

50 Hz



AFLC Series

HIGH EFFICIENCY WET ROTOR CIRCULATORS
FOR HEATING AND COOLING SYSTEMS

ErP 2009/125/EC

Cod. 191007461 Rev.B Ed.03/2013

 **LOWARA**
a xylem brand

AFLC SERIES PRODUCT RANGE CHART

TYPE	Version		Power supply		Pump coupling		Temperature of pumped liquid			Ambient temperature		Protection class
	Single	Twin	Single-phase 230 V 50 Hz	Three-phase 400 V 50 Hz	Threaded	Flanged	+15°C + +70°C	-15°C + +90°C	+15°C + +110°C	Max 30°C	Max 40°C	IP 42
AFLC 30-120 (Modbus)	•		•		•				•	•		•
AFLC (G) 32-120 (Modbus)	•	•	•						•	•		•
AFLC (G) 40-120 (Modbus)	•	•	•			•			•	•		•
AFLC 50-90 (Modbus)	•		•			•			•	•		•
AFLC (G) 50-140 (Modbus)	•	•	•			•			•	•		•
AFLC 65-90 (Modbus)	•		•			•	•			•		•
AFLC 65-120 (Modbus)	•		•			•	•			•		•
AFLC 30-120 (Modbus)	•		•		•				•		•	•
AFLC (G) 32-120 (Modbus)	•	•	•						•		•	•
AFLC (G) 40-120 (Modbus)	•	•	•			•			•		•	•
AFLC 50-90 (Modbus)	•		•			•			•		•	•
AFLC (G) 50-140 (Modbus)	•	•	•			•			•		•	•
AFLC 65-90 (Modbus)	•		•			•	•			•		•
AFLC 65-120 (Modbus)	•		•			•	•			•		•

aflc-modelli-en_a_sc

High efficiency variable speed circulators

AFLC Series



MARKET SECTORS

COMMERCIAL AND INDUSTRIAL

APPLICATIONS

- Water circulation in heating and cooling systems.
- Pumping of hot/cold liquids, chemically or mechanically non-aggressive, non-explosive, without solids or fiber matter.

SPECIFICATIONS

PUMP

- **Flow rate:** up to 60 m³/h.
- **Head:** up to 12 m.
- **Maximum operating pressure:** 10 bar (PN10).
- **Minimum operating pressure:** 0,5 bar.
- **Impeller:** made of cast iron (except for AFLC 30-120, AFLC(G) 32-120 made of composite material).
- **Temperature of pumped liquid:**

MODELS	AMBIENT TEMPERATURE	LIQUID TEMPERATURE*
30-120, 32-120, 40-120	30° C	+ 15° C ÷ + 110° C
50-90, 50-140	40° C	+ 15° C ÷ + 90° C
65-90, 65-120	30° C	+ 15° C ÷ + 90° C
	40° C	+ 15° C ÷ + 70° C

* Non-freezing, non-condensing.

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MOTOR

- Permanent magnet wet rotor type motor, with bearings lubricated by the pumped liquid. Built-in automatic motor protection with isothermal probes (with external relay, terminals accessible from the terminal board).
- Single-phase 230 V 50 Hz power supply.
- Motor-mounted inverter, with selector switch for mode and operating parameter selection and terminal board for cable connection.
- **Insulation class** 155 (F).
- **Protection class** IP 42.

CONSTRUCTION CHARACTERISTICS

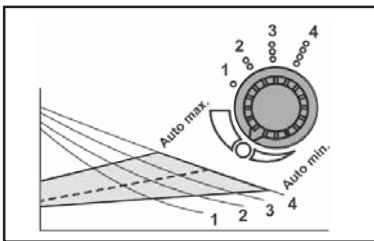
- Electric circulator pumps with in-line suction and discharge ports, designed for direct installation onto piping, DN 32, 40, 50, 65, 80 mounting flanges and 2" threaded connection (AFLC 30-120).
- According to EN standards 60335-1, 60335-2-51, 61000-6-2, 61000-6-3, 16297-1, 16297-2.
- Single or twin pump design. The two pumps can operate separately or in parallel in the following manner:
 - Separately: both differential pressure and controlled speed can be selected.
 - Parallel: controlled speed regulation only (speed selection from 1 to 4).
- Rotor shaft made of perforated stainless steel. By enabling water circulation this design ensures:
 - continuous degassing of the rotor chamber, with no need to perform this operation manually during startup;
 - bearing lubrication.

AFLC Series

- 3 modes of regulation:
 - Differential pressure.
 - Controlled speed from 1 to 4.
 - From remote via 0-10 V signal.
 - From remote via Modbus (see "Modbus version").
- On the terminal box 2 LED indicate the running status:
 - Green LED: normal operation.
 - Red LED: failure detected by the electronics or remote start/stop disconnected.

Control modes

- Differential pressure - selectable from the knob on the ter.
Thanks to the losses compensation system of the electronics, the controller adjusts the circulator's differential pressure to match the required flow.
- Controlled speed.
The motor running speed is fixed at the value set with the selector between 1 and 4.
- 0-10 V signal.
The speed can be controlled infinitely from remote between minimum speed (0 V) and maximum speed (10 V).
- Additional signals available:
 - Remote start-stop function.
 - Alarm function.



Modbus version.

The Modbus version includes all the features of the standard version described above and it additionally supports RS-485 settings. The RS-485 signal allows the connection of the circulator to a BMS system or a PLC.

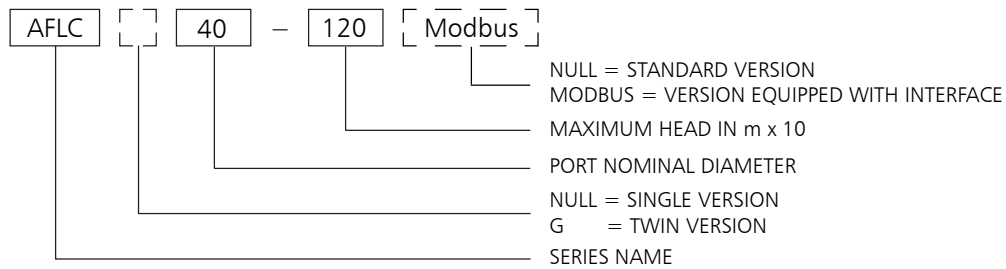
ACCESSORIES

- Blind flanges.
- Counterflanges.

INSTALLATION

- Suitable for installation in horizontal or vertical piping, in any position provided that motor axis is horizontal.
- Never install the circulator with the terminal box under the motor(s) (6 o'clock).
- For the twin design installed on horizontal piping, periodic changeover is recommended in order to prevent the formation of water pockets at the top; as an alternative, install an air bleed valve on the flange.
- For installation onto vertical piping the flow should always be upward. If not it is recommended to install an air venting point in the higher point of the circuit at the suction side.

AFLC SERIES IDENTIFICATION CODE



EXAMPLE : AFLCG 40-120

AFLC electronic circulator series, twin version, port nominal diameter = 40, max head = 12 m.

TABLE OF MATERIALS

PART	MATERIAL
Pump body	Cast iron
Impeller up to AFLC(G) 32-120	Composite material
Impeller from AFLC(G) 40-120	Cast iron
Shaft	Stainless steel
Jacket	Stainless steel
Bearings	Graphite
Gaskets	EPDM

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Regulations (EC) n. 641/2009 and (EU) n. 622/2012 – Annex I – point 2 (Product information requirements)

- Energy efficiency index: see the EEI column in the tables in the Hydraulic performance section.
- "The benchmark for most efficient circulators is $EEI \leq 0,20$ ".
- Information relevant for disassembly, recycling or disposal at end-of-life: observe the current laws and by-laws governing sorted waste disposal. Consult the product operating manual.
- Information for circulators specifically designed to potable water uses: note not applicable to these products.

