SMV VERTICAL MULTISTAGE INLINE PUMPS

FOR WHERE IT REALLY MATTERS

AUTHORIZED DEALER

CAE ENGINEERING PTE LTD

YOUR PUMPING SYSTEMS SOLUTION PROVIDER

WEBSITE: WWW.CAEGROUP.COM.SG

spp PUMPS

Application

- Suitable for transferring liquids of low viscosity, non-inflammable and non-explosive, not containing solid particles or fibers
- Water supply & drainage for high-rise buildings, filtration and transfer at waterworks, pressure boosting in main pipe
- Washing and cleaning systems, boiler feeding, cooling water circulation, water treatment systems, auxiliary system, support equipment
- Ultra-filtration systems, reverse-osmosis systems, distillation systems, separators, swimming pools
- Agricultural irrigation: sprinkler irrigation, drip-feed irrigation
- Food & beverage industry
- Fire-fighting system

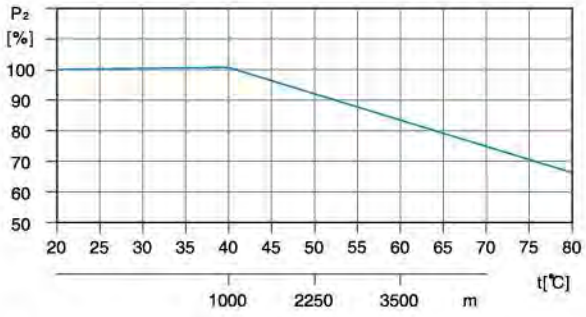
Operating Conditions

- Low viscosity, non-inflammable and non-explosive liquids not containing solid particles or fibers. The liquids must not chemically attack the pump materials. When pumping liquids with a density or viscosity is higher than that of water, a motor with a higher output power rating shall be used.
- Liquid temperature: -20℃~+120℃
- Flow ranges: 0.7-120 m^3/h
- Liquid pH value: 4 - 10
- Max. ambient temperature: +40℃
- Max. operation pressure: 33 bar
- Altitude: up to 1000 m

Ambient Temperature

Max. ambient temperature: + 40℃. Ambient temperature above 40℃ or installation at altitude of more than 1000 meters above sea level require the use of an oversize motor. Because of low air density and poor cooling effects, the motor output power P_2 will be decreased. See the picture.

In such cases, it may be necessary to use a motor with a higher output power rating.



For example, when the pump is installed at altitude of more than 3500 meters above sea level, P_2 will be decreased to 88%. When the ambient temperature is 70℃, P_2 will be decreased to 78%.

Motor

- Totally enclosed & fan-cooled motor
- Protection class: IP55
- Standard voltage: 50Hz 1 x 220V/3 x 380V
  1 x 220V/3 x 415±15V (Option)

Identification Codes

SMVS 45 - 10 - 2 - B - K

- K: Pipeline Port Code (Flange Structure)
- B: AISI316 Stainless Steel Material
- 2: Small Impeller Stages
- 10: Impeller Stages
- 45: Rated Flow (m^3/h)
- SMVS, SMVR Vertical Multistage Pump Series

SMVS: Stainless steel wetted parts
SMVR: Cast iron base & pump cover

Identifications codes of flange structure
A: Oval flange; K: Clamp connector;
G: Threaded connector F: Flange connection

Identification code for stainless steel material
B: AISI316 stainless steel
C: AISI304 stainless steel

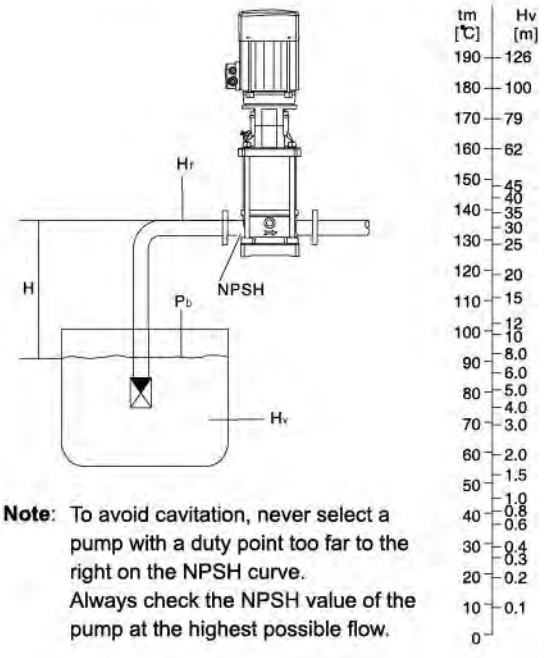
Minimum Inlet Pressure–Npsh

Calculation of the inlet pressure "H" is recommended in these situations:
The liquid temperature is high.
The flow is significantly higher than the rated flow.
Water is drawn from depths.
Water is drawn through long pipes.
Inlet conditions are poor.

