LORO-X

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LORO®

LORO-X
Balcony Drainage

For New Constructions and Modernisation of Old Buildings

- For balcony sealing with roofing sheets or liquid plastic
- With support flange, bonding flange or clamping flange
- Made of galvanized steel, stainless steel or copper

Arguments hard as steel for

LORO-X
Balcony Drainage Systems

made of steel discharge pipe with
LORO-X push fit socket connection

Content

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Product Data Finder

LORO Balcony and Terrace Drainage

for new constructions and refurbishment of old buildings

Different balcony structures and the usage of new materials - such as the usage of liquid plastic or plastic/cement combinations - require balcony systems that are adjusted to the application situation. Due to the experience in the area of balcony drainage acquired over decades, LORO has developed balcony drains that, in combination with downpipes made of galvanized steel discharge pipe, constitute balcony drainage systems for every application situation.

Available are single or direct drains, DN 50 - DN 100, made of galvanized steel, additionally coated, made of stainless steel or copper, with connecting sleeve or clamping flange, with or without thermal insulation.

Also available as all-steel welded construction with storey-high downpipe from balcony to balcony.

The newest developments in this area are the LORO-X balcony drainage systems Series V - a variable system with modular-based completion purposes which covers all application situations. Made of durable stainless steel, LORO-X balcony drainage systems Series V are resistant to heat, frost as well as UV-radiation in outside areas. In combination with the proven LORO-X steel discharge pipes, the drains of Series V constitute a balcony drainage system from one provider.

According to DIN 1986 (paragraph 5.10) balconies and loggias need to have a floor drain.
Correct solutions for the balcony drainage are formed through the interplay of drain shape, cross section and rain downpipe.
The following balcony and terrace structures can be distinguished according to usage, stress and amount of water.

Balconies without sealing sheets
with screed finish / tiles in mortar bedding

Balconies with sealing sheets
with supported slabs or tiles in granular bedding (e. g. supporting gravel) / slabs or tiles in mortar bedding

Balconies with sealing of liquid plastic
as floor surface with slabs or tiles in adhesive bed

Balconies made of waterproof concrete
without additional covering

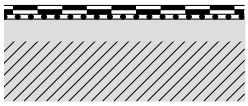
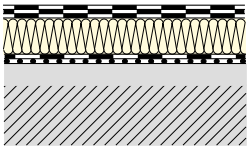
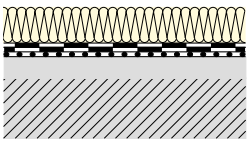
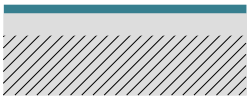
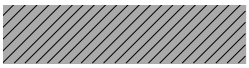
...optimal drainage with maximum safety!

LORO-X Balcony Drainage Systems

Complete systems consisting of drains and pipe for new constructions and renovation

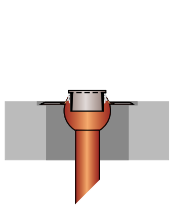
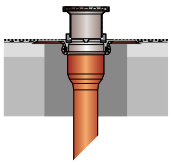
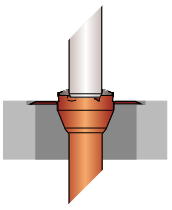
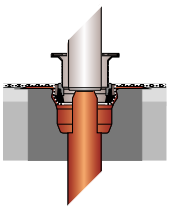
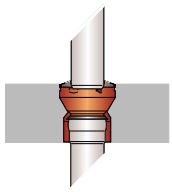
R 60 R 90

LORO-X Balcony drainage systems are fire rated R 60 and 90 as complete system and certified: AbP.-Nr. P-MPA-E-09-010

Basic set-up		Balcony covering	
	Without roofing sheets		Screed finish
			Tiles in mortar bedding
	With roofing sheets Without thermal insulation		Supported slabs
			Slabs/tiles in mortar bedding
			Tiles in granular bedding
	With roofing sheets With thermal insulation		Supported slabs
			Slabs/tiles in mortar bedding
			Tiles in granular bedding
	With roofing sheets - Inverted roof -		Supported slabs
			Tiles in granular bedding
	With liquid sealing		Liquid plastic as floor surface
			Slabs/tiles in adhesive bed
			

Serie	A		B		BE		E		F		FF		K	
														
DN	50	70	50	70	50	70	50	70	50	70	50	70	50	70
l/s*	0,9	0,9	0,9	0,9	0,9	0,9	1,8	1,8	1,8	1,8	1,8	1,8	1,8	1,8
R 60 R 90	-		-		-		R 90 **		R 90 **		R 90		-	

* At a nominal water level of 35 mm on the balcony.

Single drain			Direct drain		
					
with supporting edge	with connecting sleeve	with clamping flange	with supporting edge	with connecting sleeve	with dome
Series A Page 17			**Serie G** Page 42 **Serie J** Page 72		
Series B Page 17 **Series BE** Page 23			**Serie G** Page 42		
	Series E/F Page 27/28	**Series K** Page 81		**Series H** Page 52	
	Series F Page 28	**Series K** Page 80		**Series H** Page 52	
	Series F Page 28	**Series K** Page 81		**Series H** Page 52	
	Series E/F Page 27/28	**Series K** Page 81		**Series H** Page 52	
	Series F Page 28	**Series K** Page 80		**Series H** Page 52	
	Series F Page 28	**Series K** Page 81		**Series H** Page 52	
	Series F Page 29	**Series K** Page 81			
	Series F Page 29	**Series K** Page 81			
Series GF Page 47			**Series GF** Page 47 **Series J** Page 72		
	Series FF Page 37			**Series HF** Page 61	

G			GF			H		HF		I		GS	J	
														
50	70	100	50	70	100	70	100	70	100	50	70	100	70	100
0,9	0,9	0,9	0,9	0,9	0,9	1,8	1,8	1,8	1,8	0,9	0,9	0,9	0,9	0,9
R 90			R 90			R 90 **		R 90		R 90		R 60	-	

** For drains with thermal insulation please use the fire protection version, see pages 101-102.

General Terms, Notes on Planning and Installation

Cutting to Length of Pipes and Drains

The cutting to length conveniently takes place with a pipe cutter with 3 or 4 sharp cutting wheels without guide rollers. Burrs on cut pipes have to be removed. At the cut surface the zinc layer provides a cathodic protection and prevents underlying rusting.

Recesses in Balcony Slabs

The minimum recess dimensions for LORO balcony drainage systems can be found in this brochure at the bottom of the respective technical pages regarding the different balcony drain series. Pay attention that a backfilling below the flange is also ensured, e. g. by bevelling one recess side. Drains or extension cartridges have to be placed into the recess in a way that guarantees that the upper edge of the flange and the upper edge of the concrete or the levelling screed are positioned at the same height.

Connecting Sleeves for Sealing Sheets

At the factory, LORO balcony drainage systems Series E, F and H are equipped with backflow-proof, clamped connecting sleeves made of different sealing materials. The usage of connecting sleeves complies with DIN EN 1253. The standard connecting sleeve is made of EPDM-/bitumen compound material. Alternatively, connecting sleeves made of PVC, ECB and multi-layer compound material for liquid plastics are available.
In order to protect the connecting sleeves during the building phase before carrying out the sealing work, they are folded at the factory and protected by a foil. That way it is impossible to drain rainwater, however. If rainwater has to be drained, the connecting sleeves have to be unfolded. In this case protection measures have to be taken on site in order to prevent damage to the connecting sleeve.

Fastening with Pipe Clips

LORO-X steel discharge pipes for balcony drainage pipes have to be securely fastened. See also installation instruction for LORO-X steel discharge pipes. For floor-connecting downpipes of balcony single drains (Series A, B, E, F, K), balcony drainage units (Series BE), balcony drainage branches 300 mm long and direct drains (Series G, GF, H) that have been set in concrete an additional fastening with pipe clips is required.

Calculation of Downpipe Lengths

For the calculation of the downpipe length we support you with calculation formulas for:
- balcony drainage units (page 23)
- balcony drainage downpipes with branch (page 105)
- direct drains (page 53)
- direct drains with dome (page 67)

Direct Drains

Direct drains are balcony drains where the pipe is carried through the drain. The LORO balcony drainage Series G, GF, H, HF, I, IK and J constitute direct drains.

Setting in Concrete of Drains in Concrete Slabs

Balcony drainage systems that are encased in in-situ concrete on site have to be fastened in accordance with the installation height and gradient situation. Pay attention to a perpendicular axis of the drains and downpipes.
The setting in concrete of galvanized steel discharge pipes has been state of the art for years. If aggregates have been added to the concrete (frost protection, retarder, quick-setting cement), the pipe has to receive a protection coat consisting of the usual building protection agents at the factory.
Due to the fact that the outside of LORO balcony drainage systems is already mostly coated, only uncoated, galvanized surfaces in concrete areas have to be equipped with a protection coat on site. For the setting in concrete of waterproof concrete (WU concrete), direct drains Series I are especially suitable. The concrete slabs made of waterproof concrete are usually used without any additional structure, such as e. g. tiles in granular bedding etc., and are directly passable. However, if e. g. a covering with tiles is planned, strainer supports as special production are available. Please ask for details at the LOROWERK.
Afterwards, a backflow-proof connection of a sealing sheet to the direct drains is impossible. In order to avoid incrustation, watered areas made of cement-bound materials should not be connected to an inner rain downpipe without a surface treatment beforehand.

Single Drains

Single drains are balcony drains that are individually connected to a pipe made of LORO-X steel discharge pipe via a connection pipe. The Series A, B, E, F, FF and K constitute single drains in the LORO balcony drainage programme.

Drainage Levels

In the case of a drainage on one level, the rainwater is only drained from one area, e. g. via the tiles or slab covering that is installed in the mortar bedding on a sealing sheet. Due to leaking joints and crack formation in the screed, seeping rainwater has to be drained via seepage openings - see point ‘seepage’.
Especially in the case of balcony renovations, the usage of liquid plastics for the sealing of balconies has recently been intensified. As sealing and floor surface the liquid plastics also constitute the drainage level at the same time. A balcony drainage on one level also takes place in the case of balcony slabs made of concrete components made of waterproof concrete. Usually these components do not receive a further structure such as e. g. tiles in a mortar bedding. A drainage on two levels - one upper and one lower drainage level - takes place e. g. in the case of balconies with paving slab in gravel or grit bedding or on supported slabs. Due to the fact that there remain non-closed joints (as planned) from the installation of slabs, rainwater gets onto the sealing sheet. In the case of LORO balcony drainage systems, this rainwater is discharged into the drain via the lower drainage level with the help of drainage rings or strainer pipes - depending on the type of drain. In order to secure their functionality, the foundation bedding in the range of the drain has to be filled with coarse gravel.
Using supported slabs, the drainage can also take place on one level below the slabs only, if the distances between the slabs guarantee sufficient drainage of the rainwater via the joints.

Coat of Paint
Galvanized rain downpipes are paint-friendly. Use paints that are especially suitable for galvanized grounds.

Surface Sealing with Liquid Plastic
For the surface sealing of balconies liquid plastics such as plastic-cement-combinations, reaction resins and synthetic resin dispersions are increasingly used. This applies especially for balcony renovations. For this area, the LORO balcony drainage Series GF (see page 46), FF and HF with connecting sleeve made of multi-layer compound material (see page 36 and 60) and J (see page 71) are especially suitable.

Incline
When installing tiles or paving slab in a mortar bedding, the screed has to be spread with a slight incline towards the drain in order to avoid a congestion of residual water.

Trap
LORO balcony drainage systems are generally produced without trap. In the case of mixed water systems installing the LORO-S trap, No. 4373X, the LORO-P trap, No. 4375X, or the LORO rainpipe trap, No. 4374X, each frost-free in the cellar is recommended.

Height Adjustment
The adjustment to the balcony structure can - depending on the type of drain - be realised with help of the strainer support (height-adjustable by cutting to length), extension cartridge (height-adjustable and if necessary by cutting to length) and strainer pipe (height-adjustable by cutting to length). Pay attention that enough of the plug-in remains in the sealing area. The latter does not apply to strainer supports for balcony drainage Series E + F, H and K where the strainer support is braced in drainage rings. For an extension of strainer supports in the case of higher structures, extension pipes - also with drainage openings (strainer pipes) - are available. Notes regarding the standard adjustment range can be found on the technical pages for every drain type in the paragraph “calculation“.

Clamping Flange for Sealing Sheets
The clamping flanges, consisting of loose and fixed flange, of LORO-VERSAL® balcony drainage (Series K) comply with the requirements of DIN EN 1253. When installing the flanges, the guidelines of DIN 4122 (sealing of buildings against non-pressing surface water and seepage water with bituminous materials), of DIN 18337 (VOB - contracting rules for award of public works, part C: General technical regulations for construction works, sealing against non-pressing water) and the flat roof guidelines (also apply for balcony drainage) have to be taken into account. Project-related, LORO-VERSAL® balcony drainage systems can be equipped with connecting sleeves at the factory upon request.

Backwater Protection
The backwater protection for two-piece balcony drainage is achieved by sealing the extension cartridge, depending on the drain type, with a sealing element or a clamping ring into the drain body. In any case, use original LORO-X lubricant when inserting the extension cartridge.

Seepage Discharge
The construction of LORO balcony drainage systems guarantees that the possibly accruing seepage water is drained. However, during the installation on site pay attention that - depending on the type of drain - seepage openings or drainage rings are covered e. g. with a grid, with coarse gravel or a ring-shaped recess in order to already avoid a congestion with screed or similar during the installation phase.

Special Production
In some cases, special productions for special drainage situations can also be realised in small quantities.

Supporting Edge
The edges of LORO balcony drainage systems Series A, B, BE, G, GF and J are only intended for the support of established recesses or for a better fixation on formworks in the case of concrete works. The dimensions of the supporting edges do not comply with the DIN EN 1253 which means it is not allowed to connect sealing sheets.

Tolerance Compensation
Balcony drainage units, consisting of downpipe piece and drain, Series BE, and balcony drainage branches are equipped with long sockets for a tolerance compensation of +/- 30 mm. The horizontal runoff of balcony drainage branches is also equipped with a long socket. Direct drains of Series G do not offer the possibility of a tolerance compensation. The actual installation length has to be determined on site. When installing short direct drains, tolerances can be compensated if downpipes with a long socket are used.

Transition to other Types of Pipes
For the connection of LORO balcony drainage systems and LORO-X discharge pipes with other types of pipes (e. g. cast iron pipes, plastic pipes) connection pieces are part of the programme - see brochure LORO-X steel discharge pipes.

Installation Instruction
For LORO balcony drainage:
- installation instruction for balcony drains with connecting sleeve, Series E and F.
- installation instruction for LORO direct drains with connecting sleeve, Series H.
- installation instruction for balcony drains, Series J.
- processing notes for LORO direct drains with formwork dome, Series I and IK.

For LORO-X steel discharge pipes:
- installation instruction for LORO-X steel discharge pipes, DN 40 - 200 and DN 250 and 300.
- installation instruction for LORO compound pipes.

Thermal Insulation
The thermal insulation layer made of polyurethane foam may not be damaged, e. g. due to inappropriate, violent pressing of thermally insulated drain bodies into recesses that are too small. Any changes on the products on site are to be avoided. Pursuing pipes have to be installed in accordance with DIN 1986. For this case, the insulated LORO compound pipes from the LORO programme are available.

Technical Data

Material

Balcony drains made of steel

Material:
Quality precision steel pipe according to DIN 2394, made of cold strip according to DIN EN 10139

Tensile strength:	R_m 310 - 410 N/mm²
Elongation:	A_5 at least 28 %
Thermal conductivity:	at +20 °C = 55 W/m °C

Length expansion coefficient
between -20 °C and +80 °C: 0,012 mm/m °C

Balcony drains made of solid copper

Material:
Copper pipe SF - Cu according to DIN 1754 / 1786

Tensile strength:	R_m 290 N/mm²
Elongation:	A_5 at least 4 %
Thermal conductivity:	at +20 °C = 305 W/m °C

Length expansion coefficient
between -20 °C and +80 °C: 0,017 mm/m °C

Balcony drains made of stainless steel

Material:
Welded pipes according to DIN EN 1124 made of austenitic, stainless steel according to DIN EN ISO 1127 material number: 1.4301
Short name: X 5 Cr Ni 18 10

Tensile strength:	R_m 500 - 750 N/mm²
Elongation:	A_5 at least 26 - 50%
Thermal conductivity:	at + 20 °C = 15 W/m °C

Length expansion coefficient
between -20 °C and +80 °C: 0.016 mm/m °C

Surface finish / corrosion protection

Balcony drains made of steel:
Internal and external hot-dip galvanizing in accordance with DIN EN 1123. With additional internal coating.
Colour: Red-brown.
The cut surfaces of drains that have been cut to length do not corrode when used properly. The zinc boundary layers interact and produce the well-known cathodic protection effect.

Balcony drains made of copper:
For the material copper no additional corrosion protection measures are necessary. In combination with the oxygen in the air, permanent protection layers are developed on the surface.

Balcony drains made of stainless steel:
Bright metal finish according to DIN EN 1124. Stainless steel (X5 Cr Ni 18 9) belongs to the mostly corrosion-resistant materials. Additional corrosion protection measures are not necessary.

Connecting Sleeves

Standard:
Bitumen/EPDM compound structure – bitumen sheets, elastomer sheets according to DIN 7864 T 1

Alternatively:
PVC
– PVC sheets according to DIN 16730 (not bitumen-compatible)
– PVC sheets according to DIN 16937 (bitumen-compatible)
and others, upon request
ECB
– ECB sheets according to DIN 16729 VS (compound sealing)
– multi-layer compound material - please ask at the factory.
Other material
– Please ask at the factory.

Thermal Insulation

Material:	polyurethane foam, FCKW-free
Foam structure:	90 % closed cells
Thermal conductivity:	0.030 W/m x K.
Water vapor resistance factor:	$\mu = 60 - 80$.
Water absorption:	2 Vol. %

Material:	STYROPOR SE WLG 0.35, FCKW-free
Thermal conductivity:	0.035 W/m x K.
Water vapor resistance factor:	$\mu = 40/100$.
Water absorption:	0.5 - 1.5 Vol. %

Fire resistance

According to DIN 4102, LORO balcony drains belong to the material class A1 incombustible and are rated incombustible according to DIN 1986 part 4.

Sealing Elements

DN 50:
NB (NBR) nitrile-butadiene-rubber
DN 70 - DN 125:
SB (SBR) styrene-butadiene-copolymerizate

Leakproofness Figures of Discharge Pipes

The leakproofness figures of the LORO push-fit socket connection well exceed the requirements of DIN 1986 for all nominal diameters (inner and outer overpressure 0 - 0.5 bar).
In the case of higher pressures, the socket connection can be secured by using the LORO-X securing clamp No. 806X. For an installation with securing clamp and bonded sealing element, the following figures are achieved:

DN 50 = 15 bar overpressure
DN 70, DN 100 = 5 bar overpressure

Cleaning pipes and closing plugs are available as special productions for pressures above 0.5 bar.

Trace Heating

In frost-sensible areas, we recommend equipping our balcony drains and the pursuing pipes with an on site trace heating (see DIN EN 12056, part 3, or DIN 1986, part 100).

Supervision

The manufacturing supervision for pipes and fittings is carried out by the Material Testing Office in Würzburg, part of the Bavarian Trade Institute. The supervision for sealing elements is carried out by the Federal Material Testing Office of North Rhine-Westphalia in Dortmund (external supervision).

TÜV NORD
TÜV NORD CERT GmbH
DIN EN ISO 9001
Freiwillige Zertifizierung

DIN EN 1253
DIN EN 1123
xxxxxxxxxx
xxxxxxxxxx
DIN EN 681
DIN 4060
MPA NRW

Mitglied der Gütegemeinschaft:

RAL GÜTEZEICHEN
Gebäudeentwässerung
RAL-GZ 694

Boden-, Flachdach- und Balkonabläufe, Abwasserrohre, Formstücke aus Stahl

Norms and Guidelines

When planning and installing balcony drainage systems, different norms and guidelines have to be taken into account, such as:

Flat Roof Guidelines Edition 12/2016 (Excerpt)

1.1 Scope of Application

(1) This rule applies to the planning and application of sealings to
- unused roof areas, including extensively planted roof areas,
- used roof and ceiling areas, e. g. intensively planted areas, terraces, roofs with solar panels, balconies, loggias and arcades,
- ceiling areas covered with soil,
- roof and ceiling areas made of ferroconcrete and used for driving on,
  with sealing sheets and liquid plastics as well as all layers that are required for the functionality of the roof/component structure.

(2) The professional rule does not apply to sealings
- of sub-roofs,
- of walls with ground contact and base plates according to DIN 18533
- in and under walls according to DIN 18533,
- of interiors according to DIN 18534,
- of containers and basins according to DIN 18535,
- of areas used for traffic that are not part of a building, e. g. bridges (see DIN 18532).

1.4 Notes on Design and Planning

(3) Incline and drainage have to be planned in accordance with paragraph 2.2 and paragraph 2.5.

2.5 Drainage

(1) Taking into account the calculation norms, the drainage has to be installed in such a manner that the rainwater is discharged via short ways. The drainage can either take place via drains or via roof gutters with respective eaves (see „Professional rules for metal work in roofers craft“).

(2) Independent of the size of the roof area, roof areas with an interior drainage have to be provided with at least one roof drain and at least one emergency overflow or emergency drain. For the calculation of the roof drains and the emergency drainage the „Instructions for the Calculation of Drainage Systems“ has to be taken into account. Roof areas without incline require special measures, e. g. positioning of the drains at places with maximum deflection.

4.4 Connections to Doors

(1) The connection height shall be 0.15 m above the surface of the covering, of the gravel or the greening. In the case of sealings without covering, gravel or greening, the connection height refers to the sealing surface. This shall prevent rainwater ingress via the threshold in the case of slush formation, waterlogging due to congested drains, driving rain, wind pressure or icing.

2) A reduction of the connection height is possible if an impeccable water drainage in the area of the door and window element is ensured by the local circumstances at any time and the spray water exposure is minimised. This is the case if in the immediate area of the door and window element e. g.
- a channel-shaped drainage grit or a comparable construction each with a direct connection to the drainage or
- a channel-shaped drainage grid or a comparable construction for coverings on stilts is installed. In such cases the connection height should be at least 0.05 m (upper end of the sealing or from connection metal sheets below the weatherboard/base profile). If the spray water exposure is not minimised with help of a roofing, grids with a width of at least 150 mm should be used.

4.5 Connections to Penetrations

(2) The distance between roof penetrations and the distance of roof penetrations to other components, e. g. wall connections, expansion joints or roof edges, should be at least 0.30 m in order to be able to produce the respective connections professionally and permanently. Here the outer boundary of the flange is decisive.

4.8 Drainage

4.8.1 Drains, emergency drains and emergency overflows
(1) Roof drains that are prefabricated at the factory have to comply with DIN EN 1253-2 (calculation of the roof drains and emergency overflows see paragraph 2.5).
(2) The base bodies have to be fastened in the subconstruction. In the case of single-layer sealings, extension elements should be fastened in the subconstruction.
(3) Flanges at the sealing level should be inserted into the base.
(4) The connection can be established with loose and fixed flange constructions according to table 8 or table 9, with bonding flanges or with a connector with integrated connecting sheets that have been installed by the manufacturer.
(5) Generally, the vapor barrier has to be connected to the base body of the two-piece roof drain and the emergency drain or emergency overflow.
(6) The drains shall be protected against congestion by using gravel/leaf strainers. The drainage elements have to be covered in a way that ensures that a blocking of the drain is completely avoided. For maintenance purposes the roof drains have to be freely accessible and have to be maintained regularly.
(7) On terraces roof drains, emergency drains and emergency overflows have to be covered with removable grids or similar perforated/slitted covers. Frames for grids that are permanently installed in the terrace covering may not impair the intrinsic mobility of the terrace covering with respect to the drain.

5 Servicing and Maintenance

5.1 General Remarks
(1) For the maintenance of sealings, servicing and maintenance measures are required.

5.4 Maintenance
(1) The maintenance includes e. g. the following tasks:
– removal of dirt, leafs and unwanted vegetation
– cleaning of the roof drains

DIN EN 12056-3:2001-01 (Excerpt)

3.1 Terms

3.1.8 Roof Drainage
Pipes and fittings, inside and outside of the building, permanently installed in the building or running through the building, including ground pipes below the building up to the connection to the underground pipe that belongs to the building, that is used for the discharge of rainwater (see application area of EN 12056-1).

7.6 Rainwater Pipes

7.6.2 For rainwater pipes that run through outer walls of buildings waterproof pipe penetrations have to be provided.

7.6.3 Rainwater pipes should not be encased in concrete in supporting components of buildings.

7.6.6 At those places where condensation water can cause problems, the rainwater pipes inside the building have to be insulated.

DIN 1986-100:2016-12 (Excerpt)
5.3 Rainwater Systems

5.3.1 Planning Requirements
During the planning and calculation phase of rainwater drainage systems, primarily all options of the decentralized rainwater management should be used in order to reduce the piping of rainwater into the public wastewater system (see DIN 1986-3).

5.10 Balconies and Loggias
Balconies and loggias should be provided with a drain or a channel. If the balcony or the loggia has a closed parapet, an emergency drain or an emergency overflow of at least 40 mm clear width has to be installed in the parapet in addition to the drain.
It is not allowed to connect drains of balconies or loggias with closed parapet to rainwater downpipes of drainage systems in order to avoid the flooding of lower storeys. Even if emergency drainage systems are installed in the parapet, a connection of this kind should not be established. This also applies to terrace drains.

6.1.4 Protection against Mechanical Damage
In areas where mechanical damage is expected, e. g. in underground carparks, factory halls or warehouses, wastewater pipes have to be protected. For rain downpipes in areas where mechanical damage is expected standpipes made of a suitable material have to be used (see DIN 1986-4).

14.2 Rainwater Systems
14.2.1 Rainwater Discharge

Here is: $Q_r = r_{(D,T)} \cdot C \cdot A \cdot \frac{1}{10000}$

$r_{(D,T)}$ the calculated rainfall intensity in liter per second and hectare (l/(s•ha)), calculated on a statistical basis

C the discharge coefficient (in accordance with table 9)

A the effective, in the floor plan projected rainfall area, in square meter (m^2) (also see DIN EN 12056-3:2001-01, 4.3)

Q_r rainwater discharge in liter per second (l/s)

14.2.2 Calculated Rainfall Intensity
The normative rain duration has to be considered in the calculation with D = 5 minutes. The annuality (T) is determined by the task and has to be specified while taking into account the type and usage of the building. Safety factors do not have to be considered any longer then.

14.2.3 Discharge Coefficients
Table 9: Discharge Coefficients C for the Calculation of the Rainwater Discharge

No.	Type of Area		C*
1	Waterproof surfaces, e. g.		
	- Roof areas		1,0
	- Concrete surfaces		1,0
	- Ramp		1,0
	- Surfaces fastened in place with sealed joints		1,0
	- Blacktops (asphalt)		1,0
	- Paving with sealed joints		1,0
	- Gravel roofs		0,8
	Green roof areas		
	- roof greening extensive		0,7
	- roof greening intensive	from 30 cm	0,2
	- roof greening extensive	from 10 cm	0,4
	- roof greening extensive	below 10 cm	0,5

* Discharge Coefficient

14.2.7.2 Downpipes
The downpipe may not have a smaller nominal diameter than the connecting nominal diamter of the respective roof drain or the collector connection pipe. The downpipes can be calculated up to a filling ratio of $f = 0{,}33$.

14.2.7.3 Calculation of the Collecting Pipes and Ground Pipes
Inside the building, collecting and ground pipes have to be calculated for a filling ratio of $h/d_i = 0{,}7$ while taking into account a minimum incline of J = 0,5 cm/m. For the calculation of ground pipes outside the building, a minimum speed of v = 0,7 m/s and a maximum speed of v = 2,5 m/s has to be considered. The minimum incline here is J = 1 : DN and the allowed filling ratio $h/d_i = 0{,}7$. Behind a shaft with open flow, the complete filling can be calculated without overpressure.

Product Number List

IMPORTANT: Please indicate the nominal diameter (DN) in addition to the product number!

Series A and B:

LORO Balcony Single Drains with Supporting Edge DN 50 and DN 70, made of steel

Application area:

Balconies without sealing sheets, with screed finish or tiles in mortar bedding

System description/ proposal for tender text

Series A

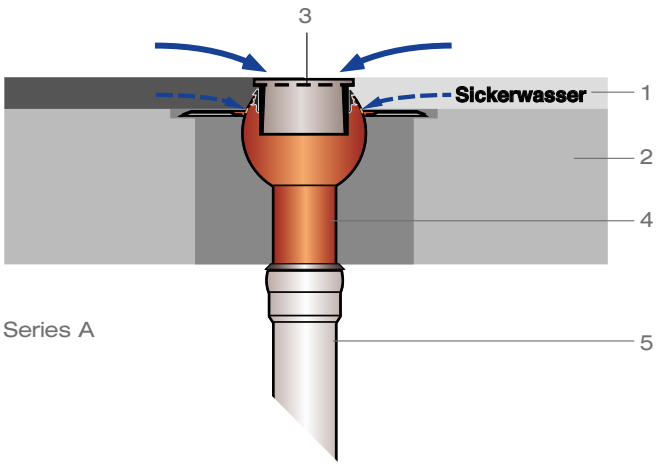
LORO balcony drains with supporting edge, Series A,
made of galvanized steel,
with additional coating,
colour: red-brown,
vertical runoff / horizontal runoff
consisting of:
drain body, sealing element, plastic strainer quadratic,
82 x 82 mm (for installation height 30 ± 5 mm),
DN 50 and DN 70

Series B

LORO balcony drains with supporting edge, Series B,
made of galvanized steel,
with additional coating,
colour: red-brown,
vertical runoff / horizontal runoff
consisting of:
drain body, sealing element, strainer support quadratic,
100 x 100 mm (for installation height 35 - 140 mm),
strainer made of stainless steel, quadratic, 94 x 94 mm,
DN 50 and DN 70

Series A

Series B



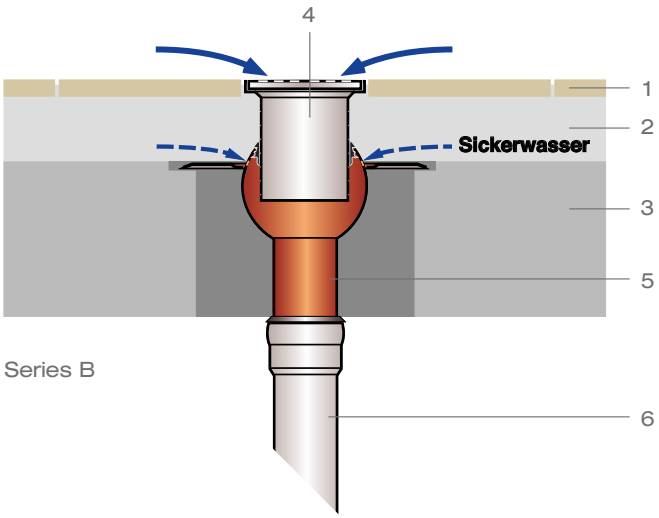
Series A

Application Example Series A:

Balcony slab with screed finish (ca. 25 mm), without sealing sheet

1 Screed finish
2 Concrete slab
3 Plastic strainer unit with tolerance compensation
4 Single drain, vertical runoff, with supporting edge
5 LORO-X steel discharge pipe

LORO solution:
Balcony drains with supporting edge, Series A, vertical runoff or horizontal runoff, plastic strainer unit with tolerance compensation.



Series B

Application Example Series B:

Balcony slab with tiles in mortar bedding, without sealing sheet

1 Tiles
2 Mortar bedding
3 Concrete slab
4 Strainer support, height-adjustable, and strainer made of stainless steel
5 Single drain, vertical runoff, with supporting edge
6 LORO-X steel discharge pipe

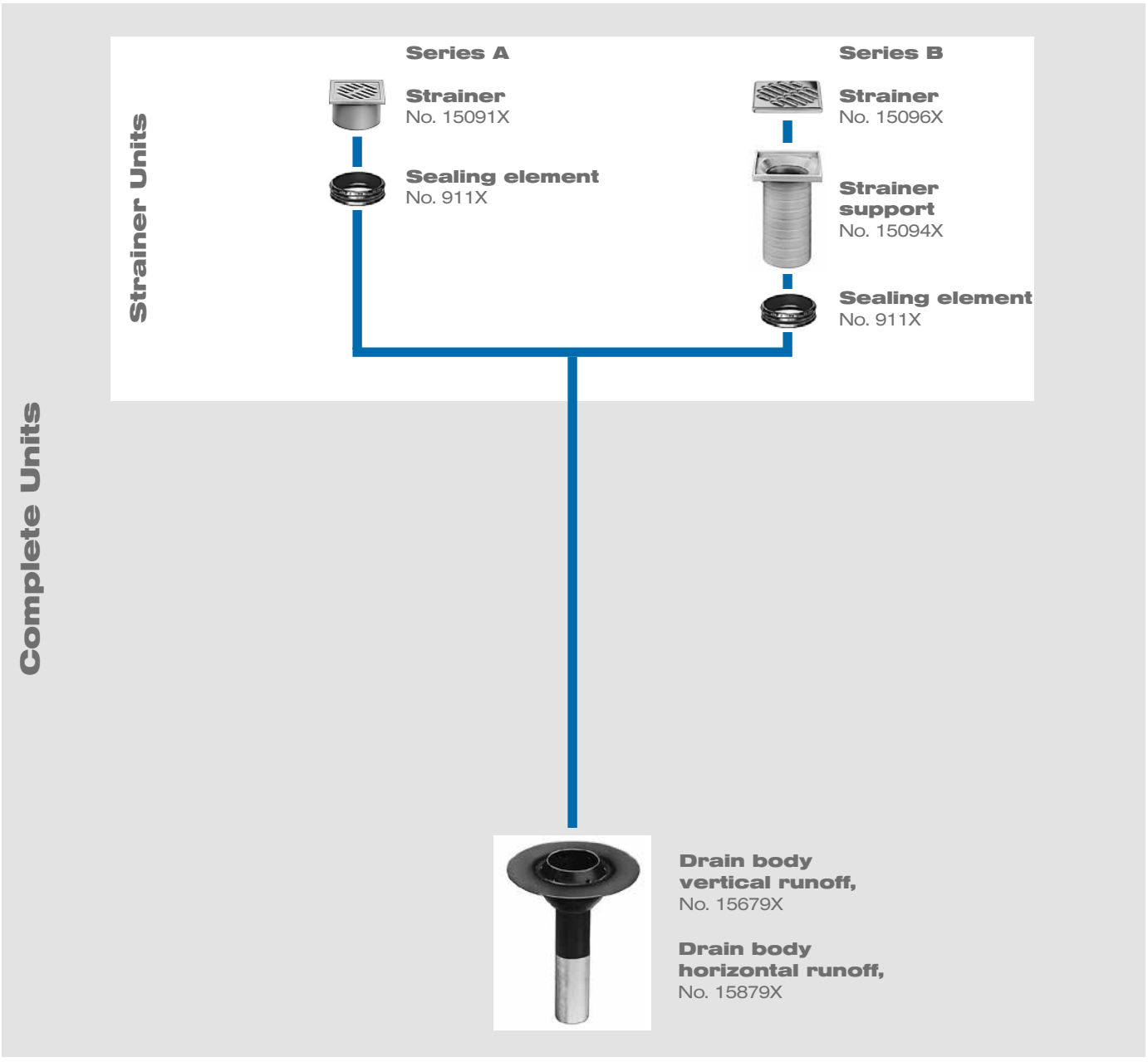
LORO solution:
Balcony drains with supporting edge, Series B, vertical runoff or horizontal runoff, with height-adjustable strainer support and strainer made of stainless steel.

See pages 19 - 20 for article numbers of Series A and B.

Setup Diagram/System Components

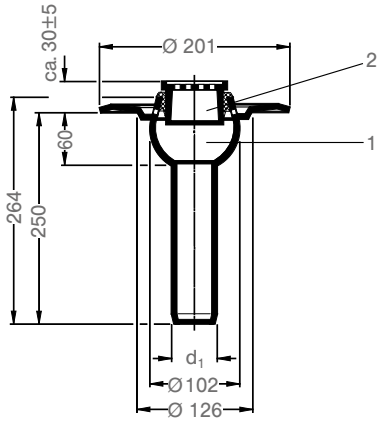
Series A and B:
LORO Balcony Single Drains with Supporting Edge

DN 50 and DN 70, made of steel



LORO Balcony drains, Series A and B, are delivered as complete units. However, they can alternatively also be put together from part units (strainer units) or from single parts for the respective application.