AFLC(G) SERIES (SINGLE VERSION, SINGLE-PHASE) HYDRAULIC PERFORMANCE TABLE

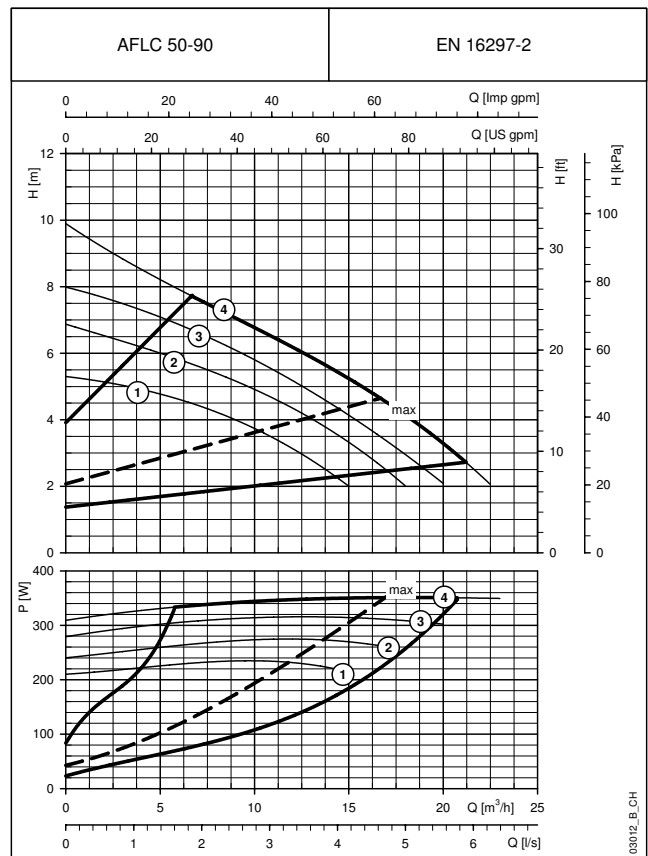
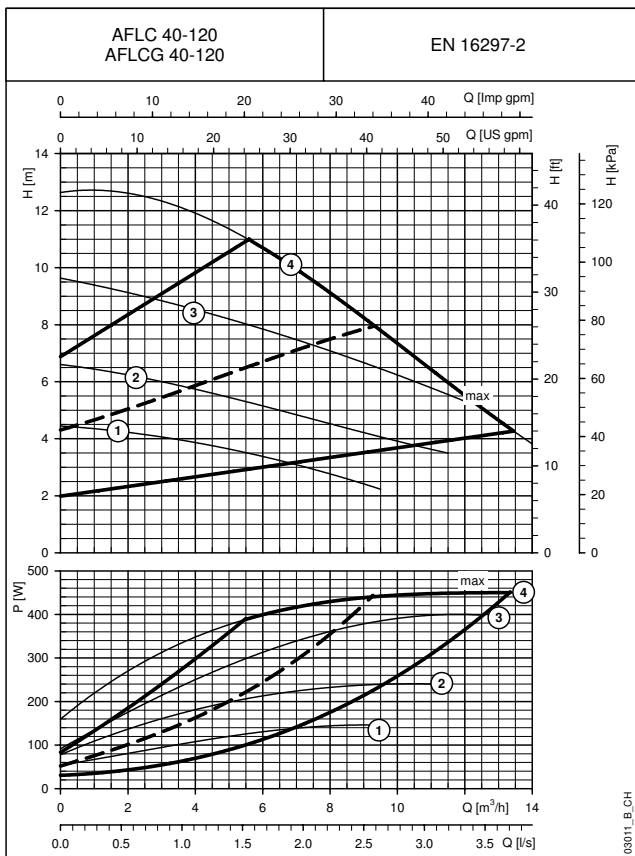
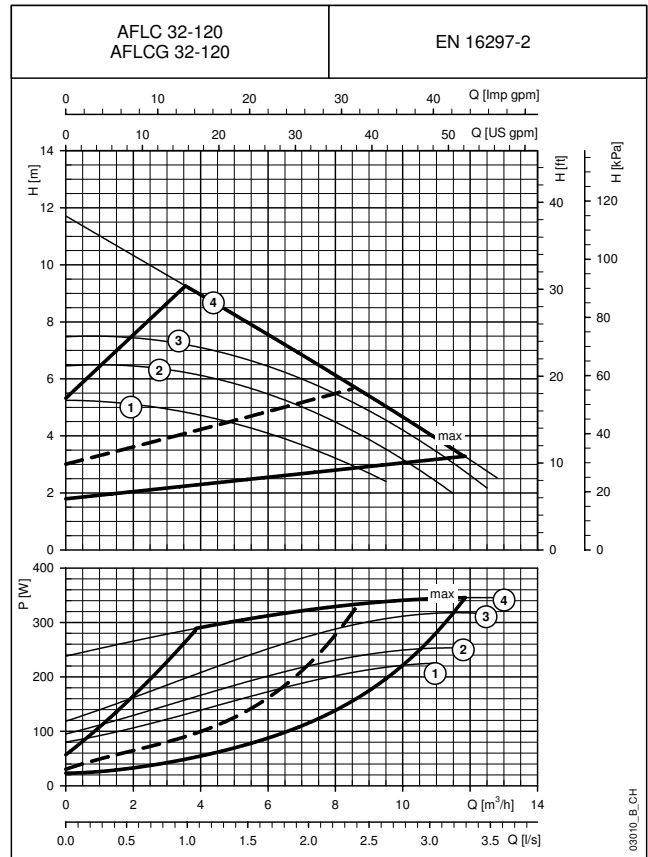
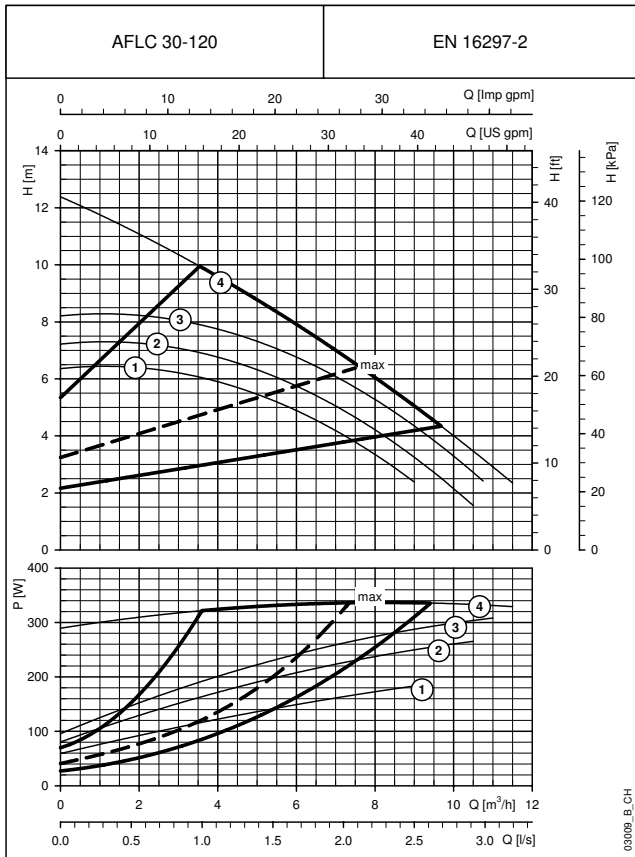
PUMP TYPE	EEI ≤ (1)	POWER ABSORBED		CURRENT ABSORBED		SPEED	Q = DELIVERY													
		MIN W	MAX W	MIN A	MAX A		l/s 0	1,4	2,2	2,8	4,2	5,6	6,9	8,3	9,7	11,1	13,9			
							m ³ /h 0	5	8	10	15	20	25	30	35	40	50			
230V 50Hz	(1)						H = TOTAL HEAD METRES COLUMN OF WATER													
AFLC 30-120 (Modbus)	0,27	30	340	0,25	2,10	1	6,4	5,5	3,3											
						2	7,2	6,3	4,2	2,2										
						3	8,2	7,3	5,3	3,3										
						4	12,4	8,8	6,1	4,0										
						max	5,3	8,8	6,1	4,0										
AFLC(G) 32-120 (Modbus)	0,27	25	350	0,21	2,30	1	5,3	4,4	3,2	2,1										
						2	6,5	5,8	4,5	3,2										
						3	7,5	6,8	5,5	4,2										
						4	11,7	8,3	6,1	4,7										
						max	5,3	8,3	6,1	4,7										
AFLC(G) 40-120 (Modbus)	0,27	27	450	0,22	2,70	1	4,4	3,6	2,8											
						2	6,6	5,4	4,5	3,9										
						3	9,6	8,2	7,1	6,2										
						4	12,6	11,4	9,1	7,3										
						max	6,9	10,6	9,1	7,3										
AFLC 50-90 (Modbus)	0,27	25	350	0,21	2,30	1	5,3	4,8	4,2	3,7	2,0									
						2	6,8	6,0	5,4	4,9	3,3									
						3	8,0	7,1	6,4	5,8	4,1	2,1								
						4	9,9	8,2	7,3	6,8	5,2	3,3								
						max	3,9	6,8	7,3	6,8	5,2	3,3								
AFLC(G) 50-140 (Modbus)	0,27	60	700	0,40	4,50	1	4,8	4,8	4,5	4,2	3,0									
						2	6,3	6,2	6,0	5,7	4,5	2,9								
						3	7,2	7,2	6,9	6,6	5,5	3,8								
						4	14,1	11,2	9,8	8,9	6,9	4,9	2,8							
						max	6,0	11,2	9,8	8,9	6,9	4,9	2,8							
AFLC 65-90 (Modbus)	0,27	60	700	0,40	4,50	1	4,2	4,2	4,2	4,1	3,9	3,4	2,7	1,8						
						2	5,3	5,3	5,3	5,2	4,9	4,5	3,8	2,9						
						3	6,0	6,1	6,0	6,0	5,7	5,3	4,6	3,8	2,6					
						4	9,0	8,2	7,7	7,4	6,6	5,7	4,8	3,8	2,7					
						max	3,7	5,3	6,3	7,0	6,6	5,7	4,8	3,8	2,7					
AFLC 65-120 (Modbus)	0,27	100	1400	0,90	9,50	1	5,1	5,1	5,1	5,0	4,7	4,1	3,4	2,4						
						2	6,6	6,6	6,6	6,5	6,2	5,6	4,9	4,0	2,9					
						3	8,0	8,1	8,1	8,0	7,7	7,1	6,4	5,5	4,4	3,1				
						4	12,1	11,7	11,4	11,1	10,4	9,5	8,4	7,2	5,9	4,4				
						max	5,8	7,5	8,6	9,3	10,4	9,5	8,4	7,2	5,9	4,4				

