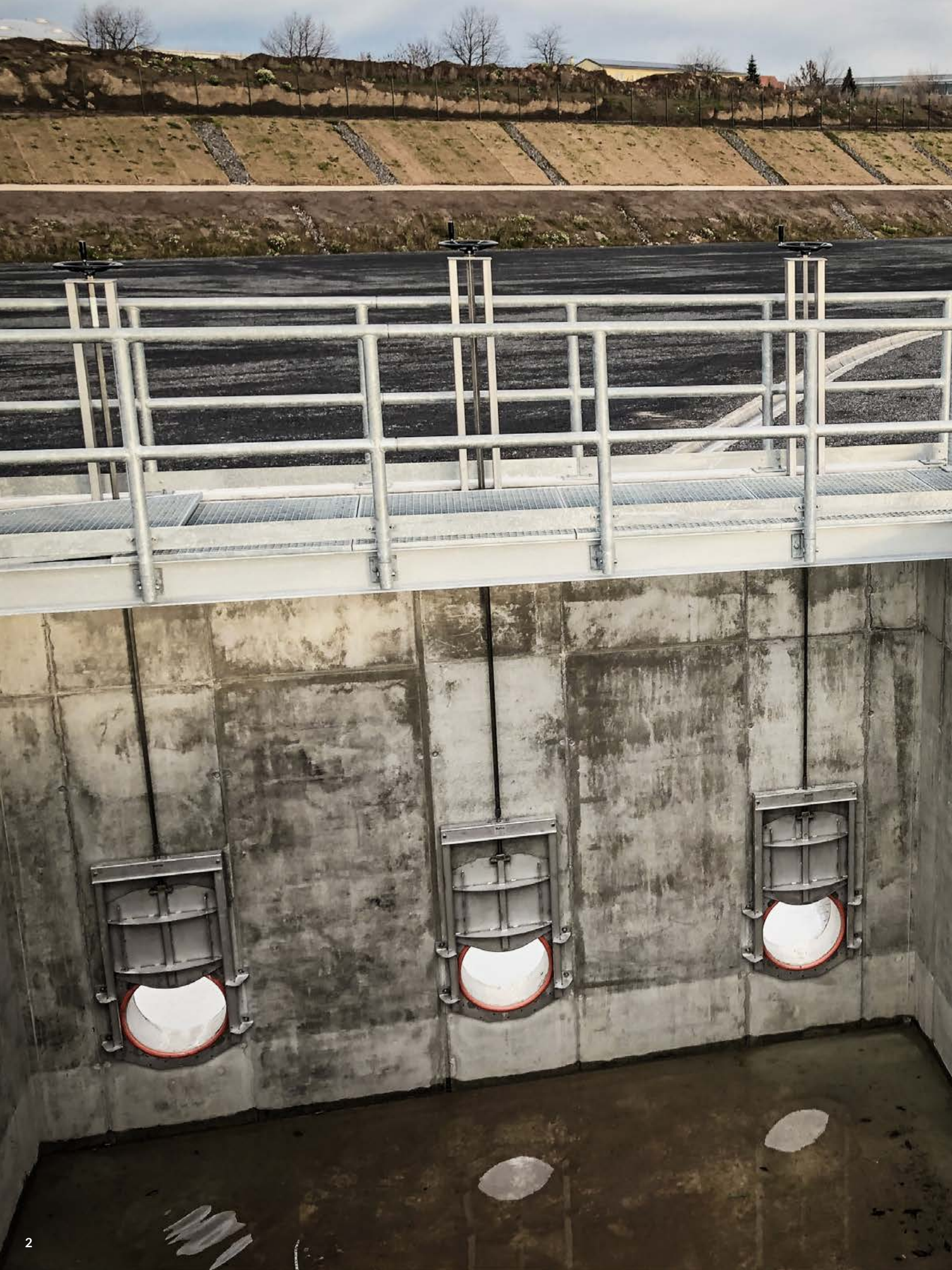




Fittings without housing.

Penstocks for use in manhole structures, sewers and open channel systems.







Fittings without housing.

Penstocks or shut-off fittings are used as control valves to control and regulate the flow of water and other liquids. Different application requirements call for expert advice. HAILO Professional offers various models of penstocks in its portfolio, which are described on the following pages.