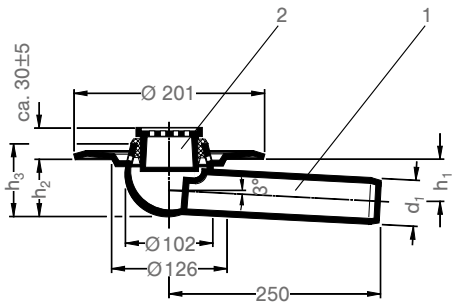
Complete Units

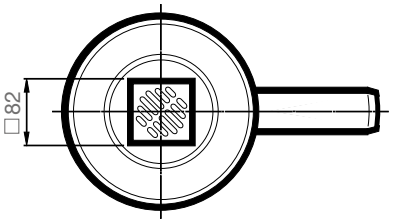


LORO Balcony Single Drain, Vertical Runoff, Series A

DN 50: Art.-No. 15671.050X weight: 1.1 kg
DN 70: Art.-No. 15671.070X weight: 1.3 kg

consisting of:
1 drain body
2 strainer unit





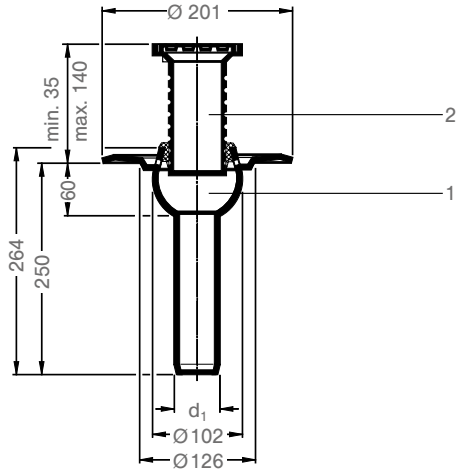
LORO Balcony Single Drain, Horizontal Runoff, Series A

DN 50: Art.-No. 15871.050X weight: 1.5 kg
DN 70: Art.-No. 15871.070X weight: 1.6 kg

consisting of:
1 drain body
2 strainer unit

DN	d_1	h_1	h_2	h_3
50	53	50	68	82
70	73	56	83	97

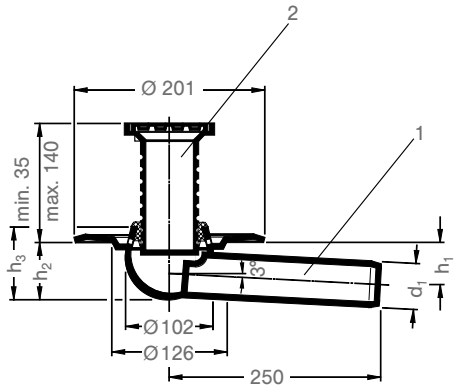
Complete Units

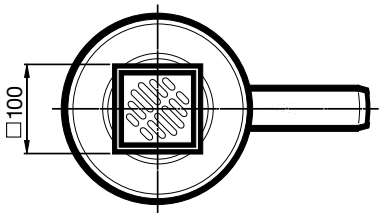


LORO Balcony Single Drain, Vertical Runoff, Series B

DN 50: Art.-No. 15672.050X weight: 1.2 kg
DN 70: Art.-No. 15672.070X weight: 1.4 kg

consisting of:
1 drain body
2 strainer unit





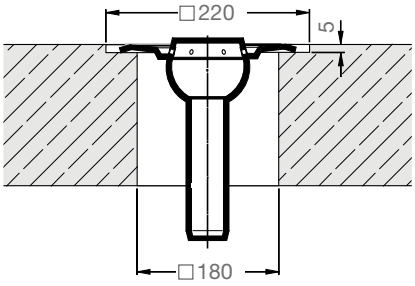
LORO Balcony Single Drain, Horizontal Runoff, Series B

DN 50: Art.-No. 15872.050X weight: 1.6 kg
DN 70: Art.-No. 15872.070X weight: 2.0 kg

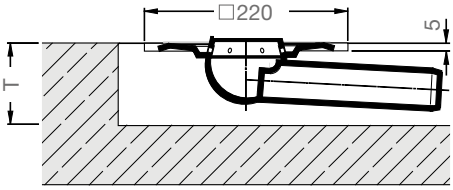
consisting of:
1 drain body
2 strainer unit

DN	d_1	h_1	h_2	h_3
50	53	50	68	82
70	73	56	83	97

Recess Dimensions Series A and B

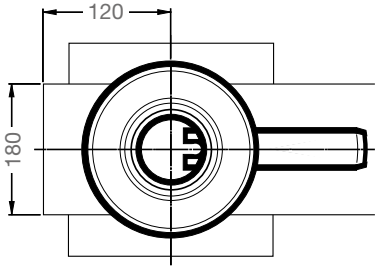


Ceiling opening
Single drain, vertical runoff



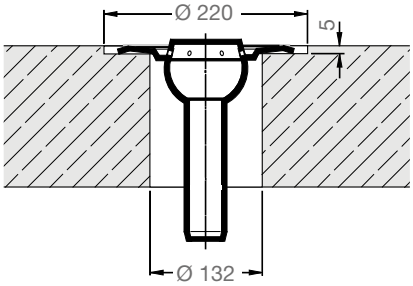
Ceiling opening
Single Drain, vertical runoff

DN	Recess Depth T
50	90
70	110

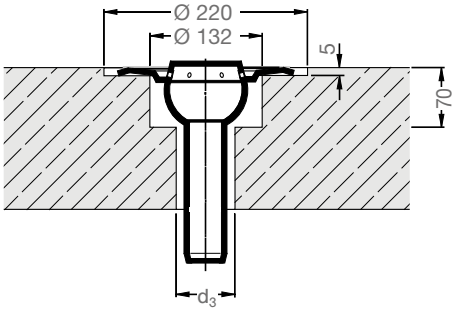


Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.



Tapping hole, single-stage



Tapping hole, two-stage

DN	d_3
50	72
70	92

Series BE:

LORO Balcony Drainage Unit with Supporting Edge

DN 50 - DN 70, made of galvanized steel

Application area:

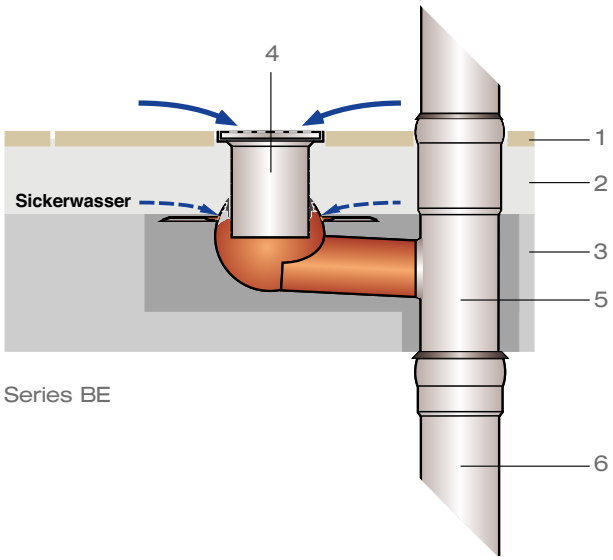
Balconies without sealing sheets, with mastic asphalt, screed finish or tiles in mortar bedding

System description/ proposal for tender text

Series BE
LORO balcony drainage units
with supporting edge and downpipe, Series BE,
made of galvanized steel,
with additional inner coating,
colour: red-brown

consisting of:
balcony drainage unit with downpipe
300 mm long,
sealing element, strainer support quadratic,
100 x 100 mm
(for installation height 35 - 140 mm),
quadratic strainer made of stainless steel,
94 x 94 mm,
DN 50, DN 70

Series BE



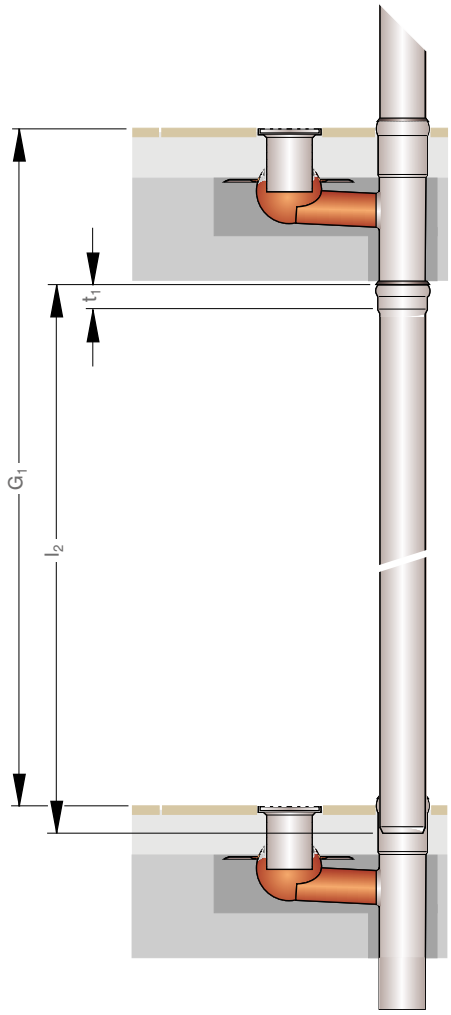
Series BE

Application Example Series BE:

Balcony slab with tiles in mortar bedding without sealing sheet

1 Tiles
2 Mortar bedding
3 Concrete slab
4 Strainer support, height-adjustable, and strainer made of stainless steel
5 Drainage unit
6 LORO-X steel discharge pipe

LORO Solution:
Balcony drainage units with supporting edge, Series BE, vertical runoff, with height-adjustable strainer support and strainer made of stainless steel.



Installation Instruction Series BE:

Determination of the downpipe length balcony drainage units
(short) 300 mm long

Branch with BE long socket (t_7)
for tolerance compensation ± 30 mm

Downpipe with LORO-X normal socket (t_1)

Total length: $l_2 = G_1 - 300\ mm + t_1$

Thus, e. g. for storey height G_1 = 2700 mm (± 30 mm)
DN 50/50 l_2 = 2700 - 300 + 38 = 2438 mm
DN 70/50 l_2 = 2700 - 300 + 55 = 2455 mm

See page 25 for article numbers of Series BE.

Setup Diagram/System Components

Series BE:
LORO Balcony Drainage Units with Supporting Edge

DN 50 and DN 70, made of galvanized steel

Strainer Units

Strainer
No. 15096X

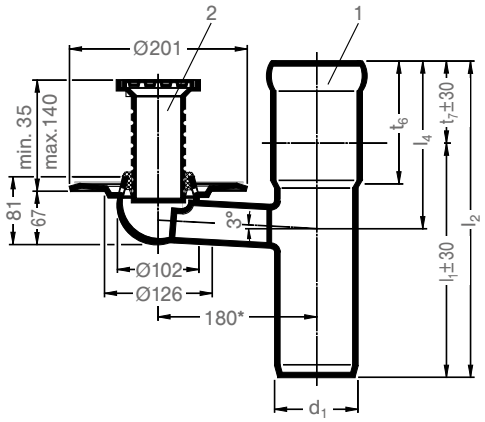
Strainer support
No. 15094X

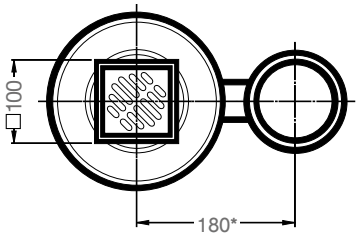
Sealing element
No. 911X

Complete Units

Single drain with downpipe
Downpipe length 300 mm,
No. 15119X

LORO Balcony drainage units, Series BE, are delivered as complete units. However, they can alternatively also be put together from subunits (strainer units) or from single parts for the respective application.





* Drainage units with a different axial dimension are available upon request.

Complete Units

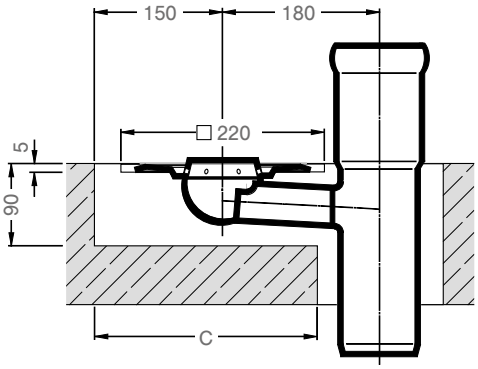
LORO Balcony Drainage Unit,
downpipe length 300 mm

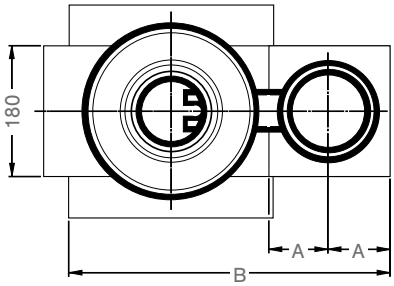
DN 50: Art.-No. 15112.050X weight: 1.8 kg
DN 70: Art.-No. 15112.070X weight: 2.2 kg

consisting of:
1 balcony drainage unit
2 strainer unit

DN1	DN2	d_1	l_1	l_2	t_4	t_6	t_7
50	50	53	300	368	177	98	68
70	50	73	300	385	194	115	85

DN 1 = DN downpipe
DN 2 = DN drain
Special lengths suitable for storey height are available as special production upon request.





Recess Dimensions

Ceiling opening/ceiling recess

DN	A	B	C
50	55	385	275
70	65	395	265

Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.

Series E and F:

LORO Balcony Single Drains with Connecting Sleeve, According to DIN EN 1253

DN 50 and DN 70, made of galvanized steel or copper

Application area:
Balconies with sealing sheets, tiles or paving slabs

System description/ proposal for tender text

Series E
LORO balcony drains with connecting sleeve*, according to DIN EN 1253, made of galvanized steel with additional coating, colour: red-brown, alternatively: made of solid copper, vertical runoff / horizontal runoff, without / with thermal insulation

one-piece, consisting of:
drain body, connecting sleeve*, clamping ring, drainage ring, plastic strainer, round - not height adjustable
DN 50 and DN 70

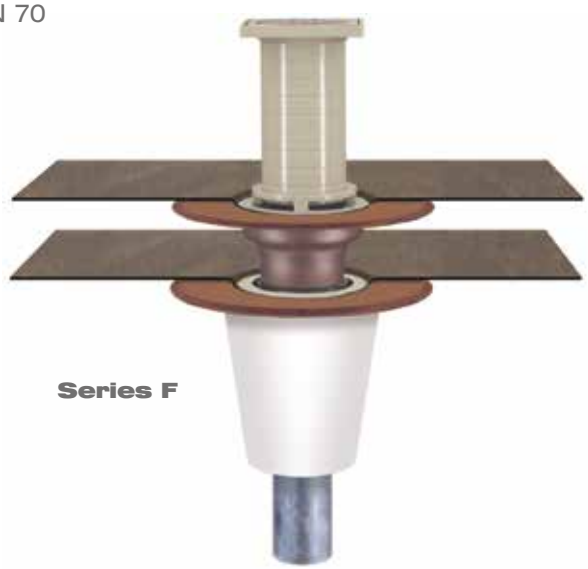
two-piece, consisting of:
drain body, connecting sleeve*, clamping ring, sealing element, extension cartridge (for installation height 40 - 120 mm),
connecting sleeve*, clamping ring, drainage ring, plastic strainer, round - not height adjustable
DN 50 and DN 70

Series F
LORO balcony drains with connecting sleeve*, according to DIN EN 1253, made of galvanized steel with additional coating, colour: red-brown, alternatively: made of solid copper, vertical runoff / horizontal runoff, without / with thermal insulation

one-piece, consisting of:
drain body, connecting sleeve*, clamping ring, drainage ring, strainer support quadratic, 100 x 100 mm (for installation height 35 - 140 mm), quadratic strainer made of stainless steel, 94 x 94 mm, class K, DN 50 and DN 70

two-piece, consisting of:
drain body, connecting sleeve*, clamping ring, sealing element, extension cartridge (for installation height 40 - 120 mm),
connecting sleeve*, clamping ring, drainage ring, strainer support quadratic, 100 x 100 mm (for installation height 35 - 140 mm), quadratic strainer made of stainless steel, 94 x 94 mm, class K, DN 50 and DN 70

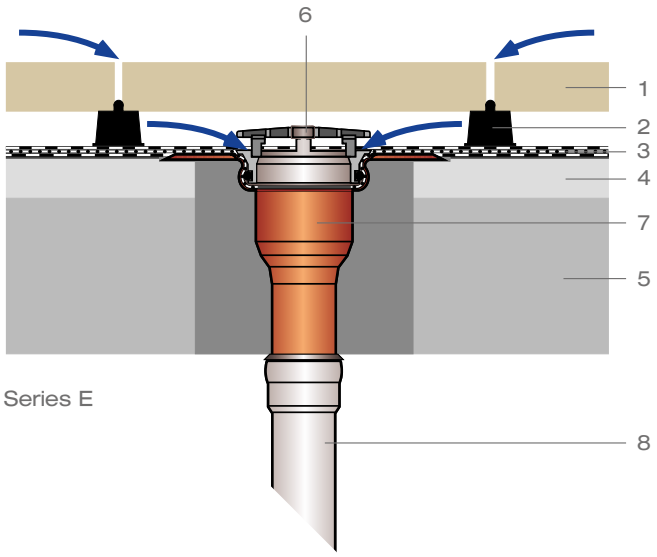
Series E



Series F

* made of bitumen/EPDM compound structure (standard) or PVC or ECB, pre-assembled at the factory

Application Examples Series E:

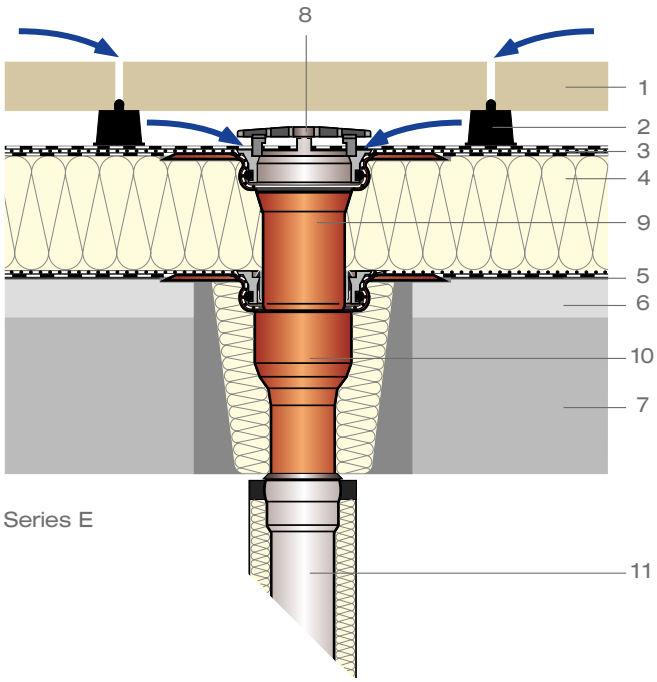


Series E

Balcony slab with supported paving slabs with sealing sheet, without thermal insulation drainage at one level below the paving slab.

1 Paving slab
2 Paving slab support
3 Sealing sheet, if necessary on separating and/or levelling layer
4 Levelling screed
5 Concrete slab
6 Plastic strainer without height adjustment, clamped onto the drainage ring
7 Single drain with connecting sleeve and clamping ring (factory-fitted) vertical runoff, without thermal insulation
8 LORO-X steel discharge pipe

LORO solution:
Balcony single drains with connecting sleeve, Series E, vertical or horizontal runoff, one-piece, without thermal insulation, with strainer, not height-adjustable.



Series E

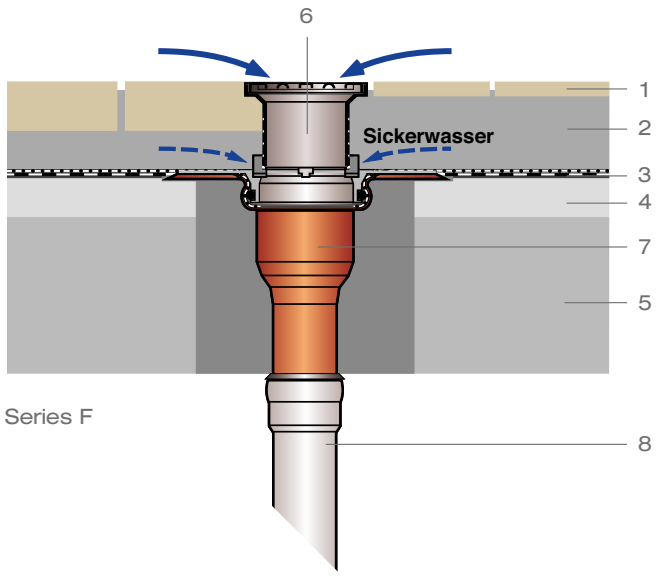
Balcony slab with supported paving slabs with sealing sheet, with thermal insulation drainage at one level below the paving slab.

1 Paving slab
2 Paving slab support
3 Sealing sheet, if necessary on separating and/or levelling layer
4 Thermal insulation
5 Vapor barrier, if necessary on separating and/or levelling layer
6 Levelling screed
7 Concrete slab
8 Plastic strainer without height adjustment, clamped onto the drainage ring
9 Extension cartridge with connecting sleeve and clamping ring (factory-fitted) and sealing element for connection with single drain
10 Single drain with connecting sleeve and clamping ring (factory-fitted), vertical runoff, with thermal insulation
11 LORO composite pipe

LORO solution:
Balcony single drains with connecting sleeve, Series E, vertical or horizontal runoff, two-piece, with or without thermal insulation, with strainer, not height-adjustable.

See pages 31 - 32 for article numbers of Series E.

Application Examples Series F:

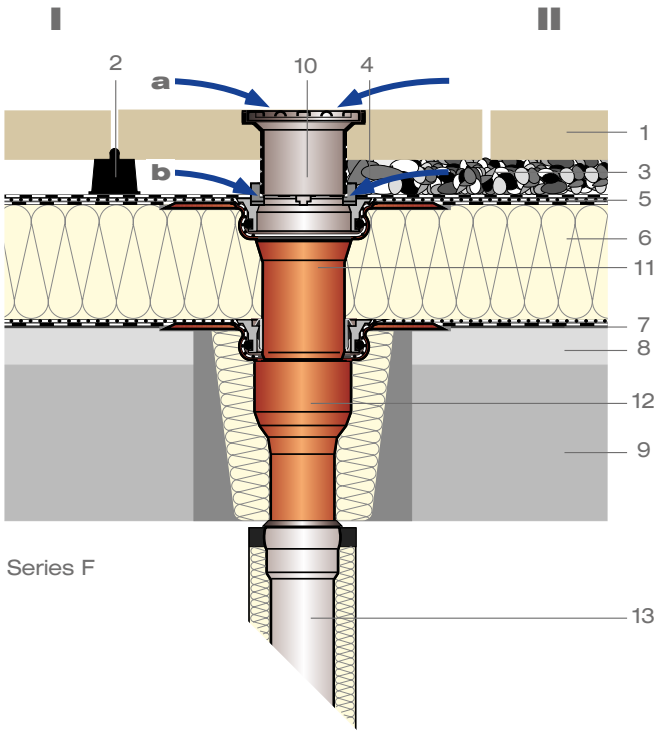


Series F

Balcony slab with paving slab-/ tiles in mortar bedding <u>with sealing sheet,</u> without thermal insulation.
Drainage at one level, with additional seepage discharge.

1 Paving slab/tiles
2 Mortar bedding
3 Sealing sheet, if necessary on separating and/or levelling layer
4 Levelling screed
5 Concrete slab
6 Strainer support and strainer made of stainless steel, height adjustable, and drainage ring for seepage discharge
7 Single drain with connecting sleeve and clamping ring (factory-fitted), vertical runoff, without thermal insulation
8 LORO-X steel discharge pipe

LORO solution:
Balcony single drains with connecting sleeve, Series F, vertical or horizontal runoff, one-piece, without thermal insulation, with height-adjustable strainer support and strainer made of stainless steel.



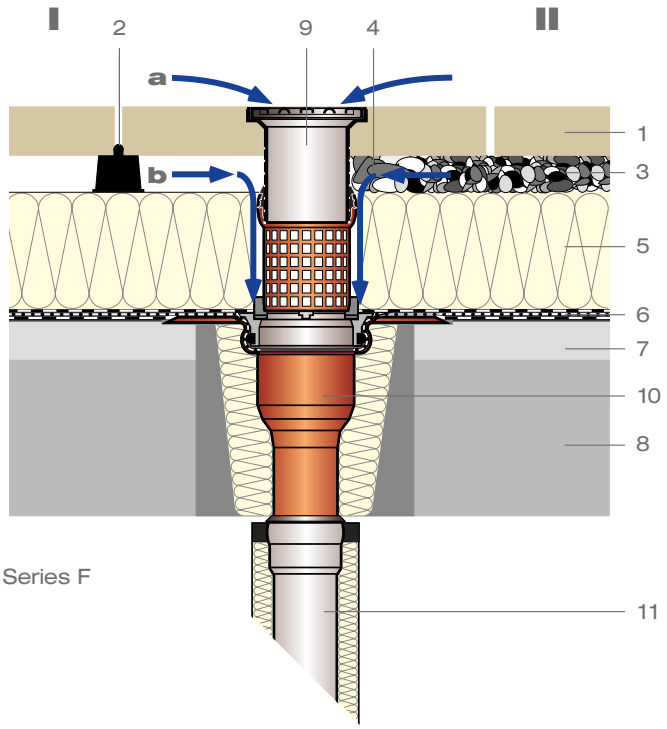
Series F

Balcony slab with paving slab
I) on paving slab support
II) on granular bedding (grit, gravel etc.)
<u>with sealing sheet,</u>
with thermal insulation.
Drainage at two levels:
a) on the sealing
b) on the paving slab.

1 Paving slab
2 Paving slab support or
3 Granular bedding
4 Coarse grit
5 Sealing sheet, if necessary on separating and/or levelling layer
6 Thermal insulation
7 Vapor barrier, if necessary on separating and/or levelling layer
8 Levelling screed
9 Concrete slab
10 Strainer support and strainer made of stainless steel, height adjustable, and drainage ring
11 Extension cartridge with connecting sleeve and clamping ring (factory-fitted) and sealing element for connection with single drain
12 Single drain with connecting sleeve and clamping ring (factory-fitted), vertical runoff, with thermal insulation
13 LORO composite pipe

LORO solution:
Balcony single drains with connecting sleeve, Series F, vertical or horizontal runoff, two-piece, with or without thermal insulation, with height-adjustable strainer support and strainer made of stainless steel.

See pages 33 - 34 for article numbers of Series F



Series F

Application Example Series E and F, system „inverted roof“:

Balcony slab with paving slab
I) on paving slab support
II) on granular bedding (grit, gravel etc.)
with sealing sheet,
with thermal insulation.

Drainage at two levels:
a) on the sealing
b) on the paving slab.

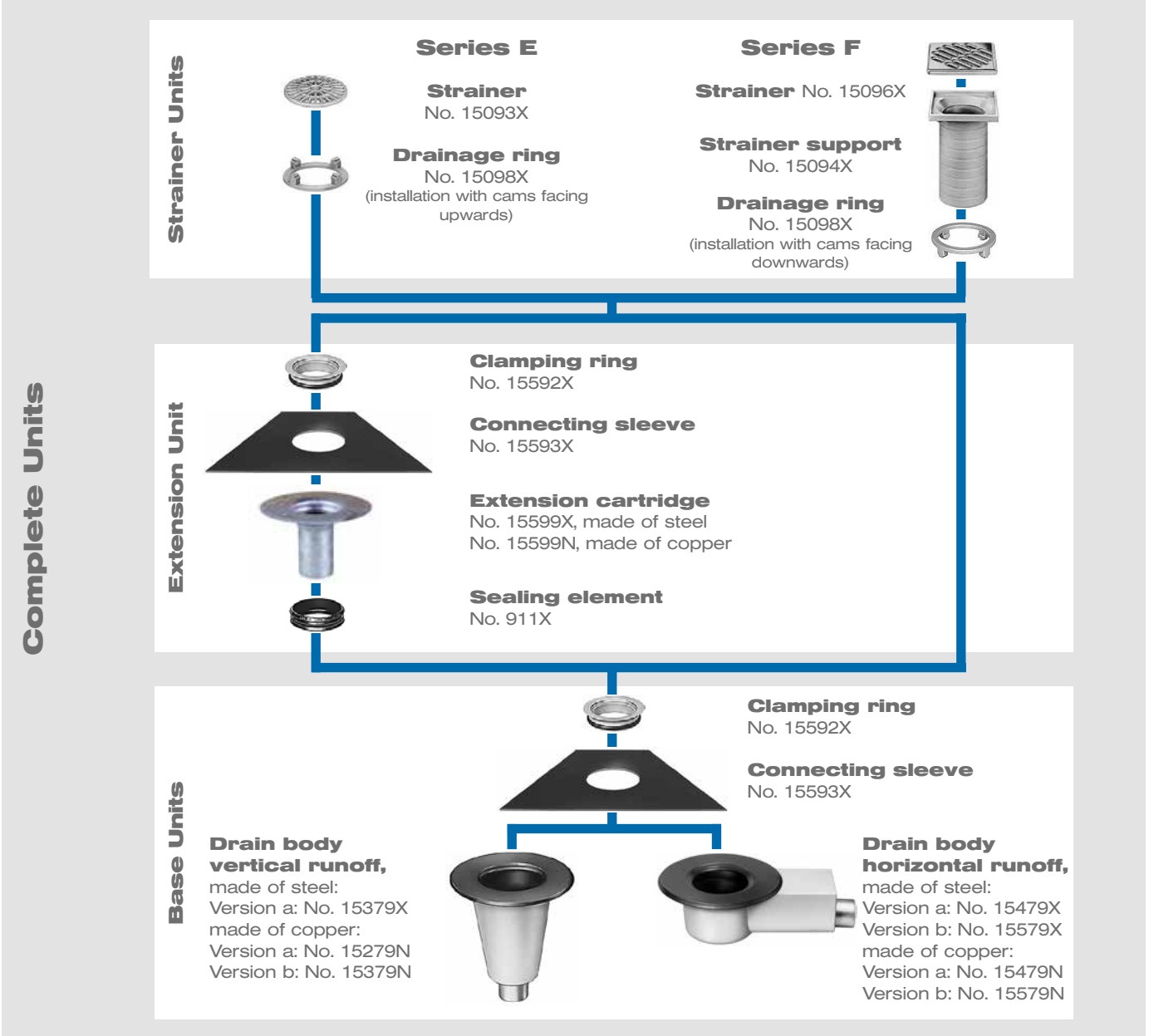
1 Paving slab
2 Paving slab support or
3 Granular bedding
4 Coarse grit
5 Thermal insulation
6 Sealing sheet, if necessary on separating and/or levelling layer
7 Levelling screed
8 Concrete slab
9 Strainer support and strainer made of stainless steel, sealing element, strainer pipe and drainage ring
10 Single drain with connecting sleeve and clamping ring (factory-fitted), vertical runoff, with thermal insulation
11 LORO composite pipe

LORO solution:
Balcony single drains with connecting sleeve, Series F, vertical or horizontal runoff, two-piece, with or without thermal insulation, with height-adjustable strainer support, sealing element, strainer pipe and strainer made of stainless steel.

See pages 31 - 34 for article numbers of the Series E and F

Setup Diagram/System Components

Series E and F:
LORO Balcony Single Drains with Connecting Sleeve
DN 50 and DN 70, made of galvanized steel



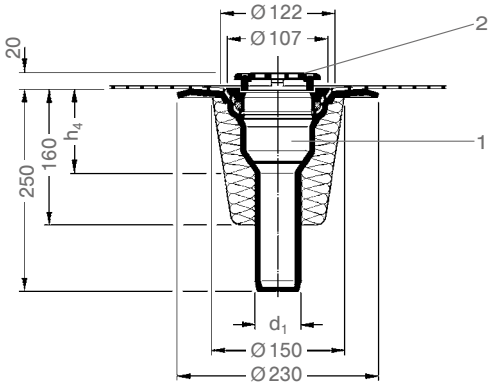
LORO balcony drains, Series E and F, are delivered as complete units. But alternatively also part units (strainer units) or single parts for the respective installation purpose can be put together. LORO balcony drains made of copper have to be put together from single parts.

The following factory-fitted connecting sleeves for balcony drainse systems Series E+F are available:

Resitrix Bitumen/EPDM Verbund - **Standard**	15593.000X
Evalon Grau	15005.000X
Flagon EP-S 150	15016.000X
Rhenofol C-Grau	15596.000X
Sarnafil T66/15D	15007.000X
Sika-Plan Typ S	15011.000X
Thermofin F18	15018.000X
Thermofol D	15015.000X
Thermoplan T TL	15003.000X
Wolfin IB Schwarz	15006.000X

The standard delivery comprises a connecting sleeve of bitumen/EPDM compound. If a different connecting sleeve is needed, please definitely indicate the desired connecting sleeve when ordering.

Complete Units

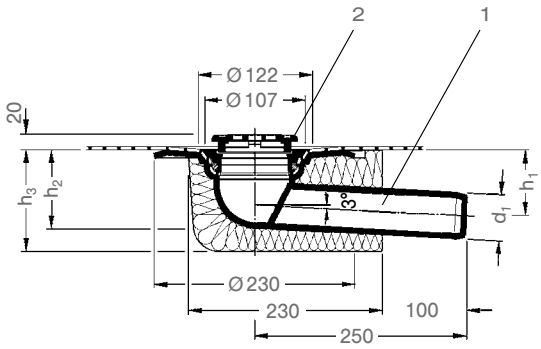


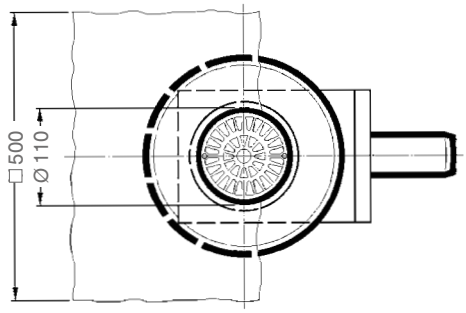
LORO Balcony Single Drain, Series E
one-piece, vertical runoff

Version a (without thermal insulation)
DN 50: Art.-No. 15271.050X weight: 2.0 kg
DN 70: Art.-No. 15271.070X weight: 2.2 kg

Version b (with thermal insulation)
DN 50: Art.-No. 15371.050X weight: 2.3 kg
DN 70: Art.-No. 15371.070X weight: 2.4 kg

consisting of:
1 base unit
2 strainer unit





LORO Balcony Single Drain, Series E
one-piece, horizontal runoff

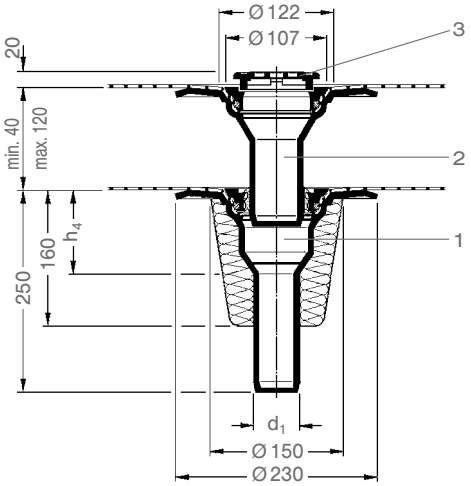
Version a (without thermal insulation)
DN 50: Art.-No. 15471.050X weight: 2.2 kg
DN 70: Art.-No. 15471.070X weight: 2.5 kg

Version b (with thermal insulation)
DN 50: Art.-No. 15571.050X weight: 2.4 kg
DN 70: Art.-No. 15571.070X weight: 2.7 kg

consisting of:
1 base unit
2 strainer unit

DN	d_1	h_1	h_2	h_3	h_4
50	53	72	90	120	107
70	73	80	106	136	70

Complete Units

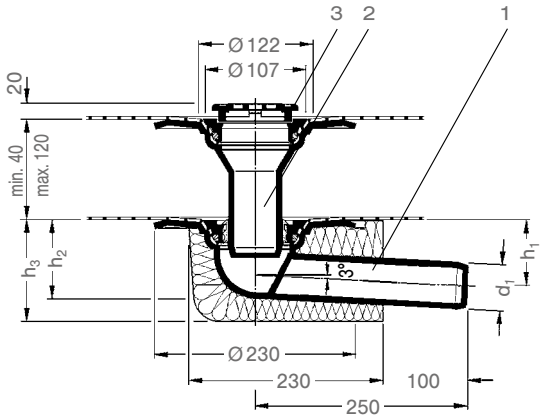


LORO Balcony Single Drain, Series E
two-piece, vertical runoff

Version a (without thermal insulation)
DN 50: Art.-No. 15281.050X weight: 3.9 kg
DN 70: Art.-No. 15281.070X weight: 3.3 kg

Version b (with thermal insulation)
DN 50: Art.-No. 15381.050X weight: 4.2 kg
DN 70: Art.-No. 15381.070X weight: 4.3 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit

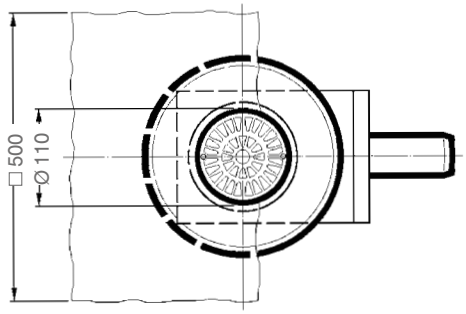


LORO Balcony Single Drain, Series E
two-piece, horizontal runoff

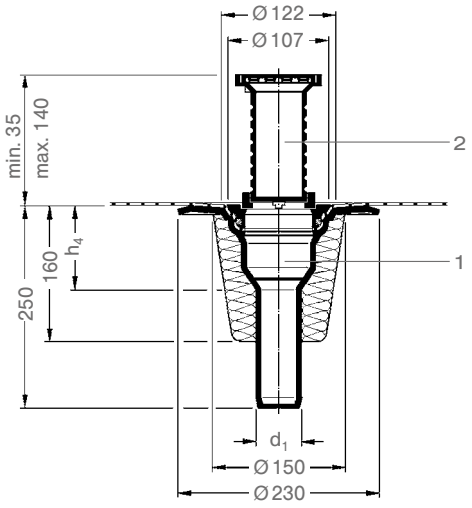
Version a (without thermal insulation)
DN 50: Art.-No. 15481.050X weight: 4.1 kg
DN 70: Art.-No. 15481.070X weight: 4.4 kg

Version b (with thermal insulation)
DN 50: Art.-No. 15581.050X weight: 4.3 kg
DN 70: Art.-No. 15581.070X weight: 4.6 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit



DN	d_1	h_1	h_2	h_3	h_4
50	53	72	90	120	107
70	73	80	106	136	70



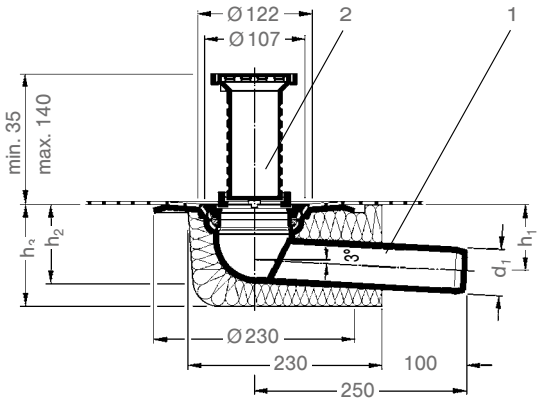
Complete Units

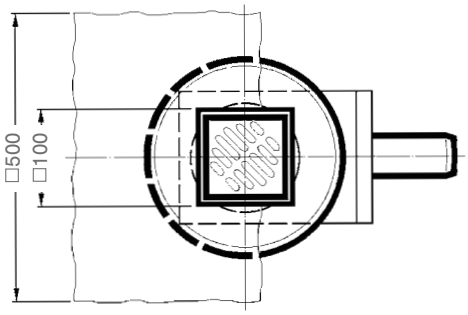
LORO Balcony Single Drain, Series F
one-piece, vertical runoff

