



## **HAWIDO - REGULATING VALVES**

Instruction for

**Valve with non return-function**

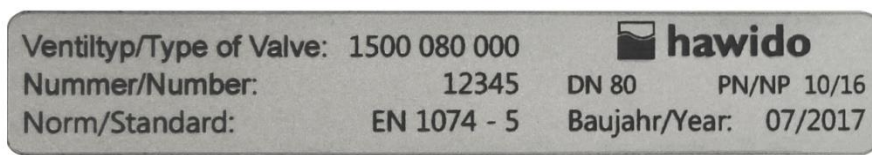
**Type 1707**

**ND40 - ND200**



Keep this instruction manual at the location of the valve

*Example of a nameplate*



Once the commissioning work has been completed, enter the following data and always specify this additional information concerning the valve type, pressure and flow ratios, whenever you consult or have reason to question the manufacture or supplier:

Year of manufacture:..... DN: ..... NP: .....

Serial number: .....

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## A. Description

### 1. Function

The backflow prevention valve works like a non-return valve. The opening and closing speed can be independently set using the flow control valves (3A) and (3B). Any return flow is prevented when the input pressure (P1) is equal to or lower than the outlet pressure (p2). The hydraulic locking system ensures a complete seal.

#### **Technical features:**

Medium:	Drinking water
Pressure stages:	PN 10 (Standard DN 200 and upwards) PN 16 (Standard up to and including DN 150) PN 25
Flanges:	Connection dimensions acc. DIN EN 1092 – 2
Manometer:	EN 837-1, accuracy class 1.0
Material:	EN-GJS-400-15
Temperature range:	2 to 40° C

### 2. General safety guidelines

The Hawle HAWIDO regulating valve is designed for use on drinking water supply systems. Please consult the manufacturer before using it with other media.

Material damage or injury to persons can occur if it is not installed, commissioned, operated or maintained according to these instructions or to codes of practice.

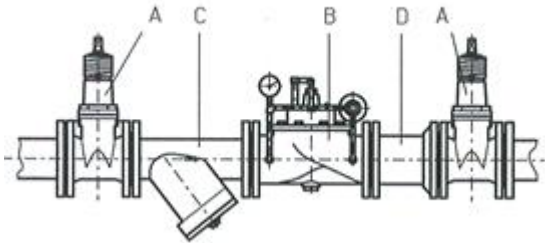
All technical regulations (e.g. SVGW, ÖVGW, DVGW...) and codes of practice (e.g. VDE, VDI ...), laws and standards are taken as a minimum standard and must be adhered to and applied.

Work on electrical installations (e.g. installation of magnetic position switches etc.) may only be carried out by personnel suitably qualified for this work.

The responsibility for layout, installation position and commissioning of the fittings in the pipe work lies with the designer, installer and/or user. Design or installation errors can adversely affect the operation of the regulating valve and can create a significant risk. If in doubt please consult us.

### 3. Recommended installation

Before the installation, all pipe work must be blown or flushed through to prevent any foreign material such as pieces of wood, stone etc. from entering the valve.

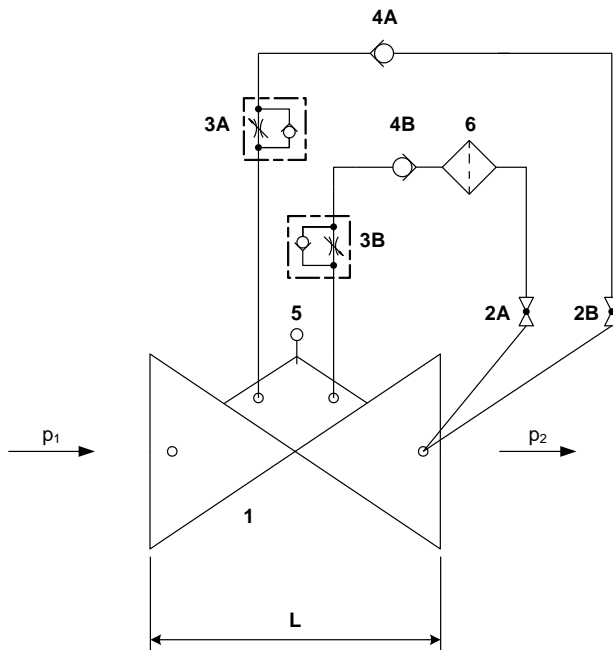


Regulating valves are normally fitted with the valve cover upwards and it is recommended that shut-off valves be fitted on both sides plus a dirt trap on the inlet side. Depending on the installation situation, a mounting adapter may also be required. Before commissioning, a check should be made that no coarse foreign bodies can penetrate into the HAWIDO.