As a rule, penstocks are attached to the wall, in the case of round drainage shafts also with the aid of a segment stone. Regardless of whether the penstock is to be used to regulate water flows or for complete shut-off, HAILO Professional offers the right model for all requirements. Penstocks are suitable for use in manhole structures, sewers and open channel systems. Due to their low maintenance costs, penstocks are often used in municipal and industrial sewage treatment plants, for example.

CP4 penstock, made of stainless steel.

Penstock with rectangular opening, 4-sided sealing

Due to the pre-tensioned seal, the CP4 penstock guarantees full sealing performance, even at low water pressure. Furthermore, it is suitable for unclean building openings, as the sealing surface to the wall is larger than the wall opening and thus leaks at wall breakouts are avoided.

Opening dimensions and pressure stage

Opening dimensions 150 x 150 mm to 1200 x 1200 mm

Pressure stage on the front side: 6 mwc

Pressure stage on the rear side: 4 mwc; from 900 x 900 mm: 3 mwc

Frame and panel

- Supplied as pre-assembled fitting which does not require assembly, setting and adjusting works
- Design as self-supporting frame construction made of stainless steel with integrated spindle bearing
- Slim construction design (width = masonry opening + 165 mm)
- Welded frame and slide panel made of stainless steel, optimised for maximum safety and durability by means of FEM certification
- No offset in rear to front invert level on the embedded penstock
- Penstock for embedding in concrete: Equipped with setting sleeve for aligning the fitting in the channel recess
- Seal and wear parts (spindle, spindle nut, spindle bearing, seal) replaceable
- Welding certificate in accordance with DIN EN 1090-2 EXC2

Material

- Stainless steel 1.4301 (304) / 1.4404 (316L)

Spindle

- Spindle with rolled trapezoidal thread made of stainless steel
- Spindle non-rising
- Spindle nut made of sea and wastewater resistant bronze Optional: Spindle outside the medium rising or non-rising (easier to lubricate)

Seal

- Movable, positioned seal support, seal clipped with stainless steel and pre-tensioned for two-sided pressure absorption
- Profile seal with hot-vulcanized (minimum temperature: 180°C) UNO angle and butt joints made of wastewater- and UV-resistant EPDM or oil-resistant NBR
- Factory pre-assembled seal against the wall made of solid, wastewater resistant cellular rubber on the seal support in the design for dowel fixing
- Seal line 44 mm larger than the masonry opening to prevent leaks on masonry spalling



CP4 penstock 500 x 500 mm

Leak tightness class

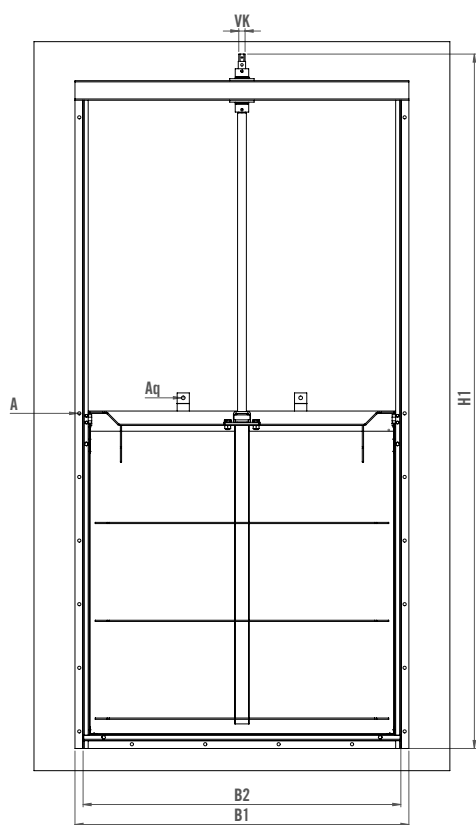
- Leak rate according to DIN EN 19569, Part 4, Table 1:
- Pressure on front side: 0.02 to 0.05 l · s⁻¹ · m⁻¹ leak tightness class 4)
- Pressure on rear side: 0.05 to 0.1 l · s⁻¹ · m⁻¹ leak tightness class 3)
- CP4 penstock leak rate:
 - Pressure on front side: maximum 1 % from 0.02 to 0.05 l · s⁻¹ · m⁻¹ (leak tightness class 4)
 - Pressure on rear side: maximum 5 % from 0.02 to 0.05 l · s⁻¹ · m⁻¹ (leak tightness class 4)

