

Perfect water pressure

Just when you need it

Pressure boosting – Pump selection

Use the table below to select the best Grundfos pump for any type of water supply task. Once you've settled on a pump model, use the corresponding sizing guide to get the perfect fit.

	Good	Better	Best
 <p>Boosting from roof tank</p>	 <p>UPA</p>	 <p>SCALA1</p>	 <p>SCALA2</p>
 <p>Boosting from tank</p>	 <p>Jet pump & booster</p>	 <p>SCALA1</p>	 <p>SCALA2</p>
 <p>Boosting from mains</p>	 <p>SCALA1</p>	 <p>SCALA2</p>	 <p>CME BOOSTER</p>

Positive inlet pressure (down to 1 metre below ground level)

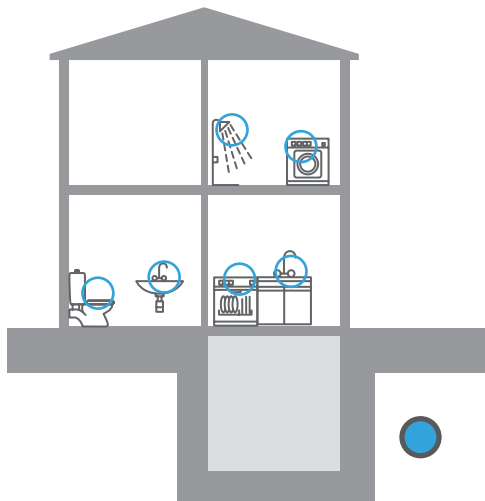
Pressure boosting – Pump selection

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	Good	Better	Best
<p>Negative inlet pressure</p>  <p>Self priming out of wells and tanks lowering the water level down to max 8m.</p>	<p>Dry installed</p>  <p>Jet pump & booster</p>	 <p>SCALA1</p>	 <p>SCALA2</p>
 <p>Boosting from well or underground tank with the pump submerged at maximum 10 m bellow the water.</p>	<p>Submerged</p>  <p>SB with PM1</p>	 <p>SBA</p>	 <p>SB with PM2</p>
 <p>Boosting from well or borehole where dynamic* water level can be pumped at more than 8 m</p> <p>* Dynamic water level means the correct installation of the pump to avoid dry running.</p>		 <p>SQ</p>	 <p>SQE constant pressure package</p>

Pressure boosting – Quick sizing

○ Tapping point





















Ex. sizing and selection









- 1. Required comfort level:**
 - Adjustable constant pressure
- 2. Find the right booster:**
 - How many taps: 6 taps
 - How many floors: 3 floors
- 3. Result: CMBE 1-44**

Taps	1-5	6-10
Floors		
4	CMBE 1-75	CMBE 1-75
3	CMBE 1-44	CMBE 1-44
2	CMBE 1-44	CMBE 1-44
1	CMBE 1-44	CMBE 1-44

Adjustable constant pressure level

 CMBE	Floors \ Taps	 1-5	 6-10	 11-20	 21-50
	 4	4	CMBE 1-75	CMBE 3-62	CMBE 5-62
 3	3	CMBE 1-44	CMBE 3-62	CMBE 5-62	—
 2	2	CMBE 1-44	CMBE 3-62	CMBE 5-62	—
 1	1	CMBE 1-44	CMBE 3-30	CMBE 3-30	—










 CMBE TWIN (Duty/Assist)	Floors \ Taps	 1-5	 6-10	 11-20	 21-50
	 4	4	—	—	—
 3	3	—	—	—	CMBE TWIN 5-62
 2	2	—	—	—	CMBE TWIN 5-62
 1	1	—	—	—	CMBE TWIN 5-31










 SCALA2	Floors \ Taps	 1-5	 6-10	 11-20
	 4	4	SCALA2 3-45*	—
 3	3	SCALA2 3-45	SCALA2 3-45	—
 2	2	SCALA2 3-45	SCALA2 3-45	—
 1	1	SCALA2 3-45	SCALA2 3-45	SCALA2 3-45


· All-in-one design
· Dry-run protection


Pressure boosting – Quick sizing

Conventional pump control

 <p>SCALA1</p> <ul style="list-style-type: none"> • All-in-one booster • Water on demand • Self-priming 	Floors\Taps	 1-5	 6-10	 11-20	 21-50
	 4	SCALA1 3-45*	SCALA1 5-55	—	—
	 3	SCALA1 3-45	SCALA1 3-45	SCALA1 5-55	—
	 2	SCALA1 3-35	SCALA1 3-45	SCALA1 5-55	—
	 1	SCALA1 3-25	SCALA1 3-35	SCALA1 3-45	—

