Operating Instructions
Metering Pump ProMinent EXtronic® EXBb

The operating instructions contain changes in the electrical safety parameters.
It replaces all earlier operating instructions.
Please carefully read through these operating instructions in full! Do not discard!
Damaged caused by incorrect operation will invalidate the guarantee!

Please enter identcode of the device here!

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Operating Instructions Metering Pump ProMinent EXtronic® ExBb
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Subject to technical modifications.
Description of Functional Elements

1. Drive unit with electronic control and solenoid
2. Delivery connection
3. End ring
4. Liquid end
5. Vent valve (only on types 1000 - 0417 NP and PP, refer to identcode on Page 13)
6. Socket for bypass hose (only on types 1000 - 0417 NP and PP, refer to identcode on Page 13)
7. Intake connection
8. Type identification plate
9. Lamp for operation/pulse indication
10. Inspection window
11. External connection
12. Power connection
13. Power switch
14. Control for stroke length
15. Locking lever
16. Control for stroke rate
17. Transparent cover
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Notes for User

Please read the following instructions carefully. They will help you make the best use of this manual.

The following are highlighted in the text:
- Numbered points
- Instructions

Operating guidelines:

**NOTE**
Notes are intended to make your work easier.

and safety instructions:

**WARNING**
Describes a potentially hazardous situation. If not avoided may result in fatal or severe injury.

**CAUTION**
Describes a potentially hazardous situation. If not avoided, could result in slight or minor injury or damage to property.

**IMPORTANT**
Describes a potentially damaging situation. If not avoided may result in damage to property.
Metering Pump Applications

The ProMinent EXtronic® EXBb is an electronically controlled, explosion-proof diaphragm metering pump with a short-stroke solenoid.

**Liquid media**
- The pump is used for metering liquid media:
  - in explosion-threatened workplaces in zone 1, device category II 2 G of explosion group II C (EXBbG) according to VDE guidelines
  - for firedamp-threatened underground excavations in explosion group I, device category 1 M 2 (EXBbM) according to VDE guidelines
  - in explosion-threatened workplaces, class I, div. 1, group B, C and D in accordance with FM and CSA standards (under preparation)

Liquid ends made of various materials cover virtually all applications:
- Polypropylene (PP)
- PVC
- Acrylic
- PTFE-Teflon®
- Stainless steel

**Gas-emitting media**
Self-venting liquid ends made of Acrylic or PVC are available for metering gas-emitting media.

**Combustible media**
The “SB” version of the liquid end is recommended for combustible media.

**IMPORTANT**
The pump is not designed to meter gaseous media as well as solids.

**Voltages**
Versions are available for various voltages and frequencies:
- 230 V, 115 V, 500 V, 100 V und 200 V;
- 50/60 Hz.

**Compatibility**
The ProMinent EXtronic® EXBb is a continuation of the former EXBa series:
- The external dimensions and securing holes are identical and the hydraulic accessories of these series can be used.
- The liquid ends are compatible with the other diaphragm metering pumps, with the exception of versions “SB _” and “ _ M” (see Identcode page 13).
1 Safety

1.1 Notes on Safety

WARNING

- Immediately switch off the pump in the case of emergency!
- Use the pump power switch or an emergency stop switch in your working environment!
- When installing the metering pump, observe the directives for the installation of devices in explosion-threatened areas, in Europe the European Operator Guideline 99/92/EC (ATEX137), implemented in Germany with the new operating safety directive.
- When using the metering pump for metering flammable media, observe (in Europe) the European Operator Guideline 99/92/EC (ATEX 137, previously ATEX118A), implemented in Germany with the new operating safety directive and the German dangerous chemicals directive.
- Observe also all relevant standards e.g. DIN EN 60079-10/14 and DIN VDE 50020 for installations in explosion-threatened areas and DIN VDE 0118 for the installation of electrical equipment in explosion-threatened areas by day.
- Note all national directives which apply to the installation when installing outside Germany.

CAUTION

- Pumps must be accessible at all times to facilitate operation and maintenance. Do not obstruct or block access routes!
- Only specially trained and authorized persons are permitted to maintain and repair metering pumps and their peripheral equipment!
- Always depressurize the liquid end first before carrying out any work on the pump!
- If hazardous or unknown metering media are used, discharge and flush the liquid end before carrying out any work on the pump!
- Observe the safety data sheets of the metering liquids!
- Always wear protective clothing (goggles, gloves) when handling hazardous or unknown liquids! This applies in particular to working on the liquid end!
- Assembly of ProMinent® metering pumps with parts not tested and approved by ProMinent is prohibited and can result in damage to persons and property, for which no liability will be accepted!

IMPORTANT

- Adjust the stroke length only with the pump running when the load on the stroke length setting pin is relieved temporarily! Release the lock before adjusting the stroke length!
- Only use clamping rings and hose sockets suitable for the relevant hose diameter as well as genuine ProMinent hoses with the specified hose dimensions and wall thickness, otherwise the stability of the connection cannot be guaranteed!

NOTE

- Avoid reducing the hose sizes!
- Use the next higher pipe cross-section or a pulsation damper for long hose lines and media with higher viscosity!

1.2 Reference Guidelines/Standards

see EC conformity declaration
Safety / Design and Function

1.3 Tests and Approvals

Explosions protection

The conformity certificate of the DMT-Gesellschaft für Forschung und Prüfung mbH, department for the safety of electric resources, exploring drifts, can be found in the appendix.

<table>
<thead>
<tr>
<th>Device type</th>
<th>Device category</th>
<th>Explosion protection</th>
<th>Approval</th>
</tr>
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<tbody>
<tr>
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<td>II 2G</td>
<td>EEx d IIC T6</td>
<td>DMT 03 ATEX E 023</td>
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<tr>
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<td>II 2G</td>
<td>c IIC T6</td>
<td>DMT 03 ATEX E 023</td>
</tr>
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<td>II (1)G</td>
<td>EEx d [a] IIC T6</td>
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<td>c IIC T6</td>
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<td>EEx d I</td>
<td>DMT 03 ATEX E 023</td>
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<td>I M2</td>
<td>c I</td>
<td>DMT 03 ATEX E 023</td>
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<tr>
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<td>I M2(1)</td>
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<td>I M2</td>
<td>c I</td>
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<td>Class I, Div.1, Group B, C and D</td>
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<td>FMR*</td>
</tr>
<tr>
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<td>Class I, Div.1, Group B, C and D</td>
<td></td>
<td>CSA*</td>
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</table>

* Under preparation

2 Design and Function

You will find the view of the metering pump and the description of the function units on the fold-out page of the cover.

The metering pump ProMinent EXtronic® consists of the main components:

**Drive unit (1)**
- With electronic control and solenoid, power connection (10) and external/analogue connection (11);

**Delivery unit**
- End ring (3) with diaphragm which is stabilised by a steel core,
- Liquid end (4) with delivery connection (2) and intake connection (7), on types 1000-0417 NP and PP with bypass hose socket (6) and vent valve (5);

**Operator control unit**
- With lamp for operation/pulse indication (9), power switch (13), control knob for stroke length (14) with inspection window (10), locking lever (15), control knob for stroke frequency (rate) (16) and transparent cover (17).

2.1 Functional principle

Metering is based on the pulse burst principle:
- A pulse produces a magnetic field around the solenoid,
- the solenoid attracts a moving thrust piece,
- as a result, the diaphragm displaces the medium in the liquid end via a pressure control valve, the valve closes on the intake side.
- The magnetic field decays on completion of the switch-on pulse,
- the thrust piece of the solenoid is reset by a reset spring,
- the diaphragm returns to its initial position, thus initiating an intake stroke, which closes the pressure valve and the media is drawn in on the intake side.

2.2 Construction / functional description, diaphragm rupture detector

The diaphragm rupture indicator monitors the tightness of the working diaphragm. Rather than having just one working diaphragm, the EXBb liquid end with diaphragm rupture indicator has an additional diaphragm assembly, comprising the working diaphragm and an additional safety diaphragm, and is fitted with a diaphragm rupture sensor (see Fig.1).
The safety diaphragm is situated between the top plate and the spacer plate and forms a sealed interim chamber with the working diaphragm.

**Function**
It serves to monitor ruptures in the working diaphragm and protects the power end from corrosion and the environment from chemical leaks in the case of diaphragm rupture. Even after diaphragm rupture, this liquid end can continue to operate in emergency mode at full working pressure and without leaks until the diaphragm is changed.

**IMPORTANT**
If the diaphragm ruptures, an electrical signal is triggered when the system back pressure reaches approx. 2 bar.

**IMPORTANT**
Precise pump feed cannot be guaranteed after a working diaphragm rupture.

**2.3 Feed rate**
The delivery capacity is determined by the stroke length and the stroke frequency (rate).
The stroke length can be steplessly adjusted with the control knob for stroke length (14) during operation from 100 % to 10 % and then locked. The maximum stroke length is 1.25 mm, 0.63 mm for type EXb, 1000.
A setting of 0 to 110 (120) stroke/min can be set manually with the control knob for stroke frequency (rate) (16).
At a maximum stroke length and rate and a max. backpressure of 1.5 bar to 25 bar, the diaphragm-operated metering pumps deliver at a rate of 0.2 l/h to 60 l/h.
Design and Function

2.4 Versions

“Internal” version:
The control pulse is generated internally, stroke length and stroke frequency (rate) can be
adjusted manually with the control knobs on the operator control unit.

