Bridge drains

Drainage and remediation of bridges and storey ceilings

ACO bridge drain systems for load classes C 250 and D 400

ACO bridge drain systems

Stringent specifications require well thought out and economic solutions. Bridge drains are an integral part of road surfaces and therefore have to permanently guarantee safe operation and safe road conditions. ACO has expanded its successful bridge drain system product line with the addition of the new Multitop HSD-2 and HSD-5 bridge drains for pre-stressed concrete bridges and reinforced concrete bridges. The focus of ACO's development work on these products was operational safety, minimum maintenance and simple operation.

ACO Multitop bridge drains for pre-stressed concrete bridges and reinforced concrete bridges.

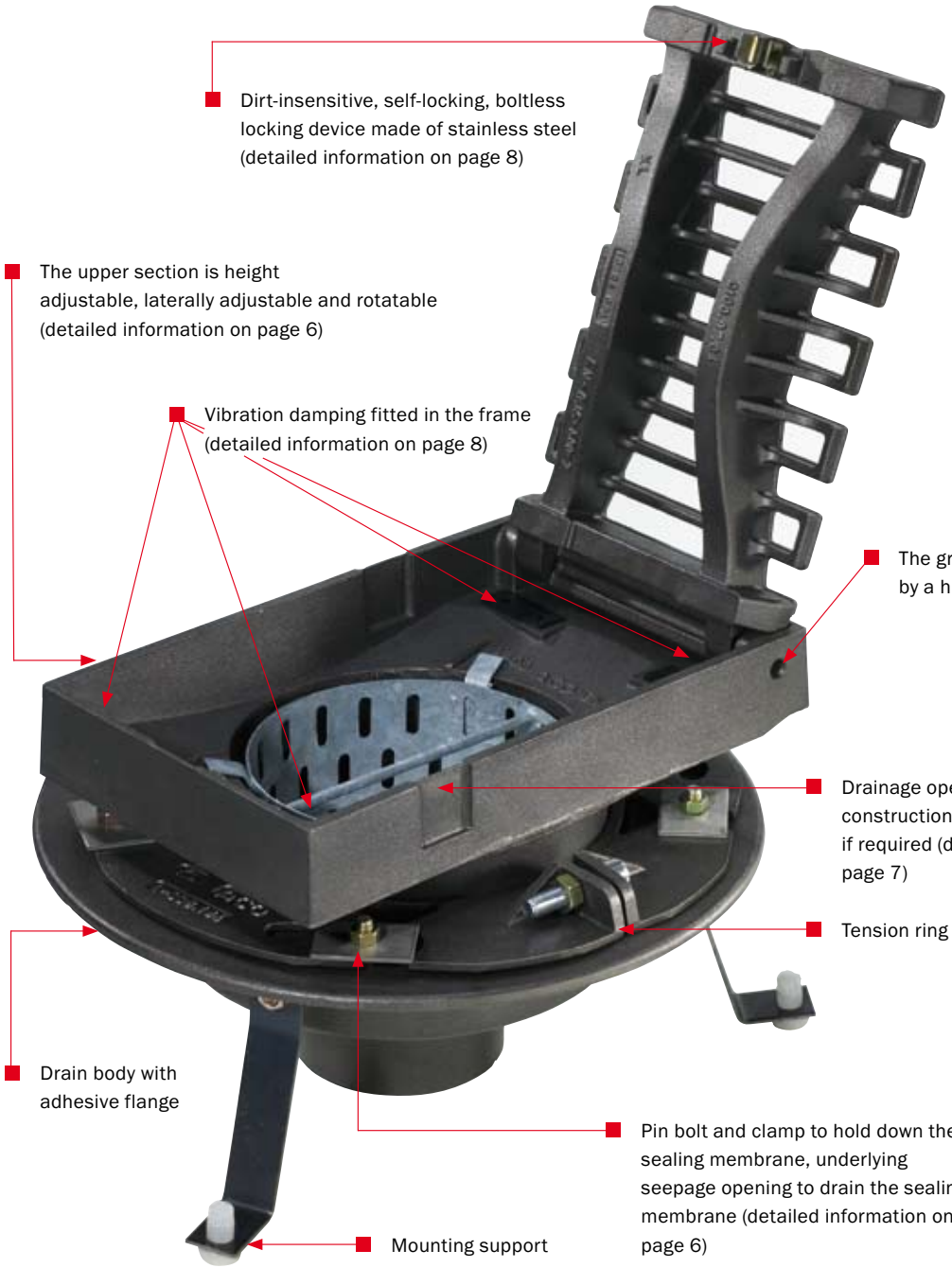
ACO bridge drains for steel bridges

ACO bridge drains for ballast bridges

CONTENTS

ACO bridge drain systems Multitop HSD-2 and HSD-5

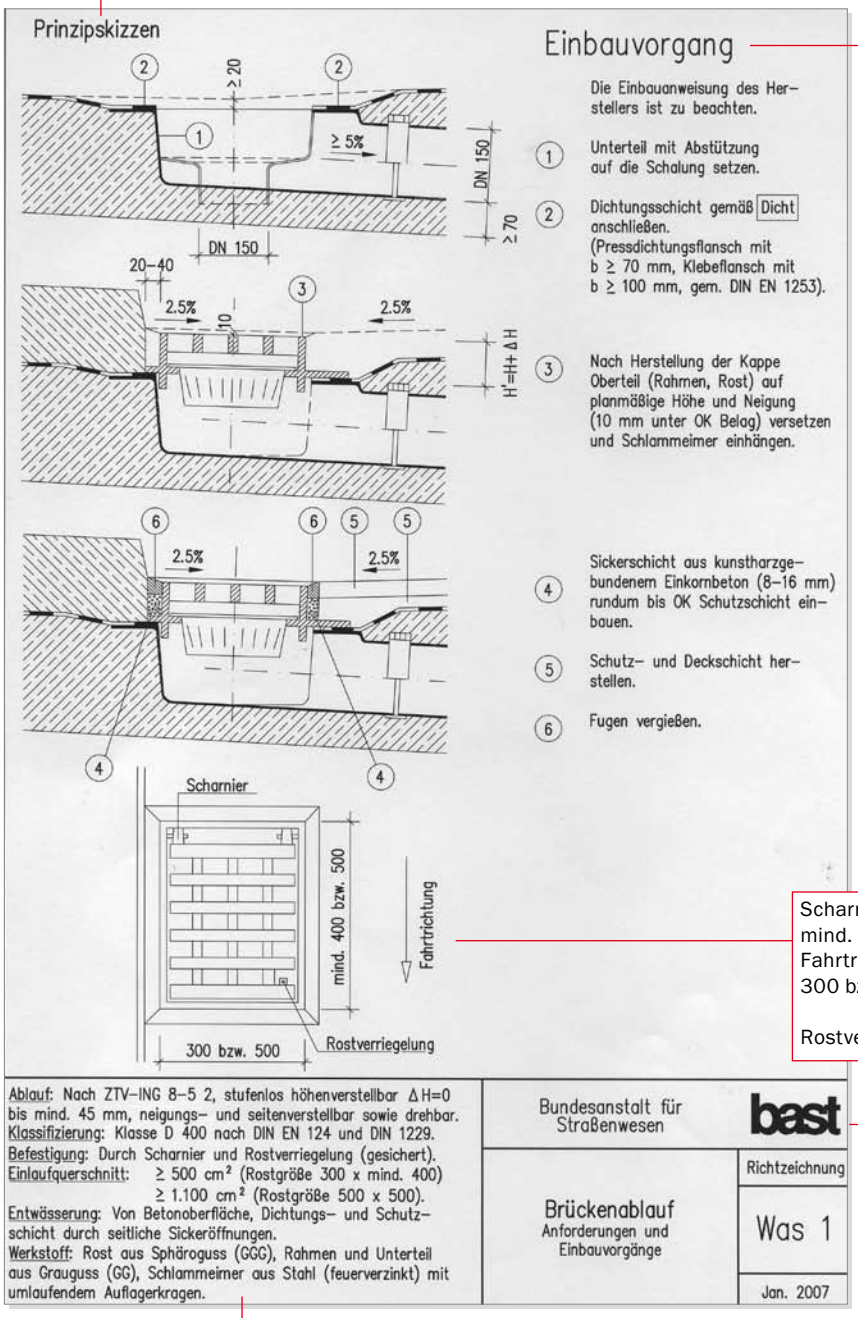
Intelligent details for function and efficiency
Most important product features shown here in the HSD-2 model



Assembly drawing Was 1for draining bridges

Federal Highway Research Institute

Schéma postupu



Montážní postup

Základním pravidlem je dodržování pokynů výrobce (viz. strana 31)

1. Osadit do bednění spodní díl, případně s montážními podpěrami.
2. Napojit izolační vrstvu podle zásad ČSN 73 6242 a TKP 21 na přírubu spodního dílu (u tlakové příruby s b ≥ 70 mm, u lepené příruby s b ≥ 100 mm podle ČSN EN 1253)
3. Po vybetonování římsy osadit horní díl (rám a rošt) na plánovanou výšku (se snížením 10 mm pod horní povrch vozovky) a zavěsit Bucket nečistot.
4. Provést vsakovací vrstvu z drenážního plastbetonu s kamenivem (8-16 mm) kolem celého rámu dokola až po horní povrch ochranné vrstvy izolace.
5. Provést ochrannou a obrusnou (případně i ložnou) vrstvu vozovky.
6. Provést zálivku spáry kolem celého rámu.

Scharnier	kloubový závěs
mind. 400 bzw. 500	min. 400 resp. 500
Fahrtrichtung	směr jízdy
300 bzw. 500	300 resp. 500
	(dle typu odvodňovače)
Rostverriegelung	zajištění roštu

	Montážní výkres
Mostní odvodňovač Požadavky a montážní postupy	Was 1

Vpust: Podle ZTV-ING 8-5 2 případne TP 107, plynule výškově a do stran nastavitelná Δ H=0 až min. 45 mm, nastavitelná do sklonu a do boku a rovněž otočná. Odtok DN 150.
Klasifikace: Třída D 400 podle EN 124.
Upevnění: Zajištění závěsu kloubovým závěsem a zámkem.
Vtokový průřez: ≥ 500 cm² (velikost roštu 300 x min. 400)
≥ 1.100 cm² (velikost roštu 500 x min. 500)
Odvodnění: Z povrchu vozovky, případně i z povrchu říms a bočními vsakovacími otvory z povrchu ochranné a izolační vrstvy vozovky.
Materiál: Rošt z tvárné litiny, rám a spodní díl ze šedé litiny. Bucket nečistot z oceli (žárově pozinkované ponorem) s obvodovým podpěrným límcem.

General information on bridge drainage

Higher specifications are laid down for bridge drainage systems because of the greater risks to traffic and the need to protect expensive infrastructure. The fast and effective removal of surface water enhances traffic safety. Drainage which functions perfectly at all times also has a positive effect on the service life and maintenance costs of engineering structures.

- The traffic surface must be optimally drained, i.e. quickly and trouble-free, to prevent the risk of aquaplaning and the formation of ice.
- The bridge structure must be protected from the penetration of damp and chlorine, and oil and petrol contaminated surface water, to prevent damage to the structure.
- To prevent frost damage, the traffic lane surface must be free of standing water.
- The bridge drains, whose tops are part of a road surface, must be able to cope with the traffic loads on the bridge. They must be permanently traffic-safe and operationally-secure.

To avoid blockages, bridge drains must prevent coarse debris from entering the drain pipes.

In addition, bridge drains also have to match the special features of each bridge construction, such as reinforced concrete bridges and pre-stressed concrete bridges, or steel bridges, as well as special construction methods, e.g. timed shifting.

Bridge drains specially designed for each area of application have been developed to satisfy these many criteria. To ensure that the optimum hydraulic performance is achieved, bridge drains are usually

installed on the road directly in front of the bridge top (guard rail).
This is analogous to installation along the kerb of a conventional road - an installation site classified as class C 250 pursuant to DIN EN 124. However, bridge drains on road bridges are classified as class D 400 as shown in assembly drawing Was 1 (see page 4). This is because, unlike normal roads, the road surfaces on bridges have much shorter service lives and therefore require more maintenance and remediation.

During the remediation work to renew the road covering on bridges, the traffic in both directions is forced to go over one half of the bridge. To accommodate the traffic, the road lanes are made much narrower, causing traffic to regularly drive along the road gutters which therefore also have to bear the weight of HGVs which preferentially drive along the inside lane. This is why bridge drains on road bridges are classified as D 400 according to DIN EN 124.