Performances according to standards EN 16297-2.

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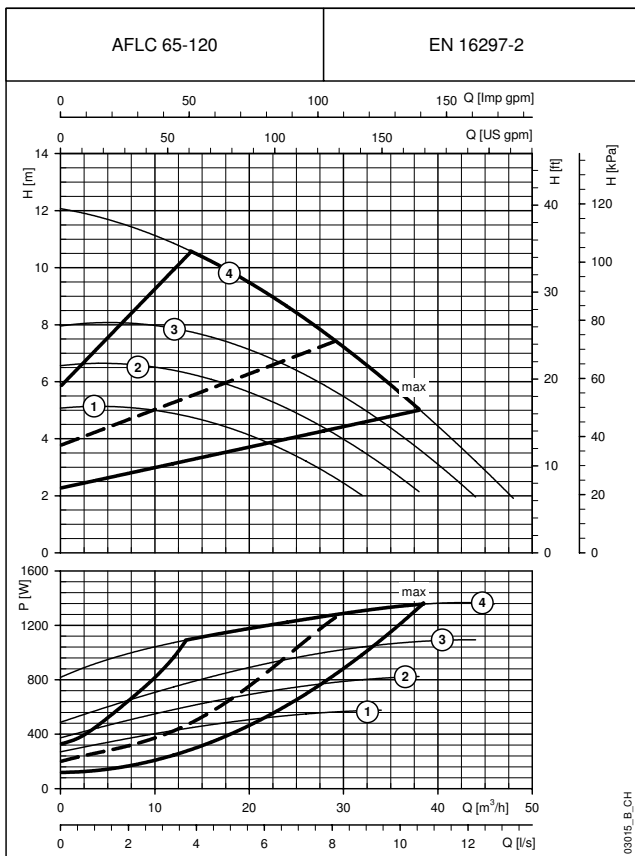
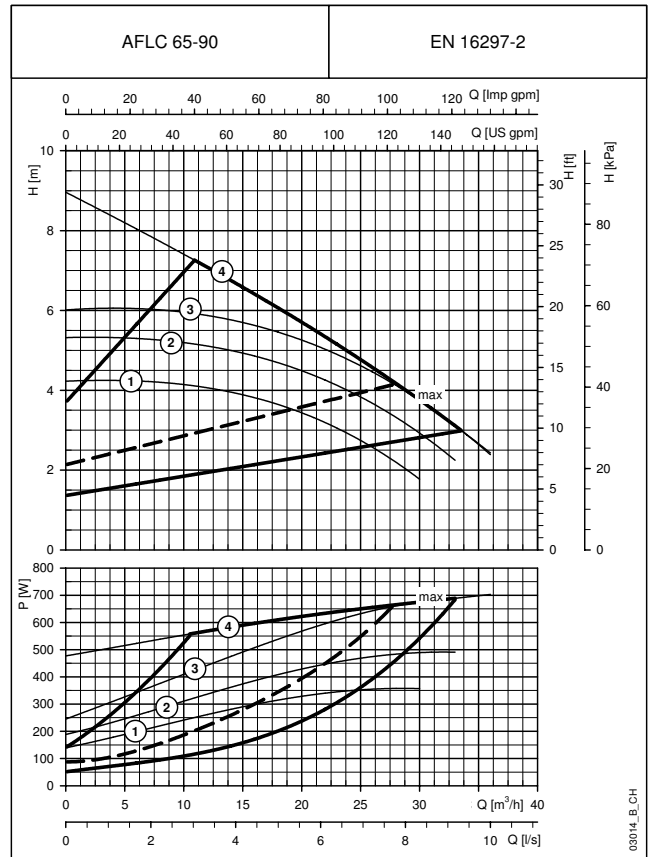
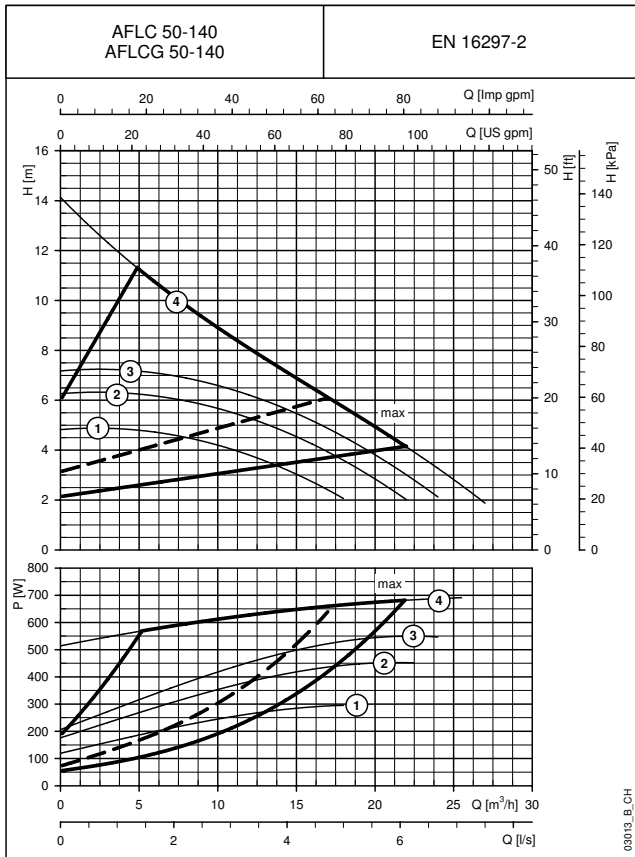
(1) Energy efficiency index.

