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› compounding & extrusion
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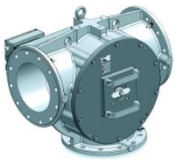
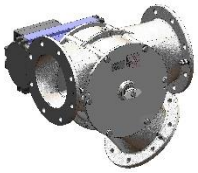
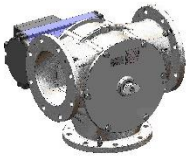
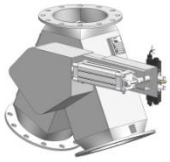
# Original installation and operating manual

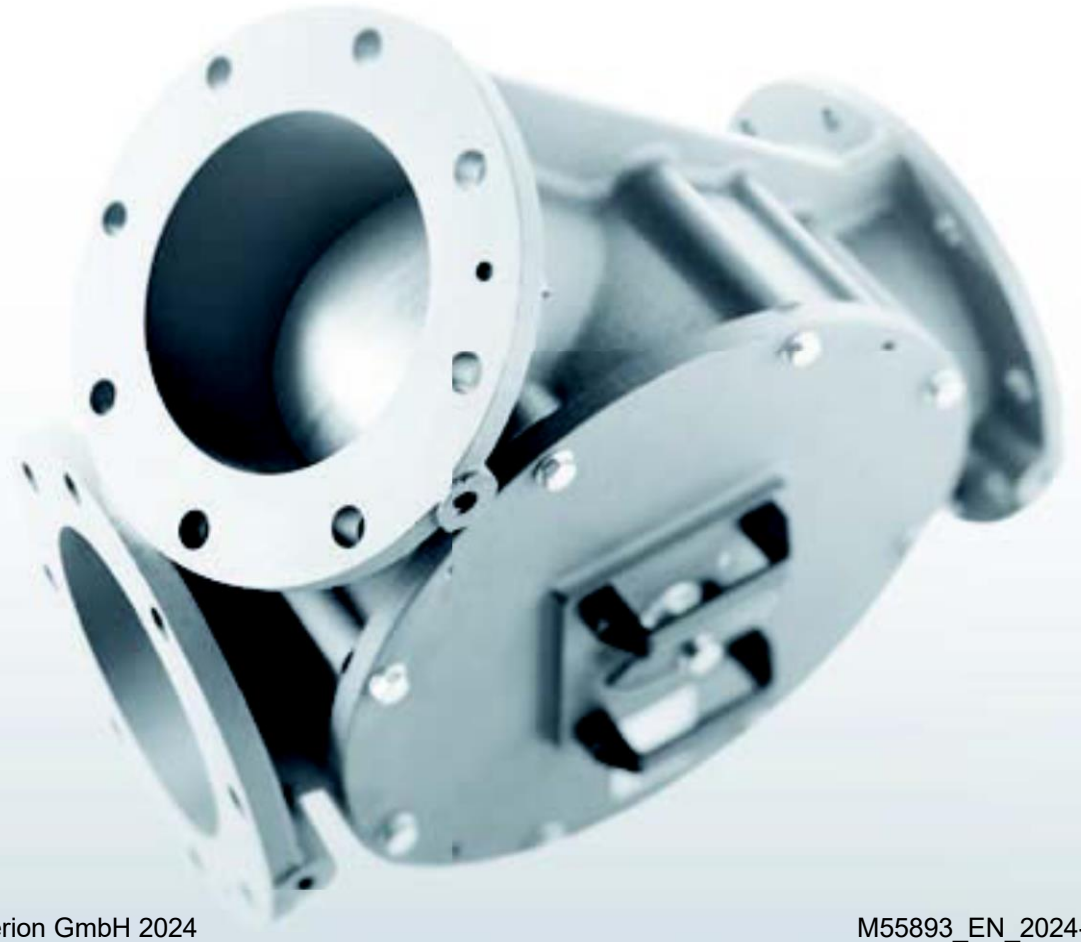
## Diverter valves

**Operating manual number** **M55893_EN_2024-03**

**Diverter valve types:**

| WEK | WET | WZK | WYK | WRK |
|---|---|---|---|---|
|  |  |  |  |  |

| WHK | WHT | WGV | GDV | DWR |
|---|---|---|---|---|
|  |  |  |  |  |



If necessary, contact our Service Center:

Mailing address:
**Coperion GmbH**
Niederbieger Strasse 9
D-88250 Weingarten

Plant and delivery address:
**Coperion GmbH**
Eisenbahnstraße 15
D-88255 Baienfurt-Niederbiegen

Tel: +49 / 751 4 08-0
+49 / 751 4 08-450 (service number)
Fax: +49 / 751 4 08-200
Email: service@coperion.com

To ensure smooth and speedy handling, we need the following information from you:

- Serial number (information on the name plate)
- Type designation
- Coperion order no. with assembly (if available)
- Operating data (information on the name plate)
- Description of the problem

# Contents

# 1 General

## 1.1 Introduction

This installation and operating manual contains important information that supports you during the intended use of the machine. The installation and operating manual is intended for qualified, instructed and trained personnel tasked with installing the machine in an existing system.

The diverter valves described here are partially completed machines by definition (Machinery Directive 2006/42/EC, Article 2 g).

The installation and operating manual must always be kept at the machine location. It must be read, understood and used by every person tasked with work on or with the machine. This applies in particular to the safety instructions that are specially marked in this installation and operating manual. Obeying the safety instructions helps to avoid accidents, errors and malfunctions.

This installation and operating manual is intended to aid familiarization with the machine and using the machine as intended.

This installation and operating manual contains important information on operating the machine safely, correctly and cost effectively.

### Obeying the installation and operating manual:

- ⇨ helps prevent hazards and risks,
- ⇨ increases operational reliability,
- ⇨ increases the service life of the machine, and
- ⇨ reduces servicing costs and downtimes.

If we provide you with additional information related to the machine (additional technical information, for example), obey this information, too, and keep it with the installation and operating manual.

If you do not understand the whole installation and operating manual or individual chapters of it, talk to your dealer and/or Coperion GmbH before starting the corresponding activity.

To ensure safe operation of this machine, it is important to comprehend, understand and obey the instructions, recommendations and notes in this installation and operating manual. If you do not obey the instructions, recommendations and notes, any possible warranty claim made with respect to this machine may be restricted or denied.

Examples of such unintended use may be the following:

- ⇨ Installation errors.
- ⇨ Poor maintenance.
- ⇨ Other uses not specified in the installation and operating manual.

## 1.2 Changes/reservations

We make every effort to ensure that this installation and operating manual is correct and up-to-date. To maintain our technical edge, it may be necessary to make changes to the product and its operation without advance notice. We assume no liability for malfunctions, outages or damage resulting from such changes.

Also obey any additional information that may have been supplied.

## 1.3 Warranty and liability

Our General Sales Terms and Delivery Conditions always apply. They are available to the end customer upon award of contract at the very latest and can be found on our Internet site.

Coperion GmbH excludes warranty services and liability claims for persons or property damage resulting from one or more of the following causes:

- Use that is not intended.
- Improper installation, commissioning
- Operation with safety equipment that is not attached properly or not functioning.
- Noncompliance with the safety instructions and information in the installation and operating manual.
- Repairs or manipulation by persons who are neither authorized nor trained for this.
- Unauthorized structural modifications or changes.
- Servicing and maintenance work performed improperly or not in due time.
- Process media, accessories, spare parts and additives that cause damage and that have not been approved by the manufacturer. The manufacturer assumes no liability for consequential damages resulting from this.
- Catastrophes resulting from foreign objects and force majeure.
- Product contamination due to malfunctions (for example, abrasion). The manufacturer assumes no liability – the operator is to take appropriate countermeasures (for example, magnetic separators).

**Information**
Do not perform any actions in or make any changes to the component not authorized by us. This applies in particular to drive systems and mechanical or pneumatic components because this may result in revocation of the Declarations for EC directives, among other consequences.

## 1.4 Shipment contents

- ⇨ After receiving the shipment, use the shipping documents to check that the machine is complete and that the individual assemblies are present.
- ⇨ In the event of transport damage, the delivering transport manager is to be held liable in writing.
- ⇨ Missing parts are to be reported immediately to the manufacturer/delivery agent.

## 1.5 Documentation

The installation and operating manual is part of the product and an element of the shipment contents.

One copy of this manual must be made available at all times to the authorized personnel over the entire service life of the machine. Make sure that, for example, if the machine is resold, this manual is supplied with the machine.

We reserve the right to make changes for technical refinement with respect to the data and illustrations contained in this installation and operating manual.

Regardless of this manual, the laws, regulations, directives, provisions and standards applicable in the country of the user and at the location of use must be obeyed.

The text and illustrations correspond to the state of the technology when printed. Subject to change. We are always grateful for improvement suggestions and information on errors in the installation and operating manual.

### 1.5.1 Language and copyright

Translations have been made to the best of the translator's knowledge. We assume no liability for translation errors or the consequences arising from them, even if the translation was made by us or under contract to us.

The German text is and remains the governing factor for all liability and warranty claims. We expressly reserve all rights under the law by way of copyright.

## 1.6 Symbols used in this manual

The symbols used in this manual are to help you use this manual and the machine quickly and safely.

**Information**
Information segments provide you with knowledge about the most effective or most practical use of the machine and of this manual.

### ⇨ Actions

The defined sequence of actions makes it easy for you to use the machine correctly and safely.

### [ ] Item numbers

Item numbers in graphics are marked in the text using brackets [ ].

### ✓ Result

Here you will find a description of the result of a sequence of actions.

### 1.6.1 Safety signs

The safety sign depicts a hazard source using pictures. The safety signs used in all technical documentation comply with ANSI Z 535.4 (Product Safety Signs and Labels).

The following symbols are used in this manual:

| Pictogram | Description |
|---|---|
|  | **Warning of a general risk**<br>This warning sign indicates activities that may have several hazard causes. |
|  | **Warning of a shear risk**<br>This warning sign indicates activities that present a hazard of shearing extremities, possibly resulting in death. |
|  | **Warning of a pinch point risk**<br>This warning sign indicates activities that present a pinch point risk, possibly resulting in death. |
|  | **Warning of a dangerous electrical voltage**<br>This warning sign indicates activities that present an electric shock hazard, possibly resulting in death. |
|  | **Warning of a hot surface**<br>This warning sign indicates activities that present hazards due to hot surfaces. |
|  | **Warning of a slipping risk**<br>This warning sign indicates activities that present slipping hazards, possibly resulting in death. |
|  | **Warning of suspended loads**<br>This warning sign indicates activities that present hazards from falling objects, possibly resulting in death. |
|  | **Warning of explosive materials**<br>This warning sign indicates activities that present hazards from explosive materials, possibly resulting in death. |
|  | **Warning of a pinch point risk**<br>This warning sign is used around activities that present pinch point hazards. |

| Pictogram | Description |
|---|---|
|  | **Warning of pressurized parts and media**<br>This warning sign indicates activities that present hazards due to pressurized parts and media. |
|  | **Warning of a health risk**<br>This warning sign indicates activities that present hazards due to skin contact with or swallowing of certain media. |
|  | **Warning of an asphyxiation hazard**<br>This warning sign is used around activities that present asphyxiation hazards. |

## 1.7 Safety instructions – classification of signal words

The following risk levels are used in this manual to warn about potential hazardous situations and important safety codes:

| Risk level | Description |
|---|---|
| DANGER | Warns about a hazardous situation that, if not avoided, will result in death or severe, permanent injuries. |
| WARNING | Warns about a hazardous situation that, if not avoided, may result in death or severe, permanent injuries. |
| CAUTION | Warns about a hazardous situation that, if not avoided, may result in slight or moderate injuries. |
| *NOTICE* | Warns about a situation that, if not avoided, may result in damage to property or the environment. |
| SAFETY INSTRUCTIONS | Describes operating procedures that are to be followed consistently, for example, shut down procedures in the event of malfunctions or emergencies. |
| ATEX | Identifies special specifications, rules and prohibitions for use in potentially explosive atmospheres. Compliance with these are mandatory or countermeasures are necessary to avoid the loss of the CE mark as per ATEX. |

## 1.8 Structure of safety instructions

Warnings are structured as follows in this installation and operating manual:

| | RISK LEVEL |
|---|---|
| Pictogram | **Type and source of the risk!**<br>Consequences if ignored<br>► Risk-prevention action |

## 1.9 Name plate

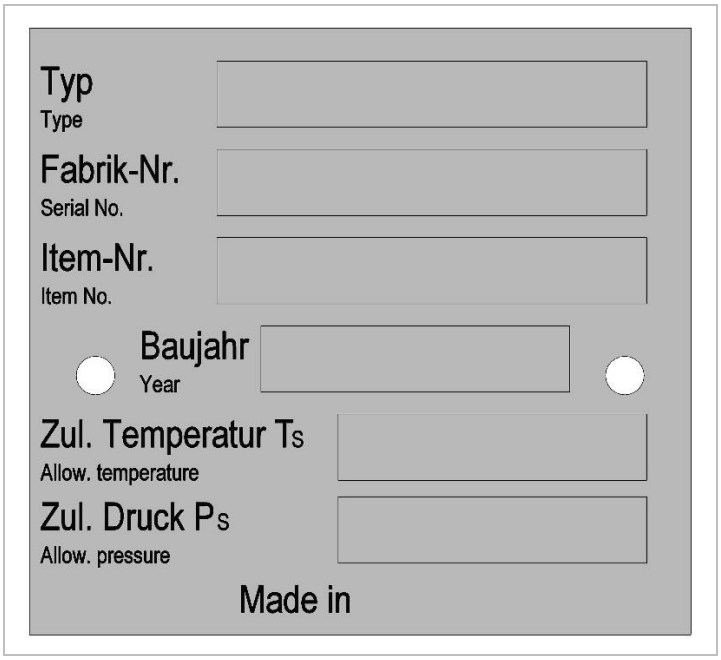



*Fig. 1.1: Standard name plate*

⇨ Enter the data from the name plate into the following table:

| Designation | Data |
|---|---|
| Type | |
| Serial No. | |
| Item No. | |
| Year of construction | |
| Allow. temperature $T_S$ | |
| Allow. pressure $P_S$ | |

**Information**
The entire label has the status of a document and must not be changed or defaced.

### 1.9.1 Type designation

**Example:** **WY K 100 P1 SS CIP**

- Diverter valve
- Diverter valve type
- Outlet
- Size
- Drive system (P = pneum., 1 = Version)
- Material designator
- Possible diverter valve design

## 1.10 Safety labels on the diverter valve

| Label | Description |
|---|---|
|  | This label warns against reaching into the inlet and outlet openings, which could result in the crushing or shearing of limbs and possibly even death. |

*Fig. 1.2: Warning label*

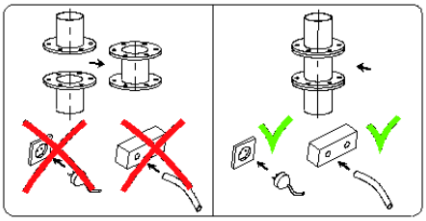
| Label | Description |
|---|---|
|  | This label points out that components should only be supplied with energy in the installed condition in order to prevent hazards posed by moving parts. |

*Fig. 1.3: Information label*

**DANGER**

**Danger due to moving sharp parts!**

May result in severe injuries or death.

► Only operate the diverter valve when installed.

# 2 Packaging, transport and storage

## 2.1 Packaging

The machine was carefully packed to ensure sufficient protection during shipment.

Upon receipt, examine the packaging and the goods for damage. Damaged cables and connectors are a safety risk and must not be used.

If there is damage, do not put the machine into service.

In this case, please contact Coperion GmbH.

## 2.2 Transport

The machine is usually packed and shipped complete and ready for installation. Depending on local circumstances and the lifting equipment available, the machine is delivered disassembled into separate assemblies, depending on the contract. In this case, the assemblies are listed separately in the shipping documents.

### 2.2.1 Safety and personnel

To avoid life-threatening injuries and property damage during transport, you must keep the following points in mind:

- ⇨ Make sure that transport tasks are only performed by appropriately trained personnel in compliance with the safety instructions.
- ⇨ Keep in mind that protruding sharp edges may lead to injuries.
- ⇨ Never loiter under suspended loads.
- ⇨ Make sure that the transport route is closed off and secured so that no unauthorized persons can enter the hazard zone.
- ⇨ Make sure that the means of transport (overhead crane, crane truck, lifting truck) satisfies the local accident prevention regulations.
- ⇨ Comply with the valid national and regional directives and accident prevention regulations. This applies especially to directives with regard to hazards from transport and conveyance.
- ⇨ Keep the weight and the dimensions of the individual parts of the system in mind when selecting the means of transport.
- ⇨ Attach chains or cables to all suspension points of suitable load suspension gear.
- ⇨ The chains or cables must make as small an angle as possible with respect to the vertical.

## 2.2.2 Transporting the machine

During transport, avoid impacts and the formation of condensate arising from large temperature fluctuations.

⇨ Attach the transport covers on the inlet and outlet openings.

**Information**
When selecting the lifting equipment, load attachment points and lashing equipment, keep the total weight of the machine and the drive system in mind (see chapter *4 Technical data*).

**DANGER**

**Danger due to improper transport!**
People may be struck by parts of the machine. The machine may slide or overturn. Risk of severe injuries resulting in death.

- ► Only pick up the machine using the threads provided for this purpose. If the machine does not have threads, always sling it on the flanges.
- ► Move the machine to the place of use using a suitable means of transport!
- ► Use appropriate transportation securing devices during transport.
- ► Do not enter or loiter in the hazard zone.
- ► Never loiter under suspended loads.

⇨ Select suitable load attachment means (for example, lifting eyebolts) depending on the diverter valve type and size.

⇨ Mount the suitable load attachment means at the positions provided for this purpose [⬆] on the diverter valve.

⇨ Attach the diverter valve to the crane using suitable hoisting equipment (for example, a lifting sling) at the load attachment means provided for this purpose.

⇨ Pay attention to the center of gravity [◔] of the machine!