To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump. The maximum suction lift "H" in meters head can be calculated as follows:

H	$= P_b \times 10.2 - NPSH - H_f - H_v - H_s$
P_b	= Barometric pressure in bar. (Barometric pressure can be set to 1 bar). In closed systems, P_b indicates the system pressure in bar.
NPSH	= Net Positive Suction Head in meters head. (To be read from the NPSH curve at the highest flow the pump will be delivering.)
H_f	= Friction loss in suction pipe in meters head. (At the highest flow the pump will be delivering.)
H_v	= Vapor pressure in meters head. (To be read from the vapor pressure scale. "H_v" depends on the liquid temperature "tm")
H_s	= Safety margin=minimum 0.5 meters head.

If the "H" calculated is positive, the pump can operate at a suction lift of maximum "H" meters head.
If the "H" calculated is negative, an inlet pressure of minimum "H" meters head is required.



Note: To avoid cavitation, never select a pump with a duty point too far to the right on the NPSH curve.
Always check the NPSH value of the pump at the highest possible flow.

Maximum Inlet Pressure

The following table shows the maximum permissible inlet pressure. However, the current inlet pressure + the pressure against a closed valve must always be lower than the Max. permissible operating pressure.
If the maximum permissible operating pressure is exceeded, the bearing in the motor may be damaged and the life of the shaft seal reduced.

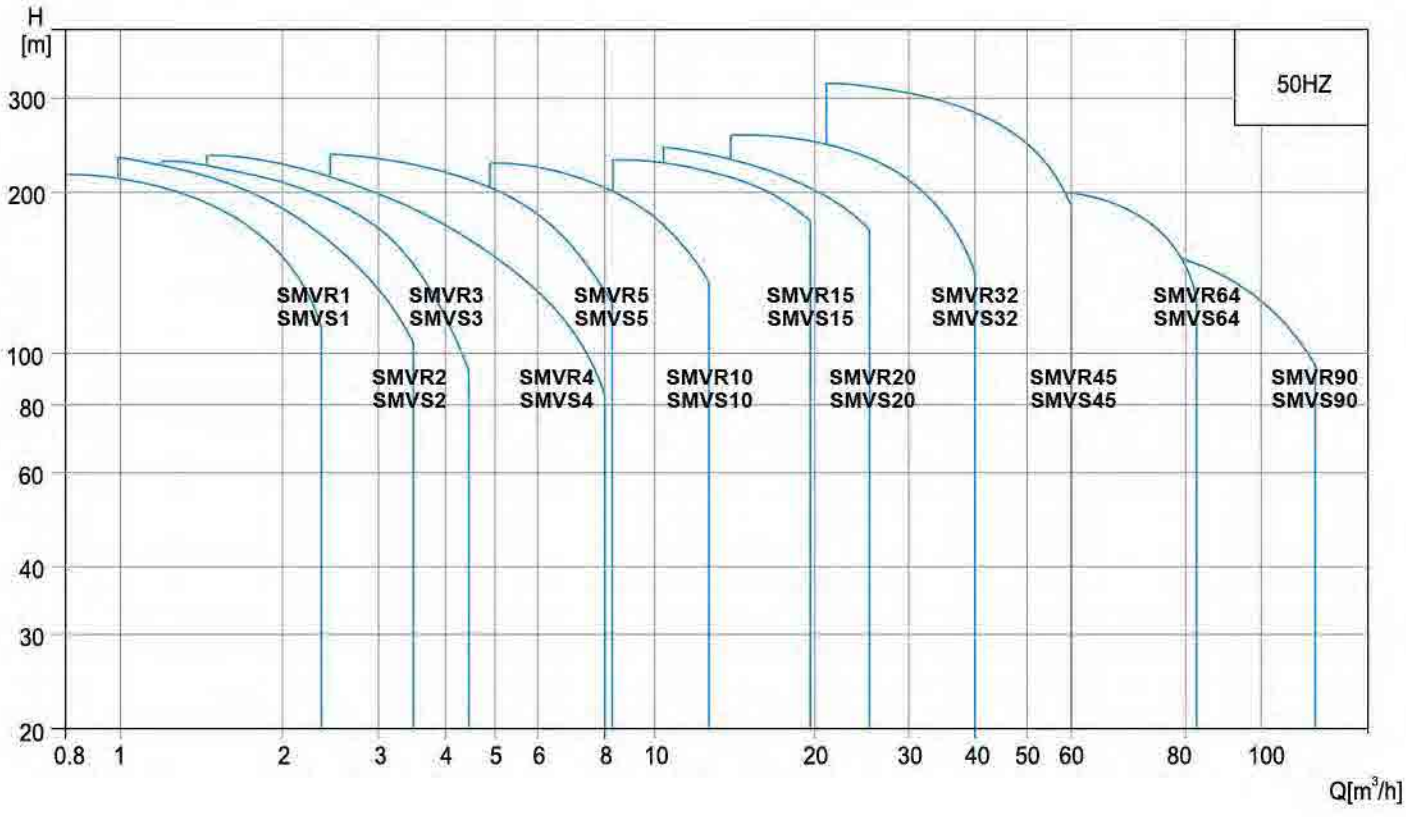
Pump Type	Maximum Inlet Pressure [bar]
SMVR1,SMVS1	
1–2 — 1–36	10
SMVR2,SMVS2	
2–2	6
2–3 — 2–12	10
2–13 — 2–26	15
SMVR3,SMVS3	
3–2 — 3–29	10
3–31 — 3–26	15
SMVR4,SMVS4	
4–2	6
4–3 — 4–11	10
4–12 — 4–22	15
SMVR5,SMVS5	
5–2 — 5–16	10
5–18 — 5–29	15
SMVR10,SMVS10	
10–1 — 10–6	8
10–7 — 10–22	10
SMVR15,SMVS15	
15–1 — 15–3	8
15–4 — 15–17	10
SMVR20,SMVS20	
20–1 — 20–3	8
20–4 — 20–17	10
SMVR32,SMVS32	
32–1–1 — 32–4	4
32–5–2 — 32–10	10
32–11 — 32–14	15
SMVR45,SMVS45	
45–1–1 — 45–2	4
45–3–2 — 45–5	10
45–6–2 — 45–13–2	15
SMVR64,SMVS64	
64–1–1 — 64–2–2	4
64–2–1 — 64–4–2	10
64–4–1 — 64–8–1	15
SMVR90,SMVS90	
90–1–1 — 90–1	4
90–2–2 — 90–3–2	10
90–3 — 90–6	15