Regulation Was 0 issued by the Federal Highway Research Institute (Bundesanstalt für Straßenwesen) defines the general specifications for draining bridges. The minimum specifications for bridge drains and the criteria for their installation in pre-stressed and reinforced concrete bridges are defined in the assembly drawing Was 1 “Bridge drain specifications and installation procedures”. The relevant assembly drawing for bridge drains in steel bridges is Was 4, sheet 1 “Bridge drains in orthotropic bridge floors with bituminous surfaces” and Was 4, sheet 2: “Bridge drains in orthotropic bridge floors with epoxy resin-bound thin road surfaces.”

Bridge drains therefore have to satisfy the following criteria:

- They have to comply with class D 400 pursuant to DIN EN 124.
- The grating must be firmly attached to the frame by a hinge.
- The gratings must be locked to prevent unauthorised opening.
- Lateral seepage openings must guarantee proper drainage of the sealing and protective layer.

Criteria to be fulfilled by bridge drains depending on the specific structure and construction method

Basic criteria for bridge drains in pre-stressed or reinforced concrete bridges

Installation and construction principles are defined in assembly drawing Was 1 issued by the Federal Highway Research Institute.

- Drains must consist of two pieces, a lower part and an upper part.
- The lower part must guarantee the fully functioning connection of a sealing membrane pursuant to DIN EN 1253. They therefore usually have a min. 100 mm wide adhesive flange.
- The sealing membrane is also clamped into position to achieve optimal sealing. This is only successful, however, if the details are properly designed.

The following negative examples are unfortunately still seen in practise today:

A drain with screws in the piping means complete sealing is impossible.

Because the bolt goes right through the flange, long-term safe sealing is impossible.

In our Multitop HSD-2/HSD-5 bridge drains, all of these details are designed to guarantee compliance with the regulations.

Bolt in the flange with a blind hole: safe, long-term sealing can be guaranteed because there is no hole going right through the flange.

- Seepage openings must guarantee proper drainage of the sealing and protective layer.

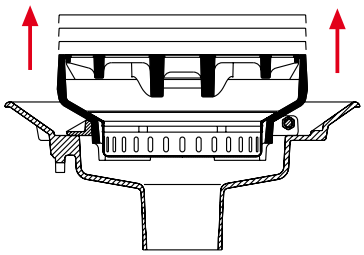
Detail of a Multitop HSD-2 bridge drain: adhesive flange and tension ring with seepage openings to clamp in the sealing membrane.

- The grating must be hinged and locked in the flange to prevent unauthorised opening.

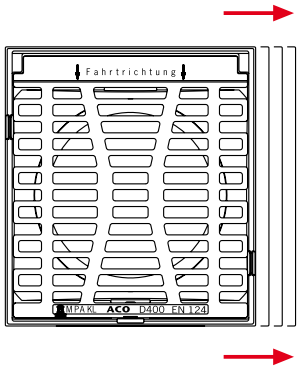
Broken hinge pins in built-in Multitop bridge drains can be easily replaced without damaging the drain or digging up the road surface.

- The upper part must be height-adjustable to ensure that it can be installed flush with the road surface. It must also be optimally aligned to the edge of the traffic lane (bridge top), and must therefore also be laterally adjustable and rotatable. Bridge drain systems Multitop HSD-2 and HSD-5 fully comply with these criteria.

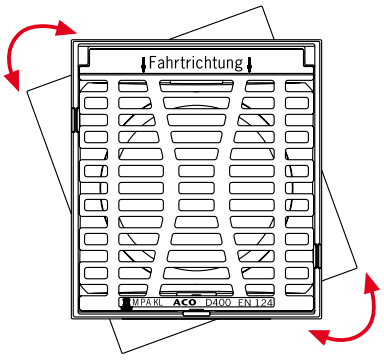
Basic specifications for HSD bridge drains



H = = infinitely height adjustable



S = laterally adjustable



D = rotatable

Other areas of application for Multitop bridge drains

Because of the outstanding features described on the previous page, Multitop bridge drains are also ideal for draining civil engineering structures subject to heavy loads, e.g. tunnels: see also assembly drawing TWS 4 and TWS 5 issued by the Federal Highway Research Institute. They can also be used for multi-storey car parks, trade fair buildings, etc., as well as for the two-level drainage of storey ceilings. Drainage is also sometimes necessary during the construction phase itself depending on the construction progress in the phases prior to the laying of the surface covering. The construction phase drainage openings in Multitop bridge drains are closed when delivered. This means that no jointing material can penetrate the drain when the joints are poured.

Knocking open the hole for construction phase drainage

Opened construction phase drain hole can be closed if required using the sealing plate, Article No. 67308.

In the case of steel and pre-stressed concrete bridges constructed using the timed shifting method, the discharge outlet of the bridge drains has to be installed at a later date.
Drains with Article No.s 4979.38, 4979.33 and 4907.33 on page 16 and 22 satisfy these special criteria.

Basic criteria for bridge drains in steel and ballast bridges

Steel bridges

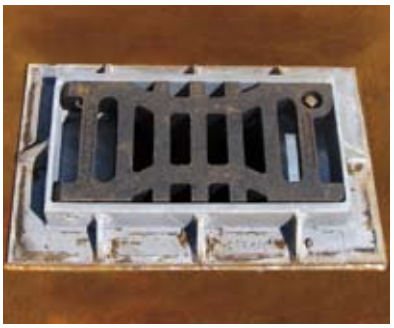
The drain housings have to be made of steel so that the drain body can be welded to the bridge structure (see page 23).

Ballast bridges

A rim is required to butt against the surrounding protective screed. Different grating slot widths are available depending on the type of ballast (see page 24).

Bridge remediation

During bridge remediation work, only the upper parts of bridge drains are usually replaced. Either standardised drain upper sections are used (system HSD-2/ HSD-5) or customised upper parts designed for the specific structure. In the latter case, our specialists are available for intense consultation.



Conditions to be satisfied for more efficient operations

- Minimum maintenance effort
- Permanent functional and operational safety

Maintenance: an important cost factor

The buckets in bridge drains are smaller than in normal road drains because the drain bodies are tailored to the special requirements of bridge engineering. This also makes the maintenance intervals shorter. Fast simple maintenance therefore cuts maintenance costs significantly and reduces traffic hold-ups.
One of the most time consuming aspects of cleaning drains in the past is the operation and maintenance of dirty and therefore non-functioning poorly accessible locking bolts.
Multitop bridge drains have dirt-insensitive self-locking boltless stainless steel locking devices which reduce the time for opening and closing the gratings to a minimum. These locks have an excellent record and have been used for many years in Multitop top sections.

Dirt-insensitive, self-locking, boltless stainless steel locking mechanisms

Operation

Simple, fast opening

Stable, user-friendly position of the opened grating thanks to wide opening angle of 110°

Simple, fast closing

No compromises in operational safety, and stable position of the grating

All Multitop bridge drains have cushioning insert in the frames.
This new principle already has a very successful track record in road drain top sections.
The cushioning insert are generously dimensioned. The large bearing surface of the grating gives rise to minor surface compression. This guarantees proper long-term functioning and abolishes rattle. In addition, the elastomer inserts are positioned permanently in the frame in enclosed chambers. There is therefore no danger that the cushioning insert can be torn out during maintenance work when e.g. removing the bucket.

ACO Multitop bridge drains are equipped with cushioning insert

Functional and operational safety Economics versus road safety.

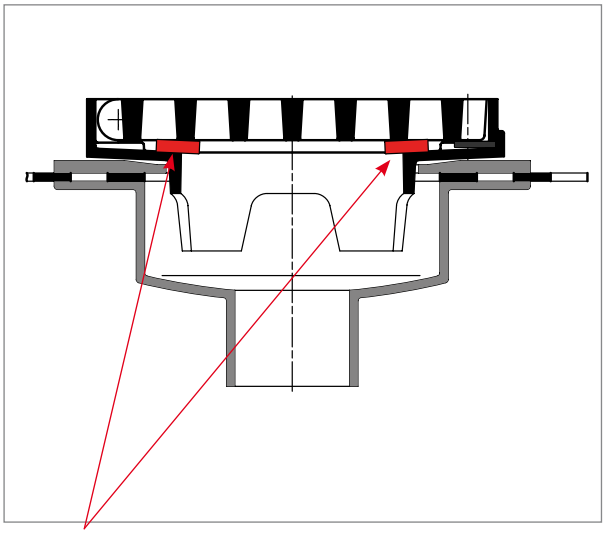
A large inlet section is no guarantee for good hydraulic performance! Economics rules the day: therefore, there is an unwise trend to use large inlet sections as an excuse to reduce the number of bridge drains on a given structure. This often fails to take into consideration the special technical features of bridges.

The installation height of bridge drains is limited by the thin road surface above the sealing membrane. If as a consequence, the widths of the slot are very large in comparison to the open cross-sections between the base of the grating crosspieces and the housing, it is possible for large parts of the drain to become blocked after a short time. As a consequence, only a small part of the inlet section assumed in the planning is actually available to drain the water. This can cause aquaplaning.

Another consequence: even shorter maintenance intervals to prevent serious blockage.

Cutting costs during construction in this case gives rise to an unproportionally high degree of maintenance expenditure and traffic restrictions during maintenance work.

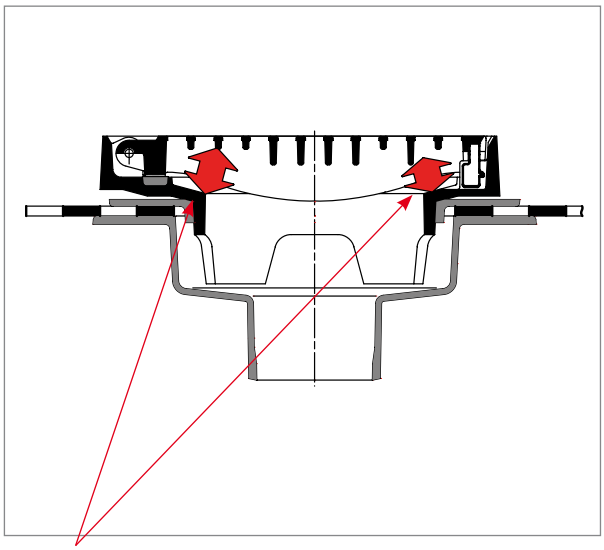
Despite the large inlet section, the gaps between the base of the grating crosspieces and the housings are often small and can quickly block up large parts of the drain.



Small gaps beneath the grating crosspieces

The solution

ACO Multitop bridge drains have optimal hydraulic performance. The slot geometry and the spaces beneath the grating crosspieces are optimally matched.



No restriction between the grating crosspieces and the housing

ACO bridge drains Multitop HSD-2 and HSD-5

Special criteria demand intelligent, economic solutions

The Multitop bridge drains guarantee high economic efficiency thanks to minimum maintenance costs and high operational and functional safety:

- Upper part infinitely height adjustable, laterally adjustable and rotatable (HSD)
- Dirt-insensitive, self-locking boltless stainless steel locking mechanism
- All round closed frame made of cast iron
- Break-out openings for construction phase drainage
- Optimised hydraulics

Drains for pre-stressed concrete bridges and reinforced concrete bridges, HSD-2

ACO bridge drain Multitop HSD-2
Nominal size 300 x 500, cast iron
Class D 400 pursuant to DIN EN 124/DIN 1229

Figure shows Article No. 4979.28.00
Article corresponds to assembly drawing Was 1

These drains consist of a lower part and an upper part with a grating, bucket and tension ring. The upper part can be eccentrically rotated in every direction and is laterally adjustable by 10 mm with respect to the lower part. The lower part is concreted in to the structure of the bridge. The broad adhesive flange in the lower part is designed for safe and secure gluing to the sealing membrane. Multitop HSD-2 drains designed for clamping-in sealing membranes can accommodate sealing membranes up to max. 12 mm thick. If this specification is too small, the customised clamping thickness should be requested specially when ordering the drains.

The upper part is infinitely adjustable in the range from 85 – 160 mm (standard range I). Customised drains with higher height adjustable ranges can be supplied upon request.
The tension ring holds the upper part at the set height and inclination when the surface is laid. It is supported by the lower part. The tension ring has seepage openings to drain the sealing membrane.

There are also HSD-2 drains with stainless steel drain outlets specially designed for retrofitting – these are ideal for bridges with road surfaces constructed using formwork.
The drains also have to comply with additional criteria depending on the bridge construction method and technical progress.

A number of variations have therefore been developed on the basis of assembly drawing Was 1, e.g.:

- Upper parts with larger height adjustable ranges or as class D 400 top sections for bridge remediation work
- Buckets with variable volume depending on the installation depth

Detailed product descriptions and specifications are given on pages 12 to 16.

