



By use in explosive hazardous areas read and follow the

special conditions and instructions for safe application

of the attached

explosive protection information

B1 / B5



first and take notice of the operating instructions.

ATTENTION Tear-off danger! Don't pour on the measuring cone. In case of full indication the filling process has to be stopped immediately.

Operating instructions

1. Description

1.1 Intended use

The level indicator observes the filling level as a limit switch in silos and vessels. It can be used as full and empty indicator for dusty and powdery, granulated and grainy bulk goods with a max. grain size up to 100 mm and with a bulk density of 0.3 t/m³ ... 3.0 t/m³.

1.2 Function

Bulk goods, being dumped besides the pendulum, are moving the pendulum more and more aside, as the filling level increases. A signal switch registers this movement and evaluates it.

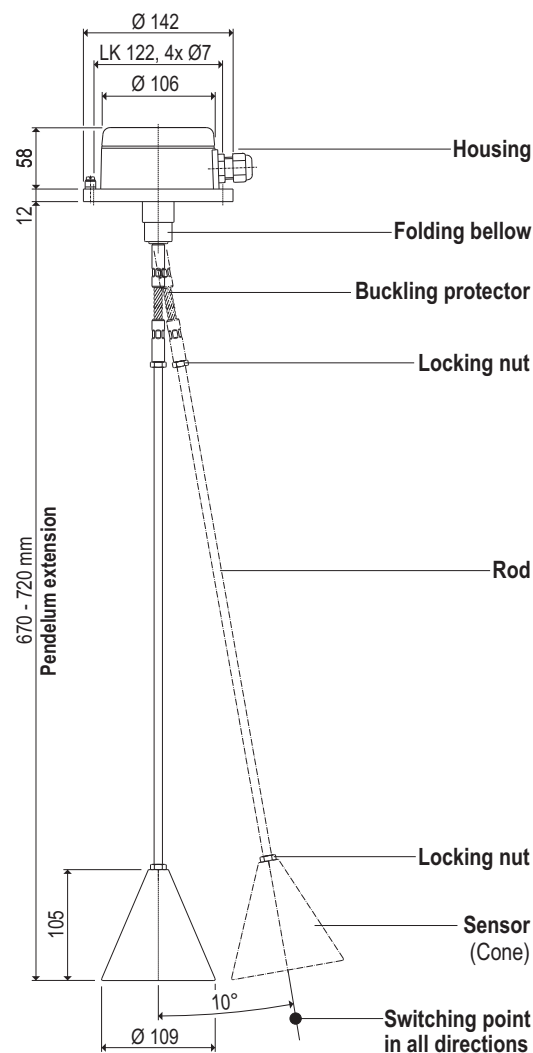
1.3 Technical data

Manufacturer	MOLLET Füllstandtechnik GmbH
Address	Industriepark RIO 103 74706 Osterburken
Name	Pendulum level indicator
Type	PF
Bulk good temperature T_s	-25 °C ... +80 °C
Ambient temperature T_a	-20 °C ... +70 °C
Signal contact	change-over contact, potentialfree
max. Switching voltage	see Type plate
max. Braking capacity	see Type plate
Response delay	none
Cable connection	Screw M4
Cable entry	cable gland M20x1.5
Type of protection	IP IP66 acc. to DIN EN 60529
Overpressure safety	up to 0.5 bar
Weight	1.15 kg
Maintenance	none
Mounting position	vertical, ± 3° inclination

1.4 Materials

Housing	GAL, RAL7001 coated
Folding bellow	NBR, black
Buckling protector	Stainless steel 1.4301 / 304
Rod	Aluminium or 1.4301 / 304
Sensor (Cone)	Aluminium or 1.4301 / 304

1.5 Dimensions

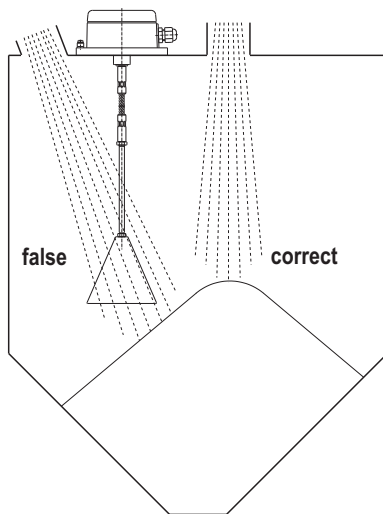


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2. Installation

2.1 Preparation

- Inspect if the delivery is complete.
The delivery consists of:
 - Housing with buckling protector
 - Rod with 2 locking nuts
 - Sensor (Cone)
- Read and follow the safety instructions and the operating instructions, before handling with the device !
- The pendulum has not to be struck by the filling stream.
- The pendulum must be able to swing unimpeded up to the switching point.



