WILO
Pumpen Intelligenz.

Rainwater utilisation solutions
Domestic and commercial

General brochure

Water is Life

Water is probably the most precious commodity we have on this planet. There's plenty of it but less than 2% of what we have is fresh water. We need it to drink, to maintain good hygiene, for the manufacture of most of our food and for every key product we rely on in our everyday lives. **So it's pretty important. There is no synthetic alternative.**

How do we maximise the resource?

For decades, we've happily cleaned our water supply and flushed it down the toilet. Actually and metaphorically.

The sensible harvesting and utilisation of rainwater has never been more important, globally and here in the UK where as a result of global warming we are seeing larger quantities of rainfall as our climate changes subtly to provide wider extremes of weather – including getting our rainfall in longer heavier bursts than we've been used to. This has seen huge quantities of rainfall causing flooding with those vast quantities of water eventually disappearing as run off into rivers and out to sea.

How much could you save?

It's conservatively thought we could save as much as 50% of the potable or drinking water we produce, if we used rainwater for those tasks where we don't need to use expensively treated water. With up to 33% of all water usage in an average home and 60% in a commercial premises – offices and the like – being used to flush toilets and urinals, there's clearly scope for using rainwater, harvested from the roofs of building and stored in tanks underground for when its needed. Washing cars. Watering the garden. Washing clothes. None of these need costly cleaned water. Stored rainwater, that's run through filters to remove any sediment will do the job just fine. Keeping costs down and leaving more drinking water to be drunk, used for washing and bathing and other hygiene requirements.

Better for the environment. Better for our pockets. It makes so much sense, it's hard to believe we've overlooked it until now.

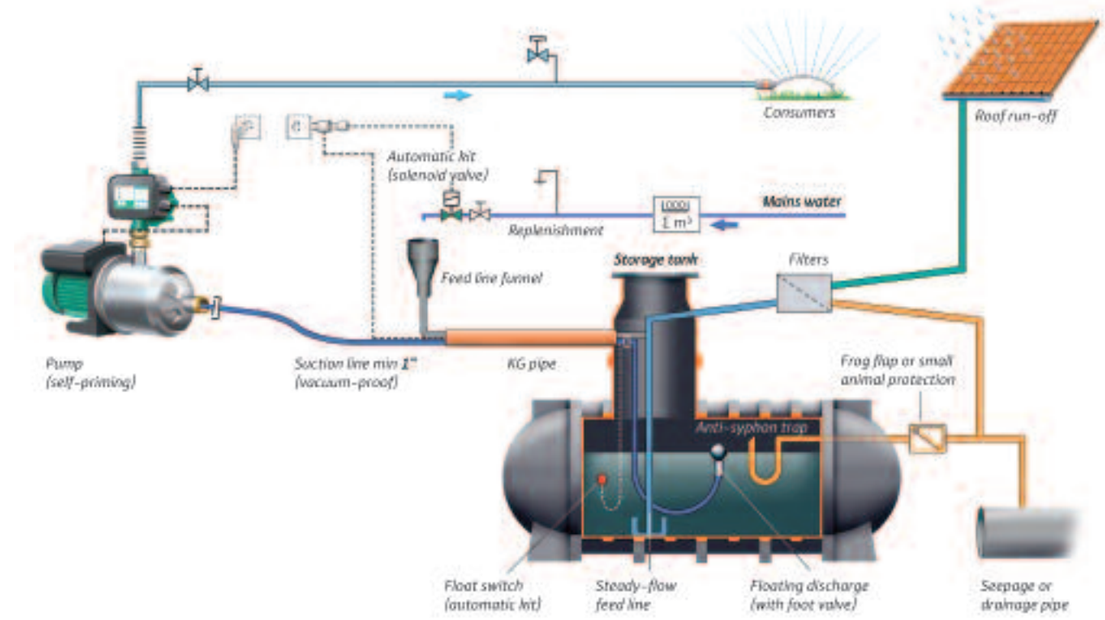
But isn't rainwater harvesting costly to install?