Drains for pre-stressed concrete bridges and reinforced concrete bridges, HSD-5

ACO bridge drain Multitop HSD-5
Nominal dimensions 500 x 500, cast iron
Class D 400 pursuant to DIN EN 124/DIN 1229

Figure shows Article No. 4907.28.00
Article corresponds to assembly drawing Was 1

These drains consist of a lower and an upper part.
Unlike HSD-2, these drains have the following special features:

- HSD-5 drains intended for use with clamped sealing membranes can accommodate sealing membranes with thicknesses up to max. 14 mm.
- The upper part can be moved eccentrically in every lateral direction by 25 mm with respect to the lower part.

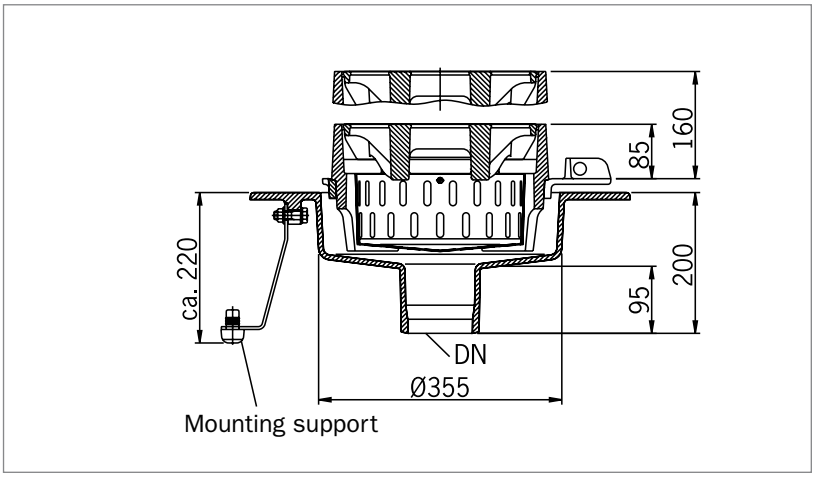
Upper part model with a tension ring
HSD-5 drains with upper parts infinitely adjustable within the range 95 – 140 mm are available for bridges with thicker road surfaces. The tension ring has seepage openings to drain the sealing membrane and the bridge surface. Customised drains with higher height adjustable ranges are available upon request.

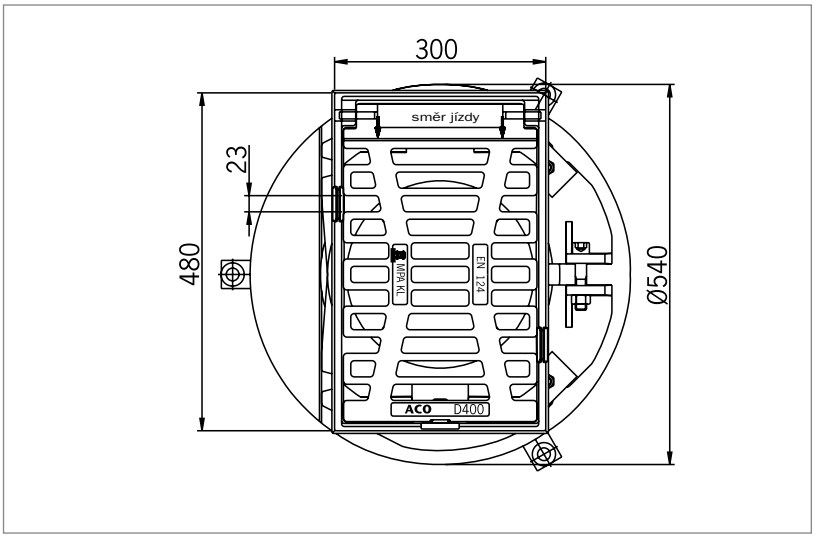
Upper part model with a reversible supporting ring
Drains adjustable in two stages (70 or 80 mm) have been developed for bridges with thin road surfaces. The upper part lies on a special supporting ring with seepage openings to drain the sealing membrane and the road surface on the bridge. This model has no tension ring.

Detailed product descriptions and specifications are given on pages 18 to 22.

ACO bridge drain Multitop HSD-2, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253, with a tension ring to clamp in the sealing membrane





Product details

Outlet	Art.-No.	Order No.	Adjustable H [mm]	Bucket	Weight [kg]
DN 100 vertical	**4979.08.00**	89321	Range 1	normal	71
	4979.08.05	89308	85-160	Vario	72
	4979.08.01	89306	Range 2	normal	79
	4979.08.06	89309	160-235	Vario	80
	4979.08.02	89307	Range 3	normal	93
	4979.08.07	89310	235-500	Vario	94
DN 150 vertical	**4979.28.00**[1)]	89328	Range 1	normal	71
	4979.28.05[1)]	89331	85-160	Vario	72
	4979.28.01[1)]	89329	Range 2	normal	79
	4979.28.06[1)]	89332	160-235	Vario	80
	4979.28.02[1)]	89330	Range 3	normal	93
	4979.28.07[1)]	89333	235-500	Vario	94

[1)] Article corresponds to assembly drawing Was 1

Specifications/product description

Bridge drain Multitop HSD-2 pursuant to Was 1, nominal dimensions 300 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

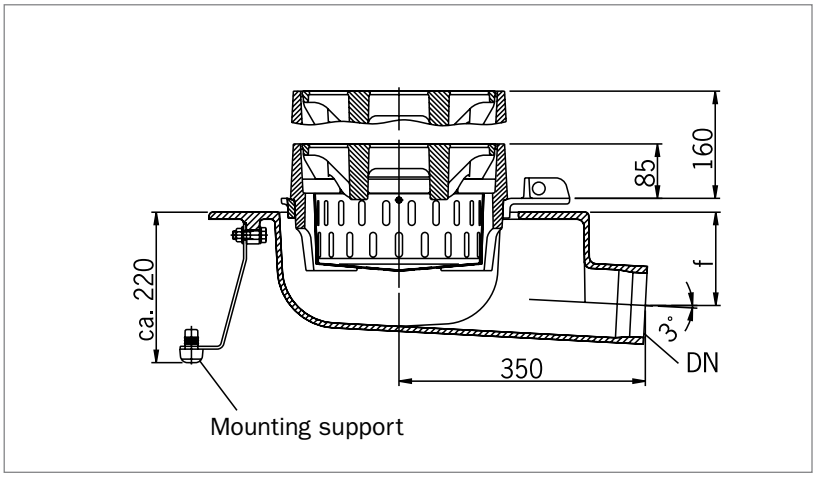
With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with outlet socket DN 100/150* vertical, tension ring bolted to drain body, tension ring with seepage openings, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required, infinitely height adjustable within the range 85-160 mm*, infinitely height adjustable within the range 160-235 mm*, infinitely height adjustable within the range 235-500 mm*, laterally adjustable and inclination adjustable, rotatable, grating with hinge max. 110° opening angle, slot width 23 mm, inlet section 523 cm², hot-dip galvanised steel bucket, volume: 5 l
Weight and **Article No.** (see table)
Alternative:
Hot-dip galvanised steel Vario bucket, Volume: up to 7.2 l
(depending on the installation height of the upper part)

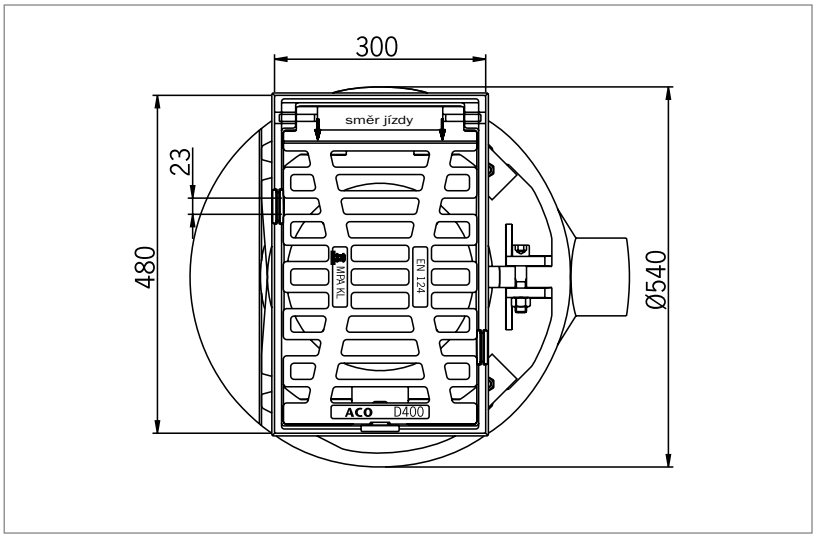
*Please select the correct tender specifications text

Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

ACO bridge drain Multitop HSD-2, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253, with a tension ring to clamp in the sealing membrane





Specification/product description

Bridge drain Multitop HSD-2 pursuant to Was 1, nominal dimensions 300 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with outlet socket DN 100/150* lateral, tension ring bolted to drain body, tension ring with seepage openings, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required, infinitely height adjustable within the range 85-160 mm*, infinitely height adjustable within the range 160-235 mm*, infinitely height adjustable within the range 235-500 mm*, laterally adjustable and inclination adjustable, rotatable, grating with hinge max. 110° opening angle, slot width 23 mm, inlet section 523 cm^2, hot-dip galvanised steel bucket, volume: 5 l
Weight and **Article No.** (see table)
Alternative:
Hot-dip galvanised steel Vario bucket, Volume: up to 7.2 l
(depending on the installation height of the upper part)

*Please select the correct tender specifications text

Product details

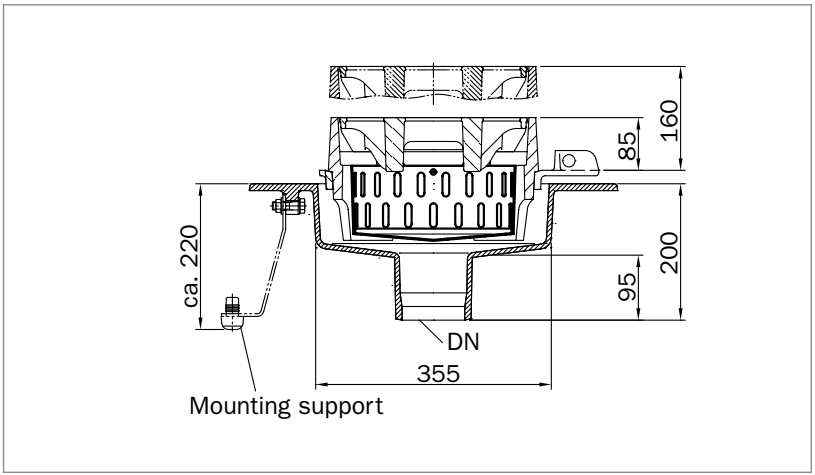
Outlet	Dimens. f [mm]	Art.-No.	Order No.	Adjustable H [mm]	Bucket	Weight [kg]
DN 100 lateral	135	**4979.58.00**	89352	Range 1	normal	74
		4979.58.05	89355	85-160	Vario	75
		4979.58.01	89353	Range 2	normal	83
		4979.58.06	89356	160-235	vario	84
		4979.58.02	89354	Range 3	normal	97
		4979.58.07	89357	235-500	vario	98
DN 150 lateral	110	**4979.78.00**[1)]	89364	Range 1	normal	73
		4979.78.05[1)]	89367	85-160	Vario	74
		4979.78.01[1)]	89365	Range 2	normal	83
		4979.78.06[1)]	89368	160-235	vario	84
		4979.78.02[1)]	89366	Range 3	normal	96
		4979.78.07[1)]	89369	235-500	vario	97

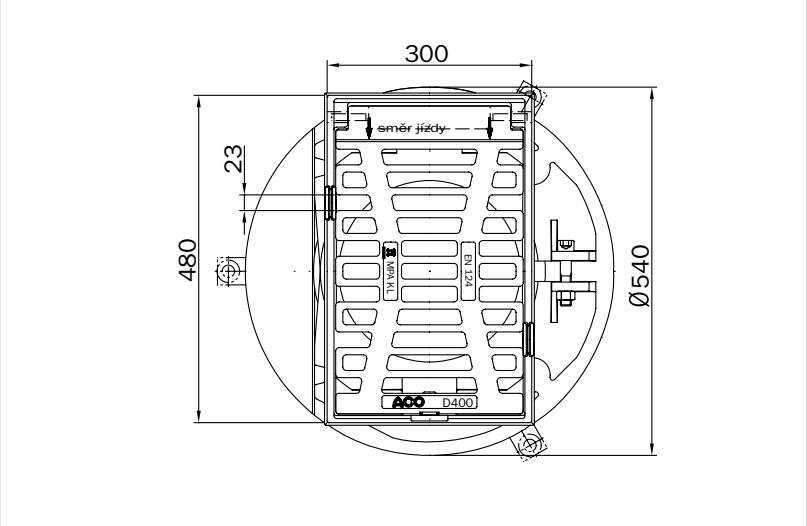
[1)] Article corresponds to assembly drawing Was 1

Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

ACO bridge drain Multitop HSD-2, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253





Specification/product description

Bridge drain Multitop HSD-2 pursuant to Was 1, nominal dimensions 300 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with outlet socket DN 100/150* vertical, tension ring with seepage openings, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required, infinitely height adjustable within the range 85-160 mm*, infinitely height adjustable within the range 160-235 mm*, infinitely height adjustable within the range 235-500 mm*, laterally adjustable and inclination adjustable, rotatable, grating with hinge max. 110° opening angle, slot width 23 mm, inlet section 523 cm², hot-dip galvanised steel bucket, volume: 5 l
Weight and **Article No**. (see table)
Alternative:
Hot-dip galvanised steel Vario bucket, Volume: up to 7.2 l
(depending on the installation height of the upper part)

*Please select the correct tender specifications text

Product details

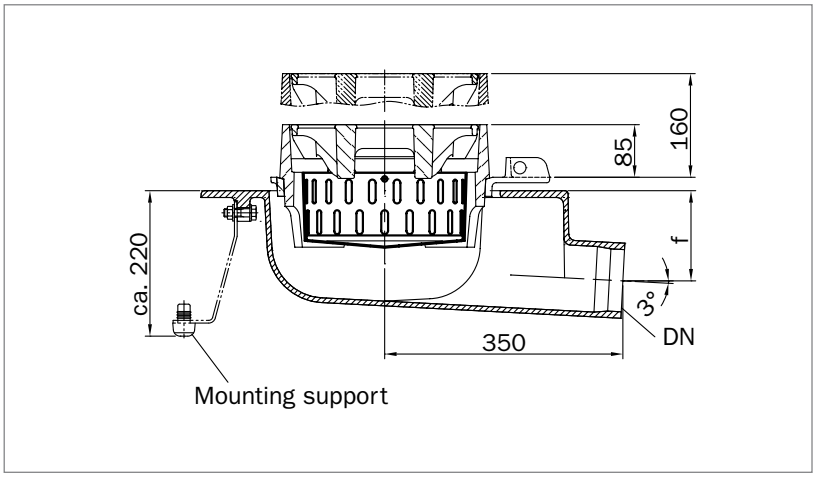
Outlet	Art.-No.	Order No.	Adjustable H [mm]	Bucket	Weight [kg]
DN 100 vertical	**4979.03.00**	89320	Range 1	normal	71
	4979.03.05	89303	85-160	Vario	72
	4979.03.01	89301	Range 2	normal	79
	4979.03.06	89304	160-235	Vario	80
	4979.03.02	89302	Range 3	normal	93
	4979.03.07	89305	235-500	Vario	94
DN 150 vertical	**4979.23.00**[1)]	89322	Range 1	normal	71
	4979.23.05[1)]	89325	85-160	Vario	72
	4979.23.01[1)]	89323	Range 2	normal	79
	4979.23.06[1)]	89326	160-235	Vario	80
	4979.23.02[1)]	89324	Range 3	normal	93
	4979.23.07[1)]	89327	235-500	Vario	94

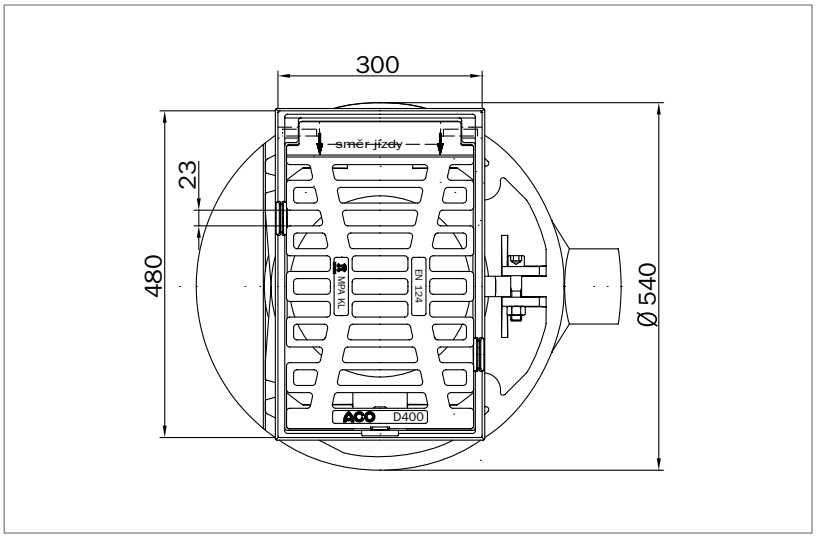
[1)] Article corresponds to assembly drawing Was 1

Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

ACO bridge drain Multitop HSD-2, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253





Specification/product description

Bridge drain Multitop HSD-2 pursuant to Was 1, nominal dimensions 300 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with outlet socket DN 100/150* lateral, tension ring with seepage openings, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required, infinitely height adjustable within the range 85-160 mm*, infinitely height adjustable within the range 160-235 mm*, infinitely height adjustable within the range 235-500 mm*, laterally adjustable and inclination adjustable, rotatable, grating with hinge max. 110° opening angle, slot width 23 mm, inlet section 523 cm^2, hot-dip galvanised steel bucket, volume: 5 l
Weight and **Article No**. (see table)
Alternative:
Hot-dip galvanised steel Vario bucket, Volume: up to 7.2 l
(depending on the installation height of the upper part)

*Please select the correct tender specifications text

Product details

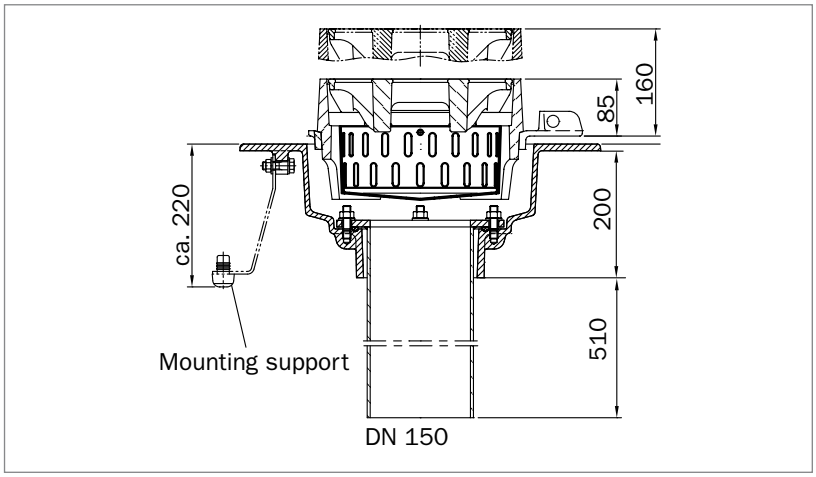
Outlet	Dimens. f [mm]	**Art.-No.**	Order No.	Adjustable H [mm]	Bucket	Weight [kg]
DN 100 lateral	135	**4979.53.00**	89346	Range 1	normal	74
		4979.53.05	89349	85-160	Vario	75
		4979.53.01	89347	Range 2	normal	83
		4979.53.06	89350	160-235	vario	84
		4979.53.02	89348	Range 3	normal	97
		4979.53.07	89351	235-500	vario	98
DN 150 lateral	110	**4979.73.00**[1)]	89358	Range 1	normal	73
		4979.73.05[1)]	89361	85-160	Vario	74
		4979.73.01[1)]	89359	Range 2	normal	83
		4979.73.06[1)]	89362	160-235	vario	84
		4979.73.02[1)]	89360	Range 3	normal	96
		4979.73.07[1)]	89963	235-500	vario	97

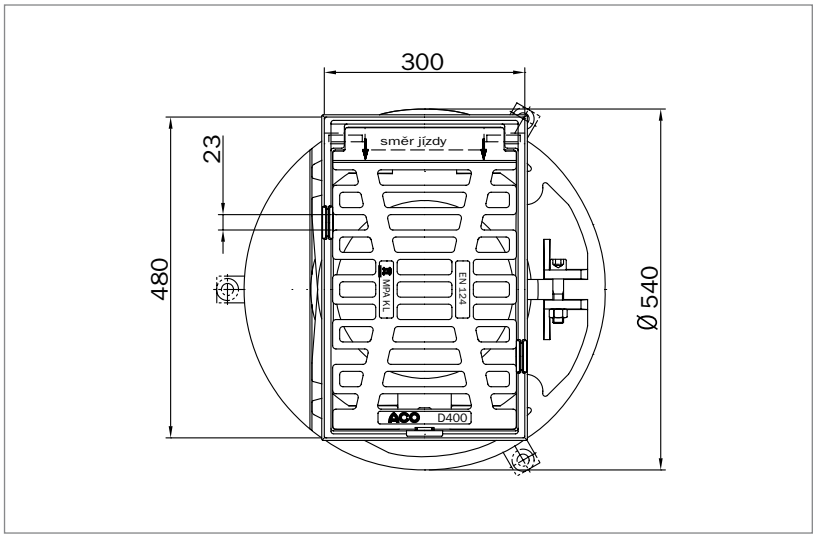
[1)] Article corresponds to assembly drawing Was 1

Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

ACO bridge drain Multitop HSD-2, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253, with inset outlet





Specification/product description

Bridge drain Multitop HSD-2, nominal dimensions 300 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with inset outlet DN 150 made of stainless steel, material number 1.4571, tension rind bolted*/not bolted* to the drain body, tension ring with seepage openings, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required, infinitely height adjustable within the range 85-160 mm*, infinitely height adjustable within the range 160-235 mm*, infinitely height adjustable within the range 235-500 mm*, laterally adjustable and inclination adjustable, rotatable, grating with hinge max. 110° opening angle, slot width 23 mm, inlet section 523 cm², hot-dip galvanised steel bucket, volume: 5 l
Weight and **Article No.** (see table)
Alternative:
Hot-dip galvanised steel Vario bucket, Volume: up to 7.2 l
(depending on the installation height of the upper part)

*Please select the correct tender specifications text

Product details

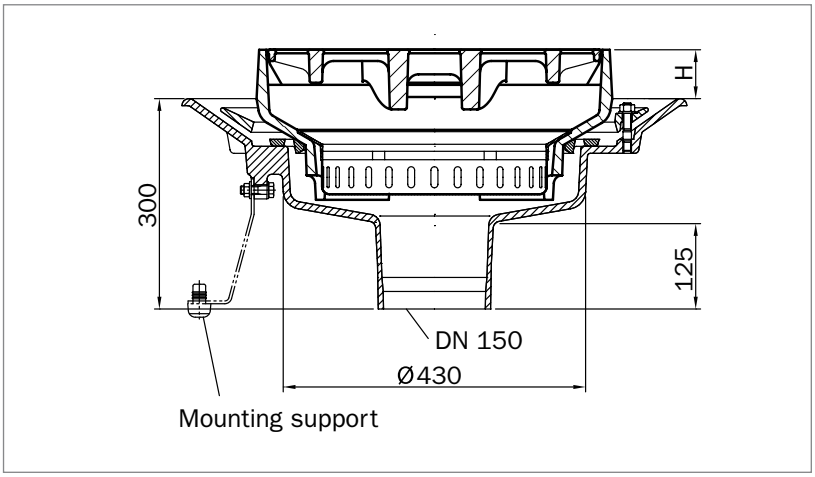
Outlet	Art.-No.	Order No.	Adjustable H [mm]	Bucket	Weight [kg]
DN 150 tension ring bolted	**4979.38.00**	89340	Range 1	normal	68
	4979.38.05	89343	85-160	Vario	67
	4979.38.01	89341	Range 2	normal	76
	4979.38.06	89344	160-235	Vario	77
	4979.38.02	89342	Range 3	normal	80
	4979.38.07	89345	235-500	Vario	81
DN 150 tension ring not bolted	**4979.33.00**	89334	Range 1	normal	67
	4979.33.05	89337	85-160	Vario	68
	4979.33.01	89335	Range 2	normal	75
	4979.33.06	89338	160-235	Vario	76
	4979.33.02	89336	Range 3	normal	79
	4979.33.07	89339	235-500	Vario	80