Version a (without thermal insulation)
DN 50: Art.-No. 15272.050X weight: 2.2 kg
DN 70: Art.-No. 15272.070X weight: 2.4 kg

Version b (with thermal insulation)
DN 50: Art.-No. 15372.050X weight: 2.5 kg
DN 70: Art.-No. 15372.070X weight: 2.5 kg

consisting of:
1 base unit
2 strainer unit





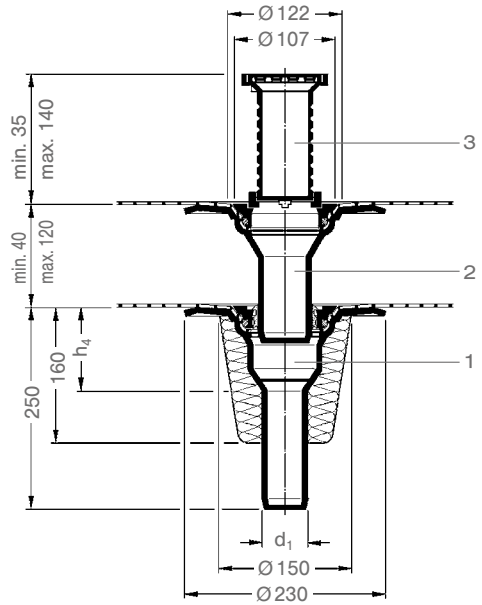
LORO Balcony Single Drain, Series F
one-piece, horizontal runoff

Version a (without thermal insulation)
DN 50: Art.-No. 15472.050X weight: 2.4 kg
DN 70: Art.-No. 15472.070X weight: 2.7 kg

Version b (with thermal insulation)
DN 50: Art.-No. 15572.050X weight: 2.6 kg
DN 70: Art.-No. 15572.070X weight: 2.9 kg

consisting of:
1 base unit
2 strainer unit

DN	d_1	h_1	h_2	h_3	h_4
50	53	72	90	120	107
70	73	80	106	136	70



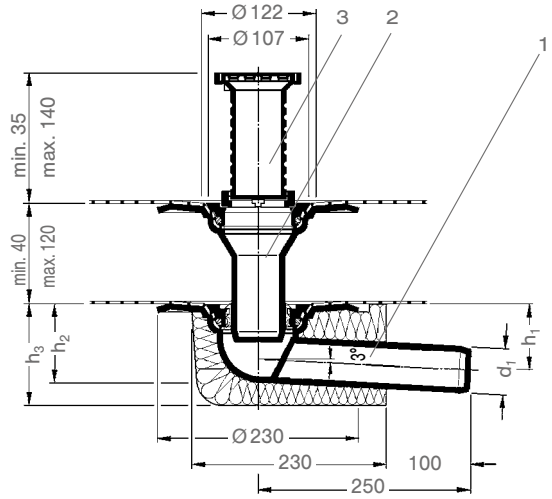
Complete Units

LORO Balcony Single Drain, Series F
two-piece, vertical runoff

Version a (without thermal insulation)
DN 50: Art.-No. 15282.050X weight: 4.1 kg
DN 70: Art.-No. 15282.070X weight: 4.3 kg

Version b (with thermal insulation)
DN 50: Art.-No. 15382.050X weight: 4.3 kg
DN 70: Art.-No. 15382.070X weight: 4.5 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit

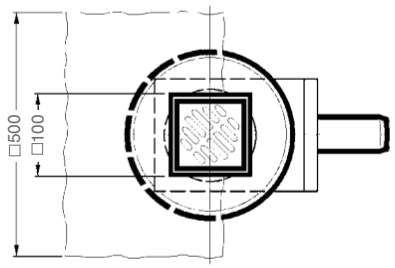


LORO Balcony Single Drain, Series F
two-piece, horizontal runoff

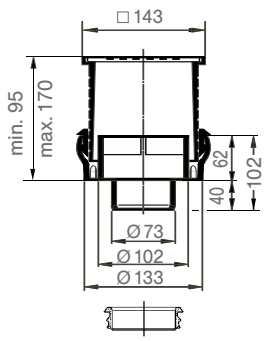
Version a (without thermal insulation)
DN 50: Art.-No. 15482.050X weight: 4.3 kg
DN 70: Art.-No. 15482.070X weight: 4.6 kg

Version b (with thermal insulation)
DN 50: Art.-No. 15582.050X weight: 4.5 kg
DN 70: Art.-No. 15582.070X weight: 4.8 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit



DN	d_1	h_1	h_2	h_3	h_4
50	53	72	90	120	107
70	73	80	106	136	107



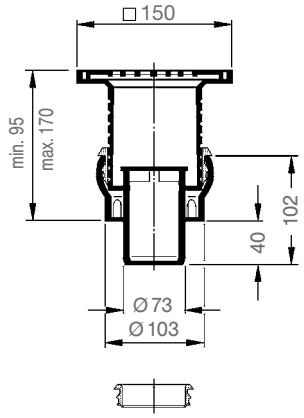
LORO-Emergency Drainage Unit
for Balcony Drainage,
Series E and F
vertical runoff

Discharge rate according to specification sheet:
LX 1966 DN 70: 1.8 l/s*

DN 70: Art.-No. 15601.070X weight: 1.5 kg

consisting of: strainer support, strainer made of stainless steel and sealing element

* According to test specification in accordance with DIN EN 1253



LORO-Emergency Drainage Unit for Balcony Drainage, Series E and F

Discharge rate according to specification sheet:
LX 1933 DN 70: 1.0 l/s*

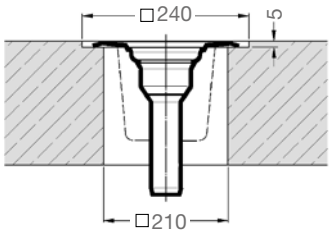
DN 70: Art.-No. 15600.070X weight: 1.0 kg

consisting of: strainer support, strainer made of stainless steel and sealing element

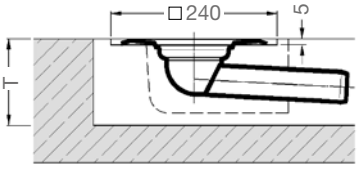
* According to test specification in accordance with DIN EN 1253

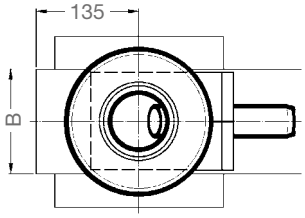
Recess Dimensions Series E and F

Ceiling opening
Single drain, vertical runoff



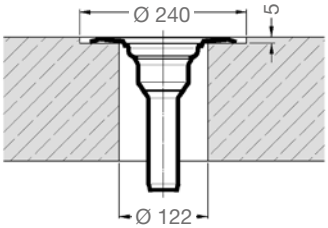
Ceiling opening
Single drain, horizontal runoff



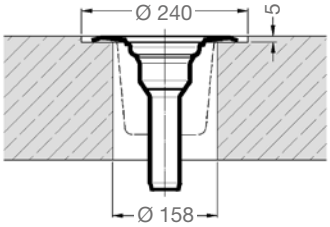


DN	Recess depth T		Recess width B	
	a	b	a	b
50	110	130	130	160
70	130	150	130	160

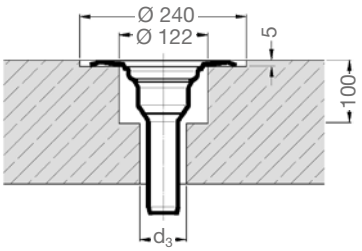
Tapping hole, single-stage
for drains without thermal insulation



for drains with thermal insulation



Tapping hole, two-stage
for drains without thermal insulation



DN	d_3
50	72
70	92

Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.

Series FF:

LORO Balcony Single Drains with Connecting Sleeve, According to DIN EN 1253

DN 50 and DN 70, made of galvanized steel

Application area:
Balconies with compound sealings

System description/
proposal for tender text

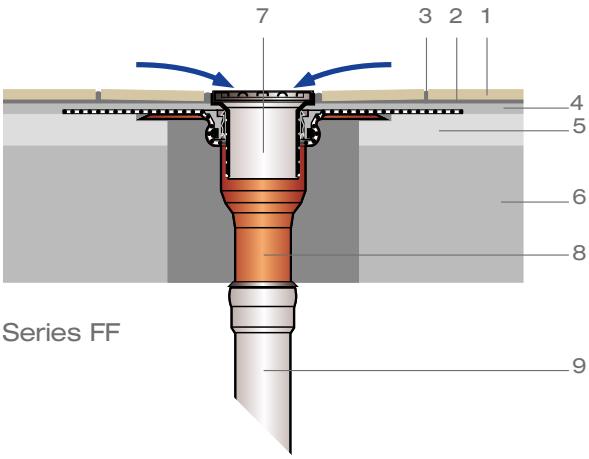
Series FF, vertical runoff
LORO balcony drains with VS connecting sleeve
made of multi-layer compound material,
made of galvanized steel with additional coating,
colour: red-brown, vertical runoff

one-piece,
consisting of:
drain body, VS connecting sleeve, clamping ring,
sealing element, strainer support quadratic,
100 x 100 mm (for installation height 15 - 130 mm)
quadratic strainer made of stainless steel,
94 x 94 mm, class K, DN 50 and DN 70

Series FF, horizontal runoff
LORO balcony drains with VS connecting sleeve
made of multi-layer compound material,
made of galvanized steel with additional coating,
colour: red-brown, horizontal runoff

one-piece,
consisting of:
drain body, VS connecting sleeve, clamping ring,
sealing element, strainer support quadratic,
100 x 100 mm (for installation height 15 - 130 mm)
quadratic strainer made of stainless steel,
94 x 94 mm, class K, DN 50 and DN 70

Series FF



Series FF

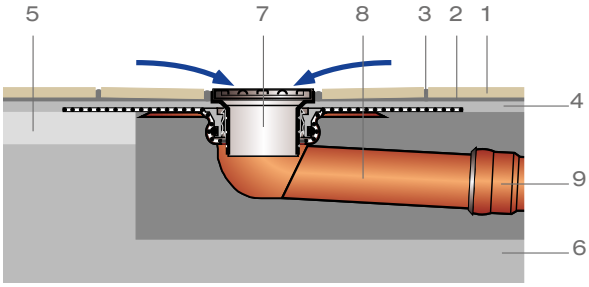
Application Examples Series FF:

Balcony slab with paving slab or tiles in adhesive bed,
surface sealing with compound sealing
without thermal insulation

Drainage at one level.

1 Tiles
2 Adhesive bed
3 Elastic joint
4 Surface sealing with compound sealing
5 Levelling screed
6 Concrete slab
7 Strainer support, height-adjustable, and strainer made of stainless steel
8 Single drain with VS connecting sleeve made of multi-layer compound material, vertical runoff
9 LORO-X steel discharge pipe

LORO solution:
Balcony single drains with VS connecting sleeve made of multi-layer compound material, Series FF, vertical runoff, one-piece, with height-adjustable strainer support and strainer made of stainless steel.



Series FF

Balcony slab with paving slab or tiles in adhesive bed
surface sealing with compound sealing
without thermal insulation

Drainage at one level.

1 Tiles
2 Adhesive bed
3 Elastic joint
4 Surface sealing with compound sealing
5 Levelling screed
6 Concrete slab
7 Strainer support, height-adjustable, and strainer made of stainless steel
8 Single drain with VS connecting sleeve made of multi-layer compound material, horizontal runoff
9 LORO-X steel discharge pipe

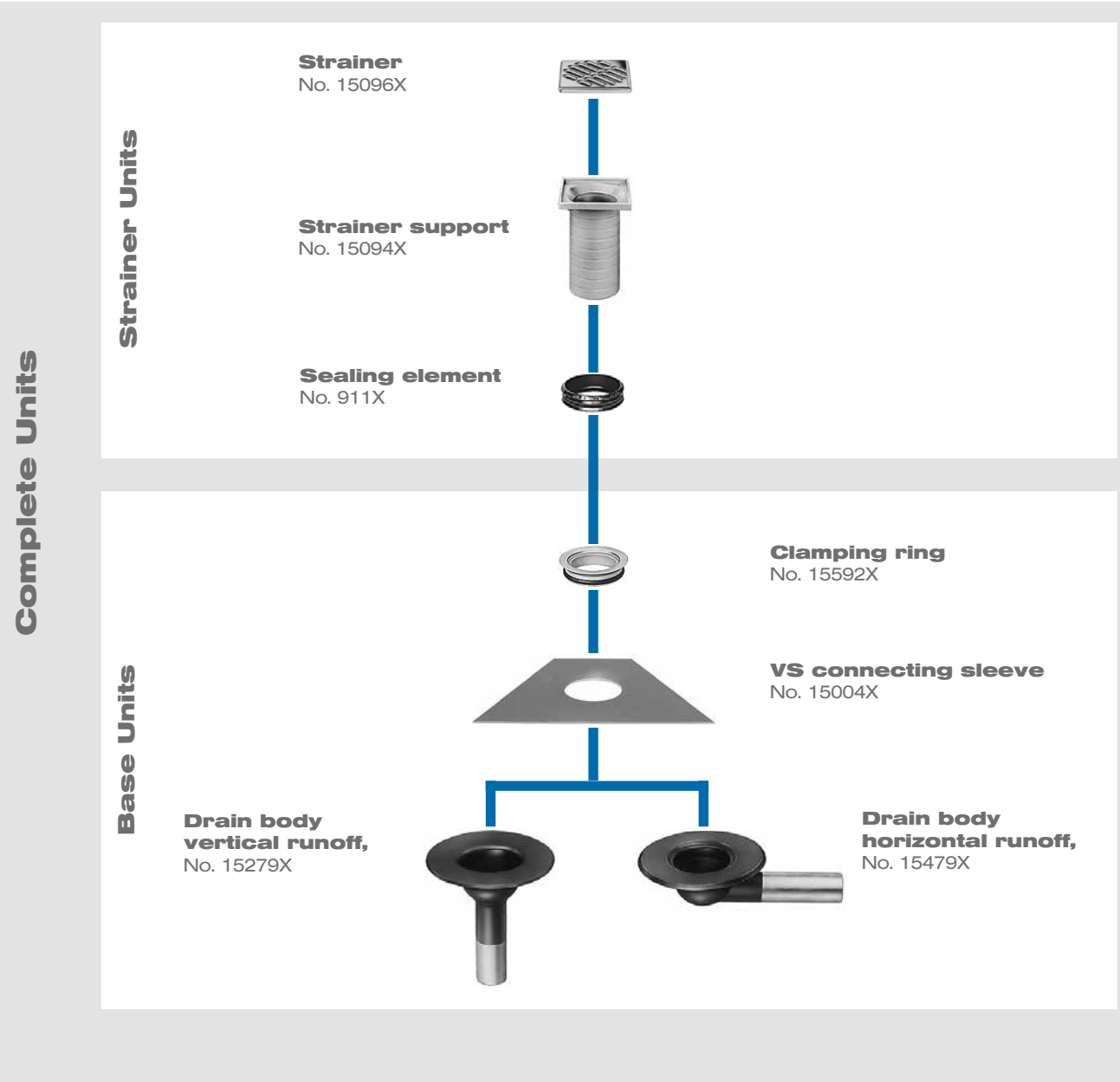
LORO solution:
Balcony single drains with VS connecting sleeve made of multi-layer compound material, Series FF, horizontal runoff, one-piece, with height-adjustable strainer support and strainer made of stainless steel.

See page 39 for article numbers of Series FF

Setup Diagram/System Components

Series FF:
LORO Balcony Single Drains with VS Connecting Sleeve

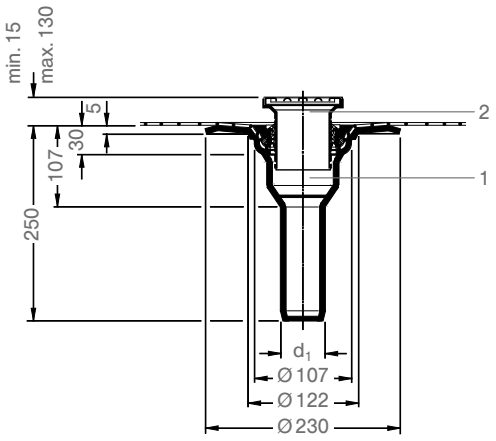
DN 50 and DN 70, made of galvanized steel



LORO balcony drains, Series FF, are delivered as complete units. But alternatively part units (drain body base unit, strainer unit) can be put together for respective installation purposes.

Upon request, LORO balcony drains, Series FF, are also available with thermal insulation and extension cartridge for thermally insulated ceilings. They can be used in combination, e. g. balcony drain with connecting sleeve, Series E/F, and extension cartridge with VS connecting sleeve.

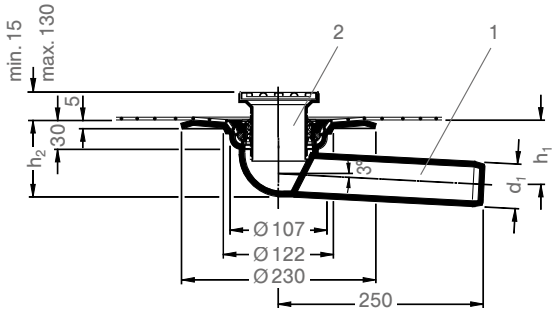
Complete Units



LORO Balcony Single Drain, Series FF
one-piece, vertical runoff

DN 50: Art.-No. 15276.050X weight: 1.7 kg
DN 70: Art.-No. 15276.070X weight: 1.5 kg

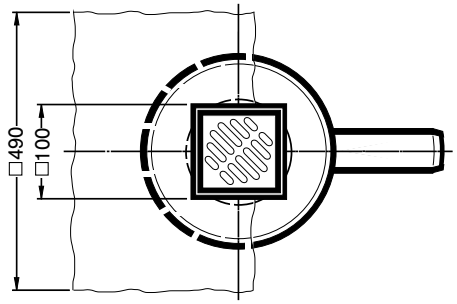
consisting of:
1 base unit
2 strainer support



LORO Balcony Single Drain, Series FF
one-piece, horizontal runoff

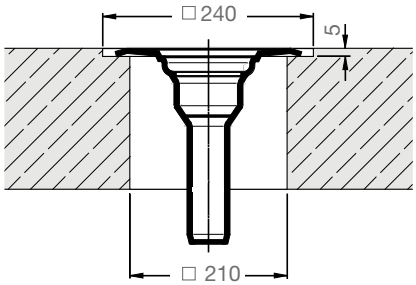
DN 50: Art.-No. 15476.050X weight: 1.5 kg
DN 70: Art.-No. 15476.070X weight: 1.9 kg

consisting of:
1 base unit
2 strainer support

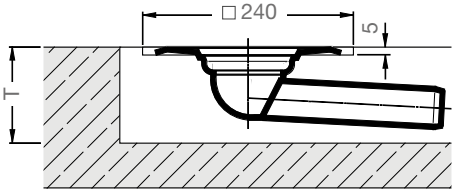


DN	d_1	h_1	h_2
50	53	72	90
70	73	80	106

Recess Dimensions Series FF

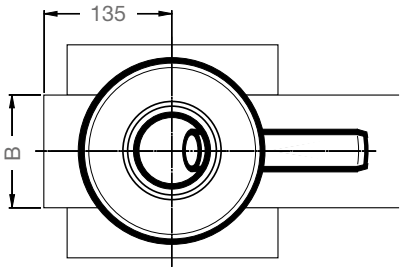


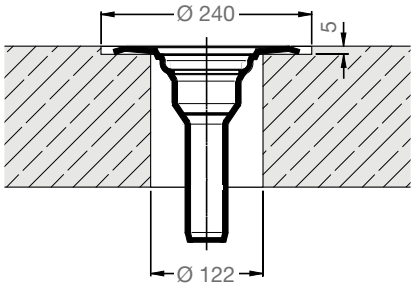
Ceiling opening



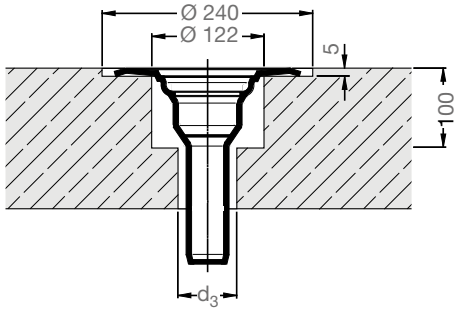
Ceiling recess

DN	Recess depth T	Recess width B
50	110	130
70	130	130





Tapping hole, single-stage



Tapping hole, two-stage

DN	d_3
50	72
70	92

Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.

Series G:

LORO Balcony Direct Drains with Supporting Edge

DN 50 - DN 100, made of galvanized steel

Application area:
Balconies without sealing sheets, with mastic asphalt, screed finish or tiles in mortar bedding

System description/ proposal for tender text

Series G, with pipe penetration
LORO balcony direct drains with supporting edge, made of galvanized steel with additional coating, colour: red-brown,
vertical runoff

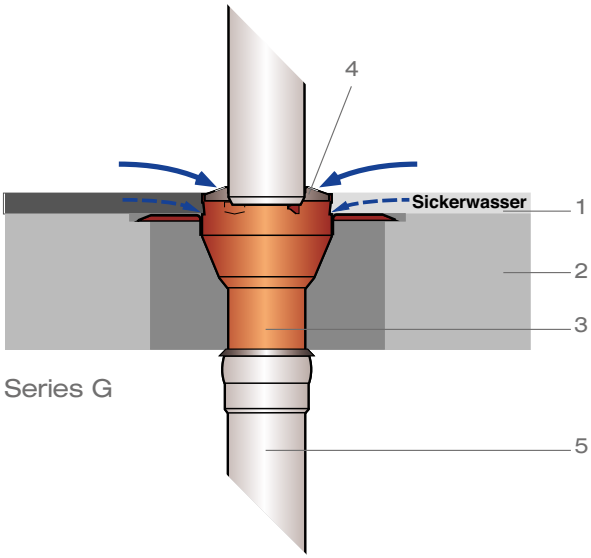
consisting of:
drain unit DN 50, DN 70 and DN 100
with downpipe 250 mm or 3000 mm long,
strainer made of stainless steel with pipe penetration

Series G, as end drain
LORO balcony direct drains with supporting edge, made of galvanized steel with additional coating, colour: red-brown,
vertical runoff

consisting of:
drain unit DN 50, DN 70 and DN 100
with downpipe 250 mm or 3000 mm long,
strainer made of stainless steel for upper balconies

Series G

Application Examples Series G:

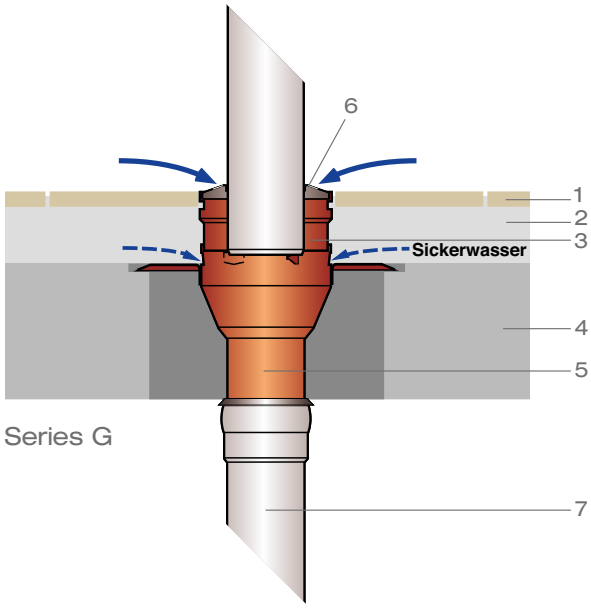


Series G

Balcony slab with mastic asphalt or screed finish, without sealing sheet

1 Screed finish
2 Concrete slab
3 Direct drain with supporting edge
4 Strainer made of stainless steel for balcony floors
5 LORO-X steel discharge pipe

LORO solution:
Balcony direct drains with supporting edge, Series G, vertical runoff, with strainer made of stainless steel for balcony floors or for upper balconies.



Series G

Balcony slab with tiles in mortar bedding, without sealing sheet

1 Tiles
2 Mortar bedding
3 Attachment
4 Concrete slab
5 Direct drain with supporting edge
6 Strainer made of stainless steel for balcony floors
7 LORO-X steel discharge pipe

LORO solution:
Balcony direct drains with supporting edge, Series G, vertical runoff, with attachment for height adjustment and strainer made of stainless steel for balcony floors or for upper balconies.

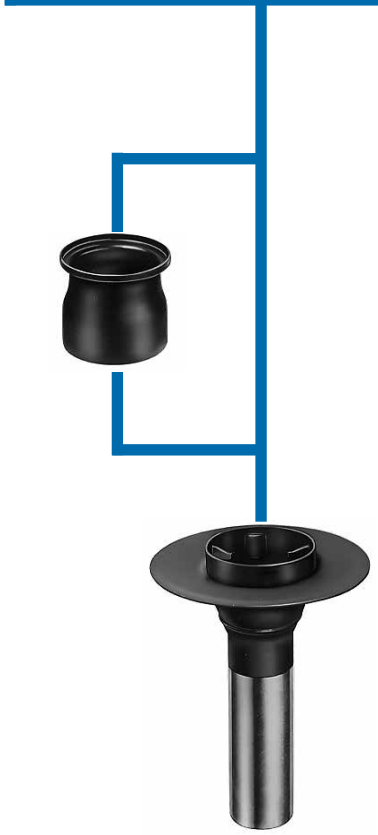
See page 44 for article numbers of Series G

Setup Diagram/System Components

Series G:
LORO Balcony Direct Drains with Supporting Edge,
DN 50, DN 70 and DN 100 made of galvanized steel

Ring strainer
for balcony floors
No. 16193X

Strainer
for upper balconies
No. 16191X

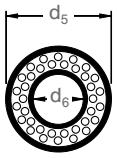


Attachment for
height adjustment
No. 16192X

Drain body
downpipe length:
3000 mm, No. 16131X
250 mm, No. 16111X

LORO balcony direct drains, Series G, are delivered without strainer and not as part or complete units. Please order strainers separately.

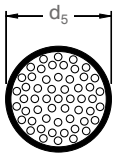
Individual Components Series G



Strainer for balcony floors

Discharge rate: 0.7 l/s = DN 50
Material: stainless steel

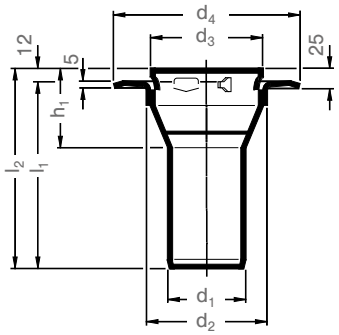
Art.-No.	DN	d_5	d_6	kg
16193.050X	50	98	55	0,07
16193.070X	70	118	75	0,1
16193.100X	100	140	104	0,1



Strainer for upper balconies

Discharge rate: 0.7 l/s = DN 50
Material: stainless steel

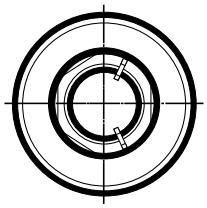
Art.-No.	DN	d_5	kg
16191.050X	50	98	0,09
16191.070X	70	118	0,12
16191.100X	100	140	0,29



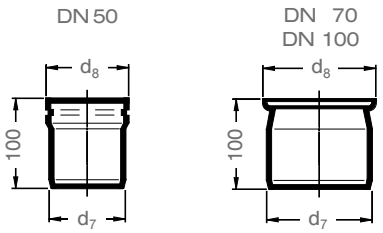
Drain body

Material: galvanized steel, additional coating

Art.-No.	DN	d_1	d_2	d_3	d_4	l_1	l_2	h_1	kg
16111.050X	50	53	106	102	195	250	262	90	1,2
16131.050X	50	53	106	102	195	3000	3012	90	6,7
16111.070X	70	73	126	123	245	250	262	100	1,6
16131.070X	70	73	126	123	245	3000	3012	100	10,2
16111.100X	100	102	150	145	245	250	262	115	2,2
16131.100X	100	102	150	145	245	3000	3012	115	15,9



Additional components, please order separately

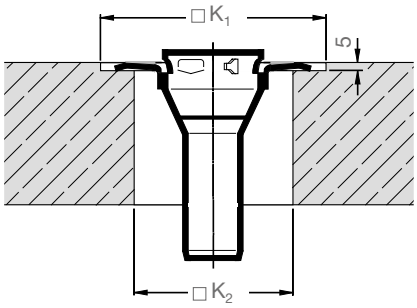


Attachment

Suitable for strainer No. 16193X and 16191X
For height adjustment from 30 - 60 mm
Material: galvanized steel, additional coating

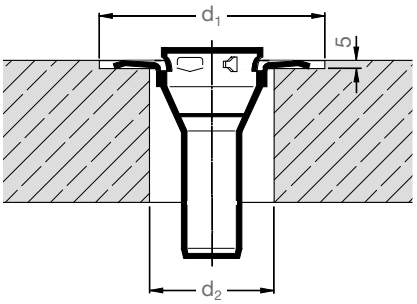
Art.-No.	DN	d_7	d_8	kg
16192.050X	50	97	102	0,6
16192.070X	70	117	123	0,6
16192.100X	100	139	145	0,9

Recess Dimensions Series G



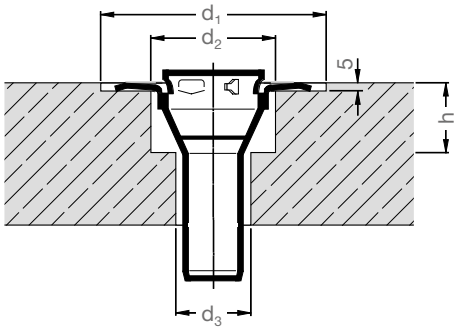
Ceiling opening

DN	Recess □K_1	Recess □K_2
50	210	170
70	260	220
100	260	220



Tapping hole, single-stage

DN	d_1	d_2
50	210	122
70	260	132
100	260	158



Tapping hole, two-stage

DN	d_1	d_2	d_3	h
50	210	122	72	70
70	260	132	92	80
100	260	158	122	90

Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.

Series GF:

LORO Balcony Direct Drains with Supporting Edge

DN 50 - DN 100, made of galvanized steel

Application area:
Balconies with sealing of liquid plastic, especially for balcony renovation

System description/ proposal for tender text

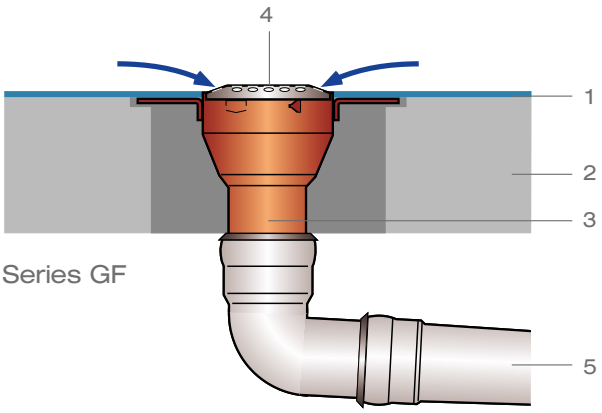
Series GF, vertical runoff
LORO balcony drains with supporting edge, Series GF, made of galvanized steel with additional inner coating, colour: red-brown, supporting edge on the upper side without coating

vertical runoff, consisting of:
drain body DN 50, DN 70 and DN 100, strainer made of stainless steel with pipe penetration or strainer made of stainless steel for upper balconies

Series GF, horizontal runoff
LORO balcony drains with supporting edge, Series GF, made of galvanized steel with additional inner coating, colour: red-brown, supporting edge on the upper side without coating

horizontal runoff, consisting of:
drain body DN 50, strainer made of stainless steel

Series GF



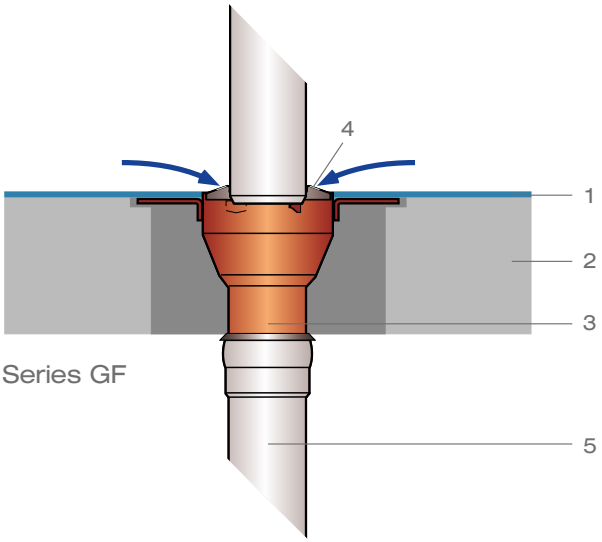
Series GF

Application Examples Series GF:

Balcony slab with liquid plastic as floor surface

1 Liquid plastic, layer thickness ca. 2 mm
2 Concrete slab
3 Direct drain with supporting edge
(coat the outside on site)
4 Strainer made of stainless steel
5 LORO-X steel discharge pipe

LORO solution:
Balcony single drains with supporting edge, Series GF, vertical runoff, with strainer made of stainless steel

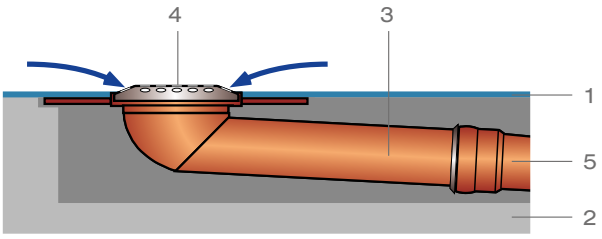


Series GF

Balcony slab with liquid plastic as floor surface

1 Liquid plastic, layer thickness ca. 2 mm
2 Concrete slab
3 Direct drain with supporting edge
(coat the outside on site)
4 Strainer made of stainless steel for balcony floors
5 LORO-X steel discharge pipe

LORO solution:
Balcony direct drains with supporting edge, Series GF, vertical runoff, with strainer made of stainless steel for balcony floors or for upper balconies



Series GF

Balcony slab with liquid plastic as floor surface

1 Liquid plastic, layer thickness ca. 2 mm
2 Concrete slab
3 Single drain with supporting edge
(coat the outside on site)
4 Strainer made of stainless steel
5 LORO-X steel discharge pipe

LORO solution:
Balcony single drains with supporting edge, Series GF, horizontal runoff, with strainer made of stainless steel

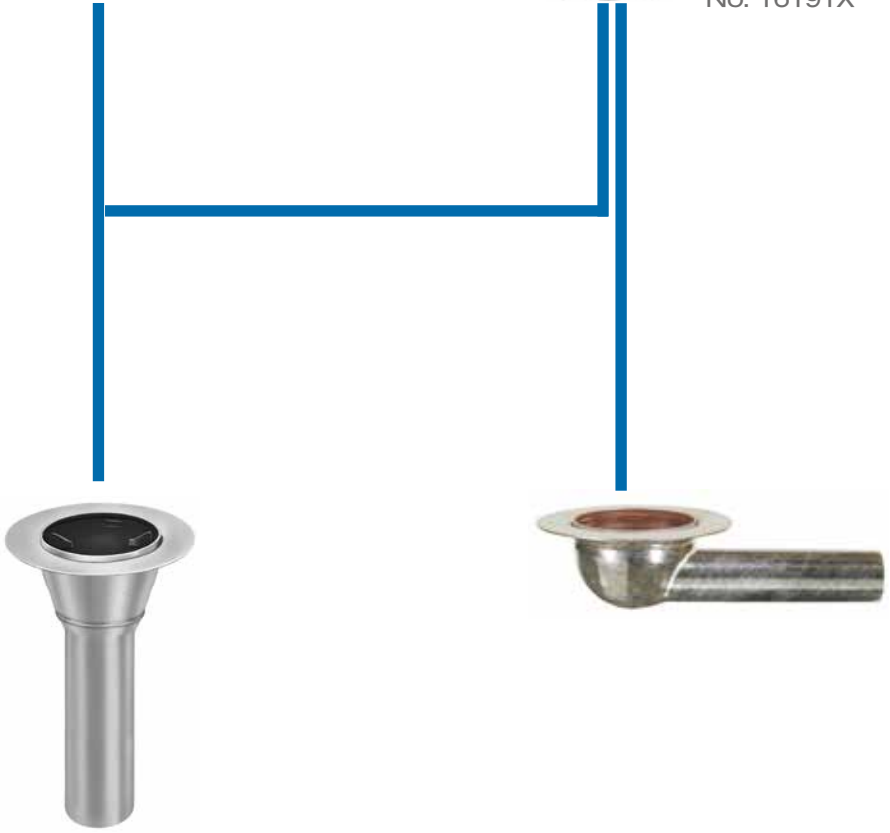
See page 49 for article numbers of Serie GF

Setup Diagram/System Components

Series GF:
LORO Balcony Direct Drains with Supporting Edge,
DN 50, DN 70 and DN 100, made of galvanized steel

Ring strainer
for balcony floors
No. 16193X

Strainer
for upper balconies
No. 16191X

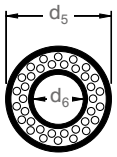


Drain body
vertical runoff,
downpipe length 250 mm,
No. 16110X
applicable as single and as direct drain

Drain body
horizontal runoff,
No. 16112X
applicable only as single drain

LORO balcony direct drains, Series GF, are delivered without strainer and not as part or complete units. Please order strainers separately.

