

Operating instructions

- Translation of the original -

Straight-way ball cock

Types 402x, 412x, 422x



English **GBR**



Guth Ventiltechnik GmbH

Horstring 16
D - 76829 Landau

☎ +49 (0) 6341 5105-0 ♦ Fax: +49 (0) 6341 5105-85
www.guth-vt.de ♦ sales@guthventiltechnik.de

List of contents

1.	General information	3
1.1	Information for your safety	3
1.2	Marking of security instructions in the operating manual	3
1.3	Designated use	3
1.4	Personnel	3
1.5	Modifications, spare parts, accessories	3
1.6	General instructions	3
2.	Safety instructions	4
2.1	Intended use	4
2.2	General safety instructions	4
2.3	General notes	4
3.	Delivery, Transport and Storage	5
3.1	Delivery	5
3.2	Transport	5
3.3	Storage	5
4.	Function and operation	6
4.1	Description of function	6
4.2	Control system and feedback unit	6
4.3	Installation instructions	7
4.4	Welding guidelines	7
4.5	Service and maintenance	7
4.6	Cleaning	7
4.7	ATEX-guidelines	8
4.8	Technical data	8
5.	Disassembly / Assembly	9
5.1	Disassembly	9
5.2	Assembly	9
6.	Drawing and Dimensions	10
7.	Dimensions	11
8.	Wearing parts kit	12
9.	Manufacturing	13
10.	Classification	14
10.1	Structure of Order Number	14
11.	Declaration of incorporation	15

1. General information

1.1 Information for your safety

We are pleased that you have decided for a high-class Guth product. With correct application and adequate maintenance, our products provide long time and reliable operation.






Before installation and initiation, please carefully read this instruction manual and the security advices contained in it. This guarantees reliable and safe operation of this product and your plant respectively. Please note that an incorrect application of the process components may lead to great material damages and personal injury.

In case of damages caused by non observance of this instruction manual, incorrect initiation, handling or external interference, guarantee and warranty will lapse!

Our products are produced, mounted and tested with high diligence. However, if there is still a reason for complaint, we will naturally try to give you entire satisfaction within the scope of our warranty. We will be at your disposal also after expiration of the warranty. In addition, you will also find all necessary instructions and spare part data for maintenance in this instruction manual. If you don't want to carry out the maintenance by yourself, our Guth service team will naturally be at your disposal.

1.2 Marking of security instructions in the operating manual

Hints are available in the chapter "safety instructions" or directly before the respective operation instruction. The hints are highlighted with a danger symbol and a signal word. Texts beside these symbols have to be read and adhered to by all means. Please continue with the text and with the handling at the valve only afterwards.

Symbol	Signal word	Meaning
	DANGER	Imminent danger which <u>will result</u> severe personal injury or death.
	WARNING	Imminent danger which <u>may result</u> severe personal injury or death.
	CAUTION	Dangerous situation which may cause slight personal injury or material damages.
	ATTENTION	An harmful situation which may result in damages of the product itself or of adjacent vicinity.
	NOTICE	Marks application hints and other information which is particularly useful.

1.3 Designated use

The fitting is designed exclusively for the purposes described below. Using the fitting for purposes other than those mentioned is considered contrary to its designated use. Guth cannot be held liable for any damage resulting from such use. The risk of such misuse lies entirely with the user. The prerequisite for the reliable and safe operation of the fitting is proper transportation and storage as well as competent installation and assembly.

Operating the fitting within the limits of its designated use also involves observing the operating, inspection and maintenance instructions.

1.4 Personnel

Personnel entrusted with the operation and maintenance of the tank safety system must have the suitable qualification to carry out their tasks. They must be informed about possible dangers and must understand and observe the safety instructions given in the relevant manual. Only allow qualified personnel to make electrical connections.

1.5 Modifications, spare parts, accessories

Unauthorized modifications, additions or conversions which affect the safety of the fitting are not permitted. Safety devices must not be bypassed, removed or made inactive. Only use original spare parts and accessories recommended by the manufacturer.

1.6 General instructions

The user is obliged to operate the fitting only when it is in good working order. In addition to the instructions given in the operating manual, please observe the relevant accident prevention regulations, generally accepted safety regulations, regulations effective in the country of installation, working and safety instructions effective in the user's plant.

2. Safety instructions

2.1 Intended use

The straight-way ball cock can be used as multiple way valve in the drinks and food industry, the pharmaceuticals and chemical industry and the bio-technology sector.

2.2 General safety instructions



ATTENTION

- To avoid danger and damage, the fitting must be used in accordance with the safety instructions and technical data contained in the operating instructions.



WARNING

- Danger of crushing or amputating limbs.
Do not reach into the valve housing when in pneumatic mode.
- Dismantling the valve or valve assemblies from the plant can cause injuries from fluids or gases flowing out.
Dismantle the valve or valve assembly only when the plant has been rendered pressure-less and free of liquid and gas.
- Liquids flowing through the rinsing connections are to be drained off without splashing into a discharge arrangement.