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2.2 Mounting of sensor (cone) and rod

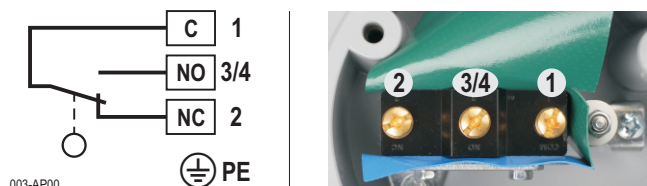
- Screw the rod with the left and right screwed hexagonal nuts in the measuring cone and counter the nut with no. 13 open jaw wrench.
- Screw now this pendulum in the buckling protector and counter the nut with no. 10 and no. 13 open jaw wrench.
- If the pendulum has to be mounted from the inside of the vessel, than screw at first the housing at the connection flange and mount then the pendulum as described.

2.3 Mounting in the vessel

Position the level indicator with the gasket at the provided flange and fix it with 4 washers and screws M6.

2.4 Electrical connection

Circuit diagram



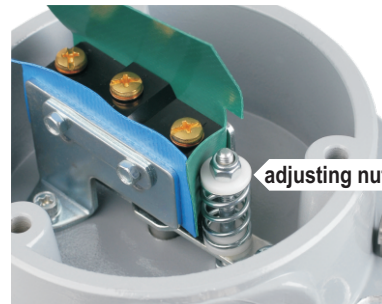
003-AP00

2.5 Cable gland

- After electrical connection, tighten the cable gland.
- Screw the cap nut, until the cable entry is closed tightly.

3. Commissioning

- Put the level indicator into operation only, if the installation and the electrical connection have been done correctly.
- The level indicator is presetted at sensitive.
- With the adjusting nut the device can be adjustable insensitive. Clockwise insensitive.



4. Utilization

4.1 Normal operation

- Use the level indicator in its intended application only.
- Comply with the specifications on the data plate.
- Damaged devices have to put out of operation immediately.

4.2 Inexpert handling

- Ignoring of the safety instructions and the operating instructions.
- Not intended use.
- Mounting of spare parts which are no original parts.
- Violation against applicable law and standards.

5. Maintenance and servicing

5.1 Maintenance

- The level indicator needs no maintenance.

5.2 Servicing

- Damaged parts have immediately replaced with similar.
- Until the complete reconstruction of the proper function, the level indicator must not be used any more.

6. Storage

- Store the level indicator dry and dust-free.
- Dismount the pendulum and store the housing on it's top.

7. Disposal

- The level indicator can be recycled.
- The disposal applies to the valid environmental guidelines according to the location of the carrier and the local manufacturing conditions.

Pendulum level indicator

Level limit switch for bulk goods

PF

Gas+
Dust



Explosion protection information

and supplement to the operating instructions

Type plate details B1

Dust

Manufacturer and address

CE sign with the number of the "Notified Body" which is involved in the production control phase

Model designation

Vessel pressure (tested pressure)

MOLLET Füllstandtechnik GmbH Industriepark RIO 103 D-74706 Osterburken Tel. +49 62 91 64 400		0044	
Typ PF-B1-KFALP1	II 1/2D Ex ta/tb IIIC T 80 °C	Contact 4 A 240 V~	Connection diagram
Δp -0,08 bar...+0,08 bar	-25 °C ≤ Ta ≤ +80 °C / -20 °C ≤ Ta ≤ +70 °C	Details to loadability of the signal contact	Details to loadability of the signal contact
S# 1234567890 A.-Nr. 1234567890	03/10	IBExU05ATEX1174	Type of protection
IP66		<input type="checkbox"/>	Type of protection