### WHK diverter valves in SS

| | Flange<br>Front view<br>Figure 2.1,<br>Figure 2.2 | Flange<br>Rear view<br>Figure 2.3,<br>Figure 2.4 | Housing<br>Top view<br>Figure 2.5,<br>Figure 2.6 |
|---|---|---|---|
| DN 100 | M12x18 (3x) | M12x18 (3x) | M10x20 (1x) |
| DN 150 | --- | --- | M10x20 (1x) |
| DN 200 | --- | --- | M12x18 (1x) |
| DN 250 | --- | --- | M12x20 (1x) |
| DN 300 | --- | --- | M16x24 (1x) |
| DN 350 | --- | --- | M16x24 (1x) |
| DN 400 | M16x24 (3x) | M16x24 (3x) | M20x30 (1x) |

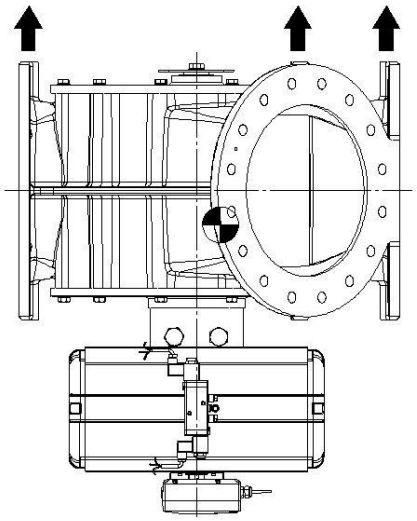


*Figure 2.1*

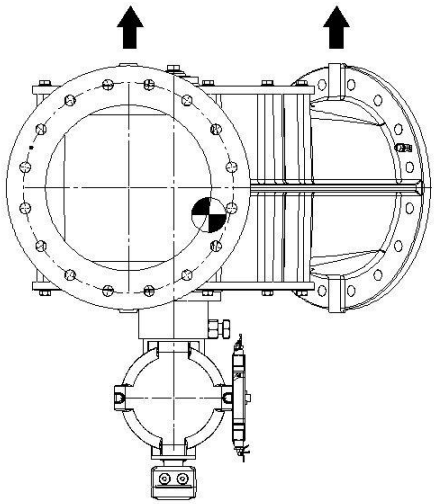


*Figure 2.2*

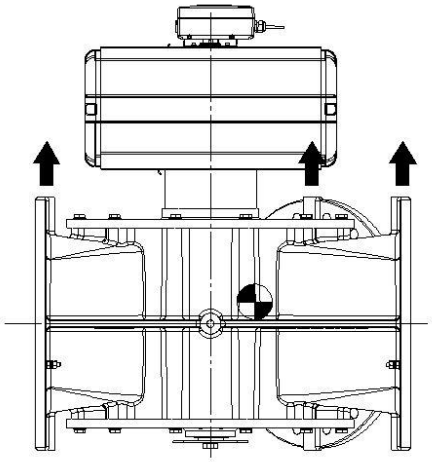


*Figure 2.3*

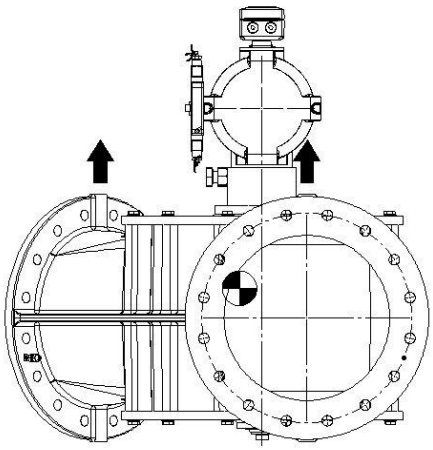


*Figure 2.4*

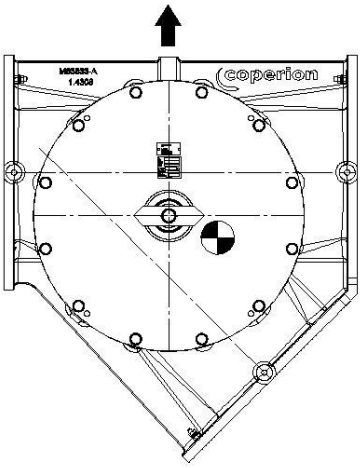



*Figure 2.5*

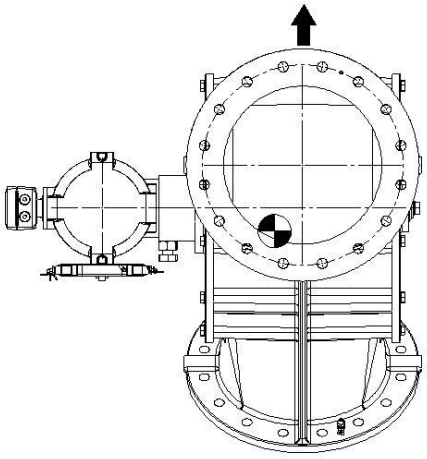


*Figure 2.6*

### WHK diverter valves in Al

| | Flange<br>Front view<br>Figure 2.7,<br>Figure 2.8 | Flange<br>Rear view<br>Figure 2.9,<br>Figure 2.10 | Housing<br>Top view<br>Figure 2.11,<br>Figure 2.12 |
|---|---|---|---|
| DN 100 | | | |
| DN 150 | | | |
| DN 200 | M16x24 (3x) | M16x24 (3x) | M16x24 (1x) |
| DN 250 | M16x24 (3x) | M16x24 (3x) | M16x24 (1x) |
| DN 300 | M16x24 (3x) | M16x24 (3x) | M16x24 (1x) |
| DN 350 | | | |
| DN 400 | | | |

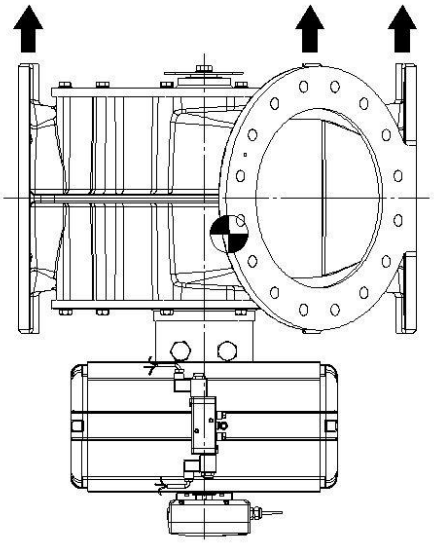


*Figure 2.7*

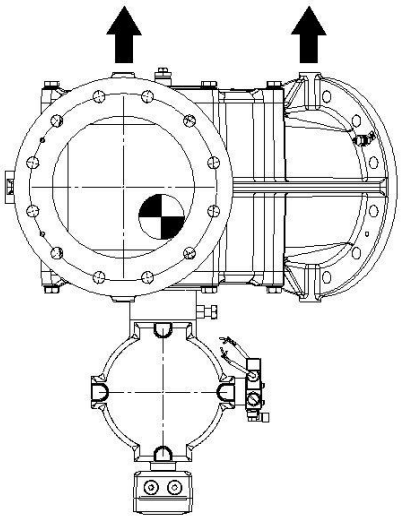


*Figure 2.8*

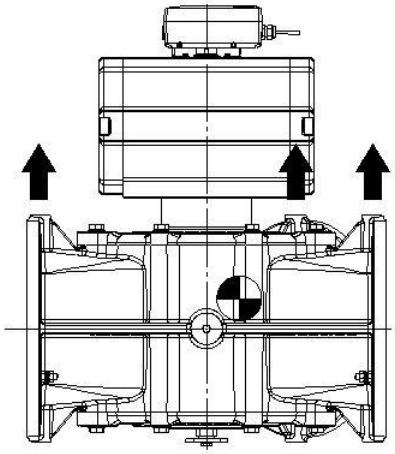


*Figure 2.9*

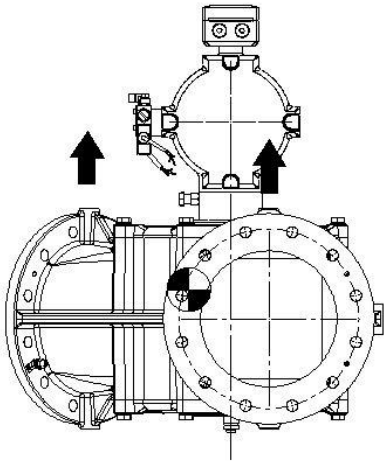


*Figure 2.10*

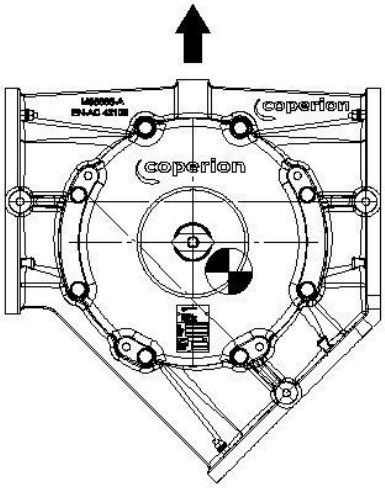



*Figure 2.11*

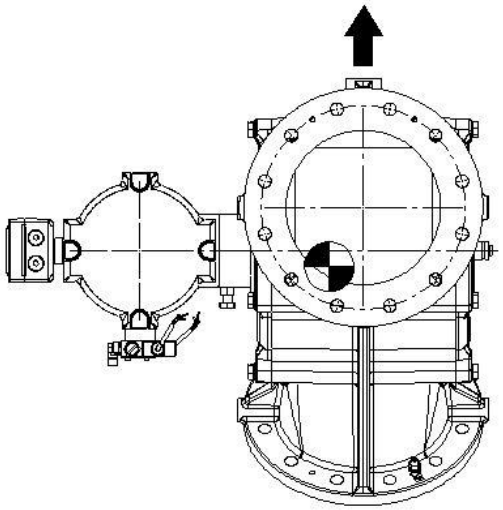


*Figure 2.12*

**WHT diverter valves in Al (new design)**

| | Flange<br>Front view<br>Figure 2.13,<br>Figure 2.14 | Flange<br>Rear view<br>Figure 2.15,<br>Figure 2.16 | Housing<br>Top view<br>Figure 2.17,<br>Figure 2.18 |
|---|---|---|---|
| DN 100 | | | |
| DN 150 | | | |
| DN 200 | M16x24 (3x) | M16x24 (3x) | M16x24 (1x) |
| DN 250 | | | |
| DN 300 | | | |
| DN 350 | | | |
| DN 400 | | | |

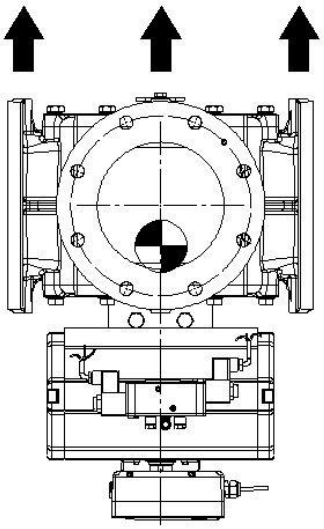


*Figure 2.13*

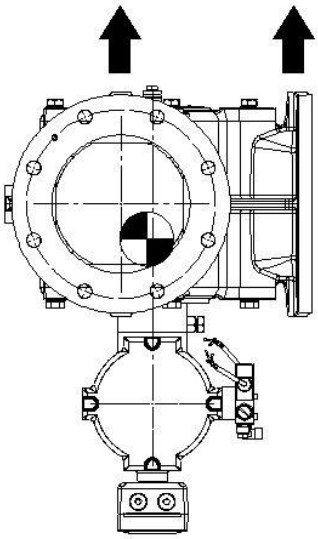


*Figure 2.14*

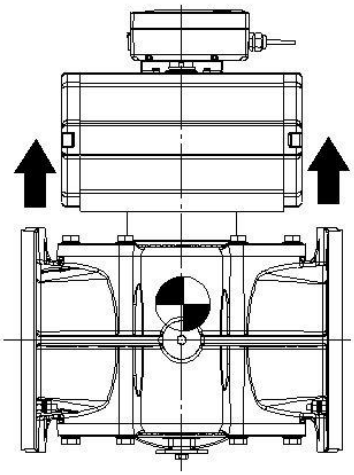


*Figure 2.15*

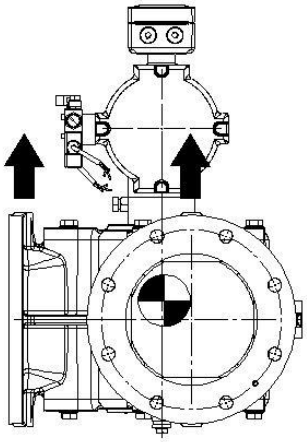


*Figure 2.16*

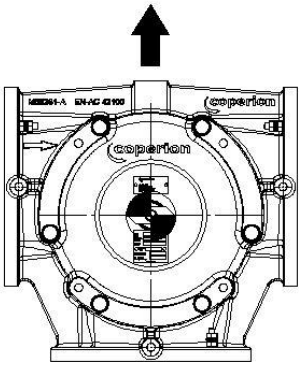



*Figure 2.17*

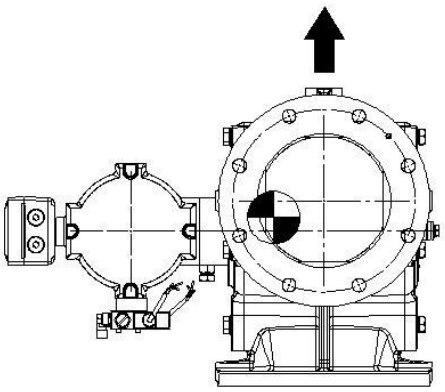


*Figure 2.18*

### WHT diverter valves in Al (old design – BKW)

| | Flange<br>Front view<br>- | Flange<br>Rear view<br>- | Housing<br>Top view<br>Figure 2.19,<br>Figure 2.20 |
|---|---|---|---|
| DN 100 | | | |
| DN 150 | --- | --- | M10x15 (1x) |
| DN 175 | --- | --- | M10x15 (1x) |
| DN 200 | --- | --- | M10x15 (1x) |
| DN 250 | --- | --- | M12x18 (1x) |
| DN 300 | --- | --- | M12x18 (1x) |
| DN 350 | | | |
| DN 400 | | | |

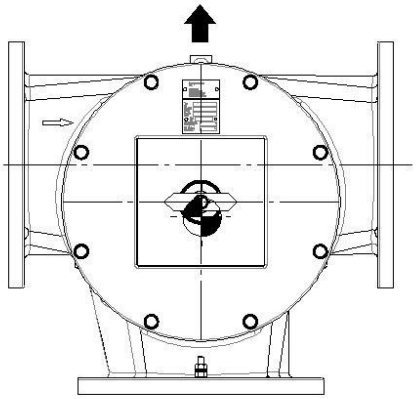


*Figure 2.19*

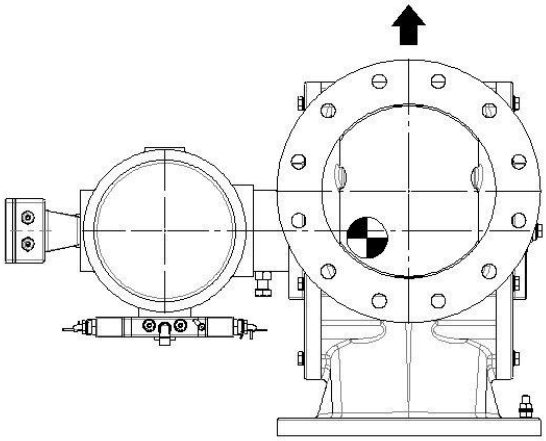


*Figure 2.20*

### WZKN diverter valves in Al

| | Flange<br>Figure 2.21,<br>Figure 2.22 | Flange<br>Figure 2.23,<br>Figure 2.24 | Flange<br>Figure 2.25,<br>Figure 2.26,<br>Figure 2.27,<br>Figure 2.28 |
|---|---|---|---|
| DN 50 | M8x10 (3x) | M8x10 (4x) | M8x10 (4x) |
| DN: 65 | M8x10 (3x) | M8x10 (4x) | M8x10 (4x) |
| DN: 80 | M8x10 (3x) | M8x10 (4x) | M8x10 (4x) |
| DN 100 | M10x12 (3x) | M10x12 (4x) | M10x12 (4x) |
| DN 125 | M12x14 (3x) | M12x14 (4x) | M12x14 (4x) |
| DN 150 | M12x14 (3x) | M12x14 (4x) | M12x14 (4x) |
| DN 175 | M16x25 (3x) | M16x25 (4x) | M16x25 (4x) |
| DN 200 | M16x25 (3x) | M16x25 (4x) | M16x25 (4x) |
| DN 250 | M16x25 (3x) | M16x25 (4x) | M16x25 (4x) |

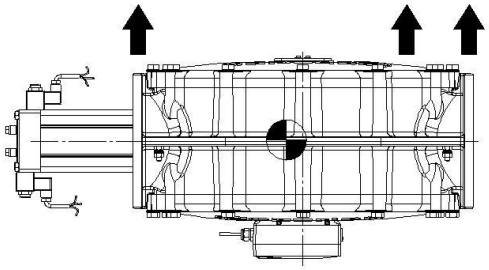


*Figure 2.21*

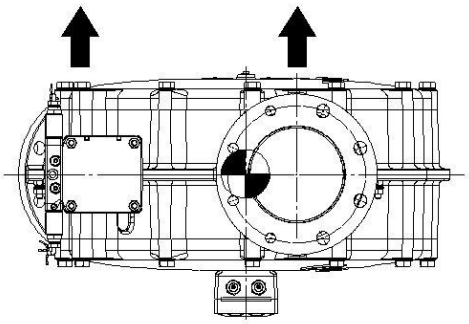


*Figure 2.22*

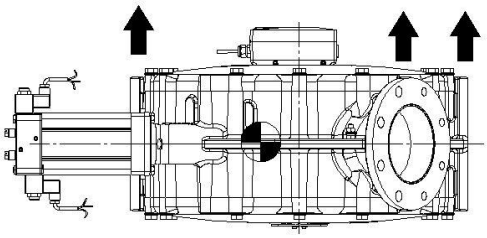


*Figure 2.23*

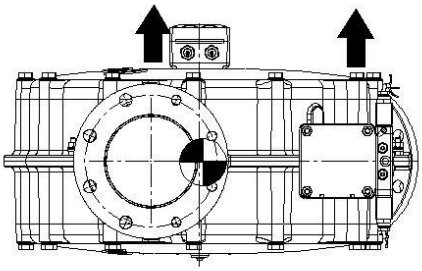


*Figure 2.24*

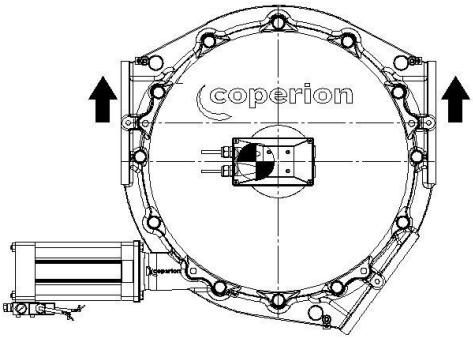



*Figure 2.25*

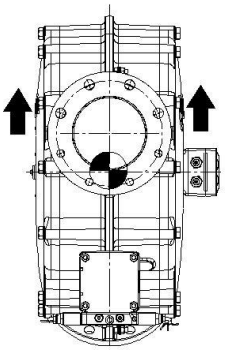


*Figure 2.26*

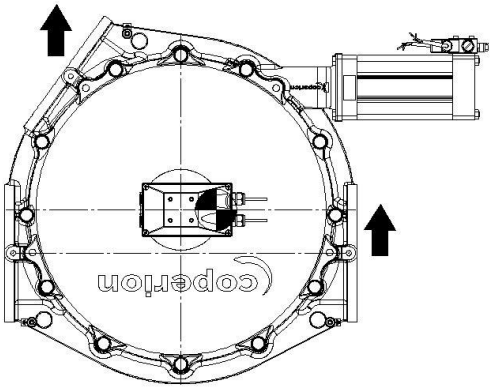



*Figure 2.27*

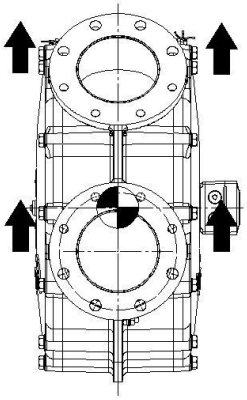


*Figure 2.28*

### WEK diverter valves in Al

| | Flange<br>Front view<br>Figure 2.29,<br>Figure 2.30 | Flange<br>Rear view<br>Figure 2.31,<br>Figure 2.32 | Housing<br>Top view<br>Figure 2.33,<br>Figure 2.34 |
|---|---|---|---|
| DN 150 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 175 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 200 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 230 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 250 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 300 | M16x24 (3x) | M16x24 (3x) | M16x24 (4x) |
| DN 350 | M16x24 (3x) | M16x24 (3x) | M16x24 (4x) |
| DN 400 | M20x30 (3x) | M20x30 (3x) | M20x30 (4x) |