There is a cost at the front end but unlike most investments this one that will pay for itself over time. It's not as costly or as complex as you might think. It's important to ensure that the site for a rainwater harvesting system makes sense. There has to be a large enough collecting area – usually a roof – to make it stack up. The rainwater needs to be channelled into a storage tank through filters to remove the sediment it may have picked up en route from the sky to the tank. You'll need a pump or pumping system to get the water from the tank to the toilets or places where you want to use the water and of course because rain doesn't always fall when you want it – feast or famine is the norm – you need a mains water back up system to ensure that there is always sufficient water to flush the loos and for the other uses you have in mind for the stored water.

This is why Wilo is the answer to your rainwater harvesting problems. It offers the solutions you need. The complete package, with those important value added benefits – experience and knowledge.

Rainwater harvesting suddenly makes extreme sense.

WILO-RAINSYSTEM FMC – For garden/small family home



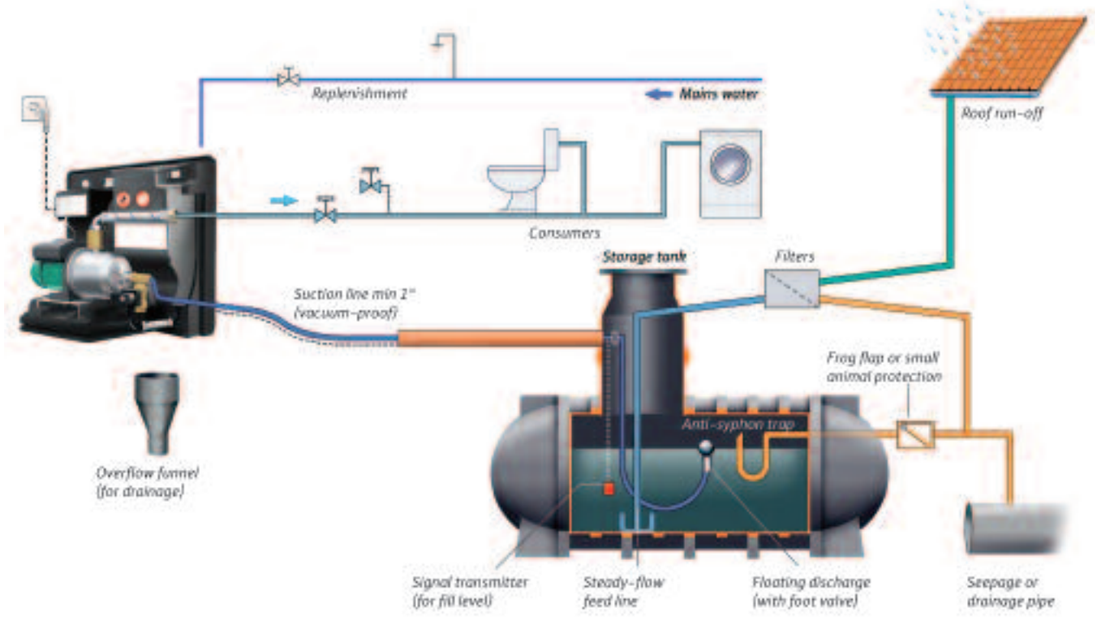
Note:
Observe pipe installation as well as max. suction head/length (see page 12)
Observe backflow level!

System with submersible pump
- Low noise operation due to multistage design
- Ideal as a system for garden irrigation
- Excellent suction behaviour
- Control by means of flow switching device
- All parts that come into contact with the fluid are corrosion-free

Field of application:
- Sprinkling
- Irrigation and spraying
- Rainwater utilisation
- Operating water utilisation

Description:
- Pumps water in suction operation from wells, cisterns underground storage tanks or in pressure operation (intake pressure max. 1.5 bar) from open pre-reservoirs
- Replenishment via solenoid valves/float switches directly in the cistern
- Pressure-/flow-dependent pump switching with built-in protection against low water level

WILO-RAINSYSTEM AF II BASIC/COMFORT- For small family home



Note:
Observe pipe installation as well as max. suction head/length (see page 12)

