

**Federal Physical/Technical Institute (PTB)  
Braunschweig and Berlin**

- (1) **EU design test certification**
- (2) Appliances and protective systems for proper use in areas with a risk of explosion - guideline 94/9/EC
- (3) EU design test certification number  
**PTB 01 ATEX 5004**
- (4) Appliance and protective system: vapour recovery pump type "MEX 0831-10" and "MEX 0831-11"
- (5) Manufacturer: Dürr-Technik GmbH und Co. KG
- (6) Address: Höpfigheimer Str. 17, D-74321 Bietigheim-Bissingen
- (7) The design of this appliance and protective system as well as the various admissible embodiments are stipulated in the enclosure to this design test certification.
- (8) As appointed agency no. 0102 pursuant to Article 9 of the Guideline of the Council of the European Communities of March 23, 1994 (94/9/EC), the Federal Physical/Technical Institute certifies fulfilment of the fundamental safety and health requirements for the design and the construction of appliances and protective systems for proper use in areas with a risk of explosion pursuant to Annex II of the guideline.

The results of the examination have been recorded in the confidential test report PTB Ex 01-50004.

- (9) The fundamental safety and health requirements are fulfilled by compliance with
- Test rules of the PTB "Requirements of explosion-protected vacuum pumps" in combination with EN 1127-1 and EN 50014 as well as PTB test methods "flame arresters" on the basis of EN 12874.**
- (10) If the sign "X" is behind the certification number, reference is made to special conditions for the safe use of the appliance and protective system in the enclosure to this certification.
- (11) This EU design test certification only refers to the design and construction of the stipulated appliance and protective system pursuant to guideline 94/9/EC. Further requirements of this guideline apply for the manufacture and circulation of this appliance and protective system.
- (12) The identification of the appliance and protective system must contain the following information:

Appliance: EX II 2 (1) G IIA T3 Protective system: EX IIG IIA

Certification Office, Explosion Protection  
By order  
(signature)  
Dr.-Ing. M. Beyer  
Senior Government Official

Braunschweig, 19.06.2001

Official Seal of the Federal Physical/Technical Institute

(13)

## **A n n e x**

(14)

### **EU design test certification PTB 01 ATEX 5004**

(15) Description of the appliance and protective system

#### **Description of the appliance**

The vapour recovery pump types "MEX 0831-10" and "MEX 0831-11" are vacuum pumps in a pendulum plunger construction with integrated flame arresters arranged on the inlet and outlet sides in order to suck off explosion-capable fuel vapour/air mixtures in gas-return devices of dispensing devices at filling stations. The vacuum pumps run in intermittent operation.

#### **Requirements of the explosion protection of the appliance:**

Interior of the inlet and outlet line: requirements according to Category 1

Environment of the vacuum pump: requirements according to Category 2

#### **Description of the protective system**

The vapour recovery pump types "MEX 0831-10" and "MEX 0831-11" are to be used as explosion pipe securing and detonation securing between the dispensing valve and the storage tank - in the gas return line - in order to prevent a flame breakthrough in deflagrations or stable detonations of explosion-capable vapour/air mixtures of explosion group IIA in the case of ignition on the dispensing valve and the following subsequent max. hose and pipe length:

a) gas return hose with an internal diameter  $\leq 10$  mm in a coaxial hose  $\leq 6$  m, or optionally

b) coaxial hose  $\leq 6$  m with an outer diameter  $\leq 38$  mm

together with a subsequent DN 15 pipe (G ½)  $\leq 3$  m

The vapour recovery pump (membrane or plunger pumps) each comprise a housing with pump parts (plunger pump). One flame block has been installed on each of the suction and pressure side of the pumps. The flame block - in the form of a belt-type securing - comprises one corrugated and one smooth belt of non-rusting steel. The belts, each 10 mm in width and 0.2 mm in thickness, are rolled up in a spiral shape in dense layers. In this way, triangular-shaped channels of 0.7 mm at the most are formed, through which vapour/air mixtures can flow, with a flame breakthrough however being prevented.

The design, materials and dimensions are stipulated by the diagrams and piece lists stated in the annex.

#### **Requirements of explosion protection of the protective system:**

Resistant to flame breakthroughs in deflagrations or detonations of explosion-capable vapour/air mixtures of explosion group IIA with a standard gap width  $> 0.9$  mm in a possible

**Federal Physical/Technical Institute (PTB)**  
**Braunschweig and Berlin**  
**Annex to EU design test certification PTB 01 ATEX 5004**

detonation at the dispensing valve and subsequent hoses and tubes of the gas return lines at filling stations.

Operating conditions:

In addition to the atmospheric conditions, the following particular conditions apply for vapour recovery pump types "MEX 0831+10" and "MEX 0831-11" in the outlet line:

- temperature of the mixture volume flow:  $95^{\circ}\text{C} \pm 5^{\circ}\text{C}$
- maximum operational overpressure compared with atmosphere: 150 mbar (150 hPa).

- (16) Test report PTB Ex 01-50004 in combination with test report Ex 00-40121 (comprising 4 pages, 22 diagrams and 1 piece list) and test report Ex 00-50003 (comprising 7 pages, 6 technical descriptions, 51 diagrams and 2 piece lists)

Result:

As an appliance, the design sample corresponds to the requirements of guideline 94/9/EC for appliances of appliance group II (sub-division II A according to EN 50014), Category 1, temperature class T3 pursuant to EN 5014, with regard to the explosion-risk areas connected to the inlet and outlet line. The EU design test certification as an appliance is limited to the requirements corresponding to Category 1.

The design sample corresponds to the provisions of guideline 94/9/EC for protective systems (sub-division IIA pursuant to EN 50014). The securing fulfils the requirements made of explosion protection as described under point (15).