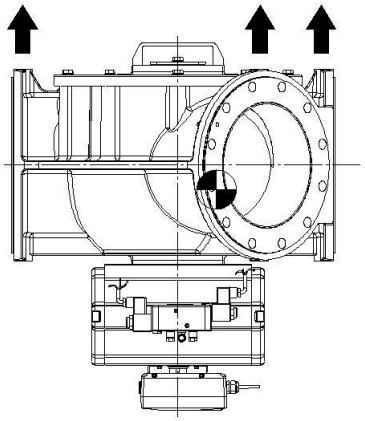


*Figure 2.29*

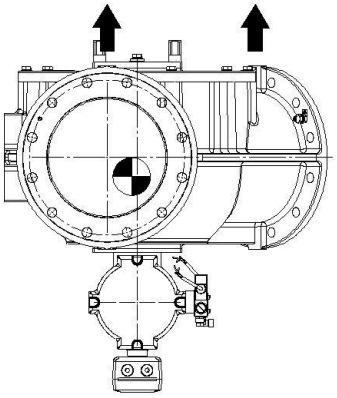


*Figure 2.30*

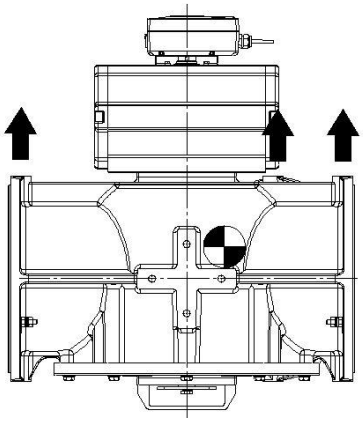


*Figure 2.31*

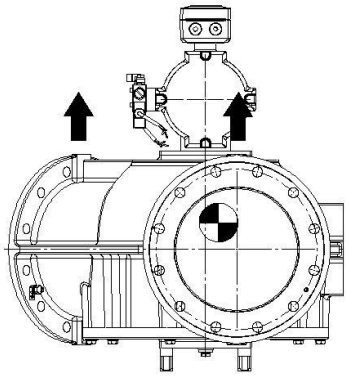


*Figure 2.32*

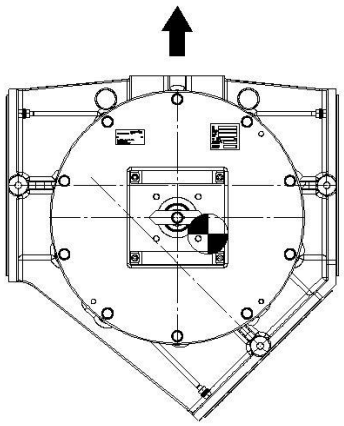


*Figure 2.33*

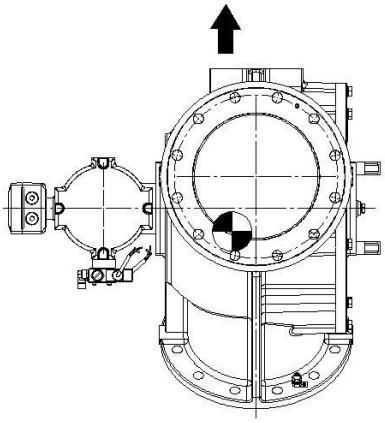


*Figure 2.34*

### WEK diverter valves in SS

| | Flange<br>Front view<br>Figure 2.35,<br>Figure 2.36 | Flange<br>Rear view<br>Figure 2.37,<br>Figure 2.38 | Housing<br>Top view<br>Figure 2.39,<br>Figure 2.40 |
|---|---|---|---|
| DN 108 | M12x18 (3x) | M12x18 (3x) | M12x18 (1x) |
| DN 162 | M12x18 (3x) | M12x18 (3x) | M12x18 (1x) |
| DN 213 | M16x18 (3x) | M16x18 (3x) | M16x18 (1x) |
| DN 265 | M16x24 (3x) | M16x24 (3x) | M16x24 (1x) |
| DN 316 | M16x24 (3x) | M16x24 (3x) | M16x24 (1x) |

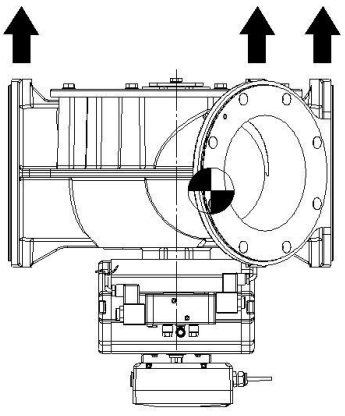


*Figure 2.35*

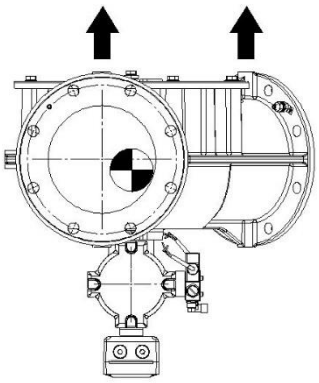


*Figure 2.36*

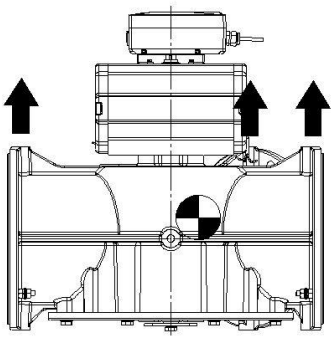


*Figure 2.37*

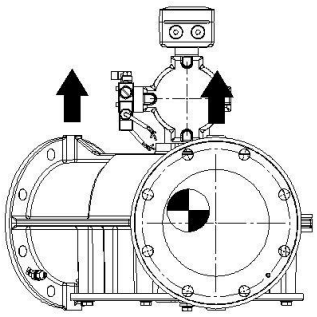


*Figure 2.38*

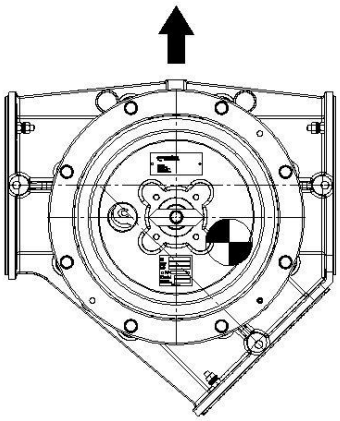


*Figure 2.39*

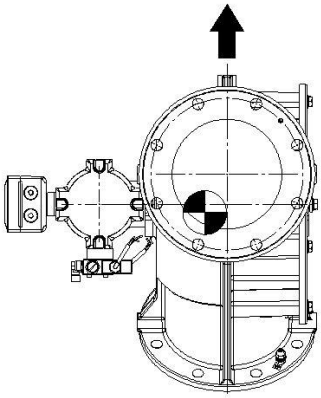


*Figure 2.40*

### WET diverter valves in Al

| | Flange<br>Front view<br>Figure 2.41,<br>Figure 2.42 | Flange<br>Rear view<br>Figure 2.43,<br>Figure 2.44 | Housing<br>Top view<br>Figure 2.45,<br>Figure 2.46 |
|---|---|---|---|
| DN 150 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 175 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 200 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 250 | M16x24 (3x) | M16x24 (3x) | M16x27 (4x) |
| DN 300 | M16x24 (3x) | M16x24 (3x) | M16x24 (4x) |
| DN 350 | M16x24 (3x) | M16x24 (3x) | M16x24 (4x) |

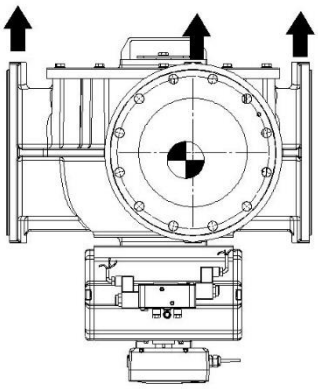


*Figure 2.41*

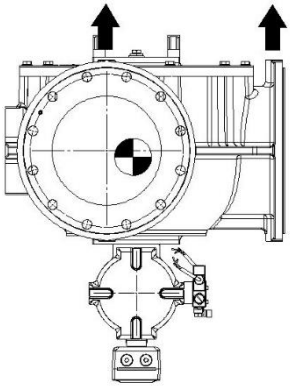


*Figure 2.42*

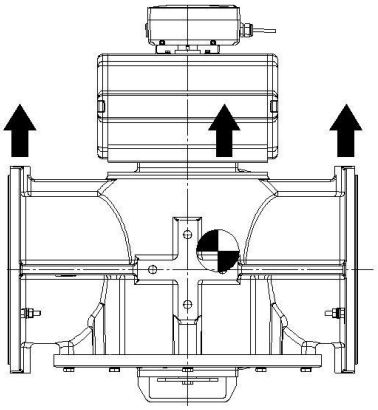


*Figure 2.43*

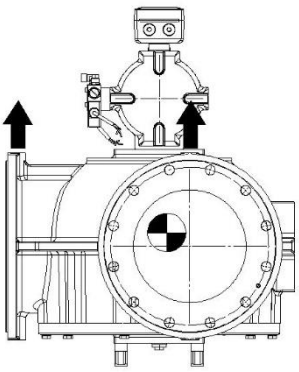


*Figure 2.44*

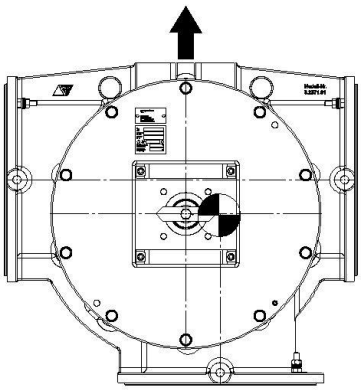


*Figure 2.45*

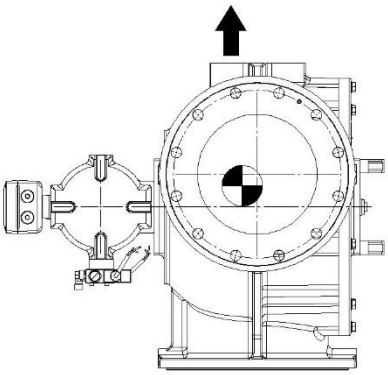


*Figure 2.46*

### WGV diverter valves in Al

| | Flange DIN EN 1092 Figure 2.47, Figure 2.48, Figure 2.49 | Flange ASME B16.5 Figure 2.47, Figure 2.48, Figure 2.49 |
|---|---|---|
| DN 150 | 8 x ø23 | 8 x ø23 |
| DN 200 | 8 x ø22 | 8 x ø22.4 |
| DN 250 | 12 x ø22 | 12 x ø25.4 |
| DN 300 | 12 x ø22 | 12 x ø25.4 |

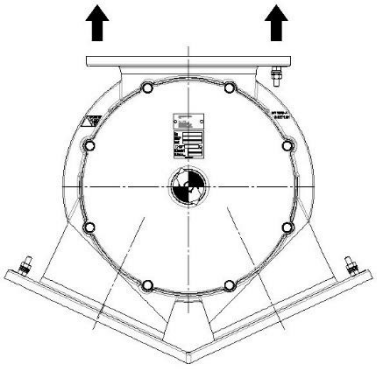


*Figure 2.47*

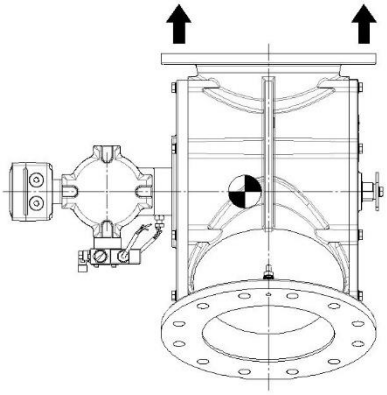


*Figure 2.48*

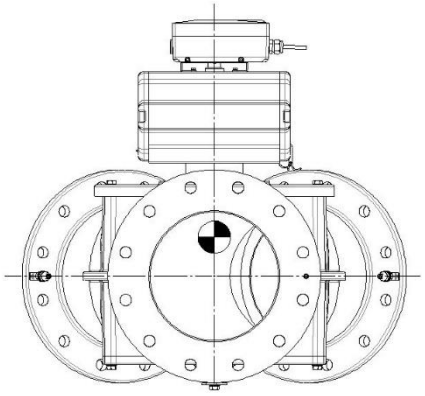


*Figure 2.49*

### WRK diverter valves in gray cast iron

| | Flange Figure 2.50, Figure 2.51 | Flange Figure 2.52, Figure 2.53 | Flange Figure 2.54, Figure 2.55, Figure 2.56, Figure 2.57 |
|---|---|---|---|
| DN 100 | M16x24 (3x) | M16x24 (3x) | M16x24 (4x) |
| DN 125 | M16x24 (3x) | M16x24 (3x) | M16x24 (4x) |
| DN 150 | M20x30 (3x) | M20x30 (3x) | M20x30 (4x) |
| DN 200 | M20x30 (3x) | M20x30 (3x) | M20x30 (4x) |
| DN 250 | M20x30 (3x) | M20x30 (3x) | M20x30 (4x) |

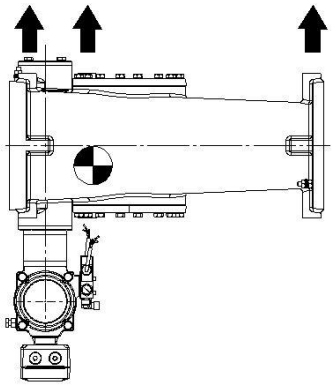


*Figure 2.50*

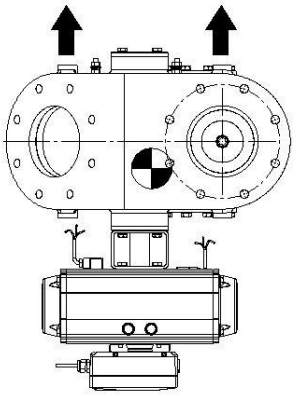


*Figure 2.51*

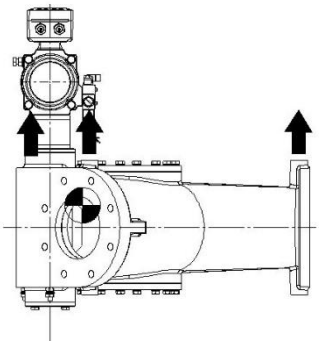


*Figure 2.52*

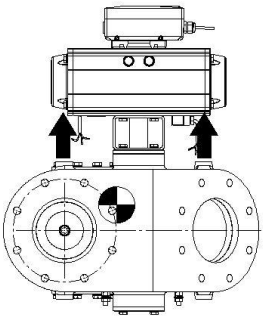


*Figure 2.53*

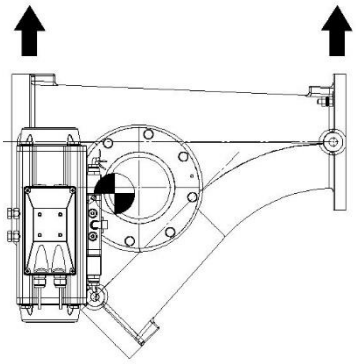


*Figure 2.54*

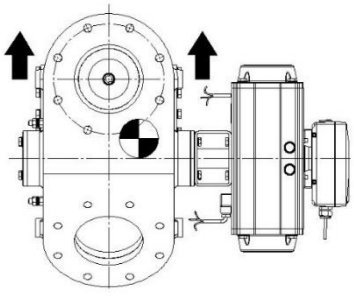


*Figure 2.55*

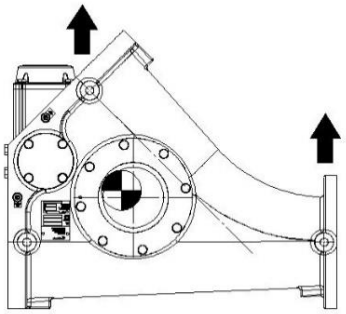


*Figure 2.56*

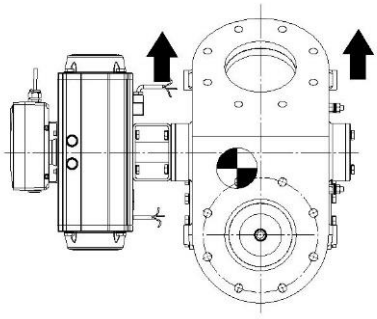


*Figure 2.57*

**GDV diverter valves in SS (symmetrical and asymmetrical)**

| | Flange DIN EN 1092 Figure 2.58, Figure 2.59, Figure 2.60, Figure 2.61, Figure 2.62, Figure 2.63 | Flange ASME B16.5 Figure 2.58, Figure 2.59, Figure 2.60, Figure 2.61, Figure 2.62, Figure 2.63 |
|---|---|---|
| DN 150 | 8 x ø22 | 8 x ø22.2 |
| DN 200 | 8 x ø22 | 8 x ø22.2 |
| DN 250 | 12 x ø22 | 12 x ø25.4 |
| DN 300 | 12 x ø22 | 12 x ø25.4 |
| DN 350 | 16 x ø22 | 12 x ø28.6 |
| DN 400 | 16 x ø26 | 16 x ø28.6 |
| DN 450 | 16 x ø26 | 16 x ø28.6 |
| DN 500 | 20 x ø26 | 20 x ø31.8 |
| DN 600 | 20 x ø30 | 20 x ø34.9 |

