

Declaration of Conformity as per Directive 97/23/EC and Manufacturer`s Declaration as per Directive 98/37/EC

The manufacturer	Pfeiffer Chemie-Armaturenbau GmbH, 47906 Kempen, Germany
declares that:	PFA/PTFE-lined ball valves Series 20a, Series 20b, Series 20c, Series 20z and Series 21a, with stuffing box packing as well as with adjustable packing <ul style="list-style-type: none"> • with pneumatic/electric/hydraulic actuator • with free shaft end for subsequent mounting of an actuator
<ol style="list-style-type: none"> 1. The valves are pressure accessories within the meaning of the Pressure Equipment Directive 97/23/EC and conform with the requirements of this Directive, 2. The valves are not complete machinery within the meaning of the Machinery Directive 98/37/EC, but meet the relevant requirements of this Directive, 3. They may only be operated observing the operating instructions <BA20a-01_EN> delivered together with the valve. <p>The commissioning of these valves is only permitted after the valve has been installed from both sides in the pipeline and a risk of injury can be ruled out. (For ball valves which are intended for dead-end service, see section 2.3).</p>	

Applied standards:

AD 2000 Regulations DIN-EN 292-2000	Regulations for pressurized valve body parts Safety of Machinery, Part 2: Technical requirements
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Type designation and technical features:

Pfeiffer data sheets <TB20a_EN, TB20b_EN, TB20c_EN, TB20z_EN and TB21a_EN> <i>NOTE: This Manufacturer`s Declaration applies to all valve types listed in this catalogue.</i>
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Applied conformity assessment procedure:

Conforming to Annex II of the Pressure Equipment Directive 97/23/EC, Module H
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Name of notified body:

Identification number of the notified body:

TÜV Rheinland Service GmbH Am Grauen Stein 51101 Köln Germany	0035
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These Declarations become invalid when modifications are made to the ball valves and/or assemblies that affect the technical data of the ball valve or the <Intended use> described in section 1 of the operating instructions, and considerably change the valve or an assembly delivered with it.

Kempen, 14. April 2010

Lorenz Stolzenberg, Managing Director

These Declaration of Conformity and operating instructions have been generated electronically and are legally binding without signature

Operating instructions

Straight-pattern ball valve with PFA/PTFE lining actuated

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0 Introduction

These instructions are designed to assist the user during installation, operation and maintenance of PFA/PTFE-lined ball valves from the **Series 20a, Series 20b, Series 20c, Series 20z and Series 21a**.

These instructions apply only to the ball valve itself. In addition, refer to the instructions of the mounted actuator.



Note

The WARNING and CAUTION notes must be strictly adhered to. **Otherwise this may lead to personal injury and equipment damage** and the manufacturer's warranty may become void. Please contact the manufacturer if you have any queries, see section 8 for contact address.

1 Intended use

After installing the valve in the pipeline and connecting the actuator to the control equipment, these ball valves are designed exclusively for shutting off or controlling media (often corrosive) within the permissible pressure and temperature ranges.

The permissible pressure and temperature ranges for these ball valves are specified in the data sheets <TB20a_EN, TB20b_EN, TB20c_EN, TB20z_EN or TB21a_EN>.



Danger

Do not operate a ball valve when its permissible pressure/temperature rating is not sized for the operating conditions specified in the data sheets <TB20a_EN, TB20b_EN, TB20c_EN, TB20z_EN or TB21a_EN>. **Failure to follow these safety precautions may result in personal injury and can damage equipment installed in the pipeline.**

Observation of conformity with the Directive 94/9/EC.



Note

Pfeiffer valves do not have their own potential ignition source according to the risk assessment in the rare incident of an operating fault in accordance with DIN EN 13463-1:2000 and therefore do not fall within the scope of the Directive 94/9 EC. Relating to this directive, CE marking is not permissible.

The integration of valves into the equipotential bonding of a plant applies to all metallic parts in hazardous areas regardless of the directive.