“External” version:
The control pulse is generated externally from potential-free or semiconductor contacts and
routed via the external/analog input of the drive unit; examples are contact-type water meters or
DULCOMETER® control systems.

“Analog” version:
An external analog signal is supplied via the external/analog input of the drive unit;
the stroke frequency changes proportional to the 0-20 mA or 4-20 mA signal.
In the case of “external” and “analogue” versions, the EXBbG series pumps with external/
analogue input are available in “intrinsically safe” ([IA] or “not intrinsically safe” versions, the
EXBbM series with external/analog input, “not intrinsically safe”.

Version “internal with pause function”:
As internal but with additional option of switching metering pump on/off via an external (low
voltage end) switch.
The “external”, “analogue” and “pause function” versions are available with intrinsically safe (ia)
signal cables.
### Technical Data

#### 3.1 Identcode

<table>
<thead>
<tr>
<th>EXBb</th>
<th>Series ProMinent Extronic® Version b</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Type of enclosure</td>
</tr>
<tr>
<td>G</td>
<td>Gas-explosion protection, explosion group IIC, device group/category II 2G</td>
</tr>
<tr>
<td>M</td>
<td>Mining/firedamp, and gas-explosion protection, expl. value IIIC device size/category I M2 U, II 2G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pump type</th>
<th>1000 1601 1201 0803</th>
<th>1002 0308 2501** 2502**</th>
<th>1006 0613 0417 2509**</th>
<th>1310** 0814 0430 0260</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st and 2nd digit: Backpressure [bar]</td>
<td>3rd and 4th digit: Capacity [l/h]</td>
<td>7 Type 2502 and 2509 only available in versions “SS” and “SB”</td>
<td>1 Type 1310 only available in versions “NP”, “PF4”, “SS” and “SB”</td>
</tr>
</tbody>
</table>

#### Liquid end material

| NP1 | Acrylic with vent, Viton®-B O-Ring |
| NP3 | Acrylic with vent, Viton®-B O-Ring |
| NS3 | Acrylic self-degassing, Viton®-B O-Ring |
| PP1 | PP with vent, EPDM O-Ring |
| PP4 | PP without vent/HV, EPDM O-Ring |
| PS3 | PVC self-degassing, Viton®-B O-Ring |
| SB1 | Stainless steel with internal thread, Rp 1/4" bzw. 1/2" Material No. 1.4571 |
| SSM | as SS1, with diaphragm rupture detector |
| SBM | as SB1, with diaphragm rupture detector |
| PS3 | Stainless steel with internal thread, 1/4"-NPT, PTFE-gasket Material No. 1.4571 |
| TT1 | PTFE +25 % carbon, PTFE-gasket |

#### Valve spring

| 0   | no valve spring |
| 1   | with 2 valve springs (1.4571) 0.1 bar |

#### Electrical connection

| A     | 230 V 50/60 Hz open End |
| B     | 115 V 50/60 Hz open End |
| C     | 200 V 50/60 Hz open End |
| D     | 100 V 50/60 Hz open End |
| E     | 500 V 50/60 Hz open End |

#### Control type

| 0   | internal stroke rate adjustment |
| 1   | external contact activation |
| 2   | analogue activation 0-20 mA |
| 3   | analogue activation 4-20 mA |
| 4   | external contact activation [a] |
| 5   | analogue activation 0-20 mA [a] |
| 6   | analogue activation 4-20 mA [a] |
| 7   | internal stroke rate adjustment with pause function |
| 8   | external stroke rate adjustment with pause function [a] |

#### Control variant

| 0   | with potentiometer |
| 1   | with push-button for ma. frequency |
| 2   | with switch for ma. frequency |

#### Approval/voltage/language

| 0   | BV/S-Europa/100–500 V/German |
| 1   | BV/S-Europa/100–500 V/English |
| 2   | FM-USA/100–500 V/English |
| 3   | CSA-Canada/100–500 V/English |

Viton® is a registered trademark of DuPont Dow Elastomers.
Technical Data

3.2 Dimensions and Weights

*) Vent valve and bypass only on Types 1000 - 0417 NP and PP
**) Dimensions for version „SSM“ and „SBM“ + 15 mm on version SS or SB

<table>
<thead>
<tr>
<th>Pump type / material</th>
<th>dimensions in mm</th>
<th>Ø D</th>
<th>Ø E</th>
<th>Ø F</th>
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<td>1002, 0308, 2502, 2505, 1006 NP3</td>
<td>391 136 61 85 8x5 50 237</td>
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<td>1310, 0613</td>
<td>391 136 52 100 8x5 66 244</td>
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<td>0814, 0417</td>
<td>391 136 52 100 12x9 66 244</td>
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<td>0430</td>
<td>391 137 46 135 DN10 117 304</td>
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*) see diagram

***) see diagram

Version „NS, PS“

Version „SB“
## Technical Data

### Pump type

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<th>Pump type</th>
<th>Material</th>
<th>Weight</th>
<th>EXBbG</th>
<th>EXBbM</th>
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</thead>
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<td>1000, 2501, 1601, 1201, 0803, 1002, 0308</td>
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<td>approx. 26/30 kg</td>
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</tr>
<tr>
<td>2502, 1006, 0613, 0417</td>
<td>NP, PP, TT, SS, SB</td>
<td>approx. 13/17 kg</td>
<td>approx. 27/31 kg</td>
<td></td>
</tr>
<tr>
<td>2505, 1310, 0814, 0430, 0260</td>
<td>NP, PP, TT, SS, SB</td>
<td>approx. 16/20 kg</td>
<td>approx. 33/34 kg</td>
<td></td>
</tr>
</tbody>
</table>

### 3.3 Capacity data

<table>
<thead>
<tr>
<th>Pump type</th>
<th>max. Capacity at max. backpressure</th>
<th>max. Capacity at medium backpressure</th>
<th>Stroke rate</th>
<th>Connection size</th>
<th>Suction lift*</th>
<th>Priming lift**</th>
<th>Perm. admission pres. intake side</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXBb</strong></td>
<td>bar</td>
<td>l/h</td>
<td>ml/stroke</td>
<td>bar</td>
<td>l/h</td>
<td>ml/stroke</td>
<td>strokes/min</td>
</tr>
<tr>
<td>1000</td>
<td>10</td>
<td>0.19</td>
<td>0.027</td>
<td>5</td>
<td>0.27</td>
<td>0.038</td>
<td>120</td>
</tr>
<tr>
<td>2501</td>
<td>25</td>
<td>1.14</td>
<td>0.15</td>
<td>16</td>
<td>1.3</td>
<td>0.18</td>
<td>120</td>
</tr>
<tr>
<td>1601</td>
<td>16</td>
<td>1.00</td>
<td>0.14</td>
<td>8</td>
<td>1.3</td>
<td>0.28</td>
<td>120</td>
</tr>
<tr>
<td>1201</td>
<td>12</td>
<td>1.70</td>
<td>0.23</td>
<td>6</td>
<td>2.0</td>
<td>0.28</td>
<td>120</td>
</tr>
<tr>
<td>0803</td>
<td>8</td>
<td>3.70</td>
<td>0.51</td>
<td>4</td>
<td>3.9</td>
<td>0.54</td>
<td>120</td>
</tr>
<tr>
<td>1002</td>
<td>10</td>
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<td>0.31</td>
<td>5</td>
<td>2.7</td>
<td>0.38</td>
<td>120</td>
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<tr>
<td>0308</td>
<td>3</td>
<td>8.60</td>
<td>1.20</td>
<td>1.5</td>
<td>10.3</td>
<td>1.43</td>
<td>120</td>
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<tr>
<td>2502</td>
<td>25</td>
<td>2.00</td>
<td>0.28</td>
<td>20</td>
<td>2.2</td>
<td>0.31</td>
<td>120</td>
</tr>
<tr>
<td>2505</td>
<td>25</td>
<td>4.20</td>
<td>0.64</td>
<td>20</td>
<td>4.8</td>
<td>0.73</td>
<td>110</td>
</tr>
<tr>
<td>1006</td>
<td>10</td>
<td>6.00</td>
<td>0.83</td>
<td>5</td>
<td>7.2</td>
<td>1.00</td>
<td>120</td>
</tr>
<tr>
<td>1310</td>
<td>13</td>
<td>10.50</td>
<td>1.59</td>
<td>6</td>
<td>7.7</td>
<td>1.2</td>
<td>120</td>
</tr>
<tr>
<td>0613</td>
<td>6</td>
<td>13.10</td>
<td>1.82</td>
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<td>14.9</td>
<td>2.07</td>
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<tr>
<td>0417</td>
<td>3.5</td>
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<td>2.42</td>
<td>2</td>
<td>17.9</td>
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<td>120</td>
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<tr>
<td>0430</td>
<td>3.5</td>
<td>27.00</td>
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<td>2</td>
<td>29.5</td>
<td>4.47</td>
<td>110</td>
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<tr>
<td>0260</td>
<td>1.5</td>
<td>60.00</td>
<td>9.09</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>110</td>
</tr>
</tbody>
</table>