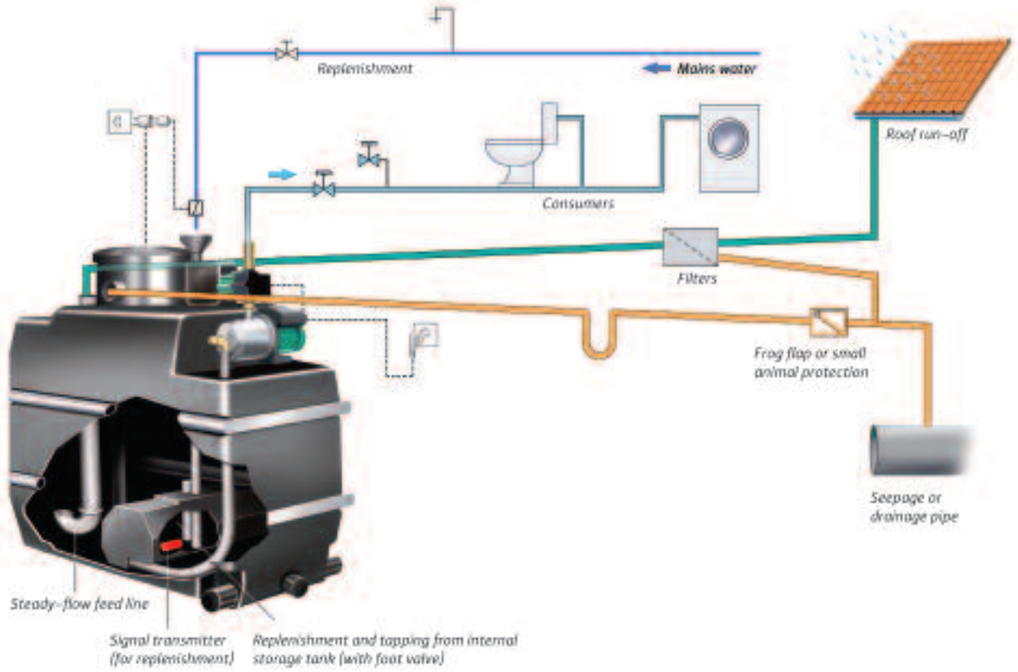
Observe backflow level!

Rainwater utilisation system in connection with cisterns or reservoirs
- Compact rainwater utilisation system, complete with plug connector
- Low-noise thanks to multistage, self-priming centrifugal pump
- Meets the requirements according to DIN 1989 and EN 1717
- Highly economical due to the metering of fresh water to meet demands

Field of application:
- Toilet flushing
- Washing machine
- Sprinkling/irrigation
- Minor cleaning functions and other non-drinking water applications

Description:
- Demand-oriented fresh water metering in the module
- Pumps water in suction operation from wells, cisterns and underground storage tanks
- Pressure-dependent pump control and automatic switchover to replenishment

WILO-RAINCOLLECTOR II RWN – For small family home/business, industry



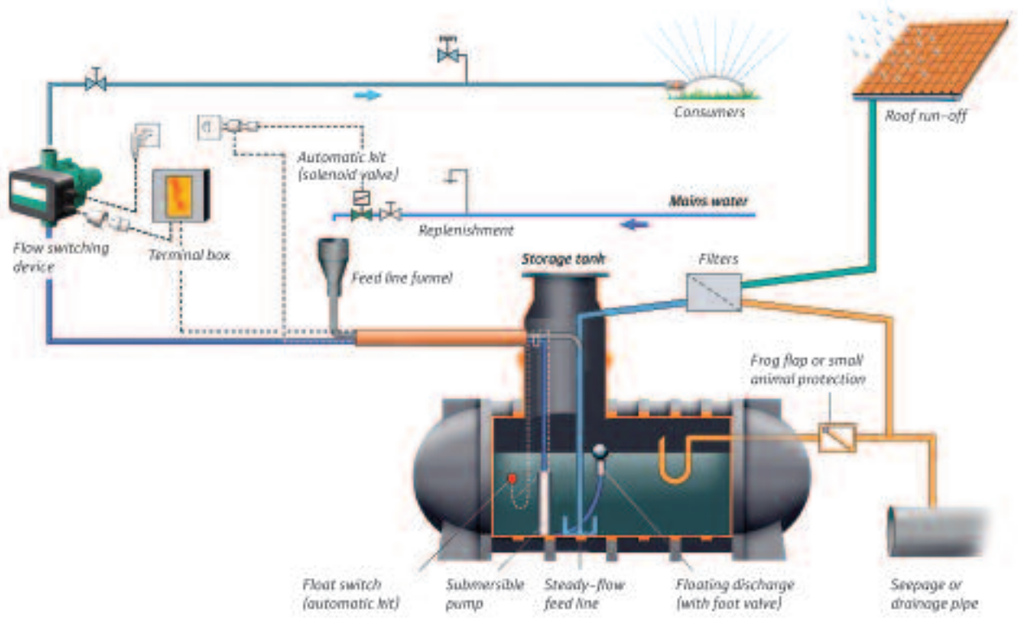
System with submersible pump
- Low noise operation due to multistage design
- Ideal as a system for garden irrigation
- Excellent suction behaviour
- Control by means of flow switching device
- All parts that come into contact with the fluid are corrosion-free

