

Product Recovery Technology



Member of NEUMO-Ehrenberg-Group

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* An asterisk in the pricing column means: available on request.

Pigging systems with a difference!

Customers associate AWH's products with being innovative, modern and cost-effective. To AWH, optimum quality is not a question of price.

AWH is not engaged in plant construction. This allows our partners, namely plant manufacturers, to discuss their projects openly with AWH at any time.

The experience gained by AWH in the use of pig products is channelled directly into their further development.

As a partner you can rely on us.

This quality is naturally also evident in pigging products that are required at short notice.

Achieving success together in our respective areas of expertise!

IMPORTANT:

Optimum results from pigging systems are achieved with a pig speed of less than 1.5 m/s. AWH drive controllers are used to ensure this maximum pig speed is maintained. For this reason, the expensive, thick-walled pipes and formed parts according to pig standard DIN 2430-1/-2/-3 are not necessary.

A significant advantage: reduced project costs

The use of pipes according to DIN EN 10357 series 2 and/or DIN 11866 together with the corresponding formed parts reduces project costs significantly.

Pig Selection

Pig type suitable for:	Tangent pig	Lip pig
Liquid products	x	x
Organic foods	x	x
Abrasive products		x
Dry run		x
Hygienic procedures	x	x
Sterilisation with steam		x
Procedure without transfer of flavours		x
One-way operation	x	x
Shuttle operation	x	x
Magnetic location	x	x
Pipes according to DIN EN 10357	x	x
Hoses	x	x
Bends standard 2d	x	
Bends standard 3d	x	
Bends standard 5d	x	x
T-outlets not reduced	x	
T-outlets reduced	x	x
Low cost operations	x	

Technology

Pigging is a displacement technology that is used for completely emptying pipelines.

The pig is a displacer that fits the pipe accurately. It travels through the pipe and pushes the content in front of it.

The pig is driven with external power. The drive medium can be a gas (compressed air, nitrogen, etc.), a liquid (water, solvent, etc.) or a secondary product.

In an open pigging system the pig is inserted at the sending station and removed at the receiving station.

In an enclosed pigging system the pig oscillates backwards and forwards between the sending station and the receiving station, without being removed. It is only exchanged when it is worn.

One pig or several pigs may be used in a system depending on the selected procedure.

Areas of application

All pumpable media is piggable. This media can be gaseous, highly fluid, viscous, papescient or pasty.

The pigging system supports the batch production of products.

Its main tasks include:

- emptying of pipelines without any product loss (single pig or multi-pig operation)
- complete emptying of pipe bags and ascending pipelines (single pig operation)
- return of the product to the storage tank when filling stops (dual pig operation)
- extensive pre-cleaning for CIP / SIP systems (single or multi-pig operation)
- degassing or venting of pipelines (dual pig operation)
- bubble- and foam-free filling from falling pipelines (dual pig operation)
- dosing of small quantities (dual pig operation)
- disinfection, dissolving or flushing without flooding the entire pipeline (dual pig/tandem operation)
- separation of products without mixed zones for successive batches (multi-pig operation)
- cleaning of the pipe's inner wall (single pig operation)

Advantages

The use of pigging systems offers operational and plant-specific advantages:

- almost 100% of the pipe's content can be used
- emptying and filling of a sequence of products without mixed zones
- emptying and filling of products without contact with gas
- no "overgrowth" of pipelines
- mechanical pipe cleaning
- pipe cleaning without disassembly
- significantly reduced flushing requirements
- less wastewater produced thanks to reduced flushing requirements
- rapid changeover to new products
- use of a single pipeline for numerous products
- free selection of pipes
- no trace heating required

Pipes, full Passage

The pig is an elastic, solid body with low adaptability. The piggable pipeline must therefore exhibit the same circular cross section throughout. Reductions are not permitted.

AWH tolerance for the inner diameter: ± 0.5 % of the nominal diameter

AWH tolerance for the ovality of the pipe: ± 0.5 % of the nominal diameter

Pipe standards

We recommend longitudinally welded pipes with seam smoothing according to DIN EN 10357, series 2 with internal roughness $R_a < 0.8 \mu\text{m}$ on the longitudinal seam $R_a < 1.6 \mu\text{m}$.

Also suitable are pipes according to DIN 2430.

Pipe wall thickness

The pipe wall thicknesses according to DIN EN 10357, series 2 are sufficiently dimensioned for a limitation of the pig speed to 1.5 m/s.

At higher speeds there is a risk of damage to the plant and plant components.

Pipe connectors and centring

Pig pipes are to be installed without an offset.

All of the components must be centred to each other. This particularly applies to pipe connections.

AWH tolerance for the offset: ± 0.2 mm

The following are recommended: Screw connections or flange couplings according to DIN 11864 and DIN 2430.

Clamp connections according to DIN 32676 or pipe screw connections according to DIN 11851 can be used for auxiliary pipelines, but not pigged pipelines.

Pipe bends

There are limits of the bending radius by passing through a bend.

It depends on the shape and material of the pig.

AWH tangent pig:

minimum bending radius $R_{\text{min}} = 1.5 \times \text{pipe diameter (type 3)}$

This asymmetric pig features a spherical segment that seals the pipe securely in the bend.

AWH lip pig:

minimum bending radius $R_{\text{min}} = 2.5 \times \text{pipe diameter (type 5)}$

Flexible lips on this pig are deformed in the bend.

The following is generally recommended:

Pipe bends type 5 with side extension

Bending radius: $R = 2.5 \times \text{pipe diameter}$

Inner roughness: $R_a < 0.8 \mu\text{m}$

Tolerable ovality: max. ± 0.5 % of the nominal diameter

T-branches

Pigs with at least 2 sealing lips run over T-branches. The distance between the lips must be greater than the diameter of the branch, otherwise the drive medium will pass over the pig and to the front.

A longitudinal guide on the branch prevents the pig from falling into a “hole” when travelling.

AWH tangent pig: Branch NS = pipe NS

AWH lip pig: Branch NS = one NS smaller than the pipe NS

Pipeline length

The length of the pig pipeline is not restricted.

Hoses

Hoses are piggable with AWH pigs if they:

- have the same inner diameter as the pipe
- are seamlessly linked

AWH supplies ready-made piggable hoses.

Sterilisation with steam

The pig elastomer and the locating magnet used must be able to withstand the sterilisation temperature of 125°C.

The AWH lip pigs can be damped in-line.

Welding

“Orbital” welded joints

To be used where possible!

Required for pigging systems that work with gaseous drive media.

Welded joints by hand:

- weld I-seam without gaps; without wire feed if possible
- WIG welding with lower current rating
- use argon as an inert gas and as a forming gas
- form with argon when crimping the piping; permissible weld sag: max. 0.5 mm

Brackets

During the pigging process the pipe is subjected to vibrations.

The brackets must therefore be mounted with fixed points and slides.

Leakage

Pigs are tight-fitting and squeeze through the pipe. They seal off the pipe securely on a straight stretch. Leakage can be caused when travelling around a bend depending on the shape of the pig. The tangent pig from AWH features a spherical segment that seals off the pipe reliably at a bend.

Service life

The friction that develops between the pig and the pipe wall results in gradual wear. This depends on the operating conditions and the “lubricating properties” of the product. When operated properly and used with non-lubricating media, AWH pigs will run for at least 200 km. When used with lubricating media the service life of the pigs can be increased significantly.

Safety

When used properly and in compliance with the operating and safety regulations, AWH pigs and fittings are safe for piggable pipelines. The pig fittings should only be installed in designated systems and used by qualified, specialist personnel.

In piggable pipelines:

- there should not be any open ends from which the pig can be freely extracted
- the pig can only be manipulated in a pressure-compensated state
- the necessary technical provisions for pig location and safeguarding in end positions are to be implemented
- manual intervention into the piping system and fittings must be prevented in the operating mode through the use of appropriate measures

Pig speed

Pigging is a pure shutdown procedure. The speed with which a pig displaces the product should resemble the conveying speed and lie within a range of 0.3 - 1.5 m/s. To prevent damage to the pipes and bends, its maximum acceleration of 10 m/s² (1 g) should not be exceeded. In order to prevent the pig from increasing in speed when the “product column” decreases, either the driving current must be regulated or the product outlet throttled back. AWH provides drive controllers for constant pig speeds with gaseous drive media.

