BURGMER
OUR VALVES FOR YOUR BUSINESS

ORIGINAL OPERATION, MAINTENANCE AND ASSEMBLY INSTRUCTION

HAZARDOUS MATERIAL VALVE TFB

Important!

Read these instructions carefully before initial operation!

IMPRINT

Details in this documentation are provided to specify products,
not to warrant any specific qualities.

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CONTENTS DIRECTORY

1 Introduction

The valves described below are type tested and fulfil the requirements of DIN EN 14432:2014 "Tanks for the transport of dangerous goods. Tank equipment for the transport of liquid chemicals. Product discharge and air inlet valves". The following standards were also applied: DIN EN 12266-1, DIN EN 10213, DIN EN 12516-2, DIN EN 10222-5, DIN EN 10026-2.

Name and address of notified body:
TÜV Nord Systems GmbH & Co. KG
Technikzentrum
Langemarck Str. 20
45141 Essen

Testing specifications are detailed in the accompanying manufacturer's declaration. In case of use outside Germany, the operating company is responsible for ensuring the compliance with all national regulations.

ATTENTION!
The valves are <u>not</u> suitable for use in potentially explosive atmospheres (according to - ATEX-regulation 2014/34/EU!
For the application range of the Pressure Equipment Directive – DGRL 2014/68/EU, only valves which bear a CE marking can be used! (observe category!)

ATTENTION!
When removing and / or disguising our nameplate, all guarantee and liability will expire.
If the nameplate is replaced by the costumer, it is his responsibility to ensure the traceability of the product!
It is not allowed to remove or replace nameplates of valves provided with CE markings!

The use of these operating instructions requires a proper qualification by the user. Please refer to chapter 4.4 "Qualified staff"
Operating staff is to be instructed according to operating instructions.

These instructions shall help you to install, operate and maintain the Hazardous material valves and provide you with all the necessary information for performing these tasks.
They should be read and kept very carefully. Hints and warnings must be strictly observed!

ATTENTION!

The following symbols are used to indicate warnings and other important notes in these operating instructions:

Means that death, severe body injuries or considerable material damage **will** ensue if the corresponding precautions are not taken.

Means that death, severe body injuries or considerable material damage **may** ensue if the corresponding precautions are not taken.

Means that light body injuries or material damage may ensue if the corresponding precautions are not taken.

These operating instructions are subject to technical improvements and alterations at any time.

2 Description

Hazardous material valves can be used for shutting off, conduction or regulation of liquid chemicals. The valves can be attached to tanks, containers and pipelines.

However, this requires that the Hazardous material valves are designed and manufactured in accordance with the working conditions and the consumer specification.
Materials, types of actuation and driving power must be suitable for the respective application.

The applications listed above are grouped below under the term “system”.

2.1 Validity of these operating instructions

These operating instructions are valid for all BURGMER Hazardous material valves of type TFB designed for use in the areas described under chapter “1. Introduction“.
Included are the following different types of design:
Hazardous material valves

- without actuation provided by manufacturer
- manual actuation
- foreign operated (pneumatic-/ electric driven)

2.2 Responding documents

The offer/work order form drawn up for each Hazardous material valve as well as all pertinent documents are an integral part of the internal documentation.
It contains the following information:

- medium / pressure / temperature / state of aggregation
- temperature class
- identification no. of operator or facility (if required)
- nameplate(s)
- manufacturer’s declaration according to DIN EN 14432:2014
- technical information concerning the Hazardous material valve and its application

Further responding documents are:

- Assembly, operating and maintenance instructions for all specified attached parts
- Declarations of manufacturer and certificates of conformity

2.3 Marking of Hazardous material valves

All Hazardous material valves are marked according to DIN EN 19. The information is located on the casing or on a nameplate.