Product Range

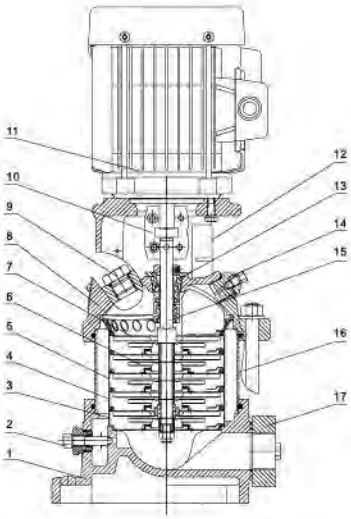
MODEL / DESCRIPTION	SMVR(S) 1	SMVR(S) 2	SMVR(S) 3	SMVR(S) 4	SMVR(S) 5	SMVR(S) 10	SMVR(S) 15	SMVR(S) 20	SMVR(S) 32	SMVR(S) 45	SMVR(S) 64	SMVR(S) 90
Rated flow [m^3/h]	1	2	3	4	5	10	15	20	32	45	64	90
Flow range [m^3/h]	0.7–2.4	1.0–3.5	1.2–4.5	2–8	2.5–8.5	5–13	9–24	11–29	15–40	22–58	30–85	45-120
Max. pressure [bar]	22	23	24	21	24	22	23	25	28	33	22	20
Motor power [kW]	0.37–2.2	0.37–3	0.37–3	0.37–4	0.37–4	0.37–7.5	1.1–15	1.1–18.5	1.5–30	3–45	4–45	5.5–45
Temperature Range [℃]	–20℃~+120℃ (Note: Both the Max. permissible pressure and liquid temperature range refer to the pump capacity.)											
Max. pump efficiency [%]	45	46	55	59	60	65	70	72	78	79	80	81
Pipe connection-SMVR												
Oval flange	G1	G1	G1	G1 1/4	G1 1/4	–	–	–	–	–	–	–
DIN flange	DN25	DN25	DN25	DN32	DN32	DN 40	DN 50	DN 50	DN65	DN80	DN100	DN100
Flange structure	○	○	○	○	○	○	○	○	●	●	●	●
Pipe connection-SMVS												
Oval flange	–	–	–	–	–	–	–	–	–	–	–	
DIN flange	DN 32	DN 32	DN 32	DN 32	DN 32	DN 40	DN 50	DN 50	DN65	DN80	DN100	DN100
Flange structure	●	●	●	●	●	●	●	●	●	●	●	●
Clamp connector	ϕ42	ϕ42	ϕ42	ϕ42	ϕ42	–	–	–	–	–	–	–
Threaded connector	G1 1/4	G1 1/4	G1 1/4	G1 1/4	G1 1/4	–	–	–	–	–	–	–

Note: ○ It means stationary flange structure , ● It means dynamic flange structure

Scope Of Performance–SMVR,SMVS

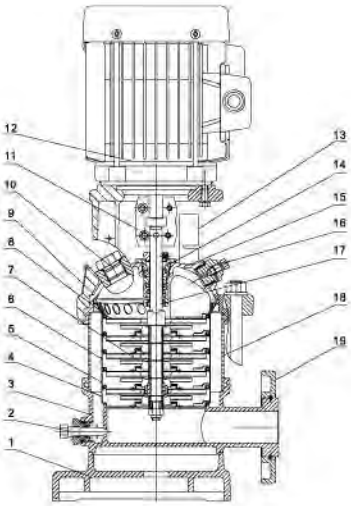


Cross Section



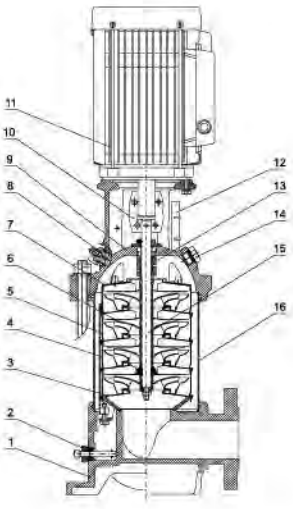
MODEL: SMVR1(2,3,4,5)