 <p>SCALA1 TWIN (Duty/Assist)</p> <ul style="list-style-type: none"> • Easy solution for twin-booster • Easy installation • Enabled for Grundfos GO Remote 	Floors\Taps	 1-5	 6-10	 11-20	 21-50
	 4	—	—	SCALA1 TWIN 5-55	SCALA1 TWIN 5-55
	 3	—	—	—	SCALA1 TWIN 5-55
	 2	—	—	—	SCALA1 TWIN 5-55
	 1	—	—	—	SCALA1 TWIN 5-55

 <p>Jet pump & booster</p> <ul style="list-style-type: none"> • Easy to install • Self-priming • Robust design 		Taps or m3/h		
		1-5 taps 1-2 m3/h	6-10 taps 3-4 m3/h	11-20 taps 4-5 m3/h
	Manually controlled water supply	JP 3-42	JP 4-47/54	JP 5-48
	Constant water supply with pressure-drop compensation	JP 3-42 PT-V/H	JP 4-47/54 PT-V/H	JP 5-48 PT-V/H
Constant water supply. Dry-running protection and anti-cycling function	JP 3-42 PM	JP 4-47/54 PM	JP 5-48 PM	

 <p>UPA</p> <ul style="list-style-type: none"> • Low noise • High energy efficiency • Easy installation 	Taps 1-2	Taps 2-4	Taps 4-8
	UPA15-90	UPA15-120	UPA-15-160
	UPA15-90	UPA15-120	UPA-15-160
	UPA15-90	UPA15-120	UPA-15-160
	UPA15-90	UPA15-120	UPA-15-160

Preconditions • 3 bar tap pressure is considered, to achieve 4 bar pressure add 2 more floors • Flooded Suction • 0.5 l/s per tap average, usage pattern is taken into account

Pressure boosting – Quick sizing

Conventional pump control



SBA



SB

Grundfos SB pumps can be equipped with:

- full control (SBA)
- simple float switches for dry running protection
- or a connected priming kit with floating ball and strainer that collects the water right below the surface

See more details on variants on Grundfos Product Center

	Vertical Max. Hgeo [m] 1" pipe*	Horizontal Max. L [m] 1" pipe*	¾" ** / ½" *** pipe	Total hor. length [m] with 1" + ¾" / 1" + ½" pipes
SB(A) 3-45 at 3m ³ /h 2.8 bar	15	15	20/4	25/19
	15	10	22/5	32/15
	10	15	33/8	48/23
	10	10	35/8.5	45/18.5
	5	15	46/11	61/26
	5	10	48/11.5	58/22.5
SB(A) 3-35 at 3m ³ /h 2.4 bar	15	15	9/2	16/17
	15	10	11/3	21/13
	10	15	23/5.5	38/20.5
	10	10	25/6	35/16
	5	15	36/8.5	51/23.5
	5	10	38/9	48/19

*Inner-ø 25mm
** Inner-ø 20mm
*** Inner-ø 15mm


The calculation is based on the assumption that inside the home you use ½" for piping or ¾".
From the cistern to the house and to that point where you change to a smaller diameter use 1".
There are considered a NRV and gate valve, an extension from small to bigger pipe and a few 90° bends

Preconditions

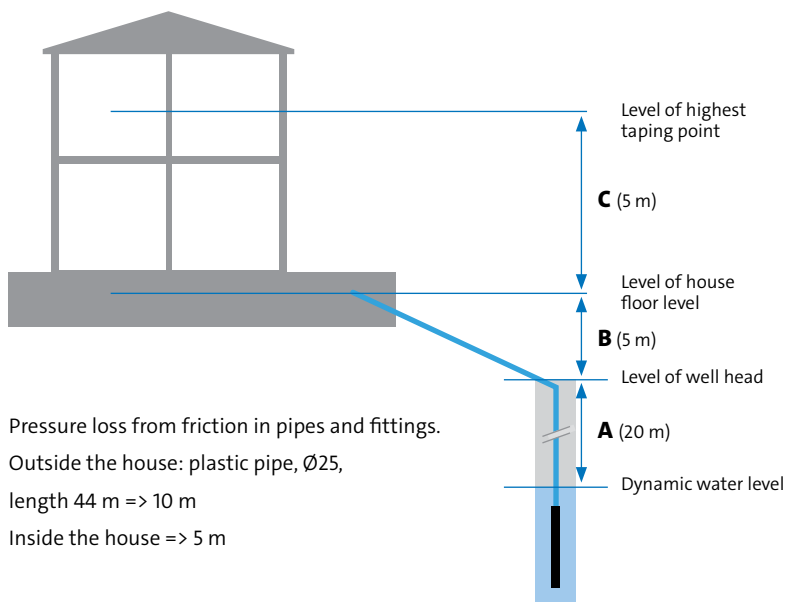
• 3 bar tap pressure is considered, to achieve 4 bar pressure add 2 more floors • Flooded Suction • 0.5 l/s per tap average, usage pattern is taken into account