For other types of installation, please contact us for advice.

## B. Commissioning

### 1. Operation diagram (1707)



#### Components:

- 1 Main valve 1200
- 2 Ball valves (A, B)
- 3 One-way flow restrictor (A, B)
- 4 Non-return valve (A, B)
- 5 Optical Position indicator (optional)  
Electrical position indicator (optional)  
Valve opening limiter (optional)

### 2. Preparation

Before commissioning the valve, check that the gate valves on the inlet and outlet sides of the valve are closed and that the flange connections are correctly tightened and sealed.

#### On main valve:

- the flow control valves (3A und 3B) need to be opened.
- the ball valve (2A) needs to be opened.
- the ball valve (2B) needs to be closed.
- the output side of the shut-off valve after the HAWIDO 1707 needs to be opened slowly, so as to place the valve under pressure. The HAWIDO closes itself.
- slightly open the upper central threaded plug of the cover or the position indicator and/or opening limiter (5) as well as the screw connections at the highest point, until all the air has completely escaped.

### 3. Venting

#### Procedure:

The ball valve (2B) must be slowly opened. **Slowly** open the shut-off valve on the input side. The water flows through the valve. The inlet pressure ( $p_1$ ) is slightly higher than the outlet pressure ( $p_2$ ).

By bleeding the valve in the control line you allow all the air to escape, after which you need to tighten the plug and loosened screw again. Check all the screwed connections for leaks and tighten if necessary.

**Control:** If the ball valve (2B) and the shut-off valve on the input side are closed, the valve must be closed, too.

If the valve does not close, the start-up process must be repeated again from Section 2 whilst paying particular attention to the bleeding of the control lines and the upper valve chamber.

## 4. Setting the response speed

### ***Setting the opening speed:***

- Set the opening speed with the adjustment screw of the flow control valve (3A), then tighten the lock nut.
- Repeat the procedure in Section 3 (without the bleeding) and Section 4 until the valve works quietly again.

### ***Setting the closing speed:***

- Set the closing speed with the adjustment screw of the flow control valve (3A), then tighten the lock nut.
- Repeat the procedure in Section 3 (without the bleeding) and Section 4 until the valve works quietly again.

### ***Recommendation:***

It is recommended that the flow control valve (3B) is opened by one-half to one turn more than the flow control valve (3A). This will close the valve base (1) more quickly and prevent the return-flow of water.

### **Caution**

The adjustment screws should never be completely closed.

## 5. Checking for leakage

HAWIDO's are tested during manufacture for both leakage and function. When checking for leakage on site particular attention must therefore be given to flange connections, the control line and the plug screw on the valve cover and these must be further tightened if necessary.

### **Notes:**

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## C. Fault finding

Symptoms	Possible cause	Action
Valve does not open	One-way flow restrictor blocked	Replace or unscrew several times the set screw until valve functions properly
	One-way flow restrictor closed too far	Undo the set screw until valve functions properly
Valve allows pressure creep	One-way flow restrictor blocked	Replace or screw set screw in and out fully several times and then reset
	Filter in control circuit blocked	Clean the filter
	Air in the control circuit or valve chamber	Vent
	Membrane defect	Carry out service, replace membrane
	Foreign matter in the main valve	Carry out service and remove foreign matter
Loud noise	Valve spindle jammed by encrustation	Carry out service and remove encrustation
	Unsatisfactory installation conditions	Change outlet pressure by 0.1 to 0.2 bar. Slightly open or close One-way flow restrictor. Contact Hawle customer service department.
	Wrong valve size	Calculate correct valve size. (If necessary contact Hawle)
Erratic operation	One-way flow restrictor incorrectly set	Reset (according to Chapter: <i>Setting the reaction speed</i> )
Original pressure value is not reached	Pressure gauge faulty	Check or replace pressure gauge
	Changed operating conditions	Reset accordingly (see Chapter: <i>Recommended installation</i> )
Epoxy-coating damaged	Transportation damage, installation damage	Repair with Hawle two-component repair set for coatings

## D. Putting out of service and Maintenance

### 1. Putting out of service

The operating pressure reducing valve must first be hydraulically shut off as follows:

- **Slowly** close the gate valves after and before the valve
- **Slowly** close ball valve (2B)

The valve is taken out of operation and the maintenance can be accomplished.

### 2. Maintenance and service

#### 2.1 General

Our long experience with diaphragm valves that are controlled by the flow medium indicates that our HAWIDO's normally function trouble-free for many years. Regular maintenance is, however, necessary to ensure continued reliable operation.