Liquid drive media

Liquids are incompressible and ensure a smooth pig run. With the help of the liquid drive medium they can be dosed at sufficiently low pig speeds. Flow rate regulators that are to be used ensure a constant pig speed. They work independently of the pressure conditions in the pipe.

Flow rate V_F (liquids) at various pig speeds W_M

DN	25	32	40	50	65	80	100
V_F in l/min at $W_M = 0.3$ m/s	8.8	14.47	20.4	35.33	61.55	90.43	141.3
V_F in l/min at $W_M = 0.5$ m/s	14.72	24.11	34.01	58.88	102.58	150.72	235.5
V_F in l/min at $W_M = 1.0$ m/s	29.44	48.28	68.01	107.75	205.17	301.44	471
V_F in l/min at $W_M = 1.5$ m/s	44.16	72.42	102.02	176.63	307.76	452.16	706.5

Gaseous drive media

The pigging operation can be significantly disrupted as the pig pipeline stores the compressed propellant gas.

The most common control errors include:

- driving with constant pressure

The propellant gas escapes from a fixed pressure regulator. The pig is accelerated over the entire run length and ultimately reaches an uncontrollably high speed.

- driving with insufficient flow rates

The propellant gas escapes from a pressure regulator, whose standard flow rate is too low to maintain the driving pressure in the pig pipeline. This results in the dreaded stick/slip effect: the pig moves jerkily through the pipe, stands still intermittently and restarts with high acceleration.

The movement is caused by the static friction of the pig, which is greater than its sliding friction.

Gaseous drive media

Prerequisites for a smooth pigging process with propellant gases are:

- a supply of propellant gas with a sufficient volumetric flow rate at driving pressure level; high standard flow rates are required at a relatively low pressure (see table 3.2).

- regulation of the driving flow rate

Mechanical AWH “Gas” drive controllers regulate the flow rate and keep the pig speed constant.

They work independently of the pressure conditions in the pipe.

Propellant gas standard flow rate V_N at 3.0 bar driving pressure and different pig speeds W_M

DN	25	32	40	50	65	80	100
V_N in l/min at $W_M = 0.3$ m/s	26.4	43.4	61.2	106	184.7	271.3	423.9
V_N in l/min at $W_M = 0.5$ m/s	44	72.4	102	176.7	307.8	452.2	706.5
V_N in l/min at $W_M = 1.0$ m/s	88	144.7	204	353.3	615.5	904.3	1413
V_N in l/min at $W_M = 1.5$ m/s	132	217.1	306	530	923.3	1365	2119.5

Highlighted figures are covered by the AWH “Gas” drive controller.

Mixed driving

In enclosed systems it is possible to drive the pig forwards with a liquid (water) and backwards with a gas (air). “Liquid” drive controllers at the inlet and outlet of the propellant liquid keep the pig speed constant in both directions.

Advantages of the mixed driving process include:

- the extremely quiet pig run
- the flushing and drainage of the pipeline in one pigging cycle

Driving pressure

The driving pressure must compensate the supply pressure of the product, the losses in the forming of the flow profile and the inherent pressure drop of the pig.

The pigs produced by AWH exhibit a low inherent pressure drop. This is approx. 0.2 bar for the lip pig and approx. 0.5 bar for the tangent pig.

Dissipation of driving pressure

When the pigging process has been conducted it leaves behind an excess of driving pressure in the pipeline, which has to be dissipated.

The frequently practised, sudden release of pressure is only acceptable for propellant liquids.

When using compressible propellant gases it is better to gradually dissipate the exhaust gas via a throttle valve and to extract any entrained fluid residues in a downstream separator.

The advantages of this method are:

- gentle dissipation of driving pressure
- low noise level
- unpressurised separator

The compact relief cyclones from AWH dissipate the driving pressure gradually.

Entrained fluid residues are separated in the centrifugal field. The exhaust gas is safely dissipated.

Empty run

The characteristic feature of an empty run is the lack of counter pressure. The pig impacts against the receiving station unhindered. The inlet can be cushioned by exerting a light holding pressure on the exhaust side.

Dry run

During normal operation the product reduces the amount of friction between the pig and the pipe wall.

In the event of a dry run this "lubrication" is non-existent, thereby resulting in the level of frictional resistance being increased significantly.

This can cause excessive abrasion and result in localised burning due to the frictional heat that develops.

The pig should therefore only be moved through the dry pipe at an even, low speed.

The lip pig from AWH exhibits a very low frictional resistance.

This makes it particularly suitable for dry runs.

Pig location

The pigs from AWH are equipped with a locating magnet.

These can be detected through a stainless steel pipe wall.

The main fields of application for AWH pigging systems are:

- product ejection to increase the yield
- product separation to prevent mixed phases
- gas ejection for venting and bubble-free filling processes

AWH offers a tried and tested modular programme for pigging technology.

This includes:

- pig components DN25 - DN100
- chamber fittings that are free of dead space for low cost applications
- mechanical drive controllers for constant pig speeds
- compact cyclones for gradual dissipation of driving pressure
- non-contact pig location through the pipe wall

AWH pig fittings are

- CIP / SIP compatible
- safe

Pigging systems are, within the meaning of the law, pipeline systems for gases or flammable, non-combustible liquids or liquids that are hazardous to water.

They are therefore subject to:

- the CE marking requirement
- the WHG (Federal Water Act, particularly para. 19 A)
- the Pressure Equipment Directive (97/23/EC)
- the TA (technical instruction for air pollution control)
- the ATEX directive (EC Explosive Atmospheres Directive for Explosion Protection, particularly ATEX 95 and ATEX 137)
- the VBF (Flammable Liquids Ordinance)
- the TRbF (Technical Rules for Flammable Liquids, particularly TRbF 100, 180 and 302)
- the ZH-RL (Directives of the Employers' Liability Insurance Association, particularly ZH 1/10 and ZH 1/200)

Special note regarding the Pressure Equipment Directive:

Pig pipelines for non-hazardous fluids up to DN100, PN10 and max. 130 °C are not subject to inspection.

The classification is independent of the length of the pipeline.

Such piping must be laid out and manufactured in accordance with "sound engineering practice".

According to the Pressure Equipment Directive, the assessment is independent of the length of the pipeline.

Please check the Approvals and Directives in your country!

Project Questionnaire - Product Recovery System

return it to: Armaturenwerk Hötensleben GmbH · Schulstraße 5-6 · 39393 Hötensleben · Fax: +49 39405 92-111

Date:

Project features:

Contact:

Company:

Street:

City / Zip Code:

Phone / Fax:

e-mail:

Business:

Pharma

Food / Beverage

Paint / Coatings

Chemistry

Lubricating Oils

Water / Wastewater

Pipe system:

DIN EN 10357

DIN 2430

Pipeline:

Nominal diameter DN:

Pressure:

Flow rate:

Run outdoors

Run in the building

Continuous

T-outlets

Branched

Double-walled

Trace heating

Leakage monitoring

Partial hose

Purpose of the pig:

Product ejection

Pipe cleaning

Product separation

Venting / Degassing

Disinfection

Degree of purity:

Free of dead space

Minimal dead space

CIP - compatible

Aseptic

Sterile

Operating mode:

Manual operation

Automatic operation

Separate PLC

Integration in process management system

Project Questionnaire - Product Recovery System

Project features:

Name:

Features:

Viscosity:

Density:

Operating data:

Temperatur < 5 °C

Room Temperature

Temperatur < 80 °C

Temperatur > 80 °C

Steam Sterilization

Pressure < 10 bar

Pressure < 16 bar

Vacuum

Drive medium:

Gaseous

Liquid

Flushing fluid:

Watery

Organic

Disinfectant

Certificates / Rules:

EHEDG

FDA

3.1

Basler Norm

WHG

TA Luft

ATEX

TÜV

Notes:

Sluice Chamber



All advantages at a glance

Functions

- pig garage for sending station
- separate flushing of the parked pig
- CIP cleaning of the pig

Features

- hygienic, CIP / SIP compatible
- no-load operation
- pig extensively flushed when cleaning

Actuation

- pig exchange: by hand

Accessories

- sensor for pig detection
- pneumatic connection fitting
- tangent pig

Technical specifications

Materials

Housing:	in contact with the product	1.4404
	not in contact with the product	1.4301

Seals: EPDM, (other materials on request)

Pressure stage: PN10

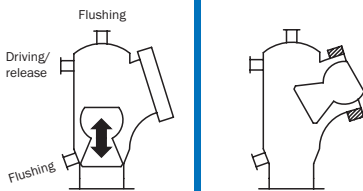
Mounting position: vertical, connection piece at the bottom