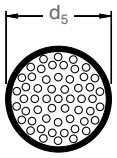
Individual Components Series GF



Strainer for balcony floors

Discharge rate: 0.7 l/s = DN 50
Material: stainless steel

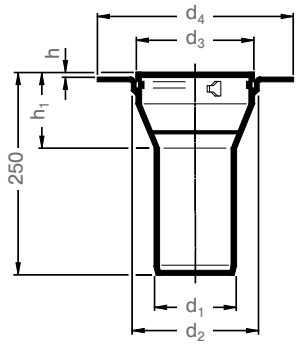
Art.-No.	DN	d_5	d_6	kg
16193.050X	50	98	55	0,07
16193.070X	70	118	75	0,1
16193.100X	100	140	104	0,1

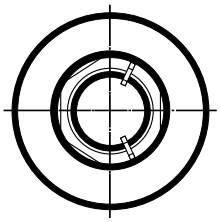


Strainer for upper balconies

Discharge rate: 0.7 l/s = DN 50
Material: stainless steel

Art.-No.	DN	d_5	kg
16191.050X	50	98	0,09
16191.070X	70	118	0,12
16191.100X	100	140	0,29

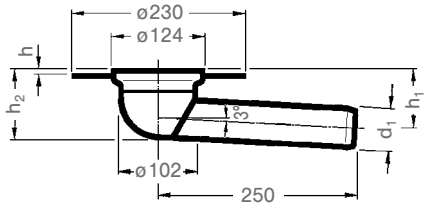




Drain body, vertical runoff

Material: galvanized steel, additional coating
(supporting edge on the upper side without coating)

Art.-No.	DN	d_1	d_2	d_3	d_4	h	h_1	kg
16110.050X	50	53	106	102	221	2	90	1,3
16110.070X	70	73	126	123	221	2	100	1,6
16110.100X	100	102	150	145	245	2	115	2,3

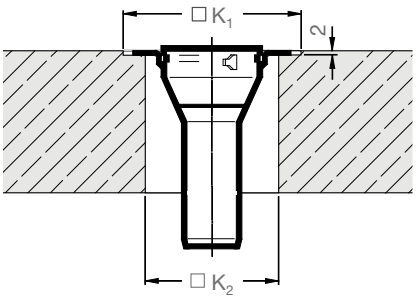


Drain body, horizontal runoff*

Material: galvanized steel, additional coating
(supporting edge on the upper side without coating)
* Install strainer Art.-No. 16191.070X!

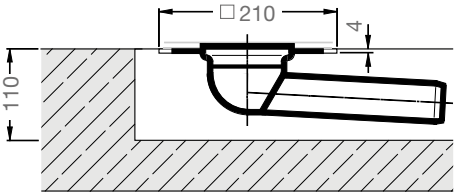
Art.-No.	DN	d_1	h	h_1	h_2	kg
16112.050X	50	53	2	75	88	2,0
16112.070X	70	73	2	80	106	2,1

Recess Dimensions Series GF

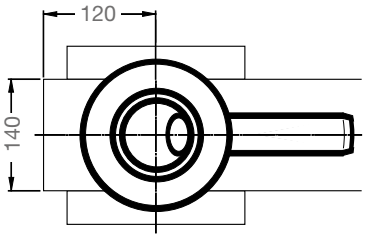


Ceiling opening

DN	Recess □K_1	Recess □K_2
50	240	170
70	240	170
100	260	220

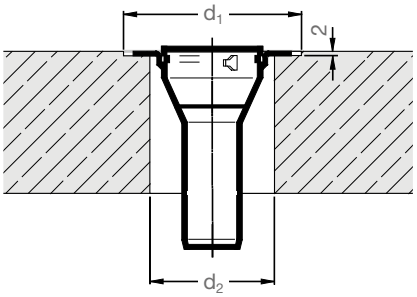


Ceiling recess



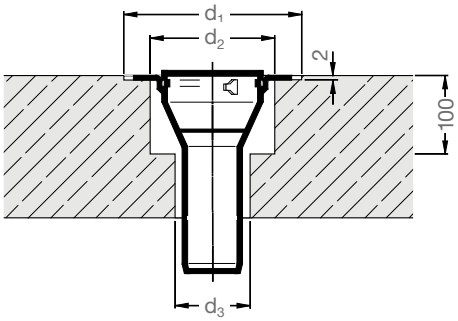
Tapping hole, single-stage

DN	d_1	d_2
50	240	122
70	240	142
100	260	162



Tapping hole, two-stage

DN	d_1	d_2	d_3
50	240	122	72
70	240	142	92
100	260	162	122



Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.

Series H:

LORO Balcony Direct Drains with Connecting Sleeve

DN 70 and DN 100, made of steel or copper

Application area:

balconies and terraces with sealing sheets, tiles or paving slab

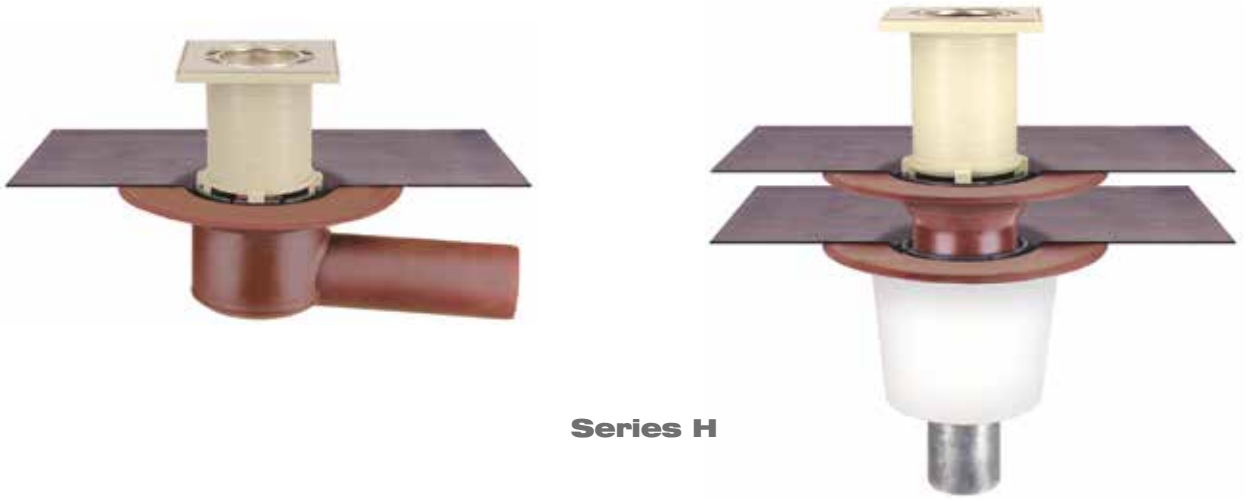
System description/ proposal for tender text

Series H, one-piece

LORO balcony direct drains with connecting sleeve*, Series H, according to DIN EN 1253, made of galvanized steel, with additional coating, colour: red-brown, alternatively: made of solid copper,
vertical runoff / horizontal runoff,
without / with thermal insulation
consisting of:
drain body, connecting sleeve*, clamping ring without drainage openings, drainage ring, strainer support quadratic, 150 x 150 mm, (for installation height 35 - 155 mm), quadratic strainer made of stainless steel, 143 x 143 mm, class K, with pipe penetration or for upper balconies, DN 70 and DN 100, horizontal version in DN 70.

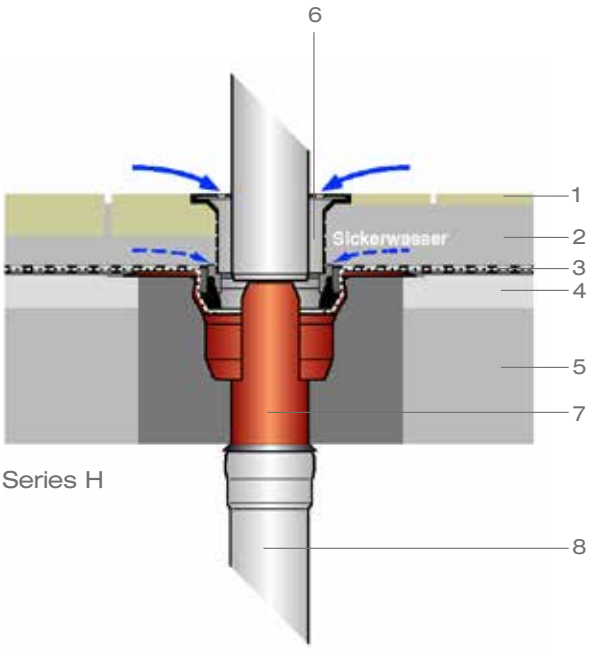
Series H, two-piece

LORO balcony direct drains with connecting sleeve*, Series H, according to DIN EN 1253, made of galvanized steel, with additional coating, colour: red-brown, alternatively: made of solid copper,
vertical runoff / horizontal runoff,
without / with thermal insulation
consisting of:
drain body, connecting sleeve*, clamping ring without drainage openings, extension cartridge (for installation height 60 -120 mm), connecting sleeve*, clamping ring without drainage openings,
drainage ring, strainer support quadratic,
150 x 150 mm, (for installation height 35 - 155 mm), quadratic strainer made of stainless steel,
143 x 143 mm, class K, with pipe penetration or for upper balconies, DN 70 and DN 100, horizontal version in DN 70.



Series H

* made of bitumen/EPDM compound structure (standard) or PVC or ECB, pre-assembled at the factory



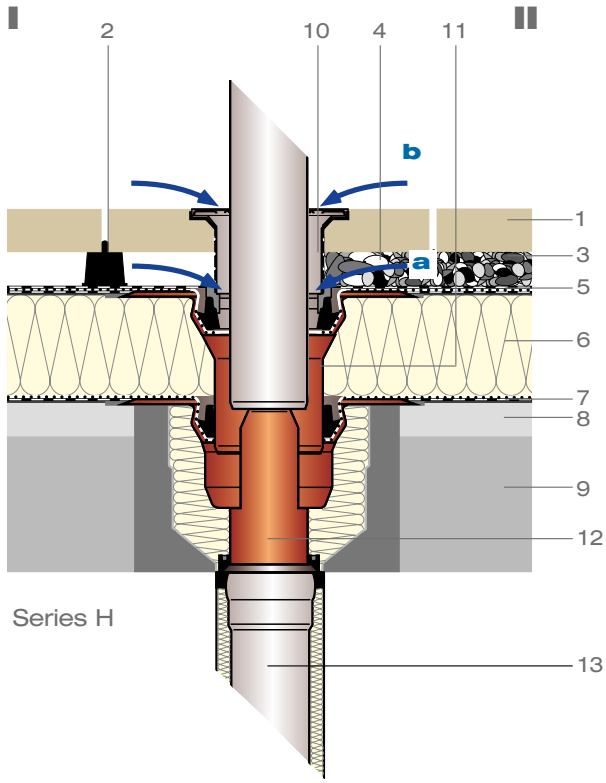
Series H

Application Examples Series H:

Balcony slab with paving slab/tiles in mortar bedding, with sealing sheet, without thermal insulation. Drainage at one level, with additional seepage discharge.

1 Paving slab/tiles
2 Mortar bedding
3 Sealing sheet, if necessary on separating and/or levelling layer
4 Levelling screed
5 Concrete slab
6 Strainer support, height-adjustable, and strainer made of stainless steel with pipe penetration and drainage ring for seepage discharge
7 Direct drain with connecting sleeve and clamping ring without drainage openings (factory-fitted), vertical runoff, without thermal insulation
8 LORO-X steel discharge pipe

LORO solution:
Balcony direct drains with connecting sleeve, Series H, vertical runoff, one-piece, without thermal insulation, with height-adjustable strainer support and strainer made of stainless steel with pipe penetration or for upper balconies.



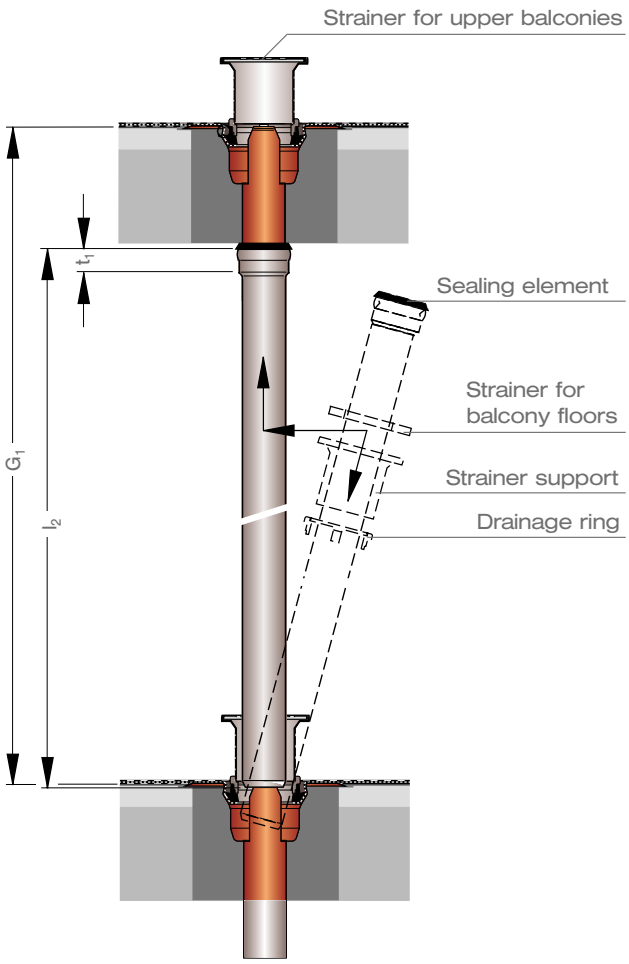
Series H

Balcony slab with paving slab
I) on paving slab support
II) on granular bedding (grit, gravel etc.)
with sealing sheet, with thermal insulation.
Drainage at two levels:
a) on the sealing
b) on the paving slab.

1 Paving slab
2 Paving slab support or
3 Granular bedding
4 Coarse grit
5 Sealing sheet, if necessary on separating and/or levelling layer
6 Thermal insulation
7 Vapor barrier, if necessary on separating and/or levelling layer
8 Levelling screed
9 Concrete slab
10 Strainer support, height-adjustable, and strainer made of stainless steel with pipe penetration and drainage ring
11 Extension cartridge with connecting sleeve and clamping ring without drainage openings (factory-fitted)
12 Direct drain with connecting sleeve and clamping ring without drainage openings (factory-fitted), vertical runoff, with thermal insulation
13 LORO composite pipe

LORO solution:
Balcony direct drains with connecting sleeve, Series H, vertical runoff, two-piece, with or without thermal insulation, with height-adjustable strainer support and strainer made of stainless steel with pipe penetration or for upper balconies.

See pages 55 - 58 for article numbers of Series H



Installation Instruction Series H:

1) Check the LORO balcony direct drains that have been set in concrete. If necessary, remove concrete remains.

2) Determine the downpipe length.
Direct drain unit, with/without connecting sleeve, 250 mm long
Total length: 250 mm + 12 mm.

Downpipe with long socket (t_2) calculated for tolerance compensation ± 30 mm.
Total length downpipe: $l_2 = G_1 - 250 + t_1{}^* + 30$ mm
* Socket depth t_1: DN 70 = 55 mm, DN 100 = 70 mm

e. g. for floor height G_1 = 2800 mm (± 30 mm)
DN 70/50 $l_2 = 2800 - 250 + 55 + 30 = 2635$ mm
DN 100/50 $l_2 = 2800 - 250 + 70 + 30 = 2650$ mm

Downpipe with LORO-X standard socket (no tolerance compensation).
Total length downpipe $l_2 = G_1 - 250 + t_1$
* Socket depth t_1: DN 70 = 55 mm, DN 100 = 70 mm

e. g. for floor height G_1 = 2800 mm
DN 70/50 $l_2 = 2800 - 250 + 55 = 2605$ mm
DN 100/50 $l_2 = 2800 - 250 + 70 = 2620$ mm

3) Shorten the downpipe to the calculated length l_2, insert the sealing element and cover it with lubricant. Push the strainer with pipe penetration No. 16196X, strainer support No. 16290X and drainage ring No. 16097X onto the downpipe.

4) Slantingly push the downpipe over one of the two brackets into the lower balcony direct drain, position the downpipe vertically and push the socket onto the plug-in of the upper balcony direct drain. Pay attention to the correct position of the sealing element.

5) Position the downpipe on both brackets of the lower balcony direct drain. Put the drainage ring onto the clamping ring. Shorten the strainer support on site to the desired height and insert it into the drainage ring. Press the strainer with the pipe penetration into the strainer support. Thus, the downpipe is fastened.

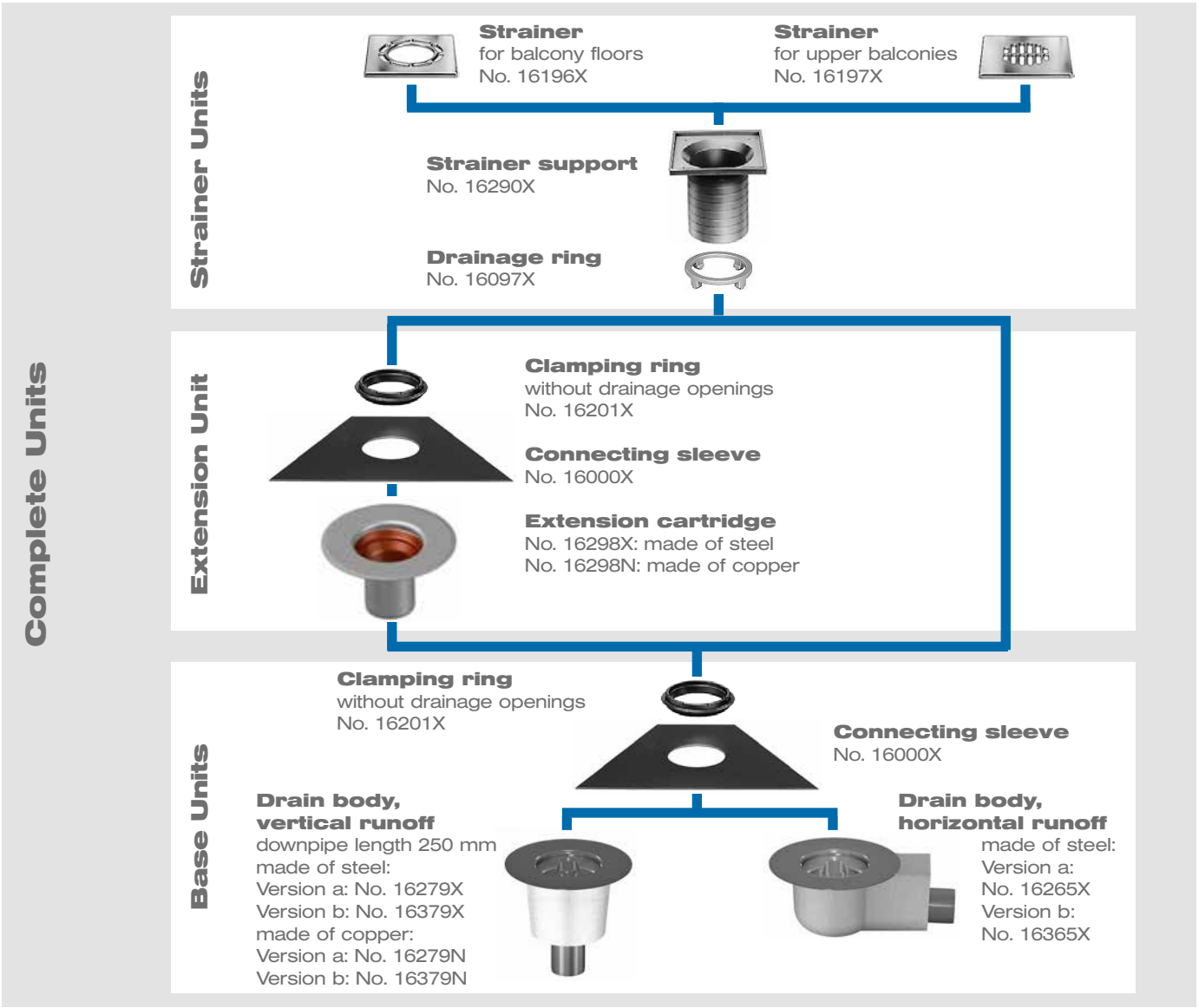
6) In the case of the top balcony, put the drainage ring onto the clamping ring. Shorten the strainer support on site to the desired height and insert it into the drainage ring. Press the strainer No. 16197X into the strainer support.

7) When installing a two-piece version also push the downpipe through the extension cartridge into the balcony direct drain. After that follow all further steps mentioned under point 4) and 5).

Setup Diagram/System Components

Series H:
LORO Balcony Direct Drains with Connecting Sleeve

DN 70 and DN 100, made of steel



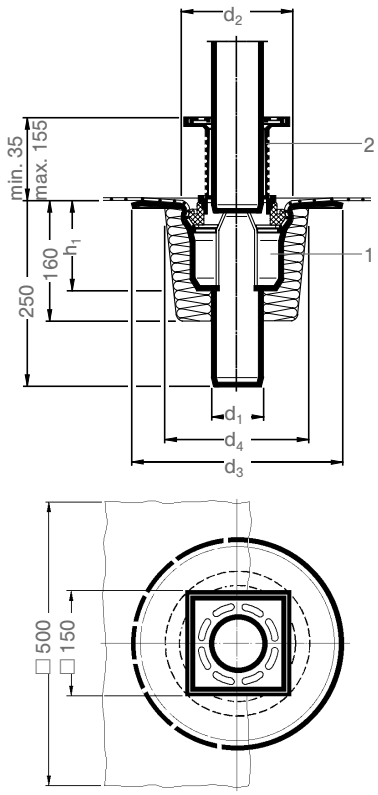
Version a = without thermal insulation Version b = with thermal insulation

LORO balcony direct drains, Series H, are delivered as complete units. But alternatively also part units (strainer units) or single parts for the respective installation purpose can be put together.

The following factory-fitted connecting sleeves for balcony drains systems Serie H are available:

Bezeichnung	DN 70	DN 100
Resitrix Bitumen/EPDM Verbund - **Standard**	16000.070X	16000.100X
Evalon Grau	16005.070X	16005.100X
Flagon EP-S 150	16016.070X	16016.100X
Rhenofol C-Grau	16596.070X	16596.100X
Sarnafil T66/15D	16007.070X	16007.100X
Sika-Plan Typ S	16011.070X	16011.100X
Thermofin F18	16018.070X	16018.100X
Thermofol D	16015.070X	16015.100X
Thermoplan T TL	16003.070X	16003.100X
Wolfin IB Schwarz	16006.070X	16006.100X

The standard delivery comprises a connecting sleeve of bitumen/EPDM compound. If a different connecting sleeve is needed, please definitely indicate the desired connecting sleeve when ordering.



Complete Units

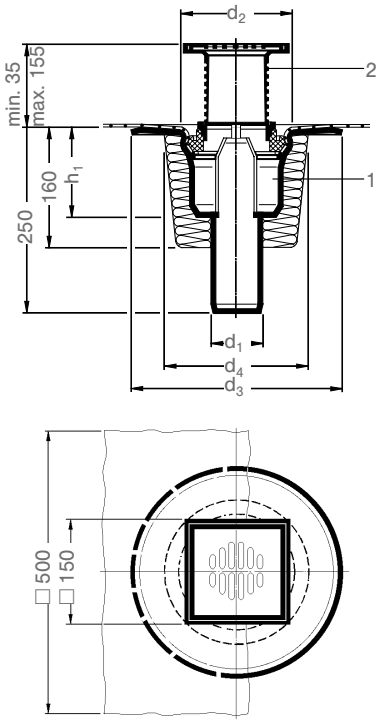
LORO Balcony Direct Drains, Series H

with pipe penetration, one-piece, vertical runoff

Version a (without thermal insulation)
DN 70: Art.-No. 16277.070X weight: 3.0 kg
DN 100: Art.-No. 16277.100X weight: 4.6 kg

Version b (with thermal insulation)
DN 70: Art.-No. 16390.070X weight: 4.0 kg
DN 100: Art.-No. 16390.100X weight: 5.3 kg

consisting of:
1 base unit
2 strainer unit with strainer with pipe penetration for balcony floors



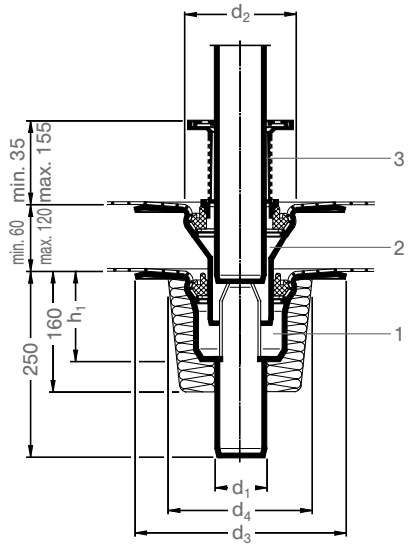
for upper balconies, one-piece, horizontal runoff

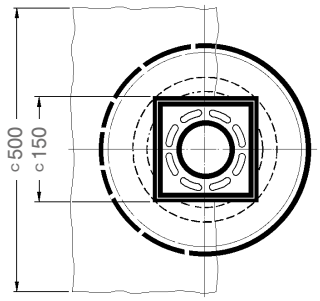
Version a (without thermal insulation)
DN 70: Art.-No. 16278.070X weight: 3.6 kg
DN 100: Art.-No. 16278.100X weight: 4.9 kg

Version b (with thermal insulation)
DN 70: Art.-No. 16391.070X weight: 4.0 kg
DN 100: Art.-No. 16391.100X weight: 5.3 kg

consisting of:
1 base unit
2 strainer unit with strainer for upper balconies

DN	d_1	d_2	d_3	d_4	h_1
70	73	146	275	190	100
100	100	178	330	220	126





Complete Units

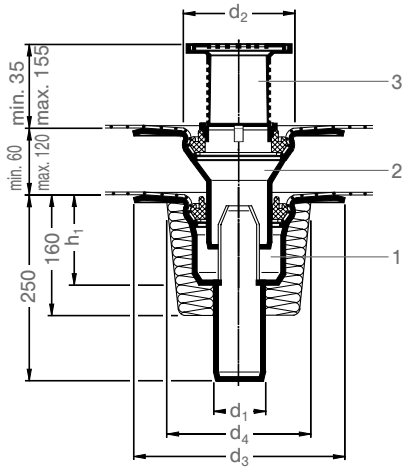
LORO Balcony Direct Drains, Series H

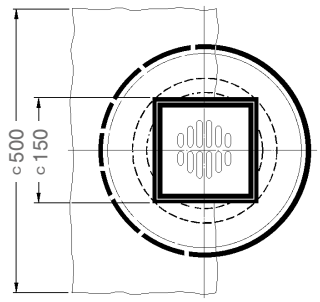
with pipe penetration, two-piece, vertical runoff

Version a (without thermal insulation)
DN 70: Art.-No. 16287.070X weight: 6.2 kg
DN 100: Art.-No. 16287.100X weight: 8.2 kg

Version b (with thermal insulation)
DN 70: Art.-No. 16397.070X weight: 7.0 kg
DN 100: Art.-No. 16397.100X weight: 8.6 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit with strainer with pipe penetration for balcony floors





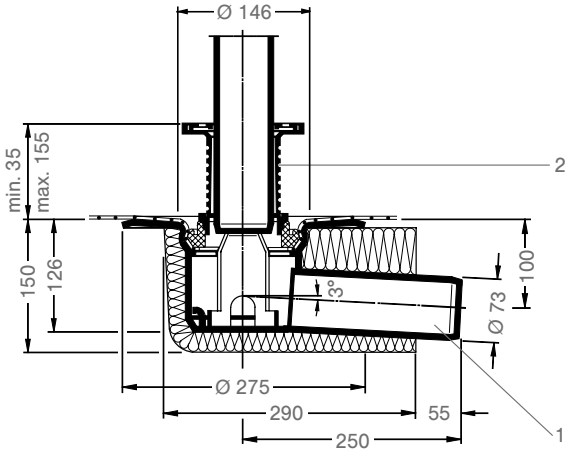
for upper balconies, two-piece, vertical runoff

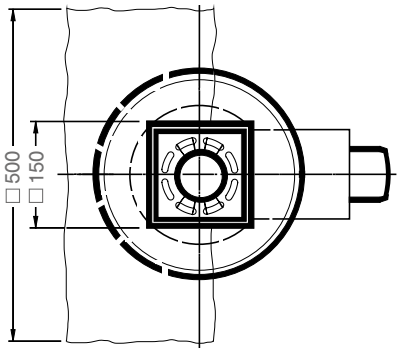
Version a (without thermal insulation)
DN 70: Art.-No. 16288.070X weight: 6.2 kg
DN 100: Art.-No. 16288.100X weight: 8.2 kg

Version b (with thermal insulation)
DN 70: Art.-No. 16398.070X weight: 7.0 kg
DN 100: Art.-No. 16398.100X weight: 8.6 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit with strainer for upper balconies

DN	d_1	d_2	d_3	d_4	h_1
70	73	146	275	190	100
100	100	178	330	220	126





Complete Units

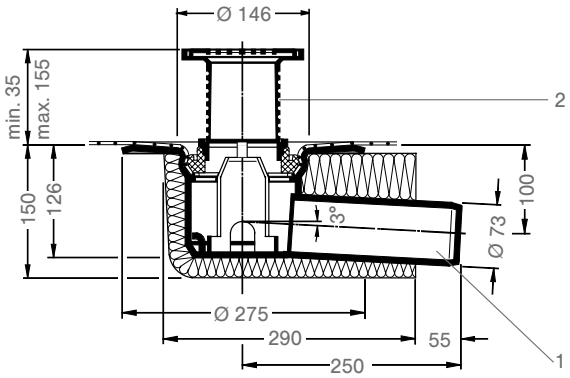
LORO Balcony Direct Drains, Series H

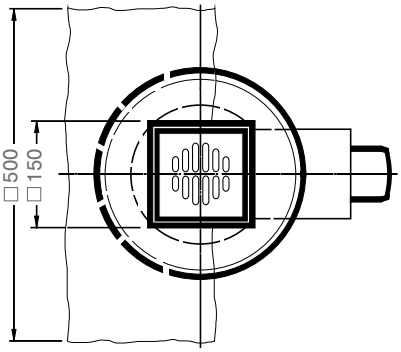
with pipe penetration, one-piece, horizontal runoff

Version a (without thermal insulation)
DN 70: Art.-No. 16222.070X weight: 3.9 kg

Version b (with thermal insulation)
DN 70: Art.-No. 16322.070X weight: 4.0 kg

consisting of:
1 base unit
2 strainer unit with strainer with pipe penetration for balcony floors



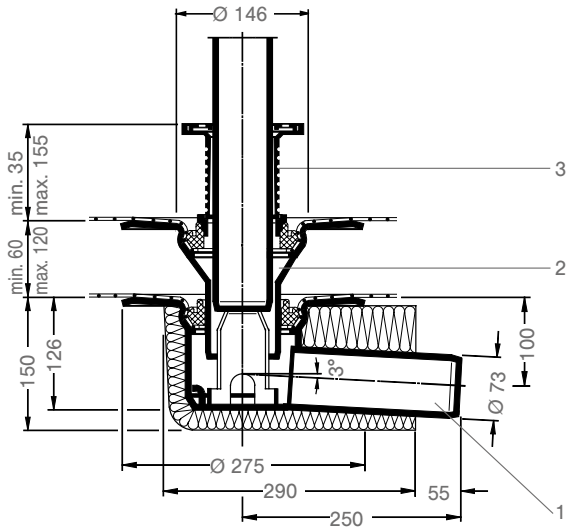


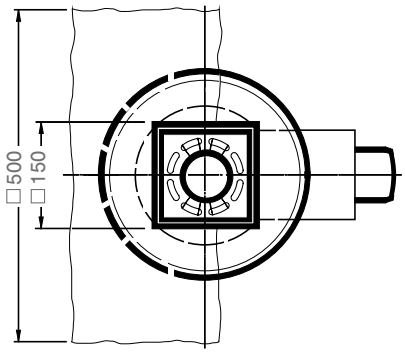
for upper balconies, one-piece, horizontal runoff

Version a (without thermal insulation)
DN 70: Art.-No. 16223.070X weight: 3.8 kg

Version b (with thermal insulation)
DN 70: Art.-No. 16323.070X weight: 3.1 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit with strainer with pipe penetration for balcony floors





Complete Units

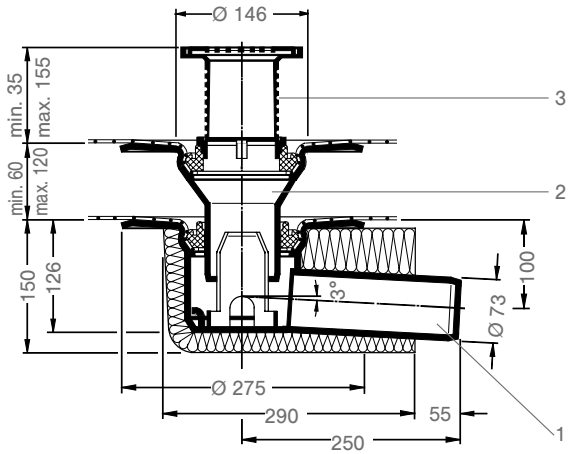
LORO Balcony Direct Drains, Series H

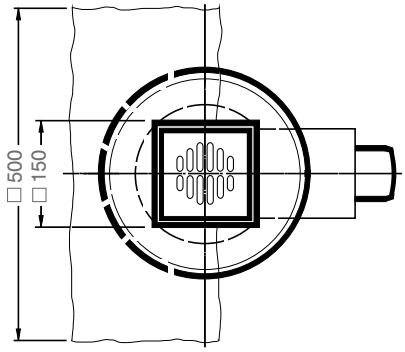
with pipe penetration, two-piece, horizontal runoff

Version a (without thermal insulation)
DN 70: Art.-No. 16232.070X weight: 10.0 kg

Version b (with thermal insulation)
DN 70: Art.-No. 16332.070X weight: 5.6 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit with strainer with pipe penetration for balcony floors



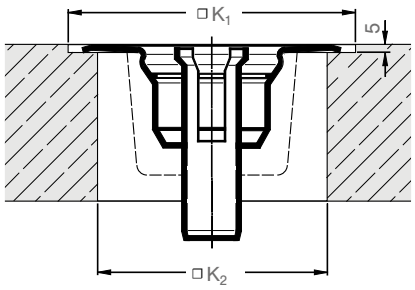


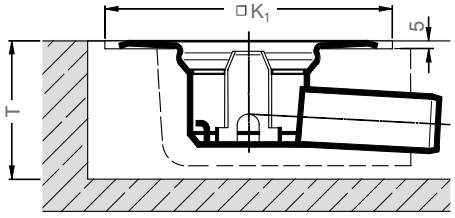
for upper balconies, two-piece, horizontal runoff

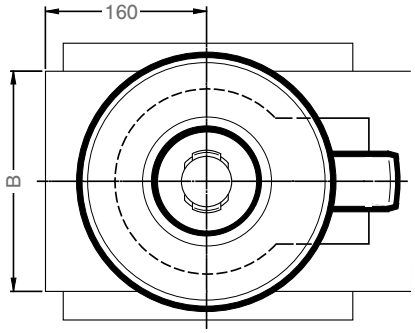
Version a (without thermal insulation)
DN 70: Art.-No. 16233.070X weight: 5.3 kg

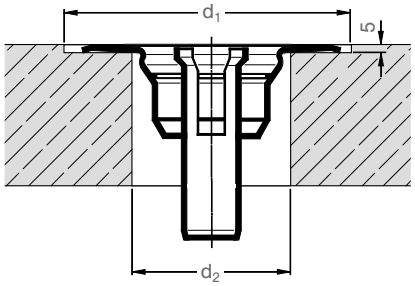
Version b (with thermal insulation)
DN 70: Art.-No. 16333.070X weight: 5.6 kg

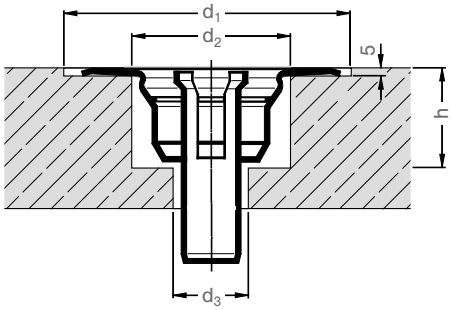
consisting of:
1 base unit
2 extension unit
3 strainer unit with strainer for upper balconies

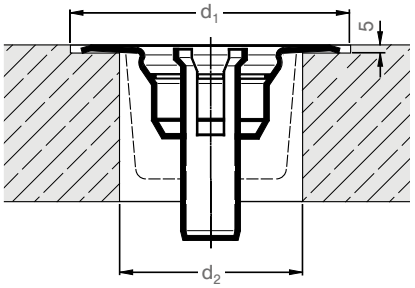












Recess Dimensions Series H

Ceiling opening

	Recess □K_1		Recess □K_2	
DN	a	b	a	b
70	300	300	250	250
100	360	360	300	300

a = without thermal insulation
b = with thermal insulation

Ceiling recess horizontal runoff

	Recess depth T		Recess width B	
DN	a	b	a	b
70	150	160	160	200

a = without thermal insulation
b = with thermal insulation

Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.

