

# Perfect water pressure

Just when you need it



Possibility in every drop

# 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><b>UPA</b></p>	 <p><b>SCALA1</b></p>	 <p><b>SCALA2</b></p>
 <p>Boosting from tank</p>	 <p><b>Jet pump &amp; booster</b></p>	 <p><b>SCALA1</b></p>	 <p><b>SCALA2</b></p>
 <p>Boosting from mains</p>	 <p><b>SCALA1</b></p>	 <p><b>SCALA2</b></p>	 <p><b>CME BOOSTER</b></p>

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

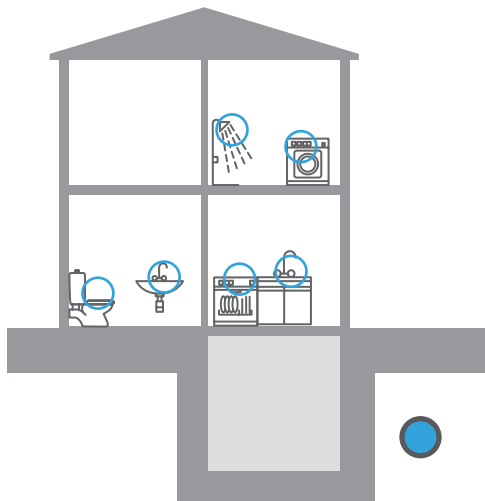
# Pressure boosting – Pump selection

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
Negative inlet pressure	 <p>Self priming out of wells and tanks lowering the water level down to max 8m.</p>	<p><b>Dry installed</b></p>  <p><b>Jet pump &amp; booster</b></p>	 <p><b>SCALA1</b></p>	 <p><b>SCALA2</b></p>
	 <p>Boosting from well or underground tank with the pump submerged at maximum 10 m bellow the water.</p>	<p><b>Submerged</b></p>  <p><b>SB with PM1</b></p>	 <p><b>SBA</b></p>	 <p><b>SB with PM2</b></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><b>SQ</b></p>	 <p><b>SQE constant pressure package</b></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

 <b>CMBE</b>	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	—










 <b>CMBE TWIN (Duty/Assist)</b>	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










 <b>SCALA2</b>	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><b>SCALA1</b></p> <ul style="list-style-type: none"> <li>• All-in-one booster</li> <li>• Water on demand</li> <li>• Self-priming</li> </ul>	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><b>SCALA1 TWIN (Duty/Assist)</b></p> <ul style="list-style-type: none"> <li>• Easy solution for twin-booster</li> <li>• Easy installation</li> <li>• Enabled for Grundfos GO Remote</li> </ul>	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><b>Jet pump &amp; booster</b></p> <ul style="list-style-type: none"> <li>• Easy to install</li> <li>• Self-priming</li> <li>• Robust design</li> </ul>		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><b>UPA</b></p> <ul style="list-style-type: none"> <li>• Low noise</li> <li>• High energy efficiency</li> <li>• Easy installation</li> </ul>	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
<b>SB(A) 3-45 at 3m<sup>3</sup>/h 2.8 bar</b>	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
<b>SB(A) 3-35 at 3m<sup>3</sup>/h 2.4 bar</b>	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**

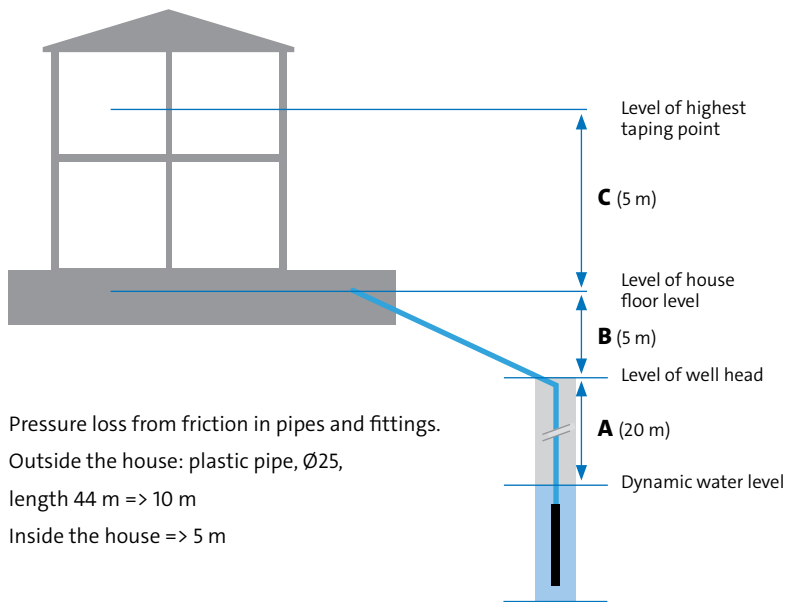
• 3 bar tap pressure is considered, to achieve 4 bar pressure add 2 more floors • Flooded Suction • 0.5 l/s per tap average, usage pattern is taken into account