Actuation of the penstock by

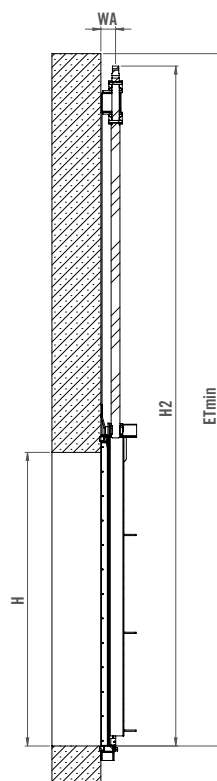
- Stainless steel handwheel on transverse yoke
- Lateral actuation with gearbox with stainless steel gearbox with stainless steel handwheel or stainless steel crank handle
- All-in-one control key via square cap
- MOBITORQ electric or accu - mobile actuators via square stem cap
- BEA®servo stainless steel electric actuator assembled on transverse yoke, optional with weather protection roof
- Pneumatic actuator assembled on transverse yoke
- Hydraulic actuator assembled on transverse yoke
- E-actuator

Mounting

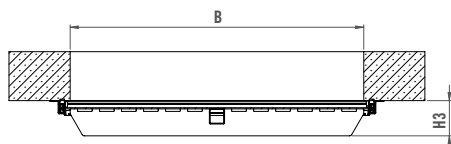
- Concreted into recess
- Dowelling to the wall in front of the opening



CP4 1200 x 1200 mm front view



CP4 1200 x 1200 mm side view



CP4 1200 x 1200 mm top view

YOUR ADVANTAGES

- **IMMEDIATELY TIGHT**
Full sealing performance independent of water level due to pre-tensioned seal
- **NARROW CONSTRUCTION**
Usable in narrow shafts
- **NO SPRAY EFFECT**
Clear control behaviour
- **LARGER SEALING LINE**
Ideal for rough construction openings
- **PERFECT CORROSION PROTECTION**
All welded stainless steel parts pickled and passivated
- **OPTIONAL EX-PROTECTION**
On request, the penstock can be proven to comply with the ATEX Directive 2014/34/EU

Dimensions in mm

B x H	150x150	200x200	250x250	300x300	400x400	500x500	600x600	700x700	800x800	900x900	1000x1000	1200x1200
B1	315	365	415	465	565	665	765	865	965	1065	1165	1365
B2	250	300	350	400	500	600	700	800	900	1000	1100	1300
H1	670	770	870	970	1170	1370	1590	1790	1990	2239	2439	2839
H2	610	710	810	910	1110	1310	1530	1730	1930	2179	2379	2779
H3	80	80	80	80	90	90	95	100	105	121	134	144
Etrmin	670	770	870	970	1170	1370	1590	1790	1990	2239	2439	2839
WA	54	54	54	54	54	54	54	54	54	60	60	60
Rev/stroke (ca.)	38	48	58	68	88	108	128	148	168	188	208	248
VK	□16	□16	□16	□16	□16	□16	□16	□16	□16	□26	□26	□26
A	"2x Ø13 M10x130"		"3x Ø13 M10x130"	"5x Ø13 M10x130"		"8x Ø13 M10x130"	"10x Ø13 M10x130"	"12x Ø13 M10x130"	"13x Ø13 M10x130"		"16x Ø13 M10x130"	"18x Ø13 M10x130"
Aq	-	-	-	-	-	-	-	"1x Ø15 M12x160"			"2x Ø15 M12x160"	

Dimensions for other nominal sizes on request.

CP4 semicircular, variant* from CP4.

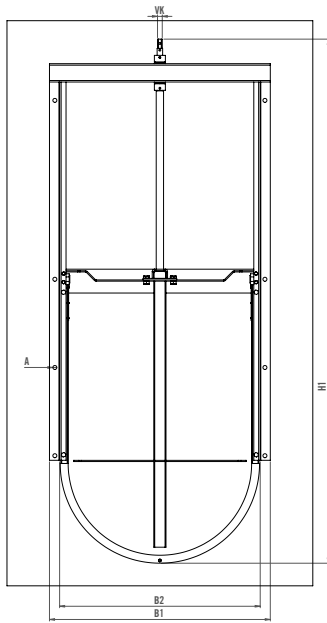
Penstock with semicircular opening, 4-sided seal