Under normal operating conditions the following should be carried out:

- Once a year, the valve should be checked for correct operation (function check)
- Once a year, the filters upstream of the valve and in the control lines should be cleaned
- Every four or five years, the inner working components should be checked, and worn parts replaced (maintenance).

Under unusual operating conditions (e.g. with water which contains quantities of suspended matter, high pressure reduction, small flow rates etc) maintenance should be carried out more frequently.

#### ***Maintenance label***

Funktionskontrolle: <b>jährlich</b>	Wartung:	
Contrôle fonctionnel: <b>annuel</b>	Maintenance:	<b>20xx</b>
Prova di funzionamento: <b>ogni anno</b>	Mantenzione:	
Function check: <b>annually</b>	Maintenance:	

xx stands for the year.

#### 2.2 Annual checks

##### **Cleaning the strainer in the main supply**

- Unscrew the lid
- Clean the filter with a brush or cloth or replace it
- Install the filter and screw the lid back on

##### **Cleaning the filter in the control line**

- Unscrew the lid of the filter
- Clean the filter with a brush or cloth or replace it
- Install the filter mesh and screw the filter lid back on

#### Functional check of the valve

- Remove the bleed plug on the valve cover.
- Check the smooth running of the valve spindle by raising and lowering the threaded rod.

#### Putting the valve back into service

- see chapter *Commissioning*

## 2.3 Four or five yearly maintenance

#### Cleaning the strainer in the main supply

- Unscrew the lid
- Clean the filter with a brush or cloth or replace it
- Install the filter and screw the lid back on

#### Cleaning the filter in the control line

- Unscrew the lid of the filter
- Clean the filter with a brush or cloth or replace it
- Install the filter mesh and screw the filter lid back on

#### Main valve (see chapter: *Repair kits and spare parts*)

- Undo the fittings of the control line and put the complete control line beside.
- Disassemble the Optical Position Indicator and replace the gaskets
- Undo the screws of the valve cover and remove this valve cover.
- Visually inspect all inner components for wear, dirt and scaling
- Clean inner components, seat and inner surfaces including the valve cover
- Disassembly the spindle guide at the housing, rinse the housing interior.  
For valves from DN 40 to DN 100 built in 2012, the spindle guide has to be removed from inside of the housing. The guiding thread of the spindle and the base valve must be **extremely clean**. Grease the thread well (eg Food Grease Aqua, Item No. 5292, see chapter control line parts and accessories).
- Replace the diaphragm, the O-ring and if necessary also the seat seal
- Thinly grease the area around the spindle guide with an agent, which is suitable for contact with foodstuffs. Check for easy movement of the spindle in the housing guide and in the cover guide.
- Assemble the main valve (See torque table in Annex). During assembly the easy movement of the spindle must be checked **several times** by actuating the threaded rod.

#### Checking the operation of the one-way flow restrictor

- loosen the locknut
- Screw in the set screw and then unscrew it as far as it goes
- Screw in again a few turns. This process must be easy and with little resistance

#### Putting the valve back into service

- see chapter *Commissioning*

### 3. Repair kits and spare parts

Several spare parts are required for the four or five yearly maintenance. These can be obtained as a repair kit for:

- the main valve
- for the control valve
- for the control circuit
- optical position indicator

The article numbers are shown in the parts lists and spare parts lists.

**Attention:**

When ordering spare parts, always specify the valve type, serial number and year of manufacture.