Month and year of delivery

Unique serial number

Number which the order was handled


Dust marking

Ambient temperature (Operation temperature)

EC-type examination certificate number

Type plate details B5

Gas+Dust  and hybrid mixtures

Manufacturer and address	Industriepark RIO 103 D-74706 Osterburken Tel. +49 62 91 64 400		CE sign with the number of the "Notified Body" which is involved in the production control phase	0044	NO NC	Connection diagram
Model designation	Type PF-B5-KFELP1	 II 1/2D Ex ta/tb IIIC T 80 °C II 2G Ex ib IIB T6	Contact	$U_i \leq 30 \text{ V}$ $I_i \leq 0,1 \text{ A}$	Details of intrinsically safe supply of the signal contact	
Vessel pressure (tested pressure)	Δp -0,08 bar...+0,08 bar	-25 °C ≤ Ta ≤ +80 °C / -20 °C ≤ Ta ≤ +70 °C			Type of protection	
	S# 1234567890 A.-Nr. 1234567890 03/10	IBExU05ATEX1174	IP66			

Month and year of delivery

Unique serial number

Number which the order was handled


Gas and Dust Marking

Ambient temperature (Operation temperature)

EC-type examination certificate number

Marking in accordance with ATEX 95 and DIN EN 60079-0:2009

Pendulum level indicator for use on the boundary from zone 20 to zone 21.

 II 1/2 D Ex ta/tb IIIC T80°C

Equivalent to **Directive 94/9/EG** (ATEX 95)

Equipment group **II** = everything except mining

Equipment category **Category 1** for zone 20, 21 and 22
Category 2 for zone 21 and 22

/ = Level indicators, which are installed on the boundary between different zones

Type of explosive atmosphere **D** = Dust

the **Ex** symbol according to DIN EN 60079-0


t = Protection by enclosure

a = Device with „very high“ protection standard for zone 20, 21 and 22
b = Device with „high“ protection standard for zone 21 and 22

IIIC for flammable conductive dust, flammable non-conductive dust and flammable fibres and flyings

T..°C maximum surface temperature

Pendulum level indicator for use in zone 1.

 II 2 G Ex ib IIB T6

Equipment category **Category 2** for zone 1 and 2

Type of explosive atmosphere **G** = Gas

i = Protection by intrinsically safe

b = Device with „high“ protection standard for zone 1 and 2

IIB for all flammable gases except hydrogen, acetylene and carbon disulphide

Temperature class **T6** = 85°C

Order code **B1**

Marking: II 1D / 2D



Equipment category appropriation by zones

Pendulum level indicator for use on the boundary from zone 20 to zone 21.

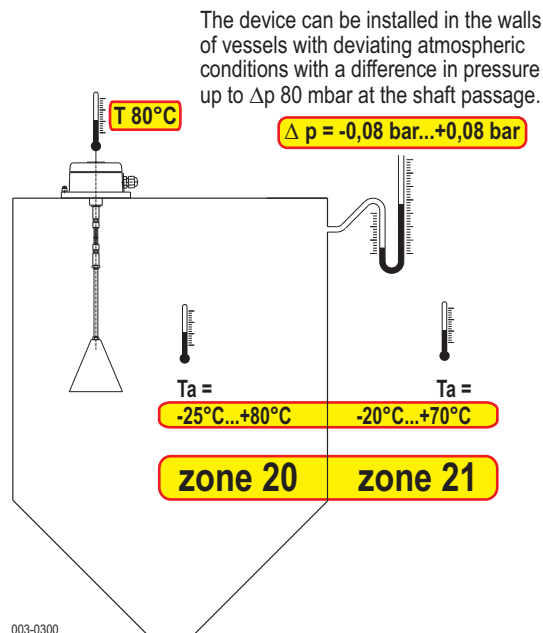
Ambient temperatures T_a

The ambient temperature T_a defines the maximum operating temperature of the indicators. Inside the vessel this is process temperature (the air or the bulk goods temperature) nearby the device.

maximum surface temperature T

The maximum surface temperature means the hottest point at the equipment.