For valves or plants/installations that are operated in a ATEX area, must be considered the valid ATEX Guidelines EG and the Installation instructions (Fig. 4 . 7 /page 8).



CAUTION

- To avoid air leaking, only use pneumatic connection parts that have an O-ring seal facing the even surface.
- Before starting the system, the entire pipeline system must be thoroughly cleaned.
- Steps should be taken to ensure that no external forces are exerted on the fitting.

2.3 General notes



NOTICE

- All data are in line with the current state of development. Subject to change as a result of technical progress.

3. Delivery, Transport and Storage

3.1 Delivery

- Immediately after receipt check the delivery for completeness and transport damages.
- Remove the packaging from the product.
- Retain packaging material, or expose of according to local regulations.

3.2 Transport



CAUTION

During the transport the

- generally acknowledged rules of technology,
 - the national accident prevention regulations
 - and company internal work and safety regulations
- must be observed.

3.3 Storage



ATTENTION

- Damage to the product due to improper storage!
 - Observe storage instructions.
 - avoid a prolonged storage.



NOTICE

- Guth recommend regularly checking the product and the prevailing storage conditions during long storage times.
 - The following points must be observed, to ensure the optimum function of the sealing elements, bearings and electronic components.
-
- To avoid damage to seals and bearings,
 - products up to DN 125 / OD 5 inch should be stored horizontally for maximum 6 months.
 - products larger than DN 125 / 5 inch, should be stored in the upright position with the actuator on top.
 - Don't store any objects on the products.
 - Protect the products for wetness, dust and dirt.
 - The product should be stored in a dry and well ventilated room at a constant temperature. (optimal indoor temperature: 25°C ±5°; indoor humidity data 70% ±5%)
 - Protect seals, bearings and plastic parts for UV light and ozone. Pack them in black plastic bags. We recommend using polyethylene packaging (minimum thickness of 0.075 mm). Don't use PVC.

4. Function and operation

4.1 Description of function

► General description of function

Straight-way ball cocks are used as a piggable shut-off valve. The valve is opened and closed by a rotatory motion of 90°.

► Functional description for valves - pneum. operation

The valve opens and closes by way of a pneum. multiturn actuator with a rotary movement of 90°.

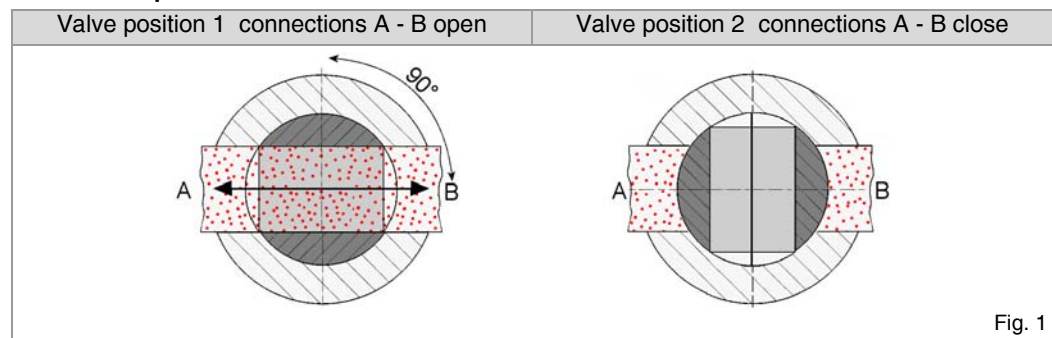
- air open - spring close (lö-fs)
 - pneum. ENGAGED ⇒ opens the valve
 - not pneum. ENGAGED ⇒ spring force closes the valve
- spring open - air close (fö-ls)
 - pneum. ENGAGED ⇒ closes the valve
 - not pneum. ENGAGED ⇒ spring force opens the valve
- air open - air close (lö-ls)
 - pneum. ENGAGED ⇒ the valve opens or closes according to control

► Functional description for valves - manual operation

The desired valve position can be positioned by a rotary movement by means of hand strength in a swivelling angle of 90°.

Before operation, unlock the final position lock by lifting the notch lever against the hand lever. By letting go of the notch lever in the respective final position the spring-loaded notch lever will latch back by itself to the final position lock. The position of the hand lever indicates whether the valve is opened or closed. It will be opened, if the valve points in the direction of the pipe axle – it will be closed, if the valve is positioned crosswise to the pipe axle. The possible assembly-line ways in dependence of the stop functions linked with it are shown in the Fig. 1 /page 6 as valve positions.

► Valve positions



4.2 Control system and feedback unit

► Retrofitting for limit position feed-back

By replacing the hand lever and the catch disc the valve can be retrofitted for limit position feedback (proximity switch).