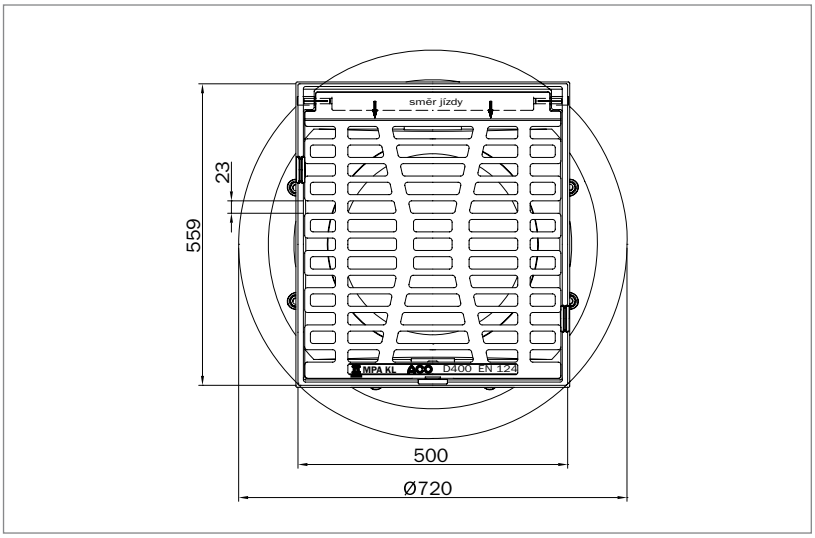
Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

Notes

ACO bridge drain Multitop HSD-5, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253, with a flange ring to clamp in the sealing membrane





Specification/product description

Bridge drain Multitop HSD-5 pursuant to Was 1, nominal dimensions 500 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with outlet socket DN 150 vertical, with flange ring to clamp down the sealing membrane, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required,

* With reversible supporting ring, with seepage openings
* Stepped height adjustment, H = 70 – 80 mm (range 1)
* Laterally adjustable, rotatable
** With tension ring, with seepage openings
** Infinitely height adjustable in the range from H = 95 – 140 mm (range 2)
** Laterally adjustable and inclination adjustable, rotatable

Grating with hinge max. opening angle 110°, slot width 23 mm, inlet section 1121 cm^2, hot-dip galvanised steel bucket, volume: 7.2 l,
Weight and **Article No.** (see table)

**Alternative model corresponding to *, please select the appropriate tender specifications

Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

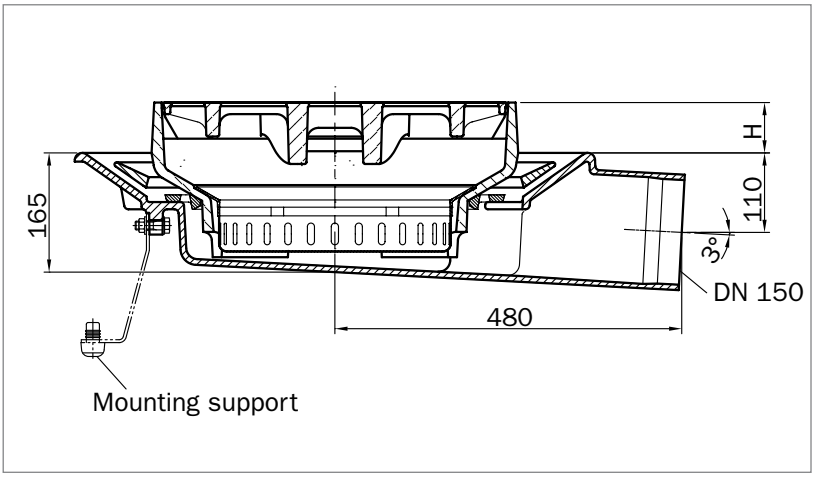
Product details

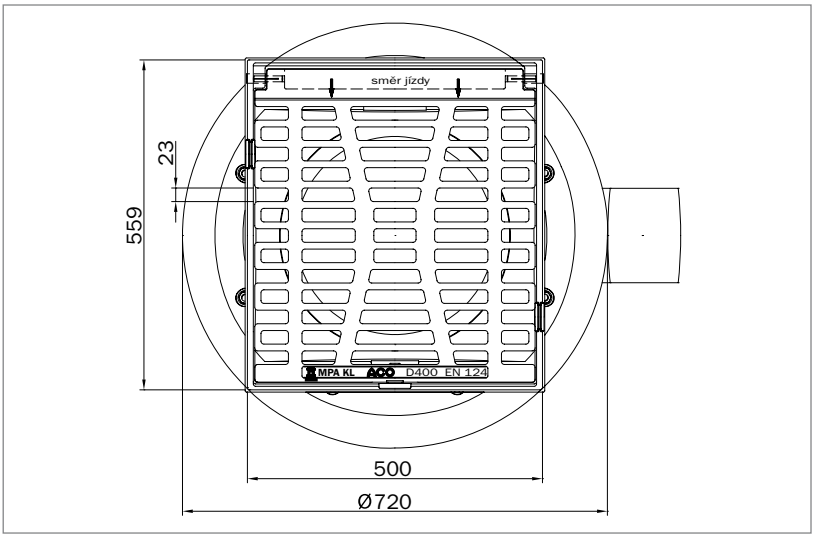
Art.-No.	Order No.	Adjustment range H [mm]	Weight [kg]
4908.28.00	89317	Range 1 70/80 mm	129
4907.28.00[1)]	89312	Range 2 95 – 140 mm	130

[1)] Article corresponds to assembly drawing Was 1

ACO bridge drain Multitop HSD-5, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253, with a flange ring to clamp in the sealing membrane





Specification/product description

Bridge drain Multitop HSD-5 pursuant to Was 1, nominal dimensions 500 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with outlet socket DN 150 lateral, with flange ring to clamp down the sealing membrane, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required,

* With reversible supporting ring, with seepage openings
* Stepped height adjustment, H = 70 – 80 mm (range 1)
* Laterally adjustable, rotatable
** With tension ring, with seepage openings
** Infinitely height adjustable in the ange from H = 95 – 140 mm (range 2)
** Laterally adjustable and inclination adjustable, rotatable

Grating with hinge max. opening angle 110°, slot width 23 mm, inlet section 1121 cm^2, hot-dip galvanised steel bucket, volume: 7.2 l,
Weight and **Article No.** (see table)

**Alternative model corresponding to *, please select the appropriate tender specifications

Product details

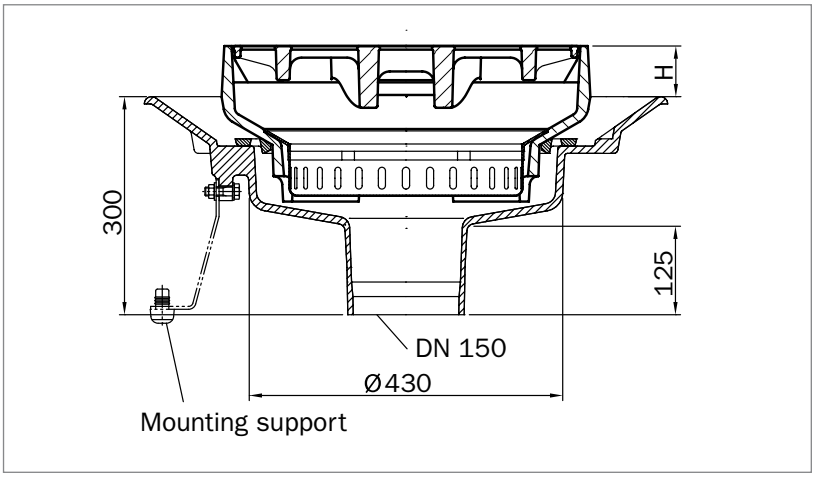
Art.-No.	Order No.	Adjustment range H [mm]	Weight [kg]
4908.78.00	89319	Range 1 70/80 mm	135
4907.78.00[1)]	89315	Range 2 95 – 140 mm	136

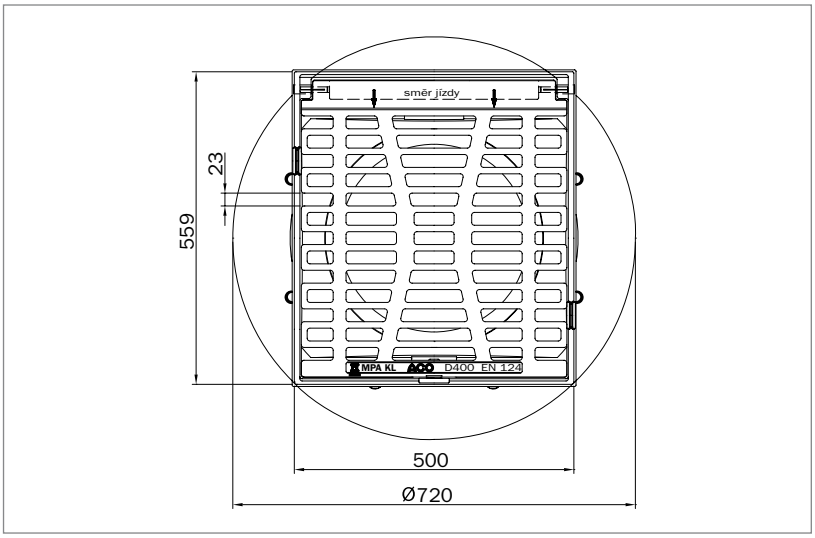
[1)] Article corresponds to assembly drawing Was 1

Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

ACO bridge drain Multitop HSD-5, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253





Specification/product description

Bridge drain Multitop HSD-5 pursuant to Was 1, nominal dimensions 500 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with outlet socket DN 150 vertical, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required,

* With reversible supporting ring, with seepage openings
* Stepped height adjustment, H = 70 – 80 mm (range 1)
* Laterally adjustable, rotatable
** With tension ring, with seepage openings
** Infinitely height adjustable in the range from H = 95 – 140 mm (range 2)
** Laterally adjustable and inclination adjustable, rotatable

Grating with hinge max. opening angle 110°, slot width 23 mm, inlet section 1121 cm^2, hot-dip galvanised steel bucket, volume: 7.2 l,
Weight and **Article No.** (see table)

**Alternative model corresponding to *, please select the appropriate tender specifications

Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

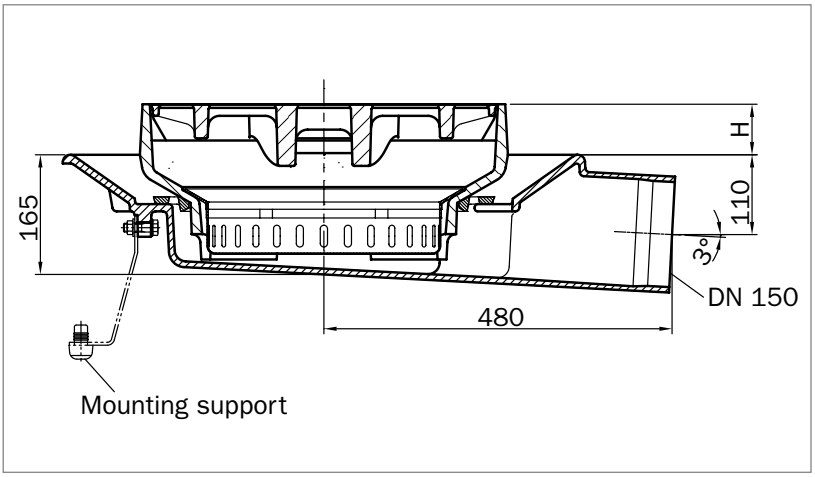
Product details

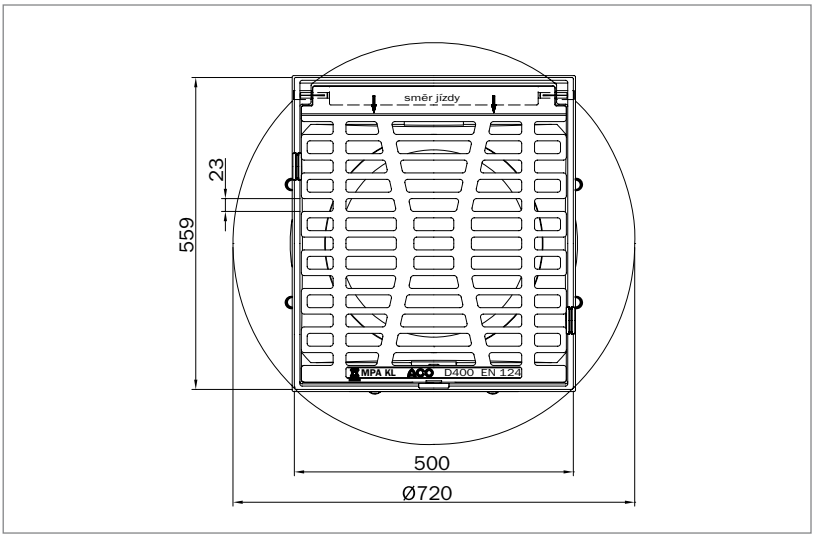
Art.-No.	Order No.	Adjustable H [mm]	Weight [kg]
4908.23.00	89316	Range 1 70/80 mm	121
4907.23.00[1)]	89311	Range 2 95 – 140 mm	122

[1)] Article corresponds to assembly drawing Was 1

ACO bridge drain Multitop HSD-5, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253





