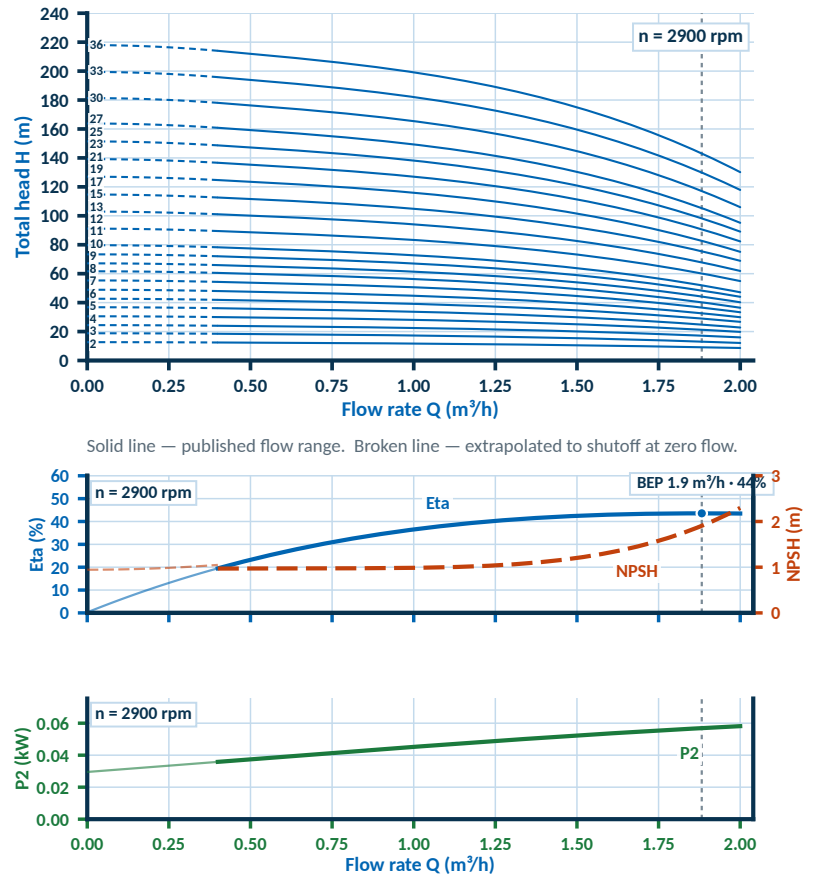


SAR 1 Vertical Multistage Centrifugal Pump



PERFORMANCE CHART AT N=2900 RPM



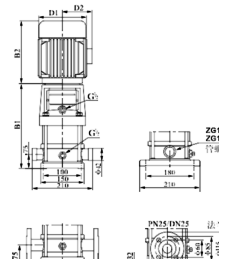
Efficiency and NPSH required (upper), absorbed power P_2 (lower), digitised from the manufacturer curve sheet. P_2 is the input power per stage.

Typical Applications

- Water supply: raw-water transfer, filtration and boosting duties in waterworks, district distribution, high-rise pressure boosting and packaged booster sets.
- Industrial pressure boosting: process water systems, washing and cleaning plant and high-pressure flushing systems.
- Industrial liquid transfer: cooling and air-conditioning circuits, boiler feed and condensate systems, machine-tool coolant supply, and mild acids and alkalis.
- Water treatment: ultra-filtration, reverse osmosis, distillation, separators and swimming-pool circulation.
- Irrigation: field and farm irrigation, sprinkler systems and drip irrigation.

Operating Conditions

- Thin, clean, non-flammable and non-explosive liquids, free of solid particles or fibres.
- Liquid temperature: standard version $-15\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$; hot-water version $+70\text{ }^{\circ}\text{C}$ to $+120\text{ }^{\circ}\text{C}$.
- Maximum ambient temperature $+40\text{ }^{\circ}\text{C}$; maximum installation altitude 1000 m.
- Maximum pressure generated ranges from 1.3 bar on SAR 1-2 to 21.0 bar on SAR 1-36, model by model — see Technical Data. Suction and discharge flanges to PN25 / DN25.
- Suction and discharge ports are in line and of equal bore, allowing the pump to be installed directly in a straight pipe run.
- Pump head and motor are coupled by a rigid spacer coupling, so the mechanical seal can be changed without disturbing the pipework.
- Non-self-priming: the pump must be fully primed and the required NPSH maintained at the inlet to avoid cavitation.
- Above $+40\text{ }^{\circ}\text{C}$ ambient or above 1000 m altitude the motor output is derated and a larger motor frame must be selected.
- Motor totally enclosed, fan-cooled, protection IP55, insulation class F.
- Optional intelligent controller protects against dry running, phase failure and overload.