AFLC(G) SERIES SINGLE VERSION, SINGLE-PHASE OPERATING CHARACTERISTICS



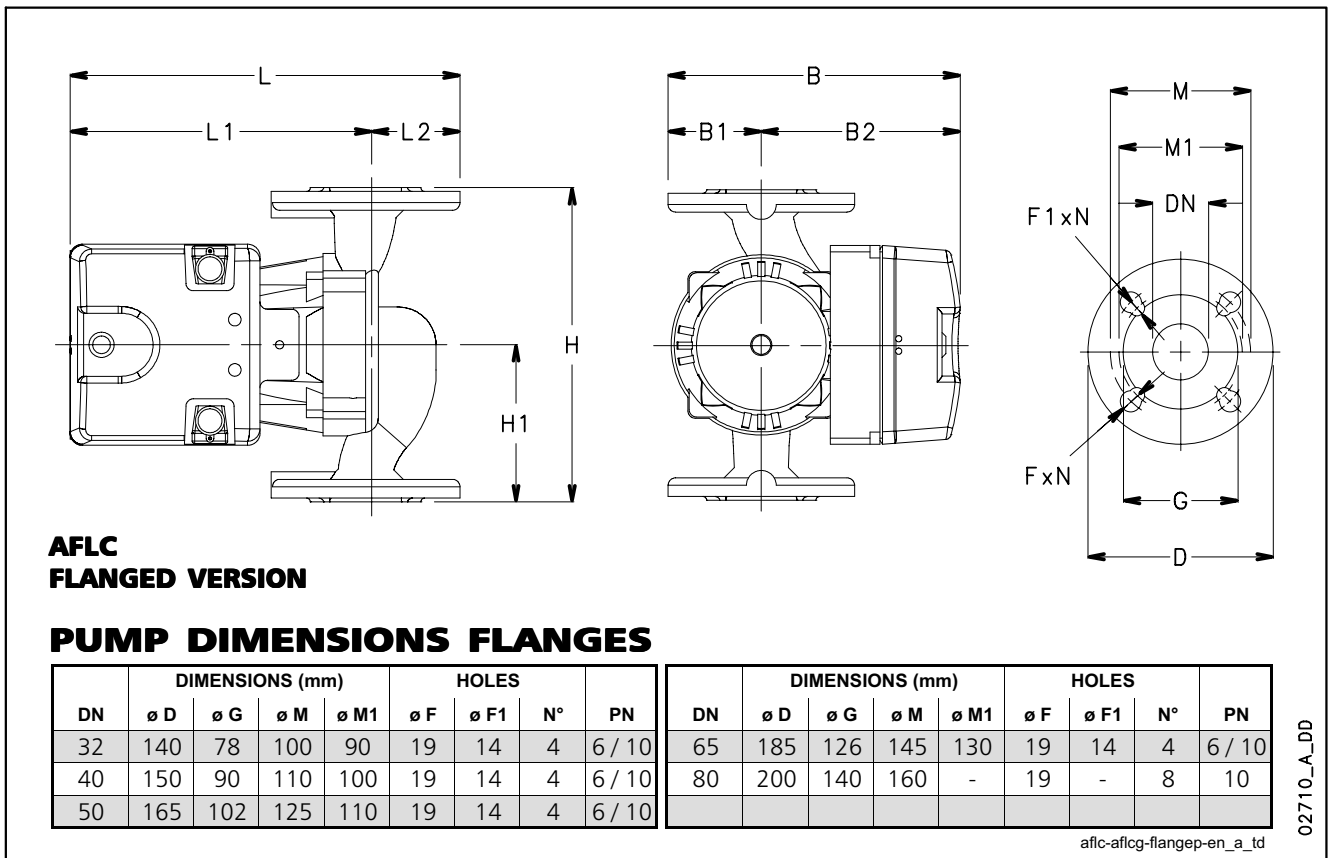
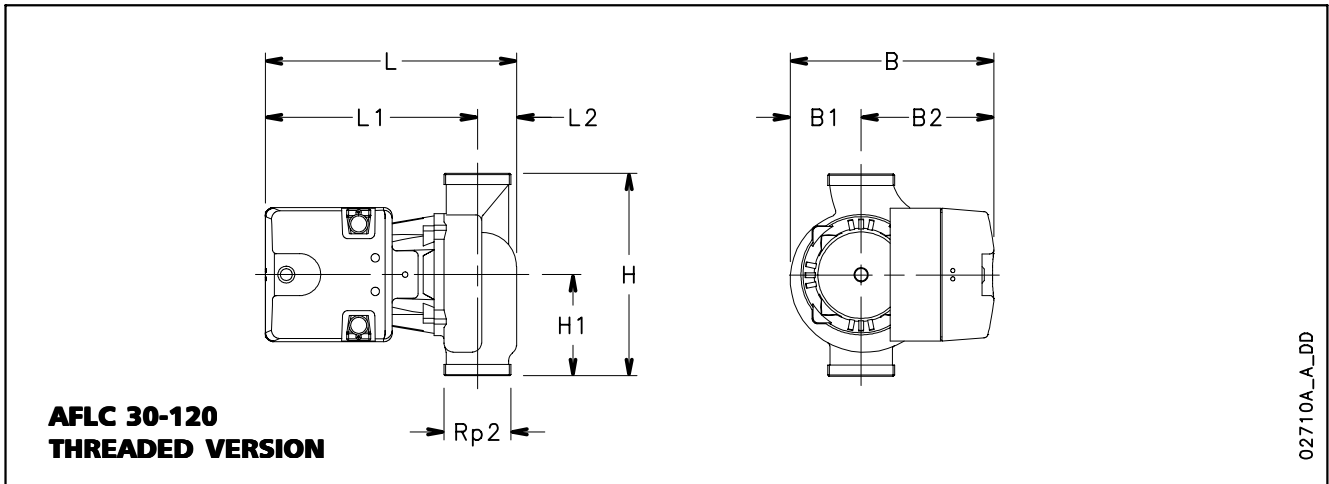
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.

**AFLC(G) SERIES
SINGLE VERSION, SINGLE-PHASE OPERATING CHARACTERISTICS**



These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.

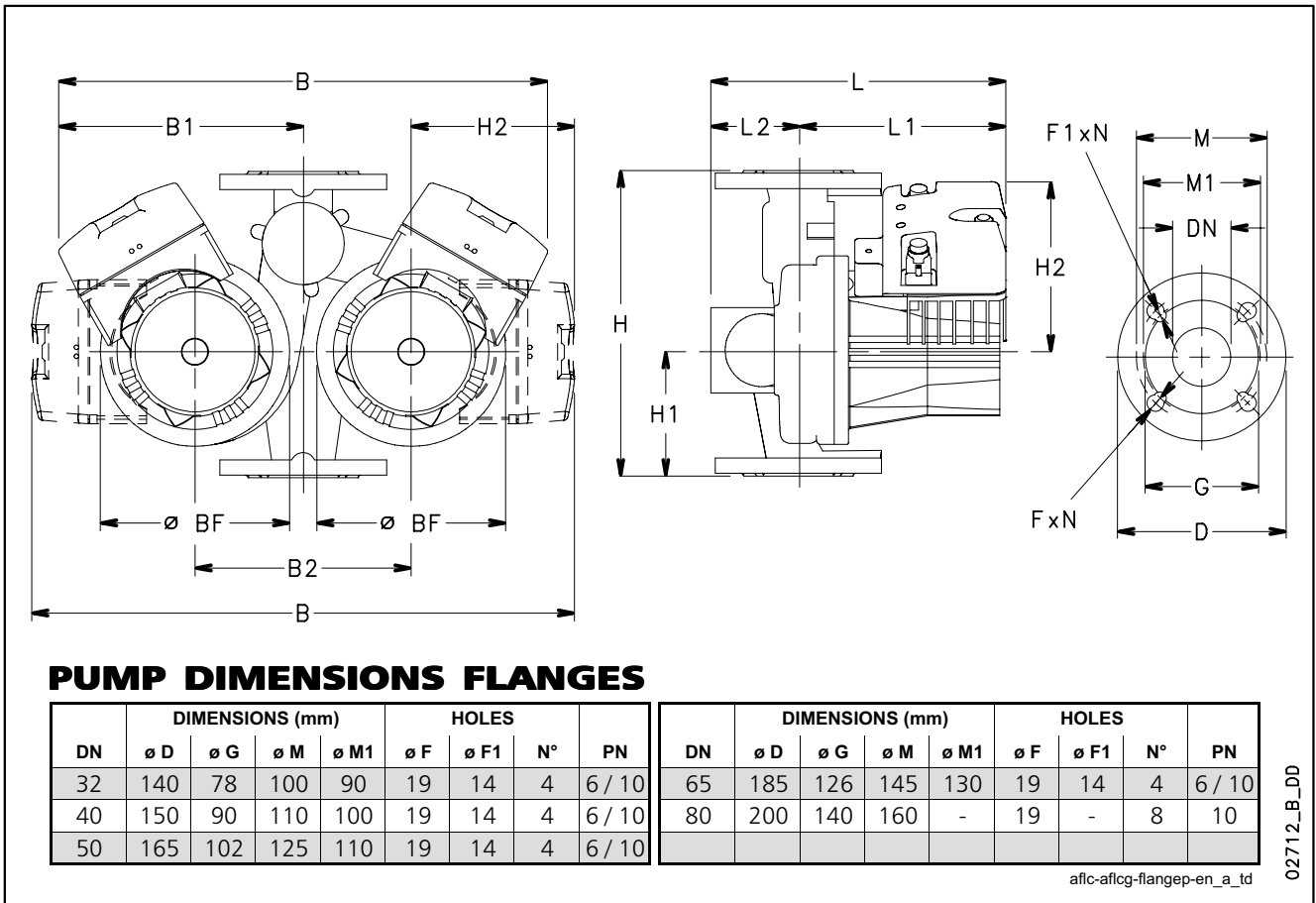
AFLC SERIES DIMENSIONS AND WEIGHTS



DIMENSIONS AND WEIGHTS TABLE

PUMP TYPE	DIMENSIONS (mm)									WEIGHT kg
	B	B1	B2	H	H1	L	L1	L2	DN	
AFLC 30-120	225	75	150	180	90	265	230	35	-	8,6
AFLC 32-120	220	70	150	220	125	285	215	70	32	12,8
AFLC 40-120	225	75	150	250	125	290	215	75	40	12,8
AFLC 50-90	255	95	160	280	140	300	225	75	50	13,5
AFLC 50-140	255	95	160	280	140	320	235	85	50	19,6
AFLC 65-90	270	105	165	340	170	315	230	85	65	25,5
AFLC 65-120	285	105	180	340	170	328	235	93	65	36,5