Valves with plastic lining (PFA, PTFE) in applications with chargeable media have to be lined with conductive plastic lining with a surface resistance less than 1 Gigaohm (10^9 Ohm) in accordance with paragraph 7.4 of DIN EN 13463-1:2001.

Refer to the supplementary data sheet <DB20a-kd_EN> if the ball valve is intended for throttling services.

The ball valve body may contain small amounts of medium in the closed and open position:

In the case that the heat in the surroundings where the valve is installed can heat up the process medium in the valve, use the **ball valve version with a relief bore** to prevent an impermissible rise in pressure.

Observance of section 2 <Safety instructions> is presumed for the Intended use.

2 Safety instructions

2.1 General safety instructions

For ball valves, the same safety regulations apply as for the pipelines in which they are installed, as well as for the control equipment connected to the actuator. These instructions only specify those safety instructions which need to be additionally observed concerning ball valves.

Additional safety instructions are specified in the instructions for the actuator assemblies.

2.2 Safety instructions for the operator

The manufacturer does not assume any responsibility. Therefore, on using the ball valve, make sure the following instructions are observed:

⇒ The valve is to be used only for its intended use as described in section 1.



Warning







Preventing misuse of the ball valve:

It is especially important to make sure that the selected lining for wetted parts in the ball valve is suitable for the media used as well as the prevailing pressures and temperatures.

Failure to follow these safety precautions may result in personal injury and can damage equipment installed in the pipeline. The manufacturer does not assume any final responsibility.

- ⇒ Make sure that the pipeline and control equipment have been installed correctly and are checked at regular intervals. The valve body wall thickness must be designed to take into account an additional load F_z in the usual order ($F_z = \pi/4 \cdot DN^2 \cdot PS$) for a correctly sized pipeline.
- ⇒ The valve needs to be connected correctly to the pipeline and to the control equipment.
- ⇒ Ball valves that are operated at temperatures greater than +50°C or lower than -20°C must be protected, together with the pipeline connections, against being touched.
- ⇒ Make sure the usual flow velocities are not exceeded in continuous service in this pipeline. Exceptional operating conditions such as oscillations, water hammering, cavitation and large proportions of solid matter in the process medium, especially abrasive, must be clarified beforehand with the manufacturer.
- ⇒ An actuator unit mounted subsequently onto the valve must fit the ball valve properly and its final positions, especially the open position, need to be correctly adjusted.
- ⇒ The valve should only be operated and serviced by personnel appropriately qualified for pressurized pipelines.

2.3 Particular hazards

 Danger	Prior to removing the ball valve from the pipeline, relieve pressure entirely in the pipeline to ensure the process medium cannot escape uncontrollably from the pipeline.
 Warning	Should it be necessary to remove a ball valve from the pipeline, process medium may escape from the pipe or out of the ball valve. In the case of process media that can damage health or are dangerous, drain the pipeline completely before removing the ball valve from the pipeline. Take special care concerning any remaining media that may still be in the pipeline or have collected in the cavities of the valve .
 Warning	Only unscrew or loosen any screws or bolts connecting the body parts after the valve has been removed from the pipeline. Tighten the screws on reassembly with a torque wrench according to repair instructions <EB20a_EN, EB20b_EN, EB20c_EN, EB20z_EN or EB21a_EN>.
 Danger	<i>For (Series 20z) Ball Valves with stuffing box gland:</i> The shaft is sealed with a stuffing box packing. Prior to unscrewing the stuffing box gland, relieve pressure entirely in the pipeline to ensure the process medium cannot escape uncontrollably from the stuffing box packing.
 Warning	<i>For ball valves intended for dead-end service:</i> During standard operation, in particular, with gases or hot and/or dangerous media, mount a blank flange at the free end connection or ensure that the ball valve is properly protected against unauthorized operation .
 Warning	If a ball valve used for dead-end service must be opened in a pressurized pipeline, special care must be taken to ensure that any process media escaping under pressure do not cause any damage. Take into consideration that in most cases the process medium is a dangerous substance!