Opening dimensions and pressure stage

DN 150 x 150 mm to DN 600 x 600 mm

Pressure stage on the front side: 4 mwc

Pressure stage on the rear side: 4 mwc



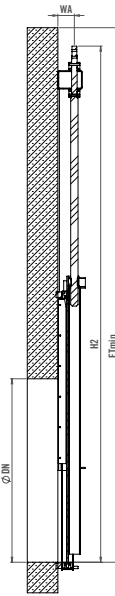
CP4 semicircular DN 600 front view

Opening dimensions and pressure stage

DN 700 x 700 mm to DN 800 x 800 mm

Pressure stage on the front side: 4 mwc

Pressure stage on the rear side: 3 mwc



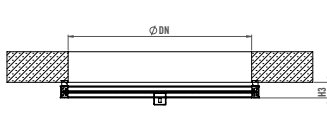
CP4 semicircular DN 600 side view



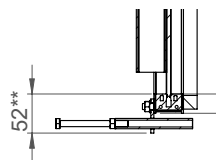
CP4 semicircular DN 200

SPECIAL FEATURES

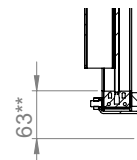
- **SEMICIRCULAR BOTTOM**
Ideal penstock for DIN channels
- **VARIABLE INSTALLATION OPTIONS**
Subsequent installation in shafts, in an existing channel, or for a new sewer construction



CP4 semicircular DN 600 top view



** flush invert with additional pressure device



*** for doweling in front of the wall

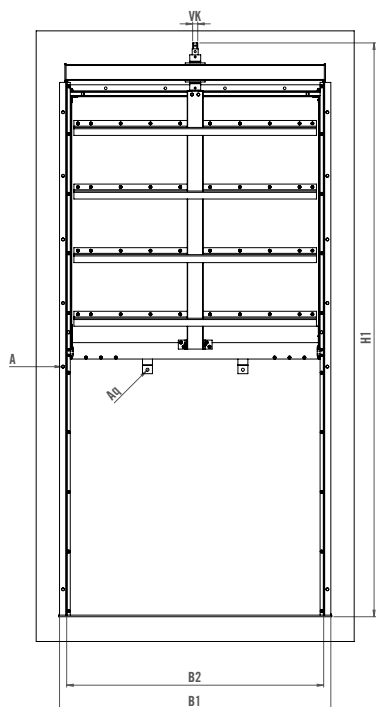
Dimensions in mm

Dimensions for other nominal sizes on request.

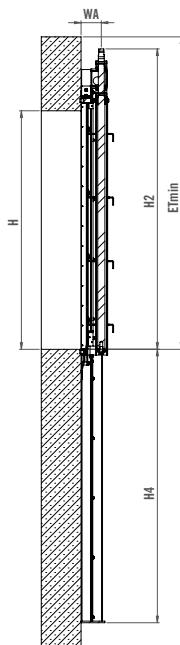
DN	150	200	250	300	400	500	600	700	800
B1	272	322	372	422	522	622	722	822	922
B2	198	248	298	348	448	548	648	748	848
H1**/H1***	625**/636***	750**/761***	875**/886***	998**/1009***	1250**/1261***	1495**/1506***	1763**/1774***	1901**/1912***	2130**/2141***
H2	573	698	823	946	1198	1443	1711	1849	2078
H3	80	80	80	80	80	80	80	80	80
H4**/H4***	52**/63***	52**/63***	52**/63***	52**/63***	52**/63***	52**/63***	52**/63***	52**/63***	52**/63***
Etmin	632	720	883	1006	1258	1503	1771	1909	2138
WA	54	54	54	54	54	54	54	54	54
Rev/stroke	32	42	52	62	82	102	122	141	161
VK	□16	□16	□16	□16	□16	□16	□16	□16	□16
A	"4x ø13 M10x130"	"5x ø13 M10x130"	"5x ø13 M10x130"	"5x ø13 M10x130"	"5x ø13 M10x130"	"7x ø13 M10x130"	"9x ø13 M10x130"	"12x ø13 M10x130"	"13x ø13 M10x130"

CP4 lowering type penstock, variant* from CP4.