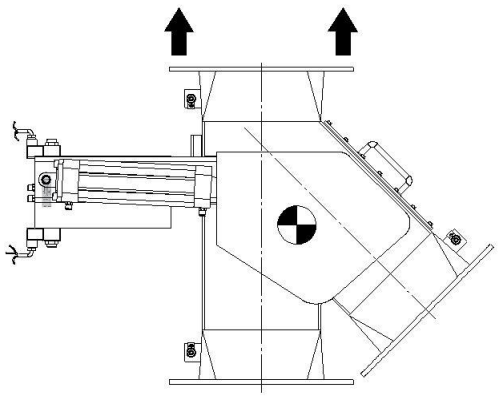


*Figure 2.58*

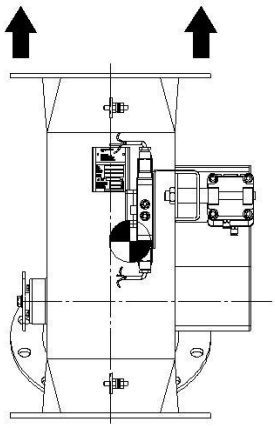


*Figure 2.59*

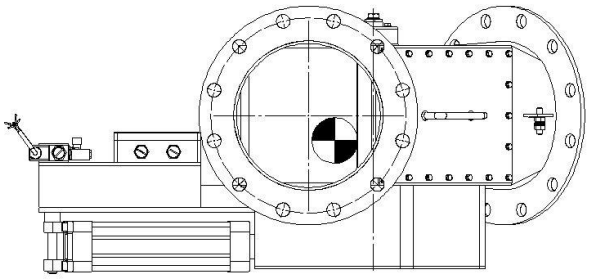


*Figure 2.60*

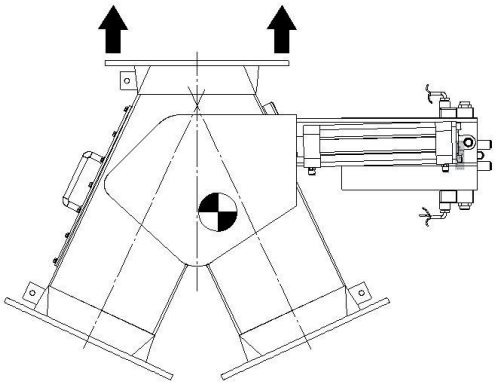


*Figure 2.61*

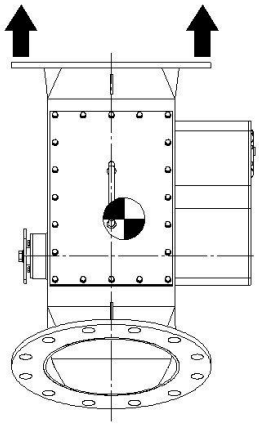


*Figure 2.62*

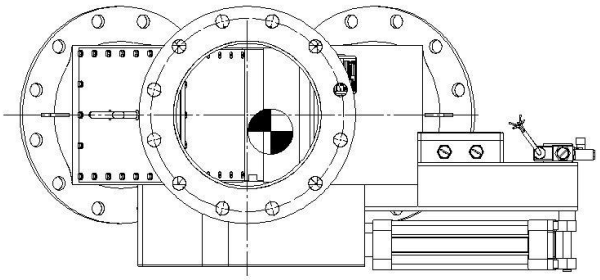


*Figure 2.63*

### WYK diverter valves

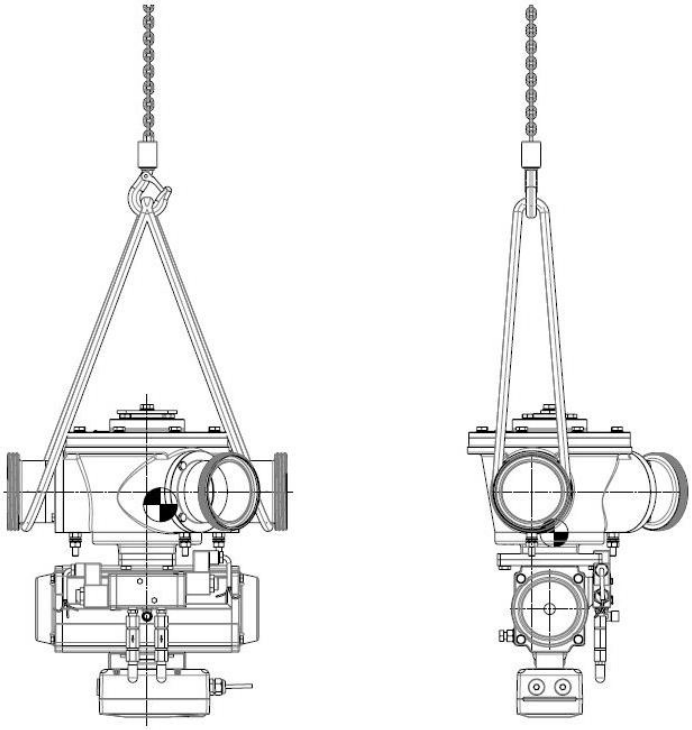


*Fig. 2.64*

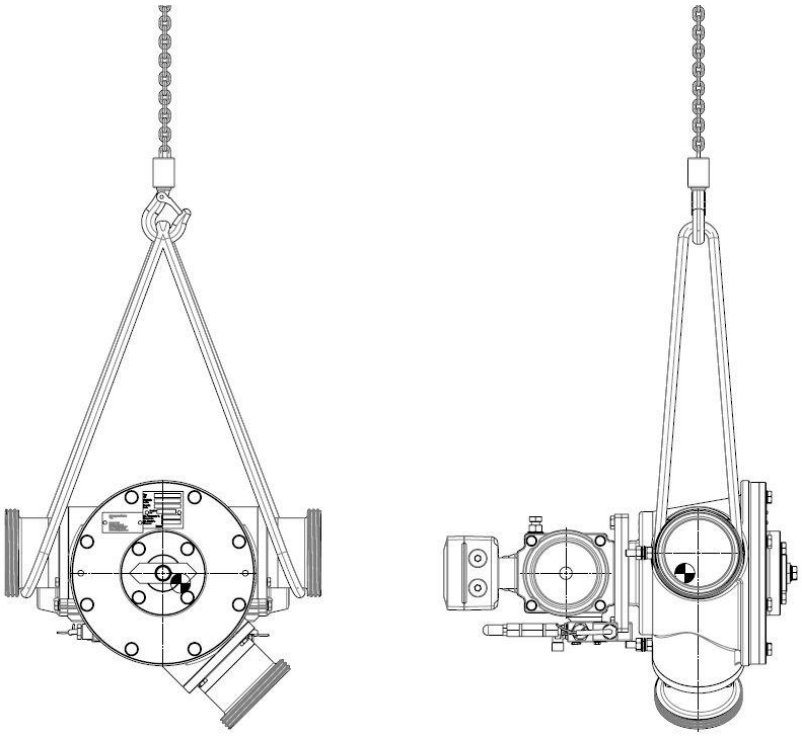


*Fig. 2.65*

## 2.3 Storage

If the machine is not to be installed and put into service immediately after unpacking, protect it against moisture and dirt.

To properly retain the quality and functional capability, perform the following actions:

- Storage up to 3 months

⇨ Store the machine under a roof in its original packaging or covered with UV-resistant film. All machine openings must be tightly closed.

⇨ Store the machine between -20 °C and 60 °C.

⇨ Prevent the formation of condensate

- The machine is delivered with desiccant and appropriate packaging.

- Storage more than 3 months

⇨ Package the machine with desiccant so as to be airtight (for example, aluminum composite film) and evacuate the package.
Storage under a roof. Store the machine between -20 °C and 60 °C.

⇨ Inspect the package monthly for damage and loss of vacuum.

or

⇨ Store the machine in a dry building
(relative humidity < 50%) in its original packaging or covered with film. All machine openings must be tightly closed.

- Actions after storing for more than 24 months

⇨ Prior to commissioning, perform maintenance for the 2-year maintenance interval in accordance with the maintenance and lubrication schedule.

# 3 Safety

Read the following safety instructions and information on safe operation carefully before starting work. Acquaint yourself with all functions. Keep this manual in a safe place and pass it on to others when necessary.
Understanding and obeying all sections on the topic of safety are very important for your safety.

On the topic of safety, read and obey

- Chapter *3 Safety*,
- the special warnings about hazardous actions,
- the safety data sheets at the workplace,
- the work instructions at the workplace.

Ignoring them may lead to a risk for the life and health of people, damage to the environment and/or extensive property damage.

Obeying the safety instructions helps prevent hazards and risks.

## 3.1 General safety instructions

⇨ General legal occupational safety statutes or directives, accident prevention regulations and environmental laws must be obeyed, for example, the German Occupational Health and Safety Regulations (BetrSichV) or the regulations applicable on a national basis.

⇨ Shut the machine down immediately if safe operation is no longer possible.

- Safe operation is, among other factors, no longer possible if

- malfunctions in the control system result in uncontrolled movements,
- the machine is blocked by a workpiece or another machine,
- damage to parts of the machine is detected.

⇨ Obey IEC/EN 60079-14 (NEC for the USA) and the pertinent installation and operating specifications during installation or when operating explosion-protected electrical systems.

## 3.2 Intended use

The machine corresponded to the state of technology and satisfied the applicable safety regulations when it was put on the market for its intended use.

Neither the foreseeable misuse nor the residual risks could be eliminated by design without restricting the intended functionality.

Depending on the type, the machine is used as a diverting element and/or converging element for powdery or granular bulk materials *(*for diverter valve types, see chapter *4 Technical data)*.

### 3.2.1 Application range:

- WZK, WYK, WHK, WRK two-way diverter valves and DWR multi-way diverter valve
- Diverging and converging element for granular and/or powdery products from pneumatic conveying pipes and gravity tubes
- WEK two-way diverter valve
- Diverting and converging element for granular products from pneumatic conveying pipes and gravity tubes
- WET two-way diverter valve
- Diverting element for granular products from pneumatic conveying pipes directly into containers
- WHT two-way diverter valve
- Diverting element for granular and/or powdery products from pneumatic conveying pipes directly into containers
- WGV, GDV gravity diverter valves
- Vertical diverting element for granular and powdery products

The partially completed machine is only intended to be installed in other machines or in other partially completed machines or equipment or to be combined with such machines or equipment to together form a machine in the sense of this directive (Machinery Directive 2006/42/EG).

The machine can be erected and operated both in confined spaces as well as outdoors as long as the electrical equipment is suitable for this.

Machines that have a defined equipment category may only be used in the corresponding ATEX protection zones.

Every use that is not intended or all activities on the machine not described in this manual constitute forbidden misuse outside the legal liability limits of the manufacturer.

**Information**
Diverter valves are approved for fluids of Group 2 according to directive 2014/68/EU (Pressure equipment directive). With the appropriate authorization by the manufacturer (see *Labeling on the name plate*), use is also possible for fluids of Group 1.

## 3.3 Reasonably foreseeable misuse

The manufacturer assumes no responsibility for any misuse of the machine. In addition, any misuse voids all warranties provided by the manufacturer with the machine.

Misuse includes the following:

- Operating the machine with the protective equipment and/or warnings removed or disassembled.
- Operating the machine under conditions other than those of the agreed technical data.
- Operating the machine with products classified as chemically unstable or as explosive.
- Operating the machine as a shut-off device for pure gas- or liquid-carrying piping.
- Maintenance or repair work that was not performed or performed incorrectly.
- Operating the machine with products classified as toxic.

## 3.4 Residual risks

The documentation refers to existing residual risks.

**You can avoid existing residual risks by implementing and obeying these specifications on a practical basis:**

- The special warnings on the machine.
- The safety instructions and warnings in this operating manual.
- The work instructions of the operator.

**A risk of death or injury to people can occur at the machine through the following:**

- Misuse
- Improper handling
- Transport
- Missing protective equipment
- Defective or damaged components
- Handling or use by personnel who are not trained or instructed

**Property damage to the machine can occur through the following:**

- Improper handling
- Noncompliance with operating or maintenance specifications
- Unsuitable operating supplies

**Property damage to other assets in the operating area of the machine can occur through the following:**

- Improper handling

**Constraints on the performance or functionality of the machine can occur through the following:**

- Improper handling
- Improper maintenance or repair
- Unsuitable operating supplies

### 3.4.1 Thermal risks

**⚠ CAUTION**

**Risk due to hot surfaces, hot product and/or hot air streams!**

Risk of burns or being startled due to hot media!

- ▶ Let the machine cool down.
- ▶ Wear personal protective equipment.
- ▶ Provide protection against contact.

**ATEX**

**Additional increase in the surface temperature due to pneumatic conveyance!**

The surface temperature depends on the product temperature. The additional increase is generated by product friction and is caused by the process parameters including:

- Product type
- Conveyor speed
- Conveyed material
- etc.

and may lead to the ignition temperatures being reached or exceeded.

- ▶ Determine the temperature during commissioning
- ▶ Assess the actually occurring surface temperatures with respect to the ignition risk

### 3.4.2 Mechanical hazards

- Pinch point injuries, crush injuries or impacts may occur due to inattention or negligent use of personal protective clothing.
- At the machine, there is the risk of unexpected malfunctions coming from damage to machine components, a failure or a malfunction of the control system.

**DANGER**

**Danger from moving and/or rotating parts!**

When the machine is running, there is a risk of injury or death due to entanglement, crushing or the shearing of extremities!

- ► Do not reach into moving or rotating parts during operation.
- ► Make sure that moving parts are not accessible during operation.
- ► Do not wear loose clothing, jewelry or uncovered long hair.
- ► Before performing any work on moving components, switch off the machine and secure it against being switched on again. Wait until all components come to a stop.

**CAUTION**

**Risk of a cut injury!**

Sharp surfaces, edges and corners of the machine may produce a cut injury!

- ► Wear personal protective equipment.
- ► In the event of injuries, see a doctor immediately.

**You must comply with the following measures:**

- There is a risk of shearing, crushing and entanglement by the unprotected drive mechanisms during installation, commissioning and *when* changing settings.

⇨ A second person must not be present in the hazard zone during these activities.

⇨ You may only open/remove covers for the duration of maintenance and repair work and these covers must be installed or closed properly during operation.

⇨ Keep hands, hair, pieces of clothing and tools away from moving parts such as the chain drive and shafts.

⇨ Do not reach into the area around moving parts or into rotating drive parts.

### 3.4.3 Electrical hazards

**DANGER**

**Danger due to electrical voltage!**

When working on live components, electric shock presents a danger to life!

- ► Only trained and qualified electricians or instructed personnel under the direction and supervision of an electrician in accordance with electrical rules may perform any work on the electrical equipment of the machine.
- ► Keep the 5 safety rules for working on electrical systems in mind: Disconnect; secure against reconnection; make sure no voltage is present; ground and short circuit; cover or cordon off adjacent live parts.

**WARNING**

**Risk of explosion from open ignition sources!**

Generating an arc that causes a flame may result in fires or explosions!

- ► Disconnect electrical connectors only with the equipment powered off.

**DANGER**

**Risk of explosion!**

Sparks generated by electrostatic discharge in rooms at risk of fire and explosions.

- ► All machinery is equipped with grounding bolts or lugs that must be connected.

**You must comply with the following measures:**

- ⇨ Inspect electrical equipment regularly. Tighten loose connections and replace damaged wires or cables immediately.
- ▪ There is an electrical hazard when working on the machine.
- - This arises through direct contact with live parts or parts that have become live due to faults.
- ▪ When working on live parts, wires or cables, a second person must always be present who, in the event of an emergency, switches off the master switch.
- ▪ Never clean electrical equipment with water or similar liquids.
- ▪ Before starting work, check all insulation for damage.
- ⇨ Before starting work, switch off the system at the master switch, check that no voltage is present and secure the system against being switched on again.
- ⇨ Use only insulated tools!

### 3.4.4 Hazards from gas, dust, fumes, vapor, smoke

**DANGER**

**Risk of explosion from dust deposits and/or escaping gas!**

Dust deposits in a layer > 5 mm and/or escaping gas may ignite on hot surfaces and result in fires or explosions!

- ► Clean the machine regularly such that no dust is dispersed.
- ► Make sure that the maximum surface temperatures of operating materials and components are not exceeded in areas presenting a hazard of dust explosions or the allowable temperature class in areas presenting a hazard of gas explosions.
- ► Check the machine regularly for dust or escaping gas.
  Pay special attention to the areas around the shaft bearings.
- ► When opening or dismantling the machine, make sure that neither dust nor gas escapes.

**DANGER**

**Asphyxiation hazard from gases and vapors!**

There is an asphyxiation hazard when using machines in confined spaces where gases and vapors displace air!

- ► Make sure that enough fresh air is supplied.

**WARNING**

**Danger of lung damage and/or eye injury due to dust!**

Whenever working on or with the machines, dust may be dispersed and may lead to eye injuries and/or to lung damage by breathing.

- ► Wear personal protective equipment (suitable filter mask, safety goggles, etc.).
- ► Vacuum up the dust, collect it, etc.

### 3.4.5 Pneumatic system, steam/vapor

**CAUTION**

**Risk from pressurized parts and media!**

When working on pressurized lines or components, the pressurized media may escape suddenly. The escaping media may cause injuries or the uncontrolled movement of components!

- ► Before starting repair work, release the pressure from those system sections or pressure lines (compressed air) to be opened.
- ► Only qualified personnel may work on pressure lines!
- ► Repair damage to lines, hoses and screw connections immediately!
- ► Wear personal protective equipment (appropriate safety goggles, protective gloves).

### 3.4.6 Oils, greases and other chemical substances

⇨ When handling oils, greases and other chemical substances, obey the safety rules that apply to the product!

- For information, see the Safety data sheet of the hazardous material.

**⚠ CAUTION**

**Health risk!**

Oils, greases and other chemical substances may cause health damage in the event of skin contact or if swallowed.

► Wear personal protective equipment (appropriate safety goggles, protective gloves).

► In the event of skin contact or if swallowed, institute immediate life-saving measures according to the safety data sheet.

***NOTICE***

**Environmental pollution by oils, greases and other chemical substances!**

Pollutants (such as oil) can contaminate soil or ground water!

► Retain, bind and properly dispose of pollutants.

⇨ Machine parts leaking pollutants (oil, grease, etc.) must be repaired immediately and resealed.

⇨ Retention basins for pollutants must be kept free of parts that reduce the retention volume. These retention basins must not have drains.

⇨ You must comply with the inspection intervals given in the maintenance schedule for checking and servicing polluting components (for example, oil tanks).

⇨ Record the maintenance measures or component changes to polluting equipment in a Plant and equipment register.

## 3.5 Additional specifications relevant for explosion protection

Within the framework of requirements of the EC Directive 2014/34/EU (ATEX) for the use of nonelectrical equipment in potentially explosive atmospheres, Coperion GmbH performed a risk analysis. The diverter valve itself is not a device in the sense of the ATEX directive. However, the diverter valve must be grounded.

Accessories for diverter valves in ATEX protection zones must comply with the equipment category required there.

If there are different equipment categories for the diverter valves and accessories or between accessories, the gate valve may only be used for the lowest designated equipment category.

**ATEX**

**This analysis examined the hazard sources associated with diverter valves along with their potential ignition sources.**

**The countermeasures to be considered are contained in the following chapters and are appropriately marked (see chapter *1.7 Safety instructions – classification of signal words*).**

## 3.6 Noise data

**Information**
No changes that result in an increase of the noise emissions may be made to the machine.

- The sound pressure level $L_{pA}$ is less than 70 dB (A), as per EN ISO 3747 and at a measuring distance of 1 m, when operating without pressure and without product throughput. It is not possible to provide data on the noise produced when the machine is integrated into the system under the operating conditions of the system (for example, bulk material, working pressure).

**CAUTION**

**Risk of hearing damage!**
During operation, noises may be created by gas expansion and product-related operating noises. Sound pressure levels $L_{pA}$ exceeding 95 dB(A) may occur and may lead to hearing damage.

► Wear personal protective equipment.

► Provide sound insulation.

## 3.7 Personnel – qualifications and duties

Only authorized personnel may perform any activity on the machine.

**Authorized personnel must:**

- Be at least 18 years of age.
- Know and be able to apply the accident prevention regulations and safety instructions for the machine.
- Be trained and instructed in the rules of behavior in the event of a malfunction.
- Have the physical and mental abilities to carry out his responsibilities, tasks and activities on the machine.
- Be trained and instructed with regard to his responsibilities, tasks and activities on the machine.
- Understand and be able to implement on a practical basis the technical documentation with regard to his responsibilities, tasks and activities on the machine.

**Obey the following instructions:**

⇨ Become familiar with the machine and your work area.

⇨ Use the machine only for its intended purpose.

⇨ Use suitable lifting equipment for transporting and attaching heavy accessories.

⇨ Wear your protective equipment, for example, appropriate safety shoes and hearing protection.

⇨ If defects are found on the safety equipment or if any other defects are found, report this to the responsible personnel immediately.

⇨ Obey the following signs and instructions attached to the machine:

- Safety signs.
- Health hazard signs.
- Safety instructions.

### 3.7.1 Personal protective equipment

All items of the personal protective equipment must be worn for all activities described in this manual on and in the area of the machine.

These include:

- Safety shoes
- Protective gloves
- Hearing protection
- Reflective clothing
- Safety goggles.

Obey the applicable national and local regulations and provisions on personal protective equipment (e.g. hard hat).

## 3.8 Switching on the machine

**SAFETY INSTRUCTIONS**

- ► Make sure that there are no people in areas of the machine presenting a risk of injury.
- ► Check to see that the machine is in proper, undamaged and complete condition. Never start operating the machine in a damaged or defective condition.
- ► Check whether all wear parts are in ready to operate condition. Immediately replace worn components or those with other defects.
- ► Check whether the machine is correctly installed and secured.
- ► Never try to operate the machine with moving parts accessible.
  There is the risk of severe injuries or death from crushing, shearing, entanglement, etc.!
- ► Never try to operate the machine with unsecured pressurized parts.
  There is the risk of severe injuries from ejected product, pressure release, etc.!
- ► Operate the machine only with the protection and safety equipment installed!

## 3.9 Directives for repair, servicing, and maintenance work and in the case of malfunctions

**SAFETY INSTRUCTIONS**

- ► Perform the prescribed installation, maintenance and inspection work on schedule.
- ► Only trained and qualified electricians may work on electrical machines.
- ► Switch off the master switch and secure it against being switched on again.
- ► Secure service media, such as voltage and compressed air, against being switched on again unintentionally.
- ► All bolts removed for maintenance or inspection work must be retightened using the specified torque and must be checked before recommissioning the machine.
- ► After completing the maintenance or inspection work, check that the safety equipment is operating properly.

# 4 Technical data

## 4.1 Characteristics

You can find the characteristics of the diverter valve in chapter *1.9 Name plate*.