**Important:**

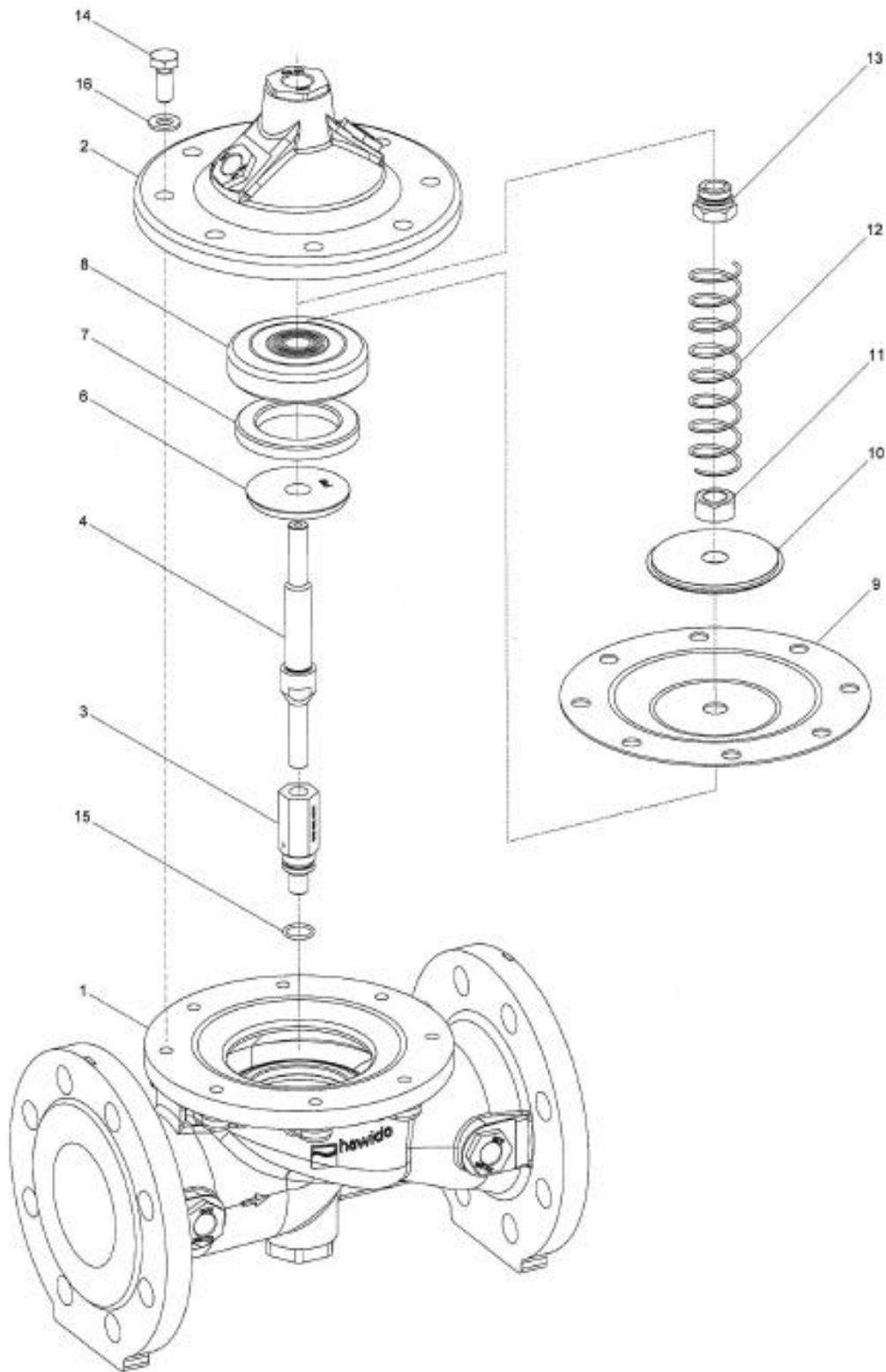
Spare parts of EPDM (membranes, seals) and NBR (O rings) have to be stored in a dark place, protected from UV radiation!

Durability in dark storage:

EPDM: eight years after production

NBR: five years after production

### 3.1 Main valve with stainless steel connection ND 40 to ND 200 (drawing)



08.12.2011/plü

### 3.2 Main valve (Parts list)

Item.	Description	Material	Article number				
			DN 40	DN 50	DN 65	DN 80	DN 100
1	Body	GGG 40	1004 040 000	1004 050 000	1004 065 000	1004 080 000	1004 100 000
2	Valve cover	GGG 40	1014 050 000	1014 050 000	1014 065 000	1014 080 000	1014 100 000
3	Spindle guide cover	INOX	1024 900 000	1024 900 001	1024 900 002	1024 900 003	1024 900 004
4	Spindle	INOX	1026 050 000	1026 050 000	1026 065 000	1026 080 000	1026 100 000
5	Seat	INOX	*	*	*	*	*
6	Counter seat	INOX	1044 040 001	1044 050 001	1044 065 001	1044 080 001	1044 100 001
7	Seal	EPDM	1022 040 000	1022 050 000	1022 065 000	1022 080 000	1022 100 000
8	Seal carrier	INOX	1027 040 200	1027 050 200	1027 065 200	1027 080 200	1027 100 200
9	Diaphragm PN10/16	EPDM	1020 050 000	1020 050 000	1020 065 000	1020 080 000	1020 100 000
	Diaphragm PN25	EPDM	1020 050 000	1020 050 000	1021 065 000	1021 080 000	1021 100 000
10	Pressure disc	INOX	1047 050 000	1047 050 000	1047 065 000	1047 080 000	1047 100 000
11	Nut	INOX	0007 710 080	0007 710 080	0007 712 080	0007 716 080	0007 716 080
12	Spring	INOX	1049 050 000	1049 050 000	1049 065 000	1049 080 000	1049 100 000
	Spring for valves installed upright position	INOX	1050 050 000	1050 050 000	1050 065 000	1050 080 000	1050 100 000
13	Spindle guide cover	INOX	1042 900 000	1042 900 000	1042 900 001	1042 900 002	1042 900 002
14	Hexagonal screw	INOX	0006 608 020	0006 608 020	0006 610 025	0006 610 025	0006 612 025
15	O-ring	NBR	0180 012 020	0180 012 020	0180 012 020	0180 016 020	0180 016 020
16	Washer	INOX	0008 208 000	0008 208 000	0008 210 000	0008 210 000	0008 212 000
17	GSK-sticker		1099 900 000	1099 900 000	1099 900 000	1099 900 000	1099 900 000
18	Maintenance sticker		9691 0xx 000	9691 0xx 000	9691 0xx 000	9691 0xx 000	9691 0xx 000
	Main valve complete	PN10/16	1201 040 000	1201 050 000	1201 065 000	1201 080 000	1201 100 000
	Main valve complete	PN25	--	--	1201 065 025	1201 080 025	1201 100 025
	Repair kit for main valve with stainless steel connection, comprising item 7, 9, 15, 18	PN10/16	1080 040 000	1080 050 000	1080 065 000	1080 080 000	1080 100 000
		PN25	1080 040 000	1080 050 000	1081 065 000	1081 080 000	1081 100 000