Connections

Pig connection:	centring flange DIN 11864
Interchangeable nozzle:	blind nut DIN 11851
Driving / release:	clamp connection DIN 32676
Flushing:	clamp connection DIN 32676

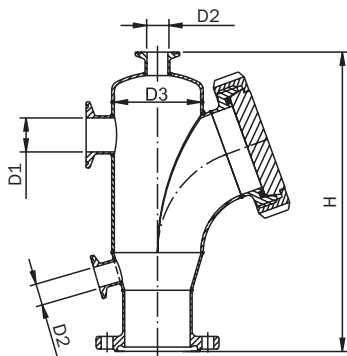
Pipe

- DIN EN 10357, series 2



Pig in Position

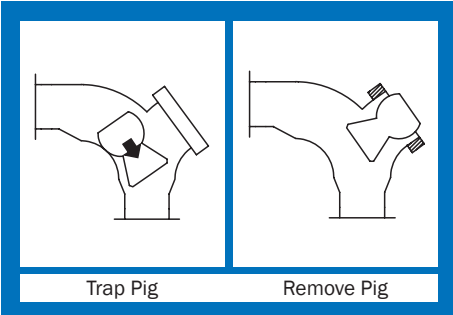
Pig Exchange



Sluice Chamber

DN	D1	D2	D3	H	Weight [kg]	1.4404/EPDM	
						Price/EUR	Article No.
25	DN10	DN10	DN32	153	1.05	517,60	6807 02 05 002
40	DN25	DN10	DN50	189.5	1.77	577,90	6807 02 07 002
50	DN25	DN15	DN65	228.5	2.94	645,90	6807 02 08 002
65	DN25	DN15	DN80	255.5	4.08	764,90	6807 02 09 002
80	DN25	DN15	DN100	293.5	6.16	908,60	6807 02 10 002
100	DN40	DN15	DN125	394.5	9.24	1221,80	6807 02 12 002

Trap Chamber



All advantages at a glance

Functions

- receiving a pig during one-way operation

Features

- hygienic, CIP / SIP compatible
- safe manual unloading of the pig

Actuation

- pig exchange: by hand

Accessories

- sensor for pig detection
- tangent pig

Technical specifications

Materials

Housing:	in contact with the product	1.4404
	not in contact with the product	1.4301

Seals: EPDM, (other materials on request)

Pressure stage: PN10

Mounting position: see illustration

Connections

Pig connection: centring flange DIN 11864

Interchangeable nozzle: blind nut DIN 11851

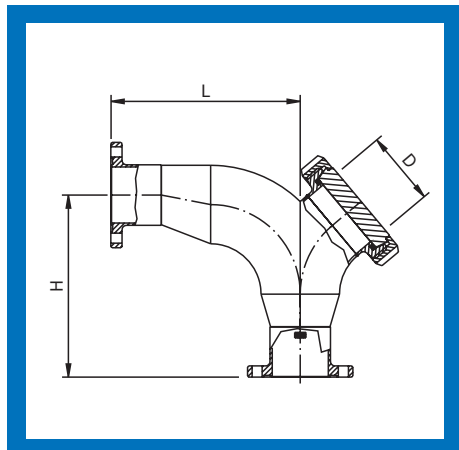
Outlet: centring flange DIN 11864

Pipe

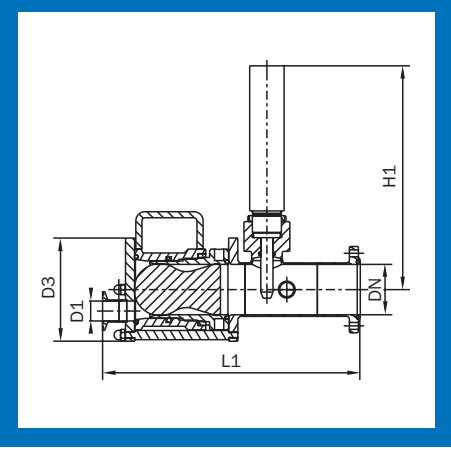
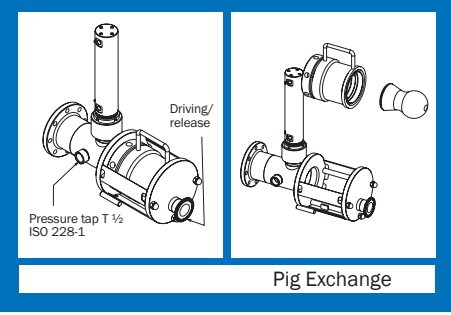
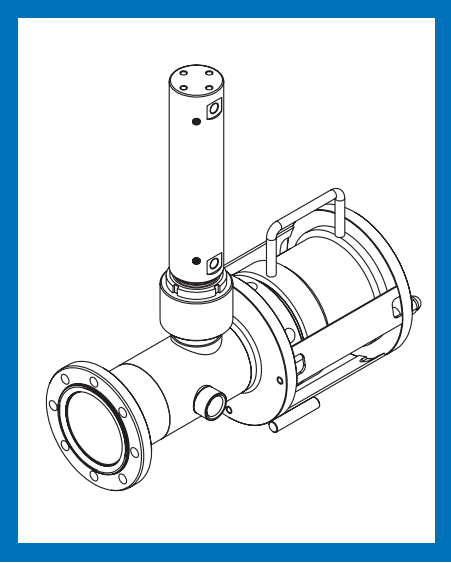
- DIN EN 10357, series 2

Trap Chamber

DN	D	L	H	Weight [kg]	1.4404/EPDM	
					Price/EUR	Article No.
25	DN32	111.5	109	1.25	546,70	6806 01 05 002
40	DN50	148	143	2.05	611,60	6806 01 07 002
50	DN65	169	162.5	3.25	684,80	6806 01 08 002
65	DN80	185.2	178.5	4.55	831,40	6806 01 09 002
80	DN100	210.5	203	6.90	981,10	6806 01 10 002
100	DN125	314	303	11.7	1532,95	6806 01 12 002



Plug-in Chamber without Butterfly Valve



All advantages at a glance

Functions

- pig garage
- sending and receiving station
- suitable for automatic operation

Features

- hygienic
- safe pig exchange
- radial installation/removal of the pig chamber
- integrated pig stopper
- connection for pressure transmitter

Actuation

- pig exchange: by hand

Accessories

- sensor for pig detection with bracket
- sensor for position detection of the pig stopper
- clamping strap for sensor
- pneumatic connection fitting
- tangent pig

Technical specifications

Materials			
Housing:	in contact with the product	1.4404	
	not in contact with the product	1.4301	
Seals:	EPDM, (other materials on request)		
Pressure stage:	PN10		
Mounting position:	horizontal preferred		

Connections

Pig connection:	centring flange DIN 11864
Driving / release:	clamp connection DIN 32676
Connection for pressure transmitter:	IG G 1/2 ISO 228-1

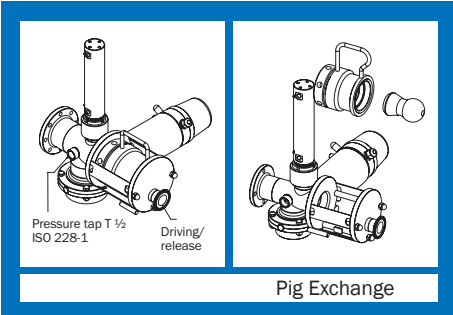
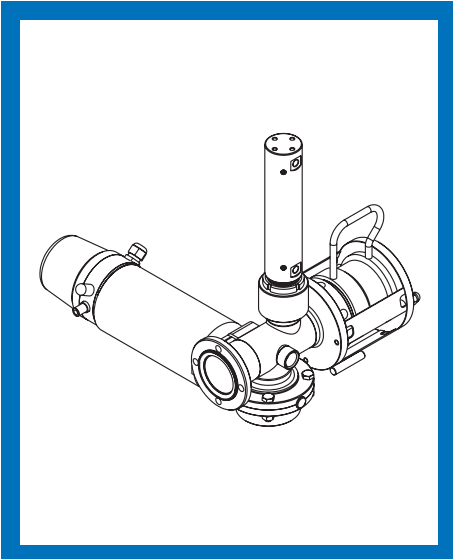
Pipe