# Groundwater – Quick sizing – Pump

## Flow sizing

 <b>SQ</b> <ul style="list-style-type: none"> <li>· Compact design</li> <li>· Built-in motor protection</li> <li>· Easy installation</li> </ul>	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
- $$H_{total} = X + Y + Z$$

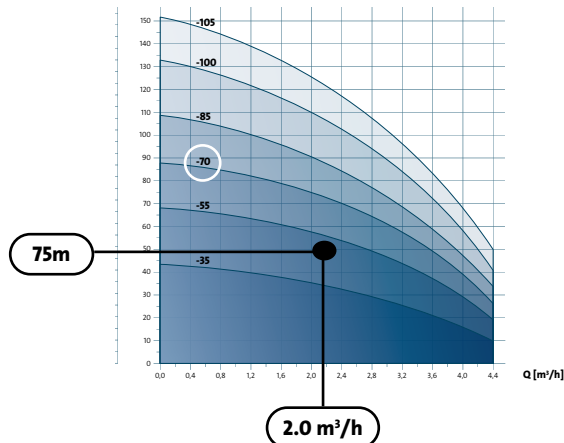
### Example of calculation

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**

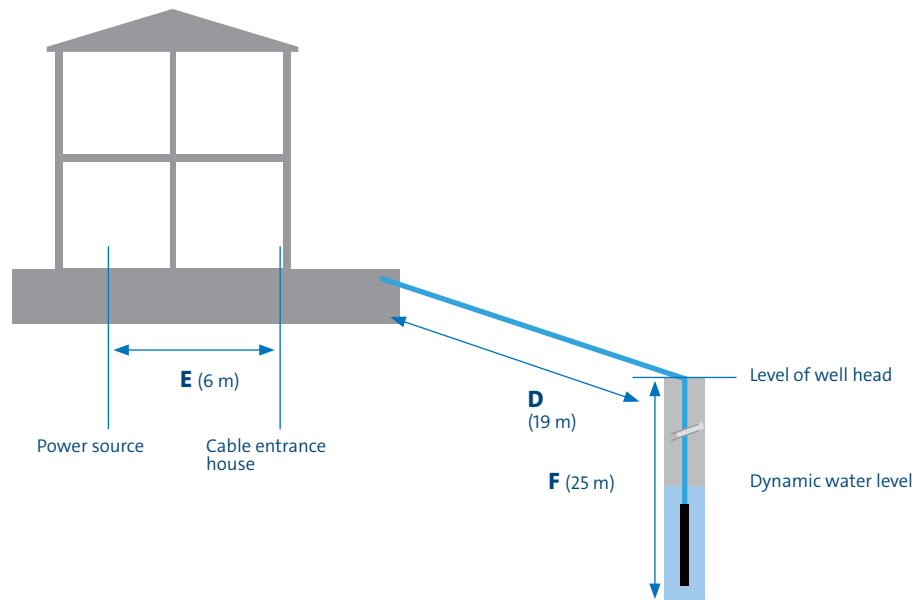
Pump choice  
**SQ2 - 70**

# Groundwater – Quick sizing – Cable

## Maximum cable length

 <b>SQ cable</b> · Supply voltage 240 V · 5% voltage drop	P2 [kW]	I <sub>MAX</sub> [A]	Wire cross sectional area [mm <sup>2</sup> ]			
			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:

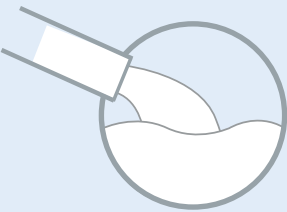
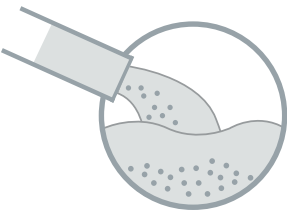
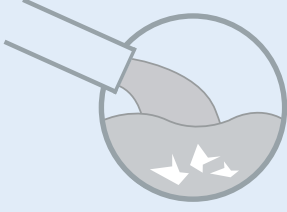
1. SQ pump incl. motor size  
**SQ 2-70, motor size 1.15 kW**
2. Distance from pump to the power source (outside 44 m (D + F) + inside 6 m (E))  
**50 m**
3. Selected cross-sectional area  
**1.5 mm<sup>2</sup>**



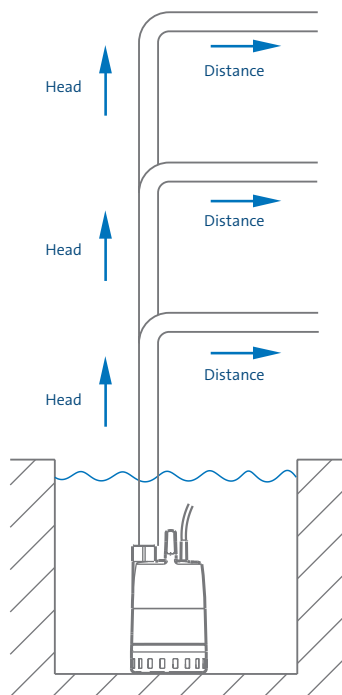
# Waste water – Pump selection

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

# 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.

	<b>AP35.40.06</b>	<b>AP35.40.08</b>
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.

	<b>AP35B.50.06</b>	<b>AP35B.50.08</b>
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 <sup>3</sup> /h (v=0.7 m/s)	Q= 3.6/5.4 m <sup>3</sup> /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

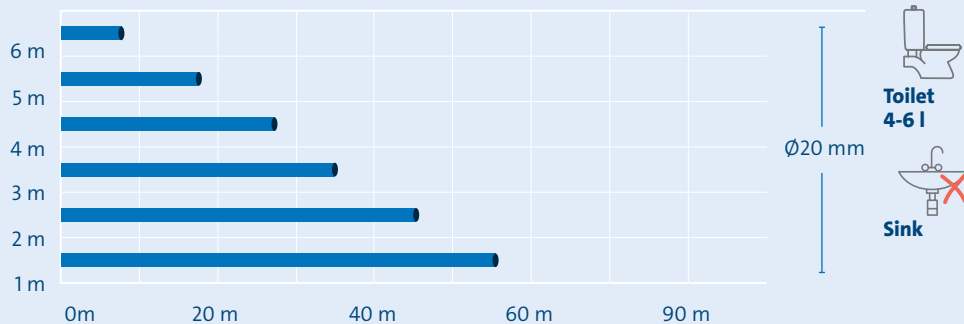
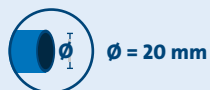
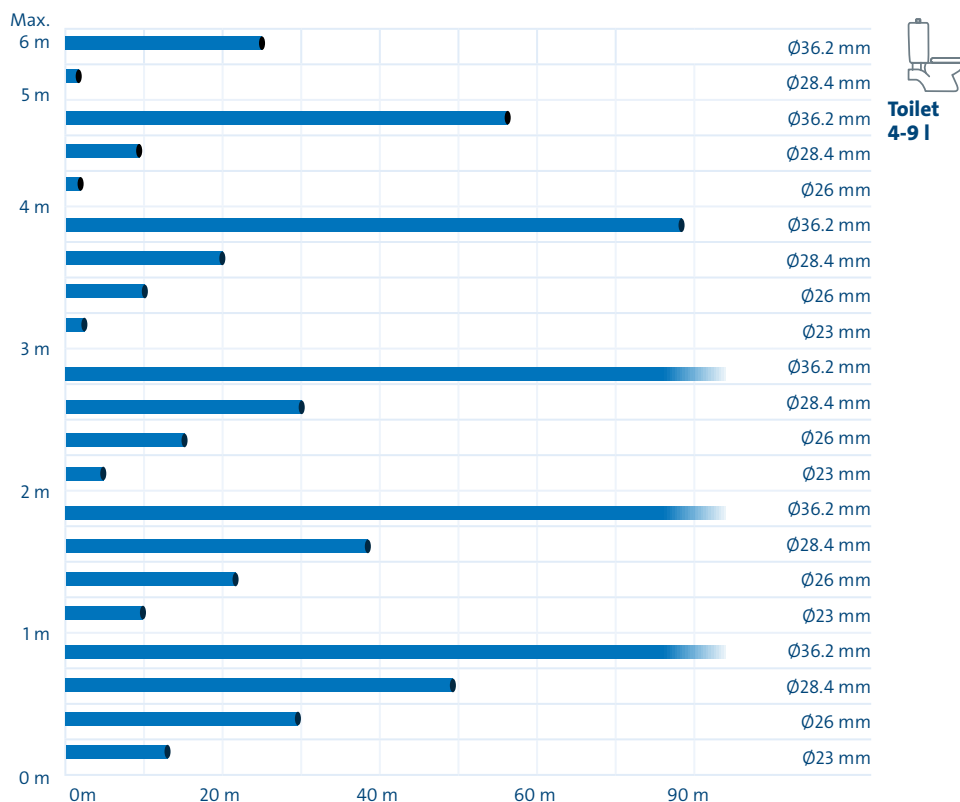
● Fixed inlet ○ Additional optional inlet