Tapping hole, single-stage
for drains without thermal insulation

DN	d_1	d_2
70	300	162
100	360	192

Tapping hole, two-stage
for drains without thermal insulation

DN	d_1	d_2	d_3	h
70	300	162	92	120
100	360	192	122	140

Tapping hole, single-stage
for drains with thermal insulation

DN	d_1	d_2
70	300	202
100	360	225

Series HF:

LORO Balcony Direct Drains with Connecting Sleeve

DN 70 and DN 100, made of galvanized steel, according to DIN EN 1253

Application area:
Balconies with compound sealings

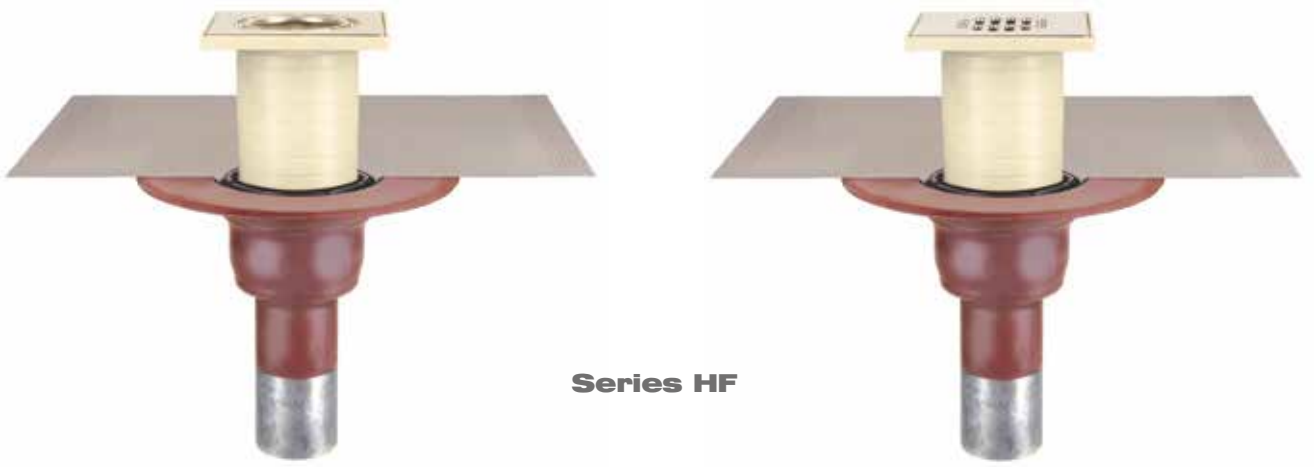
System description/ proposal for tender text

Series HF, with pipe penetration
LORO balcony direct drains with VS connecting sleeve made of multi-layer compound material, made of galvanized steel with additional coating, colour: red-brown, vertical runoff

one-piece
consisting of:
drain body, VS connecting sleeve, clamping ring, strainer support quadratic, 150 x 150 mm (for installation height 15 - 105 mm), quadratic strainer made of stainless steel, 143 x 143 mm, class K, with pipe penetration,
DN 70 and DN 100

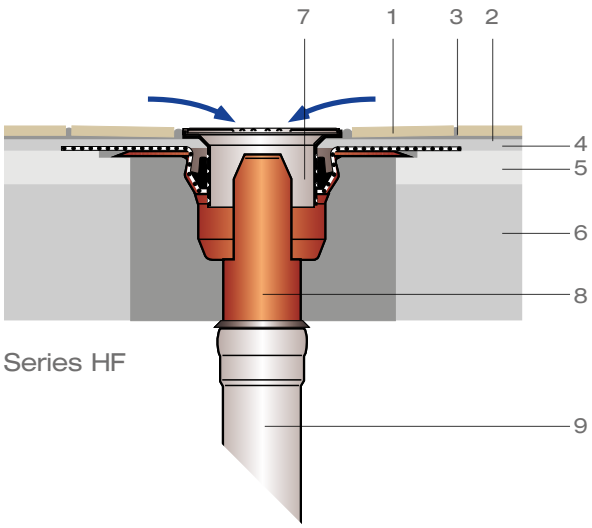
Series HF, for upper balconies
LORO balcony direct drains with VS connecting sleeve made of multi-layer compound material, made of galvanized steel with additional coating, colour: red-brown, vertical runoff

one-piece
consisting of:
drain body, VS connecting sleeve, clamping ring, strainer support quadratic, 150 x 150 mm (for installation height 15 - 105 mm), quadratic strainer made of stainless steel, 143 x 143 mm, class K, for upper balconies,
DN 70 and DN 100



Series HF

Application Examples Series HF:

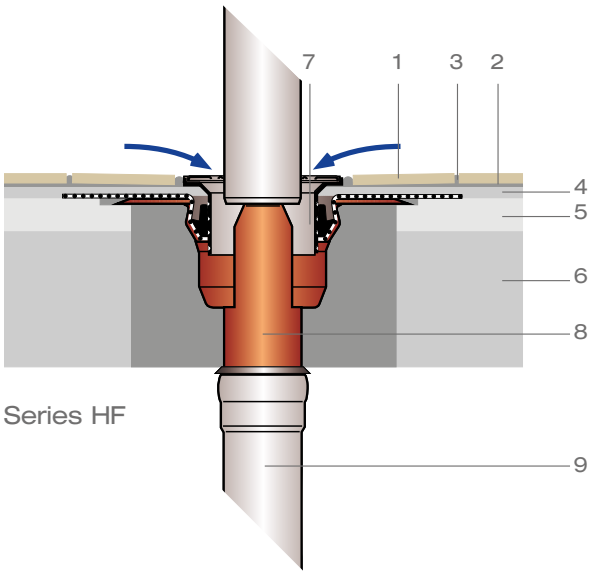


Series HF

Balcony slab with paving slab or tiles in adhesive bed surface sealing with compound sealing, without thermal insulation.
Drainage at one level.

1 Tiles
2 Adhesive bed
3 Elastic joint
4 Surface sealing with compound sealing
5 Levelling screed
6 Concrete slab
7 Strainer support, height-adjustable, and strainer made of stainless steel for upper balconies
8 Direct drain with VS connecting sleeve made of multi-layer compound material, vertical runoff
9 LORO-X steel discharge pipe

LORO solution:
LORO balcony direct drains with VS connecting sleeve made of multi-layer compound material, Series HF, vertical runoff, one-piece, with height-adjustable strainer support and strainer made of stainless steel for upper balconies.



Series HF

Balcony slab with paving slab or tiles in adhesive bed with surface sealing with compound sealing, without thermal insulation.
Drainage at one level.

1 Tiles
2 Adhesive bed
3 Elastic joint
4 Surface sealing with compound sealing
5 Levelling screed
6 Concrete slab
7 Strainer support, height-adjustable, and strainer made of stainless steel for pipe penetration
8 Direct drain with VS connecting sleeve made of multi-layer compound material, vertical runoff
9 LORO-X steel discharge pipe

LORO solution:
LORO balcony direct drains with VS connecting sleeve made of multi-layer compound material, Series HF, vertical runoff, one-piece, with height-adjustable strainer support and strainer made of stainless steel for pipe penetration.

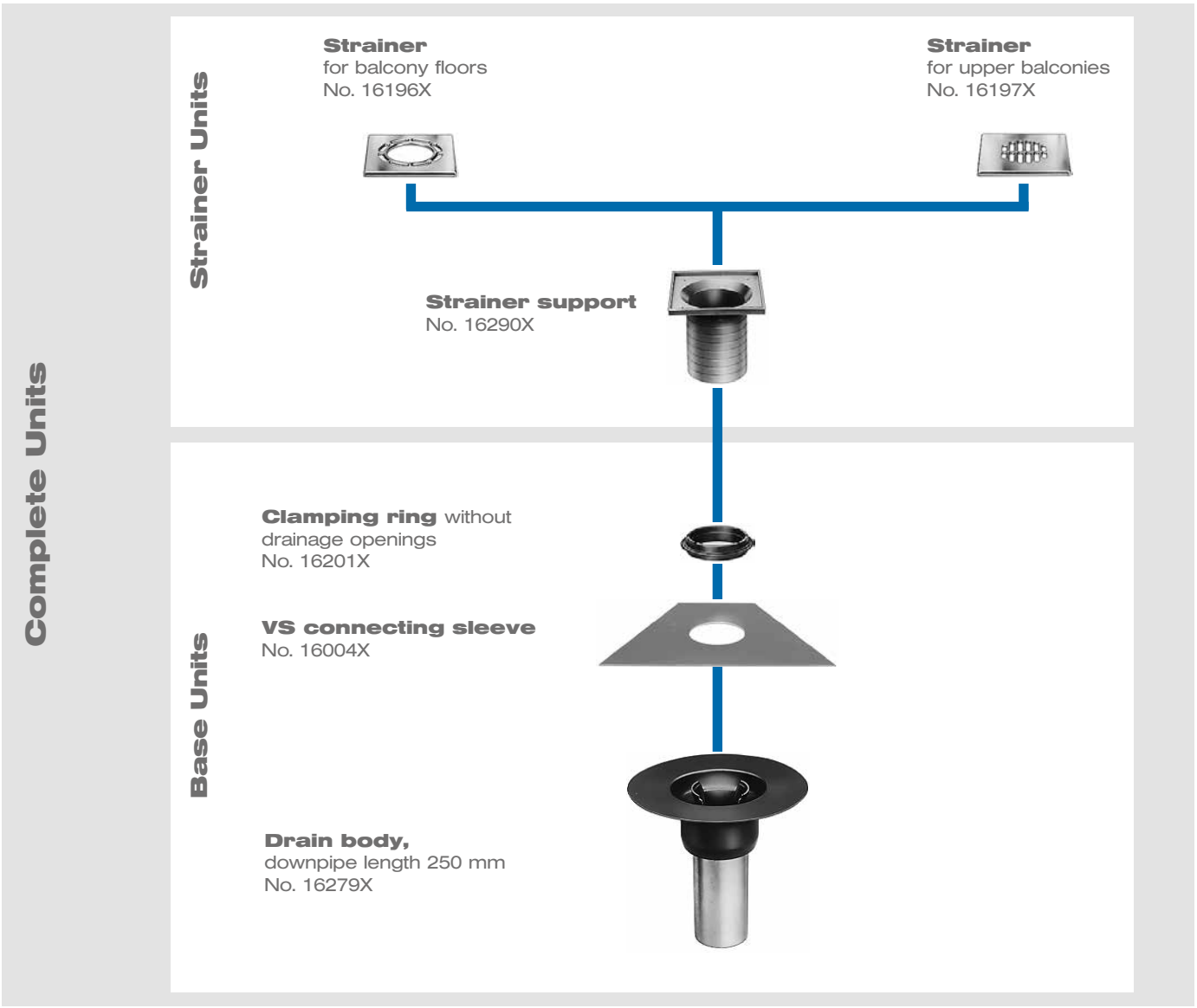
See page 63 for article numbers of Series HF

See Series H, page 53, for installation instruction

Setup Diagram/System Components

Series HF:
LORO Balcony Direct Drains with VS Connecting Sleeve

DN 70 and DN 100, made of steel

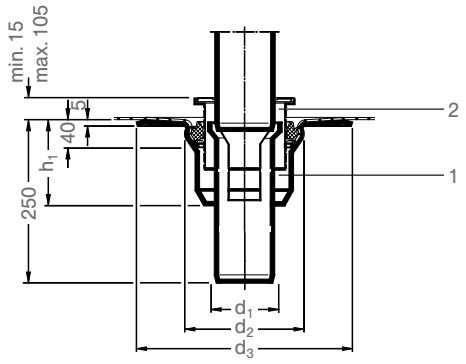


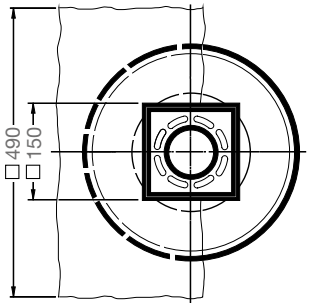
LORO direct drains, Series HF, are delivered as complete units. But alternatively part units (drain body base unit, strainer unit) can be put together for respective installation purposes.

Upon request, LORO direct drains, Series HF, are also available with thermal insulation and extension cartridge for thermally insulated ceilings. They can be used in combination, e. g. direct drain with connecting sleeve, Series H, and extension cartridge with VS connecting sleeve.

Complete Units

LORO Balcony Direct Drains, Series HF

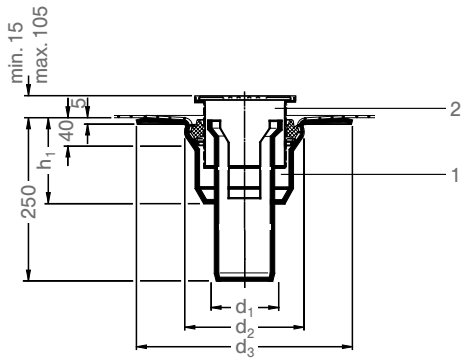


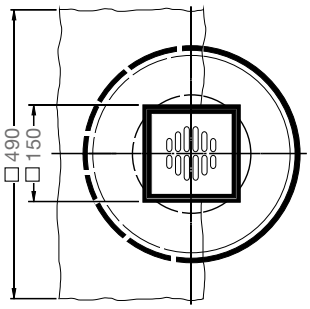


with pipe penetration, one-piece, vertical runoff

DN 70: Art.-No. 16260.070X weight: 2.7 kg
DN 100: Art.-No. 16260.100X weight: 4.2 kg

consisting of:
1 base unit
2 strainer unit with strainer with pipe penetration for balcony floors





for upper balconies, one-piece, vertical runoff

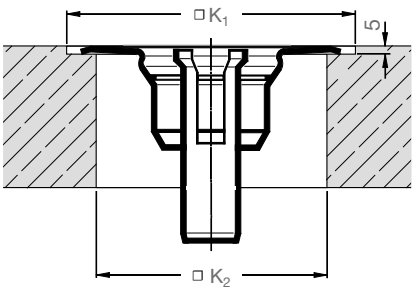
DN 70: Art.-No. 16261.070X weight: 2.8 kg
DN 100: Art.-No. 16261.100X weight: 4.2 kg

consisting of:
1 base unit
2 strainer unit with strainer for upper balconies

DN	d_1	d_2	d_3	h_1
70	73	146	275	100
100	102	178	330	126

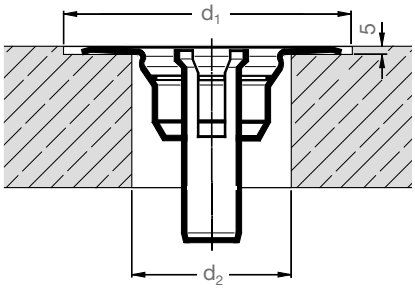
Series HF

Recess Dimensions Series HF



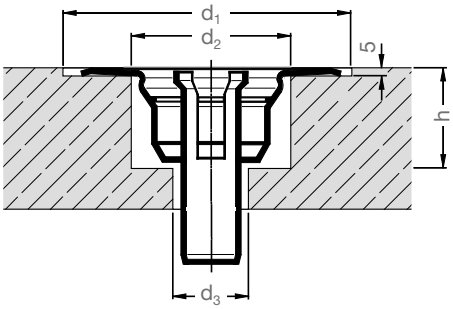
Ceiling opening

	Recess □K_1	Recess □K_2
70	300	250
100	360	300



Tapping hole, single-stage

DN	d_1	d_2
70	300	162
100	360	192



Tapping hole, two-stage

DN	d_1	d_2	d_3	h
70	300	162	92	120
100	360	192	122	140

Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.

Series I and IK:

LORO Balcony Direct Drains with Dome

DN 50, DN 70 and DN 100, made of galvanized steel

Application area:
Balconies made of concrete components made of waterproof concrete, without additional covering

System description/ proposal for tender text

Series I, vertical runoff
LORO balcony direct drains with dome,
made of galvanized steel, with additional coating,
colour: red-brown,
vertical runoff

Series I, horizontal runoff
LORO balcony direct drains with dome,
made of galvanized steel, with additional coating,
colour: red-brown,
horizontal runoff

Series I

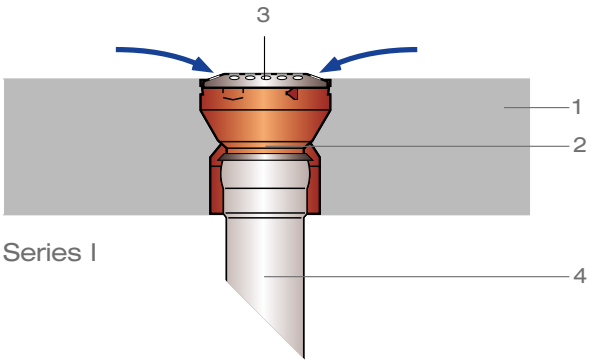
Application area:
Renovation of balconies with tapping holes

Series IK, vertical runoff
LORO balcony direct drains with dome and clamping collar, made of galvanized steel, with additional coating, colour: red-brown,
vertical runoff
LORO balcony direct drains, Series I and IK, are delivered without strainers and not as part or complete units due to the temporally shifted building succession.
Please order strainers separately together with the downpipes and sealing elements.

Series IK

Application Examples Series I and IK:

Balconies made of waterproof concrete components, without additional covering.



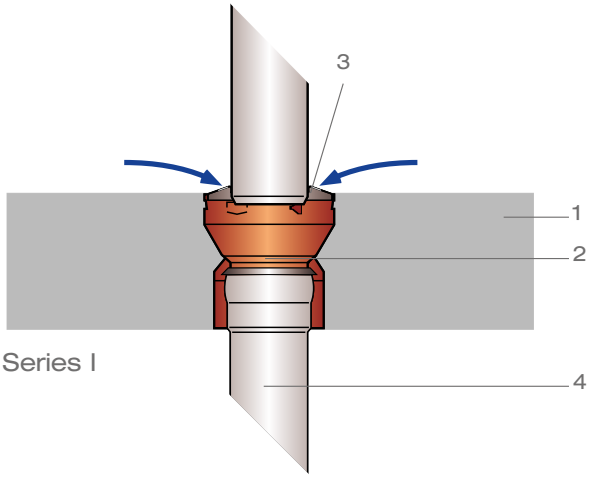
Series I

for upper balconies

1 Concrete component slab
2 Direct drain with dome, encased in concrete component slab
3 Strainer made of stainless steel for upper balconies
4 LORO-X steel discharge pipe

LORO solution:

LORO balcony direct drains with dome, Series I, vertical runoff, with strainer made of stainless steel for upper balconies.



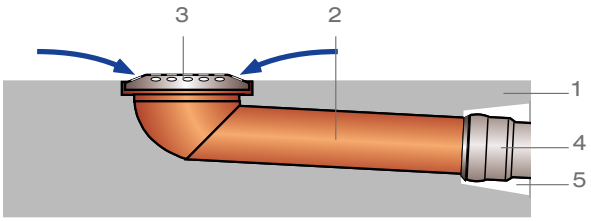
Series I

for balcony floors

1 Concrete component slab
2 Direct drain with dome, encased in concrete component slab
3 Strainer made of stainless steel with pipe penetration
4 LORO-X steel discharge pipe

LORO solution:

LORO balcony direct drains with dome, Series I, vertical runoff, with strainer made of stainless steel for balcony floors.



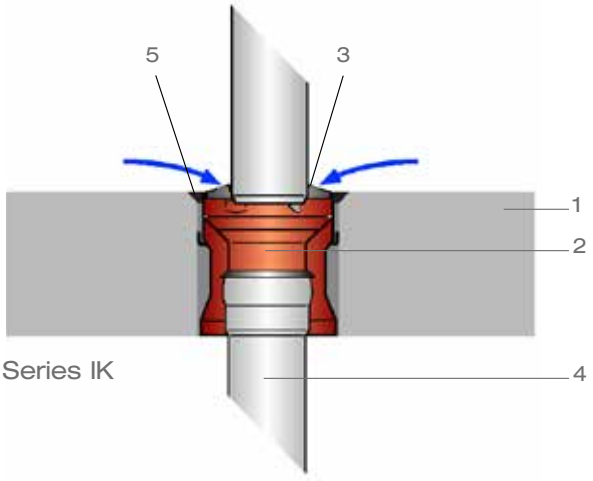
Series I

for horizontal installation

1 Concrete component slab
2 Direct drain, encased in concrete component slab
3 Strainer made of stainless steel for upper balconies
4 LORO-X steel discharge pipe
5 Recess made with help of LORO formwork dome see page 104

LORO solution:

LORO balcony direct drain, Series I, horizontal runoff, with strainer made of stainless steel for upper balconies.



Series IK

with tapping hole - for balcony floors

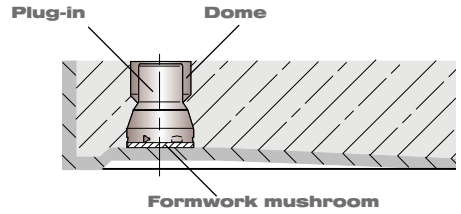
1 Balcony slab
2 Direct drain with dome and clamping collar
3 Strainer made of stainless steel for balcony floors
4 LORO-X steel discharge pipe
5 Sealing

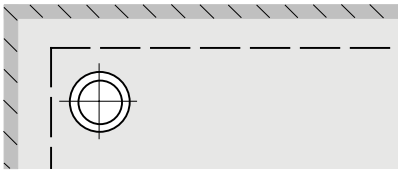
LORO solution:

LORO balcony direct drains with dome, Series IK, vertical runoff, with strainer made of stainless steel for balcony floors.

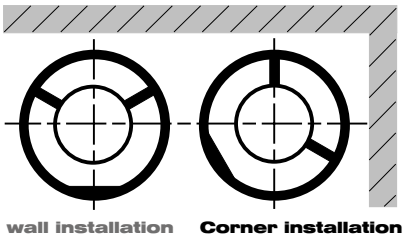
See pages 69 - 70 for article numbers of Series I and IK

Installation instruction



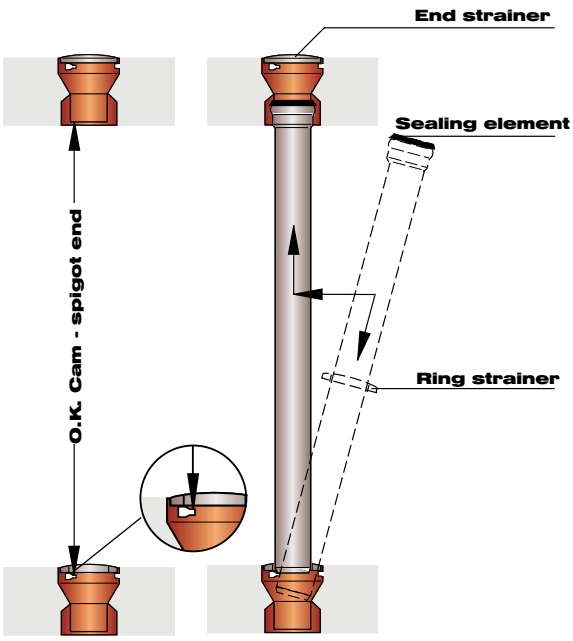


Pay attention to the position of the retaining cams!



Hints for civil engineers and workers at the concrete plant:

1) The aforementioned products are available in the following plate thicknesses: 95 mm, 120 mm, 140 mm, 160 mm, 180 mm, 200 mm, 220 mm.
2) For a safe fixation on the formwork (negative form), the concrete plant has to produce formwork mushrooms with the following diameters:
direct drain DN 50 = mushroom diameter 97 mm
direct drain DN 70 = mushroom diameter 118 mm
direct drain DN 100 = mushroom diameter 140 mm
3) When fastening the formwork mushroom in the formwork, please pay attention to the following:
a) The direct drain has to be positioned vertically in the concrete component.
b) In order to guarantee a vertical direction of the downpipe, one has to pay attention to the perpendicular position of the drains while manufacturing and installing the plates.
c) During compacting and post-treatment please keep the formwork dome free of concrete remains or remove them at an early stage.
d) After stripping the formwork, the drain has to be checked regarding an impeccable condition of the dome, of the plug-in and of the position of the strainer.



Calculation and Installation of the Downpipes

Installation instruction:

1) Check the LORO direct drains that have been set in concrete. If necessary, remove concrete remains and clean the cams.
2) Determine the length from the upper edge of the cam of the lower direct drain to the spigot end of the upper direct drain. Add 25 mm (applies to all nominal diameters). Thus, the pipe length is calculated.
3) Shorten the pipe to the desired length, insert the sealing element and cover it with lubricant.
Push the ring strainer No. 16193X onto the downpipe (curvature of the strainer on the upper side).
4) Slantingly insert the downpipe into the lower direct drain, past both cams. Position the dowpipe vertically and push the socket onto the plug-in of the upper direct drain. Pay attention to the correct position of the sealing element.
5) Position the downpipe on both cams of the lower direct drain and push the ring strainer into the drain body. Thus, the downpipe is fastened.
6) On the top balcony, push the end strainer No. 16191X into the drain body.

Setup Diagram/System Components

Series I and IK:
LORO Balcony Direct Drains with Dome

DN 50 - DN 100, made of galvanized steel, additional coating

with dome, Series I

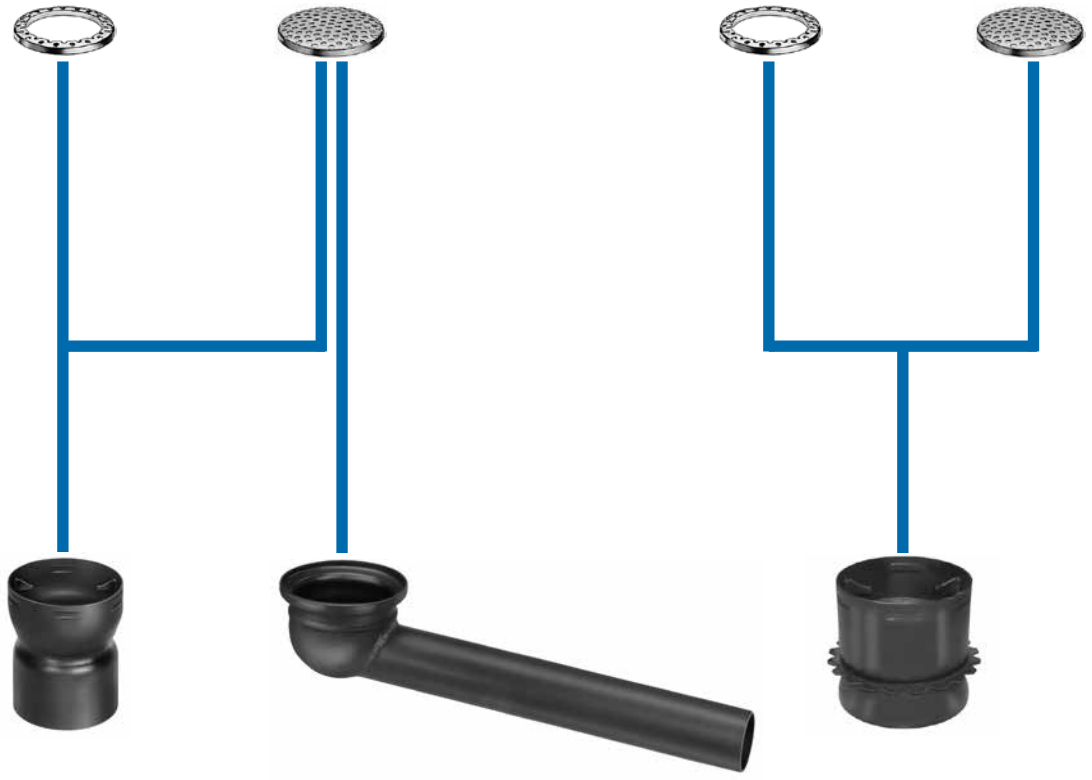
Ring strainer
for balcony floors
No. 16193X

Strainer
for upper balconies
No. 16191X

with dome and clamping collar, Series IK

Ring strainer
for balcony floors
No. 16193x

Strainer
for upper balconies
No. 16191X



Balcony direct drains
with dome,
for plate thickness from:
95 mm: No. 16375X
120 mm: No. 16370X
140 mm: No. 16371X
160 mm: No. 16372X
180 mm: No. 16373X
200 mm: No. 16374X
220 mm: No. 16376X

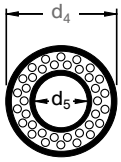
Balcony direct drains
horizontal runoff
No. 16362X

Balcony direct drains
with dome and
clamping collar,
for plate thickness from:
120 mm: No. 16310X
140 mm: No. 16311X
160 mm: No. 16312X
180 mm: No. 16313X
200 mm: No. 16314X

LORO balcony direct drains, Series I and IK, are delivered without strainers and not as part or complete units due to the temporally shifted building succession. Please order strainers separately together with the downpipes and sealing elements.

Individual Components

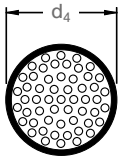
LORO Balcony Direct Drains with Dome, Series I



Strainer for balcony floors

Discharge rate: 0,7 l/s ≙ DN 50
Material: stainless steel

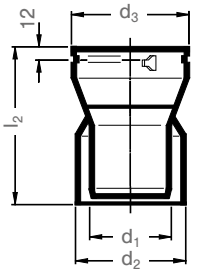
Art.-No.	DN	d_4	d_5	h
16193.050X	50	98	55	0,03
16193.070X	70	118	75	0,1
16193.100X	100	140	104	0,1



Strainer for upper balconies

Discharge rate: 0,7 l/s ≙ DN 50
Material: stainless steel

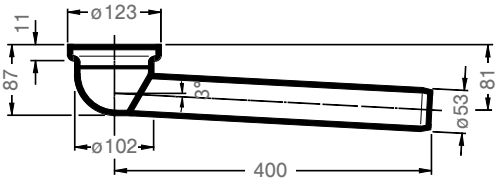
Art.-No.	DN	d_4	h
16191.050X	50	98	0,03
16191.070X	70	118	0,1
16191.100X	100	140	0,1



Direct drain with dome

Material: galvanized steel, additional coating

Art.-No.	DN	d_1	d_2	d_3	l_2	kg
16375.050X	50	53	89	102	95	0,7
16370.050X	50	53	89	102	120	0,7
16371.050X	50	53	89	102	140	0,8
16372.050X	50	53	89	102	160	0,8
16373.050X	50	53	89	102	180	0,9
16374.050X	50	53	89	102	200	1,1
16376.050X	50	53	89	102	220	1,1
16375.070X	70	73	102	122	95	0,8
16370.070X	70	73	102	122	120	0,9
16371.070X	70	73	102	122	140	1,0
16372.070X	70	73	102	122	160	1,2
16373.070X	70	73	102	122	180	1,5
16374.070X	70	73	102	122	200	1,6
16376.070X	70	73	102	122	220	1,6
16375.100X	100	102	133	145	95	1,6
16370.100X	100	102	133	145	120	1,4
16371.100X	100	102	133	145	140	1,7
16372.100X	100	102	133	145	160	1,7
16373.100X	100	102	133	145	180	1,9
16374.100X	100	102	133	145	200	2,2
16376.100X	100	102	133	145	220	2,4

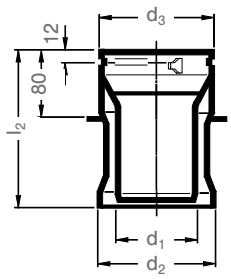


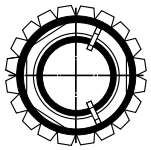
Direct drain, vertical runoff*

Material: galvanized steel, additional coating
DN 50: Art.-No. 16362.050X weight: 1.2 kg
*Install strainer Art.-No. 16191.070X!

Individual Components

LORO Balcony Direct Drains with Dome for Tapping Holes, Series IK





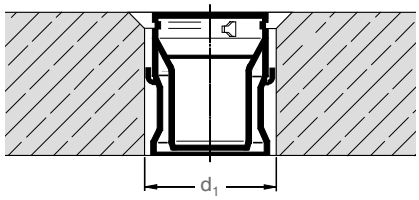
Direct drain with dome and clamping collar*

Material: galvanized steel, additional coating

Art.-No.	DN	d_1	d_2	d_3	l_2	kg
16310.050X	50	53	108	102	120	0,9
16311.050X	50	53	108	102	140	0,9
16312.050X	50	53	108	102	160	1,0
16313.050X	50	53	108	102	180	1,1
16314.050X	50	53	108	102	200	1,3
16310.070X	70	73	128	123	120	1,1
16311.070X	70	73	128	123	140	1,2
16312.070X	70	73	128	123	160	1,4
16313.070X	70	73	128	123	180	1,6
16314.070X	70	73	128	123	200	1,8

* Strainers for balcony floors or for upper balconies can be found on page 69.

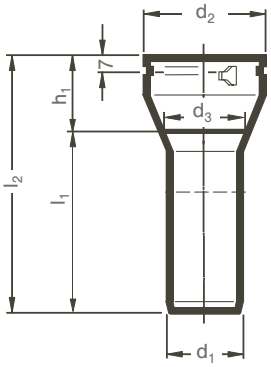
Recess Dimensions



Tapping hole

DN	d_1
50	112
70	132

LORO Balcony Direct Drains without Supporting Edge, Series GS



Drain body

Material: galvanized steel, additional coating
plate thickness up to 350 mm

Art.-No.	DN	d_1	d_2	d_3	l_1	l_2	h_1	kg
16115.050X	50	53	102	63	278	350	72	1,1
16115.070X	70	73	122	89	270	350	80	1,4
16115.100X	100	102	145	112	278	350	72	2,1

* Strainers for balcony floors or for upper balconies can be found on page 69.

Series J:

LORO-VERSAL® Balcony Direct Drains with Supporting Edge

DN 70 and DN 100, made of galvanized steel

Application area:
Renovation of balconies and walkways

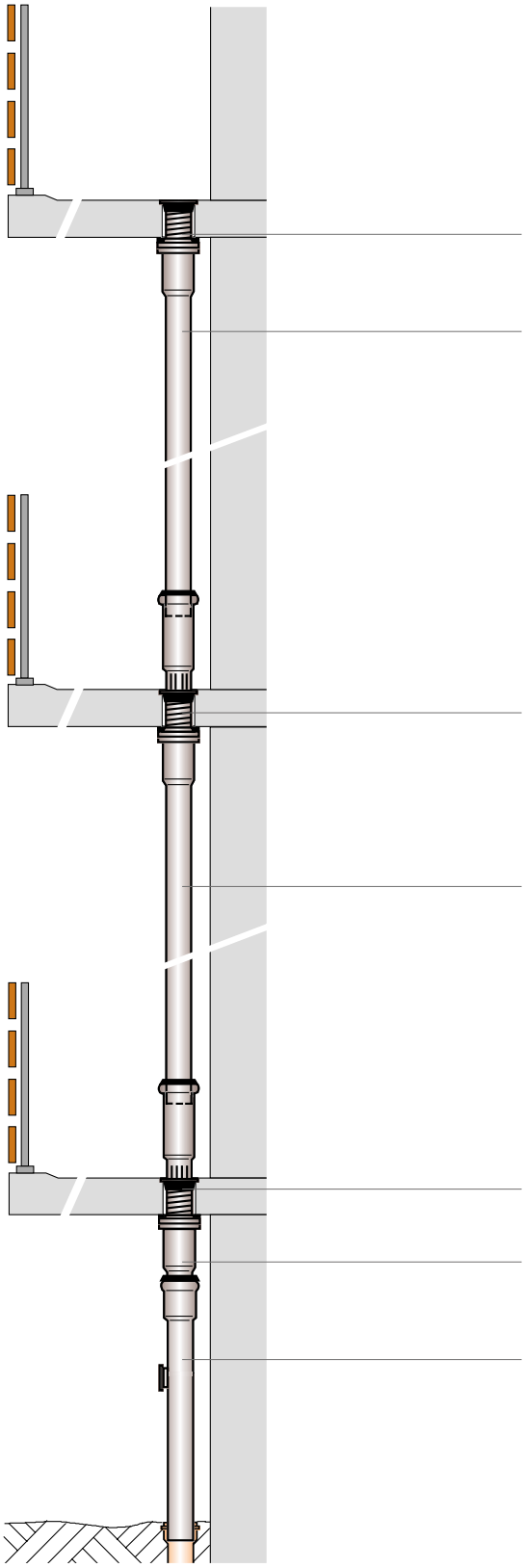
System description/ proposal for tender text

Series J
LORO-Versal® balcony direct drains with supporting edge, made of galvanized steel, additional inner coating
for upper balconies, consisting of:
drain body with connection thread and sealing, downpipe 2500 mm long, with retainer nut and sliding disk, for ceiling thickness 40 - 170 mm and 150 - 250 mm, DN 70 and DN 100

Series J

Series J
LORO-Versal® balcony direct drains with supporting edge, made of galvanized steel, additional inner coating
for balcony floors, consisting of:
drain body with long socket, sealing element, connection thread and sealing, downpipe 2500 mm long, with retainer nut and sliding disk, for ceiling thickness 40 - 170 mm and 150 - 250 mm, DN 70 and DN 100

for upper balconies, short, consisting of:
drain body with long socket, sealing element, connection thread and sealing, downpipe 350 mm long, with retainer nut and sliding disk, for ceiling thickness 40 - 170 mm and 150 - 250 mm, DN 70 and DN 100



Application Example:

Renovation of balconies and loggias. Drains and downpipes have to be replaced or to be installed subsequently. Thereby a varying ceiling thickness has to be taken into account.

Drain body with connection thread and sealing
No. 16730X (for ceiling thickness 40 - 170 mm)
No. 16731X (for ceiling thickness 150 - 250 mm)

Downpipe 2500 mm long with retainer nut and sliding disk No. 16721X

Drain body with long socket, sealing element, connection thread and sealing
No. 16713X (for ceiling thickness 40 - 170 mm)
No. 16714X (for ceiling thickness 150 - 250 mm)

Downpipe 2500 mm long with retainer nut and sliding disk No. 16721X

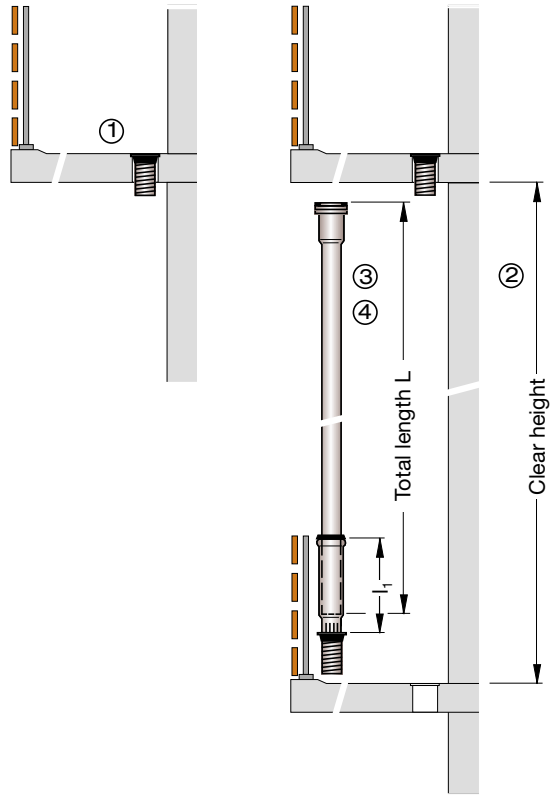
Drain body with long socket, sealing element, connection thread and sealing
No. 16713X (for ceiling thickness 40 - 170 mm)
No. 16714X (for ceiling thickness 150 - 250 mm)

Downpipe 350 mm long with retainer nut and sliding disk No. 16720X

LORO rain standpipe

LORO Solution:
Balcony direct drains with supporting edge, Series J, for the renovation of balconies and loggias, for upper balconies, balcony floors and lower balconies

See pages 75-76 for article numbers of Series J



Installation Instruction:

1) Insert the drain body, No. 16730X or No. 16731X, into the tapping hole on the upper balcony (tapping hole diameter - see page 76 for recess dimensions).