Item	Description	Material	Article number			
			DN 125	DN 150	DN 200°	DN 200^
1	Body	GGG 40	1004 125 000	1004 151 000	1004 200 000	1004 200 016
2	Valve cover	GGG 40	1014 125 000	1014 151 000	1014 200 000	1014 200 000
3	Spindle guide cover	INOX	1024 900 005	1024 900 005	1024 900 006	1024 900 006
4	Spindle	INOX	1026 125 000	1026 151 000	1026 200 000	1026 200 000
5	Seat	INOX	*	*	*	*
6	Counter seat	INOX	1044 125 001	1044 150 001	1044 200 001	1044 200 001
7	Seal	EPDM	1022 125 150	1022 151 000	1022 200 000	1022 200 000
8	Seal carrier	INOX	1027 125 200	1027 151 200	1027 200 200	1027 200 200
9	Diaphragm PN10/16	EPDM	1020 125 150	1020 151 000	1020 200 000	1020 200 000
	Diaphragm PN25	CR	1051 125 150	1051 151 000	--	1034 200 000
10	Pressure disc	INOX	1047 125 150	1047 151 000	1047 200 000	1047 200 000
11	Nut	INOX	0007 720 080	0007 720 080	0007 724 080	0007 724 080
12	Spring	INOX	1049 125 150	1049 151 150	1049 200 000	1049 200 000
	Spring for valves installed upright position	INOX	1050 125 150	1050 151 000	1050 200 000	1050 200 000
13	Spindle guide cover	INOX	1042 900 003	1042 900 003	1042 900 004	1042 900 004
14	Hexagonal screw	INOX	0006 616 035	0006 616 035	0006 620 045	0006 620 045
15	O-ring	NBR	0180 018 020	0180 018 020	0180 021 020	0180 021 020
16	Washer	INOX	0008 216 000	0008 216 000	0008 220 000	0008 220 000
17	GSK-sticker		1099 900 000	1099 900 000	1099 900 000	1099 900 000
18	Maintenance sticker		9691 0xx 000	9691 0xx 000	9691 0xx 000	9691 0xx 000
21	Retaining bracket	INOX	--	--	1200 900 020	1200 900 020
	Main valve complete	PN10/16	1201 125 000	1201 151 000	1201 200 000	1201 200 016
	Main valve complete	PN25	1201 125 025	1201 151 025		1201 200 025
	Repair kit for main valve with stainless steel connection, comprising item 7, 9, 15, 18	PN10/16	1080 125 150	1080 151 000	1080 200 000	1080 200 000
		PN25	1081 125 150	1081 151 000		1081 200 000