Technical Data

Technical data for all 22 models in the SAR 1 series is tabulated on pages 2 to 3.



SAR 1 Technical Data

Model	Motor P2		Supply / voltage range	Current at 50 Hz (A)			Motor eff. (%)	Rated flow Q (m³/h)	Head at rated Q (m)	Max. head (m)	Max. flow (m³/h)	Speed (rpm)	Max. press. (bar)	DN	Dimensions (mm)					Weight (kg)
	kW	HP		Full load In	Start DOL Ist	Soft start Iss									B1	B2	B1+B2	D1	D2	
SAR 1-2	0.37	0.5	1~ 220-240 V	2.7	12	8.2	62.0	1	11.5	13	2	2900	1.3	DN25	258	225	483	148	117	20
SAR 1-3	0.37	0.5	1~ 220-240 V	2.7	12	8.2	62.0	1	17	19	2	2900	1.9	DN25	276	225	501	148	117	20
SAR 1-4	0.37	0.5	1~ 220-240 V	2.7	12	8.2	62.0	1	22.5	24	2	2900	2.4	DN25	294	225	519	148	117	21
SAR 1-5	0.37	0.5	1~ 220-240 V	2.7	12	8.2	62.0	1	28	30	2	2900	2.9	DN25	312	225	537	148	117	21
SAR 1-6	0.37	0.5	1~ 220-240 V	2.7	12	8.2	62.0	1	33.5	36	2	2900	3.5	DN25	330	225	555	148	117	22
SAR 1-7	0.37	0.5	1~ 220-240 V	2.7	12	8.2	62.0	1	39	42	2	2900	4.1	DN25	348	225	573	148	117	23
SAR 1-8	0.55	0.75	1~ 220-240 V	3.9	17	12	65.0	1	45	48	2	2900	4.7	DN25	366	225	591	148	117	24
SAR 1-9	0.55	0.75	1~ 220-240 V	3.9	17	12	65.0	1	51	54	2	2900	5.3	DN25	384	225	609	148	117	25
SAR 1-10	0.55	0.75	1~ 220-240 V	3.9	17	12	65.0	1	57	60	2	2900	5.9	DN25	402	225	627	148	117	26
SAR 1-11	0.55	0.75	1~ 220-240 V	3.9	17	12	65.0	1	61	66	2	2900	6.5	DN25	420	225	645	148	117	26
SAR 1-12	0.75	1	1~ 220-240 V	5.0	23	15	68.0	1	67	72	2	2900	7.1	DN25	448	245	693	170	142	29
SAR 1-13	0.75	1	1~ 220-240 V	5.0	23	15	68.0	1	73	78	2	2900	7.6	DN25	466	245	711	170	142	30
SAR 1-15	0.75	1	1~ 220-240 V	5.0	23	15	68.0	1	84	89	2	2900	8.7	DN25	502	245	747	170	142	31
SAR 1-17	1.1	1.5	1~ 220-240 V	7.2	32	22	70.0	1	95	101	2	2900	9.9	DN25	538	245	783	170	142	33
SAR 1-19	1.1	1.5	1~ 220-240 V	7.2	32	22	70.0	1	106	113	2	2900	11.1	DN25	574	245	819	170	142	34
SAR 1-21	1.1	1.5	1~ 220-240 V	7.2	32	22	70.0	1	117	124	2	2900	12.2	DN25	610	245	855	170	142	35

Maximum pressure is the pressure the pump itself generates at its maximum head; the sum of inlet pressure and pump pressure must not exceed the casing rating. Currents are calculated nominal values for a 2-pole IE3 motor (single phase at 230 V, three phase at 400 V); In is the full-load running current, Ist the direct-on-line starting current and Iss the current with a soft starter set to ramp at 3 x In (adjustable, typically 2 to 4 x In). A soft starter limits inrush and mechanical shock; it does not raise running efficiency, and adds about 0.1 to 0.5 % loss unless it is bypassed once up to speed. Motor efficiency is the nominal IE3 figure at full load, direct-on-line. **Confirm against the motor nameplate before sizing cable, starter or overload.**

Maximum head is the head at the lowest published flow; maximum flow is the highest published flow for the series. Motor totally enclosed, fan-cooled, IP55, insulation class F, 2-pole, 3 x 380-415 V / 50 Hz. HP figures are the nominal standard-frame equivalents of the kW ratings. Motors up to and including 2.2 kW are single-phase as standard, 3 kW and above three-phase; 3 x 200-220 V and other supply voltages are available to special order. Flanges to PN25 / DN25. Weights are for the pump with standard motor.