► Conversion to pneumatic actuation

By a simple retrofitting operation the valve can be converted to pneumatic actuation. The rotary actuator for this purpose is supplied complete with fitting device. The following actuators are available, depending on the desired actuating function:

Nominal diameter	Actuator	air open - air close	air open - spring close
DN25 - DN80 DN1" - DN3"	PDA90/100	4100 080 100-022	4200 080 100-022
DN100 / 4"	PDA90/125	4100 100 125-022	4200 100 125-022

➤ Position control and position indication

The actuator is equipped with a proximity switch holding device and a position indication. When inductive proximity initiators M 12x1 are installed, the current "Open" or "Shut" position can be interrogated. By screwing the proximity initiator to the limit position the required switching gap for the signal transmission is established. When the valve is closed the position indication is oriented vertically to the direction of valve passage. When the valve is open it is oriented parallel to the valve passage.

➤ Control system - Control head

Optionally, modular valve control systems can be installed to the actuator for reading and actuating valve positions. The standard version is a closed system with twofold limit position messaging (standard), with SPS, Interbus or ASI bus switch-on electronics, and integrated 3/2-way solenoid valves. For tough operating conditions we recommend employing a stainless steel hood.

4.3 Installation instructions

The installation position for ball cocks without rinsing connections is any. Valve with rinsing connections must always be installed vertically to ensure that outflow of cleaning medium from the valve is such that no residue will remain inside the valve.

External forces due to the installation must always be avoided.

Generally, in order to mount and dismount fittings with two weld connections, you should provide a detachable connection.



ATTENTION

- Impurities can cause damage to the seals and seals area. Clean inside areas prior to assembly.
- To avoid a distortion of the components, all welding parts must be welded to stress-relieved.

4.4 Welding guidelines

Sealing elements integrated in weld components must generally be removed prior to welding.

To prevent damage, welding should be undertaken by certified personnel (EN ISO 9606-1). Use the TIG (Tungsten Inert Gas) welding process.

4.5 Service and maintenance

➤ Service

The maintenance intervals depend on the operating conditions "temperature, temperature-intervals, medium, cleaning medium, pressure and opening frequency". We recommend replacing the seals every 2 years. The user, however should establish appropriate maintenance intervals according to the condition of the seals.

Lift actuator

The actuator is maintenance-free and non-removable.



NOTICE

EPDM; Viton; k-flex; NBR; HNBR ⇒
Silicone ⇒
Thread ⇒

Lubricant recommendation

Klüber Paraliq GTE703*
Klüber Sintheso pro AA2*
Interflon Food Grease*

**) It is only permitted to use approved lubricants, if the respective fitting is used for the production of food or drink. Please observe the relevant safety data sheets of the manufacturers of lubricants.*

4.6 Cleaning

In order to ensure continuous hygienic conditions during operation, the surfaces between the valve body and the ball must be cleaned.

Open and close the valve several times from the open position. With an angle of rotation of $\geq 20^\circ$, cleaning fluid flows into the area between the ball and casing. A time-dependent actuation in the angle of rotation range 20° - 45° makes the cleaning process more efficient. The duration and the number of actuations should be adjusted according to the type of dirtying and the degree of dirtying.

4.7 ATEX-guidelines

For valves or plants/installations that are operated in the ATEX area, sufficient bonding (grounding) must be ensured (see valid ATEX Guidelines EG).

4.8 Technical data

Valve size:	DIN: DN 25 - DN 100 INCH: DN1" - DN4"
Connections:	<ul style="list-style-type: none">• Welding end DIN11850 (S)• Male part DIN11851 (G)• Flange connection (FI)• Clamp connection (CI)• Liner/nut DIN11851 (K/M)
Temperature range:	<ul style="list-style-type: none">• Ambient temperature: +4° to +45°C• Product temperature: +0° to +95°C medium dependent• Sterilization temperature:<ul style="list-style-type: none">- EPDM +140°C (SIP 30 min)- PTFE +130°C (SIP 30 min)- NBR +110°C (SIP 30 min)- VITON +140°C (SIP 30 min)
Pressure range:	Operation pressure: <ul style="list-style-type: none">• 16 bar Cleaning pressure: <ul style="list-style-type: none">• max. 3 bar
Leakage rate:	A (DIN EN 12268-1)
Control air: <i>(only pneum. operation valves)</i>	Control air pressure: <ul style="list-style-type: none">• 5,5 - 8,0 bar Quality of control air: <ul style="list-style-type: none">• ISO 8573-1 : 2001 quality class 3
Material product contact: <i>(according the valve type)</i>	Stainless steel: 1.4301 / AISI304 1.4404 / AISI316L Surfaces: Ra < 0,8µm e-polished Material of seals: EPDM / PTFE NBR / PTFE VITON / PTFE

5. Disassembly / Assembly

5.1 Disassembly



NOTICE

- When exchanging the seals, the ball cock itself has to be disassembled out of the system. It is imperative to observe the applicable safety information.
- Unscrew and remove control air and electrical lines, rinsing lines, heating lines, complete sensor mounting or control head.

