2018
13.000	Aug 25 2015		17.000	Jan 26 2018
13.001	Apr 28 2016		17.001	Jul 02 2018
13.003	Sept 12 2016		17.002	Nov 23 2018
13.004	Dec 07 2016		17.003	Dec 19 2018
13.007	July 31 2017		17.003.03	Jan 28 2019
13.008	Oct 25 2017		17.004.02	May 1 2019
14.000	Oct 03 2016		17.005.04	Jun 20 2019
15.001	Dec 22 2016		17.006	Oct 16 2019
15.002	May 31 2017		17.008.04	Mar 16 2020
15.003	Nov 28 2017		09.200	Nov 02 2015
15.004	Mar 23 2018		09.200.02	Nov 02 2015
15.006	Jul 16 2018		09.201.01	Jun 06 2018
16.001	Oct 04 2017		09.202.01	Mar 01 2019

1.3.12.2 The ARM-9 software contains 4 legally relevant modules

Version	Checksum	Version	Checksum	Version	Checksum
1. Application: libTqcWM.so Description: Calculation for "amount = unit price X volume"					
00.001.02	00008A76; 0x6340; 0x6350	08.001.11	0x48DD	09.030.12	0x756D
01.000.07	0x77CA	08.003.11	0x959D	10.001.12	0x7E72
02.000.07	0xF6FF	08.006.12	0x62E8	11.000.12	0x4ACC
02.001.07	0xF714	08.009.12	0x3FFF	11.003.12	0x2C2D
02.003.7	0xF6FD	08.014.12	0x6F99	11.004.12	0x0F6D
03.000.07	0x464D	08.015.12	0x6FA3	11.007.12	0x107A
04.000.07	0xA392	09.001.12	0x4514	11.008.12	0x1516
05.001.08	0x4E88	09.002.12	0x3A6F	11.010.12	0x1505
05.002.08	0x4E4F	09.005.12	0x36D2	12.000.12	0x1766
05.006.08	0x214E	09.010.12	0x4DD4	12.001.12	0x787D
05.008.08	0x2842	09.011.12	0x459D	12.003.12	0x175D
06.001.08	0x6DA7	09.013.12	0x66AE	13.000.13	0x6A05
07.005.08	0x33A4	09.019.12	0x6721	13.001.13	0x4A86
07.006.08	0x7F90	09.021.12	0x66C2	13.003.13	0x4A81
07.007.08	0x9D8C	09.026.12	0x7566	13.008.13	0x42D9
08.000.11	0xFC20	09.029.12	0x7573	15.002.13	0x58BD
2. Application: DisplayHdl.Arm Description: Interface to the CSD and VGA Manager					
00.001.04	0000C316	07.007.27	0x86D9	09.026.45	0x2A1D
00.006.09	0xCB52; 0x5EDC	08.000.29	0xDD3E	09.029.45	0x2A1E
00.006.10	0x949A	08.001.30	0x3913	09.030.45	0x2A21
00.006.11	0x7B46	08.003.30	0xD35D	10.001.41	0x2F69
01.000.15	0xFD62	08.006.30	0xE67E	11.00048	0x196D
02.000.16	0xFF74	08.009.30	0xEFE9	11.003.50	0x2A02
02.001.16	0xFF8C	08.013.31	0x6C72	11.004.50	0x3166

Version	Checksum	Version	Checksum	Version	Checksum
02.003.16	0xFF6E	08.014.31	0x7B8E	11.007.50	0x6B43
03.000.17	0x2EFF	08.015.34	0x30FA	11.008.50	0x44C4
04.000.19	0x3EE3	09.001.35	0x18E6	11.010.50	0x44BA
05.001.23	0x4C86	09.002.36	0x225D	12.000.51	0x9CD7
05.002.23	0x4B37	09.005.36	0x116B	12.001.51	0xDD35
05.006.24	0x15E5	09.010.37	0x524C	12.003.52	0xAE5A
05.008.25	0x5C87	09.011.38	0x69D6	13.000.57	0x0325
06.001.25	0x9564	09.013.41	0x78BB	13.001.57	0x11E8
07.005.27	0xE17E	09.019.44	0xC886	13.003.57	0x11DE
07.006.27	0x3329	09.021.44	0xC7FA	13.008.57	0xE28F
3. Application: VgaMgr.Arm Description: Interface to the VGA display					
00.006.31	00005616	08.000.93	0x4882	09.030.15	0xC49D
00.006.32	0x2F17	08.001.94	0x2A7D	10.001.11	0xCFD1
00.006.33	0x4BB6	08.003.95	0xAD99	11.000.13	0xD1F5
00.006.38	0xBDC6	08.006.96	0xD12C	11.001.15	0xC9DB
00.006.41	0x6867	08.009.96	0xAB5A	11.003.17	0xCA3A
00.006.42	0x4C25	08.013.97	0x9074	11.004.19	0xC937
01.000.59	0xE851	08.014.97	0xC1D3	11.007.21	0x382E
02.000.60	0x6084	08.015.97	0xC1D5	11.008.24	0x154A
02.003.60	0x6084	09.001.05	0x473F	11.010.25	0xFE6C
03.000.60	0x62E8	09.002.06	0x4AB0	12.000.25	0x175B
04.000.67	0xEF76	09.005.06	0x77EE	12.001.28	0x8C28
05.001.74	0x4515	09.010.07	0xCB46	12.002.29	0x7C76
05.003.75	0xEE2D	09.011.08	0x5692	12.003.29	0x7C7E
05.006.75	0x9890	09.013.09	0x2F6E	13.000.31	0x36A3
05.008.77	0x62EB	09.019.10	0x5020	13.001.31	0x0984
06.001.77	0xB899	09.021.10	0x4F5F	13.003.31	0x097C
07.005.81	0x3FF8	09.022.11	0x35F8	13.008.31	0x278B

Version	Checksum	Version	Checksum	Version	Checksum
07.006.81	0xE268	09.026.11	0x3C87		
07.007.82	0x7884	09.029.13	0xD202		
4. Application: IFSF_srv.Arm Description: TCP IFSF pump controller interface					
00.000.02	0x0B06	00.000.05	0x46CE *)	11.004.09	0xCDC3
00.000.03	0x0C41	00.000.05	0x46D9 *)	11.007.09	0xDCD9
00.000.03	0x0E39 *)	00.000.05	0x4537 *)	11.008.09	0xCC1C
00.000.03	0x253B *)	00.000.05	0x687B *)	11.010.09	0xCC08
00.000.04	0xDB3D	00.000.05	0x687C *)	12.000.09	0xC561
00.000.04	0x0909 *)	00.000.05	0x55C1 *)	12.001.09	0xC702
00.000.05	0x23EF	09.026.09	0x0DD5	12.003.09	0xC561
00.000.05	0x2D62 *)	09.029.09	0x0DD8	13.000.11	0x7755
00.000.05	0x60B6 *)	09.030.09	0x0DD4	13.001.11	0x82DC
00.000.05	0x50DC *)	10.001.06	0x657A	13.003.12	0x231C
00.000.05	0x3455 *)	11.000.48	0xE7E7	13.008.15	0x8697
00.000.05	0x5011 *)	11.003.09	0xCD6C		

*) New comp compilation of otherwise identical version has led to a different timestamp and therefore to a changed checksum.

1.3.12.3 The Sitara software contains 4 legally relevant modules.

Version	Checksum	Version	Checksum	Version	Checksum
1. Application: libTqcWM.so.Sit. Visible as libTqcWM.so Description: TCP IFSF pump controller interface					
08.001.11	0x0247	09.026.12	0x57F4	13.001.13	0x4D44
08.003.11	0x0253	09.029.12	0x57E2	13.003.13	0x4D3A
08.006.12	0x599F	09.030.12	0x57EE	13.008.13	0x4D4B
08.009.12	0x598C	09.200.13	0x57DF	14.000.13	0x4D85
08.014.12	0x598D	10.001.12	0x57C3	15.001.13	0x53FB
08.015.12	0x5996	11.000.12	0x7B63	15.003.13	0x58D0
09.001.12	0xFF2F	11.003.12	0x7874	15.004.13	0x584E

Version	Checksum	Version	Checksum	Version	Checksum
09.002.12	0x57EC	11.004.12	0x7888	15.006.13	0x580D
09.004.12	0x57CB	11.007.12	0x7878	16.001.13	0x5422
09.005.12	0x57DA	11.008.12	0x787D	16.002.13	0x5842
09.010.12	0x57CE	11.010.12	0x786C	17.001.13	0x57FA
09.011.12	0x57CD	12.000.12	0x788D	17.002.13	0x5865
09.013.12	0x57DE	12.002.12	0x7891	17.003.13	0x5853
09.019.12	0x57EE	12.003.12	0x788E		
09.021.12	0x57F4	13.000.13	0x4D71		
2. Application: DisplayHdl.Sit. Visible as DisplayHdl.Arm Description: Interface to the CSD and VGA Manager					
08.001.30	0xDCA0	09.026.45	0xDD3C	13.003.57	0xDDB6
08.003.30	0xDCA0	09.029.45	0xDD48	13.008.57	0xDDB6
08.006.30	0x3392	09.030.45	0xDD4B	14.000.60	0x3AA2
08.009.30	0x337F	09.200.04	0xCF30	15.001.60	0x2E95
08.013.31	0x583B	10.001.41	0x3FE2	15.002.60	0x2E41
08.014.31	0x5829	11.000.48	0x4791	15.003.61	0x370B
08.015.34	0x4C8C	11.003.50	0x66B6	15.004.61	0x3745
09.001.35	0xDB2C	11.004.50	0x66BF	15.006.62	0x629E
09.002.36	0x3DA4	11.007.50	0x66B2	16.001.61	0x374E
09.004.36	0x3D79	11.008.50	0x66B6	16.002.61	0x3740
09.005.36	0x3D8C	11.010.50	0x66AC	17.001.61	0x36FC
09.010.37	0x4DB8	12.000.51	0x9CD7	17.002.62	0x62FD
09.011.38	0x84B9	12.001.51	0x5350	17.003.64	0xC2C0
09.013.41	0xA9BC	12.003.52	0x6451		
09.019.44	0x8256	13.000.57	0xDE04		
09.021.44	0x826C	13.001.57	0xDDBE		