MOLLET Füllstandtechnik GmbH Industriepark RIO 103 D-74706 Osterburken Tel. +49 62 91 64 400				NO NC	
Typ	PF B1 -KFALP1		Ex ta/tb III C T 80 °C	Contact	4 A 240 V~
Δp -0,08 bar...+0,08 bar		$-25\text{ °C} \leq T_a \leq +80\text{ °C} / -20\text{ °C} \leq T_a \leq +70\text{ °C}$			
S#	1234567890	IBExU05ATEX1174		IP66	<input type="checkbox"/>
A.-Nr.	1234567890	03/10			



Order code **B5**

Marking: II 1D / 2D

II 2G



Equipment category appropriation by zones

Pendulum level indicator for use on the boundary from zone 20 to zone 21 and in zone 1.

Ambient temperatures T_a

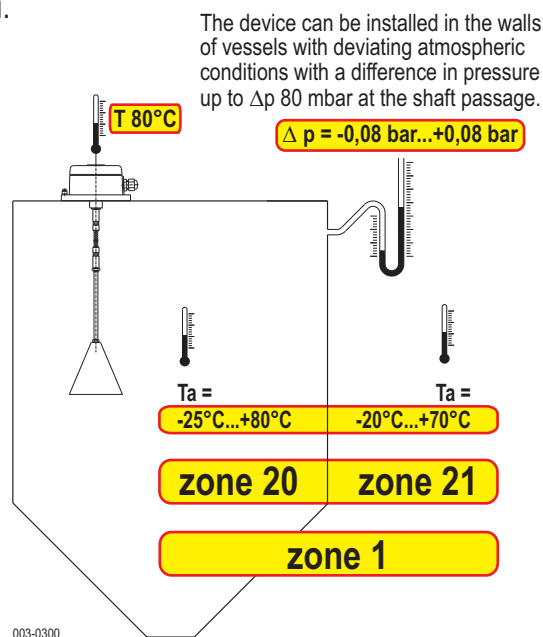
The ambient temperature T_a defines the maximum operating temperature of the indicators. Inside the vessel this is process temperature (the air or the bulk goods temperature) nearby the device.

maximum surface temperature T

The maximum surface temperature means the hottest point at the equipment.

The device matches with temperature class **T6**.

MOLLET Füllstandtechnik GmbH Industriepark RIO 103 D-74706 Osterburken Tel. +49 62 91 64 400				NO NC	
Typ	PF B5 -KFELP1		Ex ta/tb III C T 80 °C	Contact	$U_i \leq 30\text{ V}$
Δp -0,08 bar...+0,08 bar			Ex ib IIB T 6	$I_i \leq 0,1\text{ A}$	
$-25\text{ °C} \leq T_a \leq +80\text{ °C} / -20\text{ °C} \leq T_a \leq +70\text{ °C}$					
S#	1234567890	IBExU05ATEX1174		IP66	<input type="checkbox"/>
A.-Nr.	1234567890	03/10			





Special conditions and instructions for safe application

- 1.1 The installation, maintenance, initial operation, removal and repair have to be controlled resp. checked by an “authorized person” for explosion protection.
- 1.2 For the electrical connection you have to take notice of the local and statutory requirements and/or the VDE 0100.
- 1.3 Take notice of the specifications on the data plate.
- 1.4 Using the device in ambient temperatures > +60 °C, the applied connection cables have to be made for temperatures of min. +80 °C.
- 1.5 As soon as the device will be brought into the explosion hazardous area it has to be mounted immediately at the precaused place and a cable has to be brought into the cable gland.
- 1.6 The cable gland were screwed and protected at the factory. Please check if the cable gland have loosened during on the mounting or at the transport. When it is loosened, it has to be fitted again.
- 1.7 To secure the type of protection, the screw nut of the cable gland has to be fixed at the installation with a torsional force of min. 5.0 Nm.
ATTENTION! If it will be fastened too strong, the IP-protection can be affected.
- 1.8 The earth connection of the device has to be installed in such a way that mechanical damage will be excluded.
- 1.9 Using the level indicator in the silo wall under deviating atmospheric conditions, the maximum difference in pressure at the shaft passage must not exceed 80 mbar and the working temperature at the shaft passage has not to exceed +80 °C.
- 1.10 The device may put into operation with built-in cap-sealing and when it is closed, only.
- 1.11 Switch off the power supply, before opening the device. (touchdangerous voltage)
- 1.12 Tear-off danger! Don't pour on the measuring cone. In case of full indication the filling process has to be stopped immediately.
- 1.13 The cone has to be in stainless steel, in case of existing combustible dusts with a minimum ignition energy less than 3 mJ or with a minimum ignition temperature under +300 °C (BAM assessment).
- 1.14 Take notice of the requirements of DIN EN 60079-14, DIN EN 60079-17 and DIN EN 1127-1, especially regarding the dust deposits and temperatures and follow the pertinent rules and regulations.