	Part	Material
1	Base	HT200
2	Drainage plug assembly	AISI304
3	Primary diffuser	AISI304
4	Diffuser with bearing	AISI304
5	Medium diffuser	AISI304
6	Impeller	AISI304
7	Final volute	AISI304
8	Motor base	HT200
9	Filling plug	AISI304
10	Coupling	Iron based powder metallurgy
11	Motor	
12	Guarding plate	AISI304
13	Cartridge seal	
14	Vent plug assembly	AISI304
15	Pump shaft	AISI304
16	Pump barrel	AISI304
17	Oval flange	HT200



MODEL: SMVS1(2,3,4,5)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Drainage plug assembly	AISI304	AISI316
3	Chasis	ZG304	ZG316
4	Primary diffuser	AISI304	AISI316
5	Diffuser with bearing	AISI304	AISI316
6	Medium diffuser	AISI304	AISI316
7	Impeller	AISI304	AISI316
8	Final diffuser	AISI304	AISI316
9	Motor base	HT200	
10	Filling plug	AISI304	AISI316
11	Coupling	Iron based powder metallurgy	
12	Motor		
13	Guarding plate	AISI304	
14	Cartridge seal		
15	Pump cover	ZG304	ZG316
16	Vent plug assembly	AISI304	AISI316
17	Pump shaft	AISI304	AISI316
18	Pump barrel	AISI304	AISI316
19	Flange	ZG35	



MODEL: SMVR10(15,20)

	Part	Material
1	Base	HT200
2	Drainage plug assembly	AISI304
3	Primary diffuser	AISI304
4	Diffuser with bearing	AISI304
5	Medium diffuser	AISI304
6	Impeller	AISI304
7	Final volute	AISI304
8	Filling plug	AISI304
9	Motor base	HT200
10	Coupling	Iron based powder metallurgy
11	Motor	
12	Guarding plate	AISI304
13	Cartridge seal	
14	Vent plug assembly	AISI304
15	Pump shaft	AISI304
16	Pump barrel	AISI304

FOR WHERE IT REALLY MATTERS ACROSS THE GLOBE

At our main manufacturing centre in the UK we strive to develop the best products using high quality engineering and manufacture. Engineered and developed to the most rigorous standards, our products are then tested in our purpose built facility that incorporates a 1.4 million litre reservoir. It's no surprise that our products are commonly regarded as the best in the industry.

www.spppumps.com | enquiries@spppumps.com

LPCB LPCB NFPA c UL us LISTED FM APPROVED

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* Applies to: Coleford Manufacturing Site, Northern Service Centre and Wales & West Service Centre. SPP Pumps are proud to be working towards achieving this accreditation at all sites.

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12, Jalan Gemilang 8/2
Taman Banang Jaya,
83000 Batu Pahat, Johor

Pump Performance Datasheet

Customer	: CAE Engineering	Quote number	: 498864
Customer enquiry	: CUSTOMER	Pump Size	: SMVR1-15
Project	:	Stages	: 15
Item number	: 003	Based on curve number	: KIL1-15 Rev 02
Usage - Tertiary	:	Date last saved	: 30 Mar 2023 3:03 PM
Quantity	: 1	Note - Only duty point is guaranteed as per testing standard.	

Operating Conditions

Flow, rated	: 10.00 l/min
Differential Head (requested)	: 82.00 m
Differential Head (actual)	: 89.70 m
Suction pressure, rated / max	: 0.00 / 0.00 bar.g
NPSH available, rated	: Ample
Site Supply Frequency	: 50 Hz

Performance

Speed, rated	: 2900 rpm
Impeller diameter, rated (approx.)	: 73.00 mm
Impeller diameter, maximum	: 73.00 mm
Impeller diameter, minimum	: 73.00 mm
Efficiency	: 30.64 %
NPSH required / margin required	: - / 0.50 m
nq (imp. eye flow) / S (imp. eye flow)	: 19 / 61 Metric units
Minimum Continuous Safe Flow (MCSF)	: 2.50 l/min
Head, maximum, rated diameter (approx.)	: 90.89 m
Head rise to shutoff (approx.)	: 1.28 %
Flow, best eff. point	: 27.83 l/min
Flow ratio, rated / BEP	: 35.93 %
Diameter ratio (rated / max)	: 100.00 %
Head ratio (rated dia / max dia)	: 100.00 %
Cq/Ch/Ce/Cn [HI2010]	: 1.00 / 1.00 / 1.00 / 1.00
Selection status	: Acceptable
Performance testing standard	: ISO 9906 Annex A

Liquid

Liquid Type/ Application	: Water
Additional liquid description	:
Solids diameter, max	: 0.00 mm
Solids/Bagasse/Stock consistency by volume	: 0.00 %
Temperature, max	: 20.00 deg C
Fluid density rated	: 0.998 kg/dm3
Viscosity, rated	: 1.00 cSt
Vapor pressure, rated	: 0.02 bar.a