2) Calculate the clear height between the balcony slabs or loggia slabs.

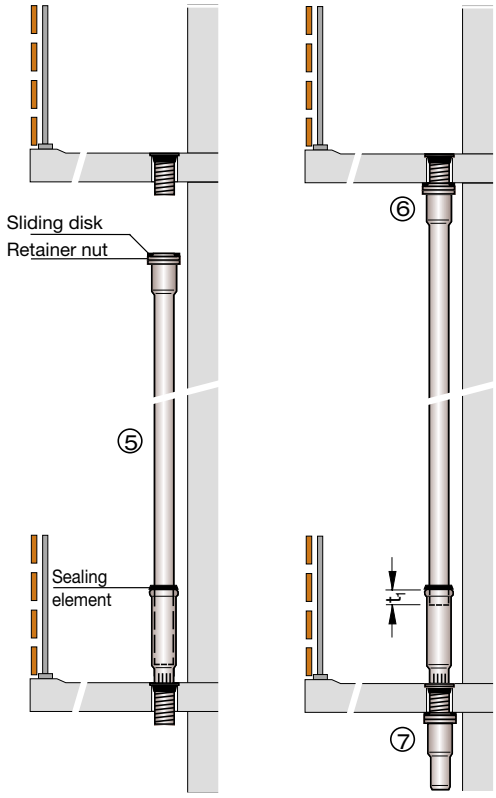
3) Calculate the total downpipe length L:

clear height + pipe insertion t_1 - Ablaufmaß l_1

Pipe insertion t_1: DN 70 = 55 mm
DN 100 = 70 mm

Ablaufmaß l_1: see dimensions table on page 75.

4) Shorten the downpipe, No. 16721X, to the calculated total length L. Put the sealing elements into the long socket and cover them with lubricant. Insert the downpipe into the long socket of the drain body.



5) Put the drain body with the downpipe into the tapping hole.

6) Pull the downpipe upwards out of the long socket, screw it to the thread of the upper drain body with retainer nut and sliding disk and fasten it with an alligator grip wrench. Pay attention to the correct position of the sliding disk. That way the downpipe is fastened. In the case of several balconies, proceed in the same way.

7) In the case of lower balconies, screw the short downpipe, No. 16720X, onto the thread of the drain body and fasten it with an alligator grip wrench.

Setup Diagram/System Components

Series J:
LORO-VERSAL® Balcony Direct Drains with Supporting Edge

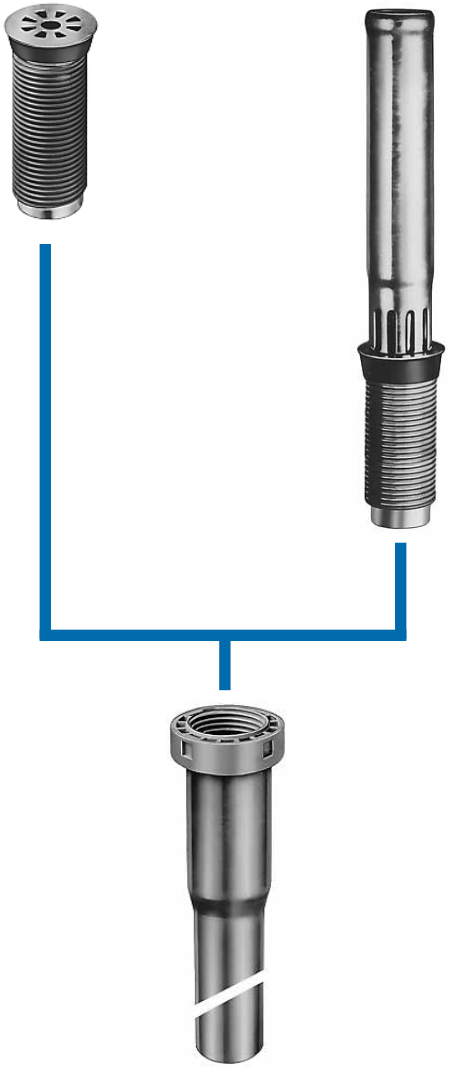
DN 70 and DN 100, made of galvanized steel, additional coating

Complete Units

Drain body
for upper balconies

for ceiling thickness
from 40 - 170 mm:
No. 16730X

for ceiling thickness
from 150 - 250 mm:
No. 16731X



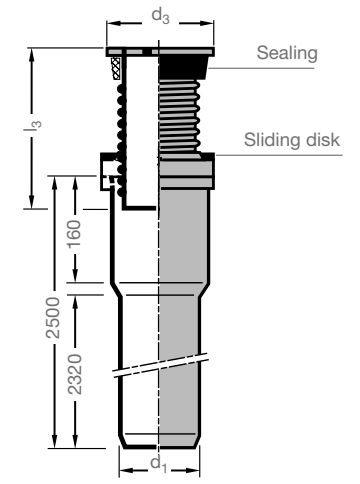
Drain body
for balcony floors

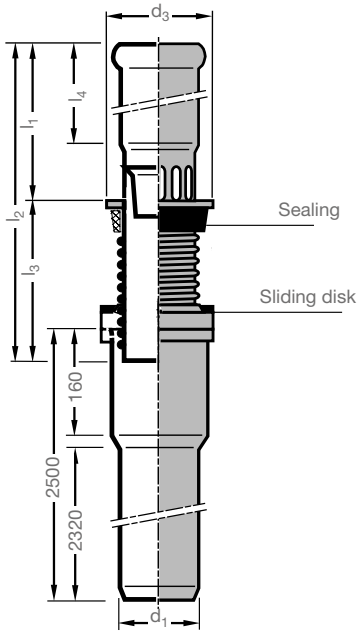
for ceiling thickness
from 40 - 170 mm:
No. 16713X

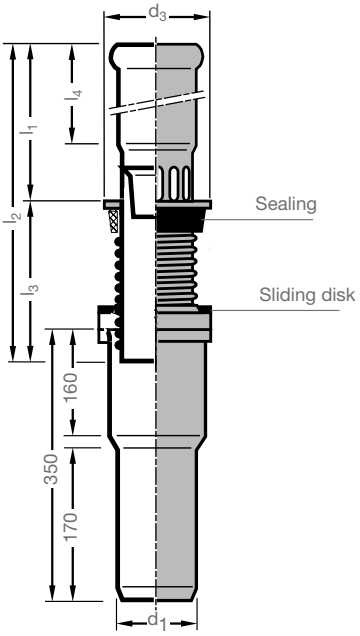
for ceiling thickness
from 150 - 250 mm:
No. 16714X

Downpipe
with retainer nut and sliding disk
No. 16720X (length 350 mm)
No. 16721X (length 2500 mm)

LORO-VERSAL® balcony direct drains, Series J, are delivered as complete units. But alternatively single parts can be put together for respective installation purposes.







Complete Units

LORO-VERSAL®
Balcony Direct Drains, Series J

for upper balconies,
consisting of:
drain body with threaded connecting socket and sealing, No. 16730X or No. 16731X,
downpipe 2500 mm long, with retainer nut and sliding disk, No. 16721X (for clear floor height up to 2830 mm)

For ceiling thickness 40-170 mm
DN 70: Art.-No. 16738.070X weight: 9.2 kg
DN 100: Art.-No. 16738.100X weight: 15.6 kg

For ceiling thickness 150-250 mm
DN 70: Art.-No. 16739.070X weight: 9.4 kg
DN 100: Art.-No. 16739.100X weight: 16.3 kg

for middle balcony floors
- storey-high -
consisting of:
drain body with long socket, sealing element, threaded connecting socket and sealing, No. 16713X or No. 16714X, downpipe 2500 mm long,
with retainer nut and sliding disk, No. 16721X
(for clear floor height up to 2830 mm)

For ceiling thickness 40-170 mm
DN 70: Art.-No. 16728.070X weight: 10.5 kg
DN 100: Art.-No. 16728.100X weight: 18.5 kg

For ceiling thickness 150-250 mm
DN 70: Art.-No. 16729.070X weight: 10.9 kg
DN 100: Art.-No. 16729.100X weight: 19.0 kg

for lower balconies - short
consisting of:
drain body with long socket, sealing element, threaded connecting socket and sealing, No. 16713X or No. 16714X, downpipe 350 mm long, with retainer nut and sliding disk, No. 16720X

For ceiling thickness 40-170 mm
DN 70: Art.-No. 16748.070X weight: 3.9 kg
DN 100: Art.-No. 16748.100X weight: 6.8 kg

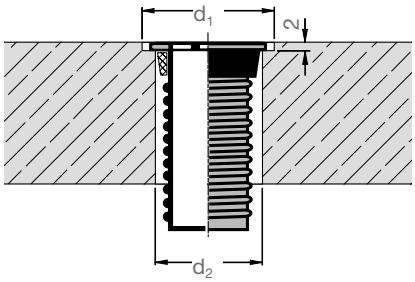
For ceiling thickness 150-250 mm
DN 70: Art.-No. 16749.070X weight: 4.3 kg
DN 100: Art.-No. 16749.100X weight: 7.3 kg

For ceiling thickness 40 - 170 mm

DN	d_1	d_2	l_1	l_2	l_3	l_4
70	73	183	400	620	220	300
100	102	210	400	620	220	320

For ceiling thickness 150 - 250 mm

DN	d_1	d_2	l_1	l_2	l_3	l_4
70	73	183	460	760	300	360
100	102	210	460	760	300	360



Recess Dimensions

Tapping hole

DN	d_1	d_2
70	190	90
100	220	120

Series J:

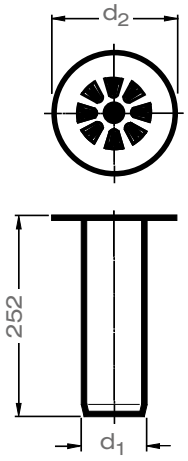
LORO-VERSAL® Balcony Direct Drains with Supporting Edge, without Thread and Longsocket

DN 50 and DN 70, made of galvanized steel

Application area:
Renovation of balconies and walkways

System description/ proposal for tender text

Series J
LORO-Versal® balcony direct drains with supporting edge, without thread and long socket,
made of galvanized steel, additional inner coating
for upper balconies,
ceiling thickness 100 - 200 mm,
DN 50 and DN 70

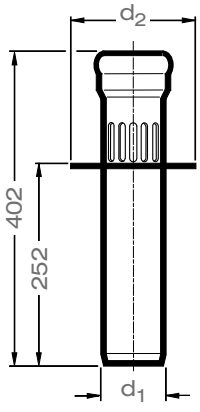


DN 50: Art.-No. 16733.050X weight: 0.6 kg
DN 70: Art.-No. 16733.070X weight: 1.1 kg

DN	d_1	d_2
50	53	152
70	73	183

Applicable in combination with LORO-X pipes with one socket.

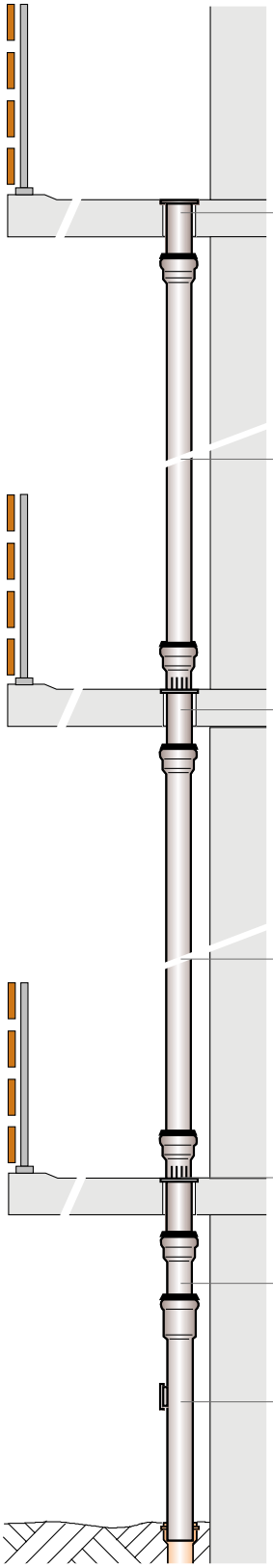
Series J
LORO-Versal® balcony direct drains with supporting edge, without thread and long socket,
made of galvanized steel, additional inner coating
for balcony floors,
ceiling thickness 100 - 200 mm,
DN 50 and DN 70



DN 50: Art.-No. 16716.050X weight: 1.2 kg
DN 70: Art.-No. 16716.070X weight: 1.8 kg

Application Example:

Renovation of balconies and loggias. Drains and downpipes have to be replaced or to be installed subsequently. Thereby a varying ceiling thickness has to be taken into account.



Drain body without thread and without long socket No. 16733X (for ceiling thickness 100 - 200 mm)

LORO-X pipe with one socket

Drain body without thread and without long socket No. 16716X (for ceiling thickness 100 - 200 mm)

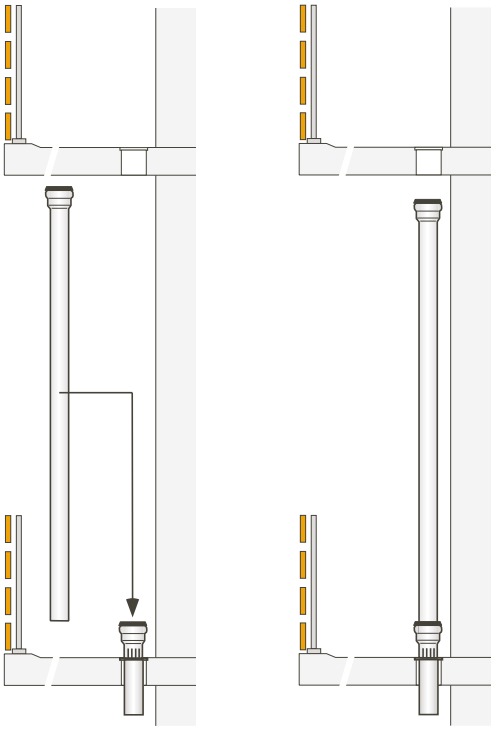
LORO-X pipe with one socket

Drain body without thread and without long socket No. 16716X (for ceiling thickness 100 - 200 mm)

LORO-X pipe with one socket

LORO rain downpipe

LORO Solution:
Balcony direct drains with supporting edge, Series J, without thread and without long socket, for the renovation of balconies and loggias, for upper balconies and balcony floors

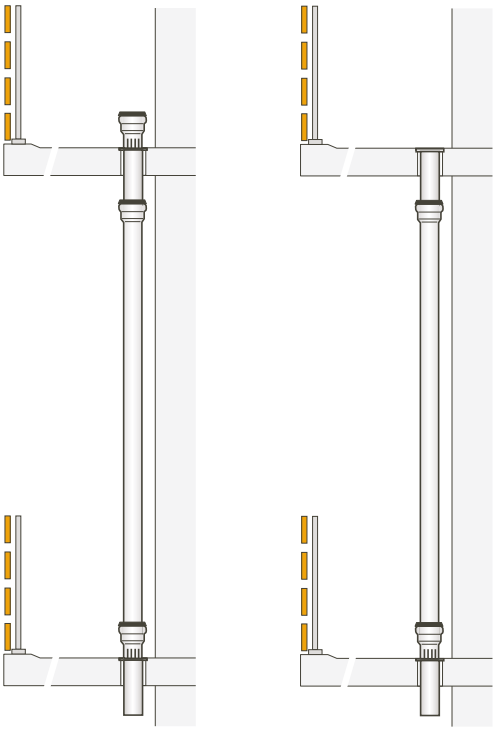


Installation Instruction:

1) Start the installation process at the bottom and move upwards. The drain No. 16716X is placed into the established recess (see table) and fixed. Put the sealing element into the socket and with the help of lubricant insert the pipe that has been adjusted on site. Proceed in the same way with the drain above. Insert the drain No. 16733X on the upper balcony.

2) Seal the connecting edge of the installed drain according to the general installation instructions of the sealing manufacturer.

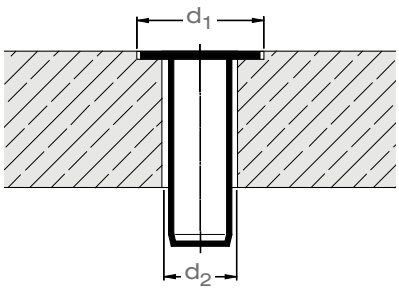
3) An additional fastening of the pipe is not absolutely necessary if the drains are correctly installed.



Recess Dimensions

Tapping hole

DN	d_1	d_2
50	160	72
70	190	92



Series K:

LORO-VERSAL® Balcony Single Drains with Clamping Flange

DN 50 and DN 70, made of stainless steel

Application area:
Balconies with sealing sheets, tiles or paving slab

System description/ proposal for tender text

Series K, one-piece

LORO-VERSAL® balcony single drains with clamping flange, Series K, according to DIN EN 1253,
made of stainless steel,
vertical runoff / horizontal runoff,
without / with thermal insulation
one-piece, consisting of:
drain body, flange sealing ring*, loose flange,
drainage ring, strainer support quadratic,
100 x 100 mm (for installation height 10 - 130 mm),
quadratic strainer made of stainless steel,
94 x 94 mm, class K, DN 50 and DN 70

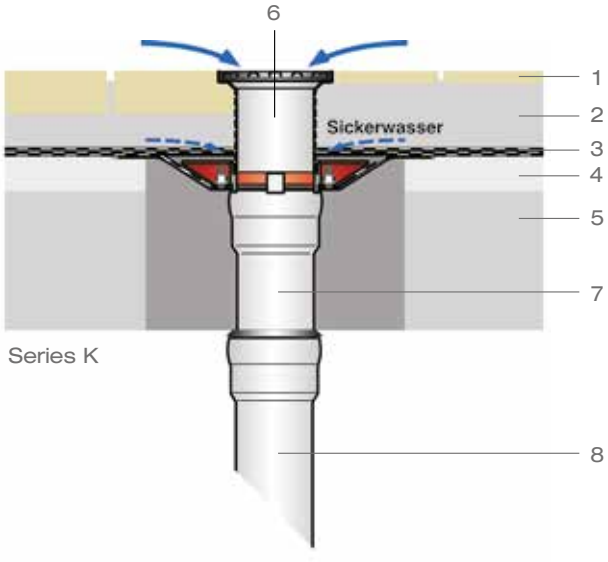
Series K, two-piece

LORO-VERSAL® balcony single drains with clamping flange, Series K, according to DIN EN 1253,
made of stainless steel,
vertical runoff / horizontal runoff,
without / with thermal insulation
two-piece, consisting of:
drain body, flange sealing ring*, loose flange,
sealing element, extension cartridge (for installation height 40 - 120 mm), flange sealing ring*, loose flange, drainage ring, strainer support quadratic,
100 x 100 mm (for installation height 10 - 130 mm),
quadratic strainer made of stainless steel,
94 x 94 mm, class K, DN 50 and DN 70

Series K

* can be omitted when bituminous roofing sheets are used.

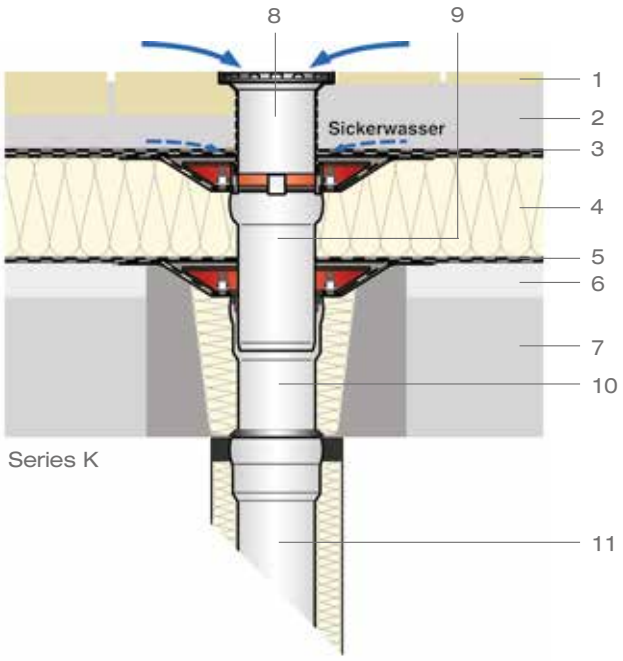
Application Examples Series K:



Balcony slab with paving slab or tiles in mortar bedding with sealing sheet, without thermal insulation. Drainage at one level, with additional seepage discharge.

1 Paving slab/tiles
2 Mortar bedding
3 Sealing sheet, if necessary on separating and/or levelling layer
4 Levelling screed
5 Concrete slab
6 Strainer support and strainer made of stainless steel, height-adjustable, and drainage ring for seepage discharge
7 Single drain with clamping flange, vertical runoff, without thermal insulation
8 LORO-X steel discharge pipe

LORO solution:
LORO-VERSAL® balcony single drains with clamping flange, Series K, vertical or horizontal runoff, one-piece, without thermal insulation, with height-adjustable strainer support and strainer made of stainless steel.



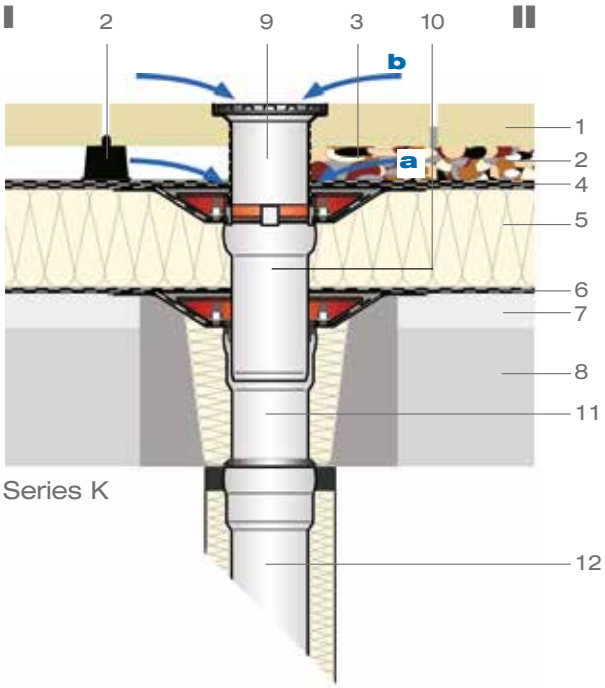
Balcony slab with paving slab or tiles in mortar bedding with sealing sheet, with thermal insulation. Drainage at one level, with additional seepage discharge.

1 Paving slab/tiles
2 Mortar bedding
3 Sealing sheet, if necessary on separating and/or levelling layer
4 Thermal insulation
5 Vapor barrier, if necessary on separating and/or levelling layer
6 Levelling screed
7 Concrete slab
8 Strainer support and strainer made of stainless steel, height-adjustable, and drainage ring for seepage discharge
9 Extension cartridge with sealing element for connection with single drain
10 Single drain with clamping flange, vertical runoff, with thermal insulation
11 LORO composite pipe

LORO solution:
LORO-VERSAL® balcony single drains with clamping flange, Series K, vertical or horizontal runoff, two-piece, with or without thermal insulation, with height-adjustable strainer support and strainer made of stainless steel.

See pages 83 - 84 for article numbers of Series K

Application Examples Series K:

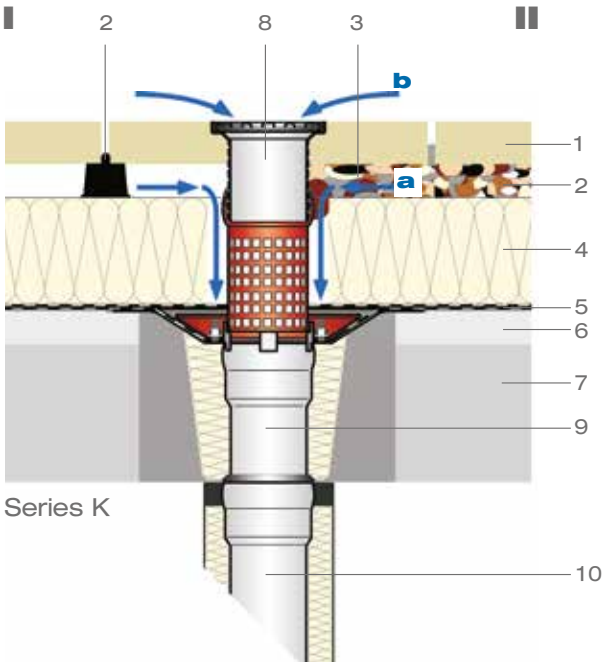


Series K

Balcony slab with paving slab
I) on paving slab support
II) on granular bedding (grit, gravel etc.)
with sealing sheet,
with thermal insulation.
Drainage at two levels:
a) on the sealing
b) on the paving slab.

1 Paving slab
2 Paving slab support or granular bedding
3 Coarse grit
4 Sealing sheet*
5 Thermal insulation
6 Vapor barrier*
7 Levelling screed
8 Concrete slab
9 Strainer support and strainer made of stainless steel, height-adjustable, and drainage ring
10 Extension cartridge with sealing element for connection with single drain
11 Extension cartridge with sealing element for connection with single drain
12 LORO composite pipe

LORO solution:
LORO-VERSAL® balcony single drains with clamping flange, Series K, vertical or horizontal runoff, two-piece, with or without thermal insulation, with height-adjustable strainer support and strainer made of stainless steel.



Series K

Balcony slab with paving slab
I) on paving slab support
II) on granular bedding (grit, gravel etc.)
with sealing sheet,
with thermal insulation.

System „inverted roof"
Drainage at two levels:
a) on the sealing
b) on the paving slab.

1 Paving slab
2 Paving slab support or granular bedding
3 Coarse grit
4 Thermal insulation
5 Sealing sheet*
6 Levelling screed
7 Concrete slab
8 Strainer support and strainer made of stainless steel, sealing element, strainer pipe and drainage ring
9 Single drain with clamping flange, vertical runoff, with thermal insulation
10 LORO composite pipe

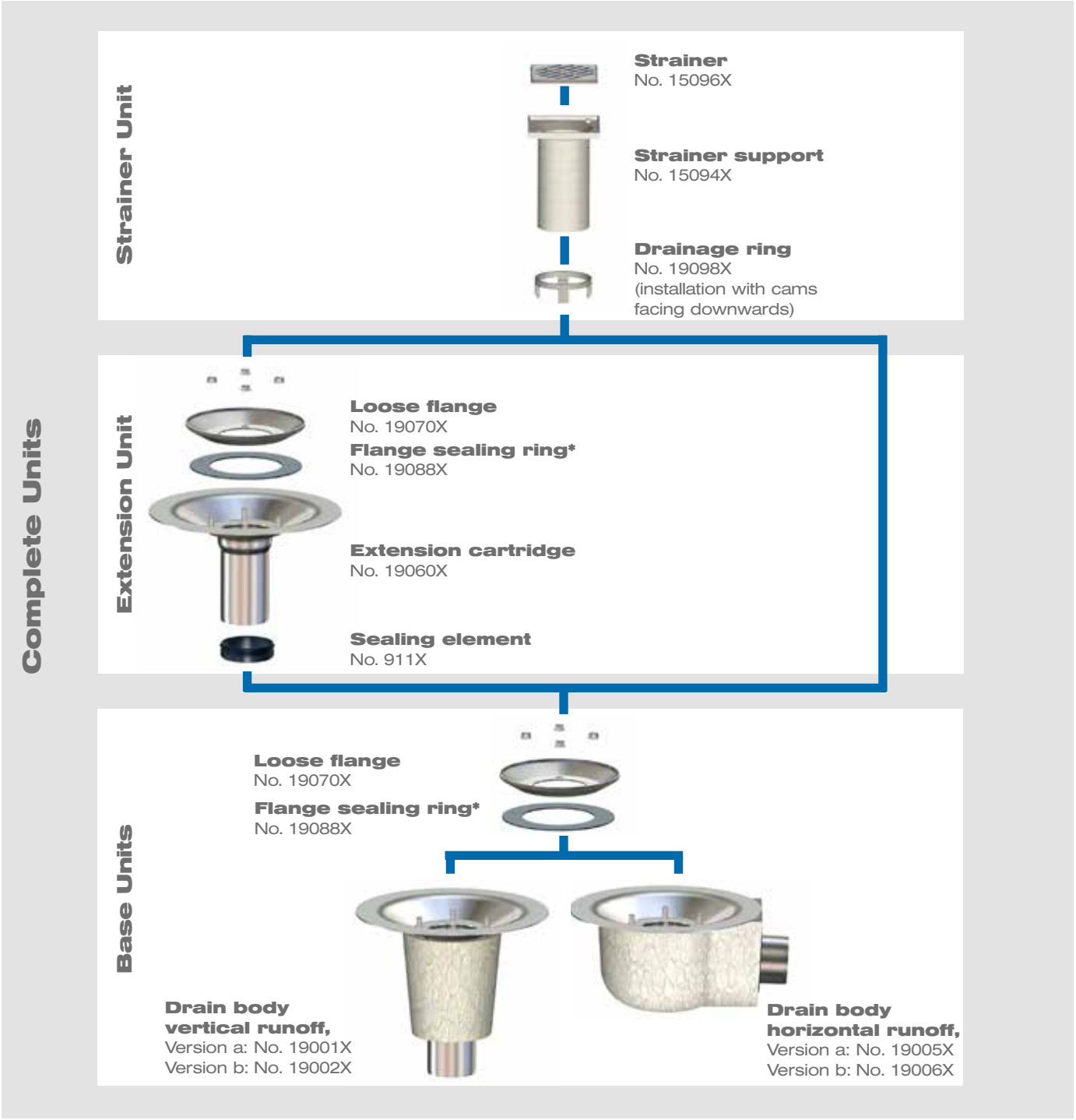
LORO solution:
LORO-VERSAL® balcony single drains with clamping flange, Series K, vertical or horizontal runoff, two-piece, with or without thermal insulation, with sealing element, strainer pipe, height-adjustable strainer support and strainer made of stainless steel.

* if necessary on separating and/or levelling layer

See pages 83 - 84 for article numbers of Series K

Setup Diagram/System Components

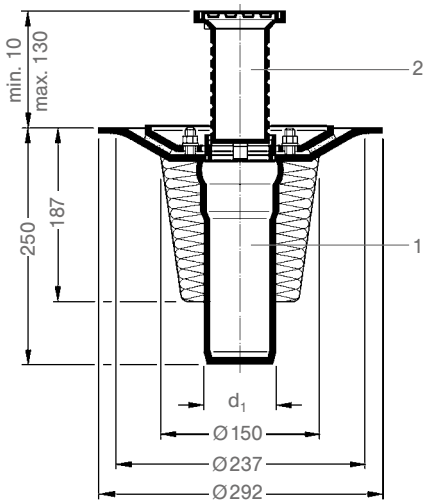
Series K:
LORO VERSAL® Balcony Single Drains with Clamping Flange DN 50 and DN 70, made of stainless steel



* can be omitted when using bituminous sealing sheets.
Version a = without thermal insulation Version b = with thermal insulation

LORO-VERSAL® balcony drains, Series K, are delivered as complete units. But alternatively part units (base units, extension unit, strainer unit) or single parts can be put together for respective installation purposes.

Complete Units



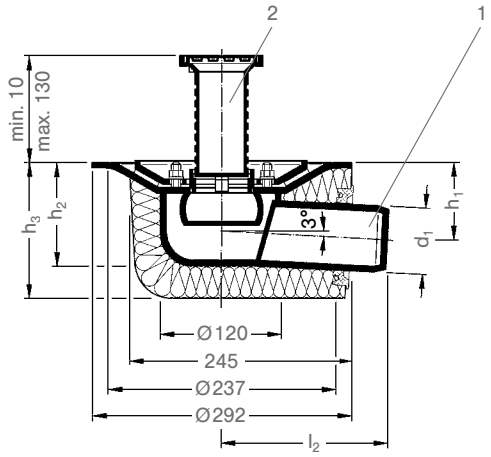
LORO-VERSAL®
Balcony Single Drains, Series K

one-piece,
vertical runoff

Version a (without thermal insulation)
DN 50: Art.-No. 19200.050X weight: 2.4 kg
DN 70: Art.-No. 19200.070X weight: 2.6 kg

Version b (with thermal insulation)
DN 50: Art.-No. 19210.050X weight: 2.7 kg
DN 70: Art.-No. 19210.070X weight: 2.7 kg

consisting of:
1 base unit
2 strainer unit

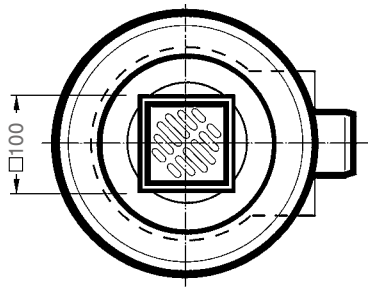


one-piece,
vertical runoff

Version a (without thermal insulation)
DN 50: Art.-No. 19205.050X weight: 2.7 kg
DN 70: Art.-No. 19205.070X weight: 2.9 kg

Version b (with thermal insulation)
DN 50: Art.-No. 19215.050X weight: 3.0 kg
DN 70: Art.-No. 19215.070X weight: 3.3 kg

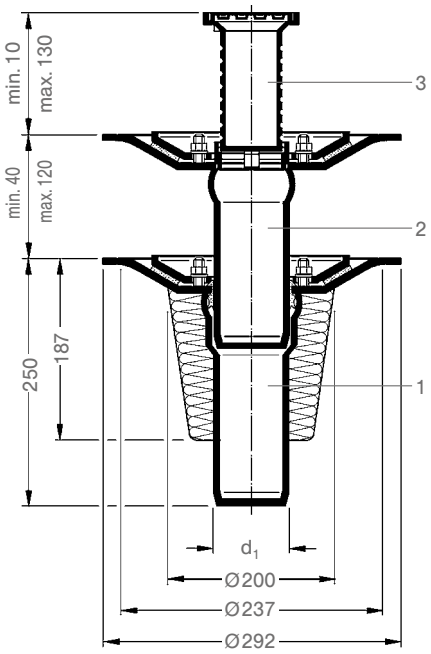
consisting of:
1 base unit
2 strainer unit



DN	d_1	h_1	h_2	h_3	l_2
50	53	75	92	130	171
70	73	80	109	150	185

Series K

Complete Units



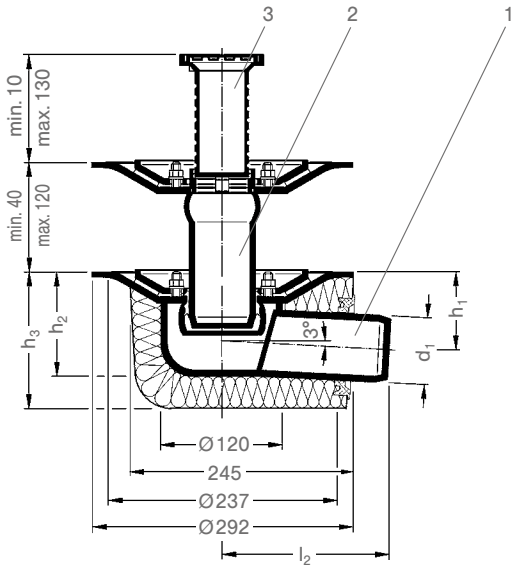
LORO-VERSAL®
Balcony Single Drains, Series K

two-piece,
vertical runoff

Version a (without thermal insulation)
DN 50: Art.-No. 19250.050X weight: 4.8 kg
DN 70: Art.-No. 19250.070X weight: 4.9 kg

Version b (with thermal insulation)
DN 50: Art.-No. 19260.050X weight: 5.0 kg
DN 70: Art.-No. 19260.070X weight: 5.0 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit



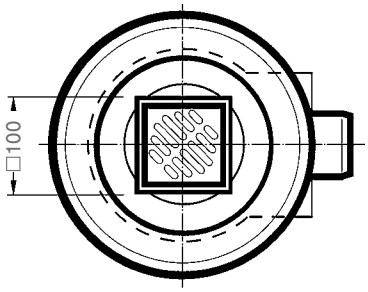
two-piece,
vertical runoff

Version a (without thermal insulation)
DN 50: Art.-No. 19255.050X weight: 4.9 kg
DN 70: Art.-No. 19255.070X weight: 5.2 kg

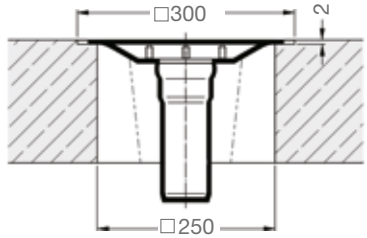
Version b (with thermal insulation)
DN 50: Art.-No. 19265.050X weight: 5.3 kg
DN 70: Art.-No. 19265.070X weight: 5.6 kg

consisting of:
1 base unit
2 extension unit
3 strainer unit

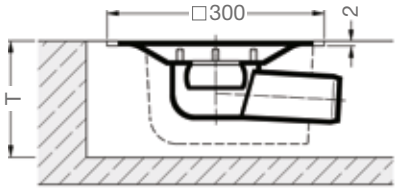
DN	d_1	h_1	h_2	h_3	l_2
50	53	75	92	130	171
70	73	80	109	150	185



Recess Dimensions Series K



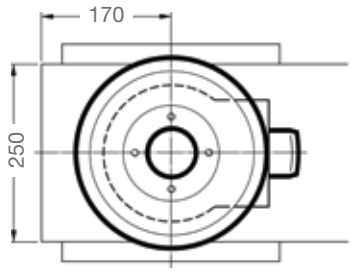
Ceiling opening vertical runoff

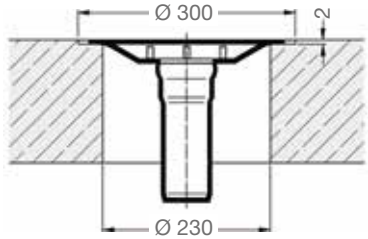


Ceiling opening horizontal runoff

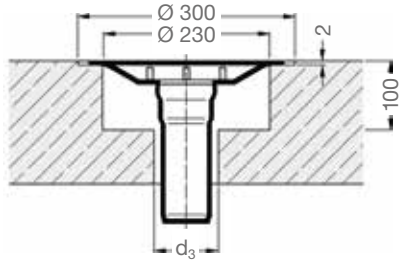
	Recess T	
DN	a	b
50	110	140
70	120	160

a = without thermal insulation
b = with thermal insulation



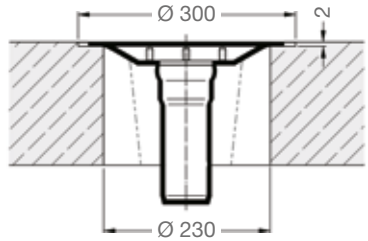


Tapping hole, single-stage
for drains without thermal insulation



Tapping hole, two-stage
for drains without thermal insulation

DN	d_3
70	72
100	92



Tapping hole, single-stage
for drains with thermal insulation

Attention:

- Drains have to be fastened in the ceiling!
- For backfilling the recesses on site, the required openings have to be considered!
- For that purpose, prepare a lower formwork slab and fasten it. Lift the drain briefly and backfill. Put the drain back into position.