SAR 1 Technical Data (continued)

Model	Motor P2		Supply / voltage range	Current at 50 Hz (A)			Motor eff. (%)	Rated flow Q (m³/h)	Head at rated Q (m)	Max. head (m)	Max. flow (m³/h)	Speed (rpm)	Max. press. (bar)	DN	Dimensions (mm)					Weight (kg)
	kW	HP		Full load In	Start DOL Ist	Soft start Iss									B1	B2	B1+B2	D1	D2	
SAR 1-23	1.1	1.5	1~ 220-240 V	7.2	32	22	70.0	1	128	137	2	2900	13.4	DN25	646	245	891	170	142	36
SAR 1-25	1.5	2	1~ 220-240 V	9.5	43	29	72.0	1	139	149	2	2900	14.6	DN25	692	290	982	190	155	42
SAR 1-27	1.5	2	1~ 220-240 V	9.5	43	29	72.0	1	150	161	2	2900	15.8	DN25	728	290	1018	190	155	43
SAR 1-30	1.5	2	1~ 220-240 V	9.5	43	29	72.0	1	166	178	2	2900	17.5	DN25	782	290	1072	190	155	45
SAR 1-33	2.2	3	1~ 220-240 V	14	61	41	74.0	1	183	196	2	2900	19.2	DN25	836	290	1126	190	155	49
SAR 1-36	2.2	3	1~ 220-240 V	14	61	41	74.0	1	200	214	2	2900	21.0	DN25	890	290	1180	190	155	51

Maximum pressure is the pressure the pump itself generates at its maximum head; the sum of inlet pressure and pump pressure must not exceed the casing rating. Currents are calculated nominal values for a 2-pole IE3 motor (single phase at 230 V, three phase at 400 V); In is the full-load running current, Ist the direct-on-line starting current and Iss the current with a soft starter set to ramp at 3 x In (adjustable, typically 2 to 4 x In). A soft starter limits inrush and mechanical shock; it does not raise running efficiency, and adds about 0.1 to 0.5 % loss unless it is bypassed once up to speed. Motor efficiency is the nominal IE3 figure at full load. direct-on-line. **Confirm against the motor nameplate before sizing cable, starter or overload.**

Maximum head is the head at the lowest published flow; maximum flow is the highest published flow for the series. Motor totally enclosed, fan-cooled, IP55, insulation class F, 2-pole, 3 x 380-415 V / 50 Hz. HP figures are the nominal standard-frame equivalents of the kW ratings. Motors up to and including 2.2 kW are single-phase as standard, 3 kW and above three-phase; 3 x 200-220 V and other supply voltages are available to special order. Flanges to PN25 / DN25. Weights are for the pump with standard motor.

Model Designation

SAR F 1 – 2 / 1

- SAR** Light vertical multistage centrifugal pump
- F** Wetted parts in stainless steel AISI 304 or 316L. Omitted on the standard cast-iron construction, which is designated SAR.
- 1** Rated flow in m³/h — identifies the series
- 2** Number of chambers (stages)
- 1** Number of impellers fitted. Where this is fewer than the number of chambers, the remaining chamber carries no impeller and the pump delivers proportionally less head. The element is omitted when every chamber carries an impeller, which is the case for all 22 models in this series, e.g. SAR 1-36.