° PN10  
^ PN16  
\* not interchangeable  
16.03.2018/plü


### 3.3 Control line and accessories





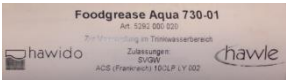
Masternumber Description	Picture	Size more sizes might be available	Art. number
<b>0130</b> Composite sealing ring		stainless steel /NBR 3/8" stainless steel /NBR 1/2" stainless steel /NBR 3/4" steel/NBR 1"	0130 012 000 0130 016 000 0130 025 000 0130 032 000
<b>0273</b> Single component		Fitting attachment (consisting of connecting nut and clamping ring) DN 12 stainless steel	0273 012 000
<b>0275</b> Support sleeve		stainless steel d4 – 6 stainless steel d12 – 9 stainless steel d12 – 10	0275 006 004 0275 012 009 0275 012 010
<b>0283</b> Clamping ring		d6 stainless steel d12 stainless steel d18 stainless steel d8 - 6 stainless steel	0283 006 000 0283 012 000 0283 018 000 0283 008 006
<b>0284</b> Orifice		d12 stainless steel Ø 0.6 mm d12 stainless steel Ø 0.9 mm d12 stainless steel Ø 1.2 mm d12 stainless steel Ø 1.5 mm d12 stainless steel Ø 1.9 mm d12 stainless steel Ø 2.4 mm d12 stainless steel Ø 3.1 mm d18 stainless steel Ø 3.5 mm d18 stainless steel Ø 4.0 mm	0284 006 000 0284 009 000 0284 012 000 0284 015 000 0284 019 000 0284 024 000 0284 031 000 0284 035 010 0284 040 010
<b>0311</b> Male adaptor union		d 12 - 3/8" stainless steel d 12 - 1/2" stainless steel d 6 - 1/8" stainless steel d 6 - 1/4" stainless steel d 6 - 3/8" stainless steel d18 – 1/2" stainless steel	0311 012 012 0311 012 016 0311 006 004 0311 006 008 0311 006 012 0311 018 016
<b>0323</b> Straight union		DN 6 stainless steel DN 12 stainless steel	0323 006 000 0323 012 000
<b>0324</b> Straight screw-on screwed fitting		d12 - 3/8" stainless steel	0324 012 012
<b>0351</b> Reduction union		d6 - d12 stainless steel	0351 012 006
<b>0361</b> Female adaptor		d 10 - 3/8" stainless steel d 12 - 3/8" stainless steel d 12 - 1/2" stainless steel d 18 – 1/2" stainless steel	0361 010 012 0361 012 012 0361 012 016 0361 018 016
<b>0371</b> Male adaptor		DN 12 - 3/8" stainless steel	0371 012 012



<b>0401 Sleeve</b>		3/8" stainless steel 1/2" stainless steel 3/4" stainless steel 1" stainless steel	0401 012 000 0401 016 000 0401 025 000 0401 032 000
<b>0411 Adjustable male adaptor</b>		DN 6 - 1/8" stainless steel DN12 - 3/8" stainless steel	0411 006 004 0411 012 012
<b>0431 Male adaptor elbow union</b>		DN 6 - 1/8" stainless steel DN6 - 1/4" stainless steel DN12 - 3/8" stainless steel DN18 - 1/2" stainless steel	0431 006 004 0431 006 008 0431 012 012 0431 018 016
<b>0431 Male adaptor elbow union with venting</b>		DN12 - 3/8" stainless steel	0431 012 013
<b>0451 Elbow union 90°</b>		DN6 stainless steel DN12 stainless steel DN18 stainless steel	0451 006 000 0451 012 000 0451 018 000
<b>0455 Female adaptor elbow union 90°</b>		IG 3/8" stainless steel IG 1/2" stainless steel IG 3/4" stainless steel IG 1" stainless steel	0455 012 000 0455 016 000 0455 025 000 0455 032 000
<b>0456 Female adaptor elbow union 90°</b>		IG 3/8" - AG 3/8" stainless steel IG 1/2" - AG 1/2" stainless steel IG 3/4" - AG 3/4" stainless steel IG 1" - AG 1" stainless steel	0456 012 000 0456 016 000 0456 025 000 0456 032 000
<b>0461 T-union</b>		d6 stainless steel d12 stainless steel d12 - 6 - 12 stainless steel d18 stainless steel	0461 006 000 0461 012 000 0461 012 006 0461 018 000
<b>0510 Plug</b>		AG 3/8" konisch stainless steel AG 1/2" konisch stainless steel	0510 012 000 0510 016 000
<b>0511 Plug aeration for Hawido</b>		AG 1/2" stainless steel AG 3/4" stainless steel AG 1" stainless steel (hexagon socket)	0511 016 000 0511 025 000 0511 032 001
<b>0520 Hexagonal male adaptor nipple</b>		d 1/8" stainless steel d 1/4" stainless steel d 3/8" stainless steel d 1/2" stainless steel d 3/4" stainless steel	0520 004 000 0520 008 000 0520 012 000 0520 016 000 0520 025 000
<b>0541 Ball valve</b>		DN 3/8" stainless steel DN 1/2" stainless steel DN 3/4" stainless steel	0541 012 001 0541 016 000 0541 016 010

