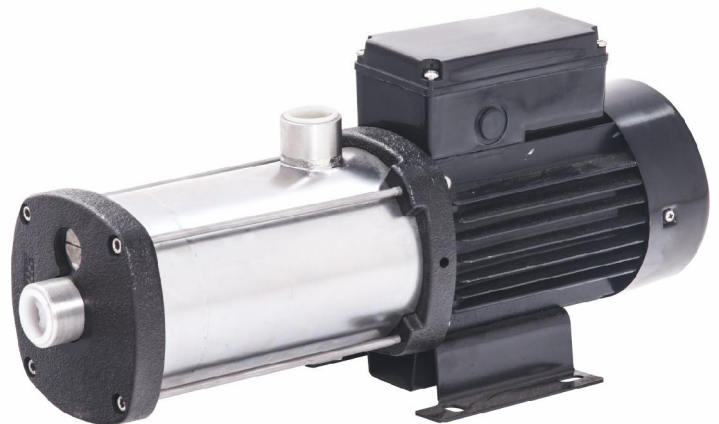


TAKING 'MAKE IN INDIA' FORWARD.



# PRESSURE BOOSTER PUMPS

SCM Series ( 50 Hz & 60 Hz )



**SHAKTI**

THE POWER OF INNOVATION, EFFICIENCY & TECHNOLOGY.

# CONTENT

Considering continuous product development the information/performance/specifications and illustration disseminated in this catalogue are subject to change without prior notice.

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# PRESSURE BOOSTER PUMPS

## SCM Series

### 1. PRODUCT INTRODUCTION

The Shakti Pumps SCM pumps are non-self-priming, horizontal, multistage, end-suction centrifugal pumps. The pumps are of the close-coupled type.

SCM Pumps also contain mechanical shaft seal. The SCM pumps are available in these three material versions:

A : Cast Iron

I : Stainless Steel (AISI 304 / EN 1.4301)

G : Stainless Steel (AISI 316 / EN 1.4401)

- The pump shaft, impeller, chamber and filling plugs are made of stainless steel (AISI 304 / EN 1.4301)

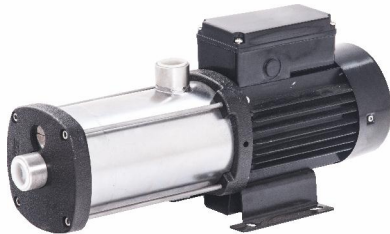


Fig. 1 Shakti SCM Pumps

The SCM pumps are unique products that have been developed in order to fulfil a wide variety of customer demands.

The SCM pumps are available in various sizes and numbers of stages to provide the flow and pressure required.

The SCM pumps consist of two main components: the motor and the pump unit. The motor is a Shakti Pumps designed to EN standards. The pump unit incorporates optimized hydraulics and offers various types of connections. The pumps offer many advantages, some of which are listed below and described in detail in Features and benefits on page 9:

- Compact design
- Worldwide usage
- High reliability
- Service-friendly
- Wide performance range
- Low noise
- Customized solutions.

### 2. APPLICATIONS

The SCM pumps are designed to cover a wide variety of applications, ranging from small domestic installations to large industrial systems. The pumps are therefore suitable for a wide diversity of pumping systems where the performance and material of the pump must meet specific demands.

Some of the most typical applications are mentioned below:

- Washing and cleaning
- Water treatment
- Temperature control
- Pressure boosting.

#### WASHING AND CLEANING

SCM pumps can be used in washing and cleaning applications, which usually involve pumping of water containing soap or other cleaning agents. Reference applications Typical washing and cleaning applications:

- Degreasing and washing of production equipment in industrial environments such as the food and beverage industry
- Washing machines
- Vehicle-washing tunnels
- Mobile-washing units
- Units for CIP (Cleaning In Place).

#### WATER TREATMENT

In water treatment plants, the water undergoes a process which makes it more suited for its end-use. In this process, the SCM pumps can be utilised either as feed pumps or as booster pumps.

#### Reference applications

Typical water treatment applications:

- Nano-, micro- and ultra-filtration systems
- Softening, ionising, demineralising systems
- Desalination systems
- Distillation systems
- Separators
- Swimming baths.

# PRESSURE BOOSTER PUMPS

## SCM Series

### TEMPERATURE CONTROL

Temperature control involves applications where the SCM pumps circulate a liquid in a closed loop consisting of a heating or cooling element for optimising a process by means of temperature. Temperature control is also chilling of equipment or food and beverage in the food production industry.

#### Reference applications

The SCM pumps can for example be used in temperature control systems such as:

- Electronic data processing
- Laser equipment
- Medical equipment
- Industrial refrigeration
- Heating and cooling in industrial processes
- Moisturising and humidifying.

To ensure safe and reliable operation in applications involving temperature control, we offer SCM pumps designed to meet your needs!

We provide solutions for applications involving pumping of these liquids:

- liquids at temperatures down to  $-4^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$ )
- high-temperature liquids
- high-viscous liquids, etc.

Pumping of liquids at temperatures down to  $-4^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$ )\*

All SCM-A, -I, -G pumps are capable of pumping liquids at temperatures down to  $-4^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$ ).

SCM-I, -G pumps capable of pumping liquids down to  $-22^{\circ}\text{F}$  ( $-30^{\circ}\text{C}$ ) are available on request.

At such low temperatures, the selection of wrong materials and dimensions may cause deformation because of thermal expansion, and eventually stoppage of operation.

Note: SCM pumps for pumping liquids at temperatures below  $-4^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$ ) are available on request.

Please contact Shakti Pumps.

#### Pumping of high-temperature liquids

The pumping of hot liquids such as water-based liquids up to  $+248^{\circ}\text{F}$  ( $+120^{\circ}\text{C}$ ) demands much of the pump parts, such as shaft seals and rubber parts. Pumping of high-viscous liquids In applications where high-viscous liquids are pumped, the motor of the pump can be overloaded, and the pump performance will be reduced. The viscosity of a pumped liquid depends strongly on the pumped liquid and its temperature. To meet the above-mentioned requirements, we offer SCM pumps with oversize motors.

### PRESSURE BOOSTING

In pressure-boosting applications, the pumped liquid must be delivered at a desired pressure on demand. The main priorities in pressure-boosting applications are to ensure maximum reliability and user comfort. Therefore, the SCM pumps are also ideal for such applications.

#### Reference applications

Typical pressure-boosting applications:

- pressure boosting and transfer of drinking water
- process-water systems.

#### Other applications

Besides the applications mentioned above, the SCM pumps can be used in many other applications.

Examples:

- Distilling systems
- Dosing/mixing
- Evaporation
- Comprised machinery
- Chemical industry
- Pharmaceutical industry.



fig 2.0 Applications of SCM pumps



# PRESSURE BOOSTER PUMPS

## SCM Series

### 3. FEATURES AND BENEFITS

SCM pumps present the following features and benefits:

#### COMPACT DESIGN

Pump and motor are integrated in a compact and user-friendly design. The pump is fitted to a low-profile base plate, making it ideal for installation in systems where compactness is important.

#### MODULAR CONSTRUCTION/CUSTOMISED SOLUTIONS

The modular construction of the SCM pumps makes it easy to create many different variants based on standard factory parts. This means that it is possible to create pump variants that are customized for the application in question.

#### ENERGY-OPTIMISED PUMPS

SCM pumps are energy-optimised and comply with the EuP Directive (Commission Regulation (EC) No 547/2012) in which most pumps are classified/ graduated in a new energy efficiency index (MEI).

#### WORLDWIDE USAGE

- With different voltage and frequency combinations, the SCM product ranges cover markets worldwide.
- The SCM product ranges have been approved and are marked for worldwide usage.

#### HIGH RELIABILITY

New state-of-the-art mechanical seal design and materials

offering these benefits:

- High wear resistance and long operating life
  - Improved sticking and dry-running capabilities.
- The pumps are less sensitive to impurities in the pumped liquid than similar pumps of the canned-rotor type.

#### EASY INSTALLATION AND COMMISSIONING

- A Quick Guide supplied with the SCM pump enables easy installation and commissioning.
- An installation indicator fitted to three-phase SCM pumps makes it easy to see if the electrical connection of the motor is correct. Based on the motor cooling air, it indicates the direction of rotation of the motor.

#### SERVICE-FRIENDLY

- Service was in mind during the development.
- No special service tools required.
- Spare parts in stock for quick delivery.
- Service parts available as kits, single parts or bulks.
- Service instructions and video make it simple to disassemble and assemble the pump.
- Service kit instructions available where estimated necessary.

#### WIDE PERFORMANCE RANGE

Can be used in a wide range of applications:

- Washing and cleaning
- Water treatment
- Temperature control
- Pressure boosting
- Chemical industry
- Pharmaceutical industry

#### LOW NOISE LEVEL

The SCM pumps offer very silent operation. High-performance hydraulics Pump efficiency is maximized by the optimized hydraulics and carefully crafted production technology.

#### ELECTRO-COATED CAST-IRON PARTS

- optimized corrosion resistance
- better efficiency because of smooth surfaces.

#### CUSTOMIZED SOLUTIONS

It is possible to create many different variants of the SCM pumps.

- Motor adaptation
- Pump body modifications.

#### Shakti Motors

Shakti Motors are remarkably silent and highly efficient.

# PRESSURE BOOSTER PUMPS

## SCM Series



### 4. IDENTIFICATION

Example	SCM	-	5	-	4	-	A	-	R	-	A	-	V	-	A	Q	Q	V
<b>Type Range</b> SCM : Shakti Centrifugal Modular																		
<b>Rated Flow Rated</b> Rated flow rate [m3/h]																		
<b>Number of impellers</b>																		
<b>Pump Version</b> A : Basic Version																		
<b>Pipe Connection</b> C : Tri Clamp F : DIN/ANSI/JIS Flange P : Victaulic coupling R : Whitworth thread Rp (ISO 7/1 S : Internal NPT Thread																		
<b>Material in contact with pump media</b>																		
A. Sleeve Pump Shaft Impeller/Chambers																		
G. Sleeve Pump Shaft Impeller /Chambers																		
I. Sleeve Pump Shaft																		
<b>Rubber parts in pumps</b> (excluding neck ring and mechanical seal)																		
E: EPDM(ethylene propylene diene monomer) K: FFKM(perfluoroelastomer) V: FKM ((fluorinated copolymer)																		
<b>Mechanical Seal Type Designation</b> A: O-ring seal with fixed driver.																		
<b>Material of rotating seal face</b> Q: Silicon carbide (SiC) V: Aluminium oxide (Al2O3)																		
<b>Material of stationary seal face</b> B: Carbon, synthetic resin-impregnated Q: Silicon carbide (SiC)																		
<b>Material of secondary seal</b> E: EPDM(ethylene propylene diene monomer) K: FFKM(perfluoroelastomer) V: FKM ((fluorinated copolymer)																		

# PRESSURE BOOSTER PUMPS

## SCM Series

### 5. PRODUCT RANGE

PUMP TYPE	50 Hz			60 Hz			Mechanical Seal						Mains - Operated Motor																												
	Material			Material									50Hz		60Hz																										
													Voltage [V]		Voltage [V]																										
	Cast Iron (SCM-A)			Stainless Steel AISI 304 / EN 1.4301 (SCM-I)			Stainless Steel AISI 316 / EN 1.4401 (SCM-G)			Cast Iron (SCM-A)			Stainless Steel AISI 304 / EN 1.4301 (SCM-I)			Stainless Steel AISI 316 / EN 1.4401 (SCM-G)			AVBE		AQQE		AQQV		AQQK		AVBV		AQBv		1 X 230 V 50 Hz (Supply Voltage B)		3 x 380-415 V 50 Hz(Supply Voltage C)		1 x 230 V 60 Hz(Supply Voltage A)		3 X 460 V, 60Hz (Supply Voltage D)		3 X 230 V, 60Hz (Supply Voltage E)		3 X 380 V, 60Hz (Supply Voltage F)
SCM 1-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-6		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-7		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-8		•	•		•	•	•	•	•	• <sup>2)</sup>	• <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-9		•	•		•	•	•	•	•	• <sup>2)</sup>	• <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-10		•	•		•	•	•	•	•	• <sup>2)</sup>	• <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-11		•	•		•	•				• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-12		•	•		•	•				• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-13		•	•		•	•				• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 1-14		•	•		•	•				• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-6	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-7	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-8	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-9		•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SCM 3-10		•	•																																						
SCM 3-11		•	•																																						
SCM 3-12		•	•																																						
SCM 3-13		•	•																																						
SCM 3-14		•	•																																						

1) On request.

2) Neither suitable for 60 Hz mains - operated pumps.

3) Not Suitable for pumping liquids at temperature above +198°F(+90°C).

## PRESSURE BOOSTER PUMPS

### SCM Series



PUMP TYPE	50 Hz			60 Hz			Mechanical Seal			Mains - Operated Motor								
	Material			Material						50Hz		60Hz						
							Voltage [V]		Voltage [V]									
	Cast Iron (SCM-A)	Stainless Steel AISI 304 / EN 1.4301 (SCM-I)	Stainless Steel AISI 316 / EN 1.4401 (SCM-G)	Cast Iron (SCM-A)	Stainless Steel AISI 304 / EN 1.4301 (SCM-I)	Stainless Steel AISI 316 / EN 1.4401 (SCM-G)	AVBE	AQQE	AQQV	AQKQ	AVBV	AQBV	1 X 230 V 50 Hz (Supply Voltage B)	3 x 380-415 V (Supply Voltage C)	1 x 230 V 60 Hz(Supply Voltage A)	3 X 460 V, 60Hz (Supply Voltage D)	3 X 230 V, 60Hz (Supply Voltage E)	3 X 380 V, 60Hz (Supply Voltage F)
SCM 5-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SCM 5-3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SCM 5-4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SCM 5-5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SCM 5-6	•	•	•	•	•	•	• <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
SCM 5-7	•	•	•	•	•	•	• <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
SCM 5-8	•	•	•	•	•	•	• <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
SCM 5-9		•	•		•	•	•	•	•	•					•	•	•	
SCM 5-10		•	•		•	•	•	•	•	•								
SCM 5-11		•	•					• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>								
SCM 5-12		•	•					• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>								
SCM 5-13		•	•					• <sup>3)</sup>	• <sup>3)</sup>	• <sup>3)</sup>								

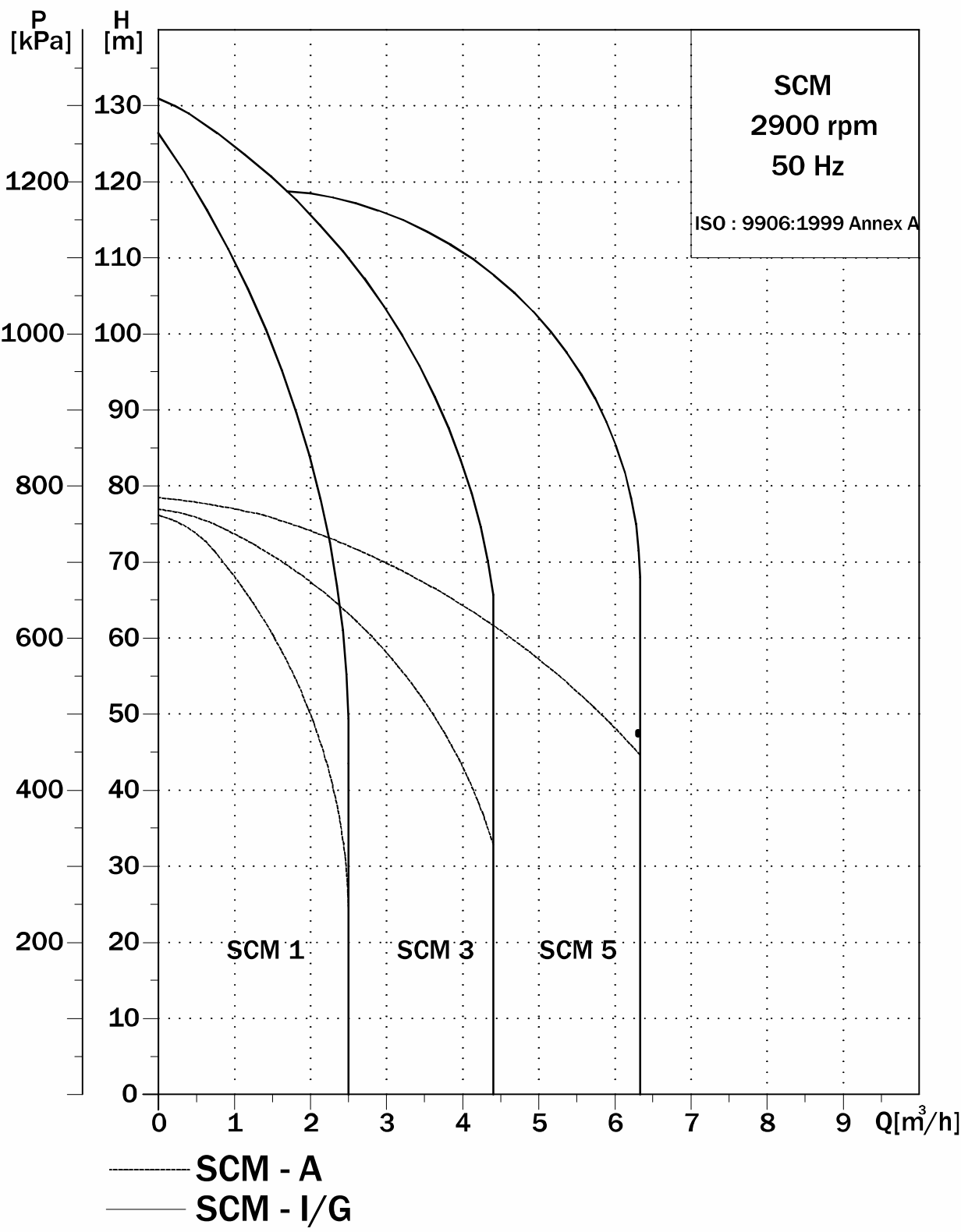
1) On request.

2) Neither suitable for 60 Hz mains - operated pumps.

3) Not Suitable for pumping liquids at temperature above +198°F(+90°C).

**PRESSURE BOOSTER PUMPS**  
SCM Series

6. PERFORMANCE SCM, 50 Hz



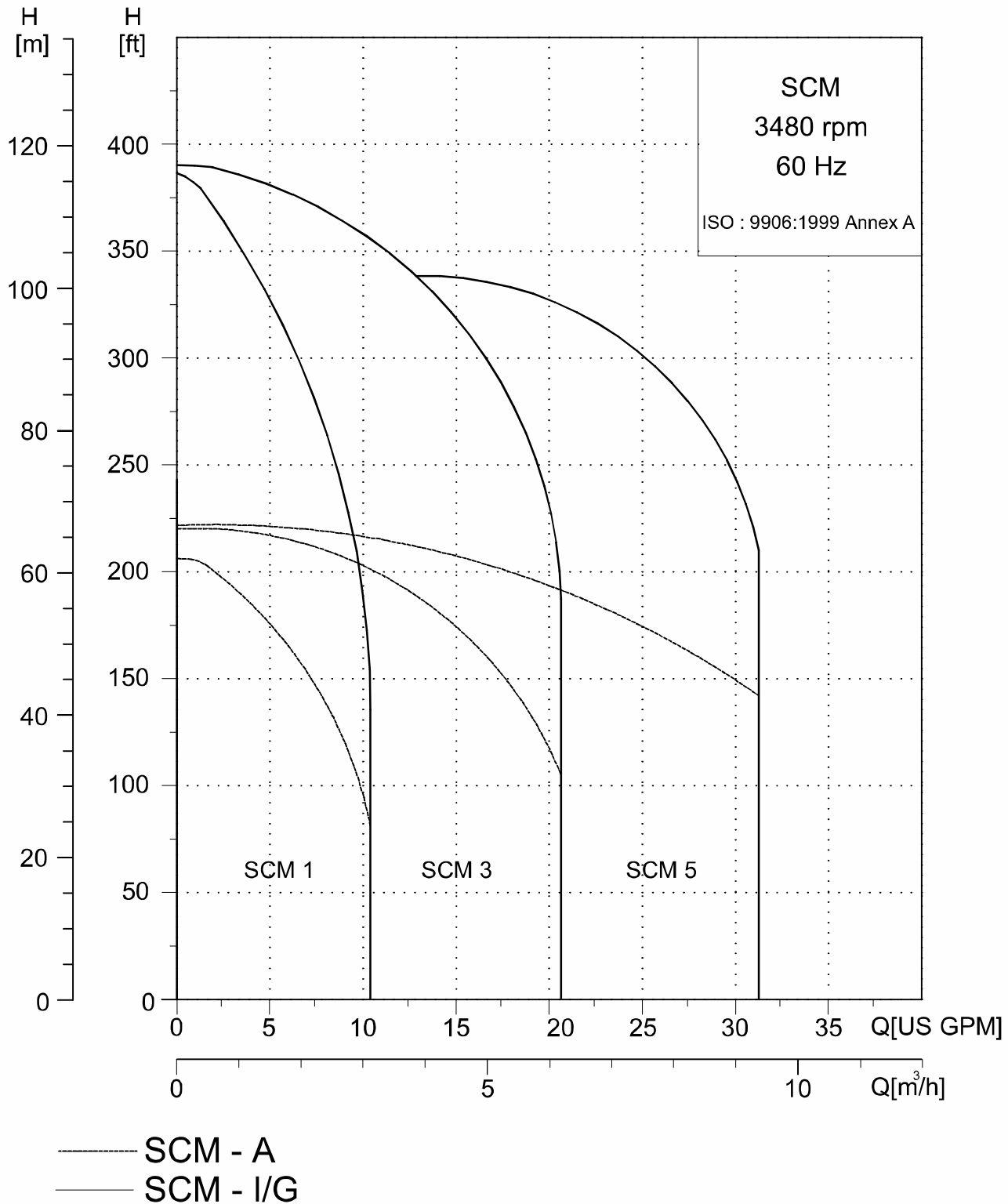


# PRESSURE BOOSTER PUMPS

## SCM Series



### PERFORMANCE SCM, 60 Hz



# PRESSURE BOOSTER PUMPS

## SCM Series

### 7. EUP READY

The SCM pumps are energy-optimised and comply with the EuP Directive (Commission Regulation (EC) No 547/2012) which has been effective since 1 January 2013. As from this date, all pumps will be classified/graduated in a new energy efficiency index (MEI).

#### MINIMUM EFFICIENCY INDEX

Minimum efficiency index (MEI) means the dimension less scale unit for hydraulic pump efficiency at best efficiency point (BEP), part load (PL) and overload (OL). The Commission Regulation (EU) sets efficiency requirements to MEI . 0.10 as from 1 January 2013 and MEI . 0.40 as from 1 January 2015. An indicative benchmark for best-performing water pump available on the market as from 1 January 2013 is determined in the Regulation.

- The benchmark for most efficient water pumps is MEI . 0.70.
- The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.
- The operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable-speed drive that matches the pump duty to the system.

Pump type	MEI	Efficiency at best efficiency point [%]
SCM 1 A	0.70	37.1
SCM 1 I/G	0.68	36.4
SCM 3 A	0.70	50.6
SCM 3 I/G	0.70	49.3
SCM 5 A	0.70	53.3
SCM 5 I/G	0.70	52.1

### 8. OPERATING CONDITIONS

#### AMBIENT TEMPERATURE

The maximum ambient temperature depends on the liquid temperature. The table below shows within which temperature ranges the SCM pumps should be used.

**Note:** The maximum permissible liquid temperature for SCM-A is +194 °F (+90 °C)

Maximum ambient temperature [°F (°C)]	Liquid temperature	Pump Type
		SCM
+131 (+55°C)	+194 (+90°C)	●
+122 (+50°C)	+212 (+100°C)	●
+113 (+45°C)	+230 (+110°C)	●
+104 (+40°C)	+248 (+120°C)	●

#### SCM (MAINS-OPERATED MOTORS)

If the ambient temperature for SCM pumps exceeds +131 °F (+55 °C), the motor must not be fully loaded due to the risk of overheating.

In such cases, it may be necessary to derate the motor output or use an oversize motor with higher rated output. The SCM pumps can be derated in relation to ambient temperature without consequence. Contact Shakti Pumps for further information.

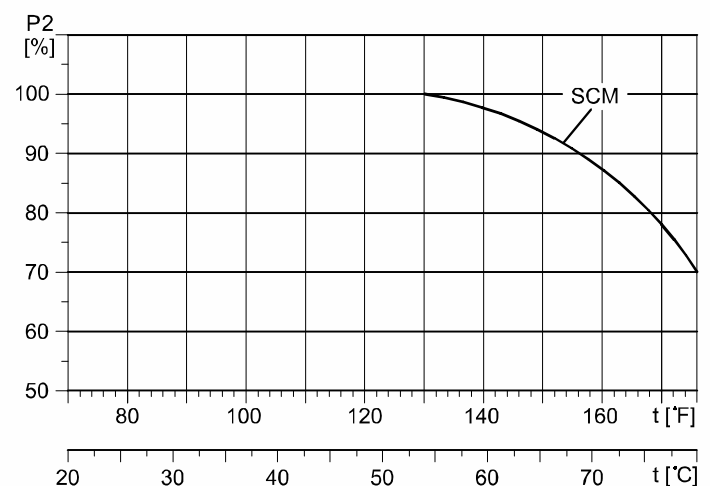


Fig. 3 Derating of SCM pump, in relation to ambient temperature

# PRESSURE BOOSTER PUMPS

## SCM Series

### STORAGE AND TRANSPORT TEMPERATURE

SCM: +58 to +158 °F (-50 to +70 °C)

### INSTALLATION ALTITUDE

Installation altitude is the height above sea level of the installation site. Motors installed at maximum altitude can be loaded 100 %. Motors installed above maximum altitude must not be fully loaded due to the low density and consequently low cooling effect of the air.

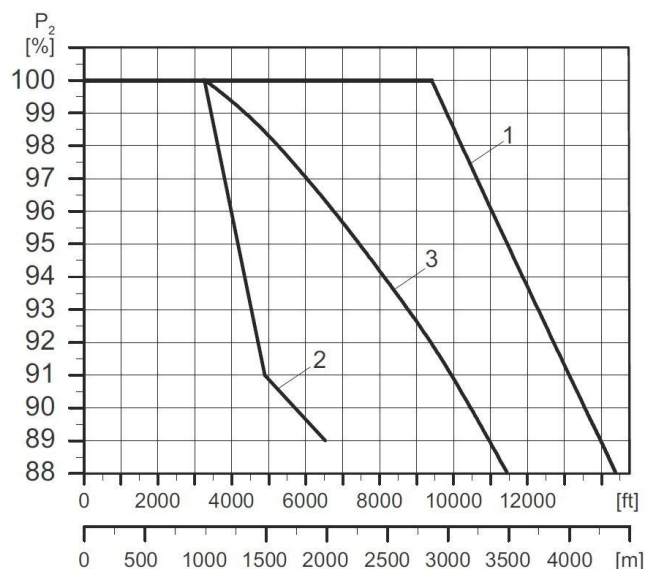


Fig. 4 Relationship between motor output (P2) and altitude

Pos.	Motor Output		Pump Type
	Kw	Hp	
1	0.37 - 7.5	0.5 - 10	SCM

### Installation of pump

The pump must be installed on a plane surface and fixed so that it cannot be displaced during startup and operation. The pump must be installed so that air locks are avoided in the pump housing and pipework.

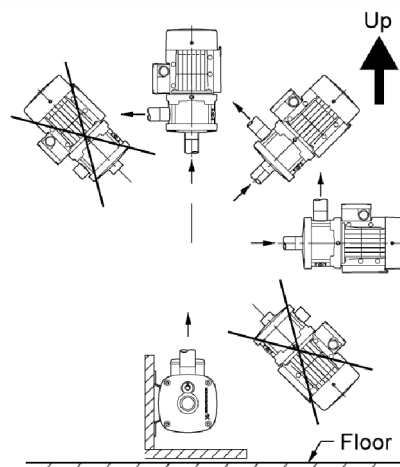


fig.5 installation of SCM pump

The pump should be installed with easy access for inspection, maintenance and service. The pump should be installed in a well-ventilated location.

### MAXIMUM OPERATING PRESSURE AND PERMISSIBLE LIQUID TEMPERATURE

The maximum operating pressure and the permissible liquid temperature depend on the pump material, the type of shaft seal and the pumped liquid

Material Variant	Shaft Seal	Permissible Liquid Temperature	Maximum Operating Pressure
		[F° (-°C)]	[psi (bar)]
Cast Iron	AVBx	-4 to + 104 (-20 to + 40)	145 (10)
		+ 105 to + 194 (+ 41 to + 90)	87 (6)
	AQQx	-4 to + 194 (-20 to + 90)	145 (10)
Stainless Steel (SS AISI 304 / EN 1.4301)	AVBx	-4 to + 104 (-20 to + 40)	145 (10)
		+ 105 to + 194 (+ 41 to + 90)	87 (6)
	AQQx	-4 to + 194 (-20 to + 90)	232 (16)
		+ 195 to + 248 (+ 91 to + 120)	145 (10)
Stainless Steel (SS AISI 316 / EN 1.4401)	AVBx	-4 to + 104 (-20 to + 40)	145 (10)
		+ 105 to + 194 (+ 41 to + 90)	87 (6)
	AQQx	-4 to + 194 (-20 to + 90)	232 (16)
		+ 195 to + 248 (+ 91 to + 120)	145 (10)

# PRESSURE BOOSTER PUMPS

## SCM Series

1. At liquid temperatures below 0 °C (32 °F), higher motor outputs may be needed due to increased viscosity, for instance if glycol has been added to the water.
- 2) +248 °F (+120 °C) applies only if the pump has an AQQE shaft seal.
- 3) SCM-I, -G for liquid temperatures below -4 °F (-20 °C) are available on request. Please contact Shakti Pumps.

### MAXIMUM LIQUID TEMPERATURE CHANGE GRADIENT

Cast-iron pumps (SCM-A) should not be used in applications where rapid temperature changes of more than 45 °C with +81 °F (+45 °C) may occur. If exposed to such rapid temperature changes, a cast-iron pump may leak. Under such operating conditions, we recommend to use stainless-steel pumps (SCM-I, -G).

### LIQUID TEMPERATURE RANGE

O - ring material / Liquid	Permissible Liquid Temperature [ °F(°C) ]
EPDM	-4 to +248 (-20 to +120)
FFKM	+32 to +248 (0 to +120)
FKM / Liquid containing water	-4 to +194 (-20 to +90)
FKM / Oil without water	-4 to +248 (-20 to +120)

### OPERATING RANGE OF THE MECHANICAL SEAL

The operating range of the mechanical seal depends on operating pressure, type of mechanical seal and liquid temperature.

The curve shows which mechanical seals are suitable at a given temperature and a given pressure. The curve applies to clean water.

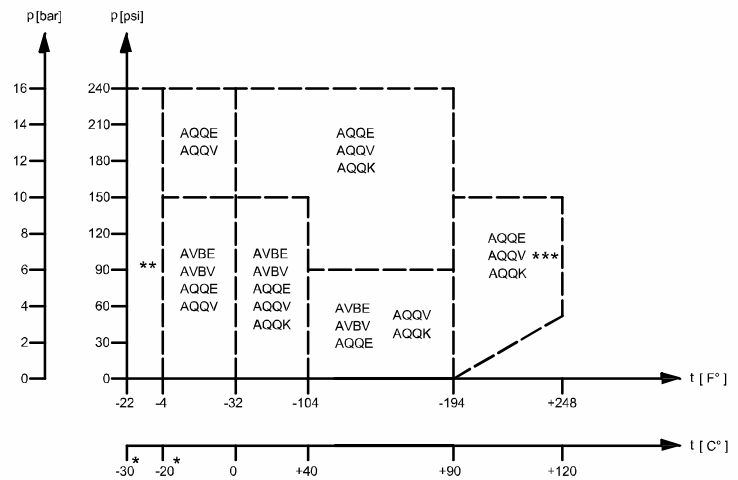


Fig. 6 Selection of shaft seals

\* Antifreeze should be added at liquid temperatures below +32 °F (0 °C).

\*\* SCM pumps for liquid temperatures below -4 °F (-20 °C) are available on request. Please contact Shakti Pumps.

\*\*\* AQQV / AQBV above 194 °F (+90 °C) only in media not containing water.

### MECHANICAL SEAL RUN-IN

The seal faces are lubricated by the pumped liquid, meaning that there may be a certain amount of leakage from the mechanical seal.

When the pump is started up for the first time, or when a new mechanical seal is installed, a certain run-in period is required before the leakage is reduced to an acceptable level. The time required for this depends on the operating conditions, i.e. every time the operating conditions change, a new run-in period will be started. Under normal conditions, the leaking liquid will evaporate. As a result, no leakage will be detected. However, liquids such as kerosene will not evaporate. The leakage may therefore be seen as a mechanical seal failure.

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### VISCOSITY

The pumping of liquids with densities or kinematic viscosities higher than those of water will cause a considerable pressure drop, a drop in the hydraulic performance and a rise in the power consumption. For instance at liquid temperatures below 0°C (32°F), higher motor outputs may be needed due to increased viscosity if glycol has been added to the water. In such situations, the pump should be fitted with a larger motor.

### SOUND PRESSURE LEVEL

The sound pressure values in the table below apply for SCM pumps. If the motor output (P<sub>2</sub>) for a given pump is not found in the table, use the nearest rounded-up value. The values for sound pressure include a tolerance of 3 dB (A) according to EN ISO 4871.

### SOUND PRESSURE LEVEL

SOUND PRESSURE LEVEL		
P <sub>2</sub> [Hp / (Kw)]	50Hz	60Hz
	LpA [dB(A)]	LpA [dB(A)]
0.5 (0.37)	65	66
0.75 (0.55)	65	66
1.0 (0.75)	65	67
1.5 (1.1)	67	69
2.0 (1.5)	67	69
3.0 (2.2)	68	69
4.0 (3.0)	69	70
5.0 (3.7)	68	68
5.5 (4.0)	68	69
7.5 (5.5)	70	71
10.0 (7.5)	71	71

The audible noise from SCM pumps is primarily noise from the motor fan. The selection of SCM pumps will reduce the noise at partial load, as the motor, and consequently, the motor fan runs at a lower speed. Possible flow noise from control valves is also reduced at partial load in the case of the SCM pump. sound pressure values are measured at 3ft / 1 m

### Maximum inlet pressure

The maximum inlet pressure of the SCM pumps is equal to the maximum Operating pressure of the pump minus the pumps discharge pressure against a closed valve. For example: SCM5-3 A-S-A-E-AQQE  
Max. operating pressure: 145 psi ( 10 bar)  
Discharge pressure against closed valve: 57 psi (4 bar)  
Max. inlet pressure=(145-57) or ( 10 - 4)=88 psi (6 bar)

### 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 feet of head can be calculated as follows:

$$H = P_b - \text{NPSH} - H_f - H_v - H_s \quad \text{for } H \text{ in feet.}$$

$$H = P_b \times 10.2 - \text{NPSH} - H_f - H_v - H_s \quad \text{for } H \text{ in meter.}$$

$P_b$  = Barometric pressure in feet absolute or bar. (Barometric pressure can be set to 33.9). In closed systems,  $P_b$  indicates the system pressure in feet and meter.

$\text{NPSH}$  = Net Positive Suction Head in feet or meter of head. (To be read from the NPSH curve at the highest flow the pump will be delivering).

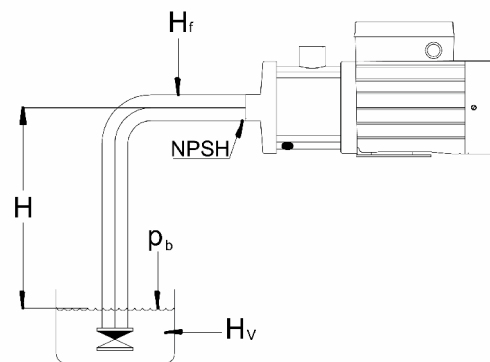
$H_f$  = Friction loss in suction pipe in feet or meter of head. (At the highest flow the pump will be delivering).

$H_v$  = Vapor pressure in feet or meter of head. (To be read from the vapor pressure scale. "H<sub>v</sub>" depends on the liquid temperature "T<sub>m</sub>").

$H_s$  = Safety margin = minimum 2 ft or 0.5 meter of head.

If the "H" calculated is positive, the pump can operate at a suction lift of maximum "H" feet or meter of head.

If the "H" calculated is negative, an inlet pressure of minimum "H" feet or meter of 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.



# PRESSURE BOOSTER PUMPS

## SCM Series

### 9. CONSTRUCTION

#### PUMP

The SCM pumps are non-self-priming, horizontal, multistage centrifugal pumps. The pumps have axial suction port and radial discharge port and are mounted on a base plate.

All movable parts are made of stainless steel. The pumps are available with mains-operated motors (SCM pumps). All pumps incorporate a maintenance-free mechanical O-ring shaft seal with fixed driver.

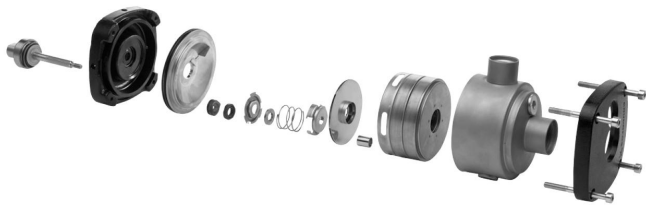


Fig. 8 Exploded view of shaft seal

#### MOTOR

SCM pumps are fitted with totally enclosed, fan-cooled, 2-pole motors with principal dimensions to EN 50347. The motors have been developed especially for SCM pumps. Electrical tolerances comply with EN 60034.

Single - phase pumps are available from 0.5 Hp (0.37 Kw) to 3 Hp (2.2 Kw)

Three - phase pumps are available from 0.5 Hp ( 0.37 Kw) to 10 Hp (7.5 Kw)

#### SOFT STARTER

Soft starters should only be used for three-phase motors.

#### EFFICIENCY

Motors for SCM pumps comply with different energy-efficiency requirements throughout the world for example CE certifications.

Generally, this means that all three-phase motors of 0.75 kW and up are IE2-compliant as standard. IE3-compliant motors are available on request. The new-generation SMG motors have a total efficiency which exceeds the IE4 super premium efficiency level defined for fixed-speed motors including the frequency converter.

#### ELECTRICAL DATA

Insulation class	H
Enclosure class	Ip55*
Supply voltages (tolerance $\pm 10\%$ )	<b>SCM</b> A : 1 X 230 V, 60Hz B : 1 X 230 V, 50Hz C : 3 X 380 - 415 V, 50Hz D : 3 X 460 V, 60Hz E : 3 X 230 V, 60Hz F : 3 X 380 V, 60Hz

\* IP55 is not recommended for operation in condensing environments.

#### MOTOR PROTECTION

##### Mains-operated motors (SCM)

Single-phase motors, 1 x 230 V, 60 Hz, do not incorporate motor protection and must be connected to a motor-protective circuit breaker which can be manually reset. Set the motor-protective circuit breaker according to the rated current of the motor ( $I_1/1$ ). See nameplate.

Other single-phase motors have built-in current- and temperature-dependent motor protection in accordance with IEC 60034-11 and require no further motor protection. The motor protection reacts to both slow- and quick-rising temperatures. The motor protection is automatically reset. Three-phase motors up to 3 kW (4HP) must be connected to a motor-protective circuit breaker which can be manually reset. Set the motor-protective circuit breaker according to the rated current of the motor ( $I_1/1$ ). See nameplate. Motors with power ratings of 3 kW and up have built-in thermistors (PTC)\*. The thermistors are designed according to DIN 44082. The motor protection reacts to both slow- and quick-rising temperatures.

# PRESSURE BOOSTER PUMPS

## SCM Series

### Mechanical Seal

The mechanical seal for the SCM pumps is of the O-ring type, which makes it very flexible when different types of O-rings and seal-face materials are needed. The mechanical seal has a fixed seal driver which ensures a reliable rotation of all parts - even under the most extreme operating conditions. Due to the special design of the mechanical seal and the interfaces to the rest of the pump construction, the dry-running capabilities are improved significantly compared to most other similar mechanical seals and pump types. Furthermore, improvements have been made to reduce the risk and effect of sticking. The mechanical seal types available can be found in Selection of mechanical seal on where the key parameters of selecting a mechanical seal are also described.



•**Note:** The available mechanical seals for SCM pumps are very robust and durable, but dry running must always be avoided. Details regarding operating conditions for the mechanical seal can be found in Operating range of the mechanical seal

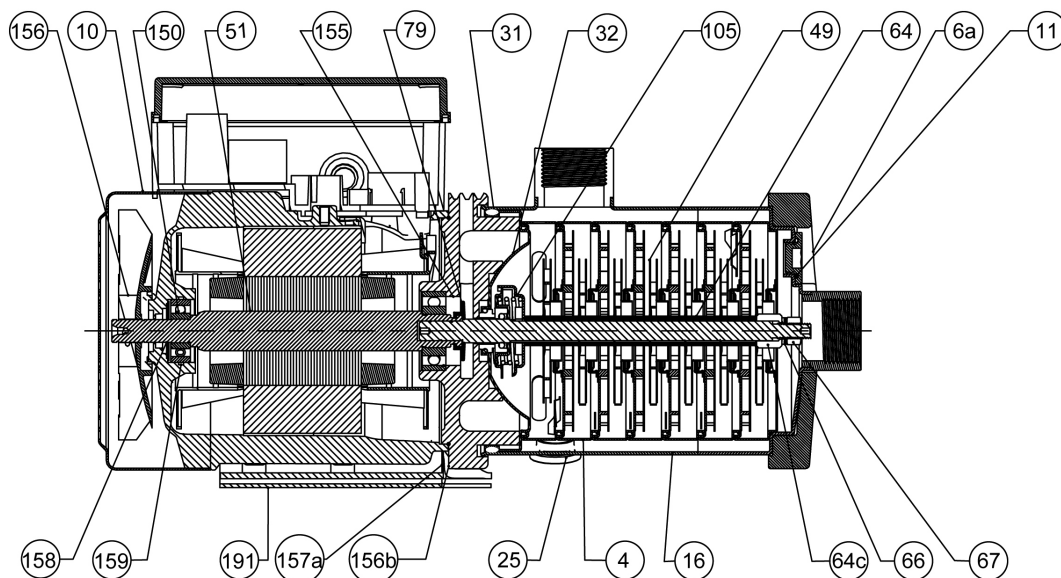


Fig. 9 SCM 1/3/5 with SMG motor

POS.	Component	POS.	Component	POS.	Component
04	Chamber	49	Impeller	150	Stator Housing
6a	Inlet Part	51	Rotor Assly.	155	Bearing Cover Plate
10	Motor Assly	64	Spacing Pipe	156	Fan
11	O - Ring	64c.	Clamp	156b	Discharge Part
16	Outer Sleeve Assly	66	Washer (NORD - LOCK®)	157a	Gasket
25	Plug	67	Nut	158	Corrugated Spring
31	O-Ring	79	Diverting Disc	159	O - Ring
32	Cover Plate Assly	105	Mechanical Seal	191	Base Plate

# PRESSURE BOOSTER PUMPS

## SCM Series

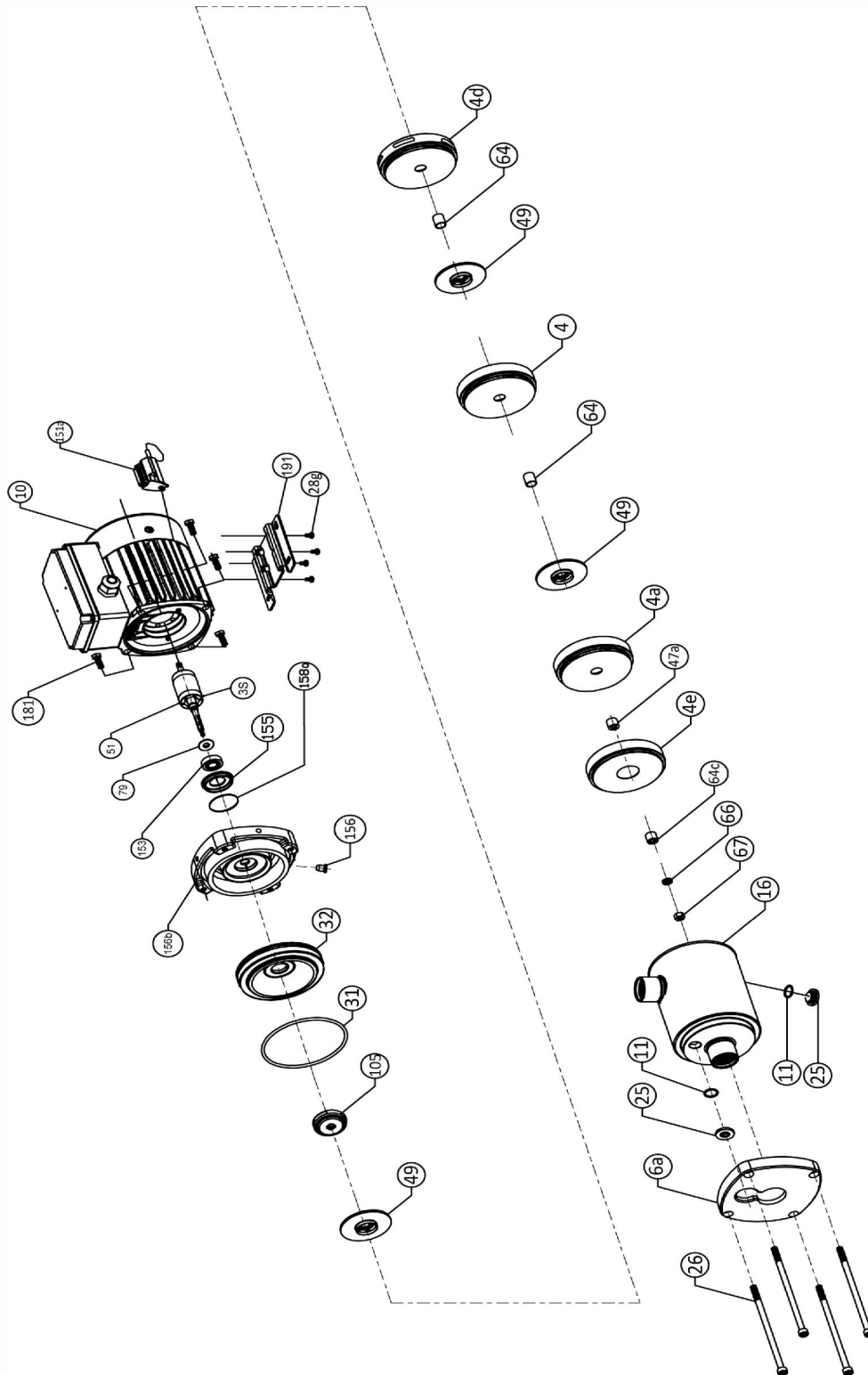
### MATERIAL SPECIFICATION

POS.	DESCRIPTION	MATERIAL	PUMP MATERIAL VERSION					
			SCM - A : CAST IRON		SCM - I : STAINLESS STEEL		SCM - G : STAINLESS STEEL	
			DIN	ISO/AISI/ASTM	DIN	ISO/AISI/ASTM	DIN	ISO/AISI/ASTM
MAJOR PARTS								
156b	Discharge Part	Iron						
151	Fan Cover	Polyphenylene Sulfide(PPS)						
152	Ball Bearing	STD						
156	Fan	Composite PA 66 30 %GF						
158	Corrugated Spring	Stainless Steel						
164b	Terminal Box, MG	Composite PC/ASA or Silumin (Alu)						
191	Base Plate	Steel, electrocoated						
		Steel, Powder - coated, 60 to 120μ, NCS 7005						
10	Motor Body	Aluminium (Silumin)						
79	Diverting Disc	Silicone Fluid (LSR)						
155	Bearing Cover Plate	Polyphenylene Sulfide(PPS)						
PUMP PARTS								
105	Mechanical Seal, Steel Parts	Stainless Steel	1.4301 / 1.4401	SS AISI 304 /SS AISI 316	1.4301 / 1.4401	SS AISI 304 /SS AISI 316	1.4404	SS AISI 316
	Mechanical Seal, Seal Faces	Al <sub>2</sub> O <sub>3</sub> /Carbon or SiC						
51	Pump Shaft	DUPLEX						
11	O - Rings	EPDM,FKM or FFKM						
31								
158a								
159								
157a	Gasket	TEFLON						
139b	Gasket	Aramide fibres (nbr)						
6	Inlet Part	Iron						
4	Chamber	Stainless Steel	1.4301 / 1.4401	SS AISI 304 /SS AISI 316	1.4301 / 1.4401	SS AISI 304 /SS AISI 316	1.4404	SS AISI 316
25	Plug	Stainless Steel	1.4404	SS AISI 316	1.4404	SS AISI 316	1.4404	SS AISI 316
49	Impeller	Stainless Steel	1.4301 / 1.4401	SS AISI 304 /SS AISI 316	1.4301 / 1.4401	SS AISI 304 /SS AISI 316	1.4404	SS AISI 316
64	Spacing Pipe	Stainless Steel	1.4404	SS AISI 316	1.4404	SS AISI 316	1.4404	SS AISI 316
64c	Clamp	Stainless Steel						
16	Sleeve	Stainless Steel			1.4301 / 1.4401	SS AISI 304 /SS AISI 316	1.4404	SS AISI 316
67	Nut	Stainless Steel						
66	Lock Washer	Stainless Steel						
47a	Radial Sleeve	Tungten carbide						

# PRESSURE BOOSTER PUMPS

## SCM Series

### EXPLODED VIEW & SECTIONAL VIEWS



\*\* QTY. CHANGES AS PER STAGE.

# PRESSURE BOOSTER PUMPS

## SCM Series

### 10. SELECTION AND SIZING

#### SELECTION OF PUMPS

Selection of pumps should be based on these elements:

- The duty point of the pump (see below)
- Dimensional data such as pressure loss as a result of height differences, friction loss in the pipework, pump efficiency, etc.
- Pump materials
- Pump connections
- Mechanical seal

#### Duty point of the pump

From a duty point it is possible to select a pump on the basis of the curve charts starting on page 21.

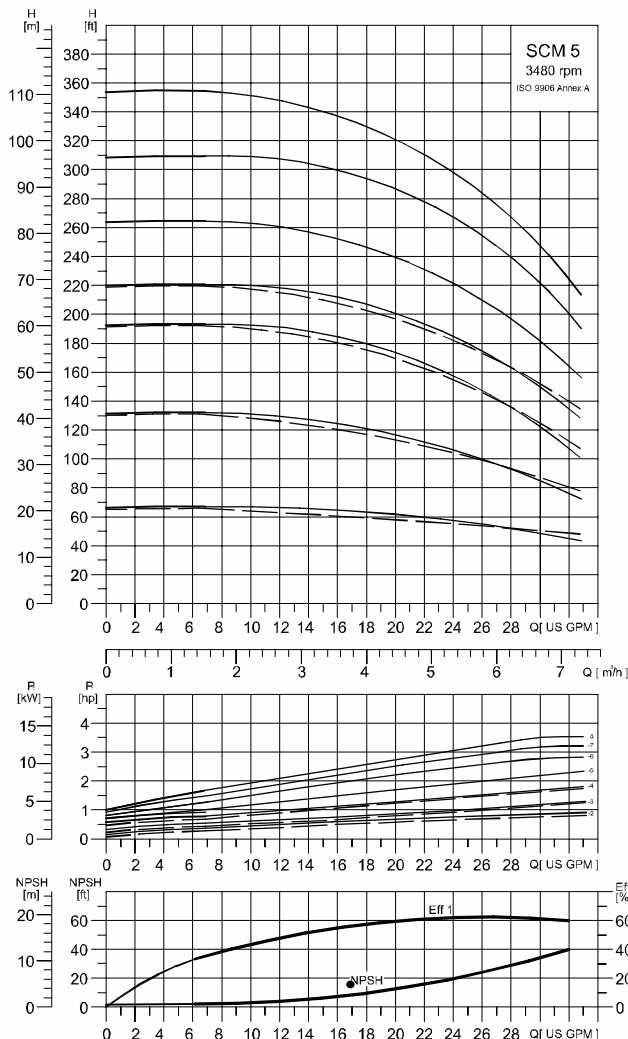


Fig. 10 Example of a curve chart

#### DIMENSIONAL DATA

When sizing a pump, take the following factors into account:

- Required flow and pressure at the draw-off point.
- Pressure loss as a result of height differences ( $H_{geo}$ ).
- Friction loss in the pipework ( $H_f$ ). It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- Best efficiency at the estimated duty point.\*
- NPSH value.

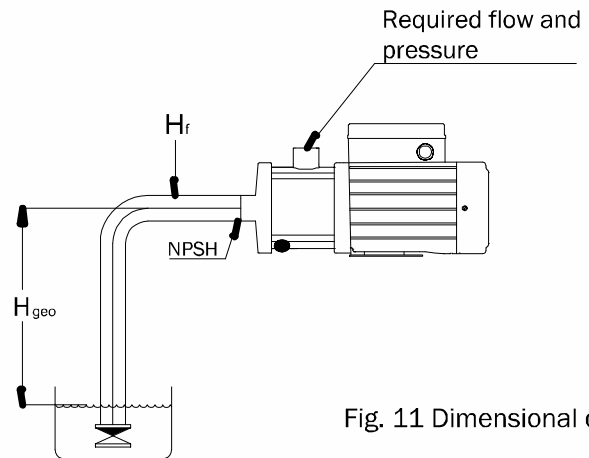


Fig. 11 Dimensional data

#### PUMP EFFICIENCY

When sizing the pump, the efficiency ( $\eta$ ) should be considered so that the pump will operate at or near its maximum efficiency, for instance on the right-hand side in the curve example.

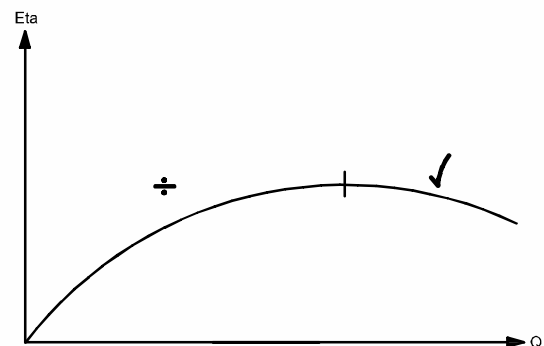


Fig. 12 Best efficiency

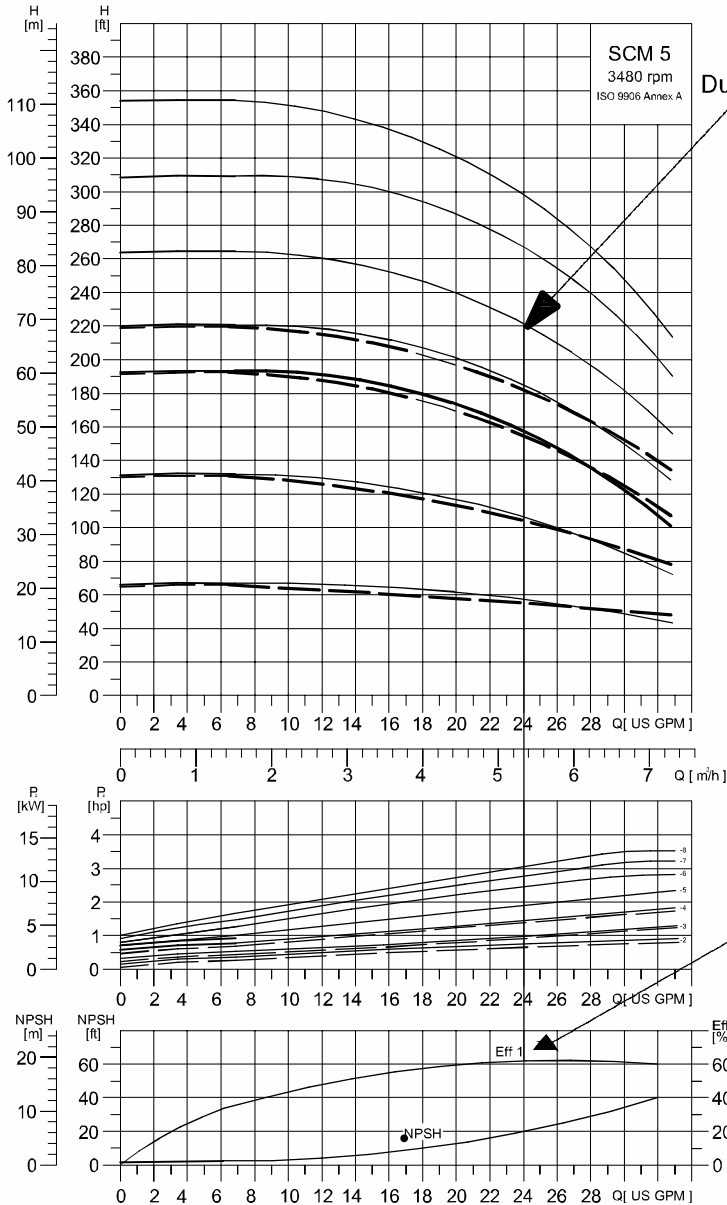
Before determining the best efficiency point, the operation pattern of the pump needs to be identified. If the pump is expected to operate at the same duty point, then select a SCM pump which is operating at a duty point corresponding with the best efficiency of the pump. The example shows how to check the pump efficiency when selecting a SCM pump.



# PRESSURE BOOSTER PUMPS

## SCM Series

### MATERIAL SPECIFICATION



### PUMP MATERIALS

Select the material variant on the basis of the liquid to be pumped. The table below gives a general recommendation regarding selection of pump material

\* The impeller, chamber and filling plugs are made of stainless steel (SS AISI 304).  
The pump shaft is made of stainless steel (DUPLEX).  
Contact Shakti for more specific selection based on the pumped liquid.

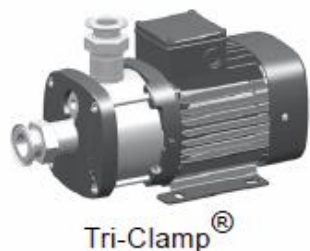
Liquid to be pumped	Material in contact with pump media	Pump Type
Clean, non-aggressive liquids such as potable water and oils	Cast Iron *	SCM - A
Industrial liquids and acids	Stainless Steel (SS AISI 304 / EN 1.4301)	SCM - I
	Stainless Steel (SS AISI 316 / EN 1.4401)	SCM - G

Fig. 13 Example of a SCM pump's duty point

# PRESSURE BOOSTER PUMPS

## SCM Series

### PUMP CONNECTIONS



Tri-Clamp®



DIN, JIS, ANSI flange



Victaulic® coupling

Selection of pump connection depends on the rated pressure and pipework. To meet any requirement, the SCM pumps offer a wide range of flexible connections such as:

- Tri-Clamp®
- ANSI flange
- Victaulic® coupling
- Internal NPT thread.
- DIN flange
- JIS flange
- Whitworth thread Rp

Fig. 14 Examples of pump connections

### SELECTION OF MECHANICAL SEAL

As standard, the SCM pumps are fitted with a Shakti Pumps O-ring type Mechanical seal with fixed driver suitable for the most common applications.

The table below shows the available mechanical seal types for SCM pumps

#### MECHANICAL SEAL TYPE

Pump type	Shaft seal type	Material	Rubber parts
SCM	AQQE	Stainless steel	EPDM (E) FKM (V) FFKM(K)
	AQQV		
	AQQK		
	AVBE		
	AVBV		



Fig. 15 Shaft seal  
(O-ring type with fixed driver)

These key parameters must be taken into account when selecting the mechanical seal:

- Type of pumped liquid
- Liquid temperature
- Maximum pressure.

**Note:** The list should be applied with some caution, as factors such as concentration of the pumped liquid, liquid temperature or pressure may affect the chemical resistance of a specific pump version.

# PRESSURE BOOSTER PUMPS

## SCM Series



### 11. HOW TO READ THE CURVE CHARTS

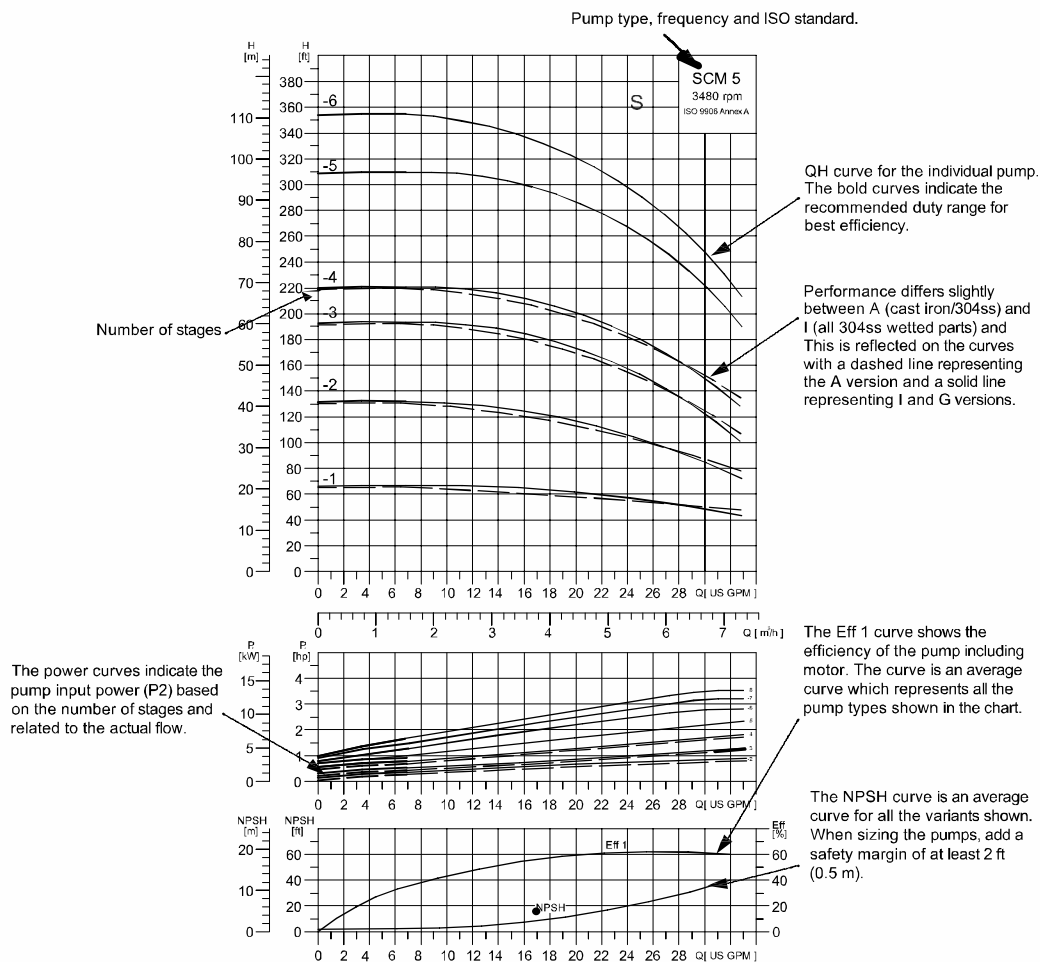


Fig. 16 How to read the curve charts

#### GUIDELINES FOR PERFORMANCE CURVES

The guidelines below apply to the curves shown on the following pages:

- Tolerances to ISO 9906:1999, Annex A, if indicated.
- Measurements have been made with airless water at a temperature of +68 °F (+20 °C).
- The curves apply to the following kinematic viscosity:  $\nu = 1 \text{ mm}^2/\text{s}$  (1 cSt).
- The QH curves apply to fixed speeds of 2900 min<sup>-1</sup> (50 Hz) and 3480 min<sup>-1</sup> (60 Hz).

**Note:** The actual speed will in most cases deviate from the above-mentioned speeds. So for realistic curves, where the pump curves include the characteristics of the selected motor and therefore show curves at actual speeds. It is also possible to adjust the curves depending on the density and viscosity.

- Due to the risk of overheating, the pumps should not be used at a flow below the minimum flow rate. The curve in fig. 17 shows the minimum flow rate as a percentage of the rated flow rate in relation to the liquid temperature.

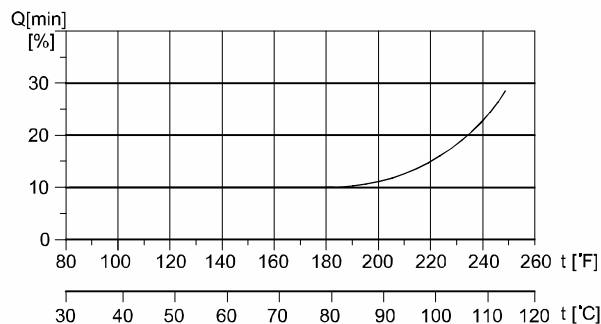


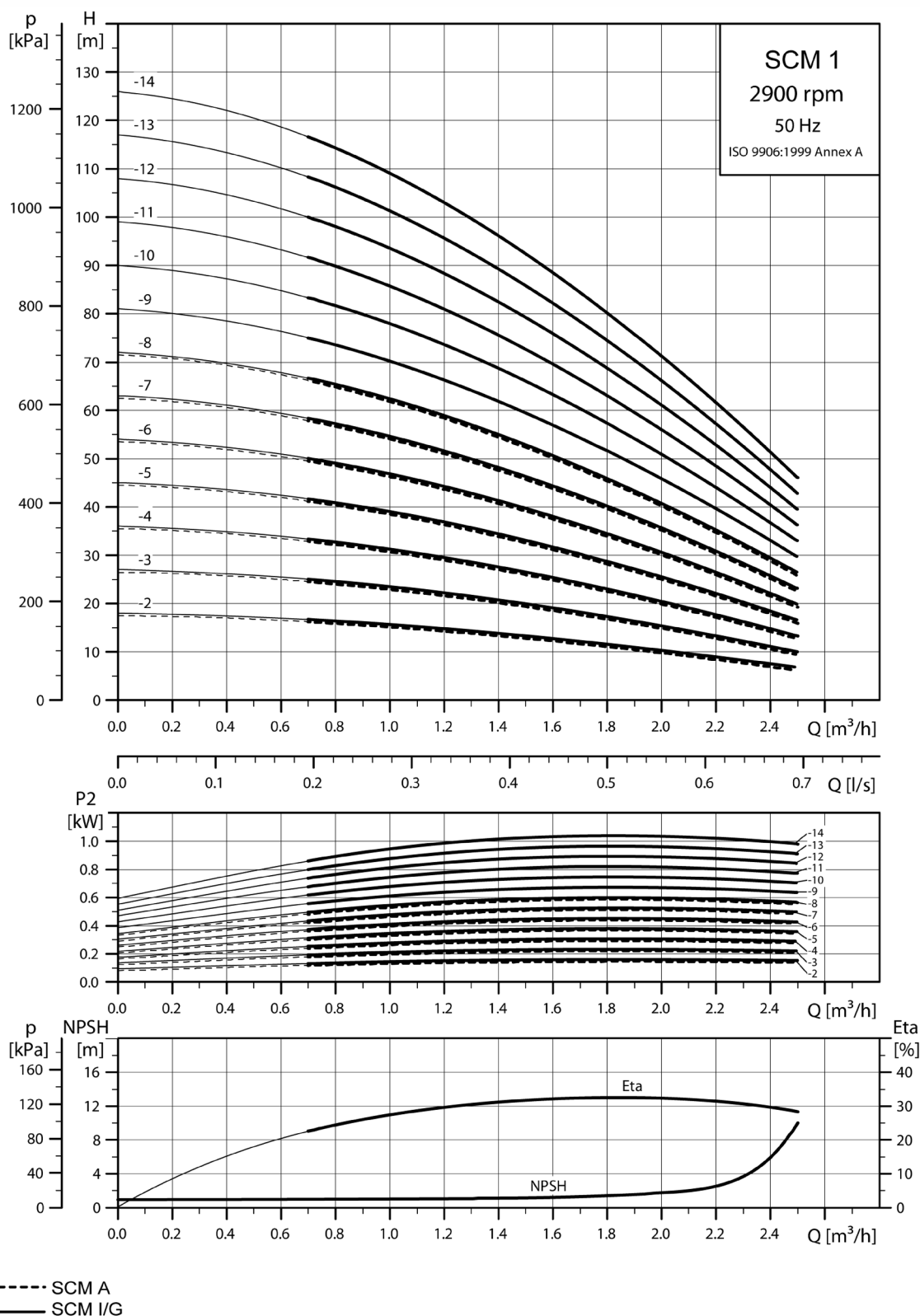
Fig. 17 Minimum flow rate

# PRESSURE BOOSTER PUMPS

## SCM Series

### 12. PERFORMANCE CURVES, SCM 50 HZ

#### SCM 1

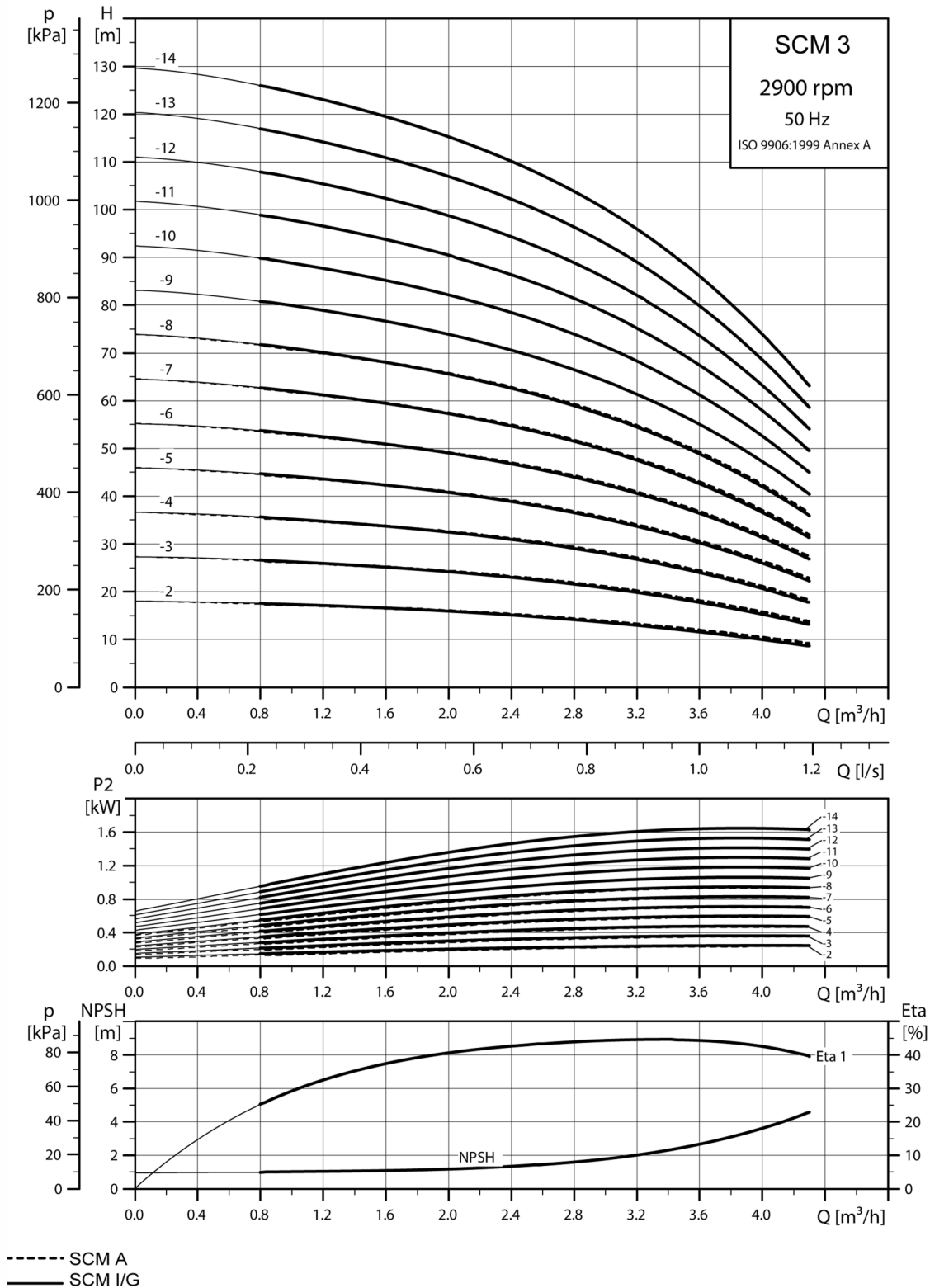


# PRESSURE BOOSTER PUMPS

## SCM Series



### SCM 3

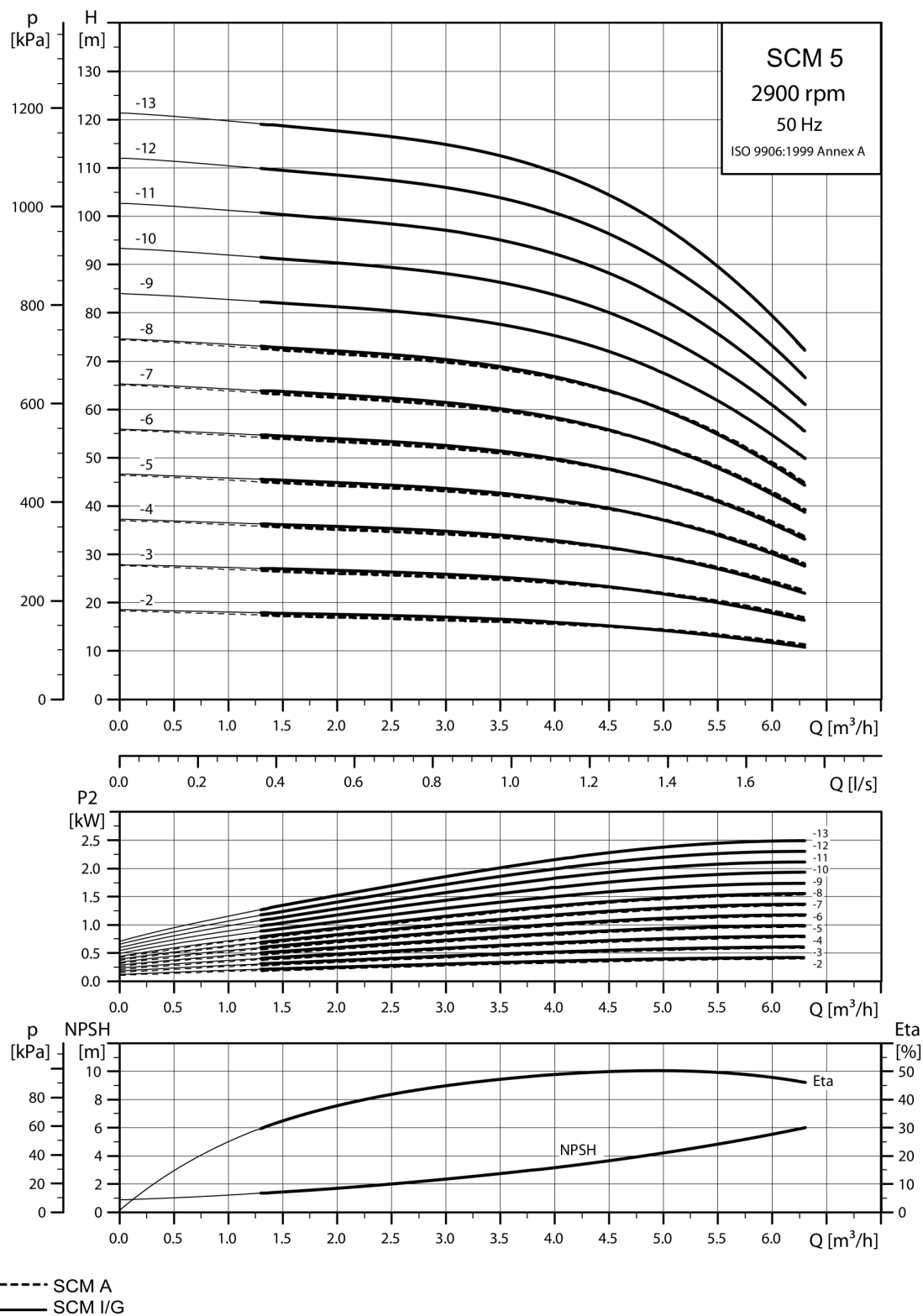




# PRESSURE BOOSTER PUMPS

## SCM Series

### SCM 5



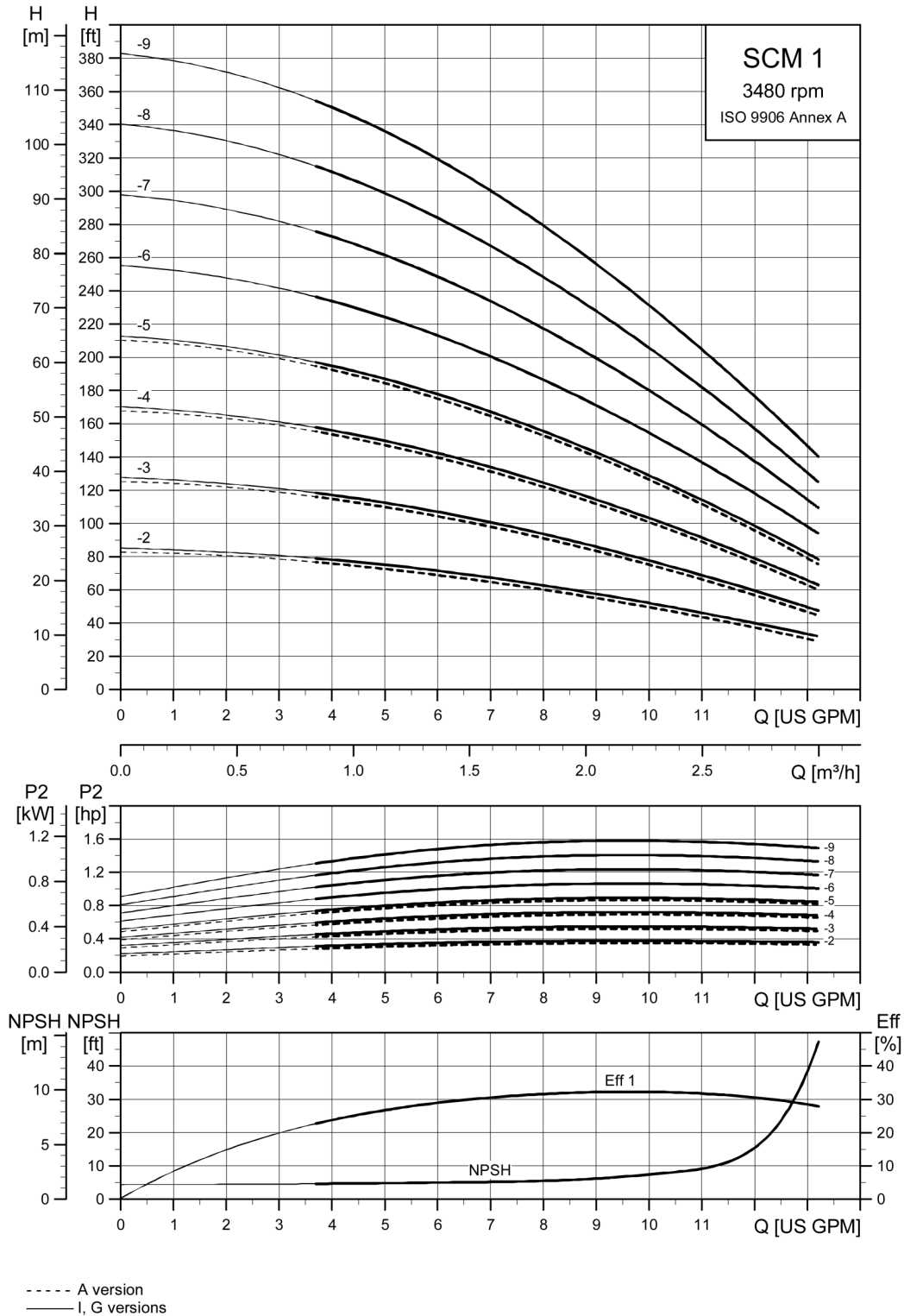
# PRESSURE BOOSTER PUMPS

## SCM Series



### 13. PERFORMANCE CURVES, SCM 60 HZ