2.4 Designation of the ball valve

The designation of the control valve includes the following details:

Details	Designation	Comments																				
Manufacturer	Pfeiffer	Address, see section 8 <Further information>																				
Valve type	BR (and number)	e.g. BR 20a = Series 20a, see Pfeiffer catalogue																				
Body material	e.g.: EN-JS 1049	Material number acc. to DIN EN 1563 (formerly GGG 40.3)																				
Size	DN (and number)	Value in mm, e.g. DN 50																				
Maximum pressure	PN (and number)	Value in bar at room temperature																				
Perm. temperature	TS (and number)	PS and TS are associated values at maximum permissible operating temperature and maximum permissible operating pressure.																				
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Serial no.	e.g.: 2070153/001/001	<table style="border: none;"> <tr> <td style="border: none;">207</td> <td style="border: none;">0153</td> <td style="border: none;">/001</td> <td style="border: none;">/001</td> <td style="border: none;">Valve no. within item</td> </tr> <tr> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;">Item in order</td> </tr> <tr> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;">Order</td> </tr> <tr> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;"> </td> <td style="border: none;">Year of manufacture (e.g. 2073=2007)</td> </tr> </table>	207	0153	/001	/001	Valve no. within item					Item in order					Order					Year of manufacture (e.g. 2073=2007)
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				Year of manufacture (e.g. 2073=2007)																		
Year of manufacture	e.g.: 2007	On customer request, the year of manufacture is stamped on the valve.																				
Conformity	CE	Conformity is certified separately by the manufacturer																				
Identification no.	0035	Notified body as per EU Directive = TÜV Rheinland Service GmbH																				
Direction of flow	➔	Note: see note in section 4.2 <Installation instructions>																				


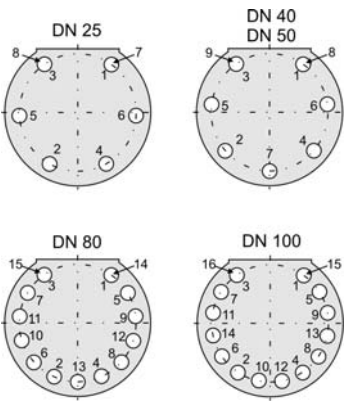
Table 1 – Designation of the control valve

Keep the labeling on the valve body and on the nameplate to ensure that the valve can be identified at all times.

3 Transport and storage

Ball valves **with linings must be carefully handled, transported and stored:**






- ⇒ Store the valve with its protective packing and/or with its protective caps in place in the end connections. Store and transport the ball valves that weigh over approx. 10 kg on pallets (or a similar type of support) right up to the point of installation. The packing is designed to protect the valve's plastic lining, that is prone to scratching, against being damaged.
- ⇒ Store the valve in a closed room before it is installed. Protect it against damaging influences such as dirt or moisture.
- ⇒ Make sure, in particular, that the plastic-lined facings of the flanges intended to connect the valve to the pipeline are not damaged through mechanical or other influences. Do not stack ball valves!
- ⇒ As a rule, ball valves are delivered in the completely open position. Store the valves in the condition they were delivered in. Do not operate the actuating device.
- ⇒ Since PFA/PTFE plastic facings have a tendency to creep, we strongly recommend after installation to retighten the bolted joint of the valve body using the tightening torques in Table 2 if the valves have been in storage for a long time.