Type 1000
Type 2502, 2505, 1310 only in version NP and SS

### Metering pumps for high viscosity media “HV”

<table>
<thead>
<tr>
<th>EXBb</th>
<th>bar</th>
<th>l/h</th>
<th>ml/stroke</th>
<th>bar</th>
<th>l/h</th>
<th>ml/stroke</th>
<th>strokes/min</th>
<th>Ø x i Ø</th>
<th>m Wc</th>
<th>m Wc</th>
<th>bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1002</td>
<td>10</td>
<td>2.30</td>
<td>0.31</td>
<td>5</td>
<td>2.7</td>
<td>0.38</td>
<td>120</td>
<td>DN10</td>
<td>1</td>
<td>-</td>
<td>3.0</td>
</tr>
<tr>
<td>1006</td>
<td>10</td>
<td>6.00</td>
<td>0.83</td>
<td>5</td>
<td>7.2</td>
<td>1.00</td>
<td>120</td>
<td>DN15</td>
<td>1.3</td>
<td>-</td>
<td>3.5</td>
</tr>
<tr>
<td>1310</td>
<td>10</td>
<td>10.50</td>
<td>1.59</td>
<td>6</td>
<td>11.9</td>
<td>1.80</td>
<td>110</td>
<td>DN15</td>
<td>1.9</td>
<td>-</td>
<td>2.0</td>
</tr>
<tr>
<td>0814</td>
<td>8</td>
<td>14.00</td>
<td>2.12</td>
<td>5</td>
<td>15.4</td>
<td>2.33</td>
<td>110</td>
<td>DN15</td>
<td>2</td>
<td>-</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### Metering pumps with self-degassing liquid end***

<table>
<thead>
<tr>
<th>EXBb</th>
<th>bar</th>
<th>l/h</th>
<th>ml/stroke</th>
<th>bar</th>
<th>l/h</th>
<th>ml/stroke</th>
<th>strokes/min</th>
<th>Ø x i Ø</th>
<th>m Wc</th>
<th>m Wc</th>
<th>bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1601</td>
<td>16</td>
<td>0.66</td>
<td>0.09</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>120</td>
<td>6x4</td>
<td>1.8</td>
<td>0.2</td>
<td>2.0</td>
</tr>
<tr>
<td>1201</td>
<td>12</td>
<td>1.0</td>
<td>0.14</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>120</td>
<td>6x4</td>
<td>2.0</td>
<td>0.2</td>
<td>2.0</td>
</tr>
<tr>
<td>0803</td>
<td>8</td>
<td>2.4</td>
<td>0.33</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>120</td>
<td>6x4</td>
<td>2.8</td>
<td>0.2</td>
<td>2.0</td>
</tr>
<tr>
<td>1002</td>
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<td>120</td>
<td>6x4</td>
<td>2.0</td>
<td>0.2</td>
<td>2.0</td>
</tr>
</tbody>
</table>

---

* Suction lift: with intake line filled
** Priming lift: with intake line not filled
*** The specified performance data are guaranteed minimum values determined with water at room temperature.
3.4 Accuracies
-5 % +15 %
at max. stroke length and max. backpressure,
in all material versions.
Better than ± 2 %
under constant conditions and min. 30 % stroke length;
observing following notes:
• All specifications refer to metering measurements with water at 20 °C.
• Constant backpressure, above 1 bar if possible.
• If metering takes place via a free outlet, a pressure retention valve must be used to generate
a backpressure of min. 1.5 bar (refer to the installation examples).
• Wherever possible, lay intake and metering lines with a constant rising gradient.
• If the liquid level of the supply tank is above the pump during operation, admission pressure
will be applied on the intake side; in this case, the backpressure should be so high that there
is a minimum differential pressure of 1.5 bar otherwise a pressure retention valve or a spring-
loaded injection valve with corresponding admission pressure must be used.

NOTE
A pressure retention valve or a spring-loaded injection valve is not an absolutely tight-
closing shut-off element. For this reason, an intake valve which is closed when the
metering pump is at a standstill, must be installed if admission pressure is applied on the
intake side.

3.5 Material Specifications

<table>
<thead>
<tr>
<th>Liquid end</th>
<th>PP1</th>
<th>PP4</th>
<th>PC5</th>
<th>NP1/NP3</th>
<th>NS3</th>
<th>PS3</th>
<th>TT1</th>
<th>SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene</td>
<td>Polypropylene</td>
<td>PVC</td>
<td>Acrylic</td>
<td>Acrylic</td>
<td>PVC</td>
<td>PTFE with carbon</td>
<td>Stainless steel</td>
<td>1.4404</td>
</tr>
<tr>
<td>Intake-/ delivery connection</td>
<td>Polypropylene</td>
<td>Polypropylene</td>
<td>PVC</td>
<td>PVC</td>
<td>PVC</td>
<td>PTFE with carbon</td>
<td>Stainless steel</td>
<td>1.4404</td>
</tr>
<tr>
<td>Seals</td>
<td>EPDM</td>
<td>EPDM</td>
<td>FPM-A</td>
<td>FPM-A/B</td>
<td>FPM-B</td>
<td>PTFE</td>
<td>PTFE</td>
<td></td>
</tr>
<tr>
<td>Balls Ø 6-D 12</td>
<td>Ceramic</td>
<td>—</td>
<td>Ceramic</td>
<td>Ceramic</td>
<td>Ceramic</td>
<td>Ceramic</td>
<td>Ceramic</td>
<td></td>
</tr>
<tr>
<td>Balls DN10-DN15</td>
<td>Ceramic</td>
<td>—</td>
<td>Duran</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Ceramic</td>
<td></td>
</tr>
</tbody>
</table>

Type 1000 with ceramic seat rings in all material versions.
PP4 with Hastelloy C valve springs.
DEVELOPAN® metering diaphragm with PTFE base in all versions.
FPM-A (Viton®-A), FPM-B (Viton®-B) and Duran (laboratory glass) are registered trademarks.

3.6 Electrical Data

3.6.1 Electrical data for "not intrinsically safe" version
Supply circuit
Rated voltage 100, 115, 200, 230 and 500 + - 10 % VAC
Maximum** power consumption $P_{\text{effe}}$ 1.5 A
Max. peak current at pulse $I_{\text{peak}}$ 8 A
Maximum** power consumption $P_{\text{effe}}$ 50 W

Control circuit
voltage max. 6 V
Current max. 30 mA

3.6.2 Electrical data, "intrinsically safe" version
Supply circuit
rated voltage, intrinsically safe: 100, 115, 200, 230 + - 10%, 500 +6 -10% VAC
Maximum power consumption $I_{\text{max}}$ as 1.5 A
Max. peak current at pulse $I_{\text{peak}}$ as 8 A
Maximum** power consumption $P_{\text{effe}}$ as 50 W
Technical data

Control circuit

Default value of all types: “ia”:

- Maximum output voltage: \( U_0 = 7.14 \text{ V} \)
- Maximum output current: \( I_0 = 5 \text{ mA} \)
- Maximum output power: \( P_0 = 23.3 \text{ mW} \)
- Internal resistance: \( R_i = 4296 \Omega \)
- Maximum external inductance: \( L_0 = 1 \text{ H} \)
- Maximum external capacity: \( C_0 = 13.5 \mu \text{F} \)

For connection of an intrinsically safe circuit:

- Maximum input current: \( I_i = 280 \text{ mA} \)
- Maximum input voltage: \( U_i = 30 \text{ V} \)
- Maximum input power: \( P_i = 2 \text{ W} \)
- Effective inner self-inductance: \( L_i = \text{negligible} \)
- Effective inner capacity: \( C_i = \text{negligible} \)

3.6.3 Electrical data, “intrinsically safe” diaphragm rupture detector

<table>
<thead>
<tr>
<th>Diaphragm rupture detector</th>
<th>Set voltage ( U_0 )</th>
<th>8 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set voltage ( U_0 )</td>
<td>8 V DC</td>
<td></td>
</tr>
<tr>
<td>Normal power consumption</td>
<td>( \leq 1 \text{ mA} )</td>
<td></td>
</tr>
<tr>
<td>Power consumption in the event of a diaphragm rupture</td>
<td>( \leq 3 \text{ mA} )</td>
<td></td>
</tr>
<tr>
<td>Effective internal capacity ( C_i )</td>
<td>( \leq 30 \mu \text{F} )</td>
<td></td>
</tr>
<tr>
<td>Effective internal conductance ( L_i )</td>
<td>( \leq 50 \mu \text{H} )</td>
<td></td>
</tr>
</tbody>
</table>

3.6.4 Electrical data, details

<table>
<thead>
<tr>
<th>Pump type</th>
<th>Voltage V</th>
<th>Power supply (V)</th>
<th>Max. power consumption [A]</th>
<th>Effective power consumption (W)</th>
<th>Average power consumption (W)</th>
<th>Fuse F1* value (A)/type</th>
<th>Fuse F2** value (A)/type</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXBG</td>
<td>100</td>
<td>100</td>
<td>1.6</td>
<td>0.27</td>
<td>1.0T</td>
<td>0.16T</td>
<td></td>
</tr>
<tr>
<td>EXBG</td>
<td>115</td>
<td>115</td>
<td>1.4</td>
<td>0.29</td>
<td>0.6T</td>
<td>0.16T</td>
<td></td>
</tr>
<tr>
<td>EXBG</td>
<td>200</td>
<td>200</td>
<td>0.7</td>
<td>0.14</td>
<td>0.4T</td>
<td>0.16T</td>
<td></td>
</tr>
<tr>
<td>EXBM</td>
<td>230</td>
<td>230</td>
<td>0.3</td>
<td>0.15</td>
<td>0.28</td>
<td>0.16T</td>
<td></td>
</tr>
<tr>
<td>EXBM</td>
<td>500</td>
<td>500</td>
<td>0.3</td>
<td>0.09</td>
<td>0.14</td>
<td>0.16T</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**

Only the effective power consumption is specified on the rating plate.