Version	Checksum	Version	Checksum	Version	Checksum
3. Application: DisplayHdl.Sit. Visible as DisplayHdl.Arm Description: Interface to the CSD and VGA Manager					
08.001.94	0xF94F	09.026.11	0x9F76	13.001.31	0x48C9
08.003.95	0x1126	09.029.13	0x5221	13.003.31	0x48C1
08.006.96	0x7B9E	09.030.15	0x877B	13.008.31	0x48C2
08.009.96	0x7B80	09.200.05	0xB46A	14.000.36	0x4CD8
08.013.97	0x828B	10.001.11	0xAE2D	15.001.36	0x3E42
08.014.97	0x8279	11.000.13	0x923E	15.002.37	0x349F
08.015.97	0x827E	11.001.15	0x8F4C	15.003.37	0x4A89
09.001.05	0xFA40	11.003.17	0x88DC	15.004.38	0x413B
09.002.06	0xCDEC	11.004.19	0xAB93	15.006.40	0xB668
09.004.06	0xCDC4	11.007.21	0xE7FA	16.001.39	0x3B7A
09.005.06	0xCDCE	11.008.24	0xC4A4	16.002.40	0x1F37
09.010.07	0x735C	11.010.25	0xA569	17.001.43	0x88EB
09.011.08	0x84CB	12.000.25	0xCD33	17.002.44	0x8972
09.013.09	0x805F	12.001.28	0xA8D0	17.003.44	0x8969
09.019.10	0x6D6A	12.002.29	0xA2A2		
09.021.10	0x6D8B	12.003.29	0xA2AB		
09.022.11	0x9F5D	13.000.31	0x491D		
4. Application: DisplayHdl.Sit. Visible as DisplayHdl.Arm Description: Interface to the CSD and VGA Manager					
00.000.05	0x8562	09.029.09	0xA312	13.003.12	0xCBE6
00.000.05	0x8565 *)	09.030.09	0xA309	13.008.15	0x2EF5
00.000.05	0x855F *)	10.001.06	0x8746 *)	14.000.12	0xCC0C
00.000.05	0x3C1E *)	11.000.06	0x8FF1	15.001.12	0x8996
00.000.05	0x3C29 *)	11.003.09	0xB02D	15.002.12	0x8978
00.000.05	0x8546 *)	11.004.09	0xB034	15.003.15	0x2076
00.000.05	0x3C05 *)	11.007.21	0xB023	15.004.19	0xE650
00.000.05	0x3C0F *)	11.008.09	0xB031	15.006.19	0xE5EE

Version	Checksum	Version	Checksum	Version	Checksum
00.000.05	0x3C0A *)	11.010.09	0xB018	16.001.15	0x2087
00.000.05	0x3C05 *)	12.000.09	0xAED7	16.002.17	0x2CBB
00.000.05	0x8551 *)	12.001.09	0xAED4	17.001.19	0xE5E9
00.000.05	0x855A *)	12.003.09	0xAEDA	17.002.19	0xE654
00.000.05	0x3C17 *)	13.000.11	0x1B93	17.003.19	0xE638
09.026.09	0xA30D	13.001.11	0x1B77		

*) New comp compilation of otherwise identical version has led to a different timestamp and therefore to a changed checksum.

1.3.12.4 Pre-processor (PP) software (for TQC and TQC EIO; TQC is identical to TQC EIO)

Version	Checksum	Version	Checksum	Version	Checksum
00.001.31	0000454F	05.000.65	0x8CC9	09.001.84	0xA191
00.006.42	0xBB57	06.000.68	0xE1FB	09.002.86	0xBCE2
00.006.44	0x1E45	06.000.70	0x1DC9	12.000.90	0xF49E
01.000.50	0xA9A4	07.000.73	0x85F4	12.000.91	0xC24B
02.000.52	0x5E8F	07.001.75	0xCC80	13.000.92	0x1B52
03.000.54	0xA7C4	07.003.76	0xEE38		
05.000.58	0xBF07	08.000.81	0x4560		

1.3.12.5 Pre-processor (PPC) software (for TQC and TQC EIO; TQC is identical to TQC EIO)

Version	Checksum	Version	Checksum	Version	Checksum
06.000.68	0xDD4F	08.000.81	0xC282	12.000.91	0x1336
06.001.72	0x8C3F	09.001.85	0x4574	13.000.92	0xBB2A
07.000.73	0x961F	09.002.86	0x5BF0		
07.003.76	0xA572	12.000.90	0x2074		

1.3.12.6 Pre-processor (PPE) software

Version	Checksum	Version	Checksum	Version	Checksum
05.000.58	0x39B8	06.001.72	0xEECD	07.003.76	0x86E5
06.000.68	0xDD4F	07.001.75	0x6FB5	08.000.81	0xC9F5

1.3.12.7 Pre-processor (PPCE) software

Version	Checksum	Version	Checksum	Version	Checksum
06.000.68	0xE2A7	06.001.72	0x4C5E	08.000.81	0xDED9

1.3.12.8 ST software (single twin software, only for the TQC EST)

Version	Checksum	Version	Checksum	Version	Checksum
05.001.05	0x0327	08.000.26	0x5DA3	12.000.40	0x8537
06.001.08	0xE199	08.000.28	0x65B0	12.000.41	0x8B56
07.001.16	0x8E6E	08.001.30	0x3ECE	12.000.42	0xB548
08.000.19	0xCC84	08.002.33	0x0F59	12.000.44	0x5BC7
08.000.20	0xCCA7	09.001.37	0x6A35	12.000.43	0x5E85
08.000.24	0x9145	11.000.30	0xAA5C	13.000.45	0xD558

1.3.12.9 STE software (single twin software, only for the TQC EST)

Version	Checksum	Version	Checksum	Version	Checksum
05.001.05	0xFDC5	07.001.15	0xCDE0	08.001.30	0xFE89
06.000.06	0xEB9C	08.000.19	0xCDE0		
06.001.08	0x34A5	08.000.20	0x1FDF		

1.3.12.10 Indicating devices software

Version	Checksum	Version	Checksum	Version	Checksum
1. Application: CSD Description: CAN based LCD display					
00.001.03	00008671	05.000.39	0x97E3	08.001.46	0x0A31
00.006.15	0xD83B	05.001.39	0x97E3	09.010.47	0x2478
02.000.27	0x6FF3	06.00040	0x1F6F	10.000.48	0x1E28
03.000.30	0xEF7A	07.001.42	0x6B6B		
05.001.38	0xA1FA	08.001.45	0xC92E		
2. Application: CSDC Description: CAN based LCD display (Cortex based)					
05.001.11	0xDEE3	07.002.18	0xFC01	10.000.26	0x9AE8
06.001.15	0xC2DB	08.002.22	0xB0A8	11.000.32	0x5ACA
07.000.16	0x7F74	08.000.23	0x8952	12.000.33	0x4470
07.001.17	0x550E	09.001.25	0x92C7	15.001.37	0x8450

Version	Checksum	Version	Checksum	Version	Checksum
3. Application: CSDF CAN based LCD display (Freescale based)					
08.000.12	0xC538	10.000.16	0x71C4	11.000.24	0x44F7
09.000.13	0xE7F4	10.000.17	0x70B8	12.000.25	0x33A7
10.000.15	0x0C8D	10.000.22	0x0CD3	15.001.26	0x3CBE
4. Application: VGA VGA screen (Ethernet connected)					
00.008.00	0x3B551A95	08.002.02	0xB1F35FDF	13.012.02	0x075CE65C
00.008.04	0xC74AAB23	09.001.02	0x4FED57BF	13.013.02	0xA27AD4C7
00.008.08	0x97CB865A	09.002.00	0x1E28ED0C	13.014.02	0xED59A297
00.008.12	0x2764D6EB	09.004.01	0xE052CD28	14.000.04	0x8985218B
00.001.04	0x70C7E761	09.005.02	0x490F6756	14.001.02	0x66B67E9C
01.000.00	0x8331D612	09.007.01	0xE3A7AD79	16.002.03	0x36C7B865
02.000.00	0x480A82DD	09.008.01	0x085AC94E	17.000.01	0xAEE6972D
04.000.03	0xE1D2A9C7	11.000.01	0x53165CB4	17.000.02	0xF60325B2
04.001.00	0x3475B699	11.002.00	0x77A6D887	17.001.01	0xEE2A90B1
05.001.00	0x1A30F1FB	11.002.01	0xE2E9BD14	17.004.01	0xDB1614E6
05.002.00	0xEFA10201	11.004.02	0x6F71D489	17.006.01	0xFB06D9F8
05.003.00	0x30CBA253	12.001.00	0x8528DC0B	17.006.02	0x23821894
05.005.00	0x870E5B36	13.000.11	0xD4D2F9A2	17.007.02	0x2DBA2E97
05.008.00	0xD30A4F70	13.005.01	0xD43DD09A	17.008.02	0x5E26B557
07.002.02	0xFC2DD913	13.007.00	0xA5FBECF1	17.009.02	0x7467C3A9
07.002.03	0x6064E1CD	13.010.05	0xC24D2E43	17.010.01	0x91D4DE13
08.000.07	0x9DEA3BD9	13.011.03	0x8842219A	17.012.02	0x922859CE

1.3.13 Impulse encoders

A dedicated connector (jtag) is available to have programming capabilities available.