With rectangular opening, 4-sided sealing



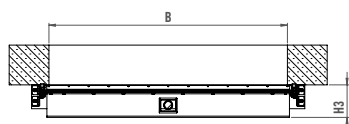
CP4 lowering type penstock
1500 x 1500 mm front view



CP4 lowering type penstock
1500 x 1500 mm side view



CP4 lowering type penstock
700 x 700 mm



CP4 lowering type penstock
1500 x 1500 mm top view

SPECIAL FEATURES

- **LOWERING TYPE PENSTOCK**
Sliding plate can be lowered for optimum water level regulation

B	Please specify when ordering
H	Please specify when ordering
B1	Size dependent
B2	
H1	Size dependent
H2	
H3	
H4 min.	= H + 150 mm
ET min.	Please specify when ordering
WA	Size dependent
Rev./stroke	
VK	
A	
As	
Aq	
Arh	

* STANDARD DATA: please refer CP4 penstock
 ** In the variant „flush invert“ (BR) the dimension H4 = 52 mm
 *** In the variant „dowelling in front of the wall“ (DV-DV), the dimension is H4 = 63 mm - the dimension H1 changes accordingly!

SAFOX[®] penstock, made of stainless steel.

Penstock with circular, round opening, all-sided seal

The SAFOX[®] penstock achieves maximum sealing performance thanks to its patented sealing system. The floating sealing ring seals perfectly to the wall and to the slide plate. It compensates for structural tolerances beyond DIN 18202.

Opening dimensions and pressure stages

Opening dimensions DN 150 to DN 3000, Standard pressure stages for pressure on the front or back sides of the penstock plate:

- DN 150 to DN 300: 10 m WS
- DN 400 to DN 800: 8 m WS
- DN 900 to DN 1200: 7 m WS
- More than DN 1200: 6 m WS
- Higher pressure stages possible

Frame and panel

- Supplied as pre-assembled fitting which does not require assembly, setting and adjusting works up to 1200 mm
- Design as self-supporting frame construction made of stainless steel with integrated spindle bearing
- Welded frame and slide panel made of stainless steel, optimised for maximum safety and durability by means of FEM certification
- Bridge screwed on, thereby all wear parts (spindle, spindle nut, spindle bearing and seal) can be exchanged in the installed condition without dismantling the fitting from the structure
- Exchangeable closing wedges in bronze frame resistant to seawater and wastewater
- Welding certificate in accordance with DIN EN 1090-2 EXC2

Materials

- Stainless steel 1.4301 (304) / 1.4404 (316L) / 1.4410 (507) / 1.4462 (318LN) / 1.4539 (904L)

Spindle

- Spindle protection made of stainless steel
- Spindle with rolled stainless steel trapezoidal thread, opening size DN 150-1300
- Spindle with whirled trapezoidal thread made of stainless steel, opening size DN 1400-3000
- Single spindle design or twin spindle design
- Spindle nut made of sea and wastewater resistant bronze
- Optional: Spindle outside the medium rising or non-rising (easier to lubricate)

Seal

- Factory-fitted profile sealing ring suspended freely in the frame, floating bearing, sealing both to the wall and also to the slide, additional sealing to the wall not permissible
- Made of wastewater and UV-resistant EPDM or oil-resistant NBR with welded UNO push joint



SAFOX[®] penstock DN 1000

- Seal line larger than the masonry opening to prevent leaks on masonry spalling
 - DN 150 to DN 600: +12 mm
 - DN 700 to DN 1200: +32 mm
 - DN 1400 to DN 3000: +50 mm

Leak tightness class

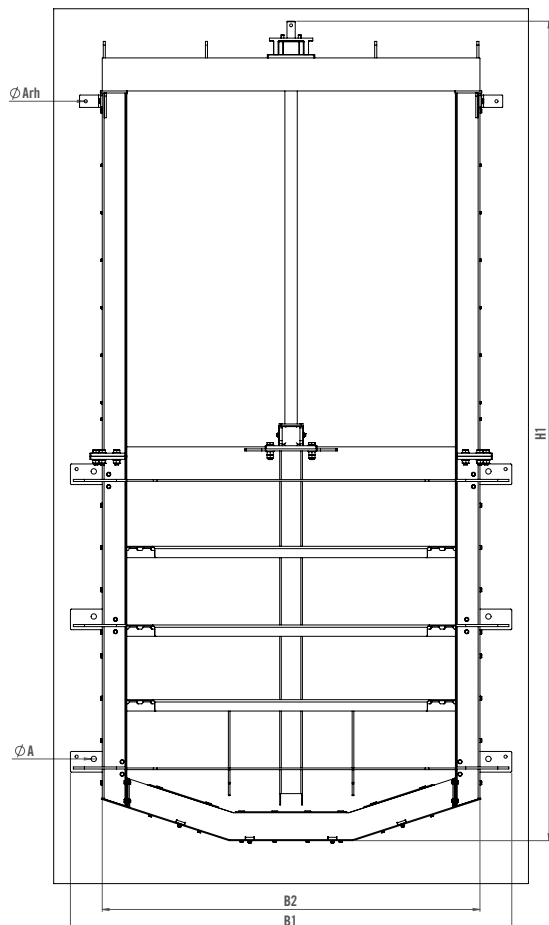
- SAFOX[®] Leak rate according to drinking water standard DIN EN 12266-2, Part 2, Table A.5:
- Pressure on the backside: leak rate C