Field of application:
- Toilet flushing
- Sprinkling/irrigation
- Water supply to washing machines
- Minor cleaning functions and other non-drinking water applications

Description:
- Rainwater collection tank for indoor set-up, modularly extensible
- Demand-oriented fresh water metering in internal reservoirs.
- Pressure-dependent pump control and automatic switchover to replenishment

Note:
Observe backflow level!

WILO-RAINSYSTEM TW5-SE- For garden/small family home



Note:
Suitable for long and unfavourable line installation as well as low-lying reservoirs.

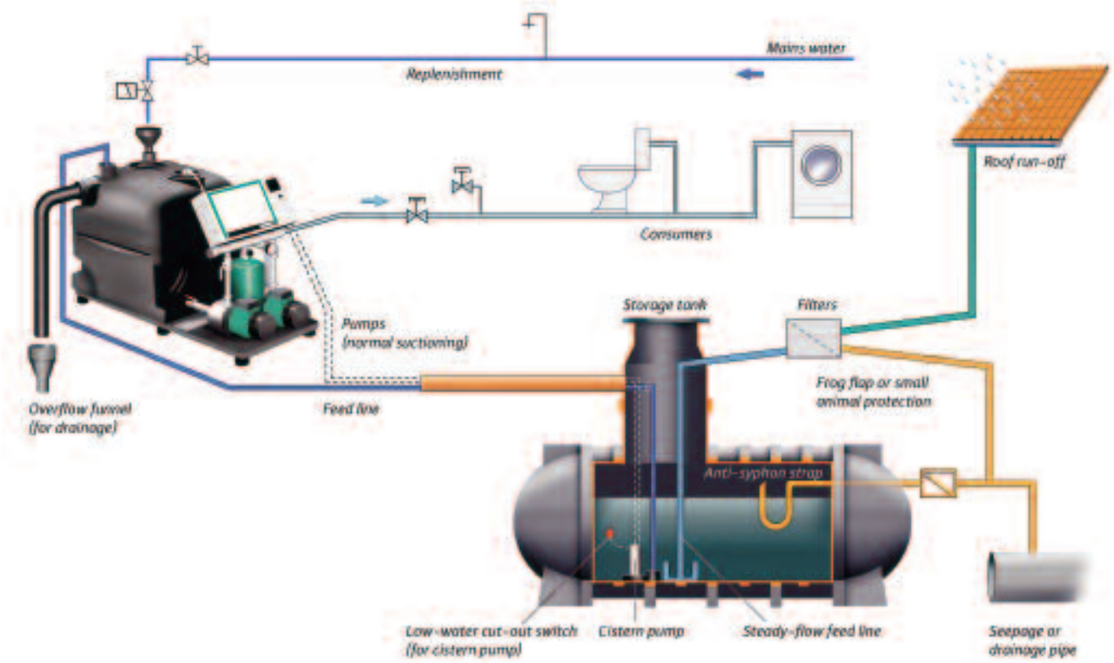
Observe backflow level!

System with submersible pump
- Intake connecting piece for connection, floating discharge
- Control by means of flow switching device

Field of application:
- Pumping from wells, cisterns and vessels
- Irrigation, sprinkling or pumping out
- Rainwater utilisation
- Operating water utilisation

Description:
- Pumps water from wells, cisterns and underground storage tanks
- Replenishment via solenoid valves/float switches directly in the cistern
- Pressure-/flow-dependent pump switching with built-in protection against low water level

WILO-RAINSYSTEM AF400 - For multi-family houses/public buildings, business, industry