This connector is only used during manufacturing, namely for programming the base software. During normal use, the impulse encoder enclosure is sealed with a Weights & Measures seal, thus preventing any access.

1.3.13.1 TQC-MPC3/4/5/6 and TQC-MPL3/4/5/6 impulse encoder software

Version	Checksum	Version	Checksum	Version	Checksum
00.001.15	00006371	05.000.32	0xED33	07.001.17	0x4781
00.006.20	0x5115	05.001.36	0x5C26	07.003.48	0x5326
00.007.23	0x2885	06.000.37	0x7363	12.000.50	0xC32C
01.000.27	0x38FD	06.001.42	0xF786	14.000.53	0x162A
02.000.28	0x86E4	07.001.44	0x768C		

1.3.13.2 TQC-MPCE impulse encoder software (applies to impulse encoders TQC-MPC3 and TQC-MPL3)

Version	Checksum	Version	Checksum	Version	Checksum
05.000.32	0x0930	06.001.42	0xF362	08.001.54	0x5941
05.000.37	0x9D66	07.001.44	0x87A7		

1.3.13.3 TQC-MPCC impulse encoder software (applies to impulse encoder TQC-MPC5)

Version	Checksum	Version	Checksum	Version	Checksum
05.001.36	0x653F	07.003.48	0xAE94	09.000.57	0xA0DF
06.000.37	0x800B	08.001.54	0x327C	09.001.58	0x5869
06.001.42	0x6D8F	08.002.55	0x73DA	12.000.63	0x9689
07.001.44	0xDF32	08.002.56	0x9611	14.000.69	0xCA13

1.3.13.4 TQC-MPCCE impulse encoder software (applies to impulse encoder TQC-MPC5)

Version	Checksum	Version	Checksum	Version	Checksum
06.000.37	0x9225	06.001.42	0x1B1F	07.001.44	0x5851

1.3.13.5 TQC-MPCM impulse encoder software (applies to impulse encoders TQC-MPC6 and TQC-MPL6)

Version	Checksum	Version	Checksum	Version	Checksum
08.001.54	0xAC9B	09.010.58	0x764B	12.000.63	0xE009
08.002.56	0x37BC	10.000.61	0x33DB	14.000.69	0xE7A4

1.3.14 Communication interface software

1.3.14.1 DART interface

Version	Checksum	Version	Checksum	Version	Checksum
09.001.04	0xC7D6	11.000.08	0x9C54	15.000.11	0x9856
10.000.07	0x7A7C	12.000.09	0xE534	18.000.16	0x3C6C

1.3.14.2 DUN interface

Version	Checksum	Version	Checksum	Version	Checksum
10.000.07	0x6DA0	11.000.08	0x700F		

1.3.14.3 EIN interface

Version	Checksum	Version	Checksum	Version	Checksum
00.007.04	0x029D	05.001.21	0xF69F	08.000.30	0x999D
02.000.07	0x6E4A	05.001.23	0x3C15	08.000.31	0xB332
02.000.13	0x9638	06.000.24	0xD624	08.000.32	0xB0E9
03.000.14	0x28BA	07.001.26	0x43C8	14.000.35	0xF11D
05.000.17	0x9393	07.003.29	0xF503	18.000.37	0xA526

1.3.14.4 EPS / Dresser interface

Version	Checksum	Version	Checksum	Version	Checksum
05.000.06	0x3ED7	07.001.22	0x45BA	13.000.32	0xCB05
05.000.12	0xB6B7	07.002.03	0xB3DA	13.000.36	0xDCEA
05.000.14	0x3908	08.001.24	0x6AE0	09.200.05	0x3FA7
05.001.16	0xD7A5	08.003.26	0xB3DA	09.200.39	0x5BFF
06.001.20	0x10D8	10.000.27	0xF6C2	09.202.40	0x5C31
07.001.21	0x11AF	13.000.29	0xB814		

1.3.14.5 GIL interface

Version	Checksum	Version	Checksum	Version	Checksum
07.000.00	0xB2DE	08.003.04	0x0BBB	09.030.12	0xEAE2
07.002.03	0xB2CF	09.000.08	0x71B5	10.000.14	0x7712
08.000.04	0x65F6	09.001.10	0x18A6		

1.3.14.6 KNZL(Kienzle) interface

Version	Checksum	Version	Checksum	Version	Checksum
08.000.03	0x69B9	08.001.05	0x1C06	10.000.09	0x3773
08.000.04	0x65F6	09.030.08	0x965D	14.000.11	0x5F4C

1.3.14.7 LOG (Logitron) interface

Version	Checksum	Version	Checksum	Version	Checksum
03.000.03	0xB7F7	09.030.23	0x3D93	12.000.31	0x13CC
05.000.11	0x4A98	10.000.25	0x2DFD	12.000.33	0x3B0C
05.001.14	0x5E7A	10.000.26	0xB761	12.000.37	0x2831
06.001.16	0x1D18	10.000.27	0xB574	12.000.39	0x11A5
07.001.17	0x4781	11.000.28	0xDAE1	13.000.41	0x3040
08.003.18	0xC926	12.000.29	0xE51D	13.000.42	0x9BFE
09.000.20	0xCC55	12.000.30	0x77ED	18.00.43	0xD915

1.3.14.8 TQC-LON interface

Version	Checksum	Version	Checksum	Version	Checksum
00.001.06	0000AEDB	02.00014	0xF4F6	04.000.18	0x92C8
00.001.10	0xA7D7	03.000.16	0x9291	07.001.22	0x92C8

1.3.14.9 TQC-LONC interface

Version	Checksum	Version	Checksum	Version	Checksum
05.000.14	0xACEA	08.000.26	0x48A9	11.000.33	0x5E75
05.000.15	0xBAD8	09.001.27	0x40A1	13.000.35	0xC73F
06.001.21	0x108B	09.010.28	0x4093	13.000.35	0xC183
07.001.23	0xD669	11.000.30	0x3F1D	15.001.37	0xD6B8

1.3.14.10 NUPC (Nuovo Pignone) interface

Version	Checksum	Version	Checksum	Version	Checksum
08.000.02	0xFF73	09.001.06	0x85F3	09.001.06	0x85F3
08.001.04	0xA807	09.000.05	0xE78F		

1.3.14.11 UDC interface

Version	Checksum	Version	Checksum	Version	Checksum
03.000.12	0x122D	06.001.43	0x9725	10.000.71	0xD2F5
03.000.15	0x35C7	07.001.45	0xF709	11.000.72	0x32C9
04.000.19	0x51F5	07.002.50	0xFEE9	11.000.73	0xE212
05.000.23	0xF75A	08.000.54	0x42F9	12.000.75	0x3888
05.000.25	0x996B	08.000.56	0xA2BB	12.000.82	0x31AF
05.000.26	0x9973	08.003.59	0xE568	13.000.83	0xEAC1
05.000.29	0x51C8	09.001.63	0x95DE	15.000.90	0x5661
05.001.37	0x1C50	09.030.65	0xAE0D	18.000.91	0xA333
05.001.38	0x211C	10.000.67	0x2BD8	18.000.93	0xCB23

1.3.14.12 UDCC interface

Version	Checksum	Version	Checksum	Version	Checksum
06.000.41	0x5FCF	07.001.45	0xC267		

1.3.14.13 ZSR interface

Version	Checksum	Version	Checksum	Version	Checksum
05.000.06	0x15F7	08.000.22	0xADBB	11.000.30	0x8DF0
05.001.09	0xC28D	08.000.23	0xADA5	11.000.31	0x48C4
06.000.10	0x3DDB	08.000.24	0x59DB	12.000.32	0x48EA
07.001.11	0x2A15	09.001.26	0x69B5	16.001.34	0x41DA
08.000.19	0xC1EC	10.000.28	0x8F0D		
08.000.21	0xBB47	10.000.29	0x52CF		

1.3.14.14 TCDU Software

Version	Checksum	Version	Checksum	Version	Checksum
09.007.01	0xA2924B37	09.010.01	0x115C5ACC		

1.3.14.15 DWCL Pump Controller Interface

Version	Checksum	Version	Checksum	Version	Checksum
12.000.02	0x3DA8	13.000.03	0x7DE2	13.000.04	0x03FC

1.3.14.16 M3000 Pump Controller Interface

Version	Checksum	Version	Checksum	Version	Checksum
13.000.02	0xABB1	15.000.04	0xA866		
13.000.03	0xAC9F	18.000.05	0xAB1D		

1.3.15 Overview of the software changes
The overview of the software changes can be found in the Evaluation Report ER7497R53

1.3.16 Hydraulic module: HYM
The Hydraulic option module hardware is legally relevant because it is used to connect and seal the pulser cables.