Mounting

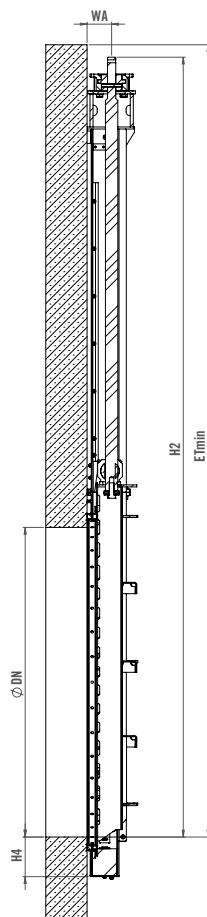
- Dowelling to the wall in front of the opening
No fixing needed on the bottom side
- Fastening in the base
Concreting in recess -> corresponds to SAFOX[®] G

Actuation of the penstock by

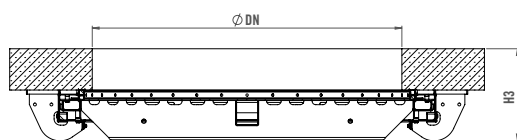
- Stainless steel handwheel on transverse yoke
- Lateral actuation with gearbox with stainless steel gearbox with stainless steel handwheel or stainless steel crank handle
- All-in-one control key via square cap
- MOBITORQ electric or accu - mobile actuators via square stem cap
- BEA[®]servo stainless steel electric actuator assembled on transverse yoke, optional with weather protection roof
- Pneumatic actuator assembled on transverse yoke
- Hydraulic actuator assembled on transverse yoke
- E-actuator



SAFOX® DN 1500 front view



SAFOX® DN 1500 side view



SAFOX® DN 1500 top view

YOUR ADVANTAGES

- ABSOLUTELY TIGHT**
 According to drinking water standard DIN EN 12266-2
- IMMEDIATELY READY FOR USE**
 Penstock is delivered ready for installation (multiple frame as of 1300 mm)
- QUICKEST POSSIBLE INSTALLATION**
 Minimum number of anchor rods, no dowels required on the underside
- DURABLE**
 Only one seal – UNO-vulcanized seal connection
- PERFECT CORROSION PROTECTION**
 All welded stainless steel parts pickled and passivated
- OPTIONAL EX-PROTECTION**
 On request, the penstock can be proven to comply with the ATEX Directive 2014/34/EU

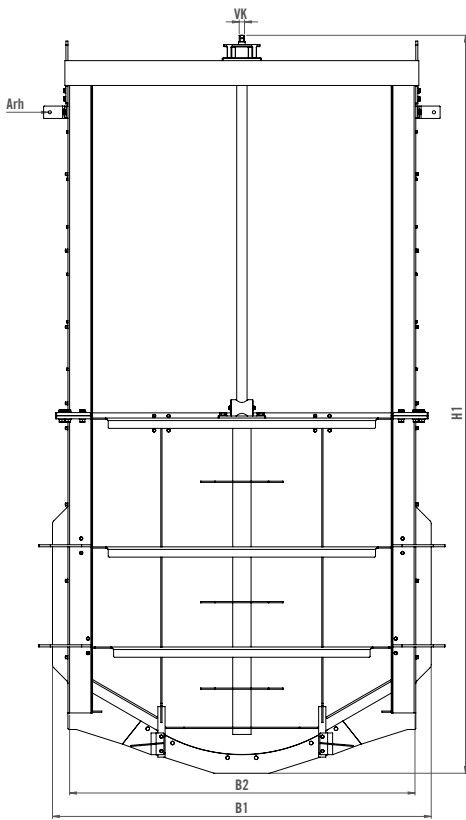
Dimensions in mm

Dimensions for other nominal sizes on request.