AFLCG SERIES DIMENSIONS AND WEIGHTS

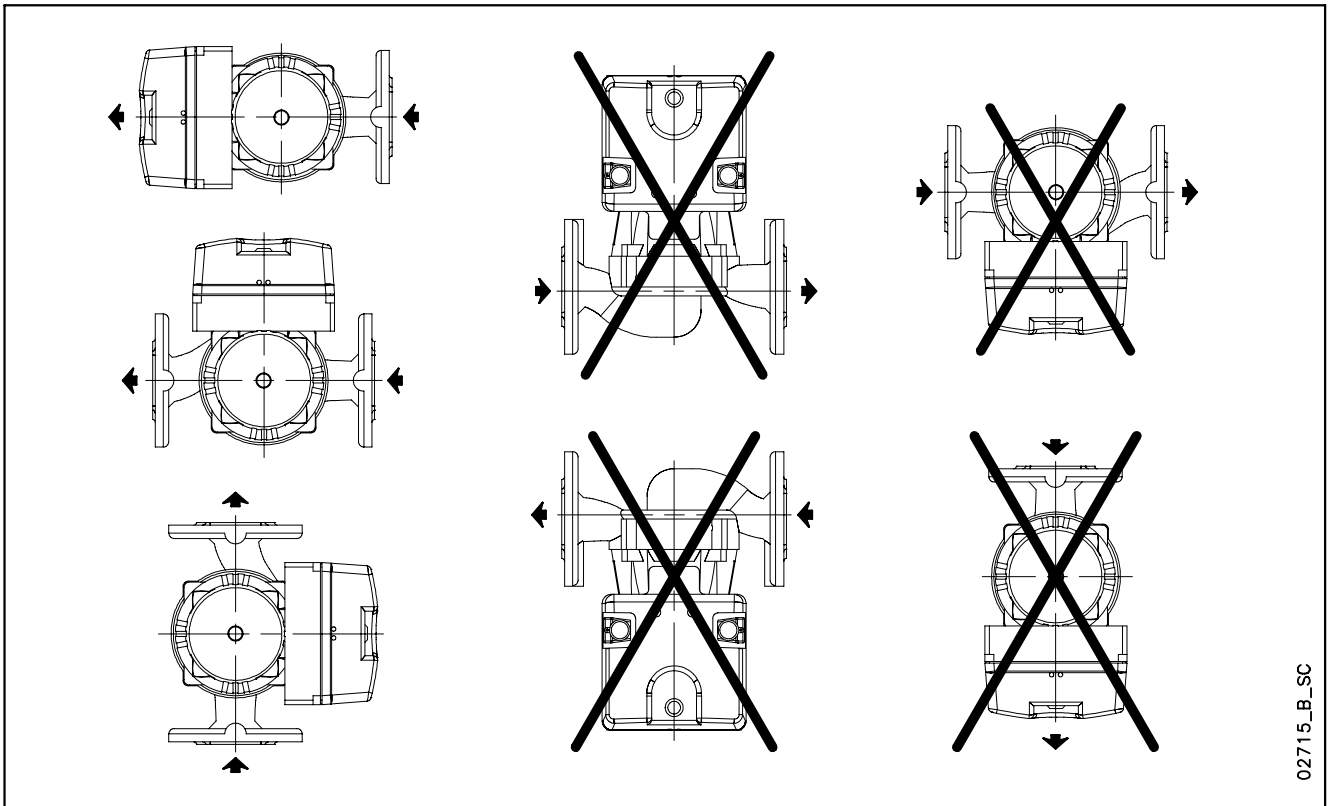


DIMENSIONS AND WEIGHTS TABLE

PUMP TYPE	DIMENSIONS (mm)											WEIGHT kg
	B	B1	B2	H	H1	H2	L	L1	L2	ø BF	DN	
AFLCG 32-120	350	180	200	220	110	160	300	230	70	135	32	21,7
AFLCG 40-120	436	218	200	250	105	170	290	215	75	135	40	22
AFLCG 50-140	490	187	200	280	120	170	318	235	82,5	161	50	34,1

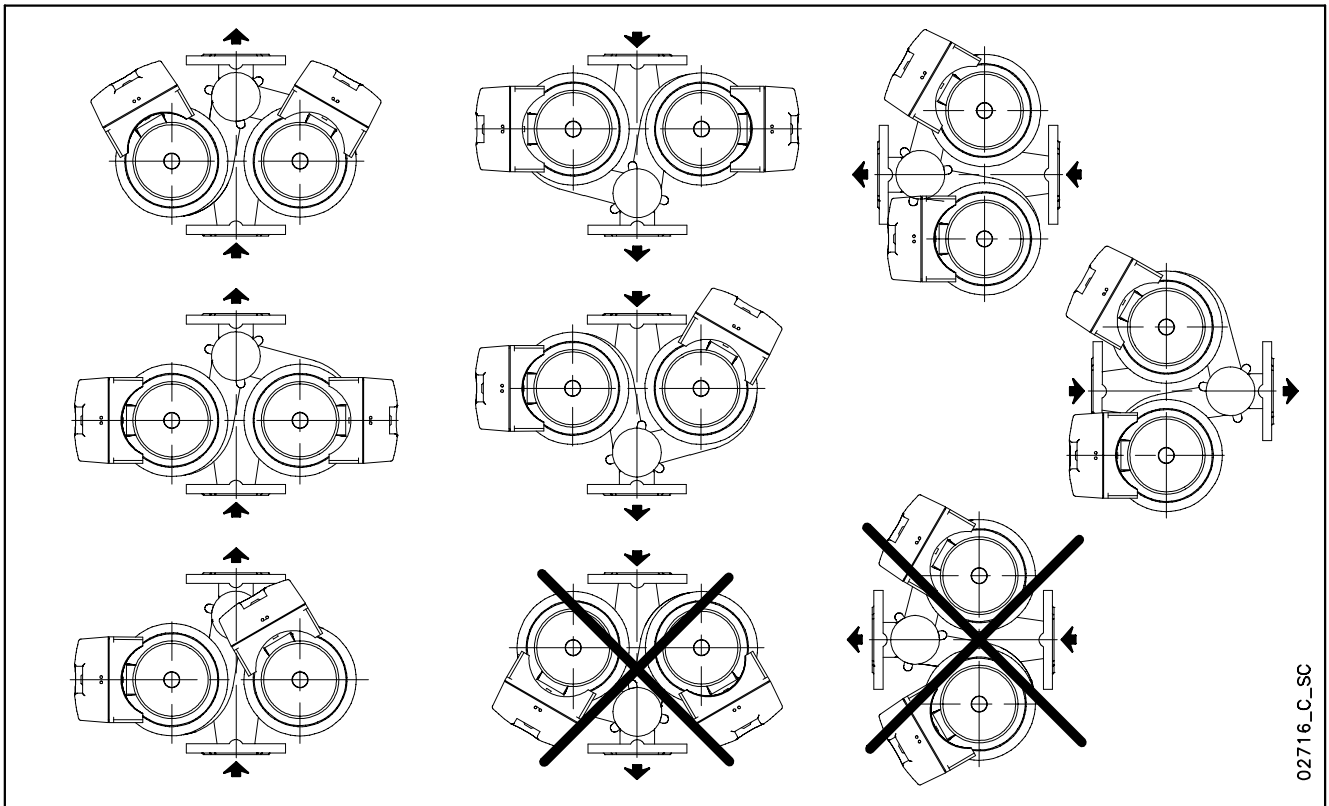
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**AFLC SERIES
INSTALLATION POSITIONS**