BURGMER Apparatebau GmbH		Refer to imprint in operating instructions for address
Type	e.g. TFB1-XX	Type of Hazardous material valve
Serial-No	e.g. 218XXXX-1	Digits 1-7: Burgmer order no., digits 8-9: item no.
Date	e.g. 2018	Date of manufacture
DN	numerical value e.g. 100	Diameter of the valve
MWP	numerical value e.g. 10,0 bar or e.g. 6,0 bar	Max. permitted working pressure (bar) **10,0 bar at temperature range -20°C/+250°C** **6,0 bar at temperature range -20°C/+200°C**
TS	numerical value e.g. -20°C /+200°C	Upper / lower temperature range ATTENTION! TS is specified only for valves for temperature range -20°C/+200°C
Body	e.g. 1.0619	Body material
Disk	e.g. 1.4408	Valve disk material
Seat	e.g. PTFE	Material of sealing
	DIN EN 14432:2014	Note on the test basis

3 Intended use

The noncompliance with the precautions described in this chapter may endanger the life of the user and cause damage in the system.

Once incorporated into the system, the Hazardous material valves are to be used only for shutting off, conduction or regulation.

The Hazardous material valves are exclusively intended for the application range described in the documentation enclosed to order (order/commission number).

It is not permitted to use the Hazardous material valves for other purposes than those described in the specification.

Don't exceed by any means the permitted pressure and temperature range of the valves!

Don't exceed by any means the permitted temperature class.

Chapter 4 "Safety hints" is to be strictly observed.

4 Safety hints

4.1 General safety hints

The safety hints applying to the system, into which the Hazardous material valve is incorporated, apply also to the Hazardous material valve itself.

These operating instructions provide only safety hints to be observed additionally for the Hazardous material valves. Please ensure to read and observe also the enclosed operating and maintenance instructions of the attached parts.

4.2 Safety hints for operator

Compliance with the safety hints as listed below lies within the sole responsibility of the operator:

- Please take care to observe all safety regulations valid for the country of operation and / or the operating company.
- The Hazardous material valve is to be used solely for the intended purpose as described in chapter 3 “Intended use”.
- The whole system must be installed and checked periodically by qualified staff**.** (**Refer to chapter 4.4 “Qualified staff”**)
- **Appropriate measures are to be taken to avoid human extremities being entrapped by moving parts of the system!**

- **Warning signs or barriers must be put up if necessary!**
- **An accidental starting or stopping of the system is strictly to be avoided!**
- Additional pipeline forces or torques acting on the Hazardous material valves are not permitted and must be previously agreed with the manufacturer.
- The correct function of safety appliances provided by the customer (e.g. emergency stopping, safety valves, etc.) is to be verified and ensured prior to start-up!
- The Hazardous material valves are to be started up only when fully incorporated into the system and only by qualified staff of the operating company.
- The valve may conduct only media previously agreed with its manufacturer!
- Abnormal working conditions like vibrations, cavitation, water hammers, etc. are not permitted.

- **The max. permitted ambient temperature for operating the valves is –20°C to +40°C. Other temperatures must be previously agreed with the manufacturer!**
- In case of operating temperatures below -20°C or above +50°C, the valve is to be provided with a protection against accidental contact.

- **ATTENTION! Don't exceed by any means the max. permitted torques indicated in item 8.1 "Torques"!**
  We point out, that there are still risks for the user of Hazardous material valves, even if they are designed and manufactured with the highest possible care. Nevertheless, damage to persons and parts can only be a result of improper handling.

4.3 Special hazards

- **Please ensure to eliminate completely any pressure existing in the system before removing the Hazardous material valve or unscrewing any bolted connections on the attached parts.**
- Please ensure to evacuate completely any medium to prevent any escapes when removing the Hazardous material valve. Proceed with special care in case of hazardous or harmful substances!

ATTENTION!

Residues may accumulate in any parts of the system and the dead spaces in the valves.

4.4 Qualified staff

Must be individuals familiarized with transport, assembly, initial operation, operation and maintenance of valves and provided of the proper qualification for their activities and duties.