- DIN EN 10357, series 2

Plug-in Chamber without Butterfly Valve

DN	D1	D3	L1	H1	1.4404/EPDM	
					Price/EUR	Article No.
25	DN15	83	248	278	2049,40	6805 00 05 002
40	DN15	103	278	278	2332,50	6805 00 07 002
50	DN25	120	304.5	286	2646,00	6805 00 08 002
65	DN25	135	336.5	293	2945,45	6805 00 09 002
80	DN25	160	390	302	3322,90	6805 00 10 002
100	DN25	180	457	311	3686,30	6805 00 12 002

Plug-in Chamber with Butterfly Valve



All advantages at a glance

Functions

- pig garage
- sending and receiving station
- suitable for automatic operation

Features

- hygienic
- safe pig exchange
- radial installation/removal of the pig chamber
- integrated pig stopper
- isolatable branch of the product pipe integrated
- connection for pressure transmitter
- butterfly valve with air / spring actuator
- control head with sensors for position detection

Actuation

- pig exchange: by hand

Accessories

- sensor for pig detection with bracket
- sensor for position detection of the pig stopper
- clamping strap for sensor
- pneumatic connection fitting
- tangent pig

Technical specifications

Materials

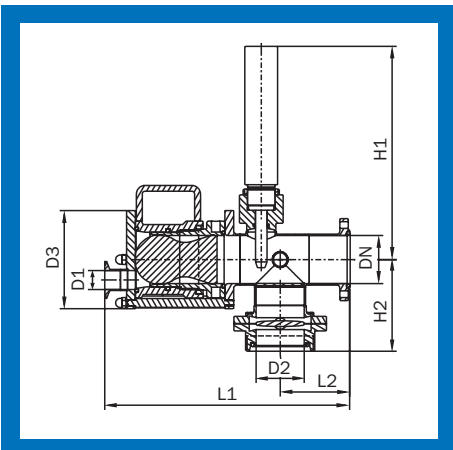
Housing:	in contact with the product	1.4404
	not in contact with the product	1.4301
Seals:	EPDM, (other materials on request)	
Pressure stage:	PN10	
Mounting position:	horizontal preferred	

Connections

Pig connection:	centring flange DIN 11864
Product branch:	threaded flange DIN 11851
Driving / release:	clamp connection DIN 32676
Connection for pressure transmitter:	IG G 1/2 ISO 228-1

Pipe

- DIN EN 10357, series 2



Plug-in Chamber with Butterfly Valve

DN	D1	D2	D3	L1	L2	H1	H2	1.4404/EPDM	
								Price/EUR	Article No.
25	DN15	Rd 52 x 1/6"	83	248	70.5	278	68	2848,70	6816 00 05 002
40	DN15	Rd 65 x 1/6"	103	278	75.5	278	83	3175,70	6816 00 07 002
50	DN25	Rd 78 x 1/6"	120	304.5	86.5	286	91	3526,10	6816 00 08 002
65	DN25	Rd 95 x 1/6"	135	336.5	95.5	293	126	3881,50	6816 00 09 002
80	DN25	Rd 110 x 1/6"	160	390	120	302	149	4368,95	6816 00 10 002
100	DN25	Rd 130 x 1/6"	180	457	152	311	165	4818,65	6816 00 12 002

End Chamber

All advantages at a glance

Functions

- receiving and returning a pig
- automatic operation possible

Features

- hygienic
- minimised dead space
- isolatable product outlet via butterfly valve

Actuation

- butterfly valve with air / spring actuator and control head

Accessories

- sensor for pig detection
- tangent pig

Technical specifications

Materials

Housing:	in contact with the product	1.4404
	not in contact with the product	1.4301

Seals: EPDM, (other materials on request)

Pressure stage: PN10

Mounting position: see illustration

Connections

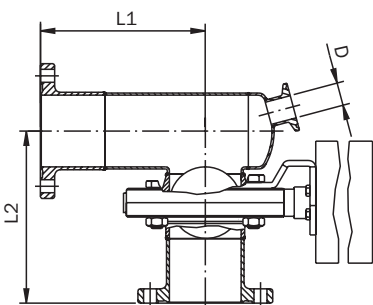
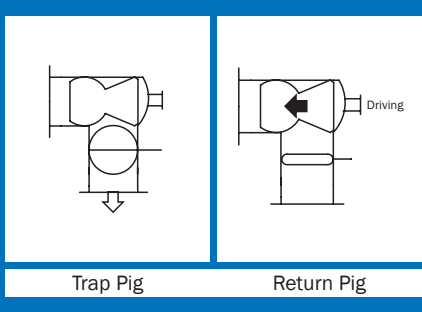
Pig connection: centring flange DIN 11864

Outlet: centring flange DIN 11864

Driving / release: clamp connection DIN 32676

Pipe

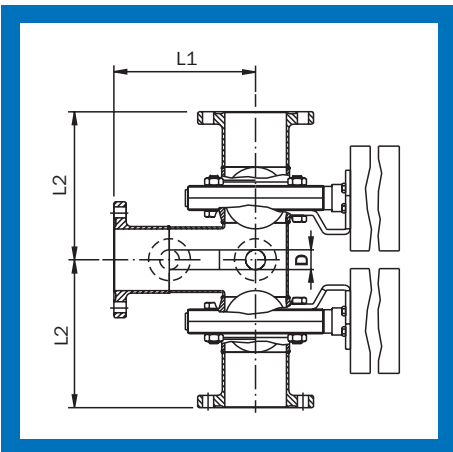
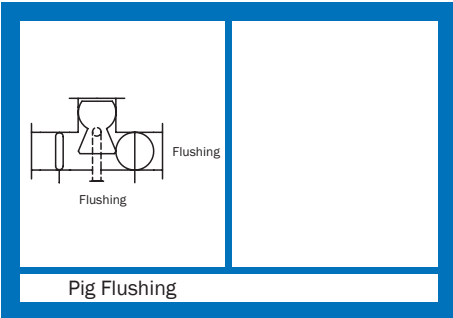
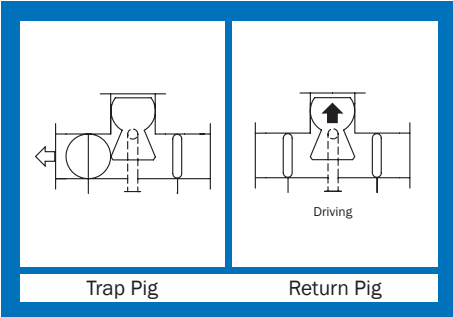
- DIN EN 10357, series 2



End Chamber

DN	D	L1	L2	Weight [kg]	1.4404/EPDM	
					Price/EUR	Article No.
25	DN10	90	96	5.10	1011,11	6809 01 05 002
40	DN10	105	118	5.50	1046,75	6809 01 07 002
50	DN15	115	120	6.05	1090,18	6809 01 08 002
65	DN15	134	146	7.10	1184,18	6809 01 09 002
80	DN25	148	169	9.75	1308,80	6809 01 10 002
100	DN25	158	190	12.50	1414,77	6809 01 12 002

Filling Head



All advantages at a glance

Functions

- trapping and returning a pig
- automatic operation possible
- front flushing of the pig

Features

- hygienic
- minimised dead space
- isolatable product outlet via butterfly valve
- separate flushing connection with valve

Actuation

- butterfly valves with pneumatic air / spring actuator and control head

Accessories

- sensor for pig detection
- tangent pig

Technical specifications

Materials

Housing:	in contact with the product	1.4404
	not in contact with the product	1.4301

Seals: EPDM, (other materials on request)

Pressure stage: PN10

Mounting position: freely selectable

Connections

Inlet: centring flange DIN 11864

Product outlet / cleaning inlet: centring flange DIN 11864

Cleaning outlet: centring flange DIN 11864

Driving / release / flushing: clamp connection DIN 32676

Pipe

- DIN EN 10357, series 2

Filling Head

DN	D	L1	L2	Weight [kg]	1.4404/EPDM	
					Price/EUR	Article No.
25	DN10	90	90	9.70	1723,00	6813 01 05 002
40	DN10	105	97	10.42	1780,00	6813 01 07 002
50	DN15	115	99	11.35	1833,00	6813 01 08 002
65	DN15	134	120	12.95	2001,00	6813 01 09 002
80	DN25	148	133	17.75	2188,00	6813 01 10 002
100	DN25	158	148.5	21.82	2379,00	6813 01 12 002