## 4.2 Application range

| Use | Gravity tube | Pneumatic conveyance | | Product | |
|---|---|---|---|---|---|
| | | Diverter valve | Collecting unit | Pellets | Powder |
| Diverter valve type | WEK, WYK, WZK, WHK, WGV, GDV, DWR | WEK, WET, WYK, WZK, WHK, WHT, GDV, DWR, WRK | WEK, WYK, WZK, WHK, DWR | All except WRK | all except WEK, WET, WHK-W, WHT-W |

### 4.2.1 Ambient conditions

The operating temperature excluding accessories is between -20 °C *and* 100 °C. Due to possible special designs, please find the actual limits on the name plate.

**ATEX**

**The maximum temperature or surface temperature of the diverter valve corresponds to the maximum allowable temperature of the diverter valve.**

**Accessories such as solenoid valves and limit switches may have other maximum temperatures or surface temperatures (see *Accessories data sheet*).**

## 4.3 Operating data

| | | WEK all | WET all | WYK all | WRK all | WZK all | WHK / WHT except -W | | WHK-W WHT-W | WGV all | GDV all | DWR all |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allowable pressure [4] | min.<br>max.<br>[bar] | -0.5<br>6 | -0.5<br>6 | -0.5<br>5 | -0.5<br>4 | -0.5<br>5 | -0.5<br>3 | -0.5<br>3 | -0.5<br>3.5 | -0.5<br>1 | 0.0<br>0.2 | -0.5<br>1 |
| Allowable pressure difference (from outlet to outlet) | [bar] | 6 | 6 | 5 | 4 | 5 | 3 | 3 | | 0 | 0 | 1 |
| Control pressure P1 drive system | min.<br>max.<br>[bar] | 4<br>8 | 4<br>8 | 4<br>8 | 4<br>8 | 4<br>8 | 4<br>8 | 4<br>8 | | 4<br>8 | 4<br>8 | [3] |
| Control pressure P2 drive system [1] | min.<br>max.<br>[bar] | 2.5<br>4 | 2.5<br>4 | | | 2.5<br>4 | | | | | | |
| Required cross-section [2] | [mm] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | 10 | 10 | 10 |

| | | WHK 200-W-SS | WHK 250-W-Al |
|---|---|---|---|
| Sealing air | [l] | 0.6 | 5.1 |
| Allowable sealing air pressure | [bar] | 1 bar above the conveying pressure, max. 4.5 bar | |

[1] if available

[2] of the supply line for control air

[3] electrical rotary drive max. 0.55 kW

[4] The values in the table are default values. They may vary in special cases. The information on the name plate is decisive.

**NOTICE**

**The compressed air must comply at least with quality class 5 as per ISO 8573-1.**
One single use of lubricated air in the components that are permanently lubricated requires constant use with the same oil content.

## 4.4 Dimensions, nominal values

| Diverter valve | Size | Total mass [kg] |
|---|---|---|
| WEK | 102/108 | 7.8 |
| | 125/134 | 52 |
| WEK/WET | 150/162 | 65 |
| | 187 | 110 |
| | 200/213 | 100 |
| WEK | 230 | 171 |
| WEK/WET | 250/265 | 175 |
| | 300/316 | 250 |
| | 350 | 310 |
| WEK | 400 | 440 |
| WEK - SS | 108 | 75 |
| | 162 | 120 |
| | 213 | 205 |
| | 265 | 300 |
| | 316 | 440 |
| | 350 | 720 |
| WYK | 65 | 34 |
| | 80 | 56 |
| | 100 | 72 |
| | 125 | 96 |
| | 150 | 126 |
| WRK | 100 | 109 |
| | 125 | 142 |
| | 150 | 192 |
| | 200 | 234 |
| | 250 | 355 |
| WZK | 50 | 28 |
| | 65 | 33 |
| | 80 | 38 |
| | 100 | 58 |
| | 125 | 89 |
| | 150 | 121 |
| | 175 | 201 |
| | 200 | 282 |
| | 250 | 433 |

| Diverter valve | Size | Total mass [kg] |
|---|---|---|
| WHK | 150 | 103 |
| | 200 | 145 |
| | 250 | 247 |
| | 300 | 338 |
| | 350 | 456 |
| | 400 | 700 |
| WHT | 150 | 59 |
| | 200 | 90 |
| | 250 | 140 |
| | 300 | 165 |
| WGV | 150 | 45 |
| | 200 | 64 |
| | 250 | 94 |
| | 300 | 142 |
| GDV (SS), symmet-rical | 50 | 22 |
| | 100 | 33 |
| | 150 | 40 |
| | 200 | 60 |
| | 250 | 90 |
| | 300 | 130 |
| | 350 | 198 |
| | 400 | 200 |
| | 450 | 226 |
| | 500 | 317 |
| | 600 | 335 |
| GDV (SS), asymmet-rical | 50 | 22 |
| | 100 | 32 |
| | 150 | 55 |
| | 200 | 75 |
| | 250 | 100 |
| | 300 | 145 |
| | 350 | 175 |
| | 400 | 230 |
| | 450 | 284 |
| | 500 | 335 |
| | 600 | 439 |
| DWR | 9 | 310 |
| | 11 | 360 |

## 4.5 Materials

| Diverter valve | Material designation |
|---|---|
| WEK/ WET | AC |
| | CR |
| WEK | SS |
| WYK | SS |
| WEK | SS |
| WRK | GG |
| WZK | CR, CD |
| | CH |
| | CW |
| | CK |
| WHK | SS, AC, AL |
| WHT | AL |
| | AC |
| WGV | AL |
| | AC |
| GDV | SS |
| DWR | SS |

## 4.6 Operating data

| Diverter valve | Size | Drive system | | | |
|---|---|---|---|---|---|
| | | Design P1 | | Design P2 | |
| | | Filling volume [dm³] 1) | Adjustment time [s] | Filling volume [dm³] 1) | Adjustment time [s] |
| WEK | 102/108 | 3.2 | 3 - 6 | 4.4 | 4 - 8 |
| | 125/134 | 3.2 | 3 - 6 | 4.4 | 4 - 8 |
| WEK/ WET | 150/162 | 4.4 | 4 - 8 | 10.4 | 4 - 8 |
| | 187 | 4.4 | 4 - 8 | 10.4 | 4 - 8 |
| | 200/213 | 4.4 | 4 - 8 | 10.4 | 4 - 8 |
| WEK | 230 | 10.4 | 4 - 8 | 16.7 | 5 – 10 |
| WEK/ WET | 250/265 | 10.4 | 4 - 8 | 16.7 | 5 – 10 |
| | 300/316 | 16.7 | 5 – 10 | 25.3 | 6 – 10 |
| | 350 | 16.7 | 5 – 10 | 25.3 | 6 – 10 |
| WEK | 400 | 31.3 | 6 – 10 | - | - |
| WYK | 65 | 2.7 | 2 - 4 | - | - |
| | 80 | 2.7 | 3 - 6 | - | - |
| | 100 | 4.5 | 3 - 6 | - | - |
| | 125 | 5.9 | 3 - 6 | - | - |
| | 150 | 5.9 | 4 - 8 | - | - |
| WRK | 100 | 2.3 | 3 - 6 | - | - |
| | 125 | 3.6 | 3 - 6 | - | - |
| | 150 | 4,8 | 3 - 6 | - | - |
| | 200 | 9.9 | 3 - 6 | - | - |
| | 250 | 18.8 | 4 - 8 | - | - |
| WZK | 50 | 0.6 | 3 - 6 | 0.9 | 3 - 6 |
| | 65 | 1.1 | 3 – 6 | 1.8 | 3 – 6 |
| | 80 | 1.3 | 3 – 6 | 2.0 | 3 – 6 |
| | 100 | 1.6 | 3 – 6 | 2.5 | 3 – 6 |
| | 125 | 3.1 | 5 - 7 | 5.1 | 5 - 7 |
| | 150 | 3.8 | 5 – 7 | 6.3 | 5 – 7 |
| | 175 | 4.5 | 5 – 7 | - | - |
| | 200 | 8.4 | 6 - 8 | 13.1 | 6 - 8 |
| | 250 | 10.4 | 6 - 8 | - | - |
| WHK | 100 | 4.4 | 4 - 8 | - | - |
| | 150 | 4.4 | 4 - 8 | - | - |
| | 200 | 10.4 | 4 - 8 | - | - |
| | 250 | 16.7 | 5 – 10 | - | - |
| | 300 | 16.7 | 5 – 10 | - | - |
| | 350 | 25.4 | 5 – 10 | - | - |
| | 400 | 34.4 | 5 – 10 | - | - |

| Diverter valve | Size | Drive system | | | |
|---|---|---|---|---|---|
| | | Design P1 | | Design P2 | |
| | | Filling volume [dm³] [1] | Adjustment time [s] | Filling volume [dm³] [1] | Adjustment time [s] |
| WHT | 150 | 3.2 | 3 - 6 | 6 | 4 - 6 |
| | 200 | 4.4 | 3 - 6 | 10 | 4 - 6 |
| | 250 | 10.4 | 4 - 8 | 20 | 6 - 8 |
| | 300 | 10.4 | 4 - 8 | 20 | 6 - 8 |
| WGV | 150 | 2.14 | 2 - 4 | - | - |
| | 200 | 3.76 | 4 - 8 | - | - |
| | 250 | 3.76 | 4 - 8 | - | - |
| | 300 | 7.1 | 4 - 8 | - | - |
| GDV (SS), symmet-rical | 50 | 0.8 | 6 – 10 | - | - |
| | 100 | 1.7 | | - | - |
| | 150 | 2.1 | | - | - |
| | 200 | 2.6 | | - | - |
| | 250 | 3.2 | | - | - |
| | 300 | 6.7 | | - | - |
| | 350 | 6.7 | | - | - |
| | 400 | 6.7 | | - | - |
| | 450 | 14.4 | | - | - |
| | 500 | 14.4 | | - | - |
| | 600 | 16.2 | | - | - |
| GDV (SS), asym-metrical | 50 | 0.9 | 6 – 10 | - | - |
| | 100 | 1.4 | | - | - |
| | 150 | 2.1 | | - | - |
| | 200 | 2.5 | | - | - |
| | 250 | 4.2 | | - | - |
| | 300 | 6.7 | | - | - |
| | 350 | 7.4 | | - | - |
| | 400 | 8 | | - | - |
| | 450 | 12.5 | | - | - |
| | 500 | 14.4 | | - | - |
| | 600 | 17.7 | | - | - |
| DWR | 9 | - | - | - | - |
| | 11 | - | - | - | - |

[1] Double stroke

# 5 Description

## 5.1 Two-way diverter valves

The different conveying paths are switched by pivoting the rotor in the housing.

### WZK two-way diverter valve

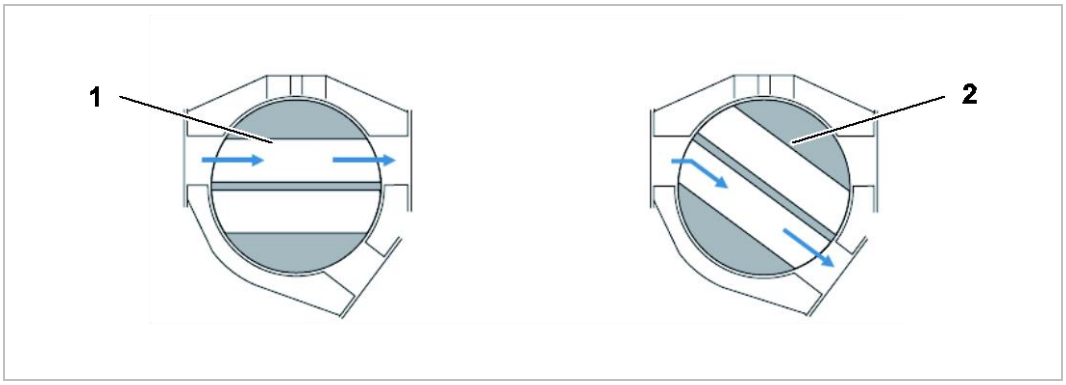



*Fig. 5.1: WZK two-way diverter valve*

**[1]** straight through channel **[2]** diversion

### WEK, WHK two-way diverter valves

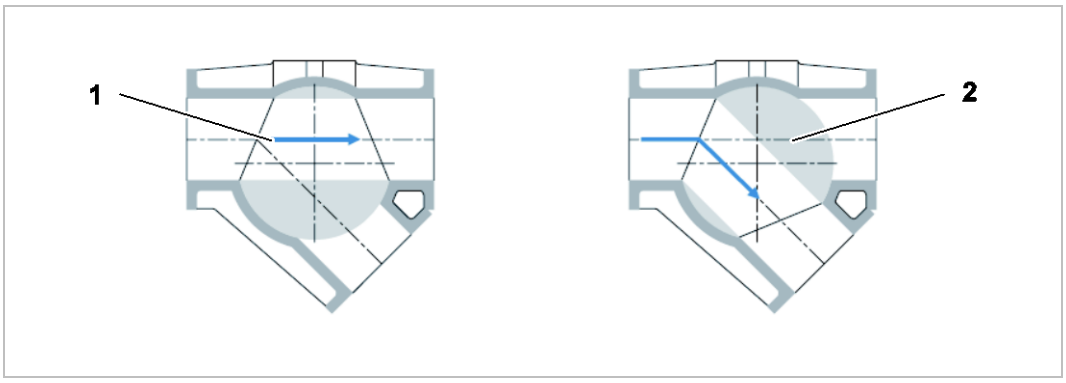



*Fig. 5.2: WEK, WHK two-way diverter valves*

**[1]** straight through channel **[2]** diversion

### WET, WHT two-way diverter valves

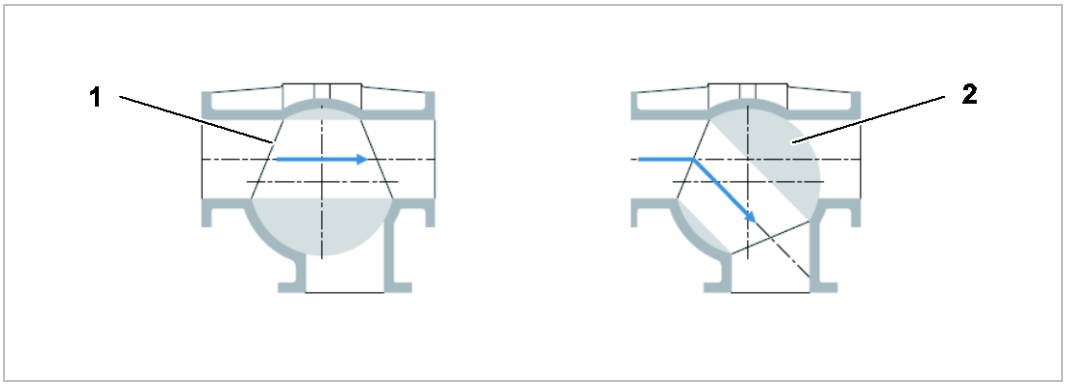



*Fig. 5.3: WET, WHT two-way diverter valves*

**[1]** straight through channel **[2]** diversion

**Flow chart 1: Switching a WHK-W / WHT-W with a 3/2 solenoid valve and pressure reducer**

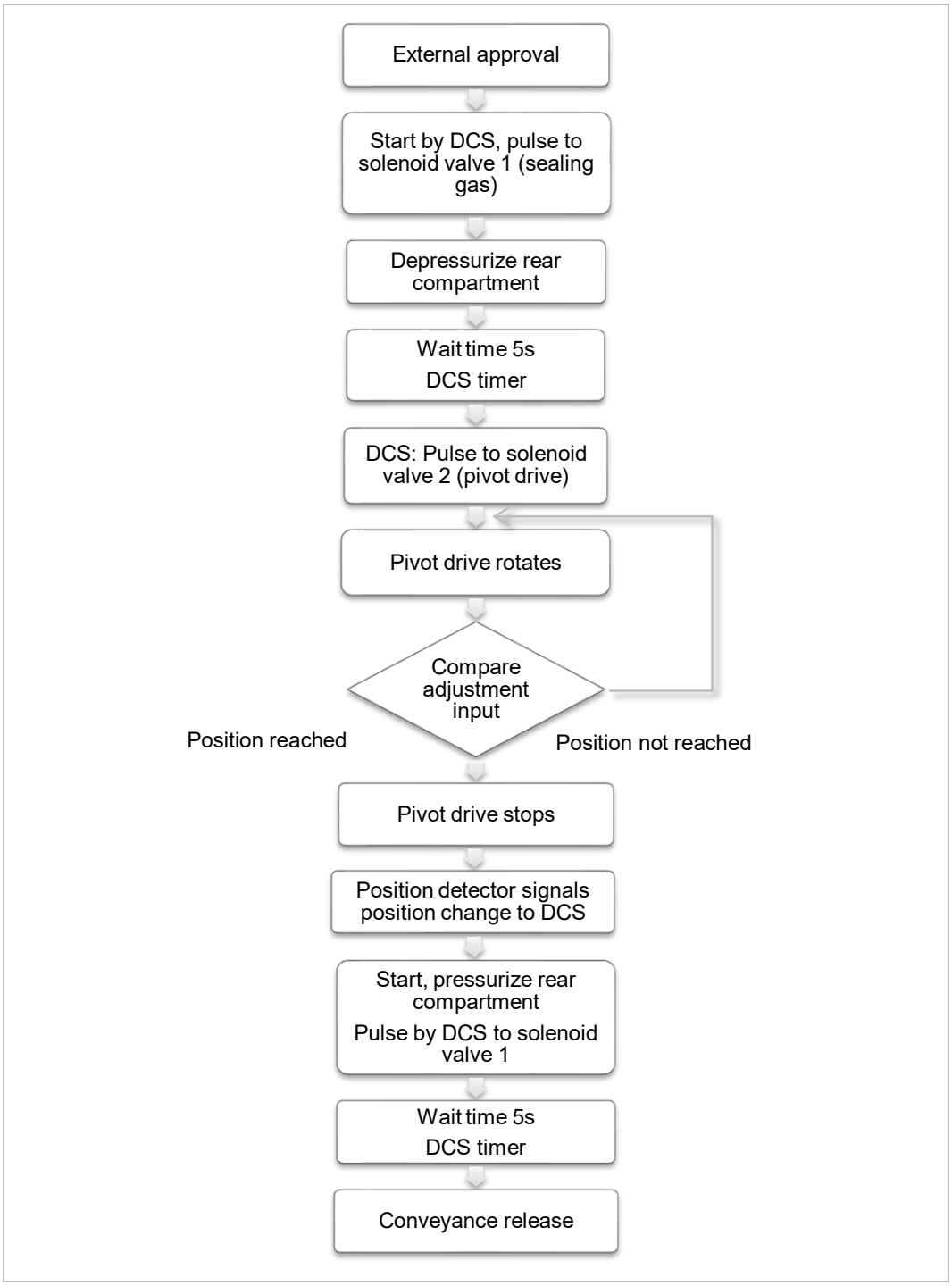



*Fig. 5.4: Flow chart 1: Switching a WHK-W with a 3/2 solenoid valve and pressure reducer*