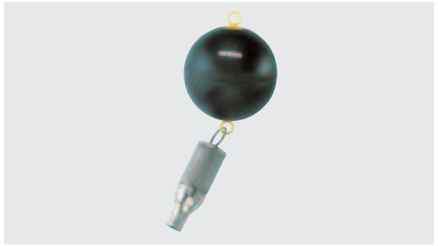
Rainwater utilisation system with twin-head pump, including booster pump in connection with cisterns or reservoirs
- Low-noise operation due to multistage centrifugal pumps
- Highest operational safety through 2 pumps
- Highly economical due to the metering of fresh water to meet demands
- Built-in feed pump control

Field of application:
- Toilet flushing
- Washing machine
- Sprinkling/irrigation
- Minor cleaning functions and other non-drinking water applications

Description:
- Demand-oriented fresh water metering in the intermediate reservoir
- Feeding pump pumps water out of wells, cisterns and underground storage tanks into the intermediate reservoir
- Pressure-dependent pump control and automatic switchover to replenishment
- Demand-oriented pump control by means of basic/peak load operation and/or reserved operation

Note:
Suitable for long and unfavourable line installation between underground storage tank (low-lying reservoir) and intermediate storage tank.

Observe backflow level!

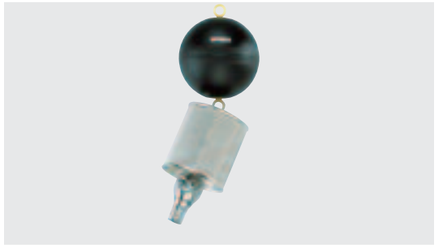


Floating coarse suction side strainer G/GR

Floating coarse suction strainer, mesh width 1.8 mm with connection hose nozzle 1¾".

Versions

Filter type:	Description:
G	Coarse inlet strainer without check valve
GR	Coarse inlet strainer with check valve



Floating fine suction filter F/FR

Floating filter with a mesh width 1.2 mm with connection hose nozzle 1¾".

Versions

Filter type:	Description:
F	Coarse inlet strainer without check valve
FR	Coarse inlet strainer with check valve

Suction pressure hose 1¾" SE – PN 10

Suction and pressure-tight hose, -25 °C to 55°C incl. two VA hose clips and hoze nozzles R 1 and R 1¾" for connection to the floating discharge.

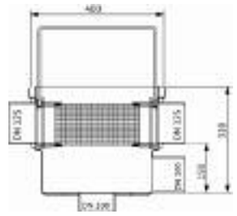
Versions

Filter type:	Length:
	1.5 m complete
	3.0 m complete
	5.0 m complete
	10.0 m complete
	15.0 m complete

Cover

Cover for AF Basic – Recyclable polypropylene sound insulation.

WILO-RAINSYSTEM AF Basic and Comfort – Accessories



Inline Filter

The Wilo Inline Filter is suitable for the filtration of rain or surface water in horizontally aligned drain pipes. Ideal for roof surfaces up to 350 m².

Installation

The Wilo Inline Filter is a versatile filter for underground or cistern installation.
The water recovery is almost 100% even during heavy downpours.
Subsequent installation in existing pipework presents no problem, because the inlet and overflow are on the same level.

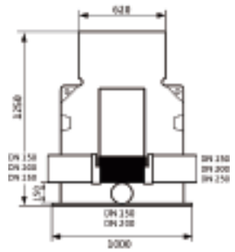
On installation a downward gradient of 2% should be incorporated in the direction of flow. Filtered water oulet on the side, to storage tank, with DN 100. difference in height between filter inlet and storage inlet connections 150 mm.

Scope of delivery

- Inline filter housing.
- For underground installation: Extension well including accessible lockable inspection cover.
- Split strainer insert with mesh width 0.5 mm.

Accessories

- Extension piece PE – Ø 400 mm/length 750 mm, can be shortened.



Inline Sump Filter

The Wilo Sump Filter is suitable for the filtration of rain or surface water in horizontally aligned drain channels and collector pipes. Ideal for roof surfaces up to 2,000 m².

Versions

The Wilo Inline filter is optionally available with inlet and overflow connections of the following sizes:

DN 150 = Roof surfaces up to 500 m²
DN 200 = Roof surfaces up to 1,000 m²
DN 150 = Roof surfaces up to 2,000 m²

Available for drain and overflow.
Sump diameter 800/600 mm.
H 1200 mm, can be shortened.