- Dismount the ball cock out of the system.

➤ Replacing the casing seals (12), (13), (14)

- Unscrew the flange (2).
- Dismantle the O-rings (13), (14) and thrust collar (12).
- Put the ball cock in the closed position and remove the ball (3) out of the housing (1).

➤ Ball valve - manual operation

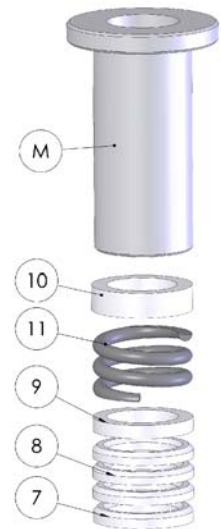
Replacing the sealing package (6) - (10)

- Unscrew the screw (18) and remove the hand lever (19).
- Unscrew the screw (16) and remove the locking disc (5).
- Remove the plain bearing (10) and the pressure spring (11) from the axis (4).
- Dismantle the axis (4) with sliding ring (6) out of the housing (1) downwards.
- Take the sealing package (7/8/9) out of the housing (1).

➤ Ball valve - pneum. operation

Replacing the sealing package (6) - (10)

- Unscrew the screws (20) and remove the pneum. actuator (24) with the square boss (23).
- Unscrew the screws (22) and remove the angle bracket (21).
- Remove the plain bearing (10) and the pressure spring (11) from the axis (4).
- Dismantle the axis (4) with sliding ring (6) out of the housing (1) downwards.
- Take the sealing package (7/8/9) out of the housing (1).



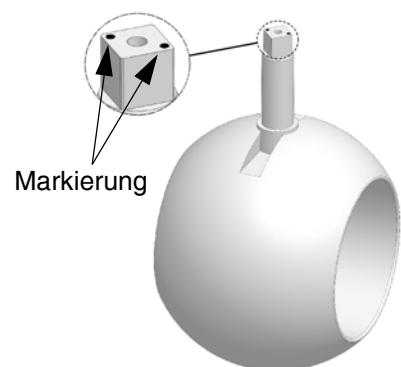
5.2 Assembly

- Thoroughly clean and slightly lubricate mounting areas and running surfaces. (see "Service and maintenance" on page 7)
- Assemble in reverse order.



NOTICE

- Mount the sealing package (7/8/9) in the sequence shown under view (Detail on the right top). Push the bearing ring (7), the V-rings (8) (3x) and the thrust collar (9) with the mounting sleeve (M) into the limit stop.
- When mounting the ball (3) and the axis (4), regard for exact match from the marks on the axis (4) and the position of the ball (3) (see fig. on the right). The mark points on the switch axis correspond to the respective ball openings.
- Mount the hand lever or the pneumatic actuator according of the valve functions.



6. Drawing and Dimensions

- Example: ball cock with welding ends (S-S)

- 1 = Housing
 - 2 = Flange
 - Welding end (S)
 - Male part (G)
 - Flange connection (FI)
 - Clamp (Cl)
 - Liner/Nut (K/M)
 - 3 = Ball
 - 4 = Axle
 - 5 = Locking disc
 - 6 = Sliding ring
 - 7 = Bearing ring
 - 8 = V-Ring package
 - 9 = Thrust collar
 - 10 = Plain bearing
 - 11 = Pressure spring
 - 12 = a) Thrust collar
b) Cavity packing
 - 13 = O-Ring
 - 14 = O-Ring
 - 15 = Straight pin
 - 16 = Screw DIN912
 - 17 = Screw DIN912
 - 18 = a) Saucer head screw
b) Screw DIN912
 - 19 = Hand lever
 - a) GFK
 - b) Stainless steel
 - 20 = Screw DIN912
 - 21 = Flange
 - 22 = Screw DIN912
 - 23 = Square boss
 - 24 = pneum. Actuator
-
- M = Mounting sleeve
 - S = Control head
 - R = Sensor mounting
 - R1 = Dog
 - R2 = Position indication
 - R3 = O-Ring
 - R4 = Screw
 - R5 = Sensor receiver
 - R6 = Cap
 - R7 = Screw