3.7 Mechanical data, cables

<table>
<thead>
<tr>
<th>Pump type</th>
<th>Voltage V</th>
<th>Cable type</th>
<th>Colour</th>
<th>outer Ø mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXBG</td>
<td>to 250</td>
<td>H07 RNF 3G1.5</td>
<td>black</td>
<td>10.0</td>
</tr>
<tr>
<td>EXBG</td>
<td>&gt; 250</td>
<td>NSSHOU 3x1.5</td>
<td>yellow</td>
<td>12.5</td>
</tr>
<tr>
<td>EXBM</td>
<td>all</td>
<td>NSSHOU 3x1.5</td>
<td>yellow</td>
<td>14.0</td>
</tr>
<tr>
<td>EXBG</td>
<td>&lt; 60</td>
<td>Ölflex 110</td>
<td>grey</td>
<td>6.3</td>
</tr>
<tr>
<td>EXBG (a)</td>
<td>&lt; 60</td>
<td>Ölflex EB</td>
<td>blue</td>
<td>5.9</td>
</tr>
<tr>
<td>EXBM</td>
<td>&lt; 60</td>
<td>Ölflex NGP</td>
<td>grey</td>
<td>11.4</td>
</tr>
</tbody>
</table>

In “FM”- and “CSA” version H07 RNF up to 500 V, the cable aperture has a 1/2” NPT internal thread for connection to the North American supply system.
3.8 Ambient conditions

Admissible storage temperature: -20 °C to +50 °C
Admissible ambient temperature: -20 °C to +45 °C
Admissible chemical temperature: -10 °C to +35 °C (in accordance with IEC 335-2-41)

<table>
<thead>
<tr>
<th>Temperature resistance of material versions</th>
<th>PP</th>
<th>NP</th>
<th>TT</th>
<th>SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long term at max. back pressure</td>
<td>50 °C</td>
<td>45 °C</td>
<td>50 °C</td>
<td>50 °C</td>
</tr>
<tr>
<td>Max. 15 min at max. 2 bar</td>
<td>100 °C</td>
<td>80 °C</td>
<td>120 °C</td>
<td>120 °C</td>
</tr>
</tbody>
</table>

Climate conditions
- Admissible humidity: 92 % non condensing
- Behaviour in damp alternating climate: DIN IEC 60068-2-3

Enclosure rating: IP 65

Sound intensity level: ≤ 70 dB (A), 1 m Abstand

4 Unpacking

NOTE
Polystyrene parts are recyclable. They do not belong in the household waste!

- It is advisable to keep the outside packing complete with the polystyrene parts in order to be able to return the metering pump in the case of repairs and warranty claims.
- Compare your delivery note with the packed contents.
- Check whether the data on the type identification plate (8) of the metering pump agree with your order data!
- Should any problems arise, contact your ProMinent dealer or representative. You will find the addresses on the back page of these operating instructions.
- Always specify the identity code and the serial number which you will find on the type identification plate when making any inquiries or ordering spare parts. In this way, the pump type and material variants can be clearly identified.

Scope of delivery
- Metering pump with power cable
- Operating instructions with conformity certificate

5 Mounting and Installation

WARNING
- When installing the metering pump, observe the directives for the installation of devices in explosion-threatened areas, in Europe the European Operator Guideline 99/92/EC (ATEX137), implemented in Germany with the new operating safety directive.
- When using the metering pump for metering flammable media, observe (in Europe) the European Operator Guideline 99/92/EC (ATEX 137, previously ATEX118A), implemented in Germany with the new operating safety directive and the German dangerous chemicals directive.
- Observe valid national regulations when installing the pump abroad!
- Remove all traces of water from the liquid end before starting operation with media which must not come in contact with water! The metering pump may still have water residue in the liquid end from the tests carried out at the factory.

5.1 Installing Metering Pump

IMPORTANT
- Secure the pump such that no vibrations can occur.
- Ensure free access to facilitate operation and maintenance.
- The valves of the liquid end must be in vertical position!
- The metering pump must be secured with screws and washers Ø 6 mm on a horizontal, firm base.
5.2 Installing Hose Lines

**IMPORTANT**

- Lay and secure intake and delivery lines such that they cannot chafe.
- Lay intake and delivery lines such that they are free of mechanical stress.
- Arrange all lines such that the pump and liquid end can be removed laterally if required.
- When metering extremely aggressive or hazardous media, a venting facility with return into the supply tank as well as a shut-off valve must be provided on the delivery and intake sides.
- Ensure all connections are tight: only use the clamping rings and hose sockets as specified for the relevant hose diameter, only use original hoses with specified hose dimensions and wall thickness.
- Avoid reductions in hose sizes: use the next higher line cross-section for long hose lines and viscous media or install a compressed air vessel or diaphragm pulsation damper!

**Fitting Hose lines**

► Remove plug if fitted in the intake/delivery connection.
► Cut end of hose straight.
► Fit union nut and clamping ring over hose.
► Fit end of hose as far as it will go over socket widen end if necessary.
► Fit hose with socket on to valve.
► Clamp hose connection: Firmly tighten union nut while at the same time pressing down hose.
► Retighten hose connection: Pull the hose line secured at the liquid end and then tighten the union nut once again.

**Fitting stainless steel pipe connections**

► Fit union nut and clamping rings on to pipe with a projection of approx. 10 mm.
► Fit pipe as far as it will go into valve.
► Firmly tighten union nut.

**Fitting PE or PTFE lines on stainless steel valves**

► Additionally fit a stainless steel support sleeve in the plastic sleeve.
5.2.1 Installing the Intake Line

**NOTE**
- The intake line should be as short as possible.
- Fit intake line in upright position in order to avoid air bubbles forming.
- Wherever possible use pipe bends and not elbows for bends in the intake line.
- Select cross section and length such that the vacuum which occurs during intake does not reach the vapour pressure of the medium to be metered. In extreme cases, excessively high vacuum on the intake side is reflected in collapse of the liquid column or by an incomplete return stroke.
- Do not exceed the permissible admission pressure on the intake side.
- Note: Suction lift x medium density ≤ max. suction lift in m water column
- Refer to the installation examples.

![Installing foot valve](image)

- Cut the free end of the intake line to size such that the foot valve just hangs over the bottom of the tank. In the case of metered solutions with impurities or bottom deposits, the foot valve should be located at an adequate distance above the tank bottom or bottom deposits.

5.2.2 Installing the Delivery Line

**IMPORTANT**
- A multiple of the maximum operating pressure can build up if the metering pump is operated against a closed shut-off element on the delivery side. This can cause the delivery line to burst!
- An overflow valve should be installed in order to avoid this, e.g., a ProMinent multi-function valve.
- Install the delivery line such that the pressure peaks during the metering stroke do not exceed the max. permissible operating pressure. Check length and cross-section.
- If necessary, install an overflow valve, compressed air vessel or diaphragm pulsation damper.
- Refer to installation examples!

When metering with atmospheric discharge, a metering valve with 0.5 bar response pressure should be mounted at the end of the line. Or a back-pressure valve should be mounted directly onto the liquid end in order to create and maintain a counter-pressure of approx. 1.5 bar.

If the level of the fluid of the supply tank is above the pump in operating condition, the response pressure is on the suction end. In this case the counter-pressure should be sufficiently high such that a minimum differential pressure of 1.5 bar exists. If this is not the case a back-pressure valve or a spring-loaded metering valve with the respective response pressure should be used.

**NOTE**
- A back-pressure valve or a spring-loaded metering valve is not an absolutely leakproof shut-off device!
- On the suction end a stop valve is therefore to be installed which is closed when the metering pump is idle.

5.2.3 Installing the Bypass Vent Line (see fold-out page)

The liquid end of the pump types 1000 - 0417 NP and PP is equipped with a vent valve (5) with bypass (6).

The admission pressure on the intake side must be at least the same pressure as in the bypass line. Operation is not possible with admission pressure in the bypass and no pressure on the intake side.