Installation

The Wilo Sump Filter is suitable for many applications in underground installations. The water recovery is almost 100% even during heavy downpours. Subsequent installation in existing pipework presents no problem, because the inlet and overflow are on the same level.

On installation a downward gradient of 2% should be incorporated in the direction of flow. rainwater drain DN 150 or DN 200 on side, to underground storage tank. Difference in height between filter inlet and storage inlet connections 150 mm.

Scope of delivery

- Inline sump filter housing
- Accessible, lockable inspection cover
- Split strainer insert with mesh width 0.5 mm

Subject to change without prior notice 08/2009 WILO SE

Filter-Collector

The Wilo-Filter Collector is the ideal means of fine-filtering catchment water directly down the down pipe. can be used for roof surfaces up to 180 m².

Versions

The Wilo-Filter Collector is available to suit the commercially available plastic, zinc and copper downpipes in the sizes DN 110, 100, 87 and 80 mm.

Installation

The filter collector is notable for its ease of installation. It is fitted by simply sawing through the down pipe and inserting the component. A vertical downpipe section of 1 m, min, should be provided for the filter collector.

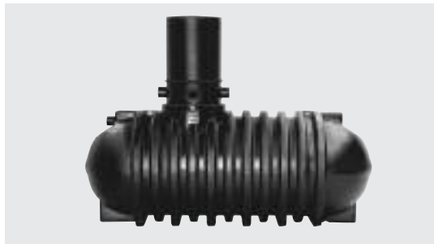
Automatic Control Kit – Mains water make-up

Make-up from the public water mains by free outlet into the make-up funnel of the storage tank.

Note: The drinking water connection must not feed directly into the stored rainwater. Air gap to be observed.

Scope of delivery

- Float switch WA 065 including small switch box for direct control of the solenoid valve. For cable length – see Price List.
- Solenoid valve R½ or R1 with 2m cable, including earthing-pin plug, electrical connection 1~230 V, 50 Hz.



1200 to 60,000 Litre Rainwater Storage Tanks

Available on request.

Self Priming Pumps

Suction operation

A self-priming pump is able to deaerate the suction line, i.e. evacuate air. During commissioning, the pump may have to be filled several times. The max. suction head is theoretically 10.33 m and depends on the air pressure (1013 hPa = normal).

Due to the technology, only a max. of 7–8m suction head hs can be achieved. This value not only includes the height difference from the lowest possible water surface to the suction port of the pump, but also the resistance losses in the connection lines, pump and fitings.

In designing the pump, it is to be observed that the suction head hs must be included in the delivery head to be designed with a negative sign.

Suction line

The suction line, which should be kept as short as possible, is to be installed at least with the nominal diameter of the pump connection piece, and if possible, should be dimensioned by a nominal diameter larger.

In the case of a long suction line, there is higher frictional resistance, which can greatly impair the suction head.

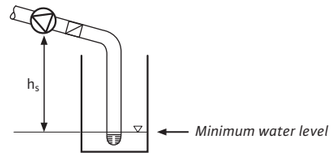
The suction line should be installed so that it continuously rises toward the pump. When hose material is used as the suction line, spiral suction hoses with high impermeability and strength should be favoured. Leaks have to be avoided no matter what since otherwise pump damage and operating faults can occur.

The suction hose should be made of EPDM. PVC hoses are attacked by rainwater and become porous with time. The suction line which leads to the building should be made of a PE material.

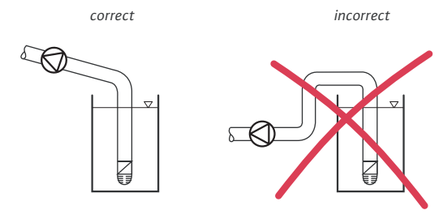
Furthermore, this suction line should be vacuum-proof/tight and pressure proof/tight.

In the case of suction operation, a foot valve is always recommendable to prevent the pump and suction line from running empty. A foot valve (floating discharge) with strainer also protects the pump and the downstreamsystems from coarse contaminants (leaves, wood, stones, insects, etc.).