Material

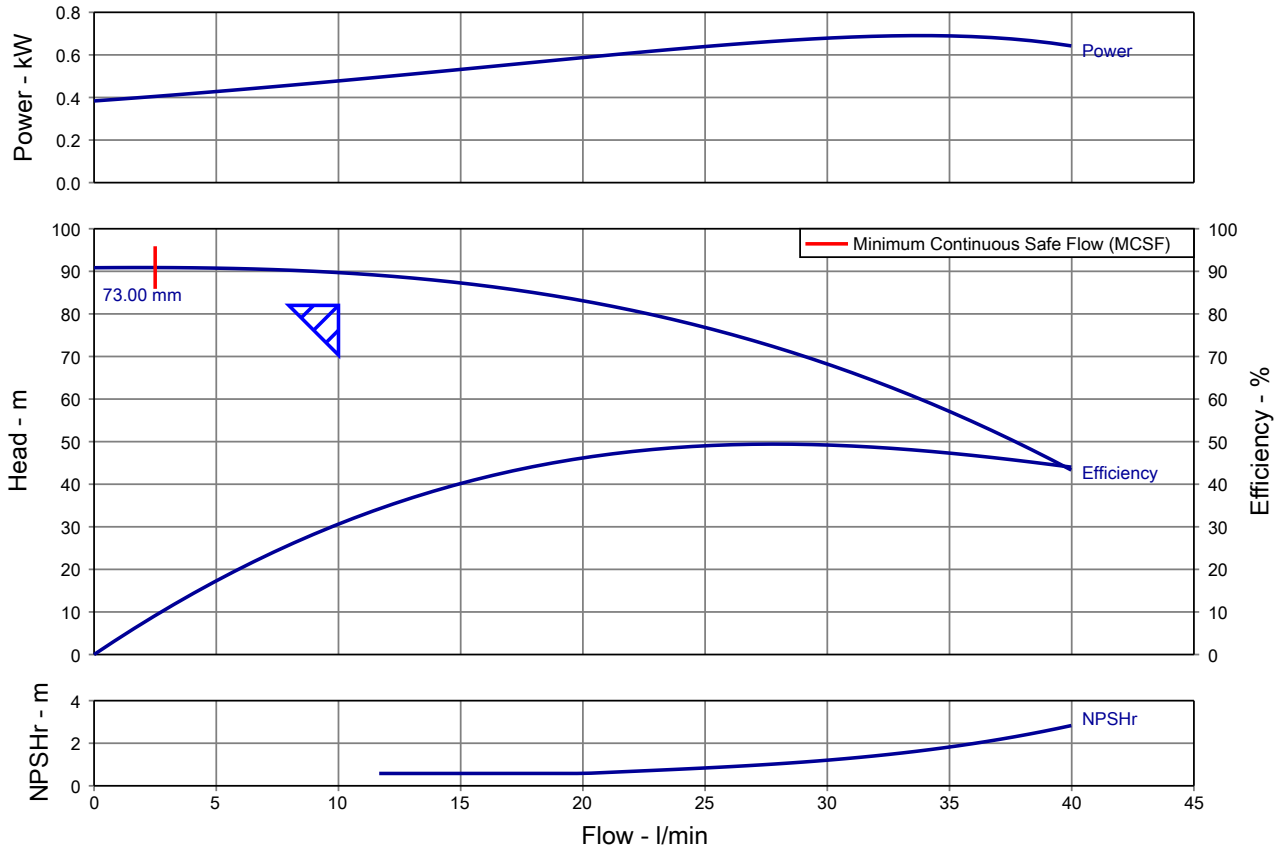
Material selected	: A MOC - CI 260 (012)/ SS304(250)/SS304(250)/ SS316(251) - For SMVR