Specification/product description

Bridge drain Multitop HSD-5 pursuant to Was 1, nominal dimensions 500 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with outlet socket DN 150 lateral, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required,

* With reversible supporting ring, with seepage openings
* Stepped height adjustment, H = 70 – 80 mm (range 1)
* Laterally adjustable, rotatable
** With tension ring, with seepage openings
** Infinitely height adjustable in the range from H = 95 – 140 mm (range 2)
** Laterally adjustable and inclination adjustable, rotatable

Grating with hinge max. opening angle 110°, slot width 23 mm, inlet section 1121 cm^2, hot-dip galvanised steel bucket, volume: 7.2 l,
Weight and **Article No**. (see table)

**Alternative model corresponding to *, please select the appropriate tender specifications

Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

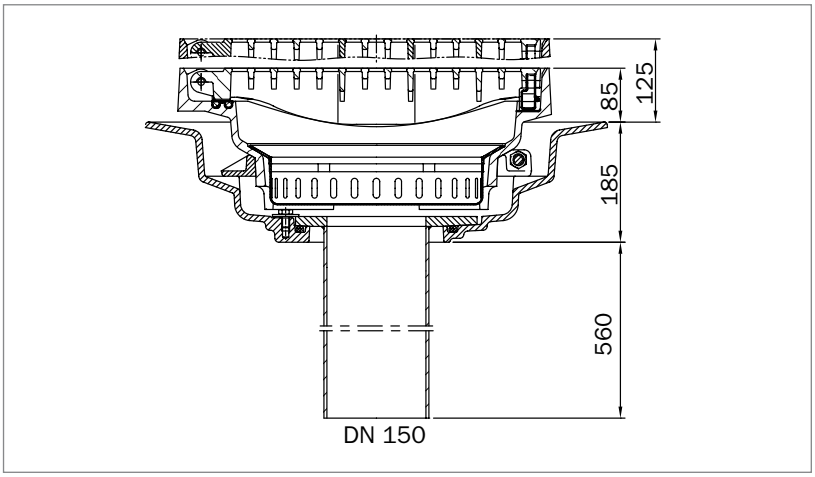
Product details

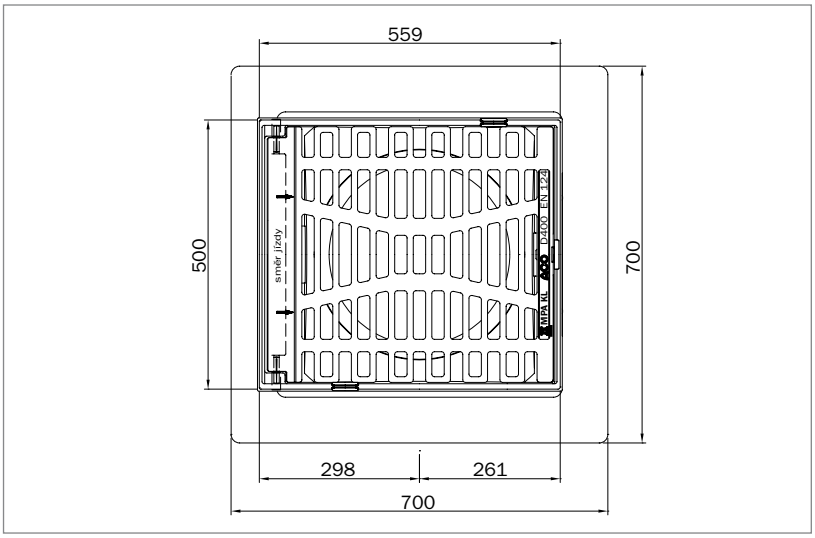
Art.-No.	Order No.	Adjustable H [mm]	Weight [kg]
4908.73.00	89318	Range 1 70/80 mm	127
4907.73.00[1)]	89314	Range 2 95 – 140 mm	128

[1)] Article corresponds to assembly drawing Was 1

ACO bridge drain Multitop HSD-5, class D 400

Pursuant to DIN EN 124/DIN 1229, with adhesive flange corresponding to DIN EN 1253, with inset outlet





Specification/product description

Bridge drain Multitop HSD-5, nominal dimensions 500 x 500, cast iron, class D 400, pursuant to DIN EN 124/DIN 1229

With fitted, permanently fixed PEWEPREN dampers in the frame, grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge, drain body with adhesive flange pursuant to DIN 1253, with inset outlet DN 150 made of stainless steel, material number 1.4571, tension ring with seepage openings, upper part with a grating and all round closed frame, break-out construction phase drainage opening to be opened if required, infinitely height adjustable within the range 85-125 mm, laterally adjustable and inclination adjustable, rotatable, grating with hinge max. 110° opening angle, slot width 23 mm, inlet section 1121 cm^2, hot-dip galvanised steel bucket, volume: 7.2 l
Weight and **Article No.** (see table)

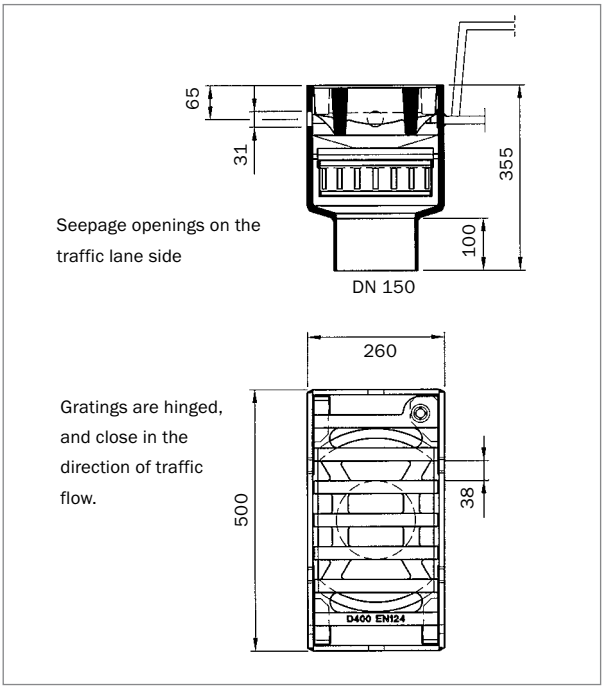
Product details

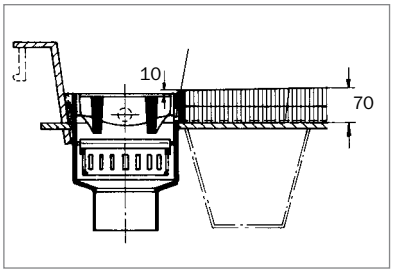
Art.-No.	Order No.	Adjustment range H [mm]	Weight [kg]
4907.33.00	89313	85-125 mm	121

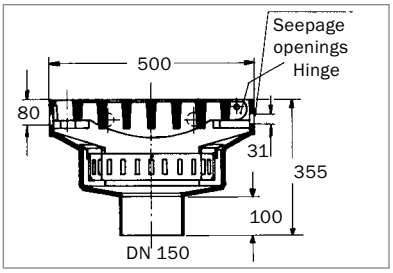
Please order separately if required:
sealing plate for construction phase drainage
(1 set = 2 pieces)
Article No. 67308
Order No. 67308
(see page 32)

Drains for steel bridges, 260 x 500

Class D 400 pursuant to DIN EN 124/DIN 1229







These bridge drains have a cast iron grating and a hot-dip galvanised-steel drain housing.

- Grating and frame are hinged and bolted to prevent unauthorised opening and removal of the grating.
- The one-piece steel housing can be welded tightly against the steel structure.
- Very precise positioning is possible during installation. Subsequent height adjustment is no longer necessary.
- Drains in the zone above the bridge plate have lateral holes to drain the sealing membrane and the surface covering.
- Bridge drains made of steel are not height-adjustable.

Tender specifications

Drain 260 x 500 for steel bridges
Class D 400,
pursuant to DIN EN 124/DIN 1229
- with locking device
- drain body made of hot-dip galvanised steel
- with seepage openings
- outlet socket DN 150, vertical
- cast iron grating, hinges with opening angle of 100°
- machined bearing surfaces
- slot widths: 38 mm, inlet section: 610 cm²
- bucket, hot-dip galvanised steel, volume 4.0 litres
- weight: approx. 56 kg

Installation

Bridge drains must be installed with the proper alignment to ensure that the seepage openings face the traffic lanes, and to make sure that the grating closes in the same direction as the traffic is flowing.

Lifting and operating key
Article No. 4145 (see page 32)

Product details

Art.-No.	Order No.	Inlet section [cm²]	Weight [kg]
4929.09	57434	610	56

Cast iron drains for ballast bridges

Drain with ball grating,
Article No.: 4905.92

These drains are used in reinforced steel bridges with ballast surfaces.

- Perfectly adapted for the specific installation situation, the drains consist of a subunit with a flange for proper connection to the sealing membrane, and an upper part with a grating for flush surface fitting with the protective screed.
- The seepage openings guarantee drainage of the sealing membranes. The width of the openings are customised to the type of ballast covering the surface: this ensures that the ballast is optimally drained without the aggregate being able to pass into the drain and block the drainpipe.

Tender specifications

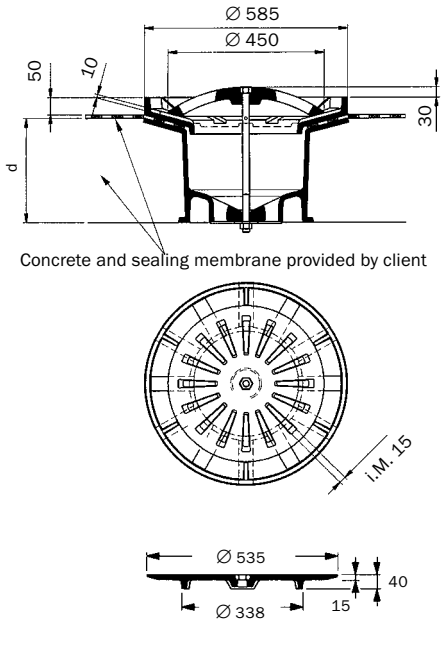
Drain with ball grating for concrete slabs with thicknesses d = 300 mm*
or d = 350 mm*
- housing for SML connection DN 200
- flange ring and grating made of cast iron
- with 6 seepage openings
- grating inlet section: 240 cm²
- fixing bolt made of material 1.4301
- weight approx. 130 kg
- Article No. (see table)

* Please select tender specifications required

Drain with ball grating

Art.-No.	Order No.	For concrete slab thickness d [mm]	Weight [kg]
4905.90	57347	300	129
4905.92	57348	350	132

* corresponds to master planning DB Netz, Deutsche Bahn Group, Drawing master planning M-ENT 804.9020



Outlet socket for connection to SML pipe, DIN 19522

To be ordered separately when required:

SML bend
DN 200 DIN EN 877
Article No. 4905.90.29

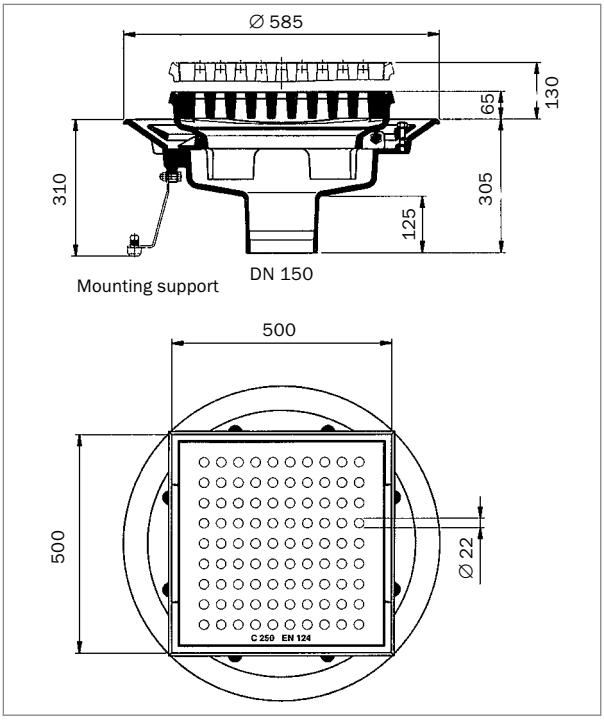
CE connection
Article No. 4905.90.30

Protective lid, cast iron
Article No. 4905.90.25

Drains, cast iron with perforated grating

Tender specifications
Bridge drain HSD, 500 x 500, cast iron, class C 250,
pursuant to DIN EN 124/DIN 1229
- with perforated grating
- with outlet socket vertical */lateral*
- drain body with adhesive flange pursuant to DIN EN 1253 and flange ring
- tension ring with seepage openings
- outlet socket DN 150
- upper part infinitely height-adjustable in the range 65 – 130 mm
- grating with 90 holes, diameter: 22 mm
- inlet section: 342 cm2
- weight approx. 158 kg
- Article No. (see table)

* Please select tender specifications required



Bridge drain HSD, 500 x 500, cast iron

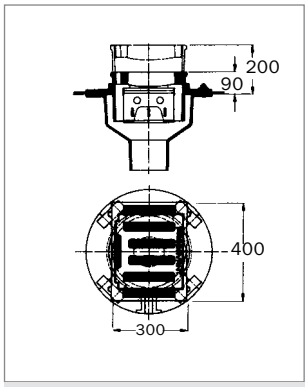
Product	Art.-No.	Order No.	Weight [kg]
Outlet socket			
Vertical	**4905.85**	57344	143
Lateral	**4905.89**	57345	149

Mounting support, **Article No. 4977.11.90** (page 32) and lifting and operating key, **Article No. 4276** (page 32) should be ordered separately as required.