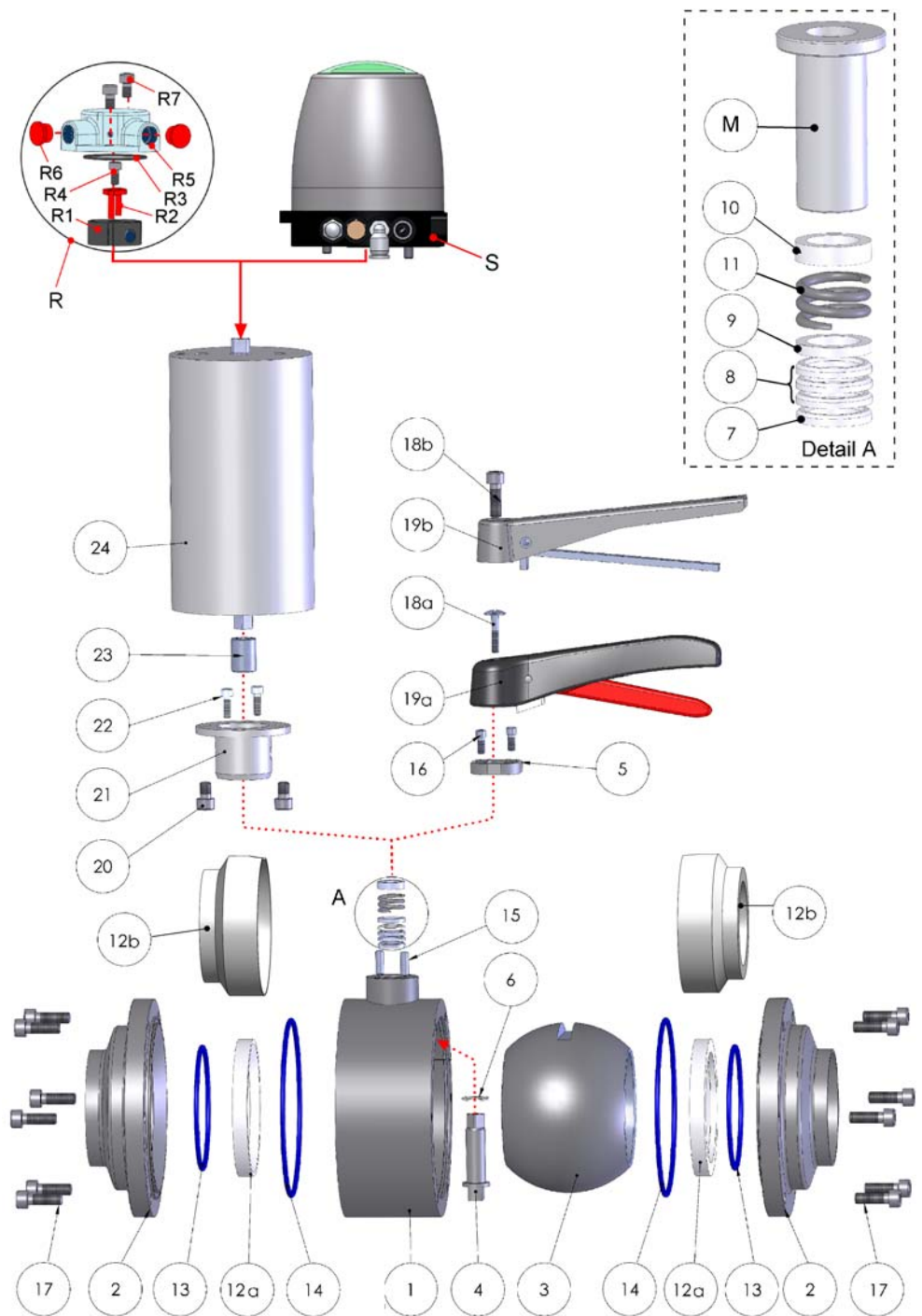
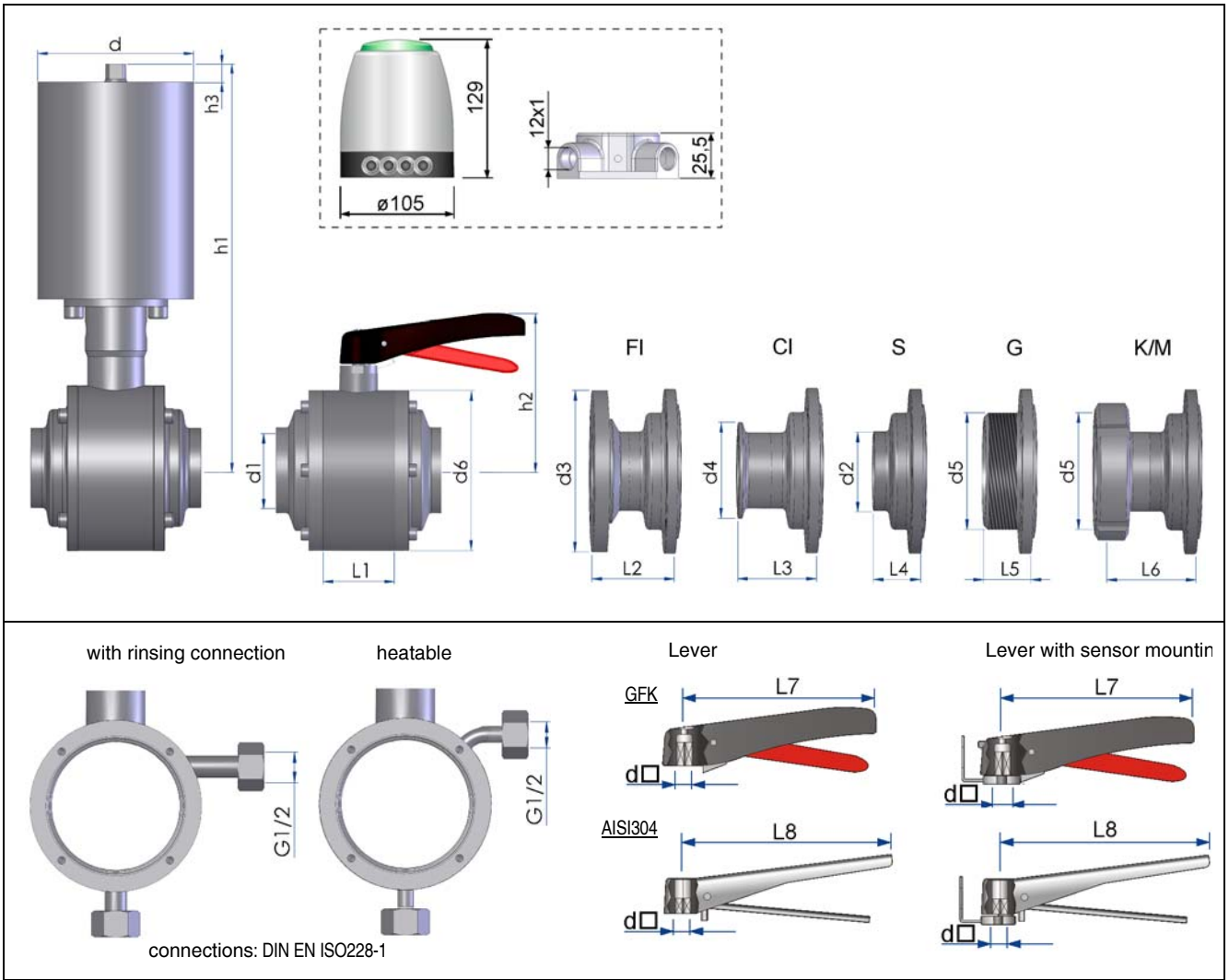