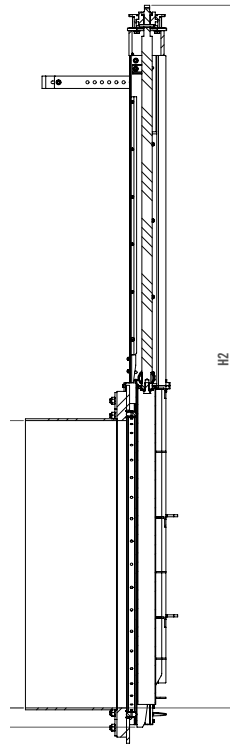
DN	150	200	250	300	400	500	600	700	800	900	1000	1200	1400	1500	1600	1800	2000	2200	2400	2600	2800	3000				
B1	412	462	512	562	674	774	874	1070	1170	1304	1404	1604	2038	2138	2238	2462	2638	2862	3260	3460	3660	3860				
B2	272	322	372	422	534	634	734	830	930	1064	1164	1364	1730	1830	1930	2150	2330	2550	2860	3060	3260	3460				
H1	623	728	828	928	1141	1341	1541	1902	2102	2313	2501	2901	3712	3970	4170	4546	4911	5366	6315	6715	7115	7515				
H2	558	658	758	858	1063	1264	1464	1797	1997	2192	2396	2796	3577	3835	4035	4411	4776	5231	6180	6580	6980	7380				
H3	100	100	100	100	125	125	125	173	183	188	198	228	246	246	246	320	320	380	380	380	450	500				
H4	65	70	70	70	78	77	77	105	105	121	105	105	135	135	135	135	135	135	135	135	135	135				
ETmin	618	718	818	918	1123	1324	1524	1857	2057	2252	2456	2856	3637	3895	4095	4471	4836	5291	6240	6640	7040	7440				
WA	49	49	49	49	49	49	49	68	68	68	68	68	103	119	119	119	119	on demand								
ϕA	„2 × ϕ 13 M10x130“						„4 × ϕ 13 M10x130“			„4 × ϕ 19 M16x190“		„6 × ϕ 19 M16x190“			„6 × ϕ 26 M20x260“			10 × ϕ 35		„10 × ϕ 26 M20 x260“						
ϕArh	-	-	-	-	-	-	-	„2 × ϕ 13 M10x130“														„2 × ϕ 15 M12x160“				
Rev./stroke	38	48	58	68	90	110	130	157	177	198	218	258	ca. 192	ca. 200	ca. 220	ca. 210	ca. 235	ca. 226	ca. 260	ca. 280	ca. 300	ca. 320				

SAFOX[®] F, variant* from SAFOX[®].

With flange, penstock with circular-shaped opening, all-round sealing



SAFOX[®] F DN 1500 front view



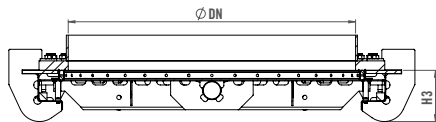
SAFOX[®] F DN 1500 side view



SAFOX[®] F penstock DN 1000 with flange

SPECIAL FEATURES

- **FLANGE**
up to DN 600: flange adapter
from DN 700: fixed flange connection



SAFOX[®] F DN 1500 top view

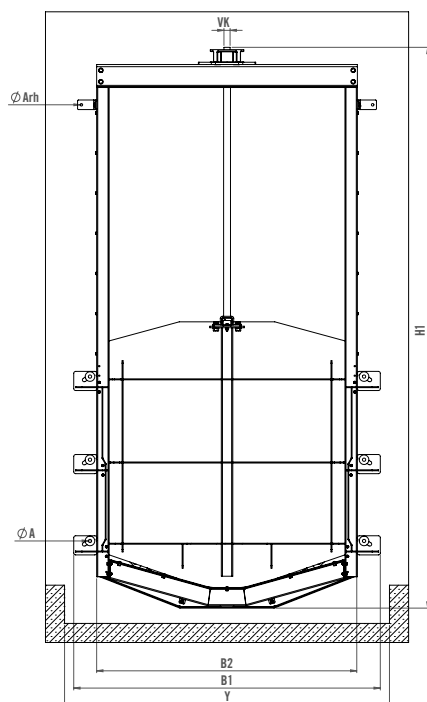
Dimensions in mm

Dimensions for other nominal sizes on request.