Pressure Data

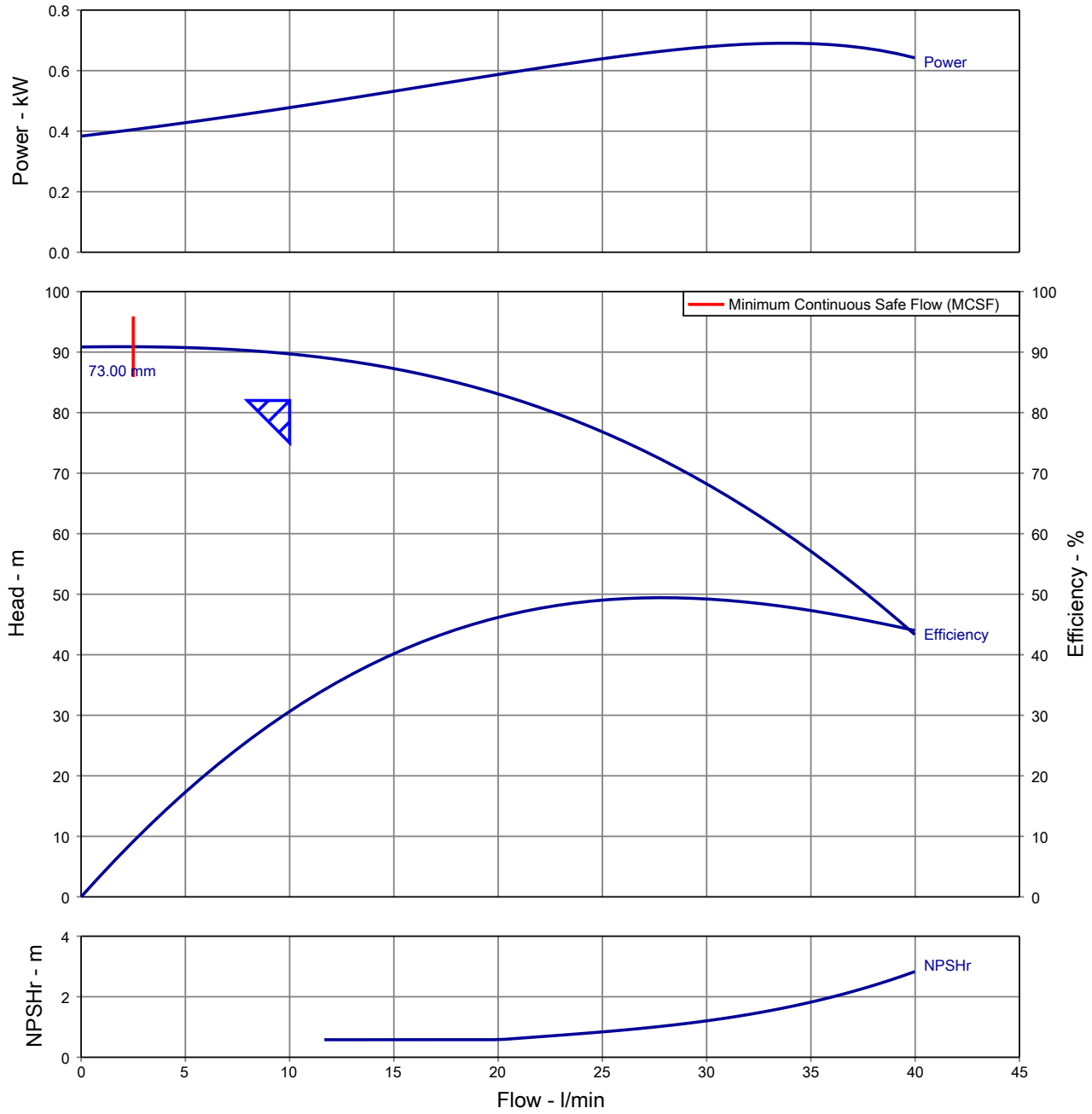
Maximum working pressure	: 8.90 bar.g
Maximum allowable working pressure	: N/A
Maximum allowable suction pressure	: 10.00 bar.g
Hydrostatic test pressure	: 13.35 bar.g

Driver & Power Data (@Rated density)

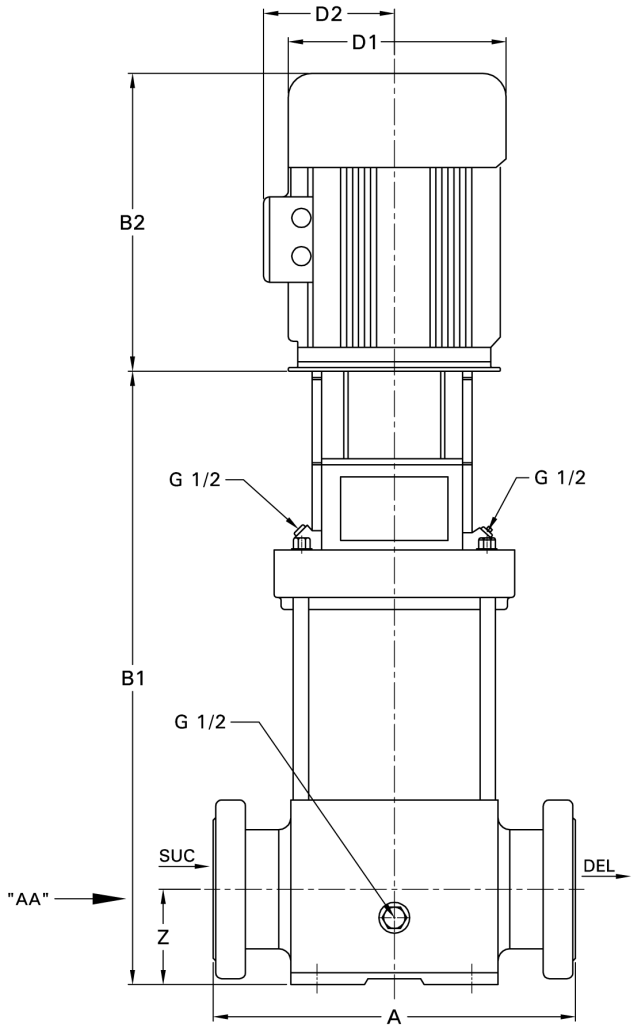
Driver sizing specification	: Maximum Power
Margin over specification	: 10.00 %
Service factor	: 1.15 (used)
Power, hydraulic	: 0.15 kW
Power, rated	: 0.48 kW
Power, maximum, rated diameter	: 0.69 kW
Motor rating	: 0.75 kW / 1.01 hp (Fixed)



