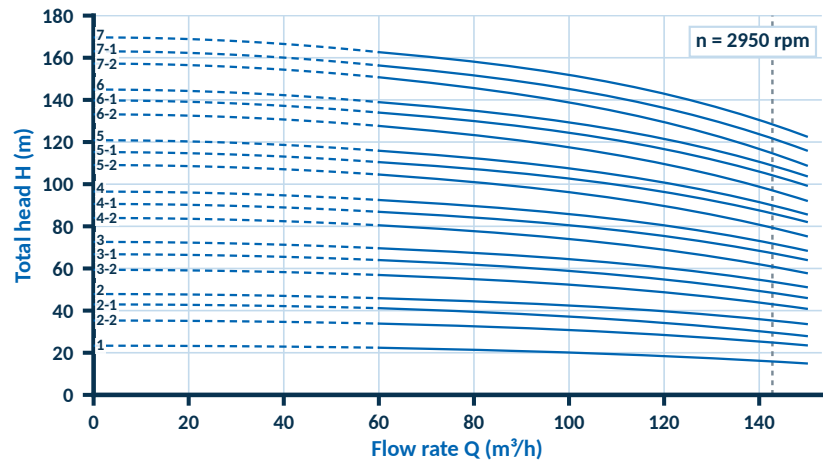


SAR 120

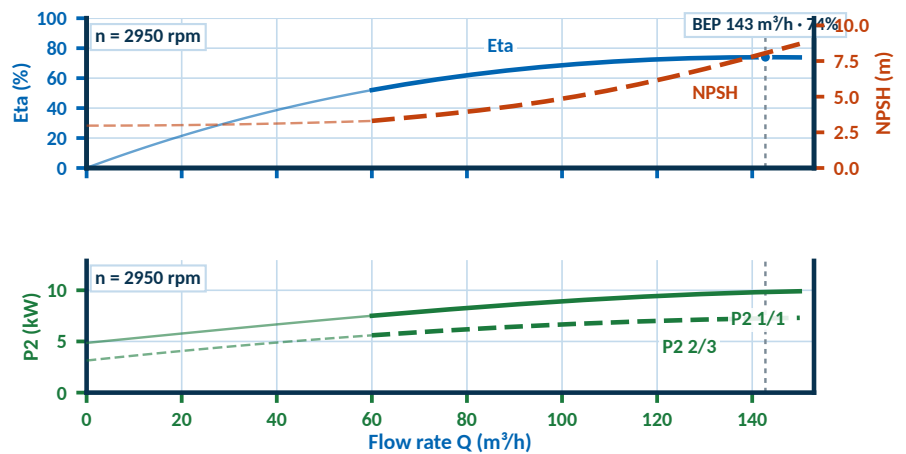
Vertical Multistage Centrifugal Pump



PERFORMANCE CHART AT N=2950 RPM



Solid line — published flow range. Broken line — extrapolated to shutoff at zero flow.



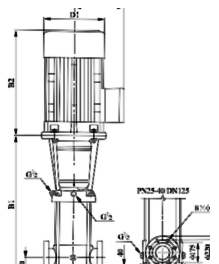
Efficiency and NPSH required (upper), absorbed power P2 (lower), digitised from the manufacturer curve sheet. P2 is the input power per stage.

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°C to $+70^{\circ}\text{C}$; hot-water version $+70^{\circ}\text{C}$ to $+120^{\circ}\text{C}$.
- Maximum ambient temperature $+40^{\circ}\text{C}$; maximum installation altitude 1000 m.
- Maximum pressure generated ranges from 2.2 bar on SAR 120-1 to 15.9 bar on SAR 120-7, model by model — see Technical Data. Suction and discharge flanges to PN25-40/DN125.
- 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 $+40^{\circ}\text{C}$ 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 19 models in the SAR 120 series is tabulated on pages 2 to 3.