 Note	When retightening the bolted joint of the body, it is essential to observe the tightening sequence and torques for each nominal size.																																	
		<table border="1"> <thead> <tr> <th>Nominal Size</th> <th>Connection</th> <th>Torque</th> </tr> </thead> <tbody> <tr> <td>DN 15</td> <td>1 to 4</td> <td>25 Nm</td> </tr> <tr> <td rowspan="2">DN 25 / 1"</td> <td>1 to 6</td> <td>25 Nm</td> </tr> <tr> <td>7 and 8</td> <td>35 Nm</td> </tr> <tr> <td rowspan="2">DN 40 / 1 1/2"</td> <td>1 to 7</td> <td>25 Nm</td> </tr> <tr> <td>8 and 9</td> <td>35 Nm</td> </tr> <tr> <td rowspan="2">DN 50 / 2"</td> <td>1 to 7</td> <td>30 Nm</td> </tr> <tr> <td>8 and 9</td> <td>40 Nm</td> </tr> <tr> <td rowspan="2">DN 80 / 3"</td> <td>1 to 13</td> <td>35 Nm</td> </tr> <tr> <td>14 and 15</td> <td>40 Nm</td> </tr> <tr> <td rowspan="2">DN 100 / 4"</td> <td>1 to 14</td> <td>35 Nm</td> </tr> <tr> <td>15 and 16</td> <td>45 Nm</td> </tr> </tbody> </table>	Nominal Size	Connection	Torque	DN 15	1 to 4	25 Nm	DN 25 / 1"	1 to 6	25 Nm	7 and 8	35 Nm	DN 40 / 1 1/2"	1 to 7	25 Nm	8 and 9	35 Nm	DN 50 / 2"	1 to 7	30 Nm	8 and 9	40 Nm	DN 80 / 3"	1 to 13	35 Nm	14 and 15	40 Nm	DN 100 / 4"	1 to 14	35 Nm	15 and 16	45 Nm	
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4 Installation in the pipeline

4.1 General


The same instructions apply for installing the ball valves in the pipeline as for connecting pipes and similar pipeline equipment. The following instructions additionally apply for ball valves. Also observe section 3 for transporting the ball valve to the point of installation.

 Caution	<p><i>The valve is lined with PFA/PTFE:</i> Handle with special care and follow the instructions for flange connection.</p>
 Note	<p><i>The facings of the valve body are lined with plastic.</i> If additional flange gaskets are used, we recommend using gaskets made of PTFE. The mating flanges must have smooth facings. Contact the manufacturer if you intend to use other flange forms.</p>
 Warning	<p><i>The actuating device is set for the operating data specified in the order.</i> Do not alter the settings for the final positions OPEN and CLOSED without the manufacturer's prior consent.</p>
 Warning	<p>If an actuator unit has been mounted subsequently, torque, direction of rotation, operating angle as well as the final positions OPEN and CLOSED must be adapted to the ball valve. Failure to follow these safety precautions may result in personal injury and can damage equipment installed in the pipeline.</p>
 Warning	<p><i>Only for ball valves with electric actuator:</i> Make sure that the actuator is switched off in the final positions by the limit switch's signal. If the actuator is switched off in an intermediate position by the torque switch's signal, this signal should be used additionally for fault indication. Remedy any faults as quickly as possible. See section 7 <Troubleshooting>. <i>See the instructions for the electric actuator for further details.</i></p>


The following warnings are to be observed for actuators:

 Warning	<i>Actuators are not designed to be used as step-ladders:</i> Do not apply any weight/load to the actuators. This can damage or destroy the ball valve.
 Warning	<i>Actuators that weigh more than the ball valve:</i> Support any actuator which due to its size and/or mounting situation would otherwise cause the valve to bend under the load.


4.2 Installation instructions

 Caution	<i>The lined surface of the valve must be specially protected before/during installation:</i> Transport the valve in its original packaging right up to the point of installation. Remove packaging first at the point of installation.
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- ⇒ Check valve and actuator for signs of damage that may have occurred during transportation. Do not install a damaged ball valve or actuator.
- ⇒ Make sure that only ball valves are installed when their pressure rating, end connections and face to face dimensions match the conditions of application. See the designation of the ball valve.

 Danger	Do not install a ball valve if its permissible pressure/temperature ranges do not apply to the operating conditions. The limits of application are marked on the valve, see section 2.4 <Designation>. The permissible range is determined in section 1 <Intended use>. Failure to follow these safety precautions may result in personal injury and can damage equipment installed in the pipeline.
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- ⇒ The connecting specifications for the actuator unit must match those of the control equipment. See nameplate(s) on the actuator unit.
- ⇒ Make sure the end connections of the pipeline are aligned with the ball valve's end connections and their ends have parallel planes. Connecting flanges that are not parallel can damage the PTFE/PFA lining during installation!
- ⇒ Prior to installation, carefully clean the valve and the connecting section of the pipeline from dirt, especially hard foreign material.
- ⇒ Make sure, in particular, that flange facings (and any flange gaskets) are free from any dirt prior to installation.
- ⇒ On inserting the valve (and flange gaskets) into a ready mounted pipeline, keep a certain clearance between the pipeline ends to ensure that all facings (and gaskets) remain undamaged.