For the version B1



- 2.1 A fuse (with max. 4A) has to be connected in series to the voltage supply.
- 2.2 Protect the signal contact from voltage peaks when inductive loads are connected.

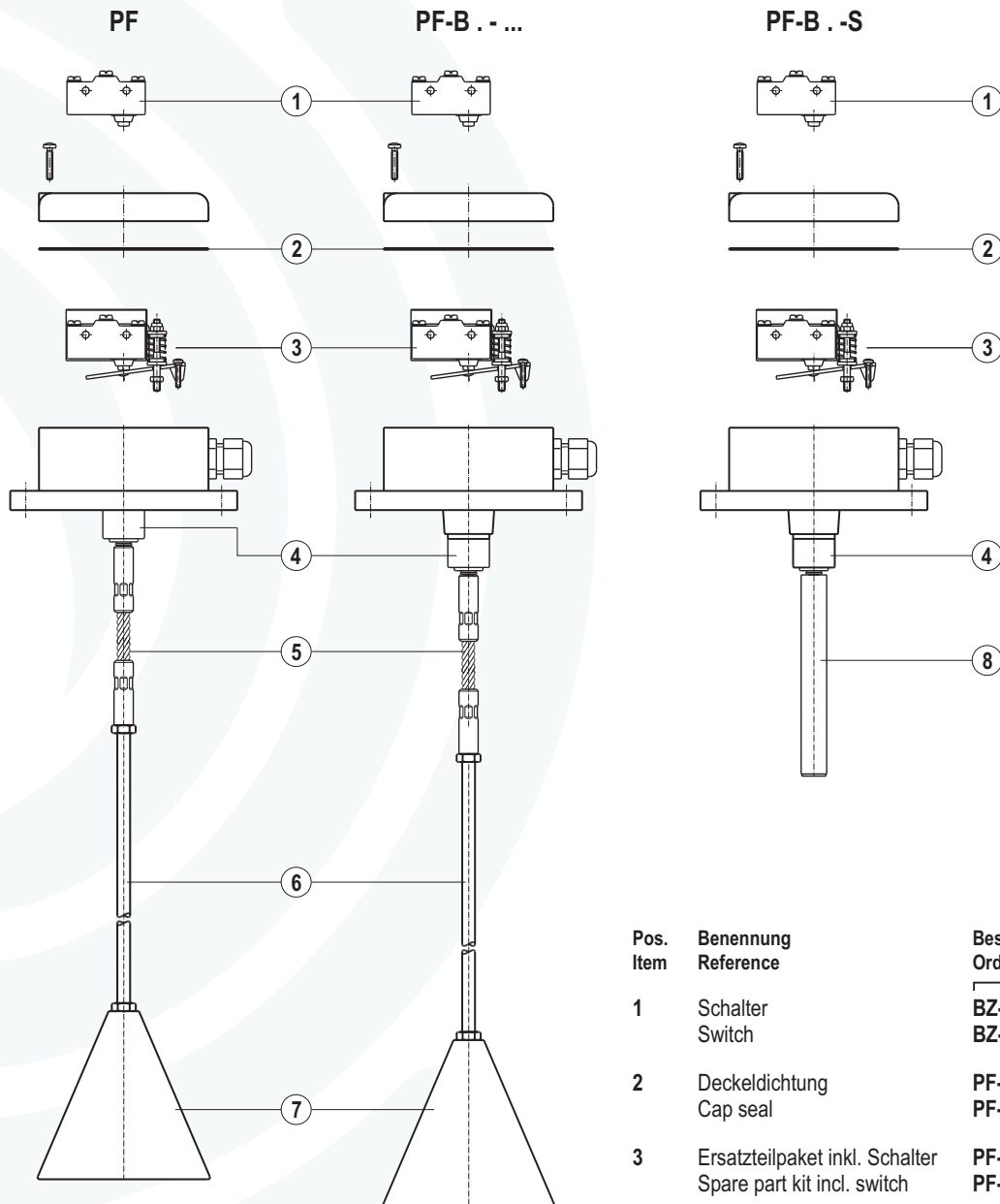
For the version B5



- 3.1 **ATTENTION!**
For load limitation a certified barrier or a certified isolation amplifier with an intrinsically safe circuit at least for the category “ib” has to be connected in series, which is certified for gases of explosion group IIB.
- 3.2 Take notice of the requirements of DIN EN 60079-14, DIN EN 60079-17 and DIN EN 1127-1, especially regarding the dust deposits and temperatures and follow the pertinent rules and regulations.
- 3.3 The device with an intrinsically safe electric circuit can be used in dusty explosive hazardous areas.
- 3.4 **Hybrid Mixtures**
The level indicator is approved for the use in hybrid mixtures.



Ersatzteile / Spare parts



003-0800

Pos. Item	Benennung Reference	Bestellcode Order code	Werkstoff Material
1	Schalter Switch	BZ-2RD-A2 BZ-2RD-A2	
2	Deckeldichtung Cap seal	PF-DS001 PF-DS001	EPDM EPDM
3	Ersatzteilpaket inkl. Schalter Spare part kit incl. switch	PF-EP001 PF-EP001	
4	Faltenbalg Folding bellow	PF-FB001 PF-FB001	NBR NBR
5	Knickschutz Buckling protector	PF-KSD01 PF-KSD01	1.4301 / 304 1.4301 / 304
6	Pendel-Stab inkl. Muttern Pendulum rod incl. nuts	PF-WE005-AL PF-WE005-AL	Aluminium Aluminium
7	Tast-Fahne (Glocke) Sensor (Cone)	PF-KF-AL PF-KF-AL	Aluminium Aluminium
8	Pendel-Stab Pendulum rod	PF-ST-NR PF-ST-NR	NBR, mit Alukern NBR, with centre of aluminium



EU-Konformitätserklärung EU-Declaration of Conformity

Wir/We