Pig Stopper

All advantages at a glance

Functions

- stopping or retention of a pig possible during automatic operation

Features

- hygienic

Actuation

- pneumatic actuator air / air

Accessories

- sensor for position detection of the piston
- clamping strap for sensor

Technical specifications

Materials

Housing: in contact with the product 1.4404
not in contact with the product 1.4301

Seals: EPDM, (other materials on request)

Pressure stage: PN10

Mounting position: stem preferably vertically upwards

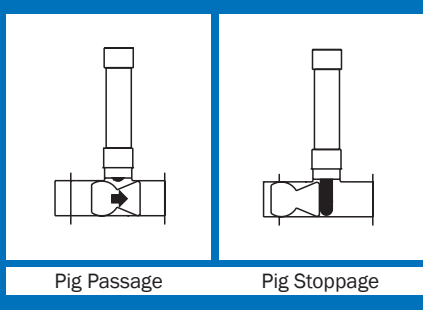
Connections

Inlet: centring flange DIN 11864

Outlet: centring flange DIN 11864

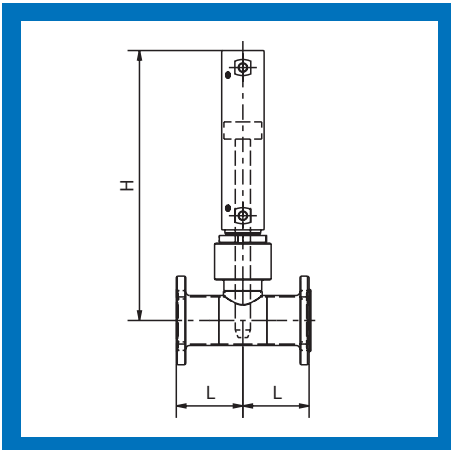
Pipe

- DIN EN 10357, series 2



Pig Passage

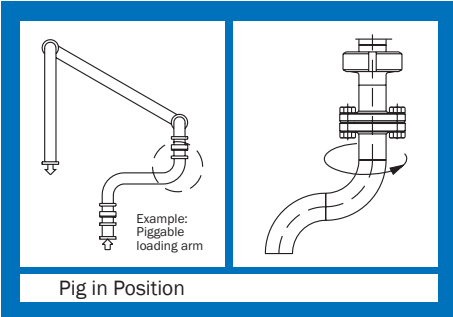
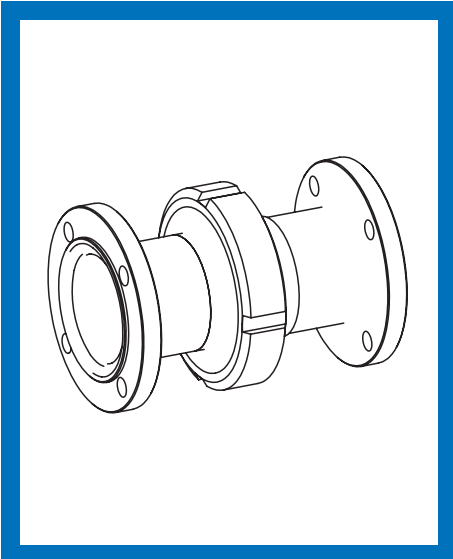
Pig Stoppage



Pig Stopper

DN	L	H	Weight [kg]	1.4404/EPDM	
				Price/EUR	Article No.
25	56.6	172.5	1.20	560,30	6819 01 05 002
40	67.5	204.5	1.65	587,90	6819 01 07 002
50	70.5	286	2.15	608,40	6819 01 08 002
65	85.5	292	3.20	653,60	6819 01 09 002
80	96	302	4.75	699,85	6819 01 10 002
100	105.5	313	7.10	748,10	6819 01 12 002

Swivel Joint



All advantages at a glance

Functions

- freely rotatable connection between piggable components

Features

- hygienic, CIP / SIP compatible

Actuation

- manually with low swivel speeds

Technical specifications

Materials

Housing:	in contact with the product	1.4404
	not in contact with the product	1.4301

Seals: EPDM, (other materials on request)

Pressure stage: PN10

Mounting position: freely selectable

Angle of rotation: 360°

Connections

Inlet: centring flange DIN 11864

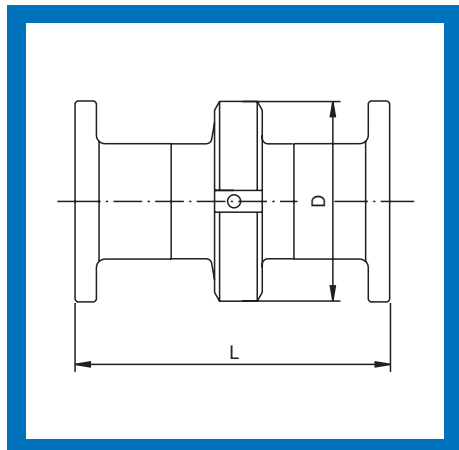
Outlet: centring flange DIN 11864

Pipe

- DIN EN 10357, series 2

Swivel Joint

DN	D	L	Weight [kg]	1.4404/EPDM	
				Price/EUR	Article No.
25	63	124	0.95	224,07	6829 01 05 002
40	78	142	1.25	249,96	6829 01 07 002
50	92	146	1.65	291,89	6829 01 08 002
65	112	172	2.50	360,64	6829 01 09 002
80	127	190	3.60	431,55	6829 01 10 002
100	148	204	5.30	499,05	6829 01 12 002



Inline Sight Glass

All advantages at a glance

Functions

- visual inspection of the pig pipe

Features

- hygienic, CIP compatible

Accessories

- safety screen, see catalogue for filters and sight glasses

Technical specifications

Materials

Housing: 1.4404

Sight glass: borosilicate glass

Pressure stage up to DN65: PN10

Pressure stage above DN65: PN6

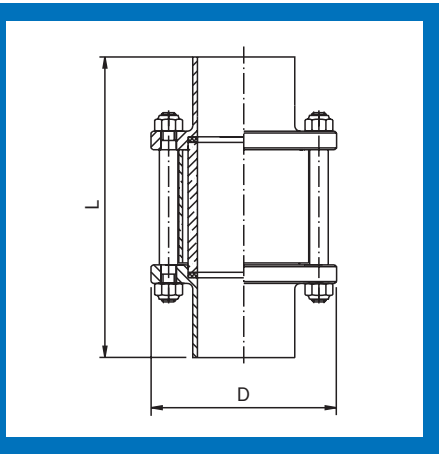
Connections

Inlet: weldon end

Outlet: weldon end

Pipe

- DIN EN 10357, series 2



Inline Sight Glass

DN	D	L	Weight [kg]	1.4404/NBR	
				Price/EUR	Article No.
25	70	148	0.82	100,60	6830 01 05 002
40	90	162	1.25	125,50	6830 01 07 002
50	100	162	1.50	138,85	6830 01 08 002
65	118	177	1.99	167,20	6830 01 09 002
80	130	185	2.60	189,90	6830 01 10 002
100	162	219	3.12	353,30	6830 01 12 002

“Gas” Drive Controller



All advantages at a glance

Functions

- regulation of pig speed with gaseous drive media
- automatic functions without auxiliary energy

Features

- regulation of the flow rate of the propellant gas
- dynamic pressure adjustment
- constant pig speed over the entire run length
- flow indicator, pressure gauge

Actuation

- manually adjustable, lockable (optional)

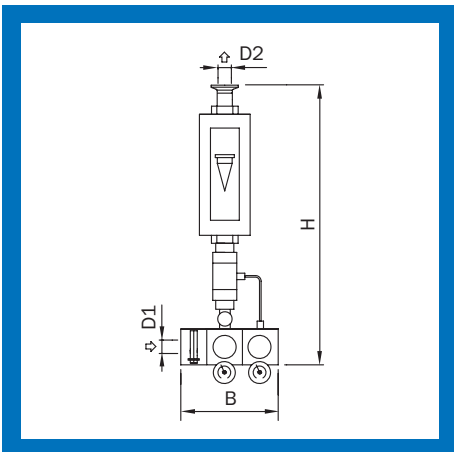
Technical specifications

Materials

Pressure regulator housing:	cast zinc, plastic
Pinch valve:	stainless steel, EPDM
Flow indicator:	steel, glass
Pressure stage:	PN16
max. operating temperature:	50 °C
Mounting position:	vertical, inlet at the bottom