The Hydraulic module's software is legally not relevant, because it does not have any impact on the measurements system. It only controls motors, valves and nozzles

1.3.17 Legal parameters and settings for TQC-MPC3 and the TQC-MPC5 impulse encoder
The following parameters are or shall be set as following, using a hand terminal or another external source. The switch settings can be changed only after breaking the seal of the impulse encoder connection.

Parameter	Setting
Set Temperature Compensation	ON or OFF. When temperature compensation is applied this shall be ON. Applicable density can be selected from a list of available products or entered manually. During a delivery, the chosen density value can be seen on the connected hand terminal. Concerning Bio products and petrol – ethanol mixtures see the table in the following line.

Products and mixtures	Value of k
Bio Diesel, heating oil, RME, SME, PME, CME	0,84E-3
Petrol - Ethanol E0 ... E40	1,27E-3
Petrol - Ethanol E60 ... E100	1,14E-3

Temperature coefficient parameters.	Correct value. Can only be downloaded from an external source.
Product density	Correct value.
Input impulse and output impulse factors.	Correct value. Can only be downloaded from an external source.
Switch settings	
Electronic calibration	ON or OFF.
Rotation direction	CLOCKWISE or COUNTER CLOCKWISE.

1.3.18 W&M Calculator parameters
Access to the Weights & Measures parameters can be activated and deactivated with the Weights & Measures switch on the processor board.

Parameter	Setting
Rounding type	To be set and motivated by the manufacturer or user. No rounding is chosen when Euro is selected as currency.
Comma amount	Number of amount figures behind the comma. For EURO, this is 2.
Comma Unit price	Depending on the application, but when selecting the EURO as currency normally presented in Euro with three decimals or in Eurocents with one decimal. Also see the next parameter, scaling.
Scaling	Applies to Germany and Great Britain only. When selecting the EURO as currency normally presented in Euro (or Pound Sterling) with three decimals or in Eurocents (or pence) with one decimal.
Pulser Hide	Set to 4 or less when the minimum measured quantity is 2 litre. Set to 10 or less when the minimum measured quantity is 5 litre.
Unit setup	Volume in litres.
Hose expansion time and Value	These parameters are used to compensate the volume of fuel, which is counted during the pressurizing stage of the hose at the beginning of a delivery. The time factor is in multiples of 10 milliseconds (ms) and the volume in centilitres (cl). The hose expansion functionality is only executed when the dispenser has been idle for more than an hour. As an example: many countries use a fixed value of 30/8 for hose expansion, i.e. volumes less than 8 cl during the first 300 ms are not counted. The setting of this parameter shall per application be motivated by the manufacturer or user.
Switching on or of software download possibility.	Depending on the application and on the demands of the country where the liquid measuring installation is installed.

1.4 Essential shapes

1.4.1 Mains input EMC filter
Make Schaffner, type FN332-1/05, or similar (not in TQC V8).

1.4.2 Indications of volume, price and price per unit.

1.4.3 Inscriptions

1.4.3.1 On the electronic calculating and indicating device, clearly visible, at least the following is inscribed:

- The Evaluation Certificate number TC7497.
- Name or trademark of the producer.
- Type designation.
- Serial number and year of manufacture.

Parts of the inscriptions (except for the Evaluation Certificate number and serial number) may be stated on the nameplate or on a separate Data Sheet belonging to the complete dispenser unit.

1.4.3.2 Other marking
When the calculating and indicating device indicates a converted volume, the reference conditions for that converted volume shall be clearly visible in the near vicinity of the volume indication.

1.4.4 Removing an SD card or placing another SD card results in an error message.
Changing the content of an SD card is only possible when the Weight & Measures switch is set to "not protected".

1.5 Conditional parts

1.5.1 Heater
Make Cirrus, type 80 – FGC 2104, or similar.

1.5.2 Slave I/O device , type TQC-SIO (documentation 7497/20-25 and -26), provides an interface to a various number of optional modules such as:

- OPT lamps
- pre-set keypads
- pre-set buttons
- others.

1.5.3 Vapour recovery safety barrier, type TQC-VFZ (documentation 7497/20-27 and -28).

1.5.4 Vapour recovery gas-flowmeter, type TQC-VCC (see documentation 7497/20-01).

1.5.5 Infra-red sensor for communication with a handheld terminal.

1.5.6 Electronic totalizers.
The totals of amount, volume and number of fillings per nozzle are stored in the calculator for single and high-speed configurations. Totals and subtotals are also available per delivery mode (two modes). This information is permanent and cannot be erased or changed unless a "cold start" is performed which would erase all the data in order to prevent data corruption.

1.6 Conditional characteristics

1.6.1 It is possible to see the software versions of all connected peripherals (through the Hand Held Terminal).

1.6.2 Electronic calibration. This is possible only after breaking W&M seals (see the pictures in Annex 1.

1.6.3 External communication, if applied, is performed by a transmission protocol (e.g. Dresser Current Loop, Dresser DART, EPSI, IFSF LON) using the physical interface (e.g. Current Loop, RS422, RS485) and is independent from the transmission protocol.

1.7 Conditional shapes

1.7.1 The volume indications and the price indications use 6 digits; the litre price indication uses 4 digits; the principle is LCD. Each connected installation has its own price indication.

2 Seals

The following seals are applied:
Remark: All pictures of the sealing should be considered examples.

2.1 Impulse encoder sealing

- The impulse encoder's enclosure, against unauthorized opening.
- The impulse encoder's enclosure mounting to the meter.
- The impulse encoder's connection to the connector board on the EIO board.

2.2 Weight and measures sealing

- Weight and Measures seals on the TQC and TQC EIO.
- Weight and Measures seals on the TQC EST.
- Sealing of the cable between the VGA indication device and the single board computer.

2.3 TQC in combination with VGA indicating devices

- Weight and Measures seals on the TCDU.

2.4 SD card (when used)

- When applying an SD memory card, the cold start switch must be sealed.

  Remark: Sealing of the SD card itself is not necessary.
  See Annex 1 for an example of the sealing positions.

3 Conditions for conformity assessment

3.1.1 The electronic calculating and indicating device must be constructed in accordance with the Description and Documentation Folder appertaining to this Evaluation Certificate.

3.1.2 Other parties may use this Evaluation Certificate only with the written permission of the producer.

4 Reports

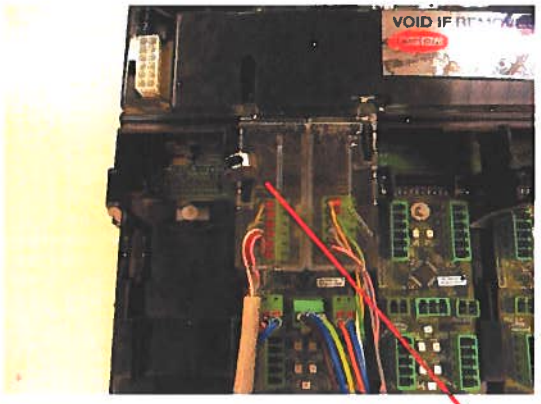
An overview of performed tests is given in the reports:

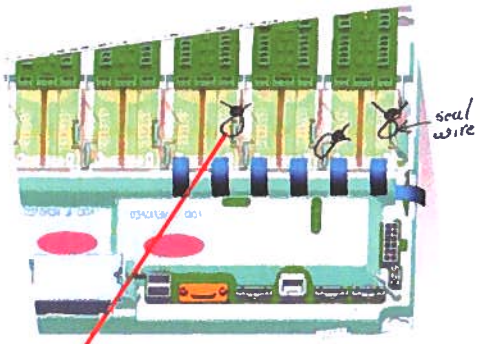
- CPC/ 811327
- NMi-11200752-1
- NMi-11200752-2
- NMi-12200002-1
- Investigation file "Conversion calculation test of biodiesel and petrol-ethanol mixtures with TQC.xls", owned by and on request available at NMi Certin B.V.
- NMi-13200218-01
- P01429

A report can be a test report, an evaluation report, a type evaluation report and/or a pattern evaluation report.