Fig. 2

7. Dimensions



DN	d	d1	d2	d3	d4	d5	d6	d□	h1	h2	h3	L1	L2	L3	L4	L5	L6	L7	L8
25 1"	104	26 22,1	29	80	50,5	Rd52x1/6	74	10	307	117	13	34	53,5	51	29,5	29,5	51,5	165	180
32 -	104	32 -	35	86	50,5	Rd58x1/6	85	10	311	121	13	38	55,5	53	31,5	31,5	56,5	165	180
40 1½"	104	38 34,8	41	92	50,5	Rd65x1/6	95	10	315	125	13	40	55,5	53	31,5	31,5	57,5	165	180
50 2"	104	50 47,5	53	108	64	Rd78x1/6	110	10	324	134	13	50	55,5	53	31,5	31,5	59,5	165	180
65 2½"	104	66 60,2	70	130	91	Rd95x1/6	130	10	335	145	13	56	58,5	62,5	34,5	34,5	66,5	165	180
80 3"	104	81 72,1	85	146	106	Rd110x1/4	159	14	346	156	13	70	70,5	74,5	46,5	46,5	83,5	-	285
100 4"	129	100 97,6	104	166	119	Rd130x1/4	195	14	412	206	20	100	84	88	60	50	104	-	285

8. Wearing parts kit

► Wearing parts kit Pos. (6)-(10), (12), (13), (14), (M)

DN	NBR/PTFE	EPDM/PTFE	VITON/PTFE
25 - 100 / 1" - 4"	4084 DN 000-055	4084 DN 000-000	4084 DN 000-051

incl: - Seal kit product contacted Pos. (12)-(14)
 - Seal kit switch shaft Pos. (6)-(10), (M)
 - Mounting sleeve (M)

► Seal kit - product contacted Pos. (12), (13), (14)

DN	NBR/PTFE	EPDM/PTFE	VITON/PTFE
25 - 100 / 1" - 4"	4084 DN 010-055	4084 DN 010-000	4084 DN 010-051

- Seal kit product contacted Pos. (12),(13), (14)

► Seal kit switch shaft Pos. (6)-(10), (M)

DN	
25 - 80 / 1" - 3½"	4084 080 020-000
100 / 4"	4084 100 020-000

- Seal kit switch shaft Pos. (12) - (10), (M)