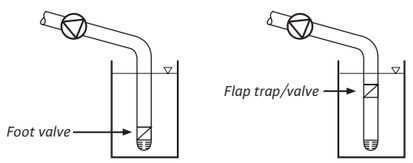
Suction head of the pump h_s



Installing the suction line



Suction operation



Installation with foot val or flap trap/valve

Pump/System Technology

Typology of the rainwater pump

Non-self priming, dry set-up pumps

- Design for pressure operation
- Available in horizontal and vertical construction form
- Utilisation in large plants which work with intermediate reservoirs

Self-priming, dry set-up pumps

- Can evacuate air from the suction line thanks to air separation technology in the pump hydraulics and suction water from a lower-lying reservoir
- System design under exact consideration of suction conditions
- For multi-pump systems, a separate suction line is necessary for each pump

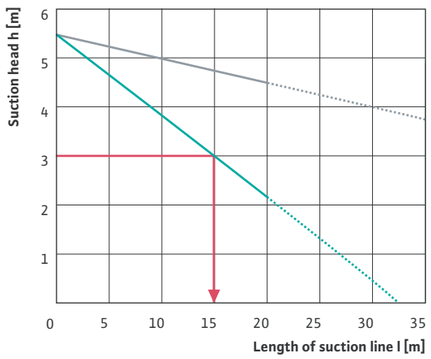
Notes regarding suction line

- Lay the suction line continuously rising to the pump (don't allow air pockets)
- Install foot valve (prevents the suction line from running empty)
- Cross-sections which are too large reduce the suction power
- Design suction line to be vacuum-tight (watertight is by no means vacuum tight. Use suction-and pressure-proof spiral hoses)
- Do not use fittings except for a foot valve in the suction line (filter, non-return valve, no shut-off valves on suction side)
- No cross-section reduction in suction line (lay minimum suction connection cross section, better one nominal diameter larger)
- Keep suction lines as short as possible (long suction line = large frictional resistance = smaller suction head)

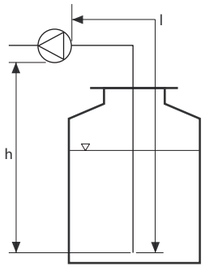
Notes with regard to the pressure pipe

- Drainage valve at lowest point in the pressure system

Suction line and suction head of a centrifugal pump



Suction line: PE-HD, 1
Suction line: PE-HD, 1¼
Volumetric flow: 3 m³/h



Case Studies

1. Kassenärztliche Bundesvereinigung

Berlin, Germany, Europe

Value of installation: 37000 Euro

Quantity	Product Name
15	TOP-S
7	CronoLine-IL
1	DPn, DPg
2	DrainLift M/L
1	RainSystem AF 150
8	TOP-E

Owner
Stangl GmbH,
Niederlassung Berlin
Torsten Rauch
Dorfstr. 9
13057 Berlin
Tel : 030/40052342
Fax : 030/40052390
E-Mail: trauch@kbv.de

Planner
Weber & Partner
Herr Weber
Siegesstr. 42
50679 Köln-Deutz

Installer
J.L.Bacon Haustechnik GmbH
Dirk Herbst
Hertastr. 20
12051 Berlin

The headquarters of the National Association of Statutory Health Insurance Physicians was established on the former premises of the Royal porcelain manufacture in Berlin-Charlottenburg, on an area of 7265 sqm. The building has a gross floor area of approx. 12119 sqm. It has a two-floor basement and it is connected to the Bundesärztekammer (German Medical Association) in the basements. The underground car park is used by all institutions.

Heat supply is realised by means of district heating. The building network is connected directly to the district heat mains. The static heating circuits are connected via the distributor to the pre-controlled feed of the district heat. The air heater and the boiler are connected via distributors to the constant feed to the district heat.

2. Rödl Campus Nürnberg

Nürnberg, Germany, Europe

Rödl & Partner is one of the leading auditing, tax consulting and law offices of German origin. In April 2004, the foundation was laid for the "Rödl Campus" in the south of the current main building of Rödl & Partner. On a land area of approx. 20,000 sqm a service park of approx. 10,000 sqm floor space will be built in the first construction stage, thus creating space for approx. 210 new jobs.

The Rödl Campus relies on a rainwater utilisation system of the AF 150 type.