MOLLET Füllstandtechnik GmbH

Industriepark RIO 103
D-74706 Osterburken
Tel. 06291 64400 Fax 06291 9846

erklären in alleiniger Verantwortung, dass das Produkt:
declares under our sole responsibility, that the product:

Pendel-Füllstand-Grenzschalter / Pendulum limit switch
Pendel-Füllstandanzeiger / Pendulum level indicator



Typ/Type **PF...**

den folgenden Europäischen Richtlinien entspricht:
conforms with the following European directives:

Niederspannungsrichtlinie **Low voltage directive** **2014/35/EU**

Angewandte harmonisierte Normen oder normative Dokumente:
Applied harmonized standards or normative documents:

EN 61010-1:2010 **EN 60529:1991 + A1:2000 + A2:2013**

Und die Geräte mit  - Kennzeichnung entsprechen zusätzlich der folgenden Europäischen Richtlinie:
And the devices with  - marking conform additional with the following European directive:

ATEX-Richtlinie **ATEX directive** **2014/34/EU**

Je nach Ausführungsvariante angewandte harmonisierte Normen oder normative Dokumente:
Depending on the design applied harmonized standards or normative documents:

EN 60079-0:2012 + A11:2013 **EN 60079-11:2012** **EN 60079-31:2014**

EG-Baumusterprüfbescheinigungsnummer:
EU-Type Examination Certificate:

IBExU05ATEX1174

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Issued by:

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Qualitätssicherung:
Quality assurance:

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Osterburken, den 10.05.2016



Wolfgang Hageleit
Geschäftsführer / managing director

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This declaration is only allowed to hand out in unchanged form.