**Information**
You must comply with the flow chart when switching a WHK-W-/ WHT-W diverter valve.

**Flow chart 2: Switching a WHK-W / WHT-W with a FESTO controller**

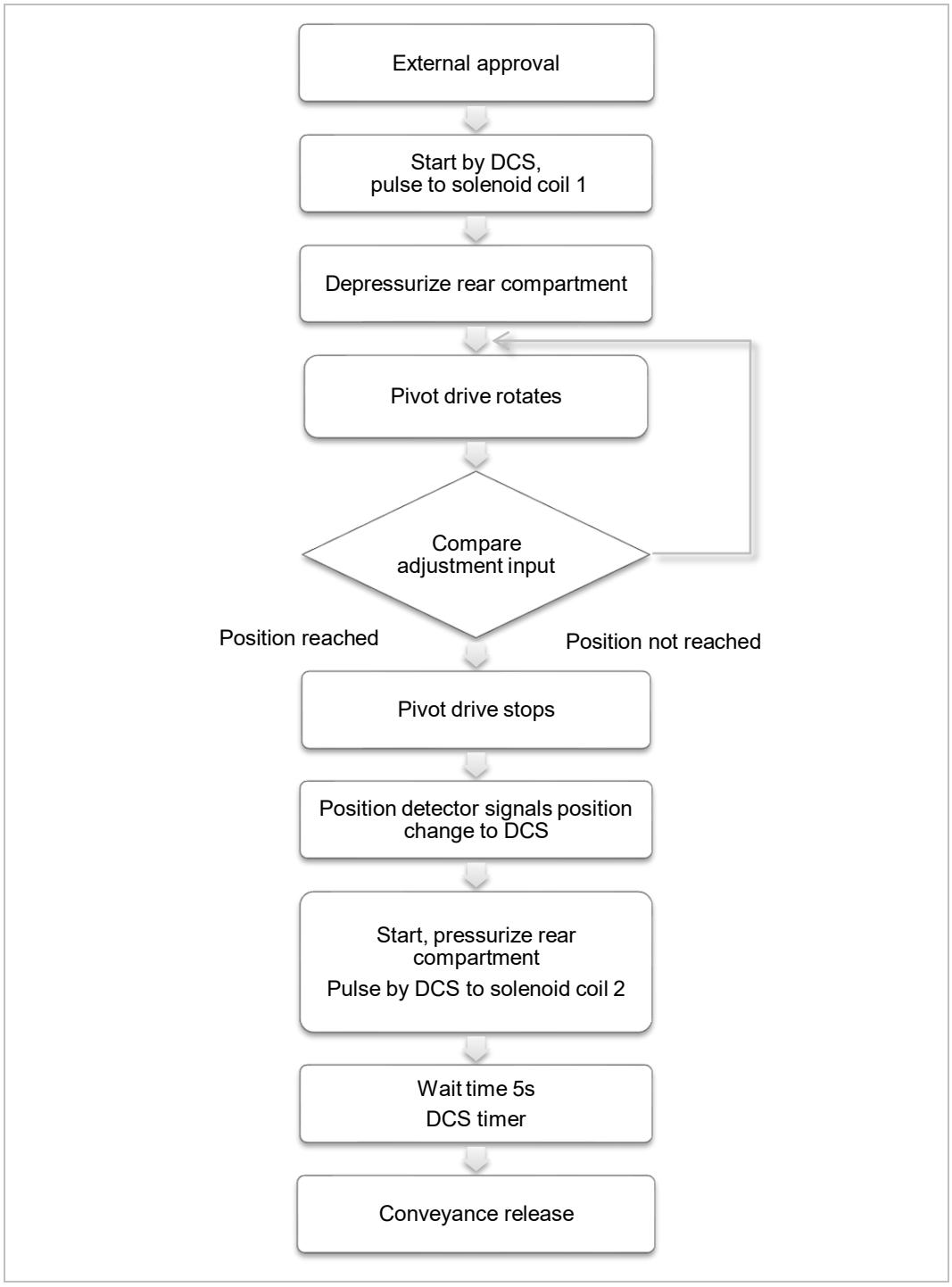



*Fig. 5.5: Flow chart 2: Switching a WHK-W with a FESTO controller*

**Information**
You must comply with the flow chart when switching a WHK-W-/ WHT-W diverter valve.

### WYK two-way diverter valve

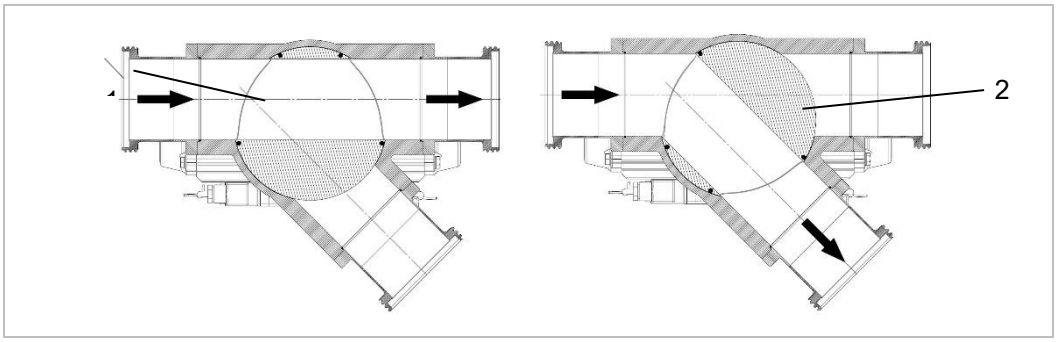



*Fig. 5.6: WYK two-way diverter valve*

**[1]** straight through channel **[2]** diversion

### WRK two-way diverter valve

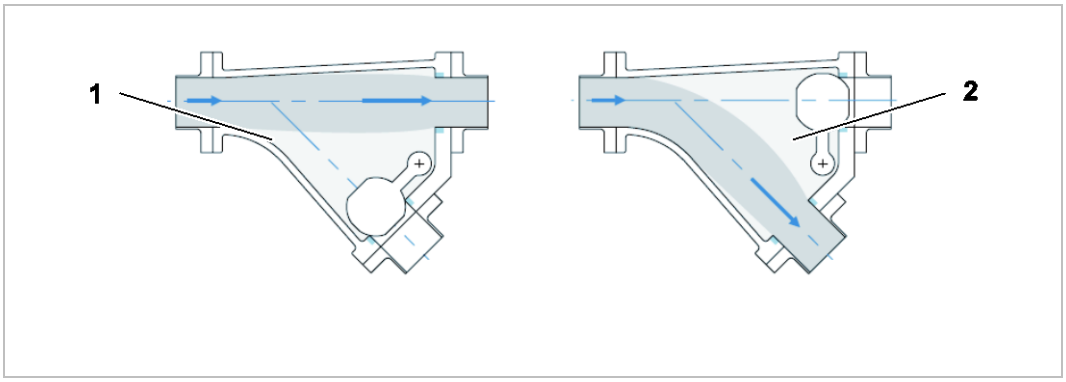



*Fig. 5.7: WRK two-way diverter valve*

**[1]** straight through channel **[2]** diversion

### WGV two-way diverter valve

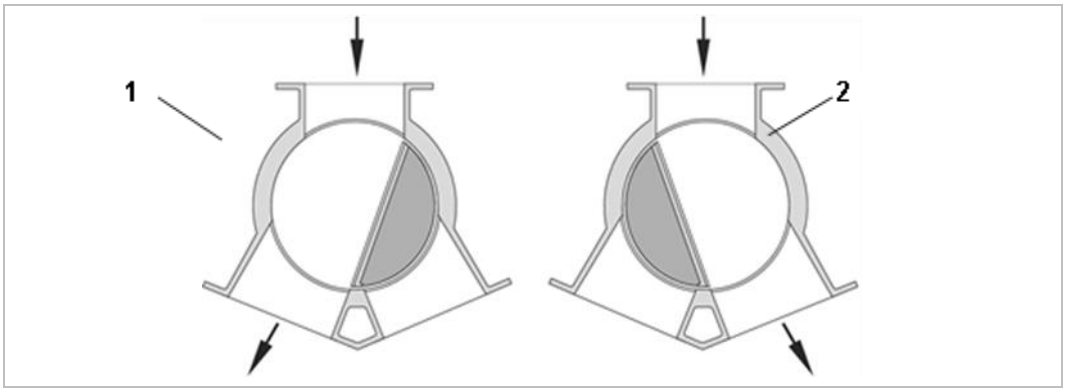



*Fig. 5.8: WGV two-way diverter valve*

**[1]** left outlet **[2]** right outlet

### GDV two-way diverter valve

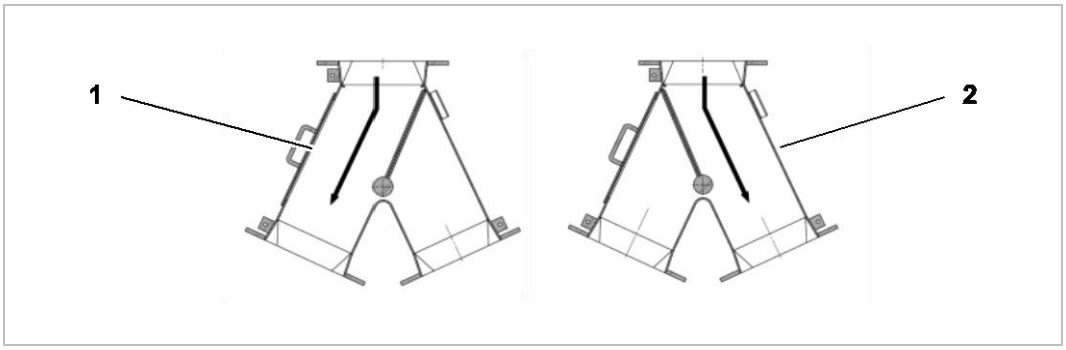



*Fig. 5.9: GDV two-way diverter valve, symmetrical*

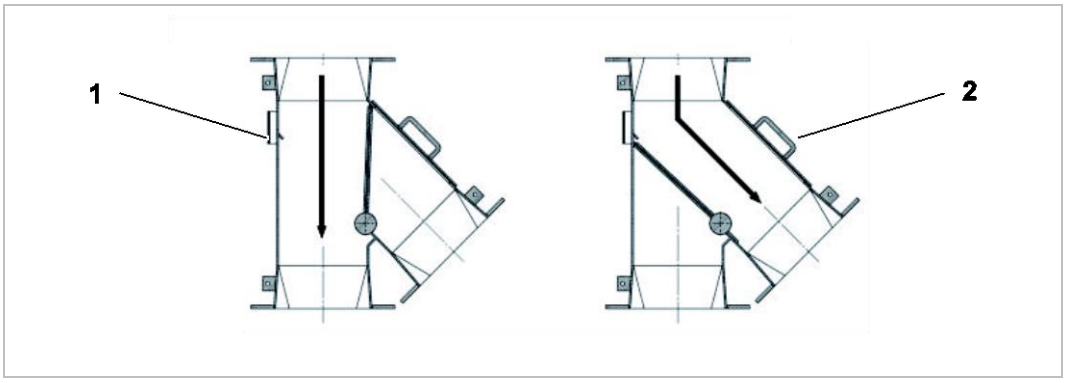



*Fig. 5.10: GDV two-way diverter valve, asymmetrical*

**[1]** left outlet **[2]** right outlet

## 5.2 DWR multi-way diverter valve

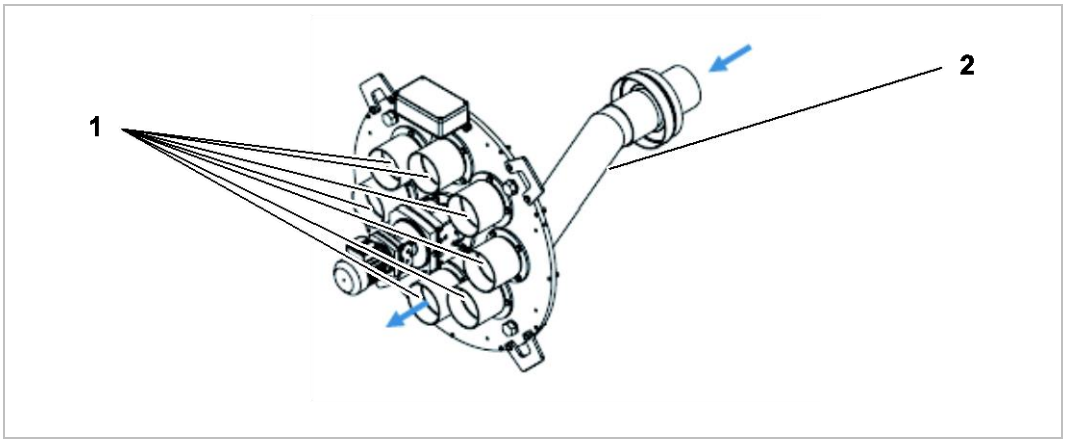



*Fig. 5.11: DWR multi-way diverter valve*

The individual outlets **[1]** are switched by rotating the distributor pipe **[2]**.

Releasing the contact pressure system lifts the rotary table, which can then be rotated by the gear motor [see Fig. 5.10].

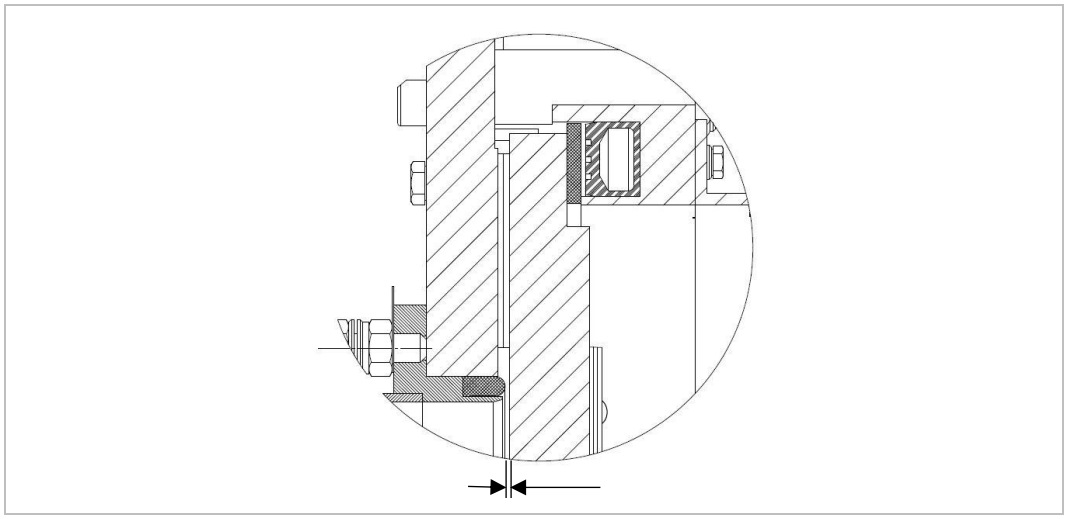


*Fig. 5.12: Contact pressure system depressurized*

After the contact pressure system applies pressure, the rotary table is pressed in its new position and the diverter valve is ready for operation again [see Fig. 5.11].

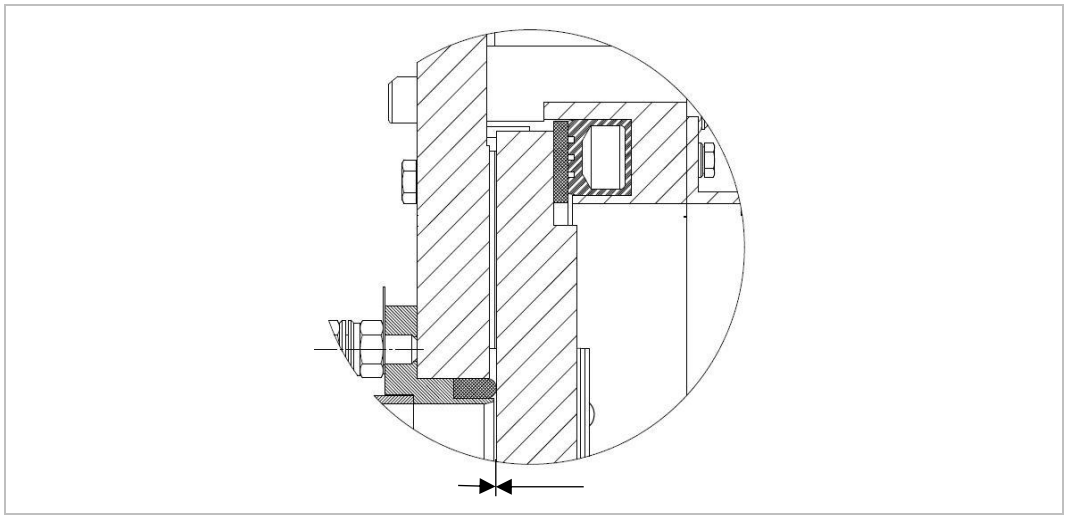


*Fig. 5.13: Contact pressure system pressurized*

**Flow chart: Switching a diverter valve**

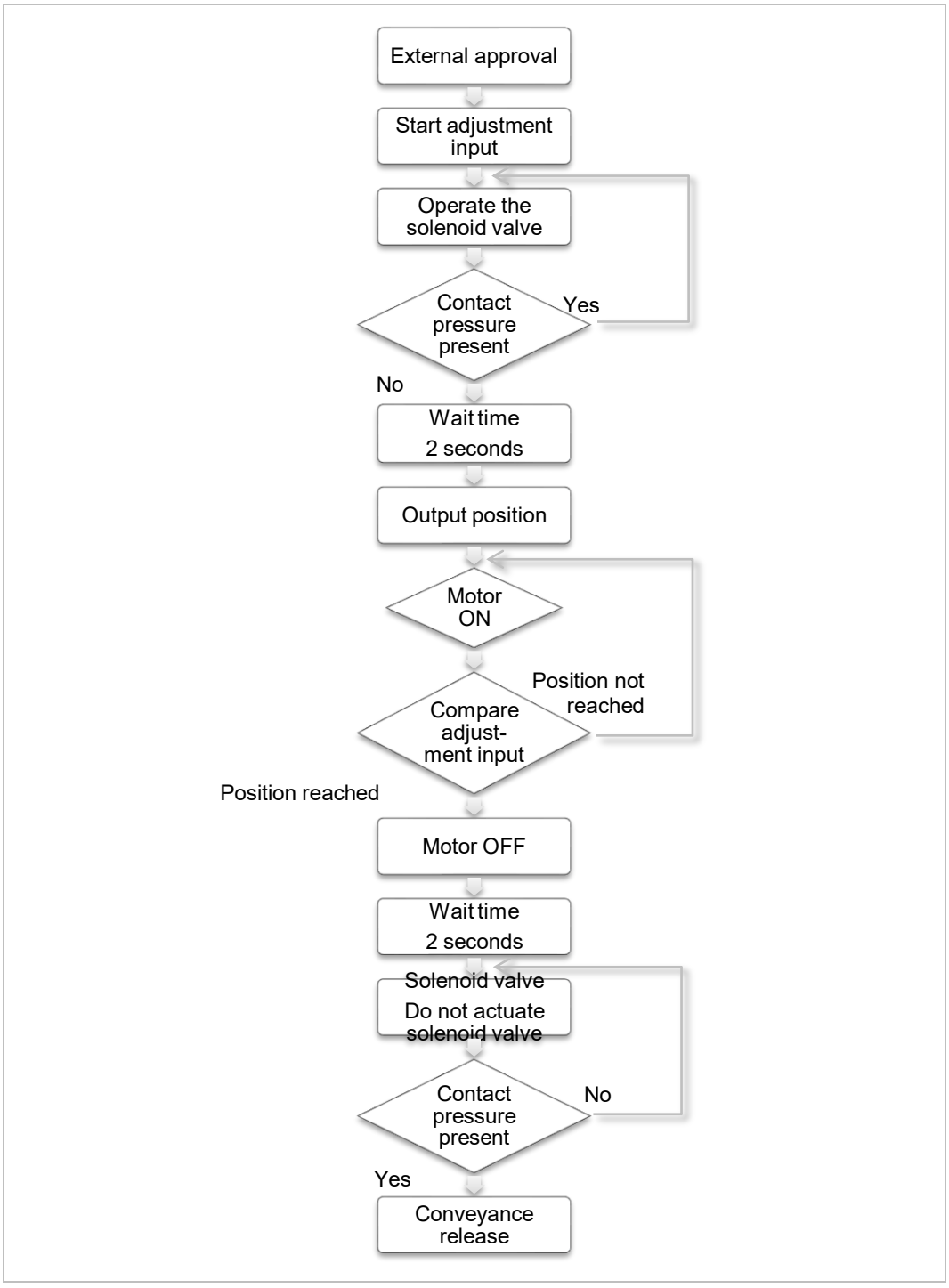



*Fig. 5.14: Flow chart: Switching a DWR diverter valve*

**Information**
You must follow the flow chart when switching a DWR diverter valve.
The motor has a motor brake which must be released before the diverter valve is switched.