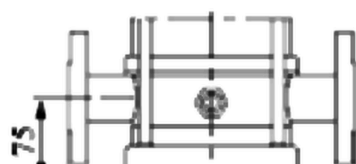
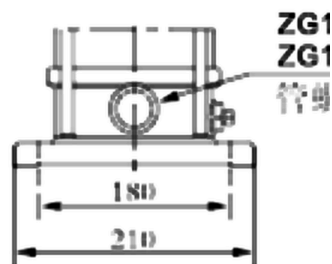
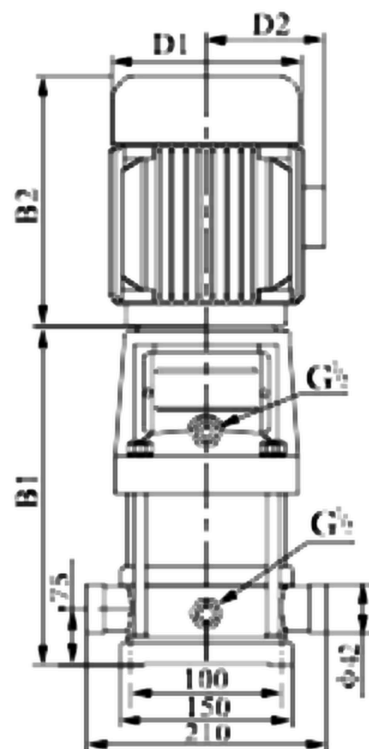
SAR 1 Performance Table

Total head H (m) against flow rate Q (m³/h) at 2900 rpm, tested on clean water at 20 °C (kinematic viscosity 1 mm²/s, air-free). Tolerances to ISO 9906, Annex A. Motor power P2 is the standard motor rating for each model.

Model	Motor			Q (m ³ /h)								
	kW	HP	Supply / voltage range	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	2
SAR 1-2	0.37	0.5	1~ 220-240 V	13	12.5	12	11.5	11	10.5	10	9.5	9
SAR 1-3	0.37	0.5	1~ 220-240 V	19	18	17.5	17	16.5	16	15	14	12
SAR 1-4	0.37	0.5	1~ 220-240 V	24	23.5	23	22.5	22	21	19	18	16
SAR 1-5	0.37	0.5	1~ 220-240 V	30	29.6	29	28	27	26	24	22	20
SAR 1-6	0.37	0.5	1~ 220-240 V	36	35.5	35	33.5	33	31	28	26	23
SAR 1-7	0.37	0.5	1~ 220-240 V	42	41	40.5	39	38	36	33	30	27
SAR 1-8	0.55	0.75	1~ 220-240 V	48	47	46	45	43	41	38	34	30
SAR 1-9	0.55	0.75	1~ 220-240 V	54	53	52	51	49	46	43	39	33
SAR 1-10	0.55	0.75	1~ 220-240 V	60	59	58	57	54	51	48	43	36
SAR 1-11	0.55	0.75	1~ 220-240 V	66	65	63	61	59	56	52	47	40
SAR 1-12	0.75	1	1~ 220-240 V	72	71	69	67	64	61	57	51	44
SAR 1-13	0.75	1	1~ 220-240 V	78	77	75	73	69	66	62	55	47
SAR 1-15	0.75	1	1~ 220-240 V	89	88	86	84	79	76	71	63	55
SAR 1-17	1.1	1.5	1~ 220-240 V	101	99	97	95	89	86	80	71	62
SAR 1-19	1.1	1.5	1~ 220-240 V	113	110	108	106	99	96	89	79	69
SAR 1-21	1.1	1.5	1~ 220-240 V	124	122	120	117	110	106	98	87	75
SAR 1-23	1.1	1.5	1~ 220-240 V	137	133	131	128	121	116	107	96	82
SAR 1-25	1.5	2	1~ 220-240 V	149	145	143	139	131	126	116	104	89
SAR 1-27	1.5	2	1~ 220-240 V	161	157	155	150	141	136	125	112	95
SAR 1-30	1.5	2	1~ 220-240 V	178	175	171	166	157	150	139	124	106
SAR 1-33	2.2	3	1~ 220-240 V	196	192	188	183	173	165	154	137	118
SAR 1-36	2.2	3	1~ 220-240 V	214	210	205	200	190	181	169	151	130

Select the duty point within the published flow range. Operating far to the right of the range overloads the motor; operating far to the left causes heat build-up in the pump. The stainless-steel construction is designated SARF and has identical hydraulic performance.

SAR 1 Dimensions and Connections



B1 base to motor flange

B2 motor height

B1+B2 overall height

D1 across motor frame

D2 across base

All dimensions in mm. Suction and discharge are in line and of equal bore, DN25, flanges to PN25 / DN25.

Per-model dimensions and weights are tabulated in the Technical Data pages. Single-phase and flameproof motors alter the external dimensions.