Groundwater – Quick sizing – Pump

Flow sizing

 SQ <ul style="list-style-type: none"> · Compact design · Built-in motor protection · Easy installation 	Kitchen sink	Dish washer, washing machine	Toilet w. wash basin and WC	Bathroom w. wash basin, WC and shower	Bathroom w. wash basin, WC and bathtub	Garden and lawn irrigation	Nominal flow [m³/h]	Recommended pump size	
	Small house	1		1				1	SQ1
	Medium house	1	2	1	1			2	SQ2
	Large house	2	2		1	1	2	3	SQ3
	2 x large house							5	SQ5
3 x large house							7	SQ7	

Head sizing



Calculate max. pressure required

1. Pressure (H) at the tap requiring max. pressure = X
 2. Static head (A + B + C) = Y
 3. Pressure loss from friction in pipes and fittings = Z
- $$H_{total} = X + Y + Z$$

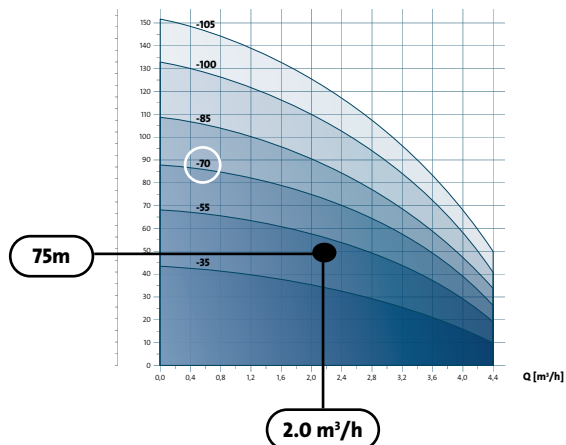
Example of calculation

1. Pressure at the tap (max pressure): 3 bar = 30 m
2. Static head: 20 m + 5 m + 5 m = 30 m
3. Pressure loss from friction in pipes and fittings: 10 m + 5 m = 15 m

Maximum pressure required:

$$H_{total} = 30 \text{ m} + 30 \text{ m} + 15 \text{ m} = \mathbf{75 \text{ m}}$$

Pump selection



Example of flow sizing


Medium house

=> Nominal flow **2 m³/h** => Pump size **SQ2**

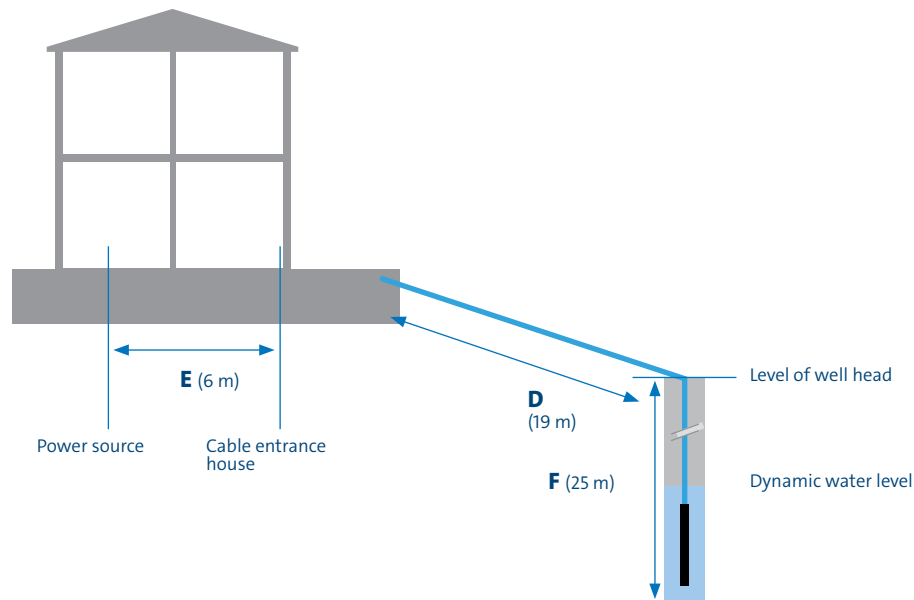
Pump choice
SQ 2 - 70

Groundwater – Quick sizing – Cable

Maximum cable length

 SQ cable · Supply voltage 240 V · 5% voltage drop	P2 [kW]	I _{MAX} [A]	Wire cross sectional area [mm ²]			
			1.5	2.5	4.0	6.0
			Maximum cable length [m]			
	0.70	5.2	86	144	230	346
	1.15	8.4	53	89	142	214
	1.68	11.2	40	66	107	160
	1.85	12.0	37	62	100	150

How to select the cross-sectional area



! Supply voltage 240 V 5% voltage drop and cable supplied by Grundfos.