<p><b>0545</b> <b>Y-filter</b></p>		<p>Y-filter stainless steel IG 3/8" Single components: Filter sieve stainless steel Plug complete Seal big for Y-filter O-Ring</p> <p>Y-filter stainless steel 1/2"</p>	<p>0545 112 002</p> <p>0545 900 051 0545 112 010 0545 112 011 0545 112 012</p> <p>0545 116 000</p>
<p><b>0549</b> <b>One-way flow restrictor &amp; Throttle valve</b></p>		<p>Throttle valve DN 3/8" Brass nickel-plated</p> <p>Stainless steel IG 3/8" Typ B d 12 with a long spindle</p>	<p>0549 000 002</p> <p>0549 000 005</p>
<p><b>0570</b> <b>Non-return valve</b></p>		<p>3/8" Brass (max. 40 bar) 1/2" Brass (max. 40 bar)</p>	<p>0570 012 045 0570 016 045</p>
<p><b>0600</b> <b>Manometer</b></p>		<p>AG 3/8" 0 - 6 bar AG 3/8" 0 - 10 bar AG 3/8" 0 - 16 bar AG 3/8" 0 - 25 bar AG 3/8" 0 - 40 bar AG 3/8" 0 - 60 bar</p>	<p>0600 012 006 0600 012 010 0600 012 016 0600 012 025 0600 012 040 0600 012 060</p>
<p><b>0610</b> <b>Solenoid valves</b></p>		<p>Solenoid valve normally open 2/2 way valve (1795/96) <b>122K84</b></p> <p>Solenoid valve normally closed 2/2 way valve (1795/96) <b>E121K04</b></p> <p>Solenoid valve normally open 3/2 way valve (1703 up to DN 100 1603, 1706 PN 16 all diameters) <b>132K04</b></p> <p>Solenoid valve normally closed 3/2 way valve (1704 up to DN 100, 1604) <b>E131K04</b></p> <p>Solenoid valve normally open 2/2 way valve (1704 DN 125 and above 1304, 1404, 1504) (old version: E322 H73 06)</p> <p>Solenoid valve normally closed 2/2 Wegeventil (zu 1703 ab DN 125, 1303, 1403, 1503, 1706 PN 25 ab DN 125) (old version: E321 H13)</p> <p>Magnetventil universel 3/2 way valve (1706 PN 25 up to DN 100)</p> <p>*****</p> <p>Spare part : Diaphragm for solenoid type 0610 510 001 and 0610 510 002</p> <p>Spare parts Kit for solenoid valve type 0610 510 001</p>	<p>0610 122 084</p> <p>0610 121 004</p> <p>0610 132 004</p> <p>0610 131 004</p> <p>0610 510 002</p> <p>0610 510 001</p> <p>0610 133 005</p> <p>*****</p> <p>0610 590 001</p> <p>0610 590 002</p>

<p><b>0620</b> <b>Coil</b></p>		<p>Coil AC voltage Indicate the voltage</p> <p>Coil DC voltage Indicate the voltage</p>	<p>0620 xxx xxx</p> <p>0621 xxx xxx</p>
<p><b>0630</b> <b>Appliance socket for electric coil</b></p>		<p>Appliance socket for electric coil</p>	<p>0630 000 000</p>
<p><b>0652, 0653</b> <b>Plug module Type LBV</b></p>		<p>Plug module for solenoid valves Type LBV 24 DC = 8-14S incl. 2m cable</p> <p>Plug module for solenoid valves Type LBV 24, IP 65 IN: 48-230VAC/DC OUT: 48VDC incl. 2m cable 3-wire</p> <p>For use with 48VDC coils only</p>	<p>0653 024 008</p> <p>0653 230 000</p>
<p><b>0670</b> <b>Hexagonal overcut</b></p>		<p>AG 3/8" IG 1/8" stainless steel AG 3/8" IG 1/4" stainless steel AG 1/2" IG 3/8" stainless steel AG 3/4" IG 3/8" stainless steel AG 1" IG 1/8" stainless steel</p>	<p>0670 012 004 0670 012 008 0670 016 012 0670 025 012 0670 032 012</p>
<p><b>0671</b> <b>Threaded connection</b></p>		<p>AG 3/8" IG 1/2" stainless steel AG 3/4" IG 1" stainless steel</p>	<p>0671 016 012 06710 32 025</p>
<p><b>0680</b> <b>Male adaptor nipple</b></p>		<p>AG 3/8" L = 30 mm stainless steel AG 3/8" L = 40 mm stainless steel AG 3/8" L = 50 mm stainless steel AG 3/8" L = 60 mm stainless steel AG 3/8" L = 70 mm stainless steel AG 3/8" L = 80 mm stainless steel AG 3/8" L = 110 mm stainless steel</p>	<p>0680 012 030 0680 012 040 0680 012 050 0680 012 060 0680 012 070 0680 012 080 0680 012 110</p>
<p><b>0690</b> <b>Male reduction nipple</b></p>		<p>AG 3/8" - 1/8" stainless steel AG 3/8" - 1/4" stainless steel AG 1/2" - 3/8" stainless steel AG 3/4" - 3/8" stainless steel AG 1" - 3/8" stainless steel</p>	<p>0690 012 004 0690 012 008 0690 016 012 0690 025 012 0690 032 012</p>
<p><b>0711</b> <b>T-union</b></p>		<p>IG 3/8" egal stainless steel IG 1/2" egal stainless steel IG 3/4" egal stainless steel IG 1" egal stainless steel</p>	<p>0711 012 000 0711 016 000 0711 025 000 0711 032 000</p>
<p><b>0730</b> <b>Seamless pipe</b></p>		<p>d6 x 1mm stainless steel d12 x 1.5 mm stainless steel d15 x 1.5 mm stainless steel d18 x 1.5 mm stainless steel</p>	<p>0730 006 010 0730 012 015 0730 015 015 0730 018 015</p>
<p><b>1188</b> <b>Rep. Set Control line</b></p>		<p>From serial number 14252 (Januar 2003) DN40 bis 100 DN125 bis 300</p> <p>From serial number 25915 (Juni 2014, Filter Typ B (0545 112 002) DN40 bis 100 DN125 bis 200</p>	<p>1188 065 100 1188 125 300</p> <p>1188 000 000 1188 000 001</p>
<p><b>SA.0</b> <b>PA-tube</b></p>		<p>Tube AD 6 mm, ID 4 mm Tube AD 12 mm, ID 9 mm</p>	<p>SA.0 000 060 SA.0 000 290</p>