Connections

Inlet:	IG G 1/2 ISO 228-1
Outlet:	clamp connection DIN 32676



“Gas” Drive Controller

Control range l/min	B	H	D1	D2	Weight [kg]		
						Price/EUR	Article No.
10 - 100	175	540	G 1/2	DN15	4.50	1046,20	6820 00 32 06
20 - 180	175	540	G 1/2	DN15	4.50	1046,20	6820 00 32 02
40 - 440	175	540	G 1/2	DN20	4.50	1104,55	6820 00 32 00

Tangent Pig

All advantages at a glance

Functions

- product displacement

Features

- hygienic, manufactured from a single cast
- drives forwards and backwards
- with pipe scraper
- with ball segment for reliable travel around bends
- with signalling magnet

Area of application

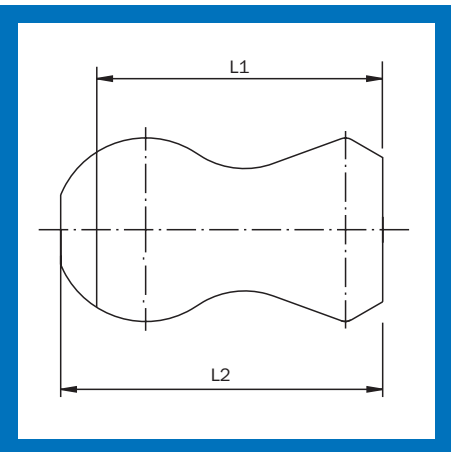
- max. temperature: 80 °C
- max. speed: 1.5 m/s
- max. delay: 1 g
- passes through tight bends up to type 3
- runs over non-reduced T-outlets with guide
- for wet pipes only (no dry run!)

Technical specifications

- Material: silicone
- Max. temperature: 80 °C
- Direction of travel: forwards and backwards

Pipe

- DIN EN 10357, series 2



Tangent Pig

DN	DIN EN 10357 series 2	L1	L2	Weight [kg]	Price/EUR	Article No.
Tangent pig, short						
25	29 x 1.5	44		0.024	117,00	6801 050 500 0/0
40	41 x 1.5	60		0.069	132,00	6801 050 700 0/0
50	53 x 1.5	75		0.155	174,00	6801 050 800 0/0
65	70 x 2	93		0.324	216,00	6801 050 900 0/0
80	85 x 2	110		0.522	304,00	6801 051 000 0/0
100	104 x 2	145		1.007	437,00	6801 051 200 0/0
Tangent pig, long						
25	29 x 1.5		49	0.025	121,00	6801 060 500 0/0
40	41 x 1.5		69	0.074	137,00	6801 060 700 0/0
50	53 x 1.5		88	0.169	184,00	6801 060 800 0/0
65	70 x 2		112	0.364	226,00	6801 060 900 0/0
80	85 x 2		134	0.608	314,00	6801 061 000 0/0
100	104 x 2		165	1.080	447,00	6801 061 200 0/0

Lip Pig



All advantages at a glance

Functions

- product displacement

Features

- hygienic, CIP and SIP compatible
- drives forwards and backwards
- interchangeable lips
- minimised elastomer surface
- with signalling magnet
- extremely low inherent pressure drop

Area of application

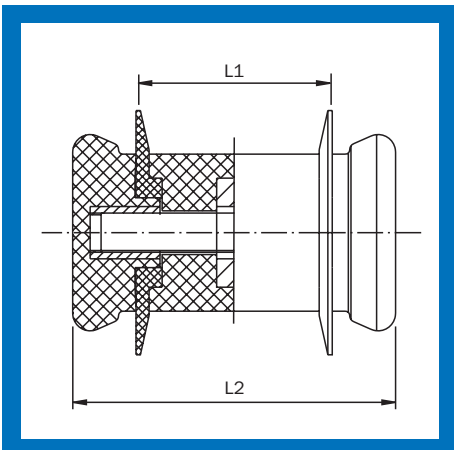
- max. temperature: 125 °C
- max. speed: 1.5 m/s
- max. delay: 1 g
- passes through type 5 bends
- only runs over reduced T-outlets
- also passes through dry pipelines

Technical specifications

Body material:	PVDF
Lip material:	silicone
Max. temperature:	125 °C
Direction of travel:	forwards and backwards

Pipe

- DIN EN 10357, series 2



Lip Pig

DN	DIN EN 10357 series 2	L1	L2	Weight [kg]	Price/EUR	Article No.
25	29 x 1.5	26	39	0.024	309,17	6801 04 05 000
40	41 x 1.5	38	57	0.099	318,57	6801 04 07 000
50	53 x 1.5	46	74	0.193	342,55	6801 04 08 000
65	70 x 2	56	88	0.329	357,10	6801 04 09 000
80	85 x 2	74	110	0.691	375,60	6801 04 10 000
100	104 x 2	88	130	1.220	605,60	6801 04 12 000

Pig Accessories



Pig Detector, Hand

	Price/EUR	Article No.
Pig detector, hand	23,60	6820 00 07 01

Functions

- mobile pig detection

Features

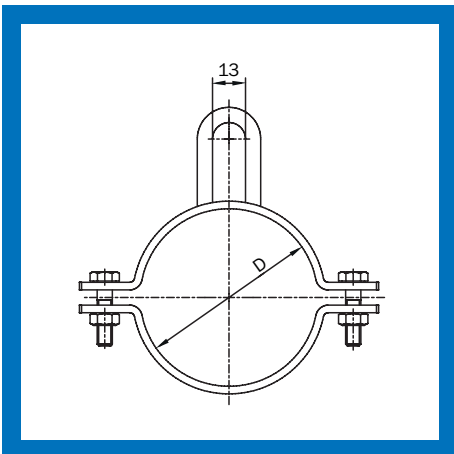
- non-contact magnetic field detection
- visual signalling device
- integrated LED flashlight

Actuation

- by hand

Technical specifications

Features:	magnetic field strength detection (range: 63-810H)
Dimensions:	25 mm x 158 mm
Weight:	45 g
Accessories:	2 x micro batteries (type AAA)



Pipe Clamp with Sensor Bracket

DN	D	Weight [kg]	1.4301/polished	
			Price/EUR	Article No.
25	28	0.11	41,10	6831 01 05 001
40	40	0.13	41,80	6831 01 07 001
50	52	0.15	42,30	6831 01 08 001
65	70	0.18	42,50	6831 01 09 001
80	85	0.24	43,93	6831 01 10 001
100	104	0.28	44,64	6831 01 12 001

Functions

- bracket for pig sensor M12

Features

- flexible mounting on pipes

Technical specifications

Materials:	1.4301
Accessories:	sensor for pig detection

Pig Accessories



Clamping Strap for Sensor for Pig Stopper

	Price/EUR	Article No.
Clamping strap for sensor for pig stopper	5,90	3901 30

Functions

- mounting the sensor on the pig stopper

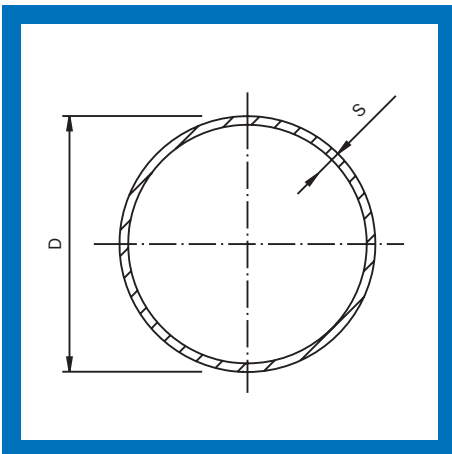
Technical specifications

Materials

Adapter:	polyamide
Clamping strap:	stainless steel (1.4305)
Piston diameter:	40 mm
Clamping range:	38 - 49 mm

Scope of delivery

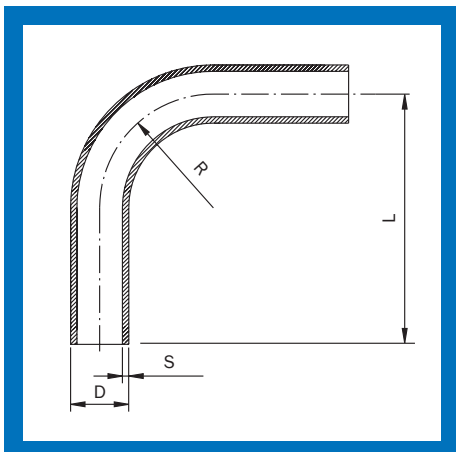
- 1 clamping strap, 1 adapter for sensor