How to select the cross-sectional area of the individual wire of a submersible drop cable

1. Select SQ pump incl. motor size
2. Required total length of cable (D + E + F)
3. Read the cross-sectional area of individual wire of the drop cable

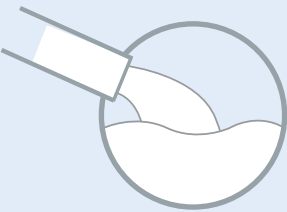
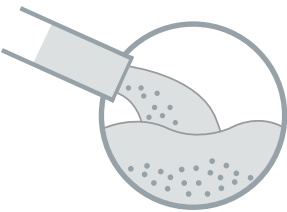
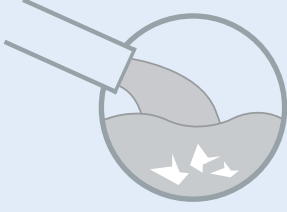
Example:

1. SQ pump incl. motor size
SQ 2-70, motor size 1.15 kW
2. Distance from pump to the power source (outside 44 m (D + F) + inside 6 m (E))
50 m
3. Selected cross-sectional area
1.5 mm²

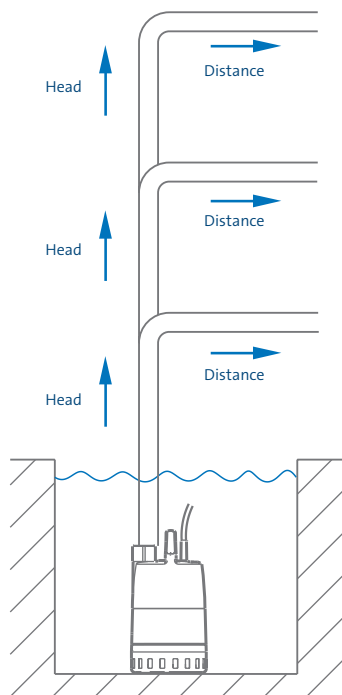
Waste water – Pump selection

Use the table below to select the best Grundfos pump for any type of water supply task. Once you've settled on a pump model, use the corresponding sizing guide to get the perfect fit.

Drainage

		Max. solid size [mm]	
 <p>Drainage For portable use or permanent installation, clean or greywater and salt water*</p>	Light duty	10 mm	UNILIFT CC
		10 mm	UNILIFT KP
	Heavy duty	12 mm	UNILIFT AP12
 <p>Effluent Surface- and rainwater as well as greywater from sanitary appliances</p>		35 mm	UNILIFT AP35
		35 mm	UNILIFT AP35B
		50 mm	UNILIFT AP50
 <p>Sewage/Domestic wastewater Domestic wastewater with toilet discharge</p>		50 mm	UNILIFT AP50B
			UNILIFT APG (grinder)

Drainage – Quick sizing



Ex. sizing and selection

1. **Select the best Grundfos pump for the type of wastewater task you need to solve:**

- Use the table on previous page

2. **Find the right pump:**

- How head: 9 m

- How long distance: 400 m

3. **Result: AP12.50.11**

	AP12.40.08	AP12.50.11
Head \ Distance		
14 m		Max. 95 m
12 m	Max. 1 m	Max. 200 m
10 m	Max. 150 m	Max. 410 m
8 m	Max. 310 m	Max. 620 m

The selection and sizing illustration is based on an inner diameter of a DN 32 discharge pipe and secure a self cleaning velocity inside the pipe.



UNILIFT CC

	CC 5	CC 7	CC 9
Head \ Distance			
7 m			Max. 45 m
6 m			Max. 80 m
5 m		Max. 15 m	Max. 115 m
4.5 m		Max. 35 m	Max. 130 m
4 m		Max. 50 m	Max. 150 m
3 m		Max. 80 m	Max. 180 m
2.5 m	Max. 10 m	Max. 100 m	Max. 200 m
2 m	Max. 25 m	Max. 110 m	Max. 215 m

Drainage – Quick sizing

The selection and sizing illustration is based on an inner diameter of a DN 32 discharge pipe and secure a self cleaning velocity inside the pipe.			
	KP 150	KP 250	KP 350
Head \ Distance			
7 m			Max. 25 m
6 m		Max. 20 m	Max. 60 m
5 m		Max. 50 m	Max. 95 m
4 m		Max. 85 m	Max. 130 m
3.5 m	Max. 15 m	Max. 105 m	Max. 145 m
3 m	Max. 30 m	Max. 120 m	Max. 160 m
2 m	Max. 65 m	Max. 160 m	Max. 195 m