SAR 120

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 120-1	11	15	3~ 380-415 V	20	142	61	89.7	120	18.5	22	150	2950	2.2	DN125	840	500	1340	330	255	230
SAR 120-2-2	15	20	3~ 380-415 V	27	190	82	90.5	120	28.5	34	150	2950	3.3	DN125	1000	500	1500	330	255	245
SAR 120-2-1	18.5	25	3~ 380-415 V	33	233	100	91.0	120	34.5	41	150	2950	4.0	DN125	1000	550	1550	330	255	250
SAR 120-2	22	30	3~ 380-415 V	40	277	119	91.3	120	40	46	150	2950	4.5	DN125	1000	575	1575	360	285	285
SAR 120-3-2	30	40	3~ 380-415 V	53	374	160	92.0	120	49	57	150	2950	5.6	DN125	1160	650	1810	400	310	360
SAR 120-3-1	30	40	3~ 380-415 V	53	374	160	92.0	120	55.5	64	150	2950	6.3	DN125	1160	650	1810	400	310	360
SAR 120-3	30	40	3~ 380-415 V	53	374	160	92.0	120	61	69.5	150	2950	6.8	DN125	1160	650	1810	400	310	360
SAR 120-4-2	37	50	3~ 380-415 V	66	460	197	92.4	120	69	80.5	150	2950	7.9	DN125	1320	650	1970	400	310	400
SAR 120-4-1	37	50	3~ 380-415 V	66	460	197	92.4	120	76	87	150	2950	8.5	DN125	1320	650	1970	400	310	400
SAR 120-4	45	60	3~ 380-415 V	80	557	239	92.8	120	81	92.5	150	2950	9.1	DN125	1320	685	2005	460	340	460
SAR 120-5-2	45	60	3~ 380-415 V	80	557	239	92.8	120	90	104.5	150	2950	10.2	DN125	1480	685	2165	460	340	470
SAR 120-5-1	45	60	3~ 380-415 V	80	557	239	92.8	120	97	110.5	150	2950	10.8	DN125	1480	685	2165	460	340	470
SAR 120-5	55	75	3~ 380-415 V	96	671	287	93.1	120	101.5	115.5	150	2950	11.3	DN125	1510	760	2270	540	370	575
SAR 120-6-2	55	75	3~ 380-415 V	96	671	287	93.1	120	110	128	150	2950	12.5	DN125	1670	760	2430	540	370	585
SAR 120-6-1	55	75	3~ 380-415 V	96	671	287	93.1	120	118	134	150	2950	13.1	DN125	1670	760	2430	540	370	585
SAR 120-6	75	100	3~ 380-415 V	130	909	389	93.7	120	123	139	150	2950	13.6	DN125	1670	845	2515	580	410	705

The stage figure in the model name is the actual number of stages.

Maximum pressure is that generated by the pump 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 230 V, three phase 400 V); In is full-load running current, Ist direct-on-line starting current and Iss the current with a soft starter ramping at $3 \times \text{In}$. **Confirm against the motor nameplate before sizing cable, starter or overload.** A soft starter limits inrush; it does not raise running efficiency.

Motors up to and including 2.2 kW are single-phase as standard, 3 kW and above three-phase; $3 \times 200\text{-}220\text{ V}$ and other supply voltages to special order.



SAR 120

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 120-7-2	75	100	3~ 380-415 V	130	909	389	93.7	120	130	151	150	2950	14.8	DN125	1830	845	2675	580	410	715
SAR 120-7-1	75	100	3~ 380-415 V	130	909	389	93.7	120	137.5	156.5	150	2950	15.3	DN125	1830	845	2675	580	410	715
SAR 120-7	75	100	3~ 380-415 V	130	909	389	93.7	120	145	162.5	150	2950	15.9	DN125	1830	845	2675	580	410	715

The stage figure in the model name is the actual number of stages.

Maximum pressure is that generated by the pump 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 230 V, three phase 400 V); In is full-load running current, Ist direct-on-line starting current and Iss the current with a soft starter ramping at $3 \times I_n$. **Confirm against the motor nameplate before sizing cable, starter or overload.** A soft starter limits inrush; it does not raise running efficiency. Motors up to and including 2.2 kW are single-phase as standard, 3 kW and above three-phase; 3×200 -220 V and other supply voltages to special order.

Model Designation

SAR F 120 – 3 – 2

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.
120	Rated flow in m³/h — identifies the series
3	Number of stages — the actual count
2	Number of reduced-diameter impellers. Omitted when every impeller is full diameter.

Reduced-Diameter Impellers

Reduced-Diameter Impellers

Stages come in whole numbers, so a plain stage count steps the head up in coarse jumps. A duty falling between two steps would otherwise be met by taking the next size up and throttling the surplus away in a valve, wasting energy for the life of the pump.

Fitting one or two impellers of reduced outside diameter trims the head between those steps. Head varies roughly with the square of impeller diameter and absorbed power with the cube, so a trimmed impeller lowers the curve while *reducing* shaft power — the duty is met on a smaller motor rather than by wasting head across a valve. The suffix gives how many impellers are trimmed.