02715_B_SC

**AFLCG SERIES
INSTALLATION POSITIONS**



02716_C_SC

TECHNICAL APPENDIX

VAPOUR PRESSURE VAPOUR PRESSURE p_s AND ρ DENSITY OF WATER TABLE

t °C	T K	p_s bar	ρ kg/dm ³	t °C	T K	p_s bar	ρ kg/dm ³	t °C	T K	p_s bar	ρ kg/dm ³
0	273,15	0,00611	0,9998	55	328,15	0,15741	0,9857	120	393,15	1,9854	0,9429
1	274,15	0,00657	0,9999	56	329,15	0,16511	0,9852	122	395,15	2,1145	0,9412
2	275,15	0,00706	0,9999	57	330,15	0,17313	0,9846	124	397,15	2,2504	0,9396
3	276,15	0,00758	0,9999	58	331,15	0,18147	0,9842	126	399,15	2,3933	0,9379
4	277,15	0,00813	1,0000	59	332,15	0,19016	0,9837	128	401,15	2,5435	0,9362
5	278,15	0,00872	1,0000	60	333,15	0,1992	0,9832	130	403,15	2,7013	0,9346
6	279,15	0,00935	1,0000	61	334,15	0,2086	0,9826	132	405,15	2,867	0,9328
7	280,15	0,01001	0,9999	62	335,15	0,2184	0,9821	134	407,15	3,041	0,9311
8	281,15	0,01072	0,9999	63	336,15	0,2286	0,9816	136	409,15	3,223	0,9294
9	282,15	0,01147	0,9998	64	337,15	0,2391	0,9811	138	411,15	3,414	0,9276
10	283,15	0,01227	0,9997	65	338,15	0,2501	0,9805	140	413,15	3,614	0,9258
11	284,15	0,01312	0,9997	66	339,15	0,2615	0,9799	145	418,15	4,155	0,9214
12	285,15	0,01401	0,9996	67	340,15	0,2733	0,9793	155	428,15	5,433	0,9121
13	286,15	0,01497	0,9994	68	341,15	0,2856	0,9788	160	433,15	6,181	0,9073
14	287,15	0,01597	0,9993	69	342,15	0,2984	0,9782	165	438,15	7,008	0,9024
15	288,15	0,01704	0,9992	70	343,15	0,3116	0,9777	170	433,15	7,920	0,8973
16	289,15	0,01817	0,9990	71	344,15	0,3253	0,9770	175	448,15	8,924	0,8921
17	290,15	0,01936	0,9988	72	345,15	0,3396	0,9765	180	453,15	10,027	0,8869
18	291,15	0,02062	0,9987	73	346,15	0,3543	0,9760	185	458,15	11,233	0,8815
19	292,15	0,02196	0,9985	74	347,15	0,3696	0,9753	190	463,15	12,551	0,8760
20	293,15	0,02337	0,9983	75	348,15	0,3855	0,9748	195	468,15	13,987	0,8704
21	294,15	0,24850	0,9981	76	349,15	0,4019	0,9741	200	473,15	15,550	0,8647
22	295,15	0,02642	0,9978	77	350,15	0,4189	0,9735	205	478,15	17,243	0,8588
23	296,15	0,02808	0,9976	78	351,15	0,4365	0,9729	210	483,15	19,077	0,8528
24	297,15	0,02982	0,9974	79	352,15	0,4547	0,9723	215	488,15	21,060	0,8467
25	298,15	0,03166	0,9971	80	353,15	0,4736	0,9716	220	493,15	23,198	0,8403
26	299,15	0,03360	0,9968	81	354,15	0,4931	0,9710	225	498,15	25,501	0,8339
27	300,15	0,03564	0,9966	82	355,15	0,5133	0,9704	230	503,15	27,976	0,8273
28	301,15	0,03778	0,9963	83	356,15	0,5342	0,9697	235	508,15	30,632	0,8205
29	302,15	0,04004	0,9960	84	357,15	0,5557	0,9691	240	513,15	33,478	0,8136
30	303,15	0,04241	0,9957	85	358,15	0,5780	0,9684	245	518,15	36,523	0,8065
31	304,15	0,04491	0,9954	86	359,15	0,6011	0,9678	250	523,15	39,776	0,7992
32	305,15	0,04753	0,9951	87	360,15	0,6249	0,9671	255	528,15	43,246	0,7916
33	306,15	0,05029	0,9947	88	361,15	0,6495	0,9665	260	533,15	46,943	0,7839
34	307,15	0,05318	0,9944	89	362,15	0,6749	0,9658	265	538,15	50,877	0,7759
35	308,15	0,05622	0,9940	90	363,15	0,7011	0,9652	270	543,15	55,058	0,7678
36	309,15	0,05940	0,9937	91	364,15	0,7281	0,9644	275	548,15	59,496	0,7593
37	310,15	0,06274	0,9933	92	365,15	0,7561	0,9638	280	553,15	64,202	0,7505
38	311,15	0,06624	0,9930	93	366,15	0,7849	0,9630	285	558,15	69,186	0,7415
39	312,15	0,06991	0,9927	94	367,15	0,8146	0,9624	290	563,15	74,461	0,7321
40	313,15	0,07375	0,9923	95	368,15	0,8453	0,9616	295	568,15	80,037	0,7223
41	314,15	0,07777	0,9919	96	369,15	0,8769	0,9610	300	573,15	85,927	0,7122
42	315,15	0,08198	0,9915	97	370,15	0,9094	0,9602	305	578,15	92,144	0,7017
43	316,15	0,09639	0,9911	98	371,15	0,9430	0,9596	310	583,15	98,70	0,6906
44	317,15	0,09100	0,9907	99	372,15	0,9776	0,9586	315	588,15	105,61	0,6791
45	318,15	0,09582	0,9902	100	373,15	1,0133	0,9581	320	593,15	112,89	0,6669
46	319,15	0,10086	0,9898	102	375,15	1,0878	0,9567	325	598,15	120,56	0,6541
47	320,15	0,10612	0,9894	104	377,15	1,1668	0,9552	330	603,15	128,63	0,6404
48	321,15	0,11162	0,9889	106	379,15	1,2504	0,9537	340	613,15	146,05	0,6102
49	322,15	0,11736	0,9884	108	381,15	1,3390	0,9522	350	623,15	165,35	0,5743
50	323,15	0,12335	0,9880	110	383,15	1,4327	0,9507	360	633,15	186,75	0,5275
51	324,15	0,12961	0,9876	112	385,15	1,5316	0,9491	370	643,15	210,54	0,4518
52	325,15	0,13613	0,9871	114	387,15	1,6362	0,9476	374,15	647,30	221,20	0,3154
53	326,15	0,14293	0,9862	116	389,15	1,7465	0,9460				
54	327,15	0,15002	0,9862	118	391,15	1,8628	0,9445				

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TABLE OF FLOW RESISTANCE IN 100 m OF STRAIGHT CAST IRON PIPELINE (HAZEN-WILLIAMS FORMULA C=100)