UNILIFT KP

The selection and sizing illustration is based on an inner diameter of a DN 32 discharge pipe and secure a self cleaning velocity inside the pipe.				
	AP12.40.04	AP12.40.06	AP12.40.08	AP12.50.11
Head \ Distance				
14 m				Max. 8 m
12 m			Max. 40 m	Max. 115 m
10 m		Max. 60 m	Max. 130 m	Max. 250 m
8 m	Max. 45 m	Max. 150 m	Max. 220 m	Max. 370 m
6 m	Max. 135 m	Max. 240 m	Max. 310 m	Max. 490 m
4 m	Max. 225 m	Max. 330 m	Max. 400 m	Max. 610 m
2 m	Max. 320 m	Max. 420 m	Max. 495 m	Max. 735 m



UNILIFT AP12

Drainage – Quick sizing



UNILIFT AP35

The selection and sizing illustration is based on an inner diameter of a DN 32 discharge pipe and secure a self cleaning velocity inside the pipe.

	AP35.40.06	AP35.40.08
Head\Distance		
9 m		Max. 30 m
8 m		Max. 75 m
7 m	Max. 35 m	Max. 120 m
6 m	Max. 80 m	Max. 165 m
5 m	Max. 130 m	Max. 215 m
4 m	Max. 170 m	Max. 255 m
3 m	Max. 220 m	Max. 305 m
2 m	Max. 265 m	Max. 350 m




UNILIFT AP35B

The selection and sizing illustration is based on an inner diameter of a DN 32 discharge pipe and secure a self cleaning velocity inside the pipe.

	AP35B.50.06	AP35B.50.08
Head\Distance		
9 m		Max. 15 m
8 m		Max. 75 m
7 m	Max. 20 m	Max. 135 m
6 m	Max. 80 m	Max. 195 m
5 m	Max. 140 m	Max. 260 m
4 m	Max. 200 m	Max. 320 m
3 m	Max. 260 m	Max. 385 m
2 m	Max. 325 m	Max. 440 m

Drainage – Quick sizing



UNILIFT AP50

The selection and sizing illustration is based on an inner diameter of a DN 32 discharge pipe and secure a self cleaning velocity inside the pipe.

	AP50.50.08	AP50.50.11
Head\Distance		
9 m		Max. 55 m
8 m		Max. 115 m
7 m	Max. 45 m	Max. 175 m
6 m	Max. 105 m	Max. 235 m
5 m	Max. 165 m	Max. 295 m
4 m	Max. 225 m	Max. 360 m
3 m	Max. 285 m	Max. 405 m
2 m	Max. 350 m	Max. 480 m



UNILIFT AP50B

The selection and sizing illustration is based on an inner diameter of a DN 32 discharge pipe and secure a self cleaning velocity inside the pipe.

	AP50B.50.08	AP50B.50.11	AP50B.50.15
Head\Distance			
14 m			Max. 65 m
12 m			Max. 190 m
11 m		Max. 25 m	Max. 250 m
10 m		Max. 85 m	Max. 310 m
9 m		Max. 145 m	Max. 370 m
8 m	Max. 45 m	Max. 205 m	Max. 430 m
6 m	Max. 165 m	Max. 330 m	*
5 m	Max. 225 m	Max. 390 m	*
4 m	Max. 285 m	Max. 450 m	*
3 m	Max. 345 m	*	*
2 m	Max. 490 m*	Max. 740 m*	Max. 1060 m*

*The pumps shall not operate for longer time with this Head

Drainage – Quick sizing

Head\Distance	The quick sizing chart below gives an approximate overview of heights and outlet pipe lengths with an inner pipe diameter of DN 32, G 1 1/2" / DN 40, and a flow, so that a self-cleaning velocity of minimum 0.7 m/s is covered.	
	DN32/40	DN32/40
22	Max. 25/35 m	
20	Max. 90/120 m	
18	Max. 160/215 m	Max. 19/25 m
16	Max. 225/305 m	Max. 40/55 m
14	Max. 295/395 m	Max. 65/90 m
12	Max. 360/485 m	Max. 90/120 m
10	Max. 430/575 m	Max. 115/150 m
8	Max. 495/665 m	Max. 135/185 m
6	Max. 565/755 m	Max. 160/215 m
4	Max. 630/850 m	Max. 185/250 m
2	Max 700/940 m	Max. 210/280 m
Flow	Q=2.1/3.2 m ³ /h (v=0.7 m/s)	Q= 3.6/5.4 m ³ /h (v=1.2 m/s)



















UNILIFT APG 40.10

The overview is only intended as a guide.

Grundfos is not liable for installations that do not comply with the overview. Pressure loss of a non-return valve and an isolating valve is calculated. The vertical height of the outlet pipe must be measured from the pump stop level. For more flow requirements a calculation is needed.