Piggable Pipe

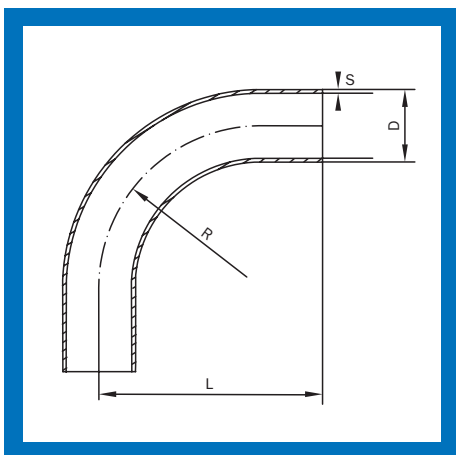
DN	D	S	Weight [kg] in m	Price/EUR	Article No.
DIN EN 10357, series 2					
25	29	1.5	1.030	*	222 114
40	41	1.5	1.490	*	222 195
50	53	1.5	1.944	*	222 242
65	70	2	3.405	*	222 270
80	85	2	4.157	*	222 287
100	104	2	5.108	*	222 304
DIN 11866, series A					
25	29	1.5	1.024	*	225 305
40	41	1.5	1.471	*	225 307
50	53	1.5	1.917	*	225 308
65	70	2	3.375	*	225 309
80	85	2	4.120	*	225 310
100	104	2	5.063	*	225 311

Pig Accessories



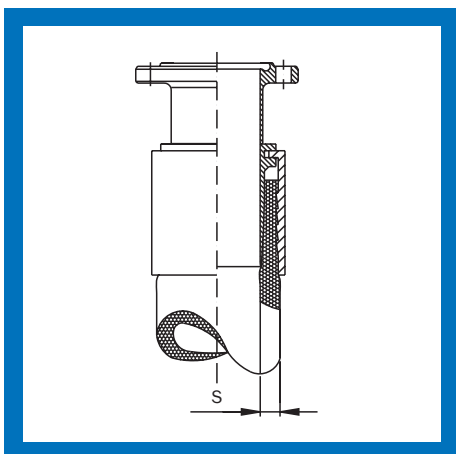
Piggable Bend 90° Type 3

DN	D	S	R	L	Weight [kg]	1.4404	
suitable for tangent pig						Price/EUR	Article No.
25	29	1.5	50	90	0.160	*	6802 01 43 012
40	41	1.5	60	100	0.254	*	6802 01 45 012
50	53	1.5	70	110	0.366	*	6802 01 46 012
65	70	2	80	120	0.701	*	6802 01 09 012
80	85	2	90	145	1.043	*	6802 01 10 012
100	104	2	100	155	1.363	*	6802 01 12 012



Piggable Bend 90° Type 5

DN	D	S	R	L	Weight [kg]	1.4404	
suitable for tangent pig and lip pig						Price/EUR	Article No.
25	29	1.5	65	165	0.312	56,45	6802 02 43 012
40	41	1.5	95	245	0.566	65,00	6802 02 45 012
50	53	1.5	125	275	0.960	71,45	6802 02 46 012
65	70	2	160	310	1.876	90,35	6802 02 09 012
80	85	2	200	350	2.552	108,55	6802 02 10 012
100	104	2	250	400	3.530	132,50	6802 02 12 012



Hose

DN	DIN EN 10357 series 2	S	Bending radius	Length acc. to requirements	Weight [kg]	1.4404	
						Price/EUR	Article No.
25	29 x 1.5	6	150	max. 40	0.93	*	
50	53 x 1.5	6	300	max. 40	2.70	*	
65	70 x 3	6	390	max. 40	3.38	*	
80	85 x 3	6	480	max. 20	3.95	*	

Functions

- flexible pig pipeline

Features

- hygienic, CIP compatible
- can be damped up to 125 °C max. 30 min.
- with internal steel spiral
- kink-proof, vacuum-proof
- smooth transition to the hose fitting

Technical specifications

Materials

Connection fitting:	1.4404
Hose material in contact with product:	white natural rubber, food grade quality
Pressure stage:	PN6
Permitted continuous operating temperature:	95 °C
Peak for max. 30 minutes:	125 °C

Connections

Inlet:	nut flange DIN 11864
Outlet:	collar flange DIN 11864 (other connections on request)

Pipe: DIN EN 10357, series 2

Pig Accessories



T-piece, long

Functions

- piggable product branch

Features

- hygienic, CIP / SIP compatible
- full branch
- with guide
- reduced branch

Technical specifications

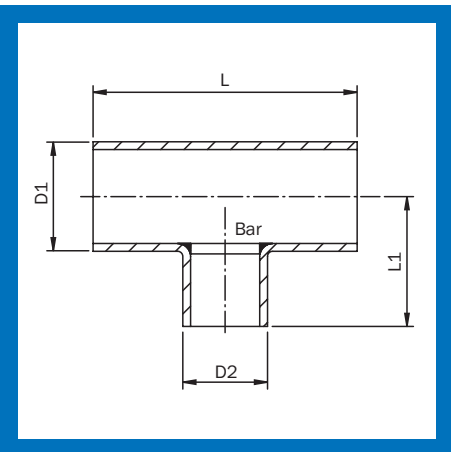
Materials:	1.4404
Pressure stage:	PN10

Connections

Inlet/outlet:	orbital weldon ends
T-outlet:	orbital weldon ends

Pipe

- DIN EN 10357, series 2



T-piece, long

DN	D1	D2	L	L1	Weight [kg]	1.4404	
T-piece, long						Price/EUR	Article No.
25	29 x 1.5	29 x 1.5	100	50	0.12	130,45	6822 01 05 002
40	41 x 1.5	41 x 1.5	120	60	0.23	145,00	6822 01 07 002
50	53 x 1.5	53 x 1.5	140	70	0.33	154,80	6822 01 08 002
65	70 x 2	70 x 2	160	80	0.83	175,20	6822 01 09 002
80	85 x 2	85 x 2	180	90	1.24	193,75	6822 01 10 002
100	104 x 2	104 x 2	200	100	5.52	221,65	6822 01 12 002
T-piece, long, reduced							
25	29 x 1.5	23 x 1.5	100	50	0.10	130,20	6824 01 05 002
40	41 x 1.5	35 x 1.5	120	60	0.19	143,10	6824 01 07 002
50	53 x 1.5	41 x 1.5	140	70	0.33	146,65	6824 01 08 002
65	70 x 2	53 x 2	160	80	0.55	171,75	6824 01 09 002
80	85 x 2	70 x 2	180	90	0.79	192,35	6824 01 10 002
100	104 x 2	85 x 2	200	100	1.14	211,05	6824 01 12 002



Aseptic Flange Connection DIN 11864-2 Form A for Pipe acc. to DIN 11866 (Series A)

Functions

- detachable connection for pig pipes

Features

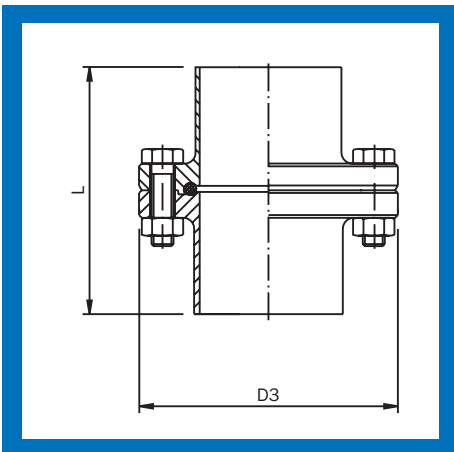
- hygienic, CIP / SIP compatible
- with centring via tongue/groove
- metallic stop