FLOW RATE		NOMINAL DIAMETER in mm and inches																		
m ³ /h	l/min		15	20	25	32	40	50	65	80	100	125	150	175	200	250	300	350	400	
			1/2"	3/4"	1"	1 1/4"	1 1/2"	2	2 1/2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	
0,6	10	v	0,94	0,53	0,34	0,21	0,13													
		hr	16	3,94	1,33	0,40	0,13													
0,9	15	v	1,42	0,80	0,51	0,31	0,20													
		hr	33,9	8,35	2,82	0,85	0,29													
1,2	20	v	1,89	1,06	0,68	0,41	0,27	0,17												
		hr	57,7	14,21	4,79	1,44	0,49	0,16												
1,5	25	v	2,36	1,33	0,85	0,52	0,33	0,21												
		hr	87,2	21,5	7,24	2,18	0,73	0,25												
1,8	30	v	2,83	1,59	1,02	0,62	0,40	0,25												
		hr	122	30,1	10,1	3,05	1,03	0,35												
2,1	35	v	3,30	1,86	1,19	0,73	0,46	0,30												
		hr	162	40,0	13,5	4,06	1,37	0,46												
2,4	40	v		2,12	1,36	0,83	0,53	0,34	0,20											
		hr		51,2	17,3	5,19	1,75	0,59	0,16											
3	50	v		2,65	1,70	1,04	0,66	0,42	0,25											
		hr		77,4	26,1	7,85	2,65	0,89	0,25											
3,6	60	v		3,18	2,04	1,24	0,80	0,51	0,30											
		hr		108	36,6	11,0	3,71	1,25	0,35											
4,2	70	v		3,72	2,38	1,45	0,93	0,59	0,35											
		hr		144	48,7	14,6	4,93	1,66	0,46											
4,8	80	v		4,25	2,72	1,66	1,06	0,68	0,40											
		hr		185	62,3	18,7	6,32	2,13	0,59											
5,4	90	v			3,06	1,87	1,19	0,76	0,45	0,30										
		hr			77,5	23,3	7,85	2,65	0,74	0,27										
6	100	v			3,40	2,07	1,33	0,85	0,50	0,33										
		hr			94,1	28,3	9,54	3,22	0,90	0,33										
7,5	125	v			4,25	2,59	1,66	1,06	0,63	0,41										
		hr			142	42,8	14,4	4,86	1,36	0,49										
9	150	v				3,11	1,99	1,27	0,75	0,50	0,32									
		hr				59,9	20,2	6,82	1,90	0,69	0,23									
10,5	175	v				3,63	2,32	1,49	0,88	0,58	0,37									
		hr				79,7	26,9	9,07	2,53	0,92	0,31									
12	200	v				4,15	2,65	1,70	1,01	0,66	0,42									
		hr				102	34,4	11,6	3,23	1,18	0,40									
15	250	v				5,18	3,32	2,12	1,26	0,83	0,53	0,34								
		hr				154	52,0	17,5	4,89	1,78	0,60	0,20								
18	300	v					3,98	2,55	1,51	1,00	0,64	0,41								
		hr					72,8	24,6	6,85	2,49	0,84	0,28								
24	400	v					5,31	3,40	2,01	1,33	0,85	0,54	0,38							
		hr					124	41,8	11,66	4,24	1,43	0,48	0,20							
30	500	v					6,63	4,25	2,51	1,66	1,06	0,68	0,47							
		hr					187	63,2	17,6	6,41	2,16	0,73	0,30							
36	600	v						5,10	3,02	1,99	1,27	0,82	0,57	0,42						
		hr						88,6	24,7	8,98	3,03	1,02	0,42	0,20						
42	700	v						5,94	3,52	2,32	1,49	0,95	0,66	0,49						
		hr						118	32,8	11,9	4,03	1,36	0,56	0,26						
48	800	v						6,79	4,02	2,65	1,70	1,09	0,75	0,55						
		hr						151	42,0	15,3	5,16	1,74	0,72	0,34						
54	900	v						7,64	4,52	2,99	1,91	1,22	0,85	0,62						
		hr						188	52,3	19,0	6,41	2,16	0,89	0,42						
60	1000	v							5,03	3,32	2,12	1,36	0,94	0,69	0,53					
		hr							63,5	23,1	7,79	2,63	1,08	0,51	0,27					
75	1250	v							6,28	4,15	2,65	1,70	1,18	0,87	0,66					
		hr							96,0	34,9	11,8	3,97	1,63	0,77	0,40					
90	1500	v							7,54	4,98	3,18	2,04	1,42	1,04	0,80					
		hr							134	48,9	16,5	5,57	2,29	1,08	0,56					
105	1750	v							8,79	5,81	3,72	2,38	1,65	1,21	0,93					
		hr							179	65,1	21,9	7,40	3,05	1,44	0,75					
120	2000	v								6,63	4,25	2,72	1,89	1,39	1,06	0,68				
		hr								83,3	28,1	9,48	3,90	1,84	0,96	0,32				
150	2500	v								8,29	5,31	3,40	2,36	1,73	1,33	0,85				
		hr								126	42,5	14,3	5,89	2,78	1,45	0,49				
180	3000	v									6,37	4,08	2,83	2,08	1,59	1,02	0,71			
		hr									59,5	20,1	8,26	3,90	2,03	0,69	0,28			
210	3500	v									7,43	4,76	3,30	2,43	1,86	1,19	0,83			
		hr									79,1	26,7	11,0	5,18	2,71	0,91	0,38			
240	4000	v									8,49	5,44	3,77	2,77	2,12	1,36	0,94			
		hr									101	34,2	14,1	6,64	3,46	1,17	0,48			
300	5000	v										6,79	4,72	3,47	2,65	1,70	1,18			
		hr										51,6	21,2	10,0	5,23	1,77	0,73			
360	6000	v										8,15	5,66	4,16	3,18	2,04	1,42			
		hr										72,3	29,8	14,1	7,33	2,47	1,02			
420	7000	v											6,61	4,85	3,72	2,38	1,65	1,21		
		hr											39,6	18,7	9,75	3,29	1,35	0,64		
480	8000	v											7,55	5,55	4,25	2,72	1,89	1,39		
		hr											50,7	23,9	12,49	4,21	1,73	0,82		
540	9000	v											8,49	6,24	4,78	3,06	2,12	1,56	1,19	
		hr											63,0	29,8	15,5	5,24	2,16	1,02	0,53	
600	10000	v												6,93	5,31	3,40	2,36	1,73	1,33	
		hr																		

FLOW RESISTANCE

TABLE OF FLOW RESISTANCE IN BENDS, VALVES AND GATES

The flow resistance is calculated using the equivalent pipeline length method according to the table below:

ACCESSORY TYPE	DN											
	25	32	40	50	65	80	100	125	150	200	250	300
	Equivalent pipeline length (m)											
45° bend	0,2	0,2	0,4	0,4	0,6	0,6	0,9	1,1	1,5	1,9	2,4	2,8
90° bend	0,4	0,6	0,9	1,1	1,3	1,5	2,1	2,6	3,0	3,9	4,7	5,8
90° smooth bend	0,4	0,4	0,4	0,6	0,9	1,1	1,3	1,7	1,9	2,8	3,4	3,9
Union tee or cross	1,1	1,3	1,7	2,1	2,6	3,2	4,3	5,3	6,4	7,5	10,7	12,8
Gate	-	-	-	0,2	0,2	0,2	0,4	0,4	0,6	0,9	1,1	1,3
Non return valve	1,1	1,5	1,9	2,4	3,0	3,4	4,7	5,9	7,4	9,6	11,8	13,9

G-a-pcv-en_a_th

The table is valid for the Hazen Williams coefficient $C=100$ (cast iron pipework);

for steel pipework, multiply the values by 1,41;

for stainless steel, copper and coated cast iron pipework, multiply the values by 1,85;

When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.

The values given are guideline values which are bound to vary slightly according to the model, especially for gate valves and non-return valves, for which it is a good idea to check the values supplied by manufacturers.

VOLUMETRIC CAPACITY

Litres per minute l/min	Cubic metres per hour m ³ /h	Cubic feet per hour ft ³ /h	Cubic feet per minute ft ³ /min	Imp. gal. per minute Imp. gal./min	US gal. per minute Us gal./min
1,000	0,0600	2,1189	0,0353	0,2200	0,2642
16,6667	1,000	35,3147	0,5886	3,6662	4,4029
0,4719	0,0283	1,000	0,0167	0,1038	0,1247
28,3168	1,6990	60,0000	1,000	6,2288	7,4805
4,5461	0,2728	9,6326	0,1605	1,000	1,2009
3,7854	0,2271	8,0208	0,1337	0,8327	1,000

PRESSURE AND HEAD

Newton per square metre N/m ²	kilo Pascal kPa	bar bar	Pound force per square inch psi	metre of water m H ₂ O	millimetre of mercury mm Hg
1,000	0,0010	1 x 10 ⁻⁵	1.45 x 10 ⁻⁴	1.02 x 10 ⁻⁴	0,0075
1000,0000	1,000	0,0100	0,1450	0,1020	7,5006
1 x 10 ⁵	100,0000	1,000	14,5038	10,1972	750,0638
6894,7570	6,8948	0,0689	1,000	0,7031	51,7151
9806,6500	9,8067	0,0981	1,4223	1,000	73,5561
133,3220	0,1333	0,0013	0,0193	0,0136	1,000

LENGTH

millimetre mm	centimetre cm	metre m	inch in	foot ft	yard yd
1,000	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	1,000	0,0100	0,3937	0,0328	0,0109
1000,0000	100,0000	1,000	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	1,000	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	1,000	0,3333
914,4000	91,4400	0,9144	36,0000	3,0000	1,000