Lifting Stations

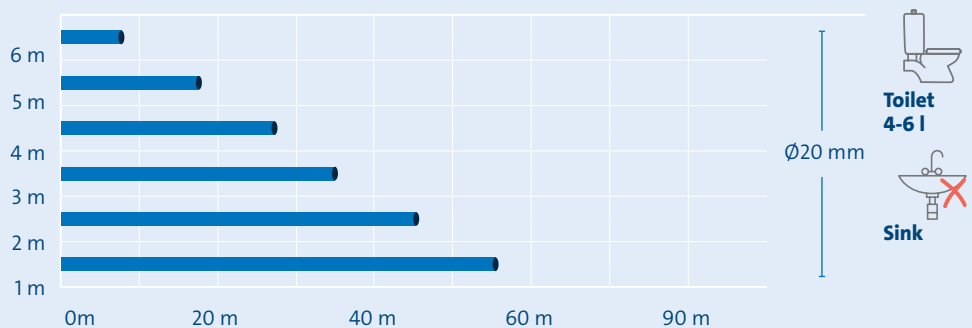
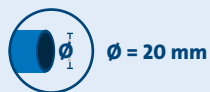
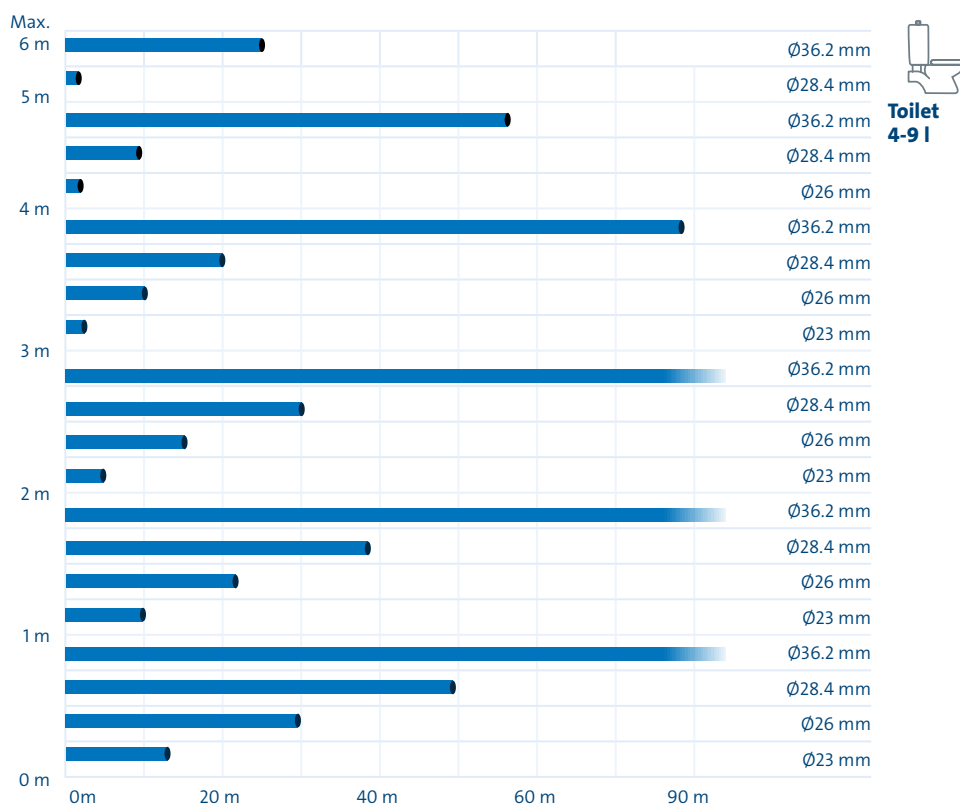
● Fixed inlet ○ Additional optional inlet

	 SOLOLIFT2 WC-1	 SOLOLIFT2 WC-3	 SOLOLIFT2 D-2	 SOLOLIFT2 C-3	 SOLOLIFT2 CWC-3
 Toilet	●	●			
 Wall-mounted toilet					●
 Urinal	○	○			○
 Sink	○	○	○	○	○
 Bidet		○	○	○	○
 Shower		○	○	○	○
 Bathtub				○	
 Washing machine				○	
 Kitchen sink				○	
 Dish-washer				○	
 Water softener				○	