- Fit hose line with $d_{\text{excess}} = 4$ mm (max. 6 mm) on to bypass hose socket, PVC-soft 6x4 is recommended.
- Secure PE lines with a cable tie to prevent them slipping.
- Route the free end of the line back into the metering tank.
- Cut the bypass line to size such that it is not submerged in the metering medium.
5.3 Installation Examples, Mechanical/Hydraulic

Symbols

- Oscillating diaphragm metering pump
- Foot valve
- Shut-off valve
- Pressure gauge
- Solenoid Valve (closed when pump switched off)
- Injection valve
- Pressure retention valve/overflow valve
- Pressure retention valve (adjustable)
- Compressed air vessel

Standard installation

Metering with free outlet and small delivery head

... and large delivery head

... and admission pressure on intake side

Installation to avoid lift-through of hazardous media
Mounting and Installation

Installation together with air vessel with long lines and for low-pulsation metering

... in a delivery line

... with free outlet

... without after-running

To protect against overpressure

Metering in vacuum or intake line

Injection valve with re-inforced spring or DHV

Do not install like this:
Intake line cannot be vented!

Do not install like this:
Intake line too high!

Do not install like this:
Free flow!

Do not install like this:
Compressed air vessel not effective!
5.4 Electrical Installation

**IMPORTANT**

- The metering pump must be electrically installed by authorised, “skilled” personnel only.
- When installing the metering pump, observe the directives for installation of devices in explosion-threatened areas, in Europe the European Operator Guideline 99/92/EC (ATEX137), implemented in Germany by the new operating safety directive.
- Observe the relevant standards e.g. DIN EN 60079, DIN EN 50020 DIN VDE 0165 and/or 0118 “Erecting electrical equipment in explosion-threatened areas”.
- Note all national directives which apply to the installation when installing outside Germany.
- Intrinsically safe installations must be checked by persons with “recognised qualifications”.
- Do not connect mains power supply to the external terminal (11).
- The internally used fusible link has a breaking capacity of 1,500A. If the short-circuit current in the supply network ma be larger than 1,500A, the pump is to be protected with a suitable back-up fuse with a higher breaking capacity (rated current smaller than 1,500A).
- Note all national directives which apply to the installation when installing outside Germany.
- Intrinsically safe installations must be checked by persons with “recognised qualifications”.
- Do not connect mains power supply to the external terminal (11).
- The internally used fusible link has a breaking capacity of 1,500A. If the short-circuit current in the supply network ma be larger than 1,500A, the pump is to be protected with a suitable back-up fuse with a higher breaking capacity (rated current smaller than 1,500A).

**Power connection**

Electrical data see 3.6

The connection terminal (23) for the equipotential bonding conductor is located on the housing next to the power supply terminal (12).

**Induction voltage**

If the pump is connected to the power supply parallel to inductive loads (e.g. solenoid valve, motor), it must be electrically isolated from these loads in order to avoid damage caused by induction voltages when switching off.

- Use several contacts for power supply via auxiliary contactor or relay.
- In the 100-V- to 230-V-versions, connect a varistor (U_N = 275 V) or RC-element (0,22 mF/220 W) in parallel.

**Switching on**

With power switch (13), a power switch must be provided by the customer for the 500 V version.
Mounting and Installation / Operation

External, contact, analogue and pause input, not intrinsically safe
EXBbG Input+ black (1)
Input- black (2)

EXBbM Input+ blue
Input- black

External, contact, analogue and pause input intrinsically safe, sheath colour blue.
EXBbG und EXBbM: Input (+) = brown (1)
Input (+) = blue (2)

El. terminal for diaphragm rupture detector, intrinsically safe, sheath colour blue.
ExBbG und EXBbM: Alarm, blue
GND+, brown

6 Operation
6.1 Start-Up

WARNING
- Always wear protective goggles and protective clothing when handling hazardous media!
- The metering pump may still contain water residue in the liquid end from the tests carried out at the factory. All water must be removed from the liquid end before start-up in the case of media which must not come in contact with water!

NOTE
- Carry out all settings only with the pump in operation.
- Release the lock before adjusting the stroke length!
- The intake head with the liquid end empty is dependent on the stroke volume: The pump intake should be set at stroke length = 100%. Select the intake head correspondingly smaller if the pump is to be discharged at a lower setting without changing the stroke length and is to be placed into operation again self-priming.
- Pump intake is not possible against backpressure
- Absolutely reliable metering cannot be guaranteed after a pump down period. Regular monitoring is necessary!

Before start-up
- Check function of pressure relief valves.
- Check pump connections and pipe connections for leaks.

Remove water from liquid end when handling media which must not come in contact with water:
- Turn pump through 180°.
- Empty liquid end.
- Flush with a suitable medium from above through the intake connection.

Filling liquid end without vent valve:
- Connect intake line but do not yet connect the delivery line to the liquid end.
- Switch on pump with power switch (13) and operate at max. stroke length and stroke rate until liquid end is filled completely and free of bubbles.
- Switch off pump with power switch (13).
- Connect delivery line to liquid end.
The pump is now ready for operation.
Filling liquid end

**Rough venting**

- Connect intake and delivery line to liquid end.
- Connect bypass line.
- Open vent valve (5) by one turn of the star knob in counterclockwise direction; the routes for rough venting via the bypass (6) is now clear.
- Switch on pump with power switch (13) and operate at max. stroke length and stroke rate until liquid end is filled completely and free of bubbles (when the medium is visible in the venting or metering line).
- Close vent valve.
- Switch off pump with power switch (13).

The pump is now ready for operation.

**Setting fine vent metering gas-emitting media:**

**NOTE**

- A part of the metered quantity is constantly routed back into the supply tank.
- The return quantity should be approx. 20 % of the metered quantity.
- The media must be low-viscous (thin-bodied) and without solids.
- If the return flow line ends above the liquid level, the precision vent valve acts as a vacuum breaker and prevents discharge of the supply tank if a vacuum builds up in the metering line.
- Retighten the screws in the liquid end after 24 hours of operation.

- Remove star knob from vent valve (5).
- Using a screwdriver, turn screw in vent valve approx. 1 turn in counterclockwise direction.
- Fit star knob on vent valve (5).

Venting liquid end

**HV version:**

Initial intake and venting is impaired to a certain extent by the valves and valve springs which are still dry. Therefore select the shortest possible intake head or vent the liquid end with inlet or admission pressure on the intake side.

If not successful, shortly operate pump without valve spring in the pressure valve:

- Unscrew delivery connection and press away ball from O-ring.
- Fill liquid end with water or suitable liquid.
- Fit delivery connection without valve spring.
- Fit short piece of PVC hose (100 mm) on to hose socket, half fill with water.
- Operate pump at max. stroke length until metering is visible in the hose.
- Re-install valve spring – avoid twisting by fitting an approx. 4 mm Ø drift through the pressure valve in order to hold the spring in the centre position.
- Reconnect delivery line.

Venting liquid end

*when pump delivers in a pressure system and has drawn in air:*

- Set venting on delivery side: Release metering line or open vent valve.
- Switch on pump and vent at stroke length 100 %.

6.2 Determining the Delivery Capacity

The actual delivery capacity is dependent on the stroke length, stroke frequency (rate) and backpressure in the metering line. The relationship between capacity/stroke length/stroke frequency (rate) is illustrated in the nomogram for each type of pump. A correction factor can be read off from the diagram which shows the change in capacity referred to backpressure.

The measurements for determining the nomograms were conducted with water and the correction factor was determined at a stroke length of 70 %. The capacity scatter over all material versions is -5 % to +15 %.
Select the required capacity within the value range of the pump type (see capacity data).
Select the nomogram and diagram of the pump type.
Mark the backpressure in the metering system on the abscissa and read off the corresponding correction factor on the ordinate.
Divide the required capacity by the correction factor.
Using a ruler, mark the determined capacity on the middle scale of the nomogram.
Draw a line across all three scales – as horizontal as possible, however, such that the line intersects at least one of the two outer scales; where possible, select a graduation with a large value on the stroke length scale.

The point of intersection of the line with the right-hand scale shows the stroke frequency (rate) to be set, the point of intersection of the line with the left-hand scale shows the stroke length to be set.