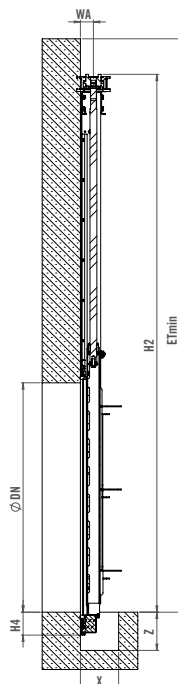
DN	150	200	250	300	400	500	600	700	800	900	1000	1200	1400	1500	1600	1800	2000
B1	412	462	512	562	674	774	874	1070	1170	1304	1404	1604	2038	2138	2238	2462	2638
B2	272	322	372	422	534	634	734	830	930	1064	1164	1364	1730	1830	1930	2150	2330
H1	623	728	828	928	1141	1341	1541	1902	2102	2313	2501	2901	3712	3970	4170	4546	4911
H2	558	658	758	858	1063	1264	1464	1797	1997	2192	2396	2796	3577	3835	4035	4411	4776
H3	100	100	100	100	115	115	115	132	132	132	152	152	246	246	246	246	246
H4	65	70	70	70	78	77	77	105	105	121	105	105	135	135	135	135	135
∅Arh	-	-	-	-	-	-	-	-	-	-	-	„2 × Ø 13 M10x130“			„2 × Ø 15 M12x160“		„2 × Ø 15 M12x160“
Rev./stroke	38	48	58	68	90	110	130	157	177	198	218	258	ca. 192	ca. 200	ca. 220	ca. 210	ca. 235

SAFOX[®] G, Variant* from SAFOX[®]

With smooth sole passage, all-round sealing



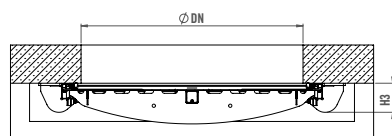
SAFOX[®] G DN 1200 front view



SAFOX[®] G DN 1200 side view



SAFOX[®] G penstock DN 1000
with smooth sole passage



SAFOX[®] G DN 1200 top view

SPECIAL FEATURES

- **SMOOTH SOLE PASSAGE**
Easy concreting into the channel, water flows at the same level as the bottom

Dimensions in mm

Dimensions for other nominal sizes on request.

DN	150	200	250	300	400	500	600	700	800	900	1000	1200
B1	412	462	512	562	674	774	874	1070	1170	1304	1404	1604
B2	272	322	372	422	534	634	734	830	930	1064	1164	1364
H1	623	728	828	928	1141	1341	1541	1902	2102	2313	2501	2901
H2	558	658	758	858	1063	1264	1464	1797	1997	2192	2396	2796
H3	100	100	100	100	115	115	115	132	132	132	152	152
H4	65	70	70	70	78	77	77	105	105	121	105	105
ETmin	618	718	818	918	1123	1324	1524	1857	2057	2252	2456	2856
ØA	„2 × Ø 13 M10x130“				„4 × Ø 13 M10x130“			„4 × Ø 19 M16x190“		„6 × Ø 19 M16x190“		6 × Ø 19
ØArh	-	-	-	-	-	-	-	„2 × Ø 13 M10x130“				
Rev/ stroke	38	48	58	68	90	110	130	157	177	198	218	258
X min	350	350	350	350	350	350	350	450	450	500	550	550
Y min	500	550	600	650	750	850	950	1150	1250	1350	1450	1670
Z min	120	120	120	120	150	150	150	150	150	150	300	300
Ø	240	295	350	400	515	620	725	840	950	1050	1160	1380

*STANDARD DATA: please refer SAFOX[®] penstock



HAILO Professional.

Access technology and access guarding for buildings, shafts, towers and machinery of all kinds

As a reliable project and development partner for customized access technology solutions, we develop, we design and manufacture access technology systems according to your individual requirements. HAILO Professional's extensive portfolio includes fixed ladders, climbing protection systems, manhole covers, service lifts as well as training and other safety-related services.



**Ladder systems for buildings
and access of any kind**



**Complete shaft equipment
systems from one source**



**Service lifts for transporting
personnel and materials**

04/2024 - Subject to technical changes.