► Mounting sleeve Pos. (M)

DN	
25 - 80 / 1" - 3½"	4084 080 021-057
100 / 4"	4084 100 021-057

- Mounting sleeve (M)

*) DN = Diameter nominal e.g. 4084 050 000-055

► Spare parts list

Pos.	Designation		Material
1	Housing		1.4301 / 1.4404
2	Flange with connection	- Welding end (S) - Male part (G) - Small flange (Fl) - Clamp (Cl) - Liner/nut (K/M)	1.4301 / 1.4404
3	Ball		1.4301 / 1.4404
4	Axis		1.4301 / 1.4404
5	Locking disc		1.4308
6	Sliding ring		PTFE
7	Bearing ring		PTFE
8	V-Ring package		PTFE
9	Thrust collar		PTFE
10	Plain bearing		PTFE
11	Pressure spring		1.4310
12	a) Thrust collar b) Cavity packing		PTFE PTFE
13	O-Ring		NBR, EPDM, VITON
14	O-Ring		NBR, EPDM, VITON
15	Straight pin DIN7		1.4301
16	Socket screw		1.4301
17	Socket screw		1.4301
18	a) Saucer head screw b) Socket screw		1.4301 1.4301
19	Lever a) GFK b) Stainless steel		a) GFK b) 1.4301
20	Screw DIN912		1.4301
21	Angle bracket		1.4301
22	Screw DIN912		1.4301
23	Square boss		1.4301
24	Actuator	- air open / spring close - air open / aiar close	-----

9. Manufacturing

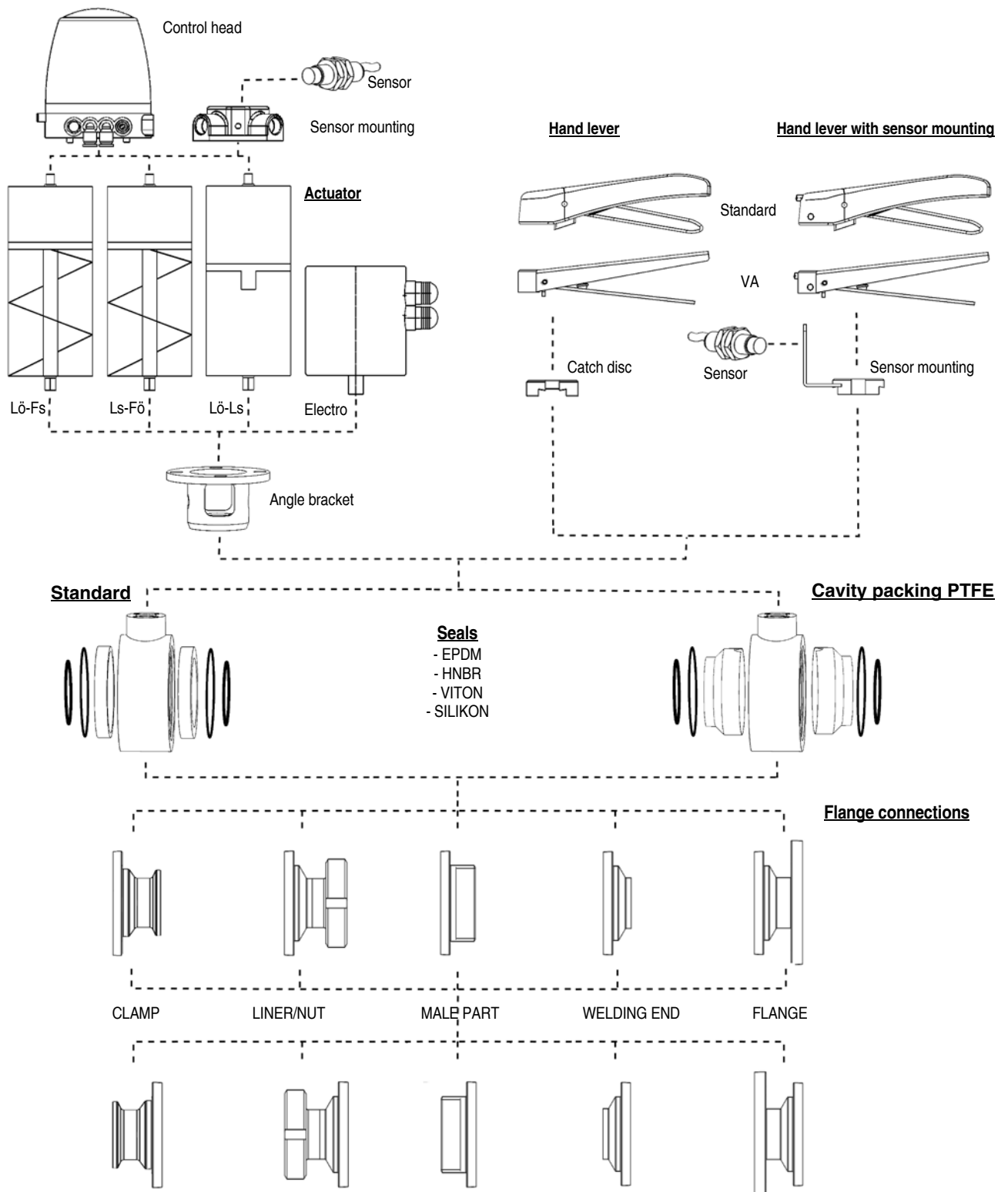
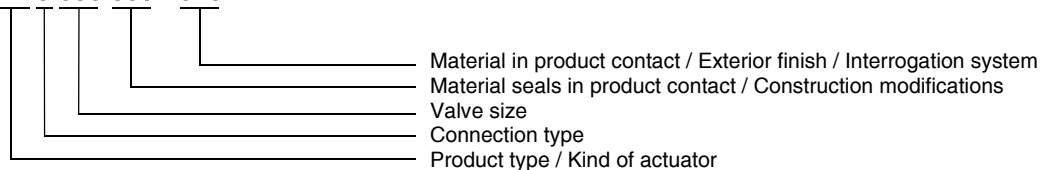