Capacity with mean backpressure: 11.9 l/h (see capacity data)
Required capacity: 6 l/h
Backpressure: 8 bar
→ Correction factor as per diagram: 0.9
→ Capacity to be set: 6 l/h
0.9 = 6.66 l/h
→ Stroke length as per nomogram: 80 %
→ Stroke rate as per nomogram: 80 stroke/min

NOTE
• Select large stroke length and low stroke rate for highly viscous and gas-emitting media.
• Use self-venting liquid end for gas-emitting media with viscosity ≤ 20 mPa s.
• Select a shorter stroke length and high stroke rate for effective mixing.
• For a precise dosing, choose metering-stroke of not less than 30 %.
  At max. pressure stroke length
  ➞ 60 % for type 1601,
  ➞ 40 % for type 1201 and 1002,
  ➞ 20 % for type 0803;
the stroke length can be reduced further at lower pressure.
• Set the stroke length greater for pumps with the precision vent open

Operating
6.3 Nomograms

**EXBb_1000**

Capacity dependent on backpressure
- Capacity 0.37 l/h at medium backpressure of 6 bar
- Capacity 0.19 l/h at max. backpressure of 10 bar

**EXBb_2501**

Capacity dependent on backpressure
- Capacity 1.30 l/h at medium backpressure of 16 bar
- Capacity 1.10 l/h at max. backpressure of 25 bar
Operating

**EXBb_1601**

Capacity dependent on backpressure

- Capacity 1.30 l/h at medium backpressure of 8 bar
- Capacity 1.00 l/h at max. backpressure of 16 bar

**EXBb_1201**

Capacity dependent on backpressure

- Capacity 2.00 l/h at medium backpressure of 6 bar
- Capacity 1.70 l/h at max. backpressure of 12 bar
Capacity dependent on backpressure

Capacity 10.30 l/h at medium backpressure of 1.5 bar
Capacity 8.70 l/h at max. backpressure of 3 bar

Capacity dependent on backpressure

Capacity 2.20 l/h at medium backpressure of 20 bar
Capacity 2.00 l/h at max. backpressure of 25 bar
Operating

EXBb_1310

Capacity dependent on backpressure
Capacity 11.90 l/h at medium backpressure of 6 bar
Capacity 10.50 l/h at max. backpressure of 13 bar

EXBb_0613

Capacity dependent on backpressure
Capacity 14.90 l/h at medium backpressure of 3 bar
Capacity 13.10 l/h at medium backpressure of 6 bar
Capacity dependent on backpressure

Capacity 15.40 l/h at medium backpressure of 5 bar
Capacity 14.00 l/h at max. backpressure of 8 bar

Correction factor

Backpressure (bar)
Capacity dependent on backpressure
Capacity 29.50 l/h at medium backpressure of 2 bar
Capacity 27.00 l/h at max. backpressure of 3.5 bar
Capacity 60.00 l/h at max. backpressure of 1.5 bar
6.4 Setting the Delivery Capacity

NOTE
Adjust the stroke length only with the pump running!
The adjustment of the stroke length control knob will be varied if the stroke length control knob (14) is turned without previously releasing the lock (15).
Defective metering is possible if the notes on setting are disregarded.

Installation and commissioning of the pump are concluded.
The setting values have been determined by means of nomograms.

Switching on
► Switch on pump with power switch (13).
Open transparent cover (17)

Setting stroke length
► Release the lock before setting the stroke length:
Press up the locking lever (15).
► Adjust determined stroke length with the control knob (14) the ring scale on the control knob (14) has a graduation of 0.01 mm, the stroke length is indicated in mm in the inspection window (10). The total setting range for the stroke length is 0 to 1.25 mm (0.63 mm for pump type 1000), i.e. only the settings 0 and 1 are possible in the inspection window (10).
► Lock stroke length control knob (14): Press down locking lever (15).

Setting stroke rate
► Adjust determined stroke rate with the control knob (16); on graduation line corresponds to 1 stroke/min.

Correction for accurate metering
► Determine delivery capacity on the intake side of the metering pump with a measuring cylinder or by weighing.
► Correct pump setting.

7 Maintenance

IMPORTANT
Only authorized persons are permitted to carry out maintenance on EXtronic®-metering pumps.

IMPORTANT
Always wear protective goggles and protective clothing when handling hazardous media!

Maintenance jobs
► Check firm fit of liquid end screws; retighten screws in liquid end after 24 hours of operation.
► Check firm fit of metering lines.
► Check firm fit of pressure valve and intake valve.
► Check entire delivery unit for leaks.
► Check correct pump delivery capacity: Briefly operate pump in intake mode.

For self-venting liquid end:
► Check firm fit of bypass line and of connection.
► Replace fuses and electronic control.
► Check vent function.

Maintenance intervals
Every 3 months
Shorter intervals for operation under heavy load (e.g. permanent operation)
8 Repairs

IMPORTANT
• Use only genuine spare parts.
• Always wear protective goggles and protective clothing when handling hazardous media.

WARNING
The following repair measures on EXtronic\textsuperscript{®}-metering pumps must only be carried out by specially trained persons or by the manufacturer:
• Replace ex-relevant parts.
• Replace damaged power connection cable.
• Replace fuses and electronic control.
• Repairs on metering pumps for combustible media, also in the area of the liquid end.

Conversion to different capacities, material or type of control are only possible at the manufacturer's factory. Please contact your ProMinent dealer or representative.
You will find the addresses on the back page of these operating instructions.
Send back the metering pump for repair only in a clean condition and with the liquid end flushed clean!

WARNING
Pumps for radioactive medium must not be shipped!!

NOTE
Legal regulations governing the protection of labour oblige all companies to protect their employees from the damaging effects of handling hazardous substances. Inspection or repair of pumps and their parts can only be carried out if a declaration of complete safety has been submitted completed correctly and in full by an authorized and qualified person of the pump operator!
If, despite careful discharge and cleaning of the pump, safety precautions are still necessary, the necessary information must be stipulated in the declaration of complete safety. The declaration of complete safety is a part of the inspection/repair order.
You will find a form at the end of these operating instructions.

8.1 Replacing working diaphragm / safety diaphragm

WARNING
Rinse the liquid end first if using hazardous metering chemicals. Use water or a suitable rinsing solution in a squeeze bottle and inject it into the suction connector of the liquid end. Protect yourself from unknown or hazardous metering chemicals.
After a diaphragm rupture, there will be chemical in the diaphragm rupture detector and the intake channel in the spacer plate (5).

- Set stroke length to zero when the pump is running. Switch off pump.
- Slacken liquid end screws and remove liquid end fastening screws.
- Then slacken and unscrew the working diaphragm (6) (see Fig. 1) by twisting the adapter (2) to the left with both hands.
- Remove the spacer plate (5) and check the condition of the safety diaphragm (4).
- If the safety diaphragm is ruptured, replace it with a new one (see also 8.2).
- Place the spacer plate (5) on the top plate.
- Tighten new working diaphragm (6) with both hands until hand-tight.
- Further assembly instructions, see 8.2.

8.2 Servicing diaphragm rupture detector

**WARNING**

- Disconnect diaphragm rupture detector from mains power supply.
- Protect yourself from unknown or hazardous metering chemicals.
- After a diaphragm rupture there will be chemical in the diaphragm rupture detector and the intake channel in the spacer plate (5).
- Check the diaphragm rupture detector after every diaphragm rupture and replace the separating diaphragm if necessary (e.g. if the chemical is crystallising or is carrying dirt and particles).

8.3 Replacing separating diaphragm in the diaphragm rupture detector

1. Take hold of the top section (2) of the diaphragm rupture detector (see Fig. 7).
2. Secure the casing (5) with a fork wrench - not the painted nut.
3. Unscrew the diaphragm rupture detector.
4. Clean soiled parts.
5. Place the new separating diaphragm (3) in the top section with the light side (PTFE) up.
6. Place the washer (4) in the top section.
7. Insert the spring (6) into the casing (5).
8. Bring casing (5) towards the top section (2).
9. Check that the spring (6) is seated correctly on the spring mounting (3A).
10. Screw the casing (5) into the top and tighten screws.
11. Check the diaphragm rupture detector.

8.4 Checking diaphragm rupture detector

1. Unscrew the diaphragm rupture detector from the liquid end to carry out check.
2. Check that electrical transmission is present.
3. Push a blunt, insulated rod Ø 2 - 3 mm, (no sharp edges) into the channel of the diaphragm rupture detector.
4. Check whether electrical transmission ceases.
5. Remove the rod.
6. Check that electrical transmission is present.
7. If everything is in order, screw the diaphragm rupture detector into the liquid end with a new seal (1).
9 Malfunctions

**IMPORTANT**
- Always wear protective goggles and protective clothing when handling hazardous media.
- Observe the safety data sheets of the metering liquids.
- Discharge liquid end and, if necessary, flush with a neutral agent.
- First decompressurize the metering line before carrying out any work on the pump.