Series K

Series V:

LORO Balcony Drains with Bonding or Clamping Flange

DN 70, made of stainless steel

Application area:
Variable balcony drainage system with only one base body and modular set up elements for all kinds of balcony structures for new constructions and renovations

Different balcony structures and the usage of new materials, such as liquid plastic or plastic/cement combinations, require balcony systems that are adapted to the situation of the application.
Using its decades-long experience in the area of balcony drainage, LORO has developed balcony drains that are especially adapted to each application. In combination with downpipes made of galvanized steel, they form a balcony drainage system provided by one single source.

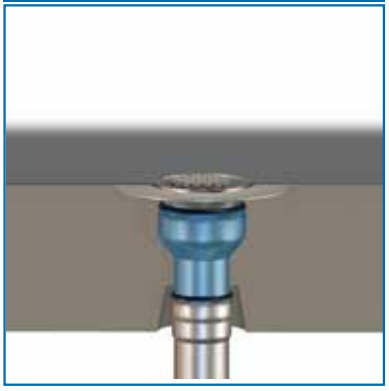
The newest development in this area constitutes the LORO-X balcony drainage system Series V - a variable system making use of the modular principle which covers all possibilities of application.
Made of durable stainless steel, the LORO-X balcony drainage system Series V is resistant to heat, frost and UV-radiation in outdoor areas.

In combination with the reliable LORO-X steel discharge pipes, the drains of Series V constitute a balcony drainage system from one single source.

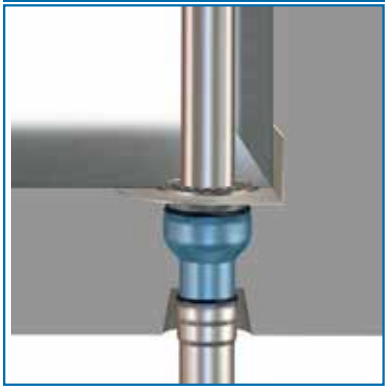
Building Shell
The basis of the new programme is a base body that can be embedded in the building shell balcony slab together with a formwork mushroom and a formwork dome. This procedure can take place on site or - as with prefabricated balconies - at the factory.

Final Construction
After the installation of the base body, different set up elements for balcony sealing with liquid plastic or with sealing sheets can be used in accordance with the balcony structure and temporally independent of the planning progress or any changes in the balcony structure.

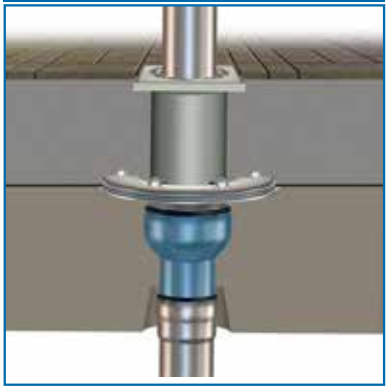
for usage of liquid plastic



for usage of liquid plastic, in wall area

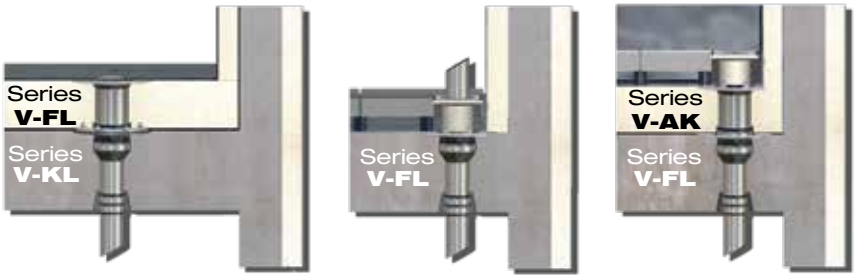


for usage of sealing sheets



New:

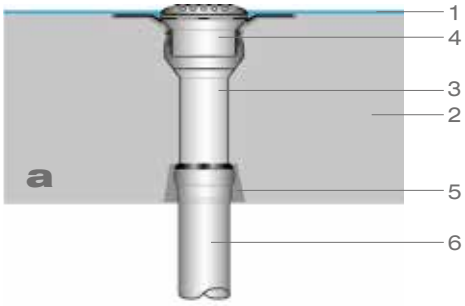
- two-piece version for thermally insulated balconies
- with up edged bonding flanges for installation in wall or corner areas

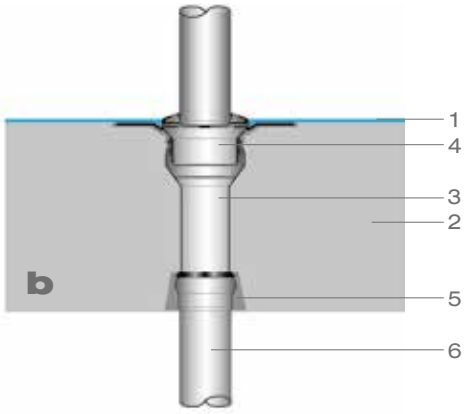


- two-piece version
- with clamping flange and bonding flange
- strainer round, without pipe penetration

- one-piece version
- with bonding flange
- strainer quadratic, with pipe penetration

- two-piece version
- with bonding flange
- strainer quadratic, without pipe penetration





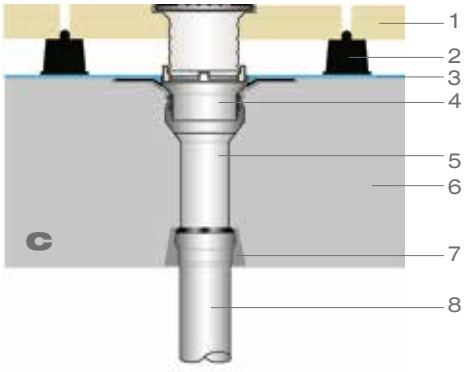
Application Examples Series V-FL

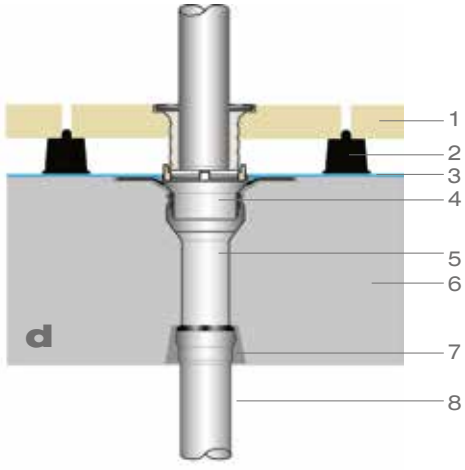
Balcony slab with sealing of liquid plastic without additional covering

LORO Solution:

LORO Balcony Drain with Bonding Flange, Series V-FL
vertical runoff with
a) strainer round, for upper balconies
b) strainer round, with pipe penetration*

1 Liquid plastic, layer thickness ca. 2 mm
2 Concrete slab
3 Balcony drain base body encased in concrete slab
4 LORO-X balcony drain setup element with bonding flange and strainer made of stainless steel
5 LORO-X formwork dome
6 LORO-X steel discharge pipe





Balcony slab with sealing of liquid plastic with paving slab

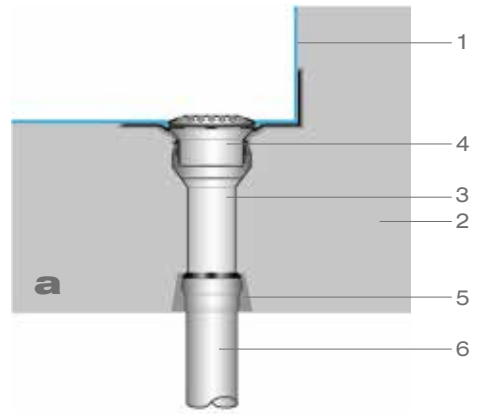
LORO Solution:

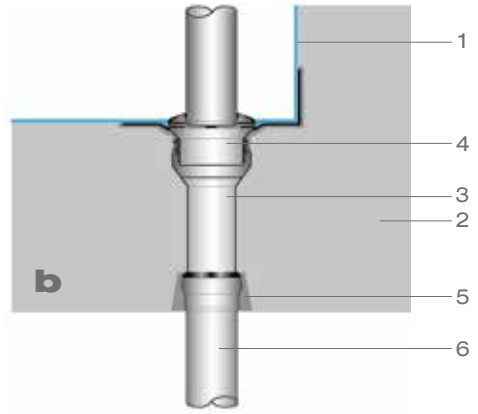
LORO Balcony Drain with Bonding Flange, Series V-FL
vertical runoff with
c) strainer support height-adjustable and strainer for upper balconies
d) strainer support height-adjustable and strainer with pipe penetration*

1 Paving slab
2 Paving slab support
3 Liquid plastic, layer thickness ca. 2 mm
4 LORO-X strainer support height-adjustable and strainer made of stainless steel
5 Balcony drain base body encased in concrete slab
6 Concrete slab
7 LORO-X formwork dome
8 LORO-X steel discharge pipe

* for balcony floors

See pages 93 - 94 for article numbers of Series V-FL





Application Examples Series V-AK

Balcony drain in wall area of balconies with sealing of liquid plastic without additional covering

LORO Solution:

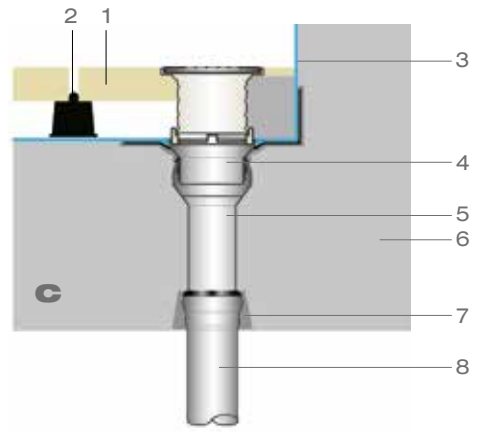
LORO Balcony Drain with Bonding Flange, Series V-AK

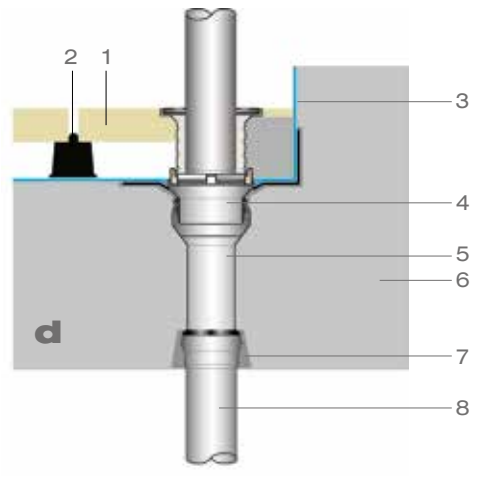
vertical runoff with

a) strainer round, for upper balconies

b) strainer round, with pipe penetration*

1 Liquid plastic, layer thickness ca. 2 mm
2 Concrete slab
3 Balcony drain base body encased in concrete slab
4 LORO-X balcony drain setup element with upedged bonding flange and strainer made of stainless steel
5 LORO-X formwork dome
6 LORO-X steel discharge pipe





Balcony drain in wall area of balconies with sealing of liquid plastic with paving slab

LORO Solution:

LORO Balcony Drain with Bonding Flange, Series V-AK

vertical runoff with

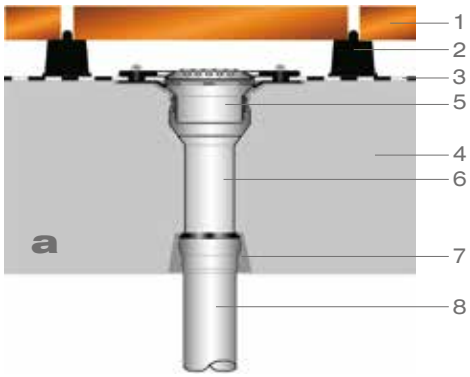
c) strainer support height-adjustable and strainer for upper balconies

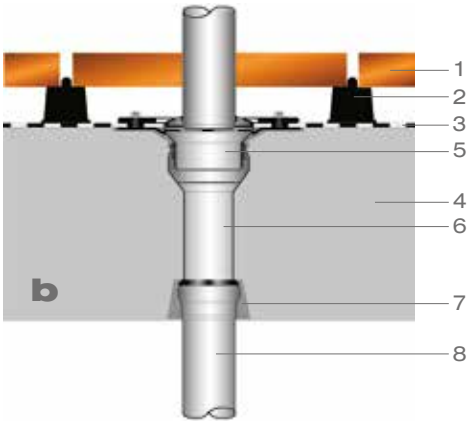
d) strainer support height-adjustable and strainer with pipe penetration*

1 Paving slab
2 Paving slab support
3 Liquid plastic, layer thickness ca. 2 mm
4 LORO-X balcony drain setup element with upedged bonding flange, strainer support height-adjustable and strainer made of stainless steel
5 Balcony drain base body in concrete slab
6 Concrete slab
7 LORO-X formwork dome
8 LORO-X steel discharge pipe

* for balcony floors

See pages 93 and 95 for article numbers of Series V-AK





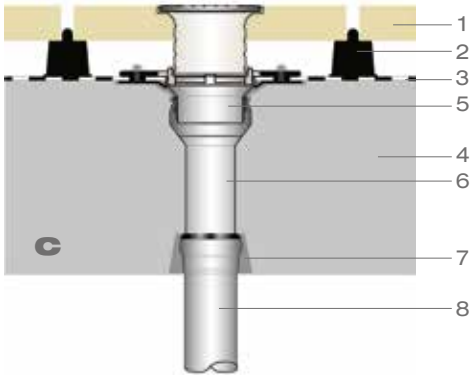
Application Examples Series V-KL

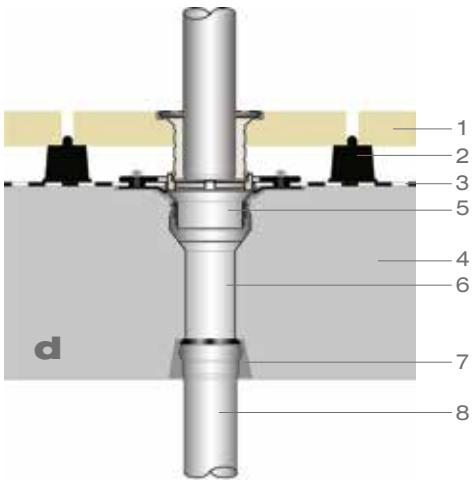
Balconies with bituminous or PVC roof sealing sheets for drainage below the paving slab

LORO Solution:

LORO Balcony Drain with Clamping Flange, Series V-KL
vertical runoff with
a) strainer round, for upper balconies
b) strainer round, with pipe penetration*

1 Paving slab
2 Paving slab support
3 Sealing sheet
4 Concrete slab
5 LORO-X balcony drain setup element with clamping flange and strainer made of stainless steel
6 Balcony drain base body in concrete slab
7 LORO-X formwork dome
8 LORO-X steel discharge pipe





Balconies with bituminous or PVC roof sealing sheets for drainage at two levels

LORO Solution:

LORO Balcony Drain with Clamping Flange, Series V-KL
vertical runoff with
c) strainer support height-adjustable and strainer for upper balconies
d) strainer support height-adjustable and strainer with pipe penetration*

1 Paving slab
2 Paving slab support
3 Sealing sheet
4 Concrete slab
5 LORO-X balcony drain setup element with clamping flange, strainer support height-adjustable and strainer made of stainless steel
6 Balcony drain base body in concrete slab
7 LORO-X formwork dome
8 LORO-X steel discharge pipe

* for balcony floors

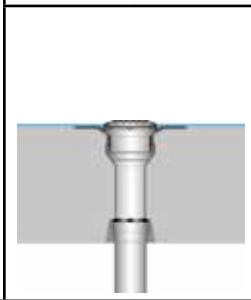
See pages 93 and 96 for article numbers of Series V-KL

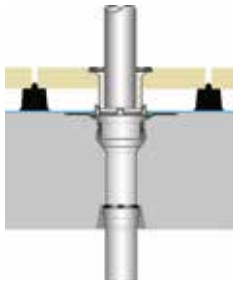
System Overview

LORO-X
Balcony Drainage Systems, DN 70, Series V

LORO-X balcony drainage systems are fire rated R 60 and R 90 as a complete system with the certificate number:
AbP.-No. P-MPA-E-09-010

Series V-FL with bonding flange





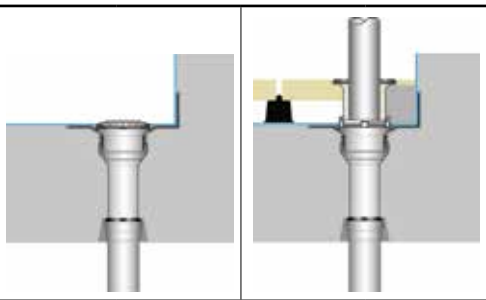
Building Shell
 **Formwork Mushroom** No. 18110.070X
 **Base Body** No. 21210.070X
 **Sliding Formwork Dome** No. 18100.070X
 **Thermal Insulation** No. 18108.070X

Final Construction	without covering		with covering	
Pipe Penetration	without	with	without	with
Strainer Form	 20421.070X	 20422.070X	 20424.070X	 20423.070X
Set Up Elements for balconies without thermal insulation	Series **V-FL**  20420.070X			
Extension Units + **Set Up Elements** for balconies with thermal insulation	Series **V-FL**  20425.070X + Series **V-FL**  20426.070X			
LX-No.	LX1221	LX1222	LX1223	LX1224
Discharge rate l/s 2 / 1	1.8 l/s*	1.3 l/s*	1.8 l/s*	1.7 l/s*

Attention:
Please order downpipes and strainer units separately.

Balcony Sealing with Liquid Plastic

Series V-AK with up edged bonding flange in wall areas



without covering		with covering	
without	with	without	with
			
20421.070X	20422.070X	20424.070X	20423.070X

Series **V-AK**

20430.070X

Series **V-AK**

20435.070X

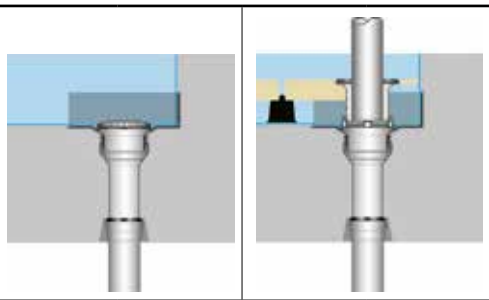
+

Series **V-FL**

20426.070X

LX1225	LX1226	LX1227	LX1228
1.8 l/s*	1.3 l/s*	1.8 l/s*	1.7 l/s*

Series V-AK with up edged bonding flange in room corners



without covering		with covering	
without	with	without	with
			
20421.070X	20422.070X	20424.070X	20423.070X

Series **V-AK**

20450.070X

Series **V-AK**

20455.070X

+

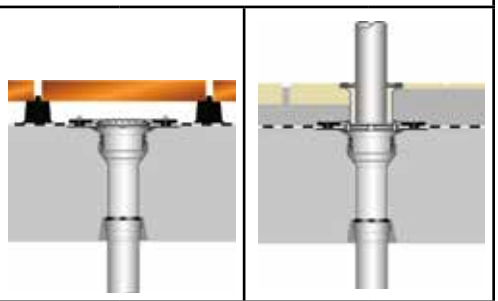
Series **V-FL**

20426.070X

LX1225	LX1226	LX1227	LX1228
1.8 l/s*	1.3 l/s*	1.8 l/s*	1.7 l/s*

Balcony Sealing with Sealing Sheets

Series V-KL with clamping flange



without covering		with covering	
without	with	without	with
			
20421.070X	20422.070X	20424.070X	20423.070X

Series **V-KL**

20440.070X

Series **V-KL**

20445.070X

+

Series **V-KL**

20446.070X

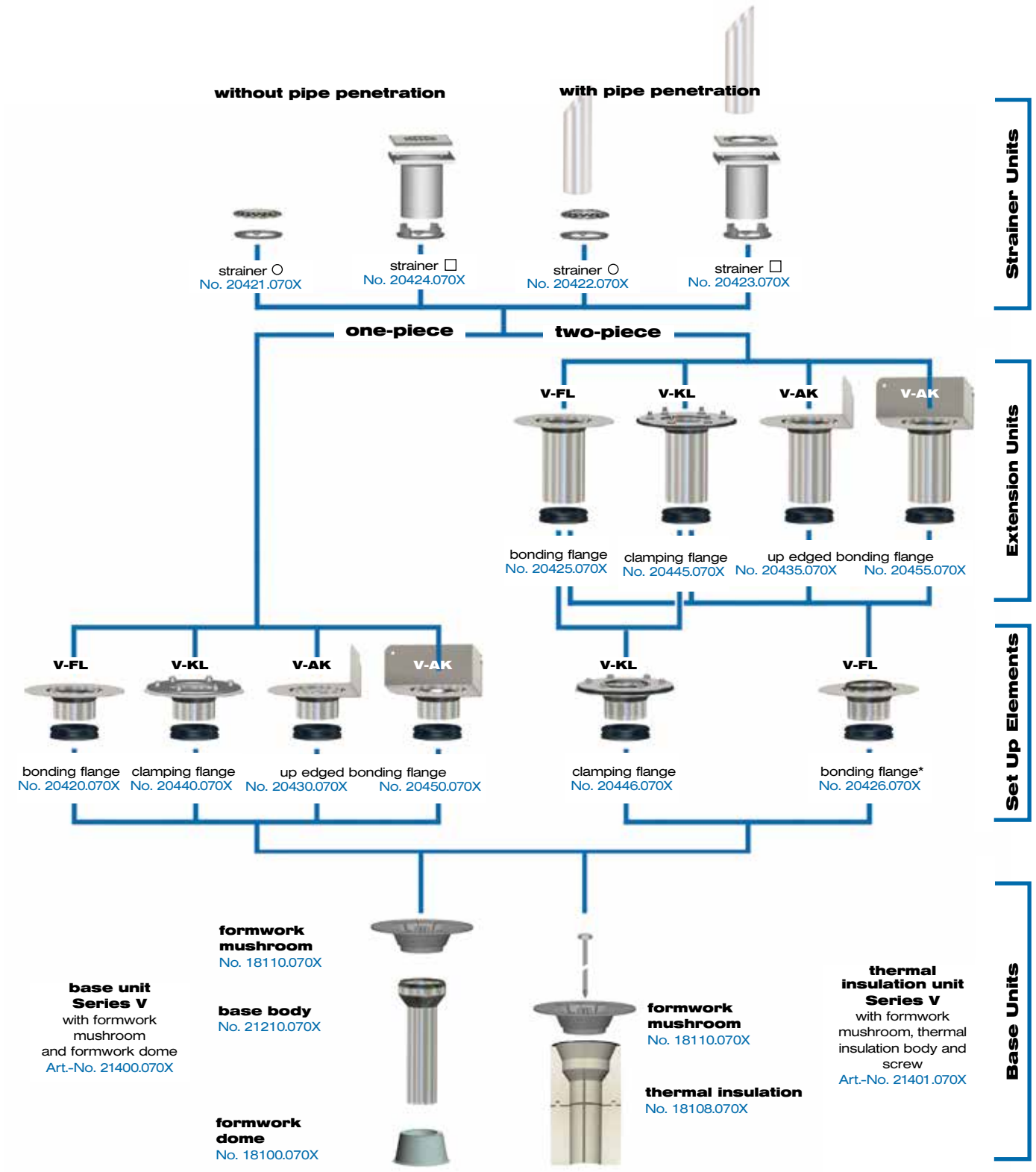
LX1229	LX1230	LX1231	LX1232
1.8 l/s*	1.3 l/s*	1.8 l/s*	1.7 l/s*

* At a nominal water level of 35 mm on the balcony.

Series V

LORO-X
Balcony Drainage, Series V
made of stainless steel, DN 70

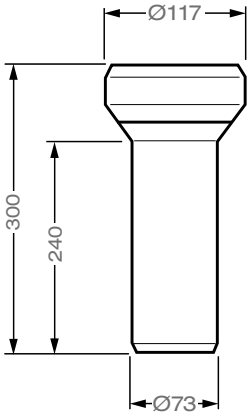
Variable balcony drainage system with only one base body and modular set up elements.
For application on balconies with liquid plastic sealing or roofing sheets.



Attention: Please order downpipes separately.

* Adapt the flange for installation in Series V-AK.

Dimensions and Weights

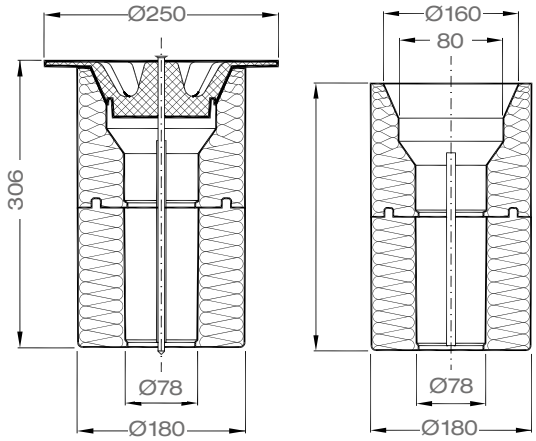


LORO Balcony Drains, Series V

Base element
DN 70, made of stainless steel
for all set up elements/balcony structures
consisting of:
base body, formwork mushroom and formwork dome

Art.-No. 21400.070X weight: 1.1 kg

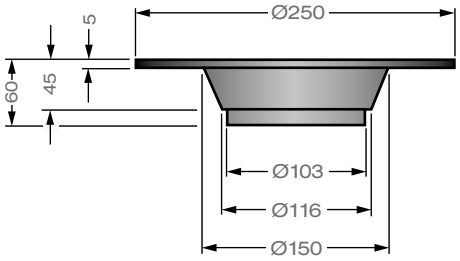
Base body
DN 70, made of stainless steel
Art.-No. 21210.070X weight: 0.8 kg



Thermal insulation base unit
consisting of:
formwork mushroom, thermal insulation body and fastening screw

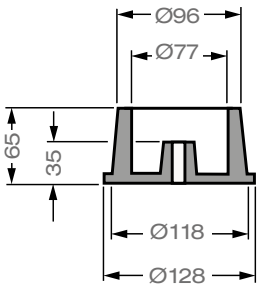
Art.-No. 21401.070X weight: 0.7 kg

Thermal insulation unit
DN 70, made of stainless steel
Art.-No. 18108.070X weight: 0.4 kg



Formwork mushroom
for base body, DN 70
made of plastic

Art.-No. 18110.070X weight: 0.1 kg

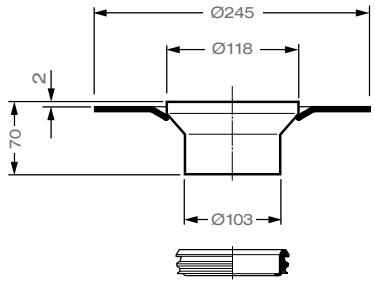


Formwork dome
for sliding onto LORO-X pipe, DN 70
made of plastic

Art.-No. 18100.070X weight: 0.1 kg

Series V

Dimensions and Weights



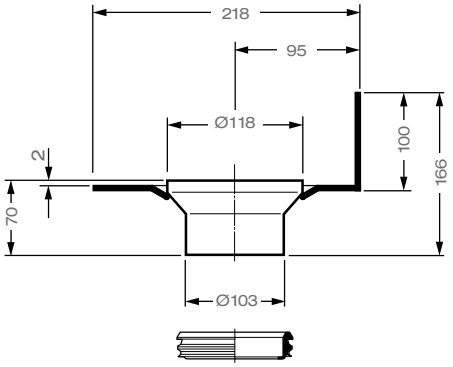
Set up elements for one-piece version

Series V-FL
with bonding flange for sealing with liquid plastic

for balconies without further structure:

consisting of:
set up element with bonding flange,
sealing element DN 100

Art.-No. 20420.070X weight: 1.0 kg

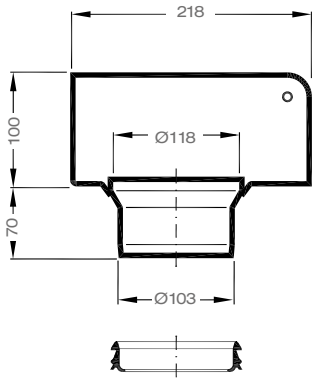


Series V-AK
with up edged bonding flange for sealing with liquid plastic in wall area

for balconies without further structure:

consisting of:
set up element with up edged bonding flange,
sealing element DN 100

Art.-No. 20430.070X weight: 1.3 kg

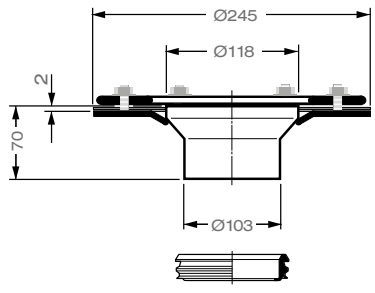


Series V-AK
with up edged bonding flange for sealing with liquid plastic in wall corner area

for balconies without further structure:

consisting of:
set up element with up edged bonding flange
for wall corner area and sealing element DN 100

Art.-No. 20450.070X weight: 1.5 kg



Series V-KL
with clamping flange for sealing with sealing sheets

for balconies without further structure:

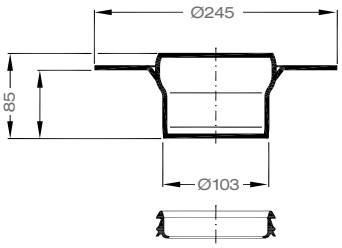
consisting of:
set up element with clamping flange,
compression sealing*,
sealing element DN 100

Art.-No. 20440.070X weight: 1.6 kg

* can be omitted when using bituminous roofing sheets.

Dimensions and Weights

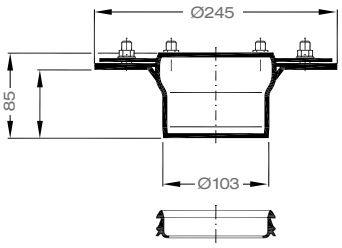
Set up elements for two-piece version



Series V-FL
with bonding flange for sealing with liquid plastic

consisting of:
set up element with socket and bonding flange,
sealing element DN 100

Art.-No. 20426.070X weight: 1.1 kg

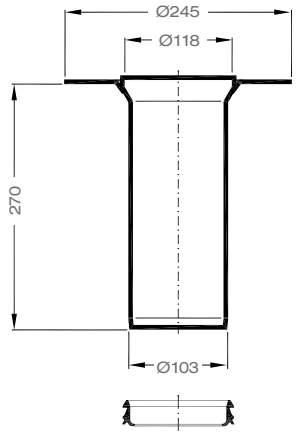


Series V-KL
with clamping flange for sealing with liquid plastic

consisting of:
set up element with socket and clamping flange,
sealing element DN 100

Art.-No. 20446.070X weight: 2.0 kg

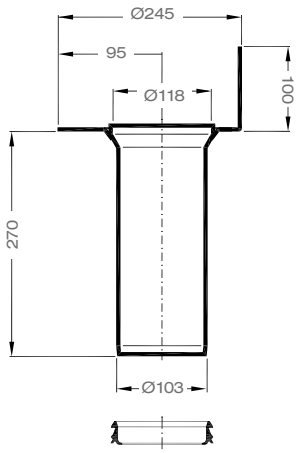
Extension units for two-piece version



Series V-FL
with bonding flange for sealing with liquid plastic

consisting of:
extension unit with bonding flange,
sealing element DN 100

Art.-No. 20425.070X weight: 1.8 kg

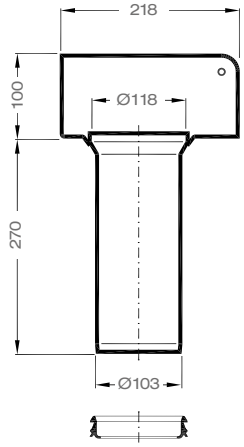


Series V-AK
with up edged bonding flange for sealing with liquid plastic in wall area

consisting of:
extension unit with up edged bonding flange,
sealing element DN 100

Art.-No. 20435.070X weight: 2.1 kg

Dimensions and Weights



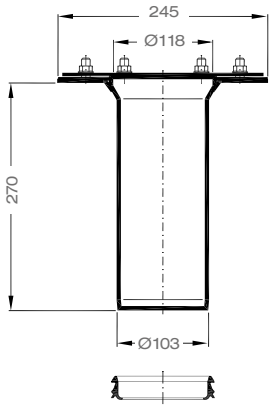
Extension units for two-piece version

Series V-AK

with up edged bonding flange for sealing with liquid plastic in wall corner area

consisting of:
extension unit with up edged bonding flange for wall corner area, sealing element DN 100

Art.-No. 20455.070X weight: 2.3 kg



Series V-KL

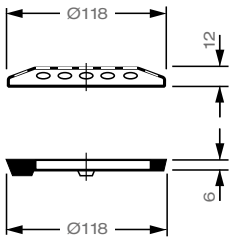
with clamping flange for sealing with sealing sheets

consisting of:
extension unit with clamping flange,
sealing element DN 100

Art.-No. 20445.070X weight: 2.6 kg

Dimensions and Weights

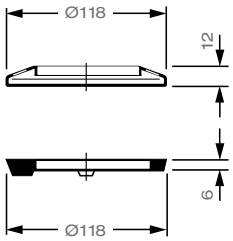
Strainer units, Serie V



For balcony structure without additional covering:

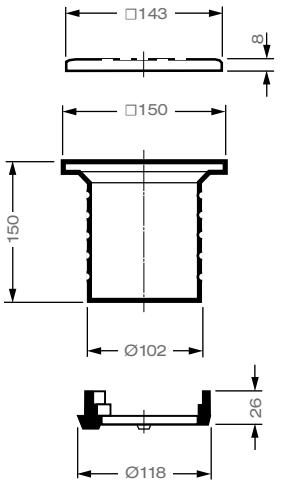
LORO balcony drain strainer unit, Series V
consisting of:
strainer round, **without** pipe penetration, support ring

Art.-No. 20421.070X weight: 0.5 kg



LORO balcony drain strainer unit, Series V
consisting of:
strainer round, **with** pipe penetration, support ring

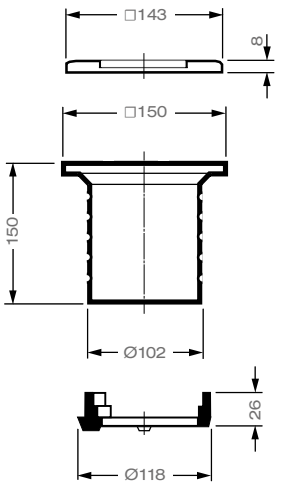
Art.-No. 20422.070X weight: 0.5 kg



For balcony structure with additional covering:

LORO balcony drain strainer unit, Series V, with height-adjustable strainer support for additional balcony structure
consisting of:
strainer quadratic, **without** pipe penetration,
strainer support 150 mm x 150 mm, height-adjustable,
drainage ring

Art.-No. 20424.070X weight: 1.0 kg



LORO balcony drain strainer unit, Series V, with height-adjustable strainer support for additional balcony structure
consisting of:
strainer quadratic, **with** pipe penetration,
strainer support 150 mm x 150 mm, height-adjustable,
drainage ring

Art.-No. 20423.070X weight: 1.0 kg

LORO Parapet Balcony Drains with Clamping Flange

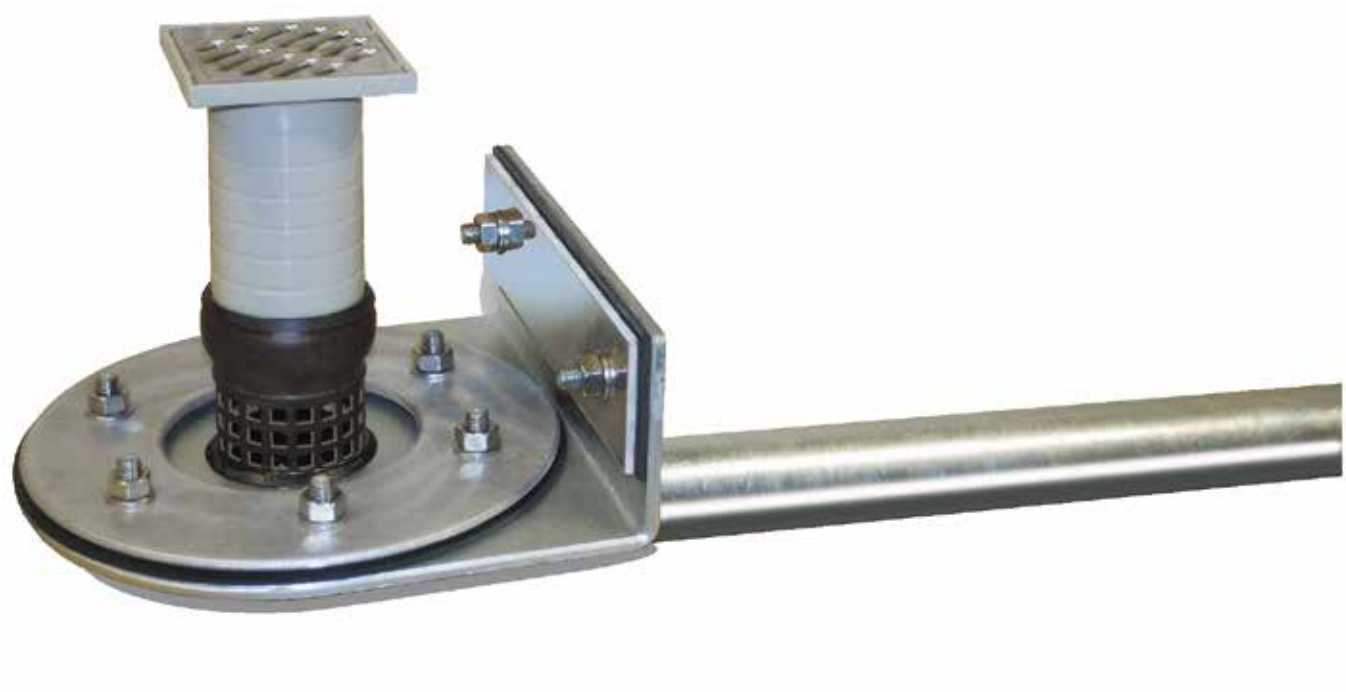
DN 50, made of stainless steel

Application area:
Drainage of balconies and terraces with roof edge upstand

- **with clamping flange**
- **for bitumen or plastic roofing sheets**
- **as emergency drain for balconies with raised parapet**

For the drainage of balconies and terraces with roof edge closure (parapet), LORO has developed a new, fluidically optimized gravity drain with clamping flange. The new parapet balcony drain made of galvanized steel, with additional inner coating, complys with DIN EN 1253 and DIN 18195.