Value of installation: 25000 Euro

Quantity	Product Name
1	RainSystem AF 150
1	DrainLift XXL

Owner
Rödl & Partner Nürnberg
Herr Köstler
Äußere Sulzbacher Str. 100
90491 Nürnberg
Tel : 49 (911) 91 93-2804
Fax : 49 (911) 91 93-8801

Planner
Ingenieurbüo Schreiber
Hr. Reicherzer
89077 Ulm

Installer
Herrmann Haustechnik
Hr. Stöger
Schüblerstr. 8
90482 Nürnberg

3. HausSchneiderei Baufritz

Erkheim, Germany, Europe

Value of installation: 10000 Euro

Quantity	Product Name
7	Stratos
4	Star-RS
4	TOP-S/SD
2	Star-Z
1	Drain TS40, TS50, TS65
1	RainSystem AF 400

Owner
Baufritz
Mario Reisacher,
Projektmanager
Alpenstr. 25
87746 Erkheim
Tel : 08336/900-631
Fax : 08336/900-111
E-Mail : reisacher@baufritz.de

Planner
Höflmeir GmbH
Hr. Walter Breimeier
Robert-Bosch-Str. 15
88450 Berkheim

Installer
Höflmeir GmbH
Hr. Walter Breimeier
Robert-Boch-Str. 15
88450 Berkheim

The new exhibition and presentation building of Baufritz, a company which manufactures individual and ecological homes in wood construction, is located in Erkheim, Germany, in the south of the newly planned Autobahn between Memmingen and Mindelheim. This is the first step of the planned relocation of Baufritz from its former premises to the area south of the Autobahn.

The high ecological requirements for the applied construction materials are also pursued in planning the building services. For energy generation, a system was selected which uses the same energy source while consuming only very little energy both for the heating and for the cooling: the ground, whose energy potential is accessed via 6 geothermal probes at 98 m. The large-area wall heating, ceiling heating and cooling surfaces provide a convenient indoor temperature in the building.

4. Kreisstraßenmeisterei

Bergisch Gladbach, Germany, Europe

The regional road maintenance authority of the Rheinisch-Bergisch district (Kuerten). Drop-in centre for the district's vehicles and devices for road and green area maintenance.

1 x AF 400. The accumulated rainwater is used for the production of NaCl brine, it is fed into the wash hall (particularly for cleaning the vehicles and devices for winter services) and is used for irrigating the green areas along the roads and motorways.

Value of installation: 20000 Euro

Quantity	Product Name
1	RainSystem AF 400
1	Economy CO 2-4 MHI ... /ER

Owner
Rheinisch Bergischer Kreis
Herr Scharmann
Am Rübezahlwald 7
51469 Bergisch Gladbach
Tel : 02202/13-2679
Fax : 02202/13-102600
E-Mail : kreisstrassen@
rbk-online.de

Planner
Fachplaner : Dieter Bittner
+Partner
Herr Bittner
51429 Bergisch Gladbach

Installer
Reinhold Musculus GmbH
Herr Musculus
51427 Bergisch Gladbach

WILO Rainwater Utilisation Questionnaire

Please answer all questions as fully as possible and FAX back on 01283 523099

From: _____ **Company:** _____

Phone: _____ **Fax:** _____ **Today's date:** _____ **Date required by:** _____

Site name: _____ **Site address:** _____

_____

** Mark inlet and cable entry*

Building roof catchment area (pitch ignored) _____ m²

Roof construction (i.e. pitched, flat) _____

Roofing material (i.e. tile, felt, gravel, planted) _____

Building location (nearest town) _____

Average yearly precipitation (if known) _____

Building occupancy (i.e. employees/patrons/family members) _____

Building occupancy (i.e. days per week) _____

Building occupancy (i.e. weeks per year) _____

Number of W.C's and flush capacity _____ / _____ litres

Number of banks of urinals _____

Number of irrigation outlets and irrigation demand _____ / _____ (litres per day)

Highest outlet point from plant level _____ m

Furthest outlet point from plant area _____ m

Minimum outlet pressure required _____ (bar or metres head)

Is plant area above gravity drain level? _____ (Y/N)

Vertical distance from catchment to Day tank _____ m

Horizontal distance from catchment tank to Day tank _____ m

Number and size of inlet pipe into catchment tanks (if known) _____

Electricity supply: 230V or 425V _____

Type of manhole cover (pedestrian as standard) _____

Other information

_____

_____

_____

_____

_____

WILO
Pumpen Intelligenz.

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