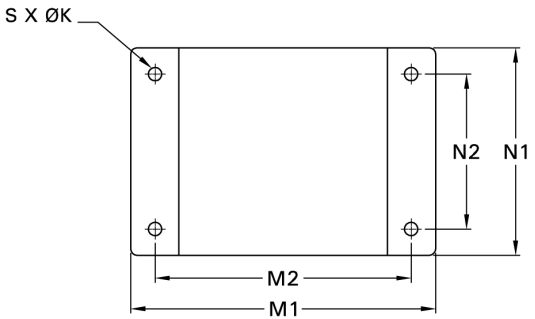
Pump Performance Curve



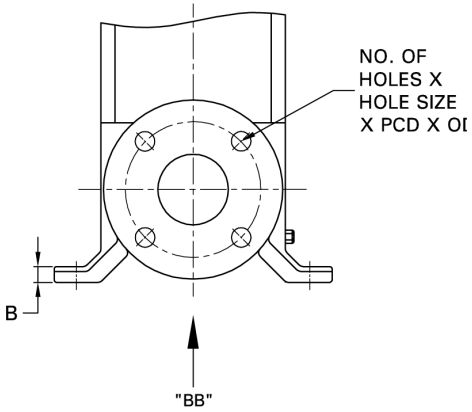
Customer	: CAE Engineering	Pump Size/ Stages	: SMVR1-15/ 15
Customer enquiry	: CUSTOMER	Speed, rated	: 2900 rpm
Project	:	Based on curve number	: KIL1-15 Rev 02
Quote number	: 498864	Viscosity	: 1.00 cSt
Item number	: 003	Cq/Ch/Ce/Cn [HI2010]	: 1.00 / 1.00 / 1.00 / 1.00
Quantity	: 1	Motor rating	: 0.75 kW / 1.01 hp (Fixed)
Flow, rated	: 10.00 l/min	Performance testing standard	: ISO 9906 Annex A
Differential Head	: 82.00 m	Date last saved	: 30 Mar 2023 3:03 PM
Fluid density rated	: 0.998 kg/dm3	Notes:	
Efficiency	: 30.64 %	1. Performance at shut off condition is approximate.	
Power, rated	: 0.48 kW	2. Rated impeller diameter is approximate.	
NPSH required	: - m	3. Only duty point is guaranteed as per testing standard.	
Liquid Type/ Application	: Water		



FRONT VIEW



PUMP FOOT VIEW FROM ARROW "BB"



PUMP END VIEW FROM ARROW "AA"

SUC	DEL	D1	D2	B1	G 1/2	B2	Z	A	S	K	M1
32.00	32.00	155	124	476	G1/2	250	75.00	250	4.00	14.00	220
M2	N1	N2	B	OD	-	-	-	-	-	-	-
180	156	100	20.00	140	-	-	-	-	-	-	-

PUMP DUTIES			
CAPACITY	10.00 l/min	PUMP EFFICIENCY	30.64 %
TOTAL HEAD	82.00 m	-	-
DENSITY	0.997 kg/dm3	PUMP INPUT	0.48 kW

FLANGE DRILLING STANDARD AND DETAILS				
FLANGE DRILLING AS PER		DIN STANDARD		
	NOM SIZE	P.C.D.	NO. OF HOLES	HOLE SIZE
SUC / DEL	DN 25	85	4	14

DRIVER DATA			
MOTOR TYPE	Totally Enclosed Fan Cooled Motor		
MOTOR RATING	0.75 kW	POLES	2 Poles
NOMINAL SPEED	2900 rpm	VOLTAGE	380-415VOLT
SUPPLY	3PHASE, AC	FREQUENCY	50 Hz +/-5%
INSULATION CLASS	F CLASS	DEGREE OF PROTECTION	IP55
EFFICIENCY CLASS	IE2		

ADDITIONAL DATA			
STATIC LOAD	30.00 kg	PUMP WT (Approx.)	30.00 kg
DYNAMIC LOAD	37.50 kg		