# 6 Installation

## 6.1 General conditions

- ⇨ Make sure that the foundation can support the weight including the accessories. Check the permissible floor loading.
- ⇨ Make sure to comply with the prescribed tightening torques.
- ⇨ The system where the diverter valve is installed must have a minimum clearance for the cleaning and inspection openings to the valve of 0.85 m or be equipped with a broken-wire interlock safety switch.
- ⇨ Install the diverter valve only using the threaded holes on the side of the flange or the housing.
- ⇨ The WGV, WHT and WHK diverter valves must be supported via the pipeline.
- ⇨ Pay attention to the typical application range and intended use.
- ⇨ Do not use the diverter valve or its accessories as steps!
- ⇨ Install the diverter valve without mechanical stress. Compensate the forces of containers and pipes using expansion joints. Keep the thermal expansion of the piping in mind.
- ⇨ Provide sufficient space for maintenance and repair work.
- ⇨ Pay attention to the flow direction as per the flow direction arrow.

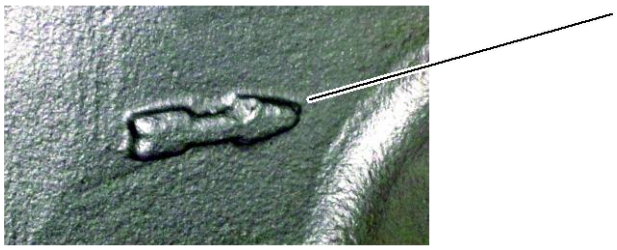



*Fig. 6.1: Flow direction arrow **[1]***

- ⇨ Special provisions apply in rooms at risk of fire and explosions, so obey the appropriate national and international specifications.

**DANGER**

**Risk of explosion!**

Sparks generated by electrostatic discharge in rooms at risk of fire and explosions.

► Diverter valves are supplied with grounding bolts that must be connected.

**Information**

The grounding bolts are attached to the housing and marked with ⏚.

**ATEX**

**Hazards from potential ignition sources of the drive unit!**

► Use a pneumatic drive with outlet throttle/silencer.

**ATEX**

**Hazards from potential ignition sources of the terminal box!**

► Use a dustproof version of the terminal box.

## 6.2 Preparatory actions

**DANGER**

**Danger due to heavy load**

The machine may fall down; there is the risk of injury or death.

► When loading by crane, pay attention to the suspension points and the operating weight of the machine.

► Do not enter or loiter in the hazard zone.

⇨ Remove all transport covers immediately before installation.

⇨ Check the diverter valve condition for the following:

- Damage
- Contamination
- Corrosion.

⇨ Check the interior of the diverter valve and make sure that no foreign matter is inside.

**NOTICE**

**Risk of damage to the machine**
Dust and preserving agent can collect on the surfaces of the diverter valve.

► Remove the dust and preserving agent from the diverter valve.

⇨ Check the contact surface of the mounting flange:

- Only complete flange contact **[1]** is permitted (no bending moment occurs).
- if this is not the case **[2]**, coordinate further actions with Coperion GmbH.

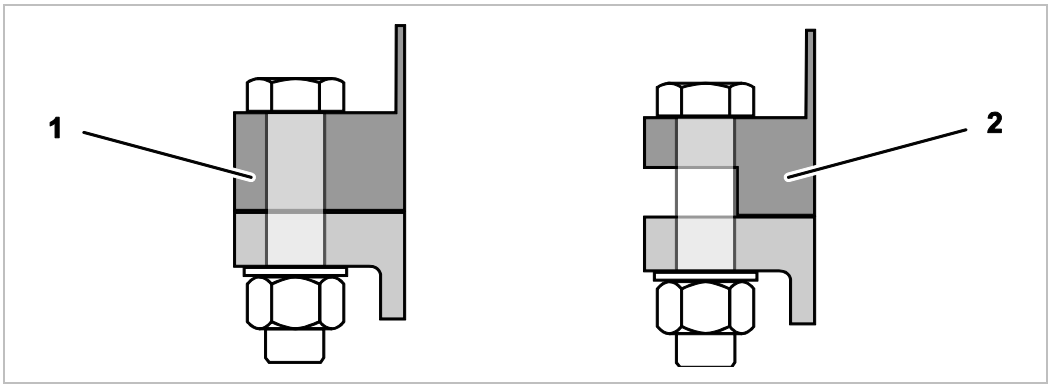



*Fig. 6.2: Flange contact*

**⚠ WARNING**

**Risk of a cut injury!**
Sharp surfaces, edges and corners of the housing bore may produce a cut injury!

► Wear personal protective equipment.

► In the event of injuries, see a doctor immediately.

**Information**
If there is damage and/or corrosion, coordinate further actions with Coperion GmbH.

## 6.3 Installation position and conveying direction

| Diverter valve | Installation position[1)] | Outlet orientation | Conveying direction |
|---|---|---|---|
| WEK | Any | Any | Any |
| WET | Horizontal | Downward | Diverging system |
| WYK[2)] | Any | Any | Any |
| WRK | Any | Any | Diverging system |
| WZK | Any | Any | Any |
| WHK | Any | Any | Any |
| WHT | Horizontal | Downward | Diverging system |
| WGV/GDV | Vertical | Downward | Diverging system |
| DWR | Horizontal, vertical | Horizontal, vertical | Any |

[1)] The diverter valve must be installed in the pipe system without mechanical stress. Use expansion joints.

[2)] If connecting flanges are welded to the nozzles of the WYK, keep the following in mind:

- Choose a suitable welding process.
- Before welding, remove all nozzles from the housing and mark them.
  During installation, make sure the parts go back together correctly.

**Information**
Welding is not permitted on diverter valve housings (even on piping connections).

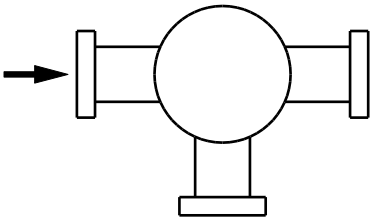
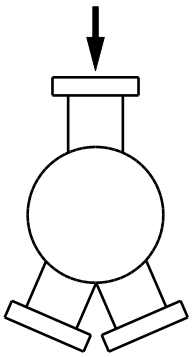
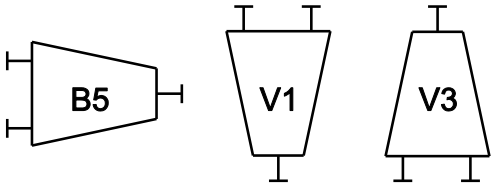
| Diverter valve | Allowable installation position |
|---|---|
| WHT/WET |  |
| WGV/GDV |  |
| DWR |  |

Fig. 6.4: Allowable installation position for WHT/WET, WGV/GDV and DWR

## 6.4 Connection

**WARNING**

**Danger due to improper connection!**

- ► Make sure that all connections – cables, hoses and lines – are routed so that they do not present tripping points!
- ► Make sure to comply with the prescribed bending radii when routing cables, hoses and leads!
- ► Make sure to comply with the specified configuration as per the connection diagram when connecting cables, hoses and leads!
- ► When connecting the cables, hoses and leads, check for the completeness and tight seating of all connections!
- ► Keep in mind that cables, hoses and lines that are not connected or incorrectly connected may result in malfunctions that jeopardize the safety of the operating personnel.

### 6.4.1 Electrical connection

**DANGER**

**Danger due to electrical voltage!**

When working on live components, electric shock presents a danger to life!

- ► Only trained and qualified electricians or instructed personnel under the direction and supervision of an electrician in accordance with electrical rules may perform any work on the electrical equipment of the machine.
- ► Keep the 5 safety rules for working on electrical systems in mind: Disconnect; secure against reconnection; make sure no voltage is present; ground and short circuit; cover or cordon off adjacent live parts.

⇨ Inspect the proper electrical installation in accordance with the provisions of the customer and the locale.

⇨ A disconnecting device that can be locked must be installed near the machine. In this way, the diverter valve can be secured against being switched on unintentionally during servicing and maintenance work.

⇨ Connect all provided grounding connections.

### 6.4.2 Pneumatic connection

**WARNING**

**Risk from pressurized parts and media!**
When working on pressurized lines or components, the pressurized media may escape suddenly. The escaping media may cause injuries or the uncontrolled movement of components!

- ► Before starting repair work, release the pressure in those system sections or pressure lines to be opened!
- ► Only qualified personnel may work on pressure lines!
- ► Repair damage to lines, hoses and screw connections immediately!
- ► Wear personal protective equipment (appropriate safety goggles, protective gloves).

---

- ⇨ Remove the plug on the solenoid valve.
- ⇨ Check whether all fittings are tight.
- ⇨ Connect the control line to the solenoid valve (see chapter 12.2 Connection diagram).
- ⇨ For the required cross-sections of the supply line, see *order and shipping documents*.
- ⇨ Set the control pressure (see chapter *4.3 Operating data*) using the pressure regulator and check it on the pressure gauge of the pressure regulator.

### 6.4.3 Connecting accessories

**Information**
If optional accessories are to be used, the instructions and specifications for installation, operation, servicing, and maintenance must be found in the vendor documentation.

The following applies to all accessories and connected parts:

- Choose them in accordance with the allowable pressure and the allowable temperature.
- Make sure all connections are tight.

Do not exceed the allowable pressure and the allowable temperature; if necessary, take protective measures.

# 7 Commissioning

## 7.1 General

We urgently recommend having Coperion GmbH perform commissioning due to a variety of effects and for warranty reasons.

During commissioning, the following actions are performed:

- the diverter valve and accessories are checked (errors during installation, etc.),
- depending on the contract, the entire system is checked and the optimum settings are determined,
- the operators are briefed,
- additional recommendations are provided for operating the diverter valve, for maintenance and repairs.

## 7.2 Safety and personnel

To avoid life-threatening injuries or property damage during commissioning, you must keep the following points in mind:

⇨ You must perform a visual inspection of the machine and accessories for damage prior to initial commissioning but after installation. Have trained service personnel repair all damage before commissioning.

⇨ Make sure that commissioning is only performed by qualified personnel while obeying the safety instructions.

⇨ Make sure that only authorized personnel are present in the work area and that no other persons are put at risk by commissioning.

⇨ Check and obey the pertinent regulations and provisions for occupational safety and health protection of the employer's liability insurance carrier or the occupational safety regulations for the country in question.

⇨ Prior to initial commissioning, check whether all tools and foreign materials have been removed from the machine.

⇨ Prior to commissioning, check all cables, hoses and lines for the completeness and tight seating of all connections!

⇨ For all inspection work requiring the machine to be stopped for safety reasons, make sure that the machine is secured against being switched on unexpectedly.

⇨ Read chapter *3 Safety*.

## 7.3 No-load test without product when installed

**Information**
The permissible operating data must not be exceeded (see chapter *4 Technical data*).
If malfunctions occur during commissioning, check chapter *8.4.1 Malfunctions, possible causes and remedies* for advice.

**SAFETY INSTRUCTIONS**

- ► Make sure that there are no people in areas of the machine presenting a risk of injury.
- ► Never try to operate the machine with the inlet or outlet accessible. There is the risk of severe injuries or death from flying product or shearing of a body part by the rotor!
- ► Operate the machine only with the protection and safety equipment installed!

- ⇨ Control medium: Air or non-aggressive media, filtered.
- ⇨ Ensure impact-free operation of the butterfly valve against the stop; if necessary, correct the air supply to the throttles (see chapter *8 Operation*).
- ⇨ Operate the diverter valve two or three times and check for the correct connection and operation of the limit switches.
- ⇨ Listen for abnormal noises.
- ⇨ Check the operation of the emergency stop switch (if present).
- ⇨ Check the operation of the safety valve (if present).

## 7.4 Commissioning

After successfully completing the no-load test, you can now integrate the diverter valve into the system.

- ⇨ After the first 10 operating hours, check all screw connections for a firm seat and retighten if necessary.
- \- For the tightening torques, see chapter *12.1 Tightening torques*

# 8 Operation

## 8.1 Safety and personnel

**⚠ WARNING**

**Danger due to improper operation!**

The machine presents risks when operated improperly or when not in the proper condition.

- ► Before switching on the machine, make sure that no one can be put at risk by the starting machine.
- ► Avoid any risky behavior!
- ► Only operate the machine if all protective and safety equipment, such as removable protective equipment and EMERGENCY stop devices, are present.

**SAFETY INSTRUCTIONS**

- ► Make sure that there are no people in areas of the machine presenting a risk of injury.
- ► Check to see that the machine is in proper, undamaged and complete condition. Never start operating the machine in a damaged or defective condition.
- ► Check whether all wear parts are in ready to operate condition. Immediately replace worn components or those with other defects.
- ► Check whether the machine is correctly installed and secured.
- ► Never try to operate the machine with moving parts accessible. There is the risk of severe injuries or death from crushing, shearing, entanglement, etc.!
- ► Never try to operate the machine with unsecured pressurized parts.
  There is the risk of severe injuries from ejected product, pressure release, etc.!
- ► Operate the machine only with the protection and safety equipment installed!
- ► Make sure the motors are rotating in the correct direction.

## 8.2 Normal operation

You can switch the diverter valve according to the following table:

| Diverter valve | State | |
|---|---|---|
| | Pressure in the conveying pipe | Product in the conveying pipe |
| WEK | No | No but possible on a case-by-case basis following discussions and approval. |
| WET | No | |
| WYK | No | No |
| WRK | No | Yes, with remaining product after emptying the pipeline |
| WZK | up to 0.15 bar | No |
| WHK / WHK-W | No / Up to 0.15 bar | No |
| WHT / WHT-W | No / Up to 0.15 bar | No |
| WGV/GDV | No | No |
| DWR | No | No |

**Example using the WZK diverter valve:** Without product, the diverter valve can be switched up to a pressure of 0.15 bar. However, if there is product in the diverter valve, you may not switch the valve.

Special designs with this function are possible.

**Example using the WYK diverter valve:** The diverter valve may only be switched in the conveying pipe without product and without pressure (conveying or cleaning pressure).

### Outlet throttles (all except WZK, GDV and DWR)

⇨ Set the outlet throttles so that the rotor approaches the blocking strip slowly.

⇨ Make the adjustment using a suitable tool and secure the throttle.

- Slower rotational speed -> rotate the outlet throttles clockwise
- Faster rotational speed -> rotate the outlet throttles counterclockwise

⇨ Check the throttle for a firm seat.

**Information**
Operation without outlet throttles is not permitted.

**Information**
In general, switch the diverter valves at regular intervals to prevent them from sticking due to caked product, for example.

## 8.3 Cleaning

**Information**
The housing, side covers, bracket and rotor form a single unit and are matched to each other. These parts must not be replaced with the same parts from other diverter valves and must always be installed at the previous position.

Only the WYK is intended for cleaning during normal operation.

**Information**
For cleaning the WYK-CIP, see M67933.

### 8.3.1 Manual cleaning of the WYK

**Information**
If the pipe system is cleaned with the diverter valve installed, the diverter valve must then be cleaned separately in accordance with the following points.

#### Actions before cleaning

**SAFETY INSTRUCTIONS**

- ► Perform the prescribed installation, maintenance and inspection work on schedule.
- ► Only trained and qualified electricians may work on electrical machines.
- ► Switch off the master switch and secure it against being switched on again.
- ► Secure service media, such as voltage and compressed air, against being switched on again unintentionally.
- ► All bolts removed for maintenance or inspection work must be retightened using the specified torque and must be checked before recommissioning the machine.
- ► After completing the maintenance or inspection work, check that the safety equipment is operating properly.

**⚠ WARNING**

**Risk from pressurized parts and media!**
When working on pressurized lines or components, the pressurized media may escape suddenly. The escaping media may cause injuries or the uncontrolled movement of components!

- ► Before starting repair work, release the pressure from those system sections or pressure lines (compressed air) to be opened.
- ► Only qualified personnel may work on pressure lines!
- ► Repair damage to lines, hoses and screw connections immediately!
- ► Wear personal protective equipment (appropriate safety goggles, protective gloves).

### Removing the drive system and rotor

**⚠ WARNING**

**Risk of a cut injury!**

Sharp surfaces, edges and corners of the housing bore may produce a cut injury!

- ► Wear personal protective equipment.
- ► In the event of injuries, see a doctor immediately.

**⚠ WARNING**

**Danger due to hot surfaces!**

Risk of burn on housing parts!

- ► Let the machine cool down.
- ► Wear personal protective equipment.

**⚠ WARNING**

**Pinch point risk!**

Machine parts are heavy. They may fall while being lifted; this is a pinch point risk.

- ► Wear personal protective equipment.
- ► If necessary, secure the diverter valve against overturning.
- ► Secure components against falling.
- ► Always attach and securely fasten suitable lifting equipment.

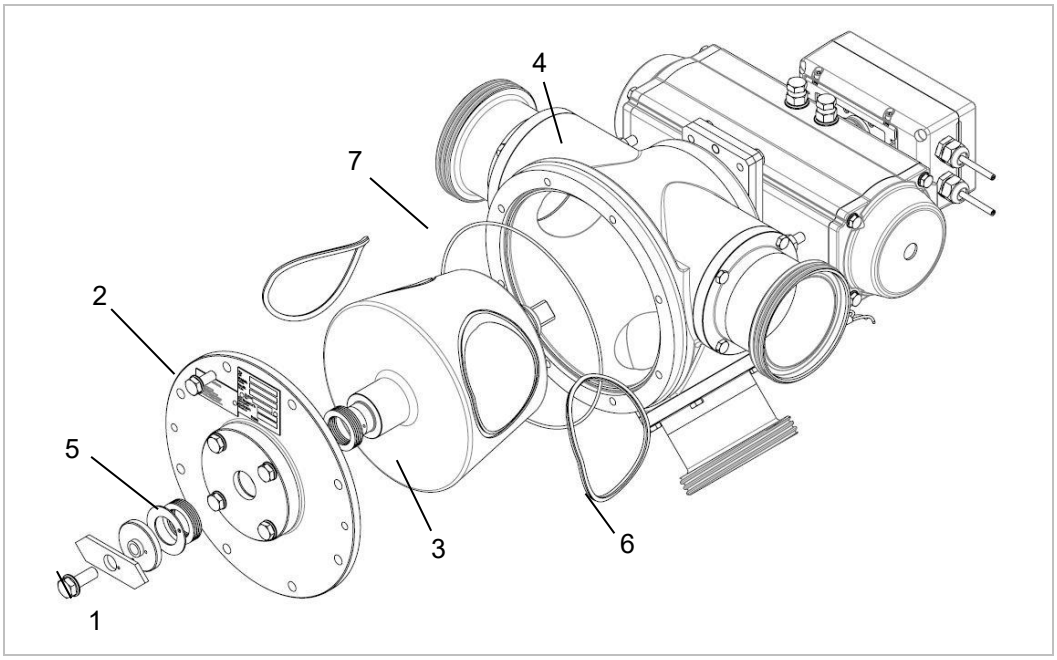



*Fig. 8.1: Disassembling the WYK side cover and removing the rotor*

- ⇨ Unscrew the bolt **[1]**, remove the washer, position indicator, spacer, thrust washer and shim.
- ⇨ Unscrew the bolts **[2]**, remove the washer and press off the side cover.
- ⇨ Mark the position of the rotor **[3]** with respect to the housing **[4]**.
- ⇨ Remove the shim **[5]**.
- ⇨ Pull the rotor out of the housing.
- ⇨ If the seal rings **[6]** on the rotor are damaged, remove them and replace with new seal rings.
- ⇨ Take the O-ring **[7]** out of the housing.

**NOTICE**

**Make note of the number of shims!**

► During disassembly, note the number of shims in front of and behind the locking block because they need to be installed again in the same way.

**NOTICE**

**Does not apply to the WYK-CIP!**

To disassemble the WYK-CIP, observe the instructions in the separate repair manual!

**Information**

When pulling the bracket with drive system and accessories out, the rotor may stick inside the housing. In this case, pull the rotor separately out of the housing.