This qualification includes, among others:

- Indoctrination and commitment to comply with all national, local and internal requirements and provisions.
- Indoctrination or training, in accordance to safety standards, in the proper use and care of the reasonable safety and personal protective equipment.

5 Transport and storage

Hazardous material valves are to be handled, transported and stored with absolute care (protected against shocks, impacts and vibrations)!
All bare parts must be protected against corrosion!
Storage and transport temperature must be within the range of –20°C to +60°C.
ATTENTION! Don't store the valves in aggressive atmosphere.
The Hazardous material valves should be transported in their protective packaging to the place of incorporation. The Hazardous material valves are to be stored with the valve disk slightly open. This doesn't apply to Hazardous material valves – with single acting pneumatic actuation, safety position "CLOSED" - mandatorily delivered in closed position. Storage time may not exceed here 2 weeks. Otherwise the valve must be separated from the actuator.

6 Assembly, initial operation, handling, disassembly

SAFETY HINTS!
Read chapters 3 "Intended use" and 4 "Safety hints" before starting to assemble and/or disassemble the Hazardous material valve.

6.1 Assembly

BURGMER Hazardous material valves are to be installed or attached between or to flanges, according to EN 1092-1 and DIN EN 1759-1, with sealing bars of shapes B1 or B2, which are plane parallel machined and have to align. Other types of flanges and sealing bars may only be used after the manufacturer has checked their technical viability.
The seal faces of body and counter flanges must be smooth and clean.
In BA and collar II seals, the sealing insert acts at the same time as flange seal. Please make sure to use counter flanges with diameters suited to support the seals of the butterfly valves.
The inner diameter of the counter flanges is intended to cover at **least** 2/3 of the seal face and at **most** the clear width of the valve.
Don't use additional flange for this type of sealing.

It is forbidden to weld the flanges to the system or other pipeline/conveyor parts after the Hazardous material valve is installed (seal insert can burn!).

INSTALLATION INSTRUCTIONS!

- Check the Hazardous material valves for transportation damages. Don't install the valves if it's damaged.
- **Make sure to install only Hazardous material valves, which technical specifications (permitted pressure, temperature class, etc.) fulfil the installation requirements.**

- **The Hazardous material valve must be inserted in a slightly open condition into the gap between the counter flanges. Seals may otherwise leak later in shaft area**.
- The clear width of the counter flanges must provide enough space for the open valve disk, otherwise it can be damaged while opening.
- The Hazardous material valves can be installed in any position with regard to the medium flow direction.
- The valve may not serve as fixed point; it is supported by the pipeline system.
- Please ensure to insert the Hazardous material valves centred between the counter flanges.
- Huge and heavy actuators **must** be stabilized.
- Clean the flange faces and install flange seals appropriate to the quality of the valve seal. (**IMPORTANT!** see also item 6.1.)
- **If the valves are provided with grounding screws, shaft and body of the valve must be integrated mandatorily into the potential equalisation of the whole system. Shaft and body are provided for this with a specially marked threaded hole. The grounding cable must have then a cross section of at least 4mm² for nominal widths 50-100 Furthermore, the 90° rotational movement of the shaft is to be taken into account when dimensioning the length of the shaft grounding cable!**

- Thermal expansions in the system are to be compensated through compensators.
- **All flange connections are to be tightened with the torques [Ma in Nm] specified in the following table.** The use of torque wrenches ensures that the necessary tightening torques are adjusted, but not exceeded. Align flanges in plane parallel first. Tighten then connecting screws crosswise in 3 steps.

Step 1: 50% of the respective tightening torque
Step 2: 80% of the respective tightening torque
Step 3: 100% of the respective tightening torque

Tightening values for DIN flange connections

Diameter DN	50	80	100
Tightening value Ma [Nm]	60	60	80

Instructions for connecting of pneumatic actuators:

- Make sure to control the system pressure of the control lines when using pneumatic actuators. The max. control air pressure specified in the order documents must be strictly observed! Never exceed it!