DIRECTION OF ROTATION	COUNTER CLOCKWISE VIEWED FROM MOTOR END

NOTES :-

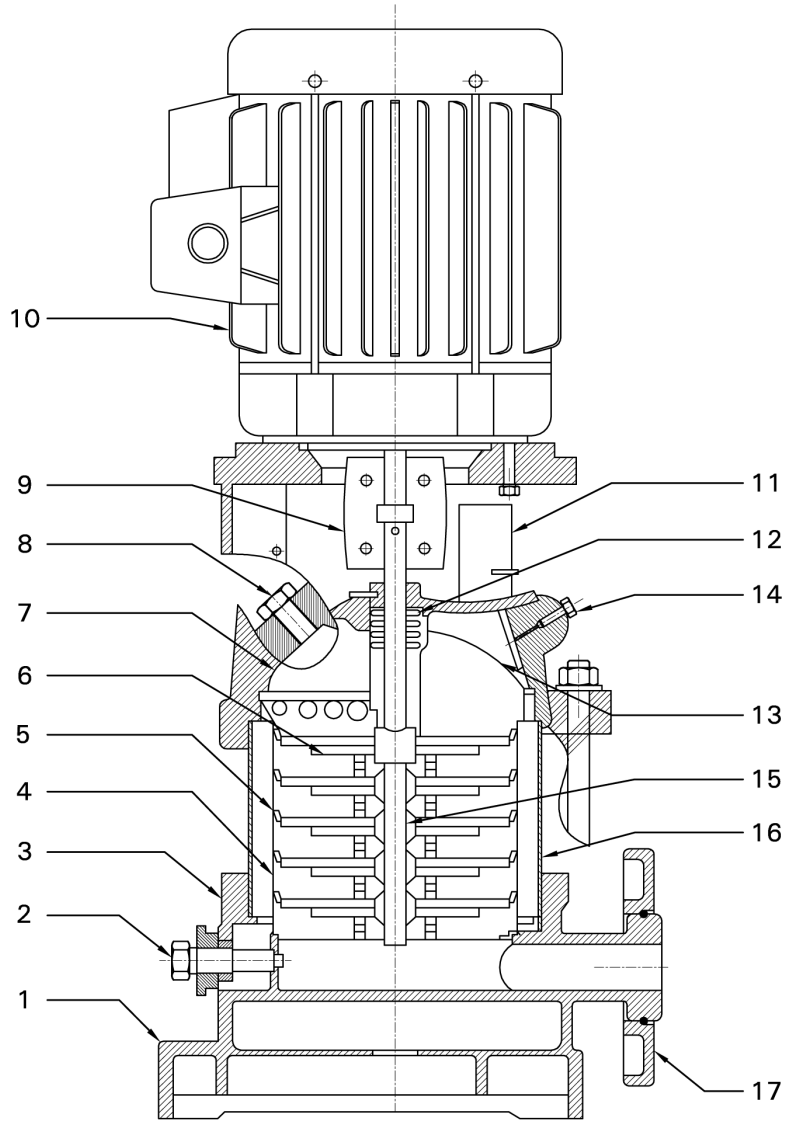
1. "G" STAND FOR THREADED CONNECTION mm
2. DO NOT LIFT OR DRAG THE PUMP USING CABLES.
3. DO NOT RUN THE PUMP DRY.
4. CHECK THE PHASE SEQUENCE BEFORE SWITCHING ON THE MOTOR.
5. CHECK THE DIRECTION OF ROTATION BEFORE LOWERING THE PUMP.
6. KEEP THE PUMP ON FLAT AND RIGID CONCRETE SURFACE.
7. THIS DRAWING IS THE PROPERTY OF KBL AND MUST NOT BE USED OR COPIED WITHOUT THEIR AUTHORITY IN WRITING.

PUMP	**SMVR1-15**		
ENQ. NO./DATE	CUSTOMER /	QUANTITY	1
PO. NO./DATE	-	TAG NO.	003
QUOTATION NO.	498864	DATE	-
O/A NO.	-	MISI	-
CUSTOMER	CAE Engineering		
END USER	CAE Engineering		
PROJECT	-		
CONSULTANT	-		
SERVICE	-		

SPP Pumps Limited
DEWAS - 455001, (INDIA)

OUTLINE DRAWING

SCALE	NTS	DRAWING NO.	TL16-1-0



PART NO.	PART DESCRIPTION	MAT. CODE	MOC DESCRIPTION	QTY
1	BASE PLATE	-	CAST IRON	1
2	DRAINAGE PLUG ASSEMBLY	-	AISI 304	1
3	CHASIS	-	CAST IRON	1
4	PRIMARY DIFFUSER	-	AISI 304	1
5	DIFFUSER	-	AISI 304	14
6	IMPELLER	-	AISI 304	15
7	MOTOR BASE	-	CAST IRON	1
8	FILLING PLUG	-	AISI 304	1
9	COUPLING	-	IRON BASED POWDER METALLURGY	1
10	MOTOR	-	MOTOR	1
11	GUARDING PLATE	-	AISI 304	1
12	MECHANICAL SEAL	-	CARTRIDGE TYPE MECHANICAL SEAL	1
13	PUMP COVER	-	AISI 304	1
14	VENT PLUG ASSEMBLY	-	AISI 304	1
15	PUMP SHAFT	-	AISI 316	1
16	PUMP BARREL	-	AISI 304	1
17	FLANGE	-	CAST IRON	2

PUMP	**SMVR1-15**	MOC	-
ENQUIRY NO./DATE	CUSTOMER /	QUANTITY	1
PO. NO./DATE	-	TAG NO.	003
QUOTATION NO.	498864	DATE.	-
O/A. NO.	-	MISI.	-
CUSTOMER	CAE Engineering		
END USER	CAE Engineering		
PROJECT	-		
CONSULTANT	-		
SERVICE	-		

SPP Pumps Limited
Coleford, England GL16 8PS

CROSS SECTIONAL DRAWING

DRAWING NO. **TC16-1-0**

NOTES:
• " * " INDICATES RECOMMENDED SPARES.