### Cleaning the diverter valve manually (wet or dry)

- ⇨ Clean the components in accordance with the shop cleaning specifications.

**NOTICE**

**Risk of damage to the machine due to improper cleaning**

Using non-approved process media or cleaning agents may result in damage.

- ► Make sure that the cleaning agent does not damage any components!
- ► Never clean electronic components with water or other liquids!
- ► Make sure that no water or other liquids get into the electrical components!

---

- ⇨ Clean and check the sealing elements. Replace if necessary.
- ⇨ Inspect the diverter valve and remove any product residue or cleaning agent present.
- ⇨ Dry all components after wet cleaning.

### Assembling the diverter valve

⇨ Eliminate the cleaning agent residue hazardous to the product from all components.

⇨ Inspect all components for proper condition. This applies especially to bearing surfaces, sealing elements and surfaces that contact the product.

⇨ Replace damaged components.

⇨ Assemble the diverter valve in reverse order.

**NOTICE**

**Pay attention to the proper distribution of the shims!**

► Install the shims in the same numbers before and after the locking block.

**Information**
Pay attention to prevent rotation of the rotor shaft.
Tighten all bolts with the specified tightening torques (see chapter *12.1 Tightening torques*).

## 8.3.2 Shutting down the diverter valve

Shutdown is performed the following order:

⇨ Switch off the material feed system and secure it against being switched on again.

⇨ Run the line empty.

⇨ Release the pressure in the lines.

# 8.4 Behavior in the event of malfunctions

The local safety regulations apply in every case regardless of the following information.

**SAFETY INSTRUCTIONS**

► Switch off the master switch and secure it against being switched on again.

► Secure service media, such as voltage and compressed air, against being switched on again unintentionally.

► Disconnect the machine from the product flow.

► Make sure that there are no people in areas of the machine presenting a risk of injury.

► After correcting a malfunction, check the operation of the safety equipment.

⇨ Eliminate the cause of the malfunction.

### 8.4.1 Malfunctions, possible causes and remedies

**Information**
The malfunctions listed below are only examples.
The remedies given in the list may not be the only ones.

| Malfunction | Possible causes | Remedies |
|---|---|---|
| The diverter valve does not switch | The diverter valve is dirty. | Clean the interior of the diverter valve. |
| | Foreign object jammed between the rotor and the housing | Disassemble the diverter valve and repair (remove the foreign object). |
| | Housing twisted | Install the housing without mechanical stress. |
| | Control pressure too low | Set the control pressure properly. |
| | Drive system defective | Replace the drive system |
| | Solenoid valve set to manual operation | Set the solenoid valve to remote control. |
| The diverter valve does not switch (DWR only) | Pressure not relieved from pneumatic pressure hose | Adjust the control system. |
| | | Relieve the pressure on the pneumatic pressure hose before switching |
| | Electric power interrupted | Check the electric power |
| Diverter valve between outlets leaking | Conveying pressure not greater than 0.2 barg (WZK) | Contact Coperion customer service |
| | Vacuum conveyor (WZK) | |
| | Seal defective | Replace the seal. |
| Leaking diverter valve (DWR only) | Pressure not relieved from pneumatic pressure hose | Press on the pneumatic pressure hose |
| | Pneumatic pressure hose defective | Replace the pneumatic pressure hose |
| Diverter valve leaking to the outside (excluding DWR) | O-rings on the cover or collar bearing defective | Replace the O-rings |
| Piston of the drive system leaking (excluding DWR) | Set of seals for the piston defective | Replace the set of seals for the piston |
| No limit switch signal present | Fuse defective | Replace the fuse. |
| | Electric power interrupted | Check the electric power |
| | Limit switch defective | Replace the limit switch |
| | Diverter valve does not reach end position. | See: *The diverter valve does not switch* |
| No compressed air present at the pneumatic drive (excluding DWR) | Solenoid valve defective | Replace the solenoid valve |

⇨ * In the case of a vacuum conveyor with a suction pressure greater than 0.2 barg at the location where the WZK diverter valve is used in the conveying pipe, the effectiveness of the seal can be improved by rotating the three seals between the housing and the rotor (notch toward the outside).

⇨ For malfunctions that you cannot eliminate yourself using this table, please contact our Customer Service.

### 8.4.2 Switching on after remedying a malfunction

**SAFETY INSTRUCTIONS**

- ► All malfunctions have been remedied.
- ► Make sure that there are no people in areas of the machine presenting a risk of injury.
- ► Check whether all wear parts are in ready to operate condition. Immediately replace worn components or those with other defects.
- ► Never try to operate the machine with the inlet or outlet open.
  There is the risk of severe injuries or death from flying product or shearing of a body part by the rotor!
- ► Operate the machine only with the protection and safety equipment installed!

⇨ Commission the diverter valve as per chapter *7 Commissioning*.

# 9 Servicing

- Operational malfunctions caused by inadequate or improper maintenance may result in very high repair costs and long down times of the diverter valves. For this reason, regular maintenance is absolutely necessary.
- The operational reliability and the service life of the diverter valve depends on proper maintenance in addition to several other factors.
- When disassembling the components, pay special attention that the main components, which are matched to one another and identified by the serial number, are reassembled in their original position with respect to one another.

**Information**
Servicing and repair work require special technical knowledge and special abilities (neither of which is provided in this operating manual) and may only be performed by qualified technicians.
As was the case for commissioning, we recommend using Coperion personnel when making repairs to the diverter valve for the first time. This will give your maintenance personnel the opportunity to gain first-hand experience.
Only repair work that may be performed during maintenance are described.
For more extensive servicing and maintenance tasks, we make reference to the appropriate repair manual (available upon order).
A disassembled unit may only be tested with tightly closed inlet and outlet openings. Use the transport covers to close the openings.

## 9.1 Safety and personnel

Only trained, authorized and instructed maintenance personnel may do the work.

**DANGER**

**Danger due to unexpected starting**
Machines can hit people. Risk of severe injuries resulting in death.

► Make sure that the master switch of the central power supply is switched off and a warning label is attached to prevent it from being switched on again. It must not be possible for the machine to be switched on while even one person is present in the hazard zone.

**DANGER**

**Danger due to electrical voltage!**

When working on live components, electric shock presents a danger to life!

- ► Only a trained and qualified electrician or instructed personnel under the direction and supervision of an electrician in accordance with electrical rules may perform any work on the electrical systems/machines or operating facilities.
- ► Make sure that the master switch of the central power supply is switched off and a warning label is attached to prevent it from being switched on again.
- ► Before beginning work, visually inspect live parts.
- ► Use suitable tools with sufficient dielectric strength.
- ► When performing repairs on electrical equipment, it must be separately switched off in advance.
- ► After opening the control cabinets and equipment of all components that store electric charge, discharge them and make sure that all components are deenergized.

**WARNING**

**Risk from pressurized parts and media!**

When working on pressurized lines or components, the pressurized media may escape suddenly. The escaping media may cause injuries or the uncontrolled movement of components!

- ► Before starting repair work, release the pressure from those system sections or pressure lines (compressed air) to be opened.
- ► Only qualified personnel may work on pressure lines!
- ► Repair damage to lines, hoses and screw connections immediately!
- ► Wear personal protective equipment (appropriate safety goggles, protective gloves).

**WARNING**

**Risk of fire/explosion!**

Dispersed dust deposits may lead to an explosion.

- ► Regularly clean the housing surface.

## 9.2 Inspection and maintenance tasks

**The following inspection and maintenance tasks are to be performed at regular intervals depending on the operating conditions:**

⇨ Inspect the diverter valve for visible defects and peculiar conditions, for example, listen for abnormal operating noises and product spillage at fall-out openings.

⇨ Check all screw connections for a firm seat.

⇨ Check the flange connections for leaks and a firm seat.

**⚠ DANGER**

**Danger from moving and/or rotating parts!**

When the machine is running, there is a risk of injury or death due to entanglement, crushing or the shearing of extremities!

► Do not reach into moving or rotating parts during operation.

► Make sure that moving parts are not accessible during operation.

► Do not wear loose clothing, jewelry or uncovered long hair.

► Before performing any work on moving components, switch off the machine and secure it against being switched on again. Wait until all components come to a stop.

**⚠ WARNING**

**Danger of lung damage and/or eye injury due to dust!**

Whenever working on or with the machines, dust may be dispersed and may lead to eye injuries and/or to lung damage by breathing.

► Wear personal protective equipment (suitable filter mask, safety goggles, etc.).

► Vacuum up the dust, collect it, etc.

**⚠ CAUTION**

**Risk of a cut injury!**

Sharp surfaces, edges and corners of the machine may produce a cut injury!

► Wear personal protective equipment.

► In the event of injuries, see a doctor immediately.

# 10 Maintenance

## 10.1 Maintenance schedule

**Information**
The following maintenance schedule refers to 4,000 switchings per year.

Remove the diverter valve every two years (WYK: every year) to perform maintenance.

| Activity | | Maintenance intervals | |
|---|---|---|---|
| | | Every six months | Every 2 years (annually for WYK) |
| Disassemble the diverter valve and clean completely. | | | ■ |
| Visually inspect the diverter valve for proper condition. | | ■ | |
| Check the screw connections for a firm seat. | | ■ | |
| Check the control air pressure and set if necessary. | | ■ | |
| Check the compressed air filter and clean if necessary. | | ■ | |
| Check the switch settings (impacts). | | | ■ |
| Check the pipelines and control lines for leaks. | | ■ | |
| Check all seals and replace if necessary. | | | ■ |
| Check the bearings and friction washers, and replace if necessary. | | | ■ |
| Check the pneumatic drive for leaks, replace the seal parts if necessary (excluding DWR). | | | ■ |
| Check the operation of the solenoid valve; replace dirty sound absorbers. | | | ■ |
| Check the inductive proximity switches. | | | ■ |
| Check the cable channels for leaks. | | | ■ |
| Check all grounding bolts for a firm seat and check the ground for continuity. | | ATEX<br>■ | |
| Check the ground between the rotor inner tube and the housing and, with the WZK, also the ground between the drive and the housing (max. 1 MΩ allowed). | | | ATEX<br>■ |
| DWR only: | Clean the inside of the protective casing. | ■ | |
| | Clean and grease the driver, check the bearings, replace if necessary. | | ■ |
| | Gear motor | Comply with the manufacturer's specifications. | |

**Information**
If more extensive work (for example, severe damage to the diverter valve) is necessary, a general overhaul must be performed in the manufacturer's factory.

**SAFETY INSTRUCTIONS**

- ► Perform the prescribed installation, maintenance and inspection work on schedule.
- ► Only trained and qualified electricians may work on electrical machines.
- ► Switch off the master switch and secure it against being switched on again.
- ► Secure service media, such as voltage and compressed air, against being switched on again unintentionally.
- ► All bolts removed for maintenance or inspection work must be retightened using the specified torque and must be checked before recommissioning the machine.
- ► After completing the maintenance or inspection work, check that the safety equipment is operating properly.

## 10.2 List of lubricating points

**Information**
Relubrication of the diverter valve is not necessary.

# 11 Disposal

## 11.1 Environmental protection

Packaging material and used or left-over operating supplies are to be sent to recycling in accordance with the environmental protection regulations and provisions applicable at the location.

Protecting natural resources is one of the top-priority tasks. Proper disposal avoids negative effects on humans and the environment, and allows reuse of valuable raw materials.

## 11.2 Operating supplies and materials

Dispose of operating supplies and materials in accordance with the pertinent specifications and the regulations of the country.

## 11.3 Electrical system/electronics

Dispose of the electrical/electronic components in accordance with the pertinent regulations of the country.

# 12 Appendix

## 12.1 Tightening torques

If no other data are provided, all fittings on the component must be tightened as per the following tables with due consideration given to the permissible mounting flanges:

| | Bolt size | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Property class (bolt head) | M6 | M8 | M10 | M12 | M14 | M16 | M20 | M24 | M27 | M30 | M33 |
| | Channel hole [mm] | | | | | | | | | | |
| | 6.4-7 | 8.4-10 | 10.5-12 | 13-14.5 | 15-16.5 | 17-18.5 | 21-24 | 25-28 | 28-32 | 31-35 | 34-38 |
| | Tightening torque $M_a$ [Nm] | | | | | | | | | | |
| 5.6 | 4 | 15 | 21 | 36 | 57 | 90 | 176 | 302 | 446 | 610 | 815 |
| 8.8 | 9 | 23 | 45 | 77 | 122 | 192 | 375 | 645 | 951 | - | - |
| 10.9 | 14 | 33 | 66 | 114 | 179 | 282 | 551 | 947 | 1397 | - | - |
| A2/A4 – 70 | 6 | 14 | 28 | 48 | 76 | 119 | 233 | 402 | - | - | - |
| A2/A4 – 50 | - | - | - | - | - | - | - | 187 | 275 | 271 | 503 |

5.6 - 10.9: with washer, dry and zinc plated; A2/A4 – XX: with washer, greased

| | Bolt size | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Property class (bolt head) | - | - | - | - | 5/8" | 3/4" | 7/8" | 1" | 1 1/4" |
| | Channel hole [mm] | | | | | | | | |
| | - | - | - | - | 17-19.1 | 20-22.2 | 23.2-25.4 | 26.4-28.6 | 32.8-34.9 |
| | Tightening torque $M_a$ [Nm] | | | | | | | | |
| ASTM A 193 B7 | - | - | - | - | 291 | 418 | 679 | 1015 | 1827 |
| 18 – 8 | - | - | - | - | 79 | 139 | 224 | 335 | 665 |

ASTM A 193 B7: with washer, dry and zinc plated; 18 – 8: with washer, greased

**Information**
The tightening torques given in the tables above must not be exceeded.

## 12.2 Connection diagram

The connection diagram is located in the terminal box.

# 13 Certificates

## Original
## Manufacturers' declaration regarding Directive 2014/68/EU (PED)

Coperion GmbH, Niederbieger Str. 9, 88250 Weingarten

declares that, under our sole responsibility, the following type of

**WEK, WET: Single channel diverter valve with a pneumatic drive system**
**Size 100 – 400**

Since the single channel diverter valve was designed to maintain the narrow gap between the housing and the rotor, the prime criterion is the rigidity of the construction with respect to bending or deformation arising from pipeline forces. Using hydraulic pressure tests, it was also confirmed that the diverter valve would be suitable for considerably greater pressures than the allowable operating pressures due to the stability.
Consequently, it is exempt from application of the Pressure Equipment Directive (PED) in accordance with PED Article 1 (2) j).

**Notice:**
We point out that commissioning is forbidden until it has been determined that the machine/system into which this product is installed complies with the specifications of additional underlying directives and with the details contained in the installation and operating manual.

| Date | by order of Johannes Scheirle<br>Development Apparatuses | by order of Hubert Gruber<br>Engineering Apparatuses |
|---|---|---|
| 03.03.2023 | | |

# Original
# Manufacturers' declaration regarding Directive 2014/68/EU (PED)

Coperion GmbH, Niederbieger Str. 9, 88250 Weingarten

declares that, under our sole responsibility, the following type of

**Two-way diverter valves: WZK, WRK, WHT, WHK, WGV, GDV, WYK**
**Multi-way diverter valve: DWR**

The component is subject to Directive 2006/42/EC of the European Parliament and Commission (Machinery Directive). At most, the component would fall into category I of the Pressure Equipment Directive because of its size, the maximum allowable pressure $P_s$ and the area of application of fluid group 2. However, based on Article 1 (2) f) i) of the Pressure Equipment Directive, the Pressure Equipment Directive does not apply to this component.

**Notice:**
We point out that commissioning is forbidden until it has been determined that the machine/system into which this product is installed complies with the specifications of additional underlying directives and with the details contained in the installation and operating manual.

| Date | by order of Thomas Schöllhorn<br>CE inspector | by order of Johannes Scheirle<br>Development Apparatuses |
|---|---|---|
| 03.03.2023 | | |

# Original

## Manufacturers' declaration regarding Directive 2014/34/EU (ATEX)

Coperion GmbH, Niederbieger Str. 9, 88250 Weingarten

declares that, under our sole responsibility, the following type of

**Two-way diverter valves:** **WZK, WRK, WEK, WET, WHT, WHK, WGV, GDV, WYK**

**Multi-way diverter valve:** **DWR**

For the diverter valves listed here, a hazard analysis according to Directive 2014/34/EU was carried out and contains the following result:

- The diverter valve itself has no potential ignition source and can be driven manually, mechanically and electrically. The diverter valve is not included in the area of application of the Directive 2014/34/EU (ATEX).
- Electrical or mechanical accessories must be subjected to their own conformity evaluation as per ATEX.
- **The diverter valve may be used in the Ex zone.**

The following harmonized standards were applied:

DIN EN 1127-1:2019, DIN EN ISO 80079-36:2016,
DIN EN IEC 60079-0:2019 including corrigendum 1: DIN EN IEC 60079-0:2021

The following national standards and directives were also applied:

None

**Notice:**

We point out that commissioning is forbidden until it has been determined that the machine/system into which this product is installed complies with the specifications of additional underlying directives and with the details contained in the installation and operating manual.

| Date | for Bruno Zinser<br>Head of Design construction<br>ATEX inspector | by order of Thomas Schöllhorn<br>CE inspector |
|---|---|---|
| 23.06.2021 | | |

# Original
# Declaration of incorporation regarding Directive 2006/42/EC

The manufacturer
**Coperion GmbH, Niederbieger Straße 9, 88250 Weingarten,**
declares herewith that for the products:

## Diverter valves:
## WEK, WET, WYK, WRK, WZK, WHK, WHT, WGV, GDV, DWR

the following basic health and safety requirements as per Appendix I

## of Machinery Directive 2006/42/EC

have been applied and complied with.

- General principles no. 1
- Numbers 1.1.2, 1.1.3, 1.1.5, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.8, 1.4.1, 1.4.2.1, 1.5.1, 1.5.2, 1.5.3, 1.5.7, 1.5.8, 1.5.9, 1.6.1, 1.6.4, 1.7.2, 1.7.3, 1.7.4, 2.1.1

Commissioning is forbidden until it has been determined that the machine into which the partially completed machine listed above is to be installed complies with the specifications of the Machinery Directive.
To this end, the following additionally applied basic health and safety requirements as per Appendix I must be assessed during planning.

- Numbers 1.1.7, 1.2.1, 1.2.2, 1.2.3, 1.2.4.1, 1.2.4.2, 1.2.4.3, 1.2.4.4, 1.2.5, 1.2.6, 1.5.5, 1.5.6, 1.5.13, 1.6.2, 1.6.3, 1.6.5, 1.7.1

The special technical documents were created as per Appendix VII Part B.
We pledge to provide the special documents on the partially completed machine to the national bodies in paper form upon request.
The following harmonized standards were applied:
EN ISO 12100:2010 including corrigendum 1: DIN EN ISO 12100:2013

Responsible for the document:
Thomas Schöllhorn, Niederbieger Straße 9, 88250 Weingarten

| Date | by order of Dr. Bernhard Stark<br>Manager, Research & Development<br>Polymer Division | by order of Thomas Schöllhorn<br>CE inspector |
|---|---|---|
| 22.04.2021 | | |

# Original
# Manufacturers' declaration regarding Directive 2014/30/EU (EMC)

Coperion GmbH, Niederbieger Str. 9, 88250 Weingarten

declares that, under our sole responsibility, the following type of

## Diverter valves
### WEK, WET, WYK, WRK, WZK, WHK, WHT, WGV, DWR

The device is intended for installation in one specific stationary system and is not available on the open market. As per Article 19, paragraph 1 of Directive 2014/30/EU, this device does not receive an EU Declaration of Conformity or CE marking according to this Directive.

To establish conformity of the overall system, the device must be installed and documented according to the recognized engineering rules of electromagnetic compatibility.

22.04.2021
Date

for Dr. Bernhard Stark
Manager, Research & Development
Polymer Division

by order of Michael Volz
Head of Automation