<b>Tools and accessories</b>			
<b>1199</b> <b>Spindel stroke</b> <b>tester</b>		M5 M6	1199 000 000 1199 000 010
<b>1199</b> <b>Tool for seal holder</b>		Key for assembling the seal holder of the pilot valve	1199 000 020
<b>1199</b> <b>Ratchet with</b> <b>attachment</b>		Ratchet with attachment for the one way flow restrictor	1199 000 030
<b>1199</b> <b>Ratchet with</b> <b>attachment.</b>		Ratchet with attachment for the one way flow restrictor	1199 000 040
<b>5292</b> <b>Grease</b>		Foodgrease Aqua Tube à 175g	5292 000 020

AG: Outside thread  
IG: Inside thread

AD: Outside diameter  
ID: Inside diameter

02.02.2018/plü

## E. Annex

### 1. Torque table

When assembling the main valve and the pilot valve, all bolts are checked with a torque wrench according to the following list. Grease the bolts before mounting !

	Diameter DN	Hexagon bolt M	Strenght class 1)	Tightening torque	
				Reference	Max. 2)
<b>Main valve</b>	40 - 50	M 8	A4 / 80	22 Nm	25 Nm
	65 - 80	M 10		47 Nm	50 Nm
	100	M 12		84 Nm	87 Nm
	125 - 150	M 16		172 Nm	216 Nm
	200	M 20		285 Nm	423 Nm
	250	M 20		285 Nm	423 Nm
	300	M 20		380 Nm	423 Nm

	Typ	Hexagon Socket bolt	Strenght class 1)	Tightening torque	
				Reference	Max.
<b>Pilot valve</b>	DRV / DAV	M 6	A2 / A4 / 70	8 Nm	8,5 Nm
	MBV / RBS				
	Control valve	Hexagon bolt M	Strenght class 1)	Reference	Max.
	NAZ	M 6	A2 / A4 / 70	8 Nm	8,5 Nm

*(Torque for bolts with term in head A2)*

	Diameter DN	Hexagon bolt M	Strenght class 1)	Tightening torque	
				Reference	Max.
<b>Main valve</b>	40 - 50	M 8	A2 / 70	17 Nm	19 Nm
	65	M 10		33 Nm	36 Nm
	80	M 10		40 Nm	40 Nm
	100	M 12		70 Nm	72 Nm
	125 - 150	M 16		172 Nm	172 Nm
	200	M 20		280 Nm	285 Nm
	250	M 20		280 Nm	285 Nm
	300	M 20		235 Nm	240 Nm

Note: 1) = Term on bolt head A2 – 70 or A4 – 80!

2) = Maximum permissible torque according strength analysis

Bolts according SN EN ISO 4014 und SN EN ISO 4017

Stand: FO 0065, Rev. 12 / 19.12.2017

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