SAR 120

Performance Table

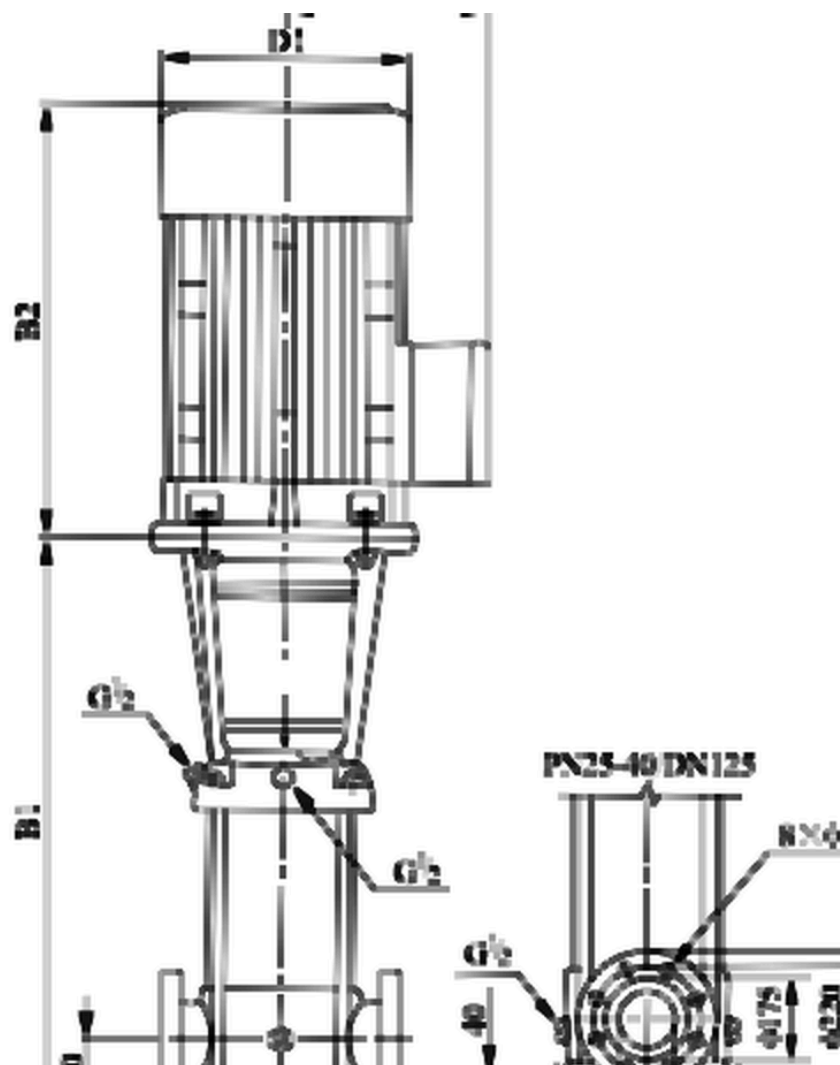
Total head H (m) against flow rate Q (m³/h) at 2950 rpm, tested on clean water at 20 °C (kinematic viscosity 1 mm²/s, air-free). Tolerances to ISO 9906, Annex A.

Model	Motor			Q (m ³ /h)									
	kW	HP	Supply / voltage range	60	70	80	90	100	110	120	130	140	150
SAR 120-1	11	15	3~ 380-415 V	22	21.8	21.6	21	20.5	19.5	18.5	17	16	15
SAR 120-2-2	15	20	3~ 380-415 V	34	33.6	33	31	30.2	30	28.5	27	25	24
SAR 120-2-1	18.5	25	3~ 380-415 V	41	40	39.5	38.5	37	36.5	34.5	32.5	30	27.5
SAR 120-2	22	30	3~ 380-415 V	46	45	44.5	43.5	42.4	41	40	38	36	33.5
SAR 120-3-2	30	40	3~ 380-415 V	57	56	55	53.5	52	51	49	46.5	43.5	41
SAR 120-3-1	30	40	3~ 380-415 V	64	63	62	60	58.5	57.5	55.5	52	49	46
SAR 120-3	30	40	3~ 380-415 V	69.5	68.5	67.5	66	64.4	62.5	61	57.5	54.5	51
SAR 120-4-2	37	50	3~ 380-415 V	80.5	79	78	76	73.5	72	69	66	61.5	58
SAR 120-4-1	37	50	3~ 380-415 V	87	86	84.5	82	80	78	76	72	68	64.5
SAR 120-4	45	60	3~ 380-415 V	92.5	91	90	88	85.5	83	81	77	73	68.5
SAR 120-5-2	45	60	3~ 380-415 V	104.5	103	101	99	96	93	90	85.5	80.5	75.5
SAR 120-5-1	45	60	3~ 380-415 V	110.5	109	107.5	105	102	100	97	92	86.5	83
SAR 120-5	55	75	3~ 380-415 V	115.5	114	113	110	107.5	104.5	101.5	96	91	86
SAR 120-6-2	55	75	3~ 380-415 V	128	125.5	123	121	117.3	113.5	110	104.5	98.5	92.5
SAR 120-6-1	55	75	3~ 380-415 V	134	132	130.5	127	124	121	118	111	105	100
SAR 120-6	75	100	3~ 380-415 V	139	137	135	132	128.8	126	123	116	110	104
SAR 120-7-2	75	100	3~ 380-415 V	151	148	145.5	143	138.6	134	130	123.5	116.5	109
SAR 120-7-1	75	100	3~ 380-415 V	156.5	154	152	148.5	144.5	141	137.5	130	123	116.5
SAR 120-7	75	100	3~ 380-415 V	162.5	160.5	158.5	155	151	148	145	137	129	123

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 120

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, DN125, flanges to PN25-40/DN125.

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