Lifting Stations – Quick sizing



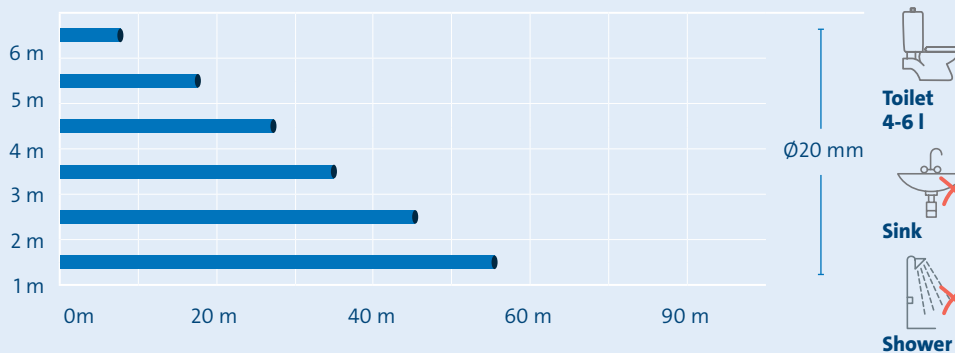
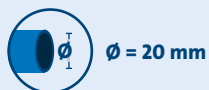
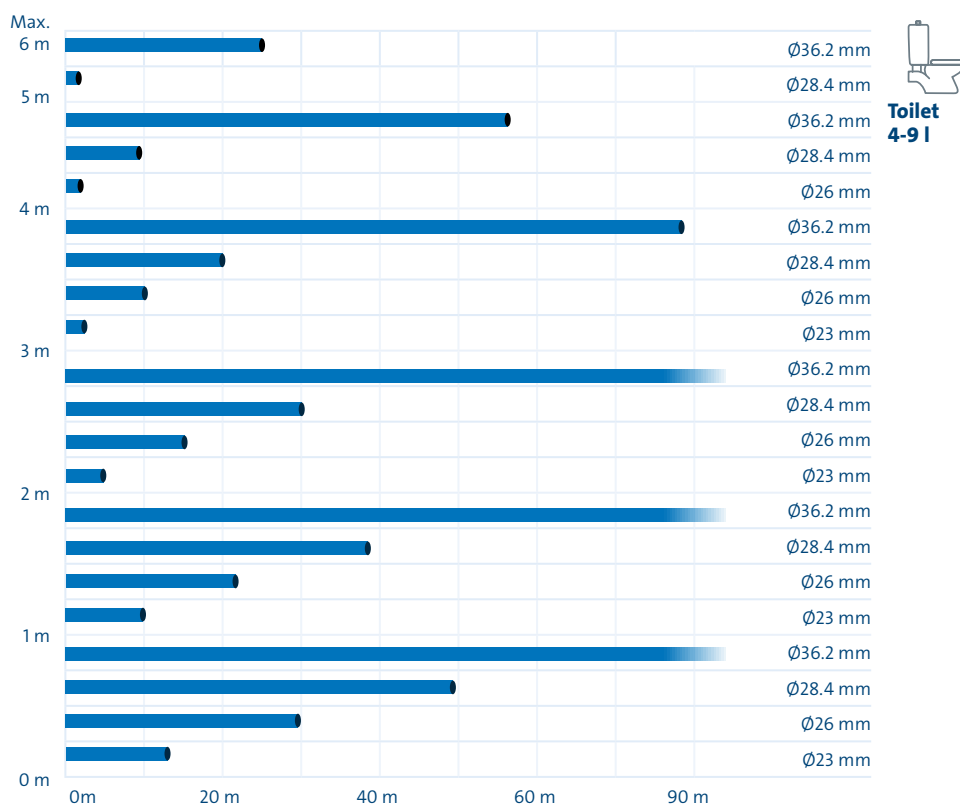
SOLOLIFT2 WC-1