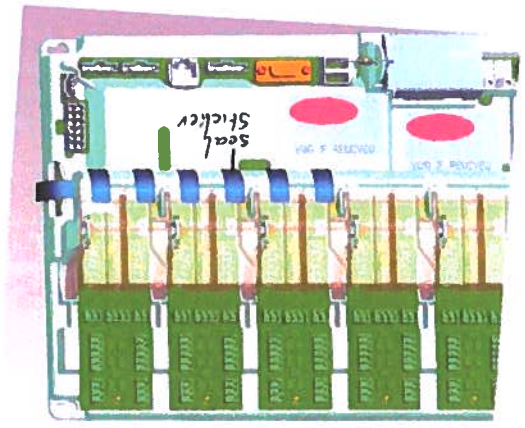
Annex 1
Examples of sealing

Impulse encoder sealing

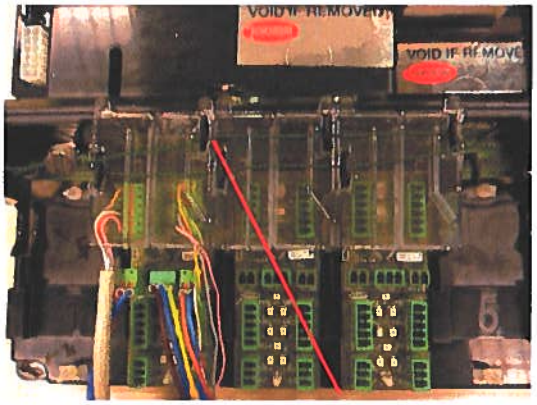




HYM
Lead seal per meter

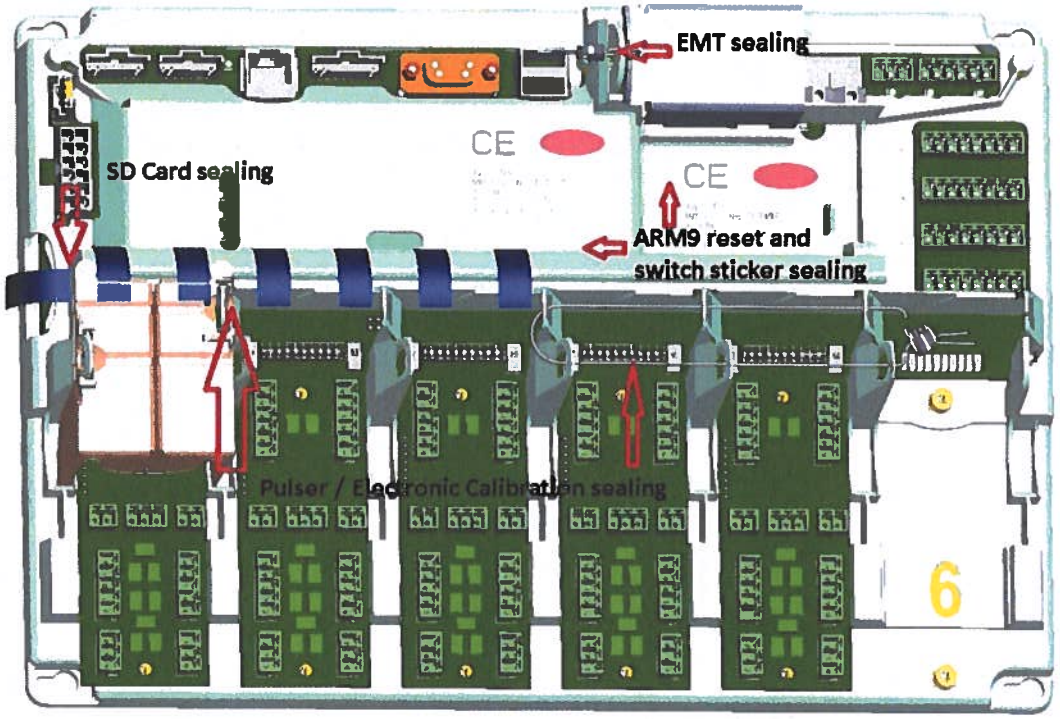


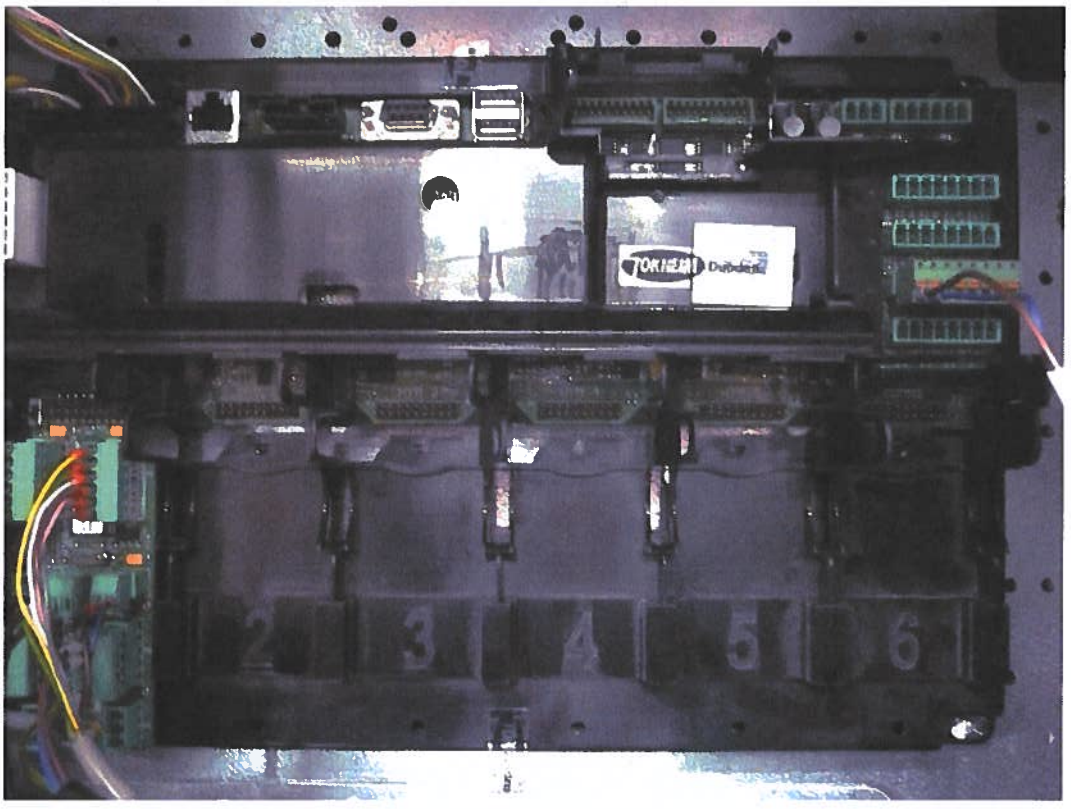
HYM with sticker seals only, per meter



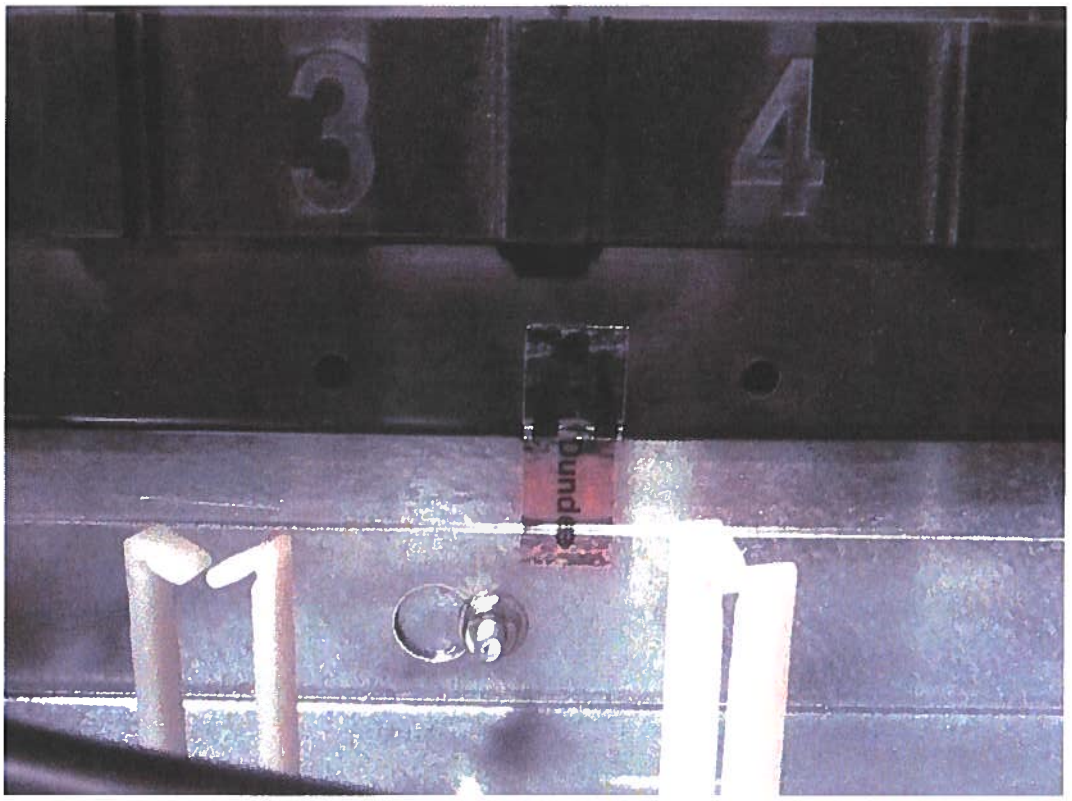
HYM
One wire lead sealing (green wire)
(all meters)