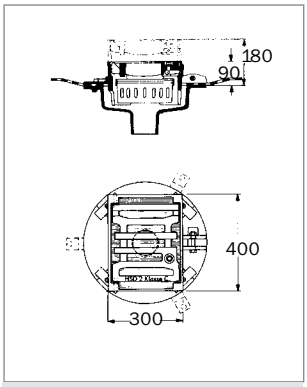
Drain upper parts for bridge remediation

Class D 400, HSD-2, HSD-3, HSD-5
Built-in bridge drains which no longer comply with the latest standards!

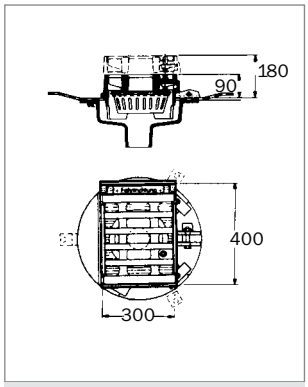
Bridge drain HSD-2



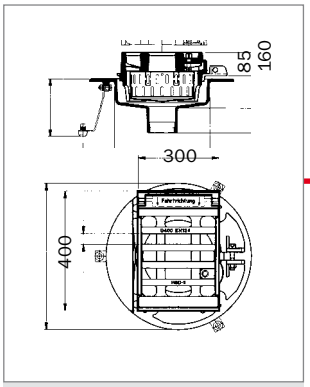
Article No.: 4960...
Schlitzweite 38 mm
Class C 250



Article No.: 4971.../4972...
16 34
Class C 250/C 400 kN



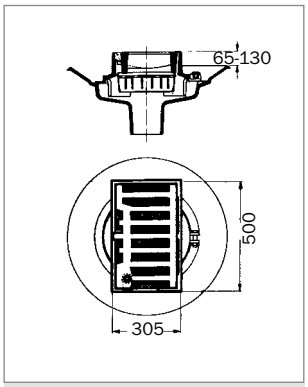
Article No.: 4973.../4974...
16 40
Class D 400



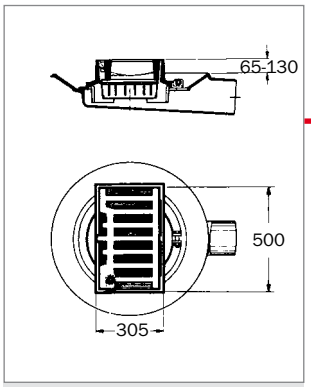
Article No.: 4977.../4978...
16 40
Class D 400

Bridge drains HSD-3

Info: The drain upper parts required when remediating built-in bridge drains are shown on the opposite page.

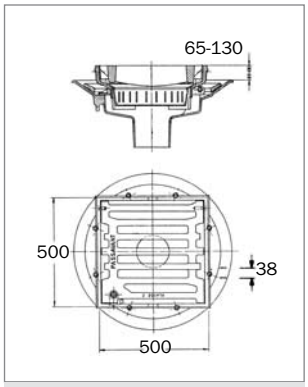


Article No.: 4961...
Slot width 38 mm
Class C 250

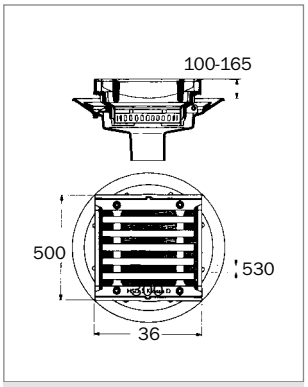


Article No.: 4961...
Slot width 38 mm
Class C 250

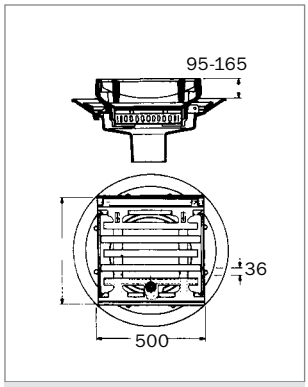
Bridge drains HSD-5



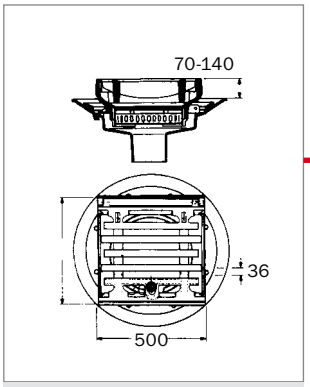
Article No.: 4901...
Slot width 38 mm
Class C 250



Article No.: 4902...
Slot width 36 mm
Class D 400



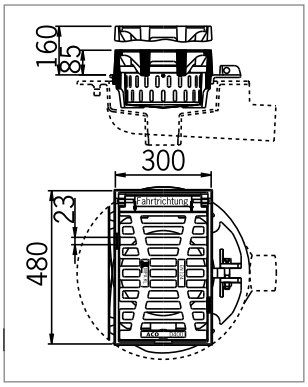
Article No.: 4904...
Slot width 36 mm
Class D 400

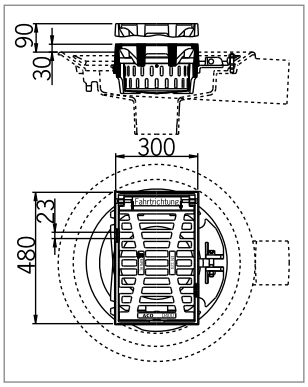


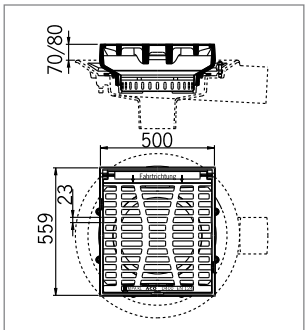
Article No.: 4905.../4906...
Slot width 36 mm
Class D 400

New drain upper parts for remediating built-in bridge drains

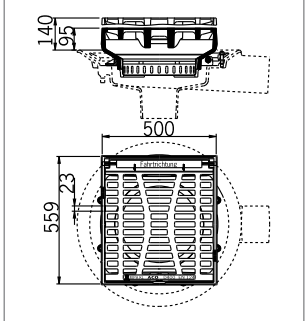
Class D 400 pursuant to DIN EN 124/DIN 1229







Model I: with reversible supporting ring height adjustable in steps



Model II: upper part infinitely height adjustable

Tender specifications for HSD-2 remediation
Multitop upper part HSD-2, nominal dimensions 300 x 500, cast iron, class D 400 pursuant to DIN EN 124/DIN 1229
- With fitted, permanently fixed PEWEPREN dampers in the frame
- Grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge
- Tension ring with seepage openings
- Upper part with a grating and all round closed frame
- Break-out construction phase drainage opening to be opened if required**
- Infinitely height adjustable within the range 85-160 mm*
- Infinitely height adjustable within the range 160-235 mm*
- Laterally adjustable and inclination adjustable, rotatable,
- Grating with hinge max. 110° opening angle
- Slot width 23 mm, inlet section 523 cm²

*Please select tender specifications required

Article No. 4979.03.80
(height-adjustable range 85 – 160 mm)
Article No. 4979.03.81
(height-adjustable range 160-235 mm)

Order separately as required:
Bucket, hot-dip galvanised steel, for bridge drain HSD-2
Article No. 4977.11.70 (volume 5l)
Article No. 3977.11.75
(volume variable to 7.2 l)
** Sealing plates see page 32

Height-adjustable range [cm]	**Art.-Nr.**	Order No.	Weight [kg]	Slot width	Inlet section
85-160	**4979.03.80**	89201	48	23	523
160-235	**4979.03.81**	89202	56	23	523

Tender specifications for HSD-3 remediation
Multitop upper part HSD-2, nominal dimensions 300 x 500, cast iron, class D 400 pursuant to DIN EN 124/DIN 1229
- With fitted, permanently fixed PEWEPREN dampers in the frame
- Grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge
- Tension ring with seepage openings
- Upper part with a grating and all round closed frame
- Break-out construction phase drainage opening to be opened if required**
- Infinitely height adjustable within the range 30-90 mm*
- Infinitely height adjustable within the range 106-165 mm*
- Laterally adjustable and inclination adjustable, rotatable,
- Grating with hinge max. 110° opening angle
- Slot width 23 mm, inlet section 523 cm²

*Please select tender specifications required

Article No. 4979.03.80
(height-adjustable range 30 – 90 mm)
Article No. 4979.03.81
(height-adjustable range 105-165 mm)

Order separately as required:
Bucket, hot-dip galvanised steel, for bridge drain HSD-2
Article No. 4977.11.70 (volume 5l)
Article No. 3977.11.75
(volume variable to 7.2 l)
** Sealing plates see page 32

Height-adjustable range [cm]	**Art.-Nr.**	Order No.	Weight [kg]	Slot width	Inlet section
30-90	**4979.03.80**	89201	48	23	523
105-165	**4979.03.81**	89202	56	23	523

Tender specifications for HSD-5 remediation
Multitop upper part, nominal dimensions 500 x 500, cast iron, class D 400 pursuant to DIN EN 124/DIN 1229
- With fitted, permanently fixed PEWEPREN dampers in the frame
- Grating secured by a maintenance free, self-locking, boltless locking mechanism and hinge
- Upper part with a grating and all round closed frame
- Break-out construction phase drainage opening to be opened if required**
- With reversible supporting ring with seepage openings height adjustable in steps 70/80, laterally adjustable, rotatable*
- With tension ring with seepage openings infinitely height adjustable in the range from 95-140 mm, laterally adjustable and inclination adjustable, rotatable*
- Grating with hinge max. 110° opening angle
- Slot width 23 mm, inlet section 1121 cm²

* Please select tender specifications required

Article No. 4907.03.80 for which reversible supporting ring
Article No. 4906.11.19 required, 50,–
(Height-adjustable range 70 and 80 mm)
Article No. 4907.03.80, for which tension ring
Article No. 4905.11.18 required, 50,–
(height-adjustable range 95-140 mm)

Order separately as required:
Flange ring **Article No. 4905.11.15**
Bucket, hot-dip galvanised steel, for bridge drain HSD-5 **Article No. 4905.11.70** (volume 7.2 l)
** Sealing plates see page 32

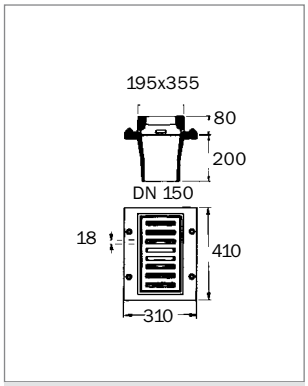
Height-adjustable range [cm]	**Art.-Nr.**	Order No.	Weight [kg]	Tension ring	Reversible supporting ring
70/80	**4907.03.80**	89204	95	–	Required
95–140	**4907.03.80**	86204	95	Required	–

Drain upper parts for bridge remediation

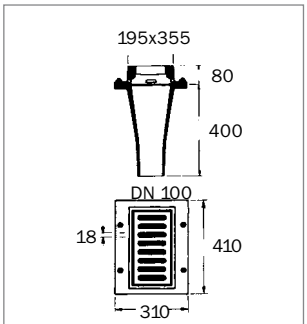
Built-in bridge drains which no longer comply with the latest standards!

Info: The drain parts required to remediate built-in bridge drains are shown on the opposite page.