 Caution	Tighten the flange bolts evenly and in a criss-cross pattern in at least three steps. Tighten all flange bolts using the torques specified in Tables 3 or 4. Use a torque wrench to ensure that the torque specified is reached, yet not exceeded.
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DN [mm]	25	40	50	80	100	150
MA [Nm]	25	50	60	65	75	140


Table 3 – Flange torques for DIN flanges

DN [inch]	1"	1 1/2"	2"	3"	4"	6"
MA [Nm]	15	30	40	65	50	100

Table 4 – Flange torques for ANSI flanges

 Warning	Since PFA/PTFE plastic facings have a tendency to creep, we strongly recommend after installation to retighten the bolted joint of the valve body using the tightening torques in Table 2 if the valves have been in storage for a long time.
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- ⇒ The valve can be installed in any position. However, if possible, the actuator should not be located directly underneath the ball valve.
- ⇒ Make sure the arrow on the valve body corresponds with the direction of flow in the pipeline.

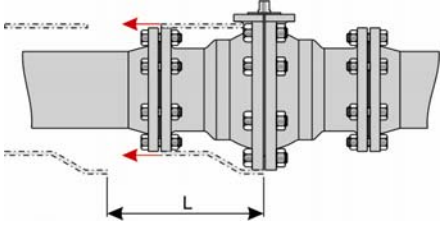
 Note	In special cases, it may be necessary for the valve to be tightly shut against the direction of flow. Contact the manufacturer prior to installation in such cases.
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Installation instructions for lined ball valves with heat packs:
When installing lined ball valves with heat packs in the pipeline, a corresponding straight outlet pipe section must be included. Should the bolted joint of the body need to be retightened, this straight outlet pipe section allows the heat pack to be moved away from the ball valve.
As a result, the heat line does not need to be shut off. We recommend flexible fittings for connecting the heating jacket to the heat line.

Note The values in this table are intended as guide to size the straight outlet pipe section (L).

DN	15	25	40	50	80	100
L	195	240	300	345	465	525

Table 5 - Straight outlet pipe section



- ⇒ The associated instructions apply for connecting the actuator unit to the control equipment.
- ⇒ After completing installation, carry out a function check using the signals issued by the control equipment. The valve must open and close properly corresponding with the control signals. Any function errors that are recognized must be remedied before commissioning. See also section 7 <Troubleshooting>.

Warning Control commands that are not carried out correctly **may result in personal injury and can damage equipment installed in the pipeline.**

5 Pressure check in pipeline section

The pressure check of valves has already been carried out by the manufacturer. To check the pressure of a section of pipeline with installed valves, the following points must be observed:

- ⇒ Carefully flush newly installed pipes to remove any foreign material.
- ⇒ **Valve OPEN:** The test pressure should not exceed the value **1.5 x PN** (see nameplate).
- ⇒ **Valve CLOSED:** The test pressure should not exceed the value **1.1 x PN** (see nameplate).


If a valve leaks, see section 7 <Troubleshooting>.




6 Standard operation and maintenance

- ⇒ Due to the fact of creeping plastic flange facings we strongly recommend to check flange bolt torques acc. to specified figures in section 4.2 after commissioning and normal operation temperature has been reached. This applies particularly to the bolted joint of the body which must be retightened according to Table 2 in Section 3.
- ⇒ Operate the valve/actuator unit over the control equipment signals. Ball valves delivered with the actuator already mounted are precisely set and should not be readjusted.
- ⇒ The shaft sealing used depending on ball valve series is free of maintenance.
 - The PTFE V-ring packing is live-loaded by a spring washer assembly and is therefore free of maintenance.
 - The PTFE cord packing is loaded by a stuffing box gland and must only be retightened when needed.
- ⇒ Normal manual force is sufficient to operate the manual override on the actuator (if required). It is not permissible to use extensions to increase the operating torque.
- ⇒ Regular maintenance work on the ball valves is not necessary. If a valve leaks, proceed as described in section 7 <Troubleshooting>.

7 Troubleshooting

Observe the safety instructions listed in section 2 on troubleshooting.

 Warning	<p>To remove a valve from a pipeline containing dangerous media and to take it out of the plant: Decontaminate the valves properly first.</p>
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Type of fault	Action to be taken	Comment
Leak at the connection to the pipeline	<p>Tighten flange bolts.</p> <p> Caution The permissible tightening torque of the flange bolts is restricted. See table 3 or 4 in section 4.2 <Installation instructions>.</p> <p><i>If the medium leaks out at the flanges of the lined valve:</i> Retighten the flange bolts using the torque specified in Table 3 or 4 in section 4.2 <Installation instructions>. If necessary, the torque may be increased by max. 20 %.</p> <p><i>If the medium leaks out at the flanges even after tightening the flange bolts:</i> Unscrew the flange bolts and remove the valve (on doing so, observe the instructions in section 2.3 <Particular hazards>). Check the parallel planes of the flanges and, if necessary, correct them. Also check the facing of all the flanges. If the plastic lining is damaged, replace it together with the associated flange gasket.</p>	
Leak at the valve body joint	<p>For the permissible tightening torque to retighten the body halves of the valve, see table 2 in section 3</p> <p><i>If the valve still leaks:</i> Replace the flange gasket and/or valve.</p>	<p>Note 1: <i>When ordering spare parts, include all the specifications listed in the valve designation. Only use original parts from Pfeiffer.</i></p> <p>Note 2: <i>If, after removing the valve from the pipeline, it is found that the PTFE/PFA lining is not sufficiently resistant to the process medium, select parts made of a suitable material.</i></p>
Leak at the shaft packing	<p>Remove the valve (observing the instructions in section 2.3 <Particular hazards>), dismantle the valve and replace the shaft packing. Contact Pfeiffer for spare parts and necessary instructions.</p> <p><i>For ball valves with stuffing box gland:</i> Alternately tighten both bolts at the stuffing box gland by turning them clockwise (in steps of 1/4 turns) until the leakage stops.</p> <p><i>If the valve still leaks:</i> The valve must be repaired. Contact Pfeiffer for spare parts and necessary instructions.</p> <p><i>On loosening or unscrewing the nuts at the stuffing box gland (counterclockwise):</i></p> <p> Danger To protect the operator, relieve pressure entirely in the pipeline upstream and downstream of the valve prior to loosening the nuts. Observe instructions in section 2.3 <Particular hazards>.</p>	
No tight shut-off when the valve is closed	<p>Remove the valve (observing the instructions in section 2.3 <Particular hazards>) and check it.</p> <p><i>If the valve is damaged:</i> If it must be repaired, remove the valve, observing section 2.3 <Particular hazards>. Contact Pfeiffer for spare parts and necessary instructions.</p>	
Malfunction	<p>Check actuator unit and control signals</p> <p><i>If actuator and control equipment are in order:</i> Remove the valve (observing the instructions in section 2.3 <Particular hazards>) and check it.</p> <p><i>If the valve is damaged:</i> If it must be repaired, remove the valve, observing section 2.3 <Particular hazards>. Contact Pfeiffer for spare parts and necessary instructions.</p>	
If a pneumatic actuator with springs must be removed from the valve	<p> Caution: Risk of injury Before removing the actuator from the valve, disconnect the signal pressure.</p>	

For malfunctioning actuator units, refer to the actuator instructions.

8 Further information

Contact the address below for the listed <Data sheets> and <Repair instructions> as well as further information.

Pfeiffer Chemie-Armaturenbau GmbH

Hooghe Weg 41 • 47906 Kempen
 Telefon: 02152 / 2005-0 • Telefax: 02152 / 1580
 E-Mail: vertrieb@pfeiffer-armaturen.com • Internet: www.pfeiffer-armaturen.com