	 <b>SOLOLIFT2</b> WC-1	 <b>SOLOLIFT2</b> WC-3	 <b>SOLOLIFT2</b> D-2	 <b>SOLOLIFT2</b> C-3	 <b>SOLOLIFT2</b> 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**

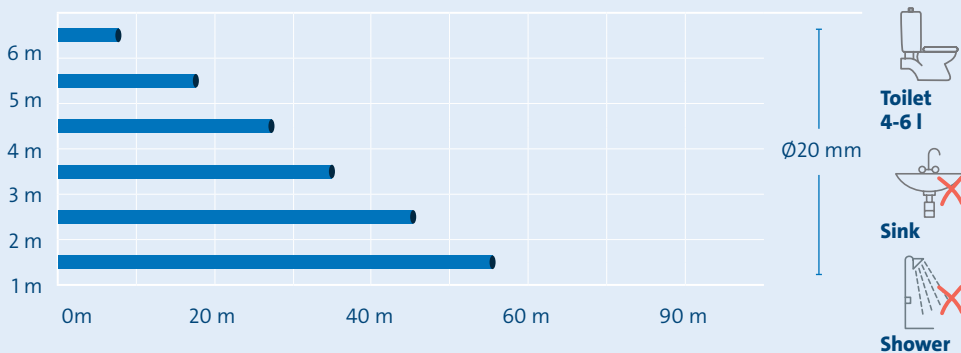
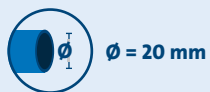
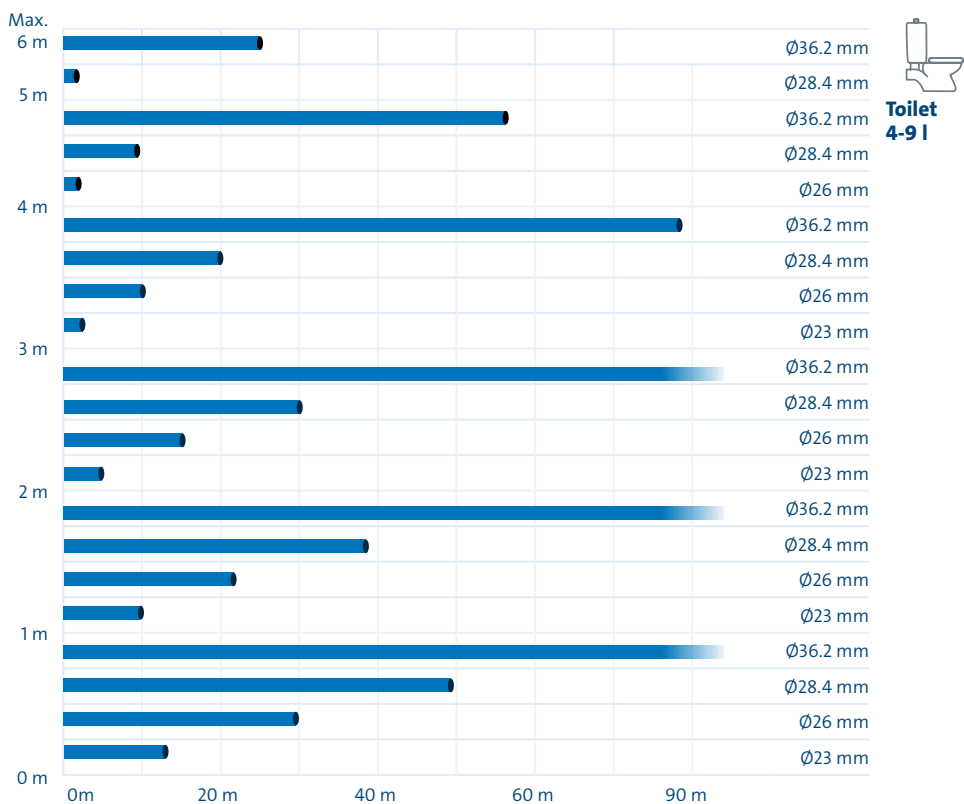