Fig. 3

10. Classification

10.1 Structure of Order Number

4225 050 000 - 040



➤ Product type

- e.g. Type 4225 - Straight way ball cock pneumatic operation, air open - spring close
 Kind of actuator - Type 412x Air / Air
 - Type 422x Air / Spring

➤ Connection type

welding end / welding end

➤ Valve size

DN = Nominal diameter

DIN	025 = DN25	032 = DN32	040 = DN40	050 = DN50	065 = DN65	080 = DN80	100 = DN100
INCH	026 = DN1	-	038 = DN1½	051 = DN2	064 = DN2½	076 = DN3	101 = DN4

➤ Material seal / Construction modifications

Material seals in product contact: - EPDM
 - NBR
 - Viton

Construction modifications: Kind of actuator - Cavity fillers
 - heatable
 - Rinsing connection

➤ Material in product contact / Exterior finish

020 - 1.4301 / AISI304 - bright turned	040 - 1.4404 / AISI316L - bright turned
021 - 1.4301 / AISI304 - E-polished	041 - 1.4404 / AISI316L - E-polished
022 - 1.4301 / AISI304 - unpolished, glass-bead blasted	042 - 1.4404 / AISI316L - unpolished, glass-bead blasted

➤ Interrogation system

Article number	Control System or Interrogation System (A1, A2)
4xxx DN xxx - 041	Valve without Control- or Interrogation System
4xxx DN xxx - 6xx	Control head ASI-Bus for rotary valves
4xxx DN xxx - K6xx	Control head KI-Top ASI-Bus for rotary valves
4xxx DN xxx - 5xx	Control head SPS for rotary valves
4xxx DN xxx - K5xx	Control head KI-Top SPS for rotary valves

DN - nominal diameter e.g. 4225 050 000-040

CE Declaration of incorporation

Translation of the original

Manufacturer / authorised representative:

Guth Ventiltechnik GmbH
Horstring 16
76829 Landau
Germany

Authorised representative,
for compiling technical documents:

Achim Kauselmann
Documentation / Development
KIESELMANN GmbH

Product

pneum. Lift actuators
pneum. Rotary actuators
Ball valves
Butterfly valves
Single seat valves
Flow control valves
Throttle valve
Overflow valve
Double seat valve
Bellow valves
Sampling valves
Two way valves
Tankdome fitting
Safety valve

Function

Stroke movement
Rotary movement
Media cutoff
Media cutoff
Media cutoff
Control of liquefied media
Control of liquefied media
Definition of fluid pressure
Media separation
Sampling of liquids
Sampling of liquids
Media cutoff
Prevention of overpressure and vacuum, Tank cleaning
Prevention of overpressure

The manufacturer hereby states that the above product is considered as an incomplete machine in the sense defined in the Directive 2006/42/EC on Machinery. The above product is exclusively intended to be installed into a machine or an incomplete machine. The said product does not yet conform to all the relevant requirements defined in the Directive on Machinery referred to above for this reason.

The specific technical documents listed in Appendix VII, Part B, have been prepared. The Authorized Agent empowered to compile technical documents may submit the relevant documents if such a request has been properly justified.

Commissioning of an incomplete machine must not only be carried out if it has been determined that the respective machine into which the incomplete machine is to be installed conforms to the regulations set out in the Directive on Machinery referred to above.

The above product conforms to the requirements of the directives and harmonized standards specified below:

- Directive 2014/68/EU
- DIN EN ISO 12100 Safety of machinery

Landau, 22. 09. 2016



Oliver Hecker
Geschäftsführer