Weights and measures sealing for TQC and TQC EIO



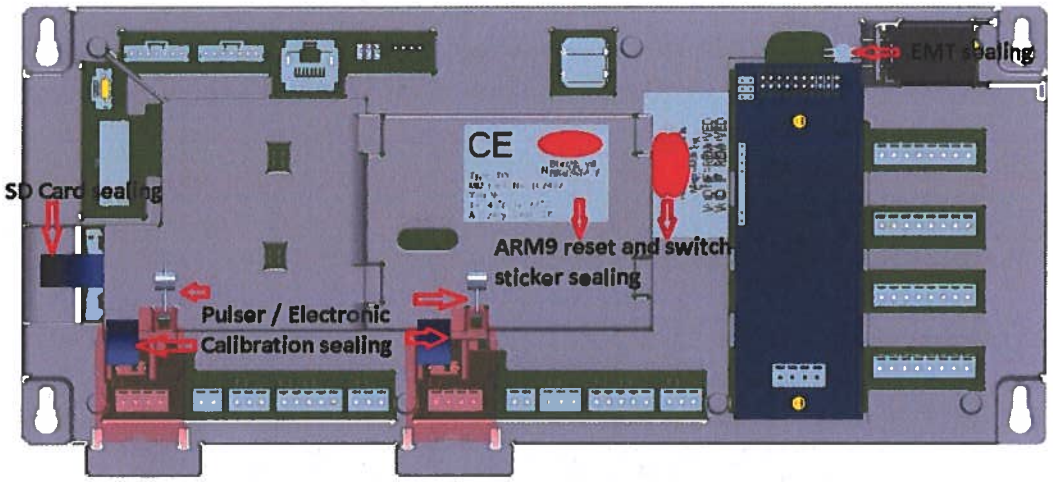


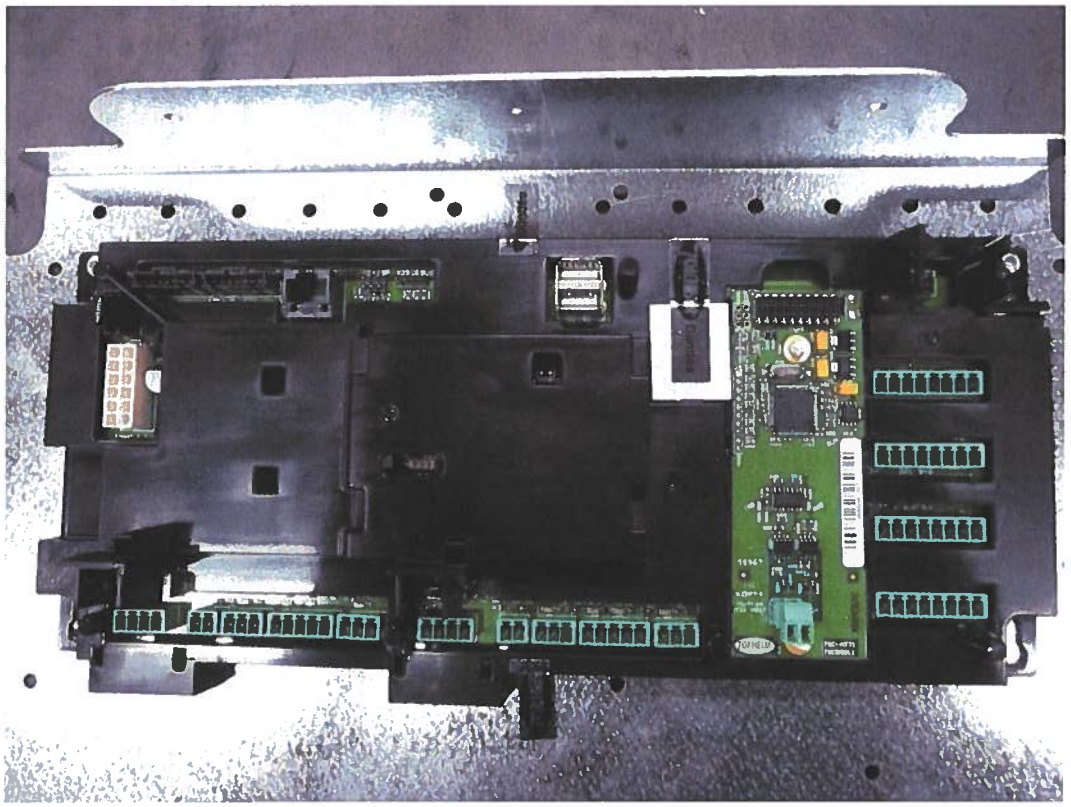
Annex 1
Examples of sealing



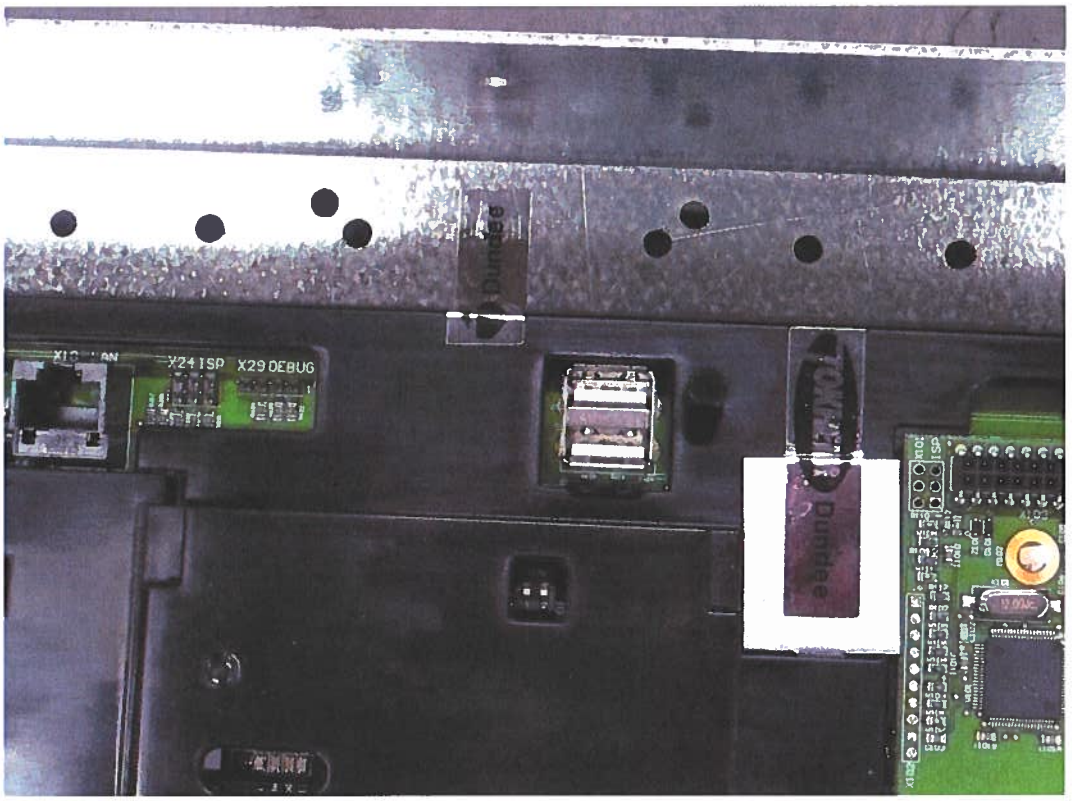
Annex 1
Examples of sealing

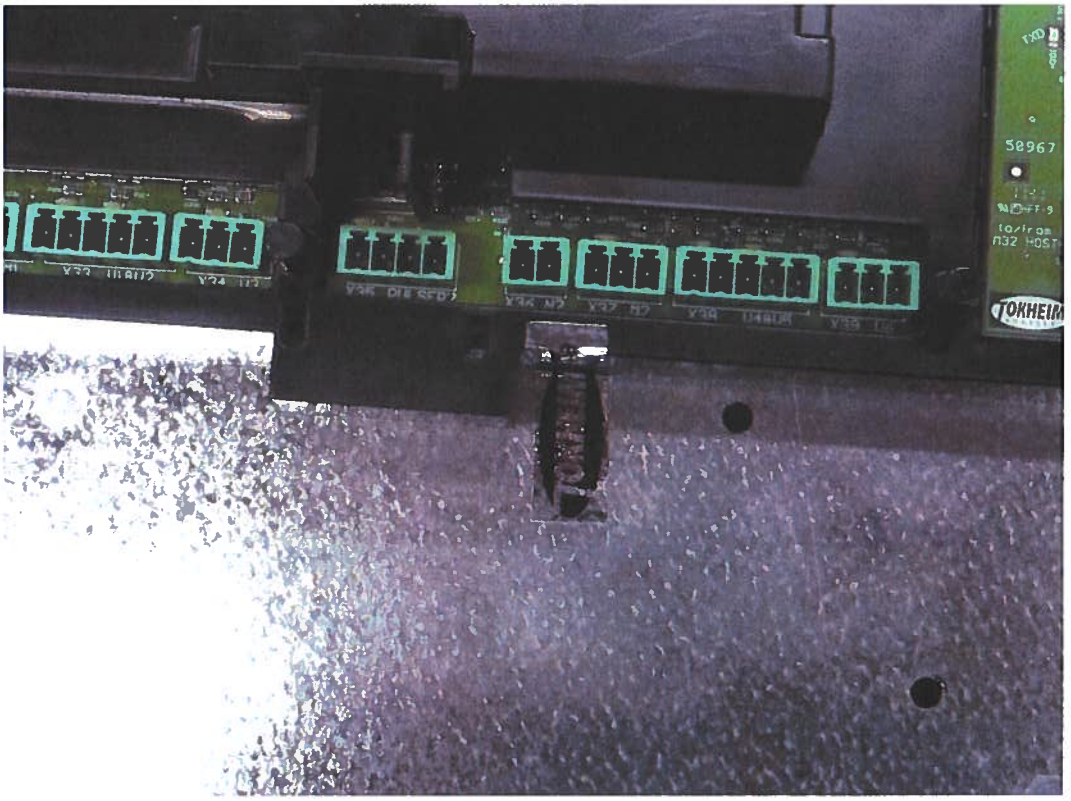
Weights and measures sealing for TQC EST