Lifting Stations – Quick sizing



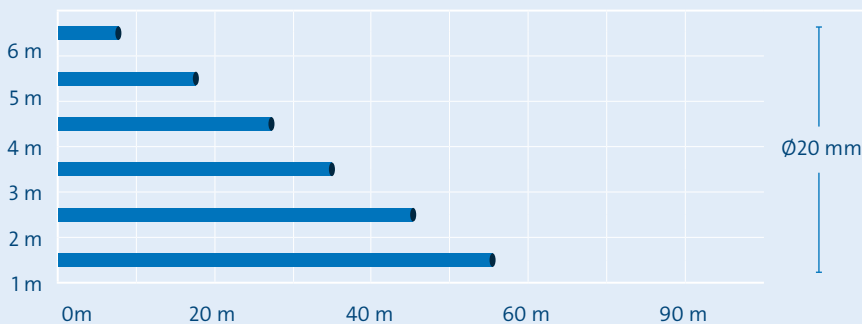
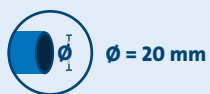
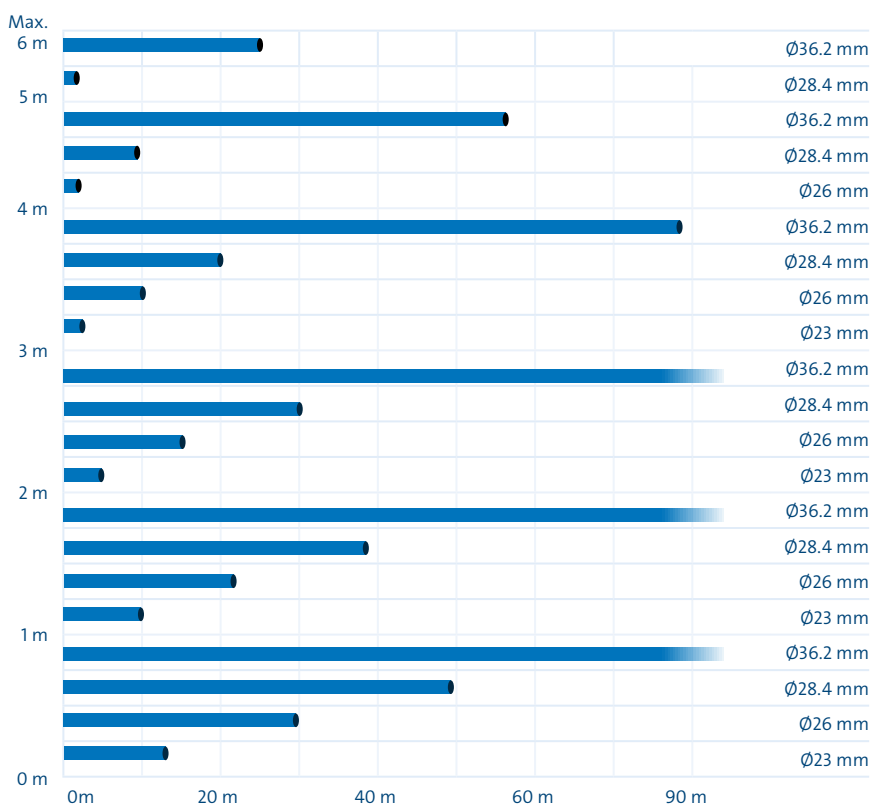
SOLOLIFT2 WC-3



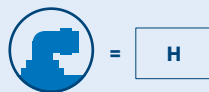
Lifting Stations – Quick sizing



SOLOLIFT2 CWC-3



Lifting Stations – Quick sizing



SOLOLIFT2 C-3

		x										
6 m			9	13								Ø36.2 mm
	30	30										Ø28.4 mm
	14	14										Ø26 mm
	4											Ø23 mm
5 m												Ø20 mm
			31	35		3						Ø36.2 mm
	54	54	2.5	4								Ø28.4 mm
	30	30										Ø26 mm
4 m												Ø23 mm
												Ø20 mm
	13											Ø20 mm
	2	2.5										Ø20 mm
3 m												Ø20 mm
			53	58	8	14		0.5				Ø36.2 mm
	78	78	9	11								Ø28.4 mm
	45	45	2.5	4.5								Ø26 mm
2 m												Ø23 mm
												Ø20 mm
	21	21										Ø20 mm
	6.5	7										Ø20 mm
1 m												Ø20 mm
			76	80	19	24		7				Ø36.2 mm
	102	102	16	18	1.5	3						Ø28.4 mm
	61	61	7	9.5								Ø26 mm
0 m												Ø23 mm
												Ø20 mm
	30	30	2	2.5								Ø23 mm
	12	12										Ø20 mm
0 m												Ø20 mm
			98	102	29	35		13		3		Ø36.2 mm
	126	128	23	25	5	6.5		1				Ø28.4 mm
	77	76	12	14	1	2.5						Ø26 mm
0 m												Ø23 mm
												Ø20 mm
	39	39	5	5.5								Ø23 mm
	16	16	0.5	0.5								Ø20 mm
0 m												Ø20 mm
			120	124	38	46		20		7		Ø36.2 mm
	150	150	30	32	9	10		3.5		0.5		Ø28.4 mm
	92	92	17	19	3.5	5		1.5				Ø26 mm
0 m												Ø23 mm
												Ø20 mm
	47	47	8	8.5	1	1.5						Ø23 mm
	20	21	2.5	2.5								Ø20 mm
		0.5 l/s	1 l/s	1.5 l/s	2 l/s	2.5 l/s	3 l/s					



Lifting Stations – Quick sizing



SOLOLIFT2 D-2

4 m					Ø28.4 mm
3 m	6				Ø20 mm
		24			Ø28.4 mm
2 m	22	0.1			Ø20 mm
		47	3		Ø28.4 mm
1 m	37	4.5			Ø20 mm
		71	10		Ø28.4 mm
0 m	52	9.5			Ø20 mm
	0.25 l/s	0.5 l/s	1 l/s	1.5 l/s	