# Lifting Stations – Quick sizing



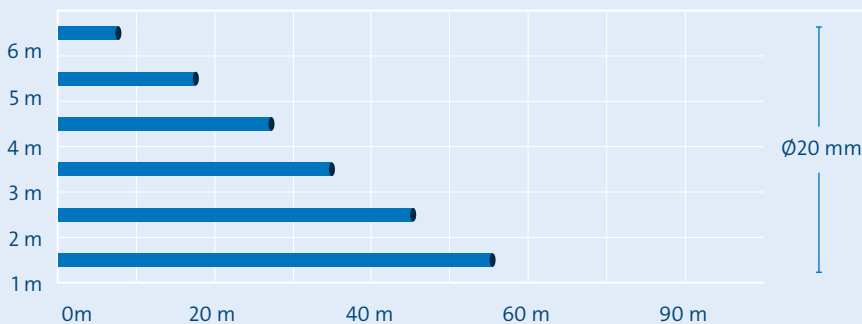
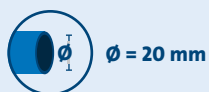
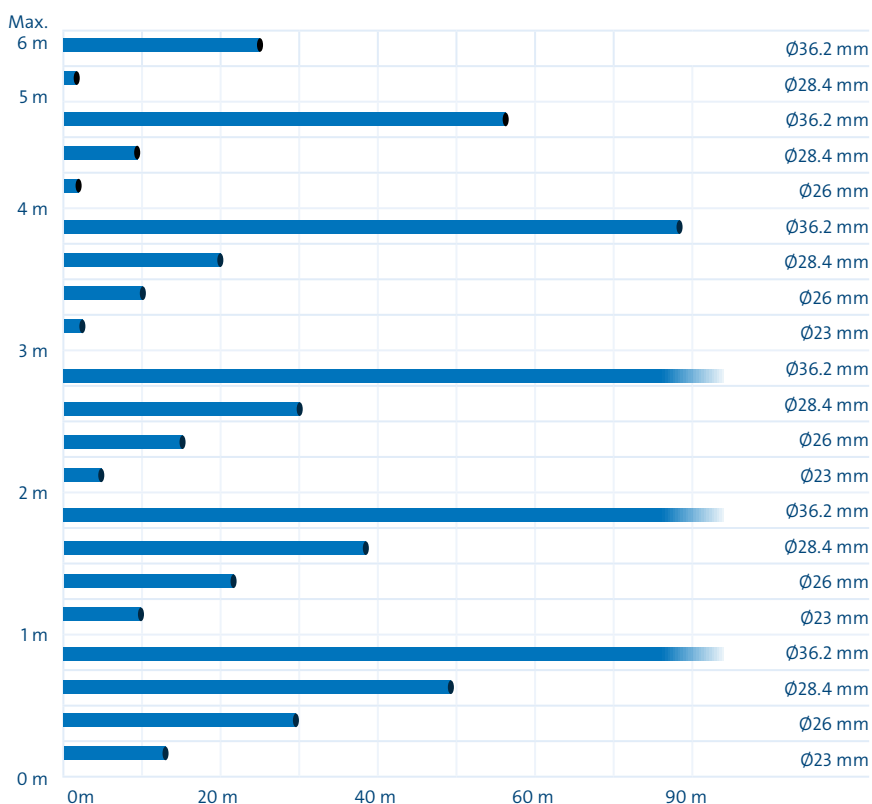
**SOLOLIFT2 WC-3**



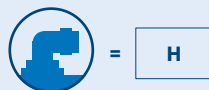
# Lifting Stations – Quick sizing



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	