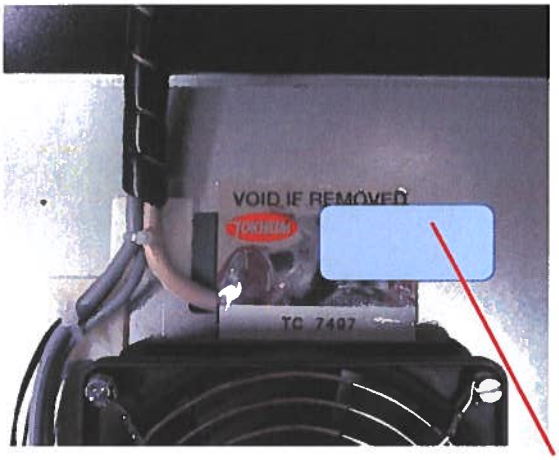


Annex 1
Examples of sealing



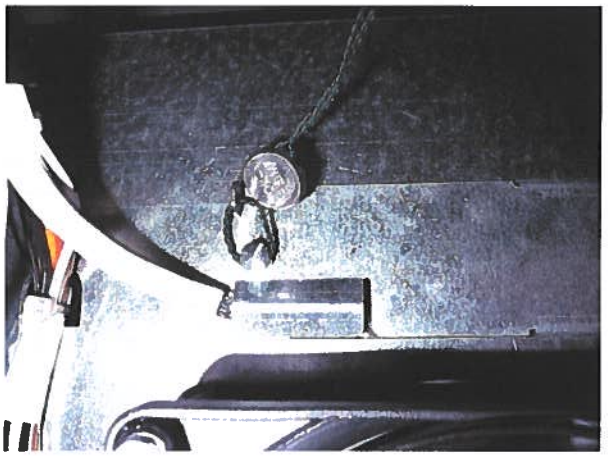


TQC with VGA device sealing

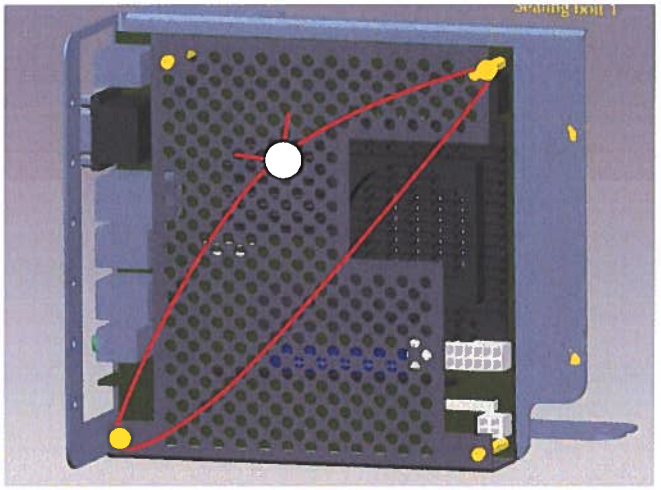


Seal sticker partly over Tokheim sticker

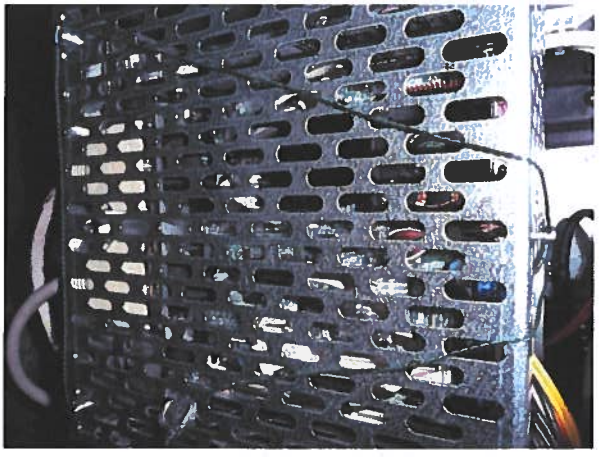
Sealing of the data cable on the VGA display device, method 1.



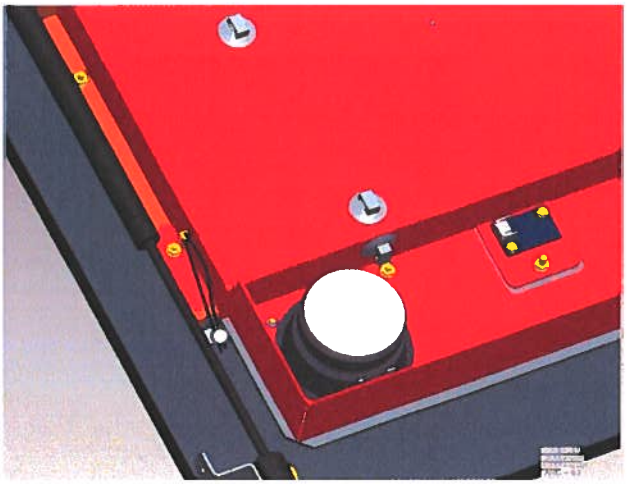
Sealing of the data cable on the VGA display device, method 2.



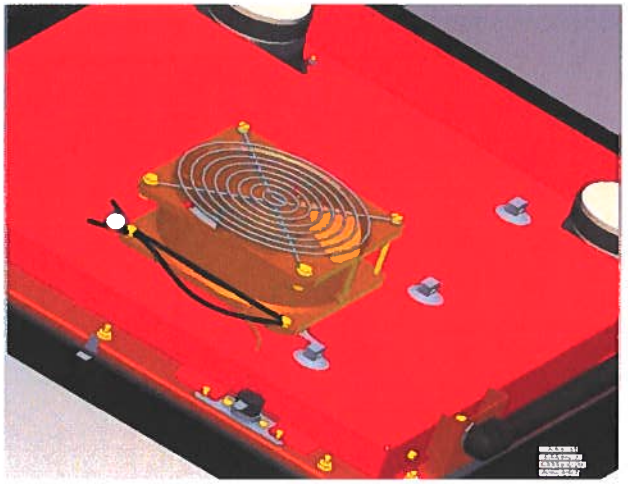
As an example: Sealing of the single board processor for the VGA display devices, thus sealing the connection of the cables to the VGA display devices, method 1.



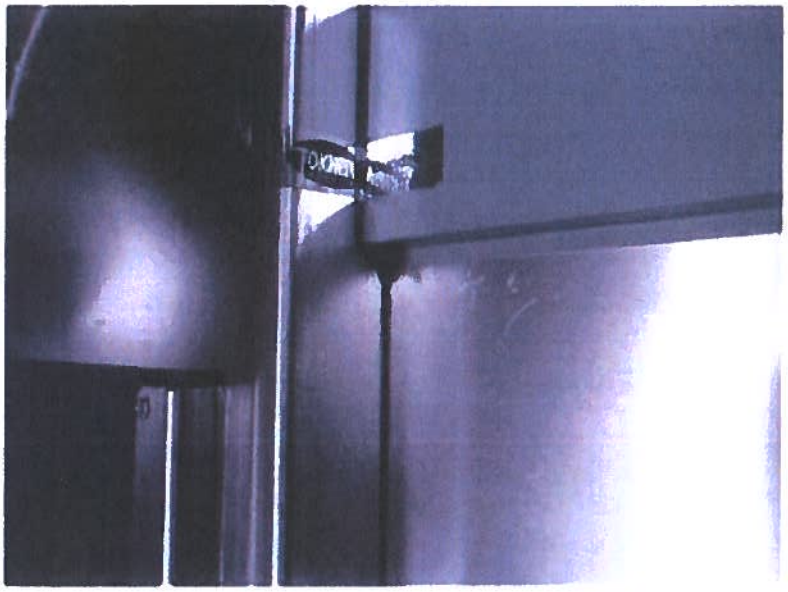
As an example: Sealing of the single board processor for the VGA display devices, thus sealing the connection of the cables to the VGA display devices, method 2.



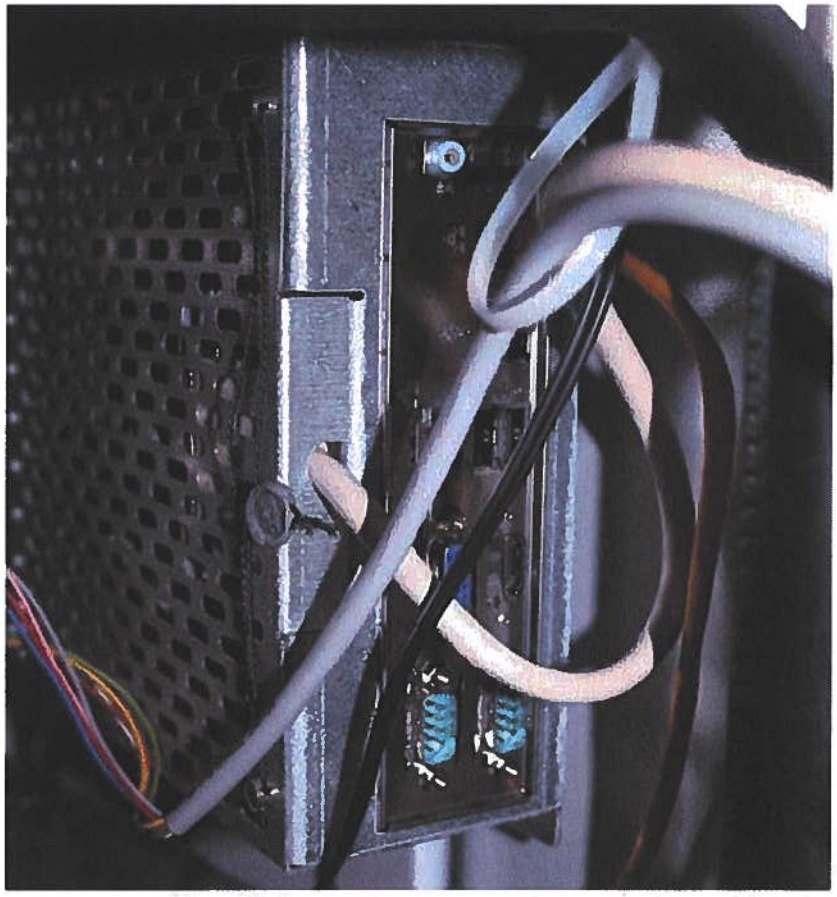
As an example: Alternative sealing of the single board processor for the VGA display devices.



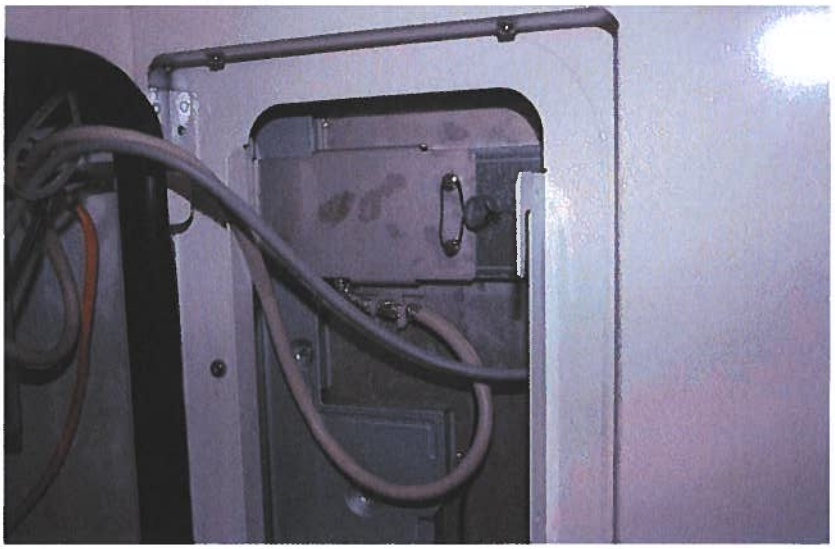
As an example: Alternative sealing of the single board processor for the VGA display devices.



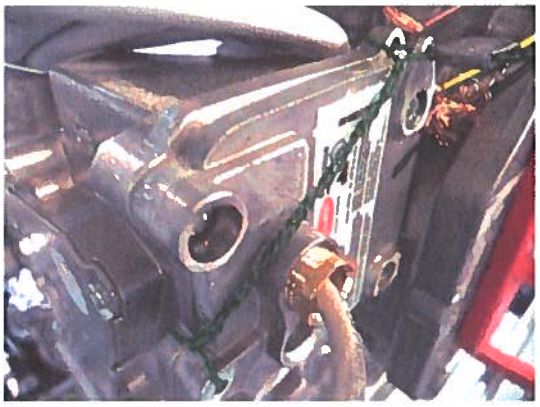
TCDU SBC sealing



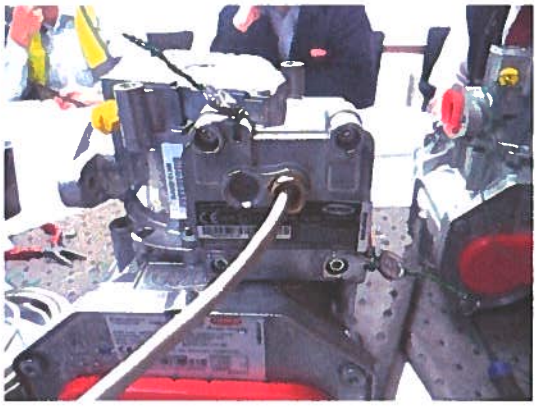
TCDU Display sealing



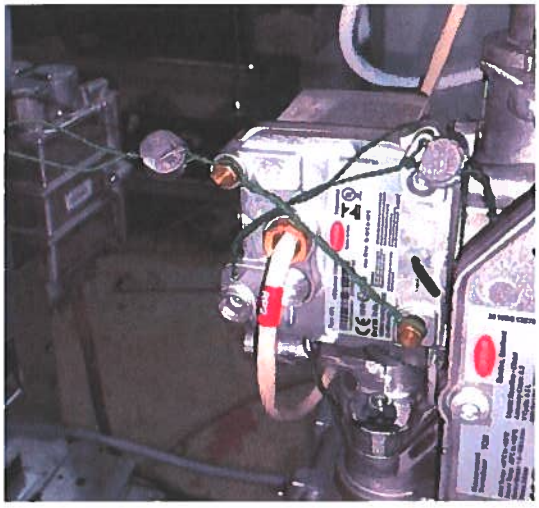
Impulse encoder sealing methods



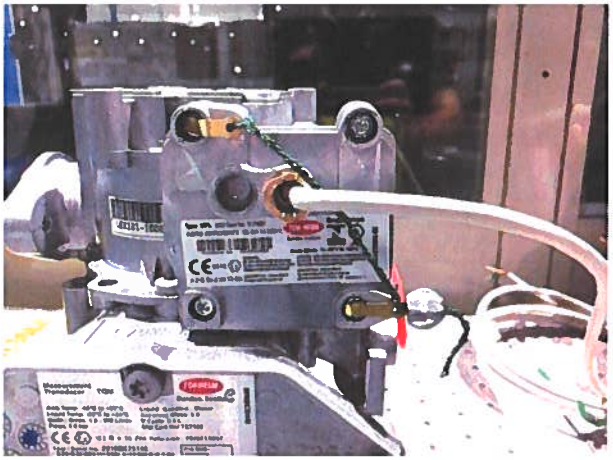
Option A



Option B



Option C

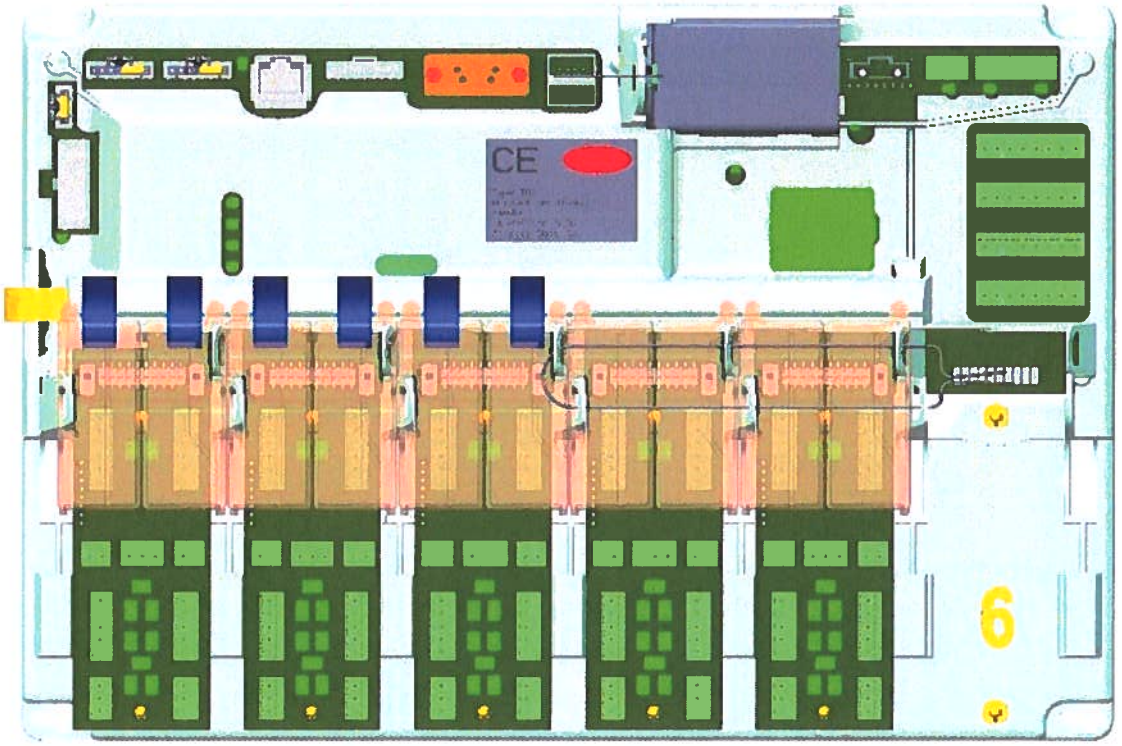


Option D

TQC-VGA sealing (retrofit kit double sided)

TQC-VGA sealing (retrofit kit single sided)

Alternative TQC sealing (sealing of the SD card is optional)



Remark: The SD card can be used for downloading of new software versions (0.3 versions or higher) and for backup and restore of existing configurations, calibration figures and totalizer values. Downloaded information can be uploaded to another TQC calculator.

When applying an SD memory card, the cold start switch must be sealed.