9.1 Operation/pulse indicator does not light, no stroke movement

<table>
<thead>
<tr>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorrect mains voltage</td>
<td>Use specified mains voltage in accordance with voltage rating on type identification plate.</td>
</tr>
<tr>
<td>Fuse is defective</td>
<td>Contact your ProMinent dealer or representative. You will find the addresses on the back page of these operating instructions.</td>
</tr>
</tbody>
</table>

9.2 Pump intake no longer operable despite full stroke movement and venting

<table>
<thead>
<tr>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline deposits on ball seat</td>
<td>Remove intake hose from metering tank.</td>
</tr>
<tr>
<td>caused by valves drying out</td>
<td>Open vent valve.</td>
</tr>
<tr>
<td></td>
<td>Flush liquid end well through.</td>
</tr>
<tr>
<td></td>
<td>If not successful, remove and clean valves.</td>
</tr>
</tbody>
</table>

9.3 Pump no longer meters, although operation/pulse indicator lights

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium level in tank too low.</td>
<td>Top up</td>
</tr>
<tr>
<td>Stroke length set too small</td>
<td>Increase stroke length with control knob (14)</td>
</tr>
<tr>
<td>Air trapped in liquid end</td>
<td>Set venting on delivery side via overflow or pressure relief valve or release metering line at injection valve or pressure connection.</td>
</tr>
<tr>
<td></td>
<td>Switch on pump and vent at stroke length of 100 %</td>
</tr>
<tr>
<td>Remedy Liquid end</td>
<td>Open vent valve (5) by max. 1 turn in counterclockwise direction.</td>
</tr>
<tr>
<td>without vent</td>
<td>Pump intake until intake line and liquid end are filled free of bubbles.</td>
</tr>
<tr>
<td></td>
<td>Close vent valve (5).</td>
</tr>
</tbody>
</table>

9.4 Liquid Emerges from end ring

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery unit leaking at diaphragm</td>
<td>Retighten screws (2-4) crosswise in liquid end.</td>
</tr>
</tbody>
</table>

**IMPORTANT**
- Observe tightening torques:
  - For M4 screw M4 → 2.5–3 Nm
  - For M4 screw M5 → 4.5–5 Nm
- Check tightening torques after 24 hours of operation!
  - Additionally check tightening torques every 3 months for PP version!
Malfunctions

If liquid still emerges from liquid end, the diaphragm is torn and must be replaced.
The service life of the metering diaphragm is dependent on
- system backpressure
- operating temperature
- properties of medium to be metered
The service life of the diaphragms is restricted in the case of abrasive media.

Flush liquid end of hazardous media:
- For this purpose force water or suitable flushing agent with a spray bottle through the intake connection of the liquid end.
- With pump running, set stroke length with control knob (14) to "0".
- Switch off pump.
- Release screws (24).
- Pull liquid end (4) with screws (24) out of end ring (3) and pump housing by approx. 5 mm until resistance can no longer be felt through screws (24) when turning the liquid end (4).
- Hold housing and end ring (3) in left hand and turn liquid end (4) in counterclockwise direction so that the diaphragm (25) is released from the drive shaft.
- Pull liquid end (4) with screws (24) out of diaphragm (25).
- Completely unscrew diaphragm (25) from drive shaft.
- Check condition of thread by screwing the new diaphragm on to the drive shaft as far as it will go and then screwing it off again.
- Re-install end ring (3) in housing.
- Fit diaphragm (25) in end ring (3) and screw on by 2 thread turns.

**IMPORTANT**
Turn diaphragm (25) such that the 4 holes of the diaphragm (25) and end ring (3) are precisely aligned! The outlet opening (26) of the end ring (3) must face downward.

---

3 Back plate
4 Liquid end
24 Screws
25 Diaphragm
26 Bypass-connector

---

fig.: 8
Malfunctions / Used Part Disposal

- Fit liquid end (4) with screws (24) on diaphragm (25) and end ring (3) such that the parts can still turn (approx. 5 mm spacing between liquid end and end ring); the intake connection must face downwards.
- Now slowly turn parts in clockwise direction until the torsional resistance of the return spring can be felt and the diaphragm is fitted firmly.

**IMPORTANT**
Do not turn diaphragm too far!

- Switch on pump.
- Set stroke length with control knob (14) to 100 % and turn the complete delivery unit in clockwise direction until the intake connection faces vertically downward.
- Switch off pump
- Now tighten the 4 screws (24) crosswise

**IMPORTANT**
Observe tightening torques
For M4 screws  M4 → 2.5–3 Nm
For M5 screws  M5 → 4.5–5 Nm

Check tightening torques after 24 hours of operation.
Additionally check tightening torques every 3 months for PP version!

9.5 Pump does not reach high pressures or no suction despite max. stroke action

**Cause**
The working diaphragm has ruptured without setting off the alarm.

**Remedy**
Replace working diaphragm immediately (see "Changing the diaphragm", section 8.1), change the separating diaphragm of the diaphragm rupture detector, check electrical connections of the diaphragm rupture detector (see section 8.4).

9.6 Diaphragm rupture indicator triggers alarm

**Cause**
The working diaphragm has ruptured; the diaphragm rupture detector cable is broken.

10 Used Part Disposal

**NOTE**
Metering pumps do not belong in the household waste!
Dispose of used parts in accordance with the law governing the avoidance and disposal of waste (Abfg) or in accordance with the waste and residual material monitoring ordinance governing the re-use of materials.

Your ProMinent dealer or representative will accept all used parts for a small cover charge.
You will find the addresses on the back page of these operating instructions.
11 Spare parts

ATTENTION: Repairs must be carried out by skilled technicians!

Check for centricity when repairing.

Check gap width when repairing, max 0.16 mm admissible.

ATTENTION: Repairs must be carried out by skilled technicians!

Postfach 101760
Dosiertechnik GmbH
Im Schuhmacherg. 5-11
69123 Heidelberg

ProMinent

View "U"
<table>
<thead>
<tr>
<th>Item-No.</th>
<th>Quantity</th>
<th>Description</th>
<th>Order number</th>
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<td>housing set. EXB_E/G</td>
<td>814210</td>
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<tr>
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<td>1</td>
<td>housing set. EXB_S/M</td>
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<td>103221</td>
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<tr>
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<td>spring housing EXB_</td>
<td>103220</td>
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<tr>
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<td>1</td>
<td>terminal - M3 EXB_</td>
<td>814123</td>
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<tr>
<td>22</td>
<td>1</td>
<td>terminal - M6 EXB_</td>
<td>814123</td>
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<td>23</td>
<td>1</td>
<td>DU terminal MB3530DU</td>
<td>469535</td>
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<tr>
<td>24</td>
<td>1</td>
<td>washer EXB_</td>
<td>814122</td>
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<td>25</td>
<td>1</td>
<td>diaphragm EXB_</td>
<td>485146</td>
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<td>1</td>
<td>compression spring d3.2/Dm54/I5/Lz125</td>
<td>1020671</td>
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<td>26</td>
<td>1</td>
<td>compression spring d4.5/Dm56</td>
<td>791061</td>
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<tr>
<td>26</td>
<td>1</td>
<td>compression spring d3.8/Dm55</td>
<td>791060</td>
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<td>28</td>
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<td>countersunk-head screw DIN 963 M 4x12 A2</td>
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<td>cheese head screw DIN 912 M 5x 20 8.8 vern.</td>
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<td>30</td>
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<td>30</td>
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<td>setscrew DIN 913 M 6x12 A2</td>
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<td>32</td>
<td>1</td>
<td>button d4/9 black #4129403</td>
<td>703563</td>
</tr>
<tr>
<td>33</td>
<td>1</td>
<td>button d4/15 black #4131403</td>
<td>703561</td>
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<tr>
<td>33</td>
<td>1</td>
<td>O-ring 107.00 - 2.50 NSRO</td>
<td>480283</td>
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<tr>
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<td>4</td>
<td>spring lock washer DIN 127 B 5 A2</td>
<td>462411</td>
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<tr>
<td>35</td>
<td>1</td>
<td>solenoid 90 EXBb 230V</td>
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<td>cover, grey #4116028</td>
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Installation data

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<tr>
<td>Project No.: ........ Date: ...................</td>
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<tr>
<th>Metering pump</th>
<th>Type</th>
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<tbody>
<tr>
<td>Capacity</td>
<td>l/h</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Stroke rate</td>
<td>stroke/min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke length</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve spring pressure, intake side</td>
<td>bar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve spring pressure, delivery side</td>
<td>bar</td>
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<table>
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<th>Medium</th>
<th>Description/ Concentration</th>
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<tr>
<td>Percentage solids/ grain size</td>
<td>% / mm</td>
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<tr>
<td>Solid material / hardness</td>
<td>– / (Mohs-Skala)</td>
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<tr>
<td>Dynamic viscosity</td>
<td>mPa s (cP)</td>
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<tr>
<td>Density</td>
<td>kg /m³</td>
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<tr>
<td>Vapour pressure at operating temp.</td>
<td>bar /°C</td>
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<tr>
<th>System, intake side</th>
<th>Pressure in intake tank</th>
<th>bar</th>
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<tr>
<td>Nominal diameter intake line</td>
<td>DN / mm</td>
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<tr>
<td>Intake head min/max</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Supply head min/max</td>
<td>m</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Intake line length min/max</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of bracket/valves</td>
<td>–</td>
<td></td>
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<tr>
<td>Pulsation damper</td>
<td>Diaphragm accumulator</td>
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<td>Pressure vessel</td>
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<th>System, delivery side</th>
<th>Static system pressure min/max</th>
<th>bar</th>
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<td>Nominal diameter of delivery line</td>
<td>DN / mm</td>
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<td>Number of brackets/valve</td>
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<tr>
<td>Pulsation damper</td>
<td>Diaphragm accumulator</td>
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<td></td>
<td>Pressure vessel</td>
<td>ltr.</td>
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Guarantee Claim

In the case of failure of the metering pump within the guarantee period, please return the metering pump in a cleaned condition with the guarantee claim completed in full.

Please complete in full!