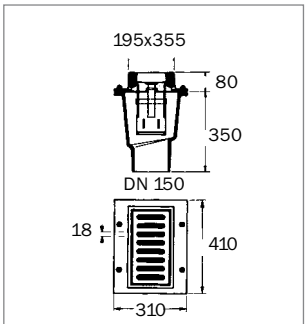
Bridge drains 250 kN test load



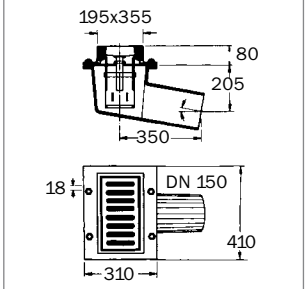
Article No.: 4918...	
Slot width mm	18
Inlet section, cm²	175



Article No.: 4919...	
18
175

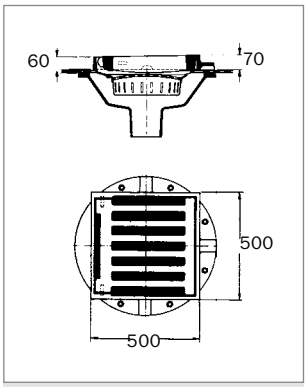


Article No.: 4918.1...	
18
175

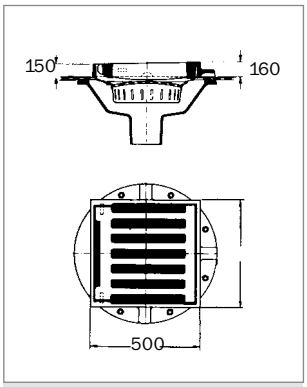


Article No.: 4920.1...	
18
175

Bridge drains 25 Mp test load

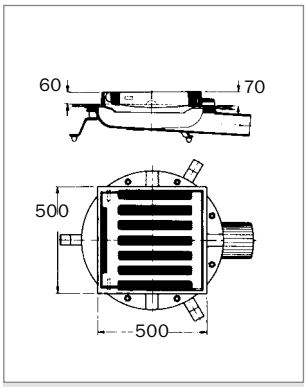


Article No.: 4900...	
Slot width mm	40
Inlet section, cm²	1000



Article No.: 4900...	
40
1000

Bridge drains FS1, class C



Article No.: 4927...	
40
1000

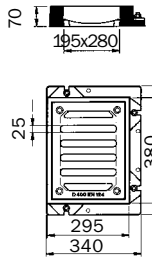
If bridge drains needing remediation do not match the HSD-2, HSD-3, and HSD-5 product lines, top sections are required which can either be directly connected to the cemented-in drain body or connected via an adapter.
This means that the drain body and the drain pipes can remain in place (assuming that they are in a good enough condition).

New top sections for class D 400 applications were specially developed for remediation jobs. The thin frame heights and the large flange enable all these parts to be located above drain bodies with a range of different geometrical shapes.
The broad frame flange extends beyond the drain body so that it can be properly fixed into place.

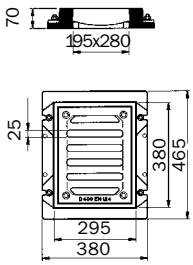
The top sections, as well as the upper parts, shown in the following are examples of the remediation and conversion of built-in bridge drains. Please contact us with your special requests whenever necessary.

New drain upper parts for remediation of built-in bridge drains

Class D 400 pursuant to DIN EN 124/DIN 1229



Flange, three-sided



Flange, four-sided

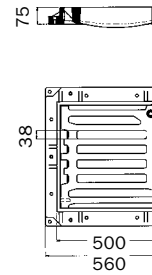
Tender specifications for top sections 300 x 400

Top sections 300 x 400 mm
Class D 400, pursuant to
DIN EN 124/DIN 1229
- frames, gratings and flange made of cast iron (flange three-sided)
- grating and frame bolted
- slot width: 25 mm
- inlet section: 265 cm²
Weight approx. 49 kg
Article No. 4977.80

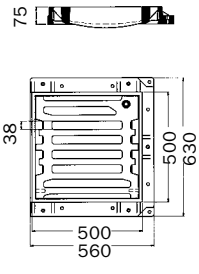
Top sections 300 x 400 mm
Class D 400, pursuant to DIN EN 124/DIN 1229
- frames, gratings and flange made of cast iron (flange four-sided)
- grating and frame bolted
- slot width: 25 mm
- inlet section: 265 cm2
Weight approx. 53 kg
Article No. 4977.90

These top sections cannot be supplied with buckets. An adapter is necessary for connection to the lower part or if the height exceeds 70 mm.
Available upon request.

Flange	**Art. No.**	Order No.	Weight [kg]	Slot width	Inlet section
Three-sided	**4977.80**	57430	48	25	265
Four-sided	**4977.90**	57431	52	25	265



Model right



Model left

Tender specifications for top sections 500 x 500

Top sections 500 x 500 mm
Class D 400, pursuant to
DIN EN 124, DIN 1229
- frames, grating and flange made of cast iron (flange three-sided)
- frame with seepage openings
- grating with hinge and opening angle 100°
- folds open
- with locking device
- slot width: 38 mm
- inlet section: 1100 cm²
Weight approx. 87 kg
Models:
In traffic flow direction right
Article No. 4905.81
In traffic flow direction left
Article No. 4905.83
Order the following if required:
Bucket, steel, hot-dip galvanised
Article No. 4905.81.70
Operating key:
Article No. 4145

An adapter is required to make up the height difference if the height is > 75 mm.
Available upon request

Flange	**Art. No.**	Order No.	Weight [kg]	Slot width	Inlet section
Right	**4905.81**	57425	81	38	1100
Left	**4905.83**	57426	81	38	1100

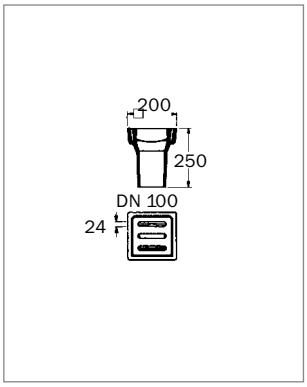
Special drains

Bridge drain DN 100

Drain body and grating, cast iron

Article No.: 4916

Test load, kN	250
Slot width, mm	24
Inlet section, cm²	80
Weight approx., kg	16
Order No.	57338

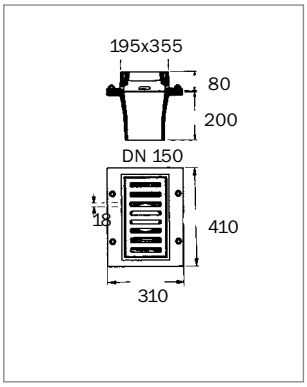


Bridge drain DN 150

Drain body and grating, cast iron, with seepage openings

Article No.: 4918

Test load, kN	250
Slot width, mm	18
Inlet section, cm²	175
Weight approx., kg	41
Order No.	57340

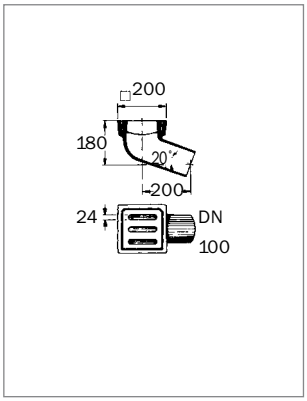


Bridge drain DN 100

Drain body and grating, cast iron

Article No.: 4917

Test load, kN	250
Slot width, mm	24
Inlet section, cm²	80
Weight approx., kg	19
Order No.	57339

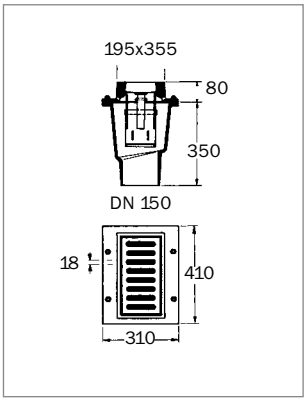


Bridge drain DN 150

Drain body and grating, cast iron with seepage openings

Article No.: 4918.10

Test load, kN	250
Slot width, mm	18
Inlet section, cm2	175
Weight approx., kg	56
Bucket, steel, hot-dip galvanised, volume 4.7 litres	
Order No.	57341

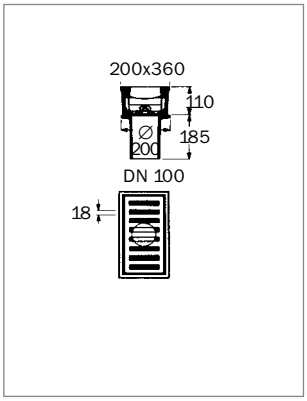


Bridge drain DN 100

Drain body and grating, cast iron, with seepage openings

Article No.: 4921

Test load, kN	250
Slot width, mm	24
Inlet section, cm²	175
Weight approx., kg	31
Order No.	57343

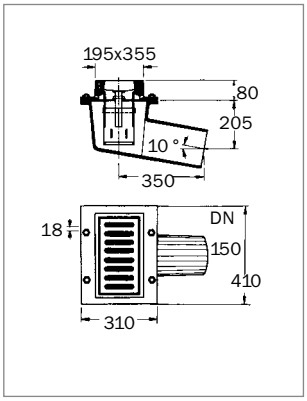


Bridge drain DN 150

Drain body and grating, cast iron, with seepage openings

Article No.: 4920.10

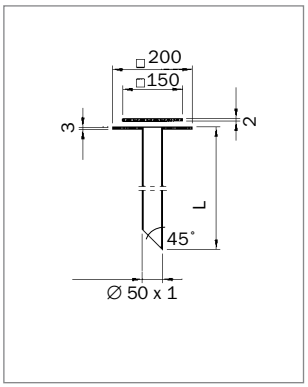
Test load, kN	250
Slot width, mm	18
Inlet section, cm2	175
Weight approx., kg	56
Bucket, steel, hot-dip galvanised, volume 4.7 litres	
Order No.	57338



Accessory components for bridge drains

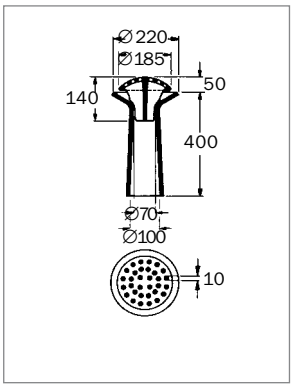
Drip casing
Pursuant to WAS 11
Drain body and seepage hood, stainless steel, material 1.4571

Article No.: 4954	
Weight, approx. kg	4,1
Order No.	57442



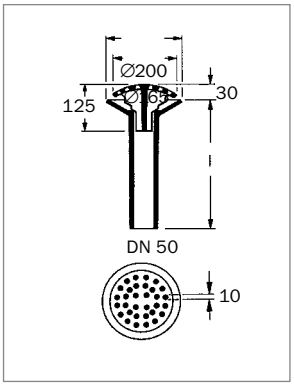
Drain with seepage hood
Drain body with seepage hood, cast iron

Art.-No.: 4952	
Weight approx., kg	11
Order No.	57441



Drain with seepage hood
Drain body and seepage hood, cast iron

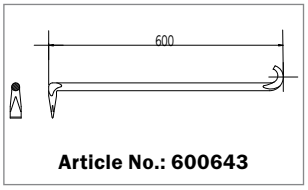
Article No.:: 4950/4951	
Length, mm	300/400
Weight, approx. kg	7/7
Order No.	57439/57440



Lifting and operating key

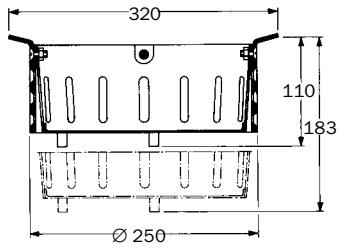
Galvanised, suitable for all Multitop bridge drains

Length, mm	600
Order No.	600643



Article No.: 600643

Buckets for drains DBGM



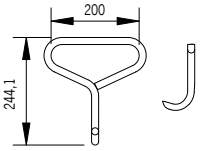
Article No.: 4977.11.75

Product	**Article No.**	Volume Litres	Volumen Liter
Bucket, galvanised steel for HSD-2	**4977.11.70**	58268	5
Vario bucket, galvanised steel for HSD-2	**4977.11.75**	5744	Up to 7,2
Bucket, hot-dip galvanised steel for HSD-5	**4905.11.70**	58221	7,2
Bucket, galvanised steel for remediation top sections	**4905.81.70**	58759	10
Bucket, galvanised steel, for steel bridge drains	**4929.10.70**	58247	4

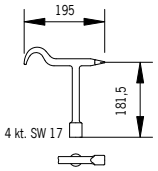
Lifting and operating key

Galvanised, suitable for all bolted bridge drains

Article No.	4276
Order No.	85516
Article No.	4145
Order No.	88141



Article No.: 4276

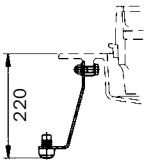


Article No.: 4145

Mounting supports

One set for HSD-drains
Amount: 1 set = 3 pieces

Article No.	4977.11.90
Order No.	57435



Article No.: 4977.11.90

Sealing plates

One set for HSD-drains
Amount: 1 set = 2 pieces

Article No.	67308
Order No.	67308

All-round flange ring

Suitable for drains HSD-2 to completely clamp in sealing membranes

Article No.	4977.11.16
Order No.	57429

Notes

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