LORO parapet balcony drains are delivered as complete drainage system in combination with LORO rain downpipes and fittings. They can also be used as spouts with flange for the emergency drainage of balconies and terraces.

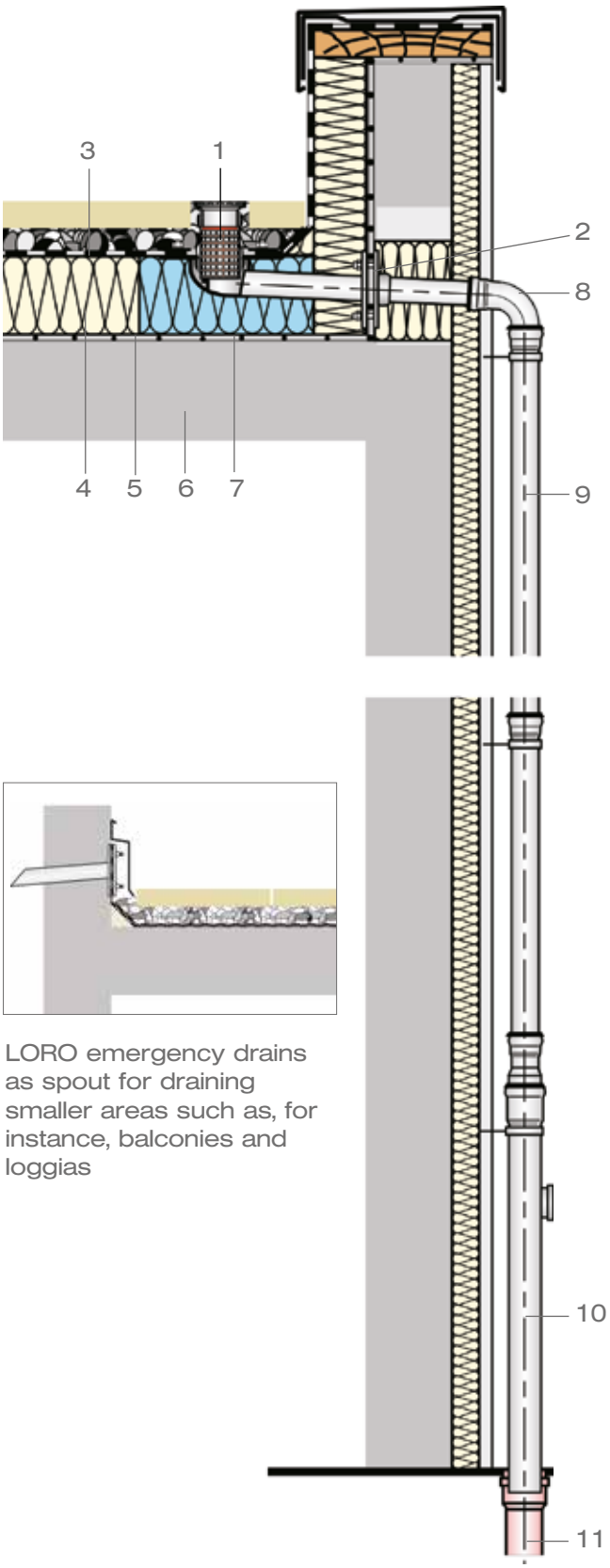


Application Example

LORO Parapet drains, DN 50, with clamping flange, according to DIN EN 1253 and DIN 18195

Discharge rate DN 50: 1.5 l/s*

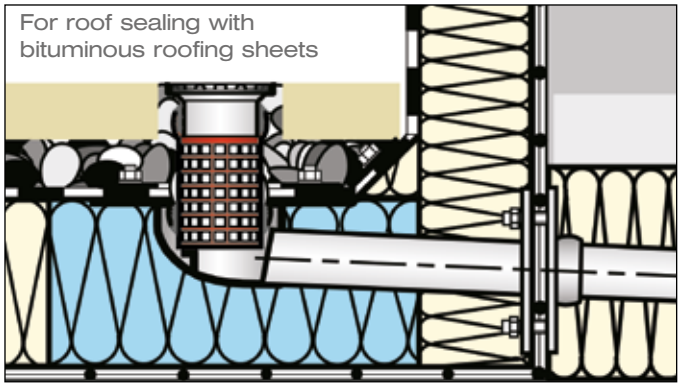
for bituminous and plastic sealing sheets, for flat roofs, balconies and terraces with roof edge closure (parapet)

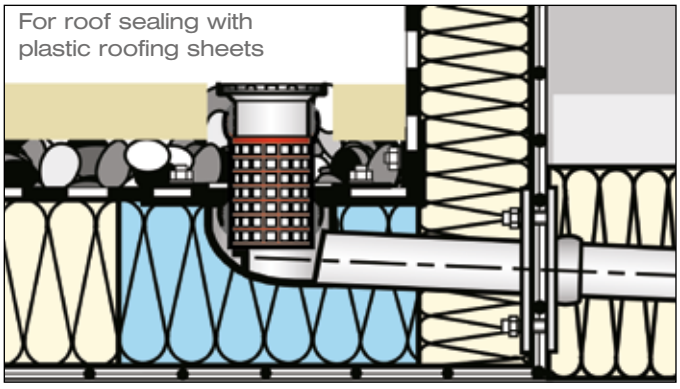


1 LORO parapet roof drain
2 LORO sliding flange
(for installation of the vapor barrier)
3 Bituminous sealing sheets
4 Thermal insulation
5 Vapor barrier
6 Concrete slab
7 LORO thermal insulation block
(installation aid for installation of the parapet drain in the thermal insulation)
8 LORO-X bend
9 LORO-X rain downpipe
10 LORO-X rain stand pipe
11 Ground pipe

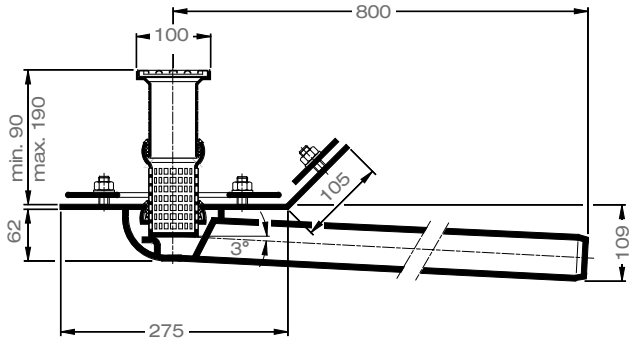
* According to test specification in accordance with DIN EN 1253 at a congestion height of 35 mm.

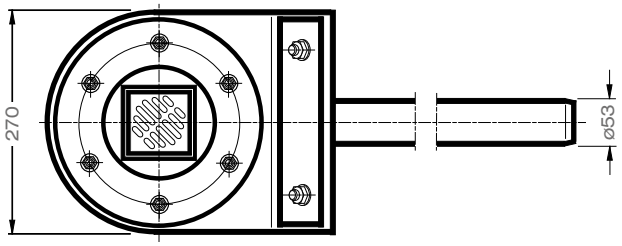
LORO emergency drains as spout for draining smaller areas such as, for instance, balconies and loggias





Dimensions and Weights





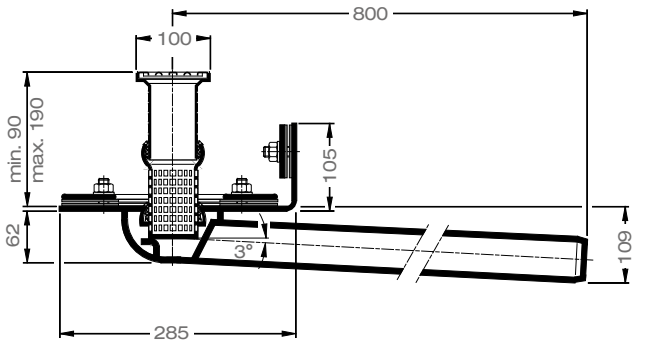
LORO Parapet Drains, DN 50
for Bituminous Roofing Sheets
with clamping flange

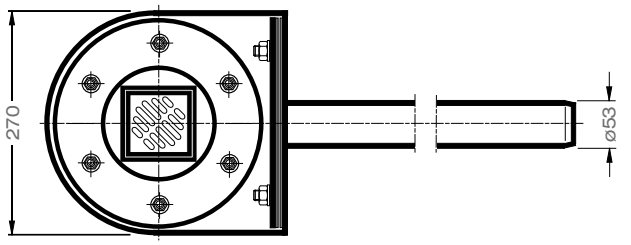
galvanized steel, with additional coating

Discharge rate: DN 50 = 1.5 l/s*

DN 50: Art.-No. 01570.050X weight: 8.0 kg

consisting of:
strainer made of stainless steel, strainer support, strainer pipe, loose flanges, drain body





LORO Parapet Drains, DN 50
for PVC Roof Sealing Sheets
with clamping flange

galvanized steel, with additional coating

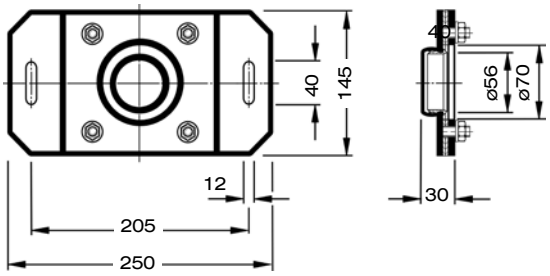
Discharge rate: DN 50 = 1.5 l/s*

DN 50: Art.-No. 01572.050X weight: 8.0 kg

consisting of:
strainer made of stainless steel, strainer support, strainer pipe, loose flanges, drain body

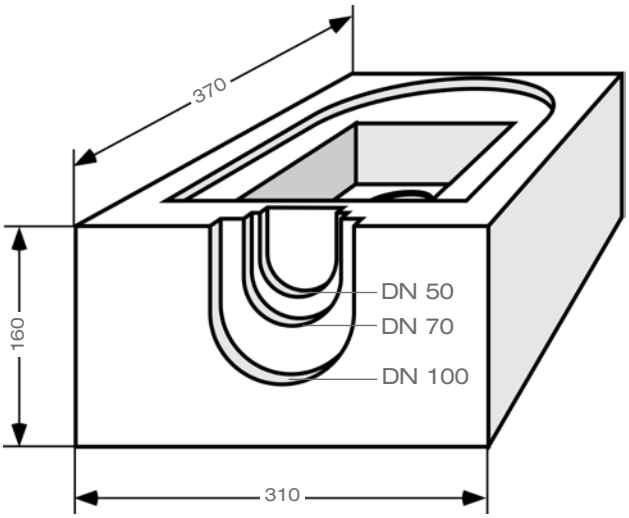
* According to test specification in accordance with DIN EN 1253 at a congestion height of 35 mm.

Dimensions and Weights



LORO sliding flange, DN 50
for installation of the vapor barrier
made of stainless steel

DN 50: Art.-No. 13232.050X weight: 1.7 kg

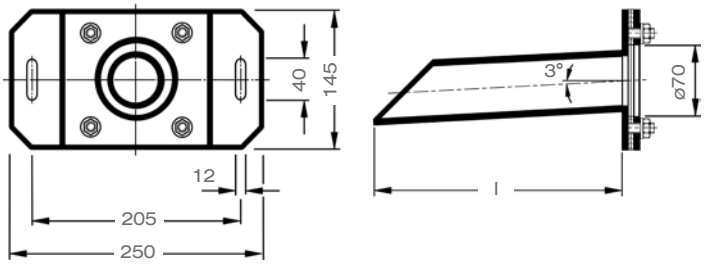


LORO thermal insulation block
made of styrofoam SE WLG 0.35, FCKW-free,
coefficient of thermal conductivity: 0.035 W/m x K
water vapor diffusion resistance: μ = 40/100
water absorption: 0.5 - 1.5 Vol. %
building material class B1, flame retardant

universally suitable for LORO-RAINSTAR
parapet drains DN 70 - DN 100
and LORO parapet balcony drain DN 50

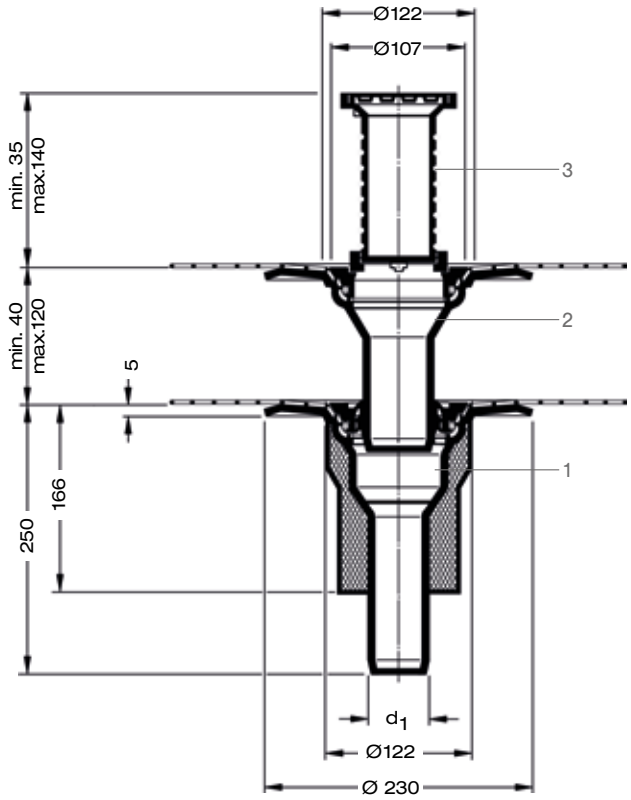
Art.-No. 01384.000X weight: 0.04 kg

LORO spout with flange,
DN 50
made of stainless steel



Art.-No.	DN	l	kg
15070.050X	50	250	2.2
15071.050X	50	800	2.7

LORO-X Fire Protection Drains
AbP.-No. P-MPA-E-09-010, Series F,
with Connecting Sleeve, According to DIN EN 1253

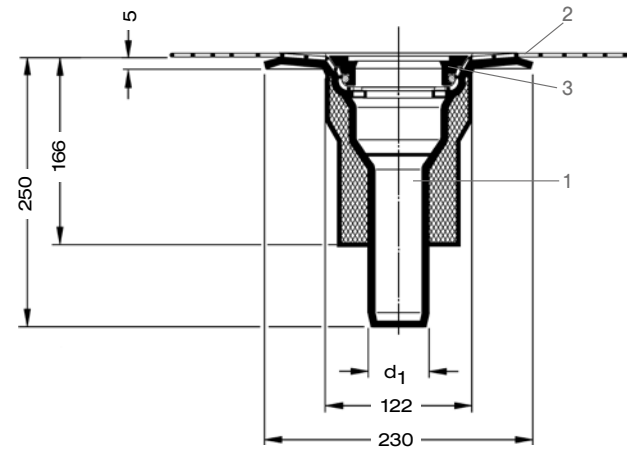


Complete Units

LORO Balcony Drains, Series F,
Fire Protection Drains
AbP.-No. P-MPA-E-09-010
two-piece, vertical runoff

with fire protection sleeve
DN 50: Art.-No. 15383.050X weight: 4.8 kg
DN 70: Art.-No. 15383.070X weight: 5.6 kg

consisting of:
1 base unit with fire protection sleeve
2 extension unit
3 strainer unit



Subunits

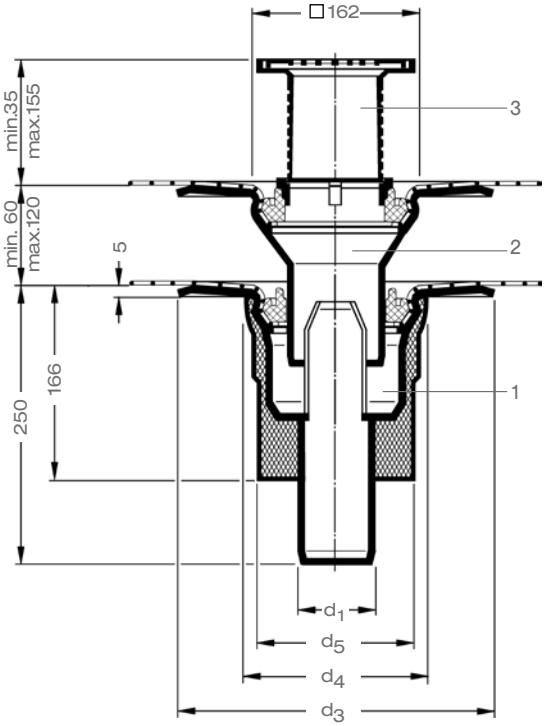
LORO Balcony Drain Base Units,
Series F, Fire Protection Drains
AbP.-No. P-MPA-E-09-010
vertical runoff

with fire protection sleeve
DN 50: Art.-No. 15283.050X weight: 2.8 kg
DN 70: Art.-No. 15283.070X weight: 3.0 kg
1 drain body with fire protection sleeve
2 connecting sleeve
3 clamping ring

DN	d_1
50	53
70	73

See page 30 for strainer units

LORO-X Fire Protection Drains
AbP.-No. P-MPA-E-09-010, Series H,
with Connecting Sleeve, According to DIN EN 1253

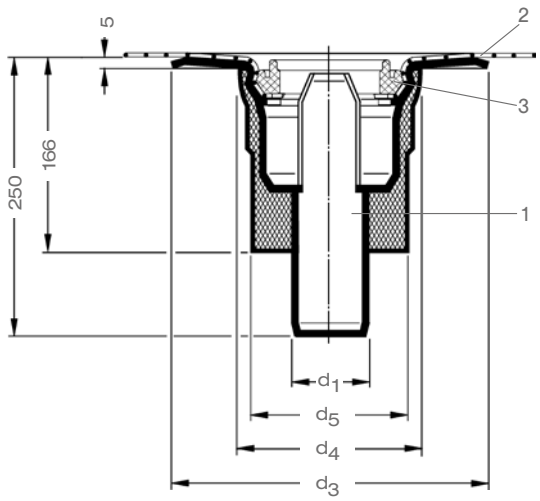


Complete Units

LORO Balcony Drains, Series H,
Fire Protection Drains
AbP.-No. P-MPA-E-09-010
two-piece, vertical runoff

with fire protection sleeve
DN 70: Art.-No. 16399.070X weight: 8.6 kg
DN 100: Art.-No. 16399.100X weight: 10.5 kg

consisting of:
1 base unit with fire protection sleeve
2 extension unit
3 strainer unit



Subunits

LORO Balcony Drain Base Units,
Series H, Fire Protection Drains
AbP.-No. P-MPA-E-09-010
vertical runoff

with fire protection sleeve
DN 70: Art.-No. 16283.070X weight: 4.8 kg
DN 100: Art.-No. 16283.100X weight: 6.7 kg
1 drain body with fire protection sleeve
2 connecting sleeve
3 clamping ring

DN	d_1	d_3	d_4	d_5
70	73	275	152	133
100	102	330	184,8	168

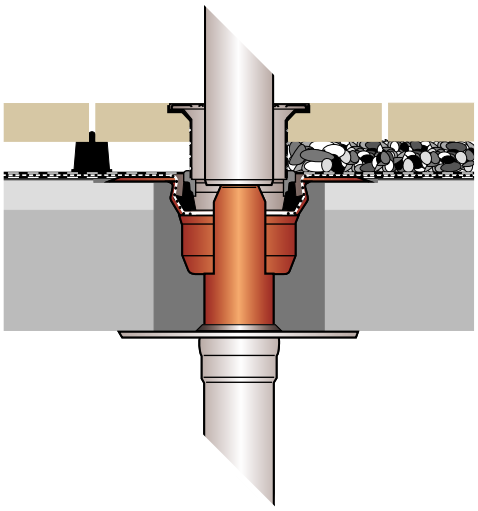
See page 54 for strainer units

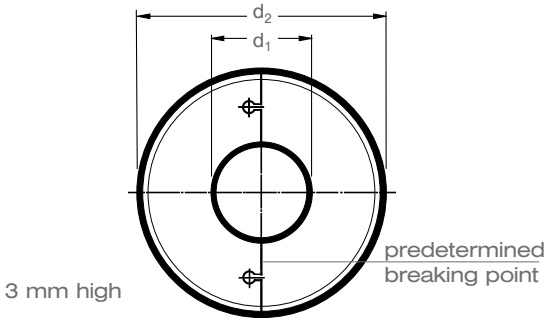
LORO Collars

LORO collars for balcony drains enable an elegant closure below the ceiling opening. They can either be slid over the socket of the downpipe or over the downpipe. Thus, they constitute a solution for every application. Proceeding: LORO collars can either be installed simultaneously with the pipe (slid over the pipe) or subsequently.

In this case, the collars can be dismantled into two halfs at the predetermined breaking point, be slid onto the pipe or the socket from each side below the ceiling and then be hooked together again. The collars are bonded to the ceiling with the help of silicone (spread silicone drops evenly, press on the collars evenly).

Collar slid onto socket



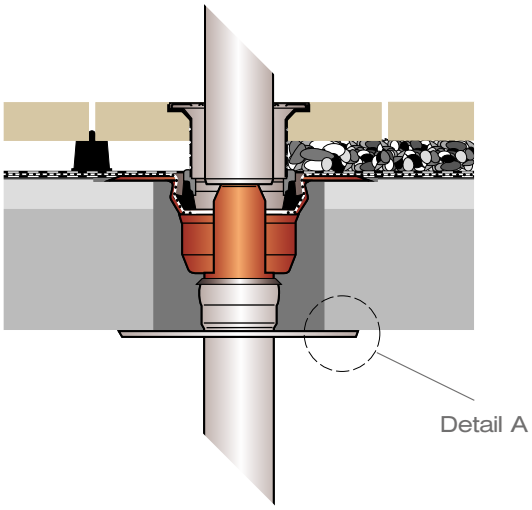


Collar for sockets

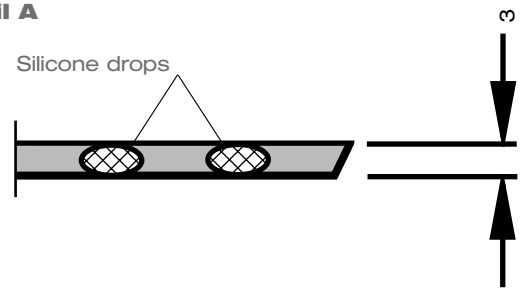
Material: stainless steel 1.4301, 1.0 mm thick

Art.-No.	DN	d_1	d_2	kg	for Series
16801.050X	50	64	180	0,15	A, B, E, F, FF, G, GF, I, IK
16801.070X	70	85	180	0,16	A, B, E, F, FF, G, GF, I, IK
16803.100X	100	119	180	0,17	G, GF, I, IK
16805.050X	50	64	260	0,23	K
16807.070X	70	85	260	0,40	H, HF, K
16811.100X	100	119	300	0,48	H, HF

Collar slid onto pipe



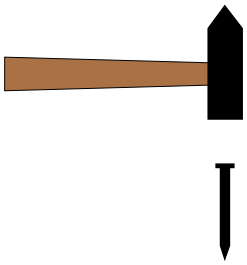
Detail A

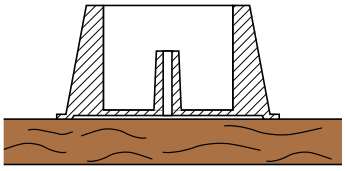


Collar for pipes

Material: stainless steel 1.4301, 1.0 mm thick

Art.-No.	DN	d_1	d_2	kg	for Series
16800.050X	50	54	180	0,16	A, B, E, F, FF, G, GF, I, IK
16800.070X	70	74	180	0,17	A, B, E, F, FF, G, GF, I, IK
16802.100X	100	103	180	0,18	G, GF, I, IK
16804.050X	50	54	260	0,24	K
16806.070X	70	74	260	0,40	H, HF, K
16810.100X	100	103	300	0,52	H, HF



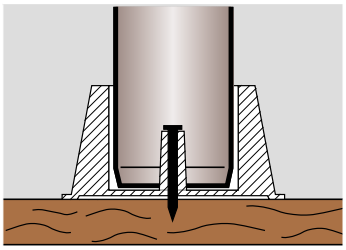


LORO Formwork Domes

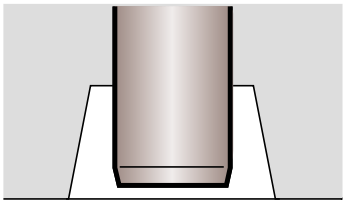
LORO formwork domes made of plastic are suitable for vertical and horizontal connections. For sliding on, they are available in the nominal diameters DN 50, DN 70 and DN 100.

For encasing the LORO balcony drains in concrete, the LORO formwork domes have the following advantages:

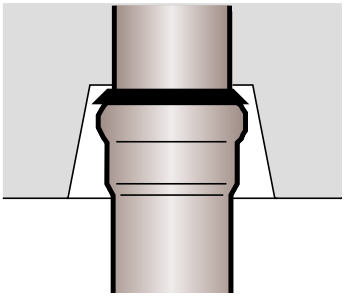
LORO formwork domes are easily fastened to the formwork and reusable several times.



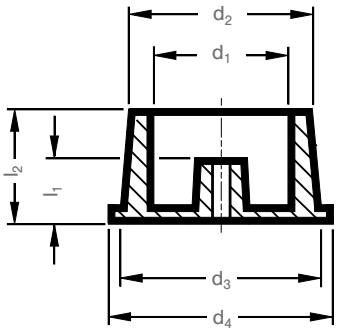
Application with LORO formwork dome.



After removing the LORO formwork dome:
No cutout in the formwork.



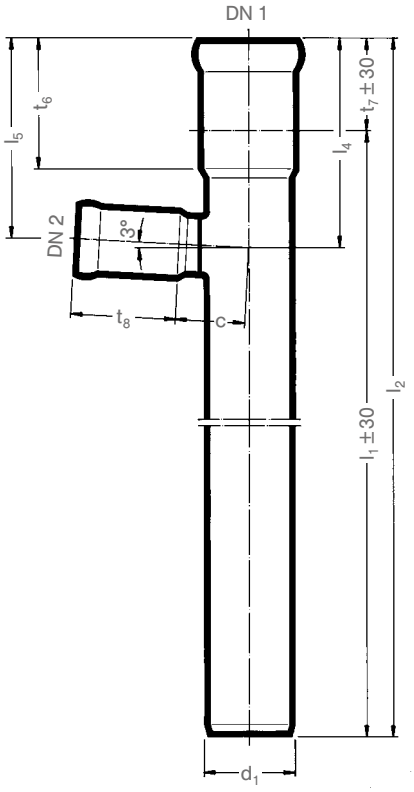
Neat connection, without reworking.



LORO formwork domes,
DN 50 - DN 100.
made of plastic, for sliding onto LORO-X pipe.

Art.-No.	DN	d_1	d_2	d_3	d_4	l_1	l_2	kg
18100.050X	50	55	72	89	96	30	50	0.1
18100.070X	70	77	96	118	128	35	65	0.2
18100.100X	100	106	132	161	169	50	83	0.3

Dimensions and Weights



Balcony drainage downpipes

consisting of:
downpipe with BE long socket with tolerance compensation for ±30 mm and sidewise welded long socket, for completion with LORO single drains

Art.-No.	DN 1	DN 2	d_1	l_1	l_2	l_4	l_5
15019.CB0X	70	50	73	300	385	194	186
15039.CB0X	70	50	73	3000	3085	194	186
15019.CC0X	70	70	73	300	385	200	191
15039.CC0X	70	70	73	3000	3085	200	191
15019.DB0X	100	50	102	300	400	209	201
15039.DB0X	100	50	102	3000	3100	209	201
15019.DC0X	100	70	102	300	400	215	205
15039.DC0X	100	70	102	3000	3100	215	205

Art.-No.	DN 1	DN 2	t_6	t_7	t_8	c	kg
15019.CB0X	70	50	115	85	90	55	1,4
15039.CB0X	70	50	115	85	90	55	9,1
15019.CC0X	70	70	115	85	120	60	1,7
15039.CC0X	70	70	115	85	120	60	9,3
15019.DB0X	100	50	130	100	90	70	2,5
15039.DB0X	100	50	130	100	90	70	16,1
15019.DC0X	100	70	130	100	120	75	2,6
15039.DC0X	100	70	130	100	120	75	17,3

Calculation of the downpipe length

balcony drainage downpipes (short) 300 mm long
balcony drainage downpipe with BE long socket (t_7) for tolerance compensation ± 30 mm

downpipe with LORO-X standard socket (t_1):
total length: $l_2 = G_1 - 300 \text{ mm} + t_1$

Thus, e. g. for storey height G_1 = 2700 mm (± 30 mm)

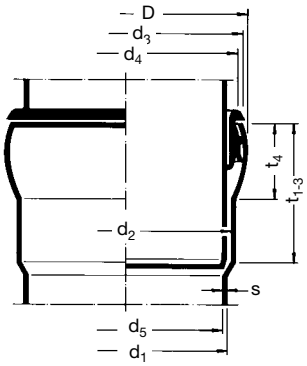
DN 50/50 $l_2 = 2700 - 300 + 38 = 2438$ mm
DN 70/50 $l_2 = 2700 - 300 + 55 = 2455$ mm
DN 100/50 $l_2 = 2700 - 300 + 70 = 2470$ mm

balcony drainage downpipes (storey-high) with BE long socket (t_7) for tolerance compensation ± 30 mm
total length: $l_2 = G_1 + t_7$

Thus, e. g. for storey height G_1 = 2800 mm (± 30 mm)

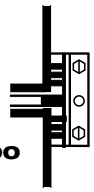
DN 50/50 $l_2 = 2800 + 68 = 2868$ mm
DN 70/50 $l_2 = 2800 + 85 = 2885$ mm
DN 100/50 $l_2 = 2800 + 100 = 2900$ mm

LORO-X Steel Discharge Pipes



DN 40 – 200

t_1 = standard
t_2, t_3 = special production



DN 250 - 300

Pipe and socket dimensions (in mm)*

DN	D	d_1	d_2	d_3	d_4	d_5	s	t_1	t_2	t_3	t_4	kg/m	kg/m**	F***
40	51	42	45	48	45	39	1.5	30	70	100	16	1.5	2.6	1194.6
50	63	53	56	60	56	50	1.5	38	90	130	19	2.0	4.0	1963.5
70	84.2	73	76	81	76	69.8	1.6	55	120	175	27	3.0	6.8	3826.5
80	102.2	89	92	99	92	85.8	1.6	60	130	190	31	3.5	9.3	5781.8
100	118	102	106	114	107	98	2.0	70	150	220	38	4.9	12.4	7543.0
125	152	133	138	147	140	128	2.5	75	160	235	41	8.0	20.8	12868.0
150	181	159	164	176	168	154	2.5	80	170	250	46	9.6	28.2	18626.5
200	246.8	219	224	241	228	213.2	2.9	120	250	370	76	15.7	51.4	35699.7
250	-	273	-	-	-	265	4.0	-	-	-	-	24.2	81.7	55154.6
300	-	324	-	-	-	316	4.0	-	-	-	-	31.7	110.0	78426.7

* Tolerance of dimensions for pipes and fittings according to DIN EN 1123 part 2
** kg/m filled to capacity with water
*** F= cross section (mm^2) inner pipe

System overview

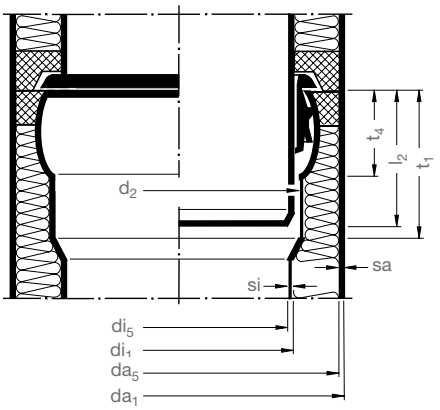
LORO-X steel discharge pipe DN	40	50	70	80	100	125	150	200	250	300
Pipes with one socket	●	●	●	●	●	●	●	●	O	O
Pipes with two sockets	●	●	●	●	●	-	-	-	-	-
Branches	●	●	●	●	●	●	●	●	O	O
Reducing branches	●	●	●	●	●	●	●	●	O	O
Reducing double branches	●	●	●	-	●	●	●	●	-	-
Reducing corner branches	●	●	●	-	●	●	●	●	-	-
Bends	●	●	●	●	●	●	●	●	O	O
Bends with short radius	●	●	●	●	-	-	-	-	-	-
Offset pipes	-	●	●	●	●	●	●	●	O	O
Angle bends	●	●	●	●	●	-	-	-	-	-
Bends with smoothing length	●	●	●	●	●	●	●	●	O	O
Traps	-	-	●	-	●	-	-	-	-	-
Cleaning pipes	●	●	●	●	●	●	●	●	O	O
Rain standpipe, round	-	-	●	●	●	●	●	-	-	-
Socket pieces	●	●	●	●	●	●	●	●	-	-
Transition pipes	●	●	●	●	●	●	●	●	O	O
Connectors with thread	●	●	-	-	-	-	-	-	-	-
Connectors to pipes from other manufacturers	-	●	●	●	●	●	●	●	O	O
Sealing elements	●	●	●	●	●	●	●	●	-	-
Pipe clips	●	●	●	●	●	●	●	●	O	O

O = Steel discharge pipes DN 250 and DN 300 are delivered without socket.

The dimensions and weights of the LORO steel discharge pipe programme can be found in the „LORO-X Steel Discharge Pipe“ brochure - please order at the LOROWERK.

LORO-X Compound pipes

Pipe and socket dimensions (in mm)*



DN	di_1	da_1	d_2	di_5	da_5	l_2	t_1	t_4	si	sa	kg/m	kg/m**	F***
40	42	89	45	39	85.8	25	30	16	1.5	1.6	5.0	6.2	1194.6
50	53	89	56	50	85.8	30	38	19	1.5	1.6	6.3	8.3	1963.5
70	73	102	76	69.8	98	45	55	27	1.6	2.0	10.0	13.8	3826.5
80	89	133	92	85.8	128	50	60	31	1.6	2.5	12.0	17.8	5781.8
100	102	133	106	98	128	60	70	38	2.0	2.5	15.0	22.5	7543.0
125	133	168	138	128	163	60	75	41	2.5	2.5	24.0	38.8	12868.0
150	159	219	164	154	213.3	65	80	46	2.5	2.9	30.0	49.1	18626.5
200	219	273	224	213.2	267	100	120	76	2.9	3.0	43.0	78.7	35699.7

* Tolerance of dimensions for pipes and fittings according to DIN EN 1123 part 2
** kg/m filled to capacity with water
*** F= cross section (mm^2) inner pipe

System overview

LORO-X steel discharge pipe DN	40	50	70	80	100	125	150	200
Pipes with one socket	●	●	●	●	●	●	●	○
Pipes with heating	-	-	○	-	○	○	○	-
Branches	●	●	●	●	●	●	●	○
Reducing branches	●	●	●	●	●	●	●	○
Bends	●	●	●	●	●	●	●	○
Cleaning pipes	-	●	●	-	●	●	●	-
Slide-on sockets	-	●	●	-	●	●	-	-
Transition pipes	-	-	●	-	●	●	●	○
Connectors	-	-	-	-	●	-	-	-
Sealing elements	●	●	●	●	●	●	●	○
Pipe clips	●	●	●	●	●	●	●	○
Broadband clamp	●	●	●	●	●	●	●	○
Closing plug	-	-	-	-	●	●	-	-

● = available as standard programme
○ = available upon request

The dimensions and weights of the LORO compound pipe programme can be found in the „LORO Compound Pipes“ brochure - please order at the LOROWERK.

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