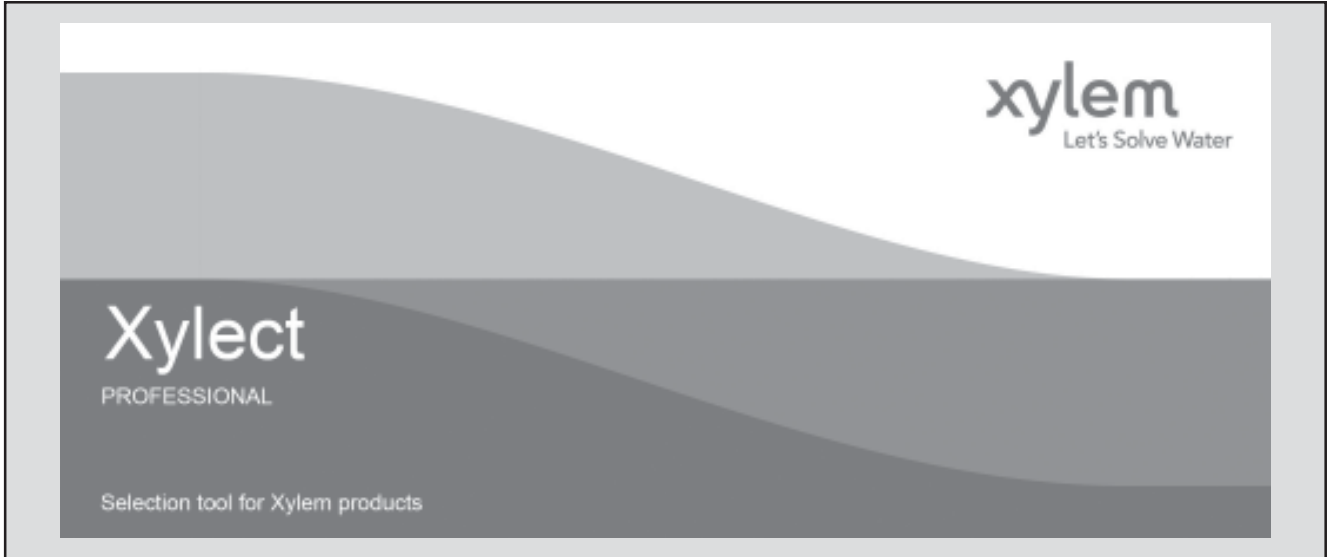
VOLUME

cubic metre m ³	litre litro	millilitre ml	imp. Gallon imp. gal.	US gallon US gal.	cubic foot ft ³
1,000	1000,0000	1 x 10 ⁶	219,9694	264,1720	35,3147
0,0010	1,000	1000,0000	0,2200	0,2642	0,0353
1 x 10 ⁻⁶	0,0010	1,000	2.2 x 10 ⁻⁴	2.642 x 10 ⁻⁴	3.53 x 10 ⁻⁵
0,0045	4,5461	4546,0870	1,000	1,2009	0,1605
0,0038	3,7854	3785,4120	0,8327	1,000	0,1337
0,0283	28,3168	28316,8466	6,2288	7,4805	1,000

G-at_pp-en_a_sc

FURTHER PRODUCT SELECTION AND DOCUMENTATION

Xylect™



Xylect™ is pump solution selection software with an extensive online database of product information across the entire Lowara, and Vogel range of pumps and related products, with multiple search options and helpful project management facilities. The system holds up-to-date product information on thousands of products and accessories.

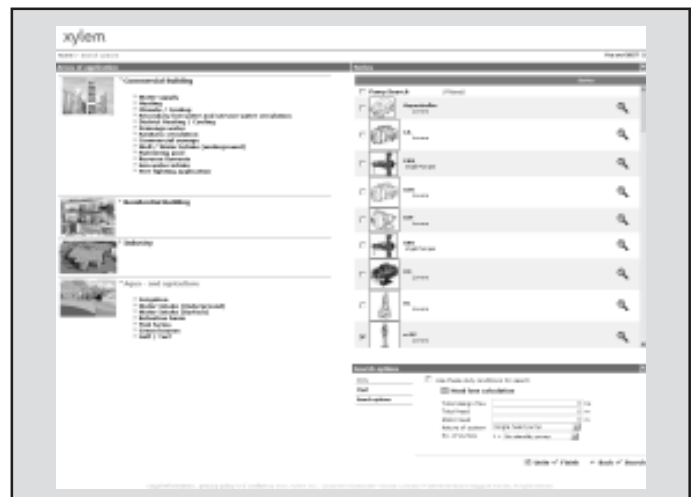
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara and Vogel products.

The search can be made by:

- Application
- Product type
- Duty point

Xylect™ gives a detailed output:

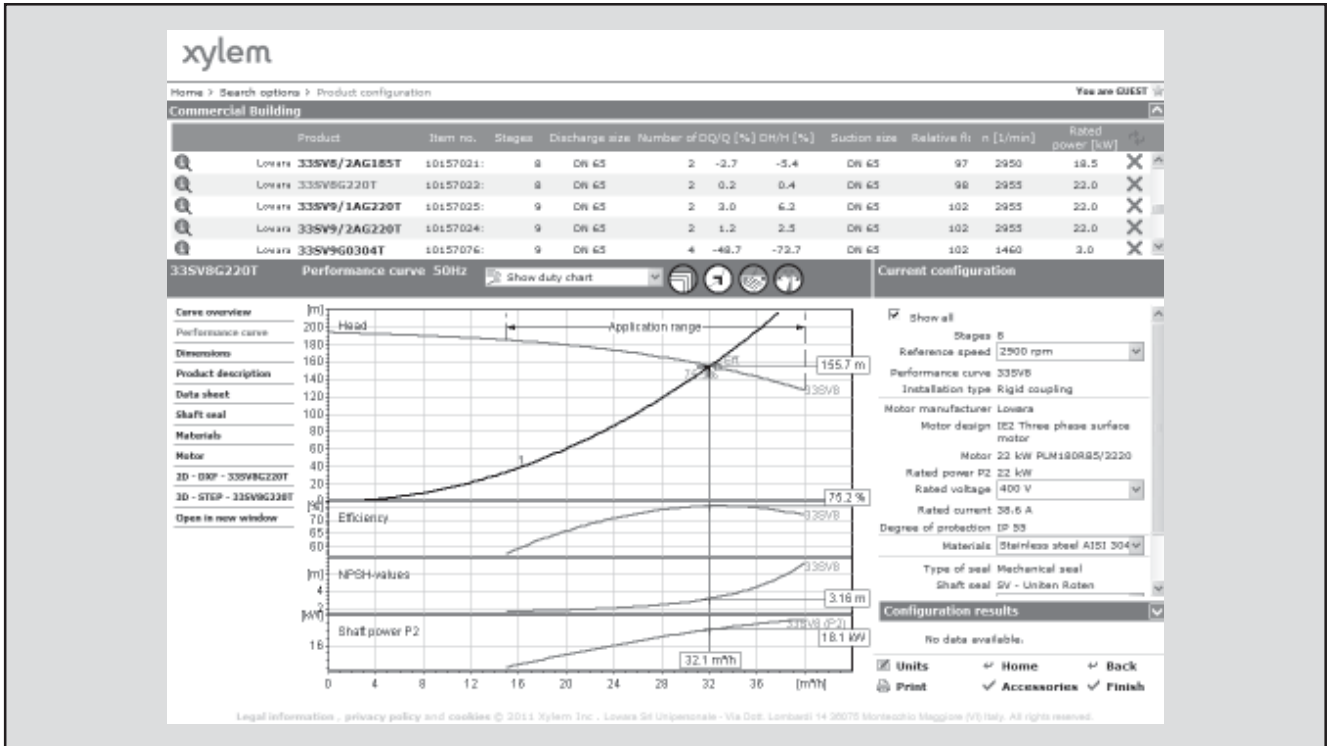
- List with search results
- Performance curves (flow, head, power, efficiency, NPSH)
- Motor data
- Dimensional drawings
- Options
- Data sheet printouts
- Document downloads incl dxf files



The search by application guides users not familiar with the product range to the right choice.

FURTHER PRODUCT SELECTION AND DOCUMENTATION

Xylect™



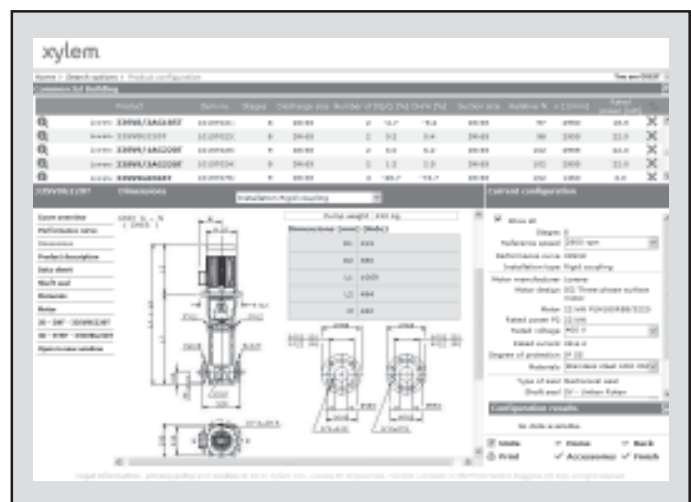
The detailed output makes it easy to select the optimal pump from the given alternatives.

The best way to work with Xylect™ is to create a personal account. This makes it possible to:

- Set own standard units
- Create and save projects
- Share projects with other Xylect™ users

Every user has a My Xylect space, where all projects are saved.

For more information about Xylect™ please contact our sales network or visit www.xylect.com.



Dimensional drawings appear on the screen and can be downloaded in dxf format.

Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're approximately 12,700 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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