Technical specifications

Materials: 1.4404
Pressure stage: PN16

Pipe

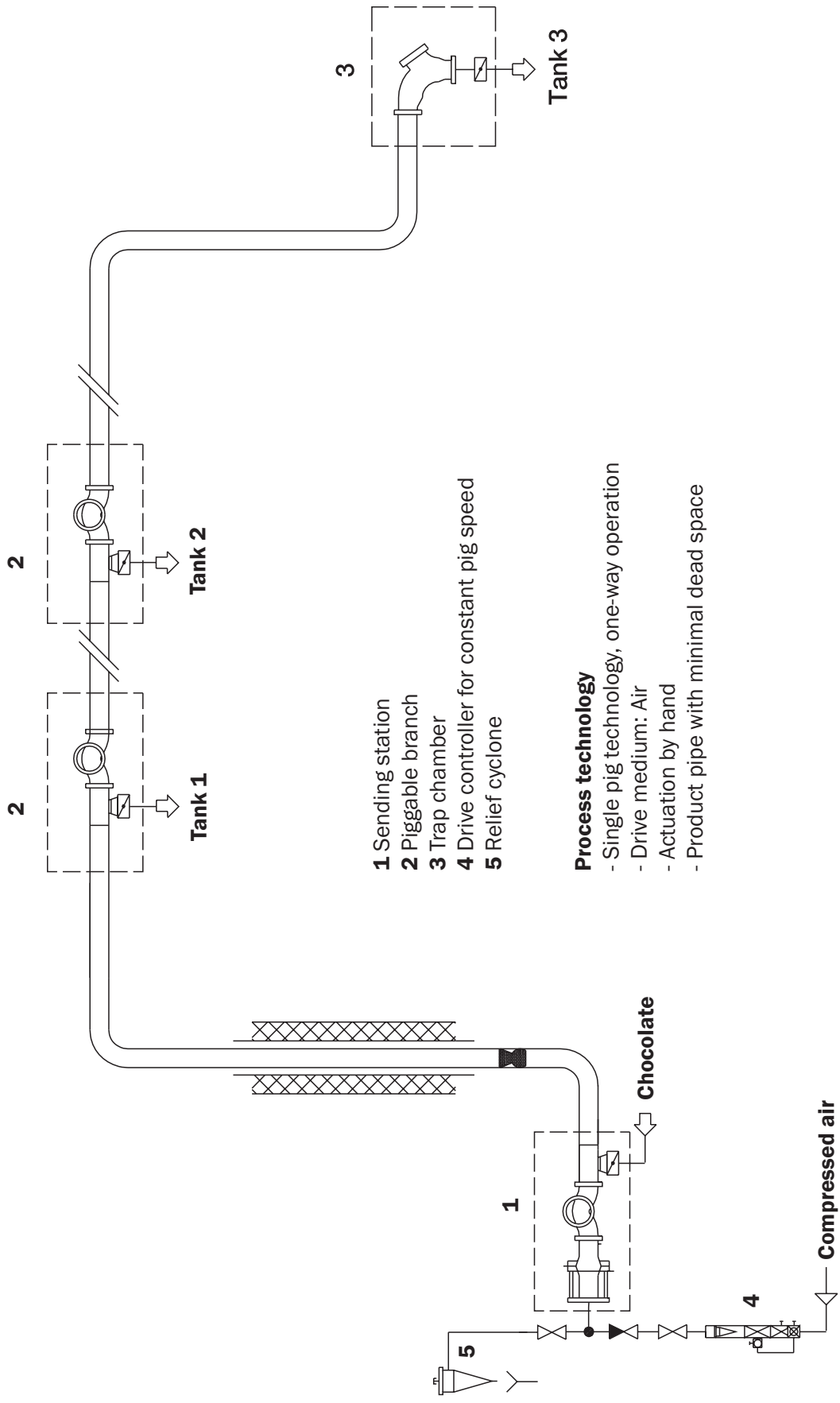
- DIN EN 10357, series 2



Aseptic Flange Connection DIN 11864-2 Form A for Pipe acc. to DIN 11866 (Series A)

DN	D3	L	Weight [kg]	1.4404	
				Price/EUR	Article No.
25	70	80	0.53	47,00	113L 00 43 2/1
40	82	90	0.70	55,21	113L 00 45 2/1
50	94	90	0.86	58,40	113L 00 46 2/1
65	113	108	1.24	75,07	113L 00 09 2/1
80	133	116	1.86	105,82	113L 00 10 2/1
100	159	116	2.88	145,38	113L 00 12 2/1

Flow Chart – Piggable Pipeline DN80 for Transferring Chocolate

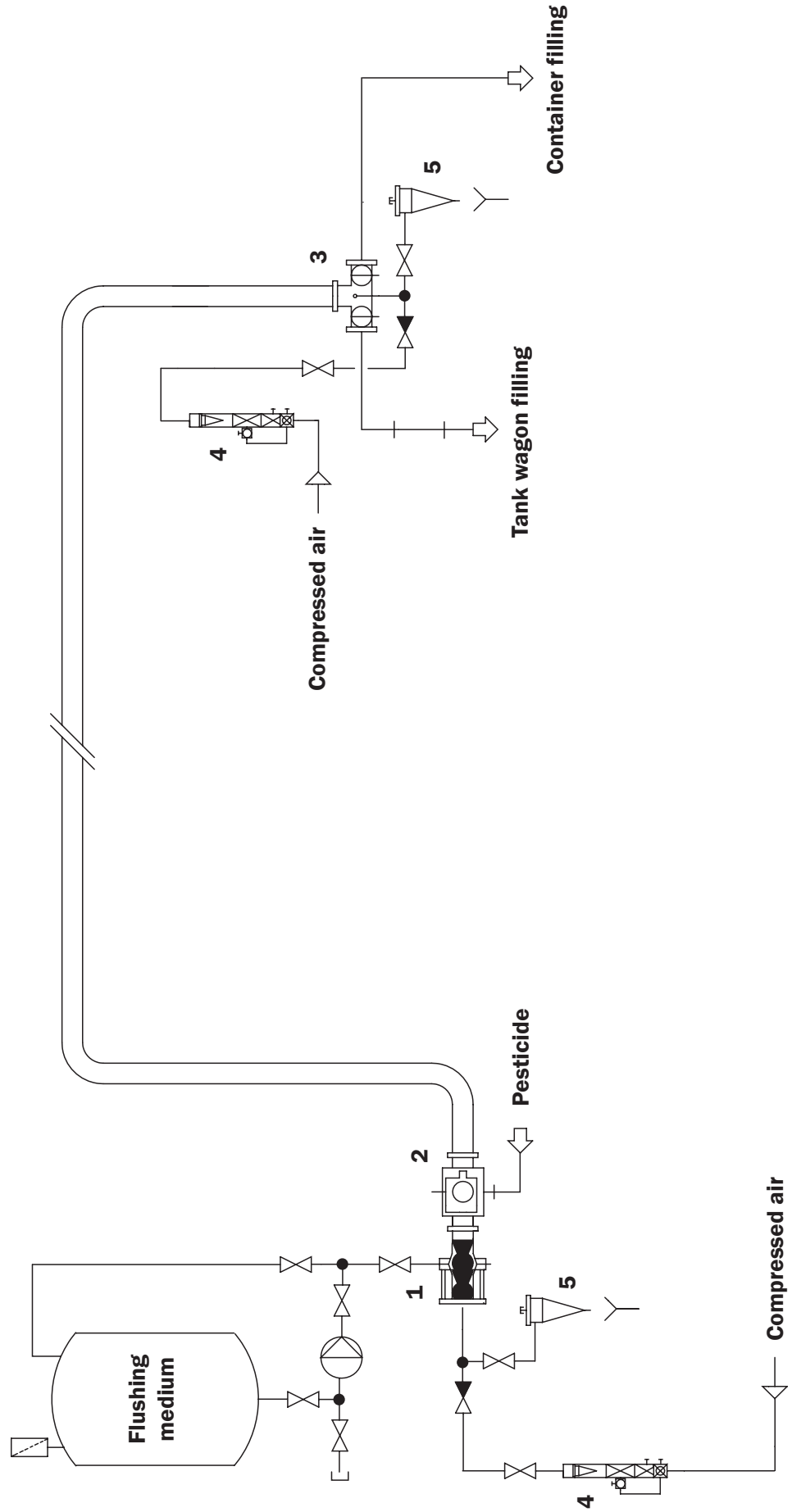


Flow Chart – Piggable Pipeline DN50 for Transferring Pesticide

- 1 Plug-in chamber (2 pigs)
- 2 Branch tap
- 3 Filling head
- 4 Drive controller for constant pig speed
- 5 Relief cyclone

Process technology

- Dual pig technology, tandem operation
- Drive medium, forwards and backwards: Air
- Flushing medium cushion between 2 pigs





Potravinářský průmysl
Farmaceutický průmysl
Biotechnologie
Petrochemie
Chemický průmysl
Energetika
Úprava vody
Papírenství a zpracování celulózy
Plynárenský průmysl
Keramický průmysl
Zpracovatelský průmysl



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