Instructions for connecting of electric actuators:

- Does the existing connection voltage relate to the rate of the actuator manufacturer!? (see nameplate and operation instructions)
- Check sense of rotation right after connecting (phase balance). Observe sense of rotation arrow in the inspection glass.
- Depending on the design of the electric actuators, safety precautions against overload (thermal switch or torque switch) are to be integrated as well into the control circuit.

Instructions for connecting of ordered accessories:

- Please refer to the corresponding operation instructions of the ordered accessories for the connecting of solenoid valves, positioners, signalling units as well as the specified actuators (pneumatic, electric).

6.2 Initial operation phase

ATTENTION! Prior to commissioning, it must be ensured that the system contains no foreign objects!

A test run without product must be always performed first!
Refer to item 6.5 “Troubleshooting” in case of leaks on the Hazardous material valve!
The Hazardous material valve may only be used after a successful test run has been performed.

6.3 Handling

The Hazardous material valve can be provided with either a manually operated lever or an actuator for opening and closing. Normal hand force is sufficient for manual operation.
The functioning of the Hazardous material valve can be monitored by inductive or optic limit switches.

IMPORTANT! It is not permitted to use extensions to increase actuating moment.
Don’t exceed by any means the max. driving torques specified in Table under “8.1 Driving torques”!

6.4 Disassembly

IMPORTANT! Disassembly of the Hazardous material valves may be performed only after authorisation by the responsible company department and only by qualified staff (decision of the operating company)

6.4.1 Switching off the system

The following points are to be observed mandatorily in addition to the measures indicated in item 6.1 “Assembly”:

- **Relieve pressure in pipeline**
- **Let the medium cool-off**
- **Empty plant completely**
- **Ventilate the pipeline in case of corrosive, aggressive, toxic or inflammable media.**

Hazardous material valves with pneumatic or electric actuation must be duly shut down by “qualified staff” in accordance to the valid occupational safety regulations of country of operation before disassembly.

6.4.2 Carrying out of disassembly

Remove carefully bolted connections on flanges (IMPORTANT! The system must be relieved of pressure!).
Remove Hazardous material valve in closed position from the system.
Remove carefully any dirt.
Unrepairable valves are to be disposed of according to the valid environment protection regulations.

6.5 Troubleshooting

Failure	Reason	Elimination
Flange connections are leaky	Hazardous material valve wasn’t centred during installation	• **Switch off system (refer to 6.4.1)** • Remove Hazardous material valve • Check for damage on sealing and flange faces • Replace seal if necessary • Install Hazardous material valve (according to assembly instructions) • Carry out function test

Failure	Reason	Elimination
Flange connections are leaky	Inner diameters of flanges or flares are too big	• **Switch off system (refer to 6.4.1)** • Remove Hazardous material valve • Check for damage on sealing and flange faces • Check out inner diameters of flanges or flares • If necessary, install flanges or flares provided of a sufficient bearing surface • Install Hazardous material valve (according to assembly instructions) • Carry out function test
Hazardous material valve can't be closed	Solid object between seal insert and valve disk	• **Switch off system (refer to 6.4.1)** • Remove Hazardous material valve • Remove solid object • Check for damage on sealing and valve disk and repair them if necessary • Install Hazardous material valve (according to assembly instructions) • Carry out function test
Hazardous material valve can't be closed	Seal insert is porous	• Check out if operating temperature is according to specification • **Switch off system (refer to 6.4.1)** • Remove Hazardous material valve • Check for damage on sealing • Repair with corresponding sealing • Install Hazardous material valve (according to assembly instructions) Carry out function test
Hazardous material valve can't be closed	Additional pipeline forces are too big! Hazardous material valve is distorted	• Refer to chapter 4.2.
Hazardous material valve can't be closed	Pressure of medium in pipeline is too high	• Check out if system pressure of control line is according to specification • Driver power is insufficient
Hazardous material valve can't be closed	Cross section of pneumatic feed lines is too small	• Checkout lines and replace them if necessary