<table>
<thead>
<tr>
<th>Guarantee claim for metering pumps</th>
<th>No.</th>
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<td>Tel.-No.: .................. Date: ..................</td>
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<td>Address: ..................................</td>
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<tr>
<td>Person responsible (customer): ..........</td>
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<tr>
<td>Order No.: ..................................</td>
<td>Date of delivery: ..................</td>
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<tr>
<td>Pump type/ Identity code: ..........</td>
<td>Serial No.: ..................</td>
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Brief description of fault:

Type of fault

1 Mechanical fault
- Abnormal wear
- Wearing parts
- Breakage/ other damage
- Corrosion
- Damage during transport

2 Electrical fault
- Connections such as connector or cable loose
- Operating elements (e.g. switches)
- Control

3 Leakage
- Connections
- Liquid end

4 None or poor delivery capacity
- Diaphragm defective
- Others

Operating conditions of ProMinent® pumps

Place of installation/ system description:

Pump accessories used:

Commissioning (date):

Running period (approx. duty hours):

Please specify installation data and enclose system drawing.
Declaration of Complete Safety

Safety declaration form

A completed form must always be returned with the equipment!
This declaration must only be completed and signed by an authorized member of the technical staff!

The equipment or its parts will only be repaired or serviced if it is accompanied by a correctly completed and signed safety declaration form. The work could be delayed if no form is returned.

Legally binding declaration

We hereby assure that:

1. The enclosed equipment

   Type: _______________________________________________________________________________________________________
   Serial No.: _____________________________________________________________________

   is free from any
   - toxic
   - corrosive
   - microbiological
   - carcinogenic
   - explosive
   - radioactive substances
   - or other substances that may be harmful to health.

2. The equipment was thoroughly cleaned before being shipped.

3. There is no hazard due to residual contamination.

4. The details given in this form are correct and complete.

Company / Institute: _______________________________________________
Street: ____________________________________________________________________ Postcode, Town: ___________________________________________________
Tel: _________________________________________________________________________ Fax: _______________________________________________________________________
Surname, First name: ____________________________________________ Position: ________________________________________________________________
Date: ______________________________________________________________________

______________________________ ________________________________
Legally binding signature Company stamp
ProMinent Dosierotechnik GmbH
Im Schuhmacherergewann 5 - 11
D - 69123 Heidelberg

We, hereby declare that, on the basis of its functional concept and design and in the version brought into circulation by us, the product specified in the following complies with the relevant, fundamental safety and health stipulations laid down by EC regulations. Any modification to the product not approved by us will invalidate this declaration.

Product description: Metering pump, series Extronic / b
Product type: EXBb ...
Serial number: see type identification plate on device

Relevant EC regulations:
EC-Ex-regulation 94/9/EEC
EC - machine regulation 98/37/EC
EC - low voltage regulation 73/23/EEC
EC - EMC regulation 89/336/EEC subseq.92/31/EEC

Harmonised standards used, in particular:
EN 50014, 50018, 50020, 50284, 50303, 1127-1, 13463-1
EN 292-1, EN 292-2, EN 809
EN 60335-1, EN 60335-2-41
EN 50081-1/2, EN 50082-1/2, EN 55014
EN 61000-3-2, EN 61000-3-3

National standards and other technical specifications used, in particular:
DIN VDE 0700 T1, IEC 60335-1
DIN VDE 0700 T41, IEC 60335-2-41
DIN VDE 0700 T500, VDE 0110
IEC 1000-3-2, IEC 1000-3-3

Date/manufacturer’s signature: June 12, 2003
The undersigned: Dr. Rainer V. Dulger, Executive Vice President R&D and Production
EC Model Certificate

Translation

1st Supplement
(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
DMT 03 ATEX E 023

Equipment: Proportional pump type EXBb M ... and type EXBb G ...
Manufacturer: ProMinent Dositechnik GmbH
Address: 69067 Heidelberg

Description
The pump can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report.

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:
EN 50014:1997+A1-A2 General requirements
EN 50018:2000+A1 Flameproof enclosure
EN 50202:2002 Intrinsically safe
EN 50284:1999 Group II Category 1G
EN 50300:2000 Group I Category M1 Apparatus
EN 1127-1:1997 Explosive atmospheres – part 1: Basic concepts and methodology
EN 13463-1:2001 Non electrical equipment for potentially explosive atmospheres – part 1: Basic methods and requirements

The marking of the equipment shall include the following:

<table>
<thead>
<tr>
<th>Type</th>
<th>Marking</th>
<th>Type</th>
<th>Marking</th>
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</thead>
<tbody>
<tr>
<td>EXBb M</td>
<td>I M2 Ex d I</td>
<td>EXBb M</td>
<td>I M2 Ex d I</td>
</tr>
<tr>
<td></td>
<td>I 2G Ex d [a] I</td>
<td></td>
<td>I 2G Ex d [a] I</td>
</tr>
<tr>
<td>EXBb G</td>
<td></td>
<td></td>
<td>I 2G Ex d [a] BC</td>
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<tr>
<td></td>
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<td>I 2G Ex d [a] BC</td>
</tr>
</tbody>
</table>

Page 1 of 1 in DMT 03 ATEX E 023 / 01. This certificate may only be reproduced in its entirety without change. (Product) 12.11.2001 04.10.2004 / 11.10.2004 (Product) 31.05.2003 (Deutsche Normen Technologie GmbH. A6 Technologiepark 1 45307 Essen, Germany)
EC Model Certificate

Parameters

1. Supply circuit

1.1 Supply circuit (triggering circuit not intrinsically safe)
- Rated voltage: AC 500 V
- Maximum current input (I_{In}) ≤ 1.5 A
- Maximum current: 8 A
- Maximal power input: 50 W

*averaged over the stroke cycle

1.2 Supply circuit (triggering circuit intrinsically safe)

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated voltage</th>
<th>V</th>
<th>Rated voltage</th>
<th>V</th>
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</thead>
<tbody>
<tr>
<td>Type</td>
<td>max. voltage</td>
<td>Umax</td>
<td>AC 500 ±10%</td>
<td>V</td>
</tr>
<tr>
<td>EXEh</td>
<td>min. voltage</td>
<td>Um</td>
<td>230 ±10%</td>
<td>V</td>
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</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated voltage</th>
<th>V</th>
<th>Rated voltage</th>
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<td>max. voltage</td>
<td>Umax</td>
<td>AC 115 ±10%</td>
<td>V</td>
</tr>
<tr>
<td>EXEh</td>
<td>min. voltage</td>
<td>Um</td>
<td>233 ±10%</td>
<td>V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated voltage</th>
<th>V</th>
<th>Rated voltage</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>max. voltage</td>
<td>Umax</td>
<td>AC 200 ±10%</td>
<td>V</td>
</tr>
<tr>
<td>EXEh</td>
<td>min. voltage</td>
<td>Um</td>
<td>253 ±10%</td>
<td>V</td>
</tr>
</tbody>
</table>

2. Triggering circuits

2.1 Triggering circuits (not intrinsically safe)

| Voltage | ≤ 6 V |
| Current | ≤ 30 mA |

2.2 Axtostromkreise (eigenmacher)

| Voltage | U0 DC | 7.14 V |
| Current | I0 | 5 mA |
| Power | P0 | 33.3 mW |
| Internal resistance | R0 | 4206 Ω |
| Trapezoidal output characteristic | |
| max. external impedance | Co | 13.5 Ω |
| max. external inductance | Le | 1 H |

for the connection of an intrinsically safe circuit

| Voltage | Ui DC | 30 V |
| Current | Ii | 280 mA |
| Power | Pi | 2 W |
| Effective internal inductance | Li | negligible |
| Effective internal capacitance | Ci | negligible |

3. Ambient temperature range

T_a ≤ -20 °C up to +45 °C
EC Model Certificate

EXAM BBG Prüf- und Zertifizier GmbH
Bochum, dated 19. April 2006

Signed: Migenda
Certification body

Signed: Dr. Arnold
Special services unit

We confirm the correctness of the translation from the German original. In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 19. April 2006
BVS-SchKw A 20006193

EXAM BBG Prüf- und Zertifizier GmbH

Migenda
Certification body

Dr. Arnold
Special services unit
EC-Type Examination Certificate

- Directive 94/9/EC -

Equipment and protective systems intended for use in potentially explosive atmospheres

DMT 03 ATEX E 023

Equipment: Metering pump type EXBb M ... Und EXBb G ...

Manufacturer: ProMinent Dosierotechnik GmbH

Address: D  69007 Heidelberg

The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.

The certification body of Deutsche Montan Technologie GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test and assessment report BVS PP 03.2087 EG and PP 2310/108/03 EG.

The Essential Health and Safety Requirements are assured by compliance with:
EN ...
EN ...

If the sign “X” is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

The marking of the equipment shall include the following:

Deutsche Montan Technologie GmbH
Essen, dated 15. May 2003

Signed: Eickhoff
DTM Certification body

Signed: Schumann
Head of special services unit
Translation

(13) Appendix to

(14) **EC-Type Examination Certificate**
DMT 03 ATEX E 021 X

(15) 15.1 Subject and type

Metering pump type EXBb M ... Und EXBb G ...

15.2 Description

15.3 Parameters

(16) Test and assessment report
BVS PP XX.XXXX EG as of “Datum des Prüfprotokolls”

(17) Special conditions for safe use