- (17) Special conditions

The vapour recovery pump types "MEX 0831-10" and "MEX 0831-11" may only be used in gas-return devices at filling stations for sucking off fuel vapour/air mixtures.

The vapour recovery pump type "MEX 0831-10" and "MEX 0831-11" are to be earthed electro-statically.

The flame arresters (and components including the latter) are to be subjected to a visual check, above all for contamination and corrosion, at suitable intervals of time and to be cleaned or replaced if need be.

The operating temperature in the outlet line may not exceed  $95^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .

The operating overpressure in the outlet line compared with atmospheric pressure may not exceed 150 mbar (150 hPa).

In the use of vapour recovery pump types "MEX 0831-10" and "MEX 0831-11" as a protective system, the following conditions must additionally be complied with or fulfilled:

- max. hose and pipe lengths between dispensing valve and gas-return pump

a) gas return hose with an internal diameter  $\leq 10$  mm in a coaxial hose  $\leq 6$  m, or optionally

**Federal Physical/Technical Institute (PTB)  
Braunschweig and Berlin  
Annex to EU design test certification PTB 01 ATEX 5004**

b) coaxial hose with an outer diameter  $\leq 38$  mm, length  $\leq 6$  m

together with a subsequent DN 15 pipe (G ½), length  $\leq 3$  m.

The combustible gases or fluids occurring in operation must belong to explosion group IIA with a standard gap width  $> 0.9$  mm.

(18) Fundamental safety and health requirements

The fundamental requirements of Guideline 94/9/EC, Annex II, have been fulfilled.

**Examination documents for the examination as an appliance:**

Expert analysis of 25.01.2000 by the BAM on the operational reliability of the components "Birnteils quick-action disk" used by Dürr-Technik GmbH und Co. KG under operational conditions (8 pages and 3 pages of annex)

Letter from Dürr to PTB of 18.05.2000 with temperature measurement diagram (total of 7 pages).

Vapour recovery pump MEX 0831-10:

Technical description plunger pump MEX 0831-10 (4 pages) of 06.03.2000

Store service life description (6 pages) of 02.02.2000

Piece list MEX 0831-10 (1 page) of 02.03.2000

Diagram no.	Amendment index	Date
SKLT-0300	-	00-02-17
SKLT-0298	-	00-02-17
0831-210-05	-	97-03-11
0831-211-17	-	97-03-04
0831-212-08	a	99-08-30
0831-215-02	-	00-02-09
0831-330-01	-	93-12-01
0831-341-01	d	95-08-24
0831-345-02	c	97-08-22
0831-601-01	b	93-07-05
0831-214-02	-	93-08-11
0831-139-01	a	95-10-20
0831-139-02 (2 pages)	a	95-10-20/95-12-21
0831-233-01	d	95-01-19
0831-216-01	-	93-08-04
0831-216-05	a	93-08-11
0831-216-03	a	92-12-03
0831-216-04	-	92-09-30
1000-0002	-	96-12-13
83205 A	-	1991
0831-217-01	d	93-08-24
0831-007-00 (4 pages)	1 & 3:a 2:d 4:-	97-03-06/97-07-10/98-03-01
0831-008-00 (2 pages)	1:a 2:d	97-03-06
0831-009-00 (2 pages)	1:a 2:c	97-11-03/97-03-06
0831-010-00 (2 pages)	1:a 2:c	97-11-03/97-03-06
0831-011-00 (2 pages)	a	98-07-29/98-08-03

**Federal Physical/Technical Institute (PTB)**  
**Braunschweig and Berlin**  
**Annex to EU design test certification PTB 01 ATEX 5004**

Vapour recovery pump MEX 0831-11:

Technical description plunger pump MEX 0831-11 (4 pages) of 31.05.2000

Store service life description (6 pages) of 02.02.2000

Piece list MEX 0831-11 (1 page) of 06.04.2000

<u>Diagram no.</u>	<u>Amendment index</u>	<u>Date</u>
SKLT-0299	-	00-02-17
SKLT-0298	-	00-02-17
0831-210-05	-	97-03-11
0831-211-17	-	97-03-04
0831-212-02	a	99-08-30
0831-215-02	-	00-02-09
0831-330-01	-	93-12-01
0831-341-01	d	95-08-24
0831-345-02	c	97-08-22
0831-214-02	-	93-08-11
0831-139-01	a	95-10-20
0831-139-02 (2 pages)	a	95-10-20/95-12-21
0831-233-01	d	95-01-19
0831-216-01	-	93-08-04
0831-216-05	a	93-08-11
0831-216-03	a	92-12-03
0831-216-04	-	92-09-30
1000-0002	-	96-12-13
83205 A	-	1991
0831-217-01	d	93-08-24
0831-007-00 (4 pages)	1 & 3:a 2:d 4:-	97-03-06/97-07-10/98-03-01
0831-008-00 (2 pages)	1:a 2:d	97-03-06
0831-009-00 (2 pages)	1:a 2:c	97-11-03/97-03-06
0831-010-00 (2 pages)	1:a 2:c	97-11-03/97-03-06
0831-011-00 (2 pages)	a	98-07-29/98-08-03

Examination documents for the examination as a protective system:

a) Design samples of the gas-return pumps type "MEX 0831-10" and "MEX 0831-11"

b) Diagrams and piece list

<b>Diagram no.</b>	<b>Page</b>	<b>Date</b>	<b>Amendment date</b>
SKLT-0298	-	17.02.00	-
SKLT-0337	-	07.07.00	-
0831-215-02	(d)	01.12.92	24.05.99
0831-215-02	(e)	01.12.92	07.02.00
0831-211-15	-	28.02.97	11.12.97
0831-007-00	1	06.03.97	23.04.99