Failure	Reason	Elimination
Hazardous material valve can't be closed	Choke in solenoid valve is clogged	• Remove and clean choke
Hazardous material valve leaks in closed position	Sealing is worn out (natural wear)	• **Switch off system (refer to 6.4.1)** • Remove Hazardous material valve • Checkout if sealing is worn out and repair with new spare part • Install Hazardous material valve (according to assembly instructions) • Carry out function test • Observe maintenance intervals and shorten them if necessary
Hazardous material valve leaks in closed position	Actuator provided by client: driving torque is too big, causing distortion of square	• Use actuator with lower driving torque (refer to item 8.1. „Driving torque") • Replace shaft
Hazardous material valve leaks in closed position	Position of valve disk and limit switch or valve control don't match	• Check out actual position of valve disk • The marking of the front side of upper shaft ("0") must align to the markings on valve neck ("0") and valve disk ("0") • In case of polished or coated valve disk („0") the marking on the outside of the valve must align to the marking („0") on the front side of upper shaft • Hazardous material valves with actuators (pneumatic, electric) check end position adjustment of actuators (refer to the operation instructions of the actuators)
Hazardous material valve leaks in closed position	Inner diameter of counter flanges is too small. Valve disk hits flanges in open position.	• Replace flanges and if necessary damaged shaft / valve disk

ATTENTION! Observe the safety hints listed in chapter 4 when performing works of any kind on the Hazardous material valve!

7 Maintenance

BURGMER Hazardous material valves, without attachments, are maintenance-free if operated correctly.

RECOMMENDATION! Extensive maintenance and repair should be done by the manufacturer in order to avoid costs of stand-still

Relubrication of bearings is not necessary. Bearings are provided with permanent lubrication by manufacturer.

ATTENTION! When detecting a defect on a valve or its attachments, the system is to be shut down immediately and restarted only after elimination of defect!

7.1 Safety hints

Any kind of work on the Hazardous material valves should be done only by "qualified staff" (refer to chapter 4.4)!
Before starting to work, inform the safety officer.

- **Secure the Hazardous material valves against accidental start up, cut off pneumatic or electric connections!**
- **Do not grasp into the open Hazardous material valve!**
- **Hazardous material valves mounted under vessels have to be secured by an emergency shutoff before working on them!**
- **Keep vessels, pipes and feeding parts of plant free of product when doing extensive maintenance or repair works on the Hazardous material valves.**
- **Avoid after-running of product by closing stop valves or taking other convenient actions.**

7.2 Inspection list and maintenance works

Action	weekly	monthly (every 4-5 weeks)
Visual control of electric and pneumatic connections	●	
Check air-tightness of solenoid valves and pneumatic connections		●
Check bolted connections (actuators, control elements, flanges) and tighten them if necessary		●
Checking for leaks in shaft exits area (upper and lower shaft) of valve: Liquids: Check visually for leaks! **ATTENTION! When detecting a leak, shut down plant as soon as possible and repair valve!**	●	

8 Annex

8.1 Torques

Breakaway torques indicated in table applies to liquid and well lubricating media! Values are to be multiplied by a factor 1, 2 in case of dry non-lubricating media!

Diameter DN	50	80	100
Breakaway torque [Nm] unpressurized	**35**	**55**	**65**

Don't exceed by any means the max. permitted driving torques on the valve shaft indicated in Table!
This is to be taken strictly into account when choosing an actuator and establishing the system pressure of the actuator control lines!

Diameter DN	50	80	100
Max. perm. driving torque [Nm]	**50**	**80**	**90**

8.2 Permitted internal working pressure "**MWP**" of valves

ATTENTION! Don't exceed the permitted working pressure values listed below in Table!

Diameter DN	50	80	100
Max. perm. working pressure MWP (bar) -20°C/+50°C	10	10	10
Max. perm. working pressure MWP (bar) -20°C/+200°C	6	6	6

8.3 Material compatibility of valve

ATTENTION! The valve may conduct only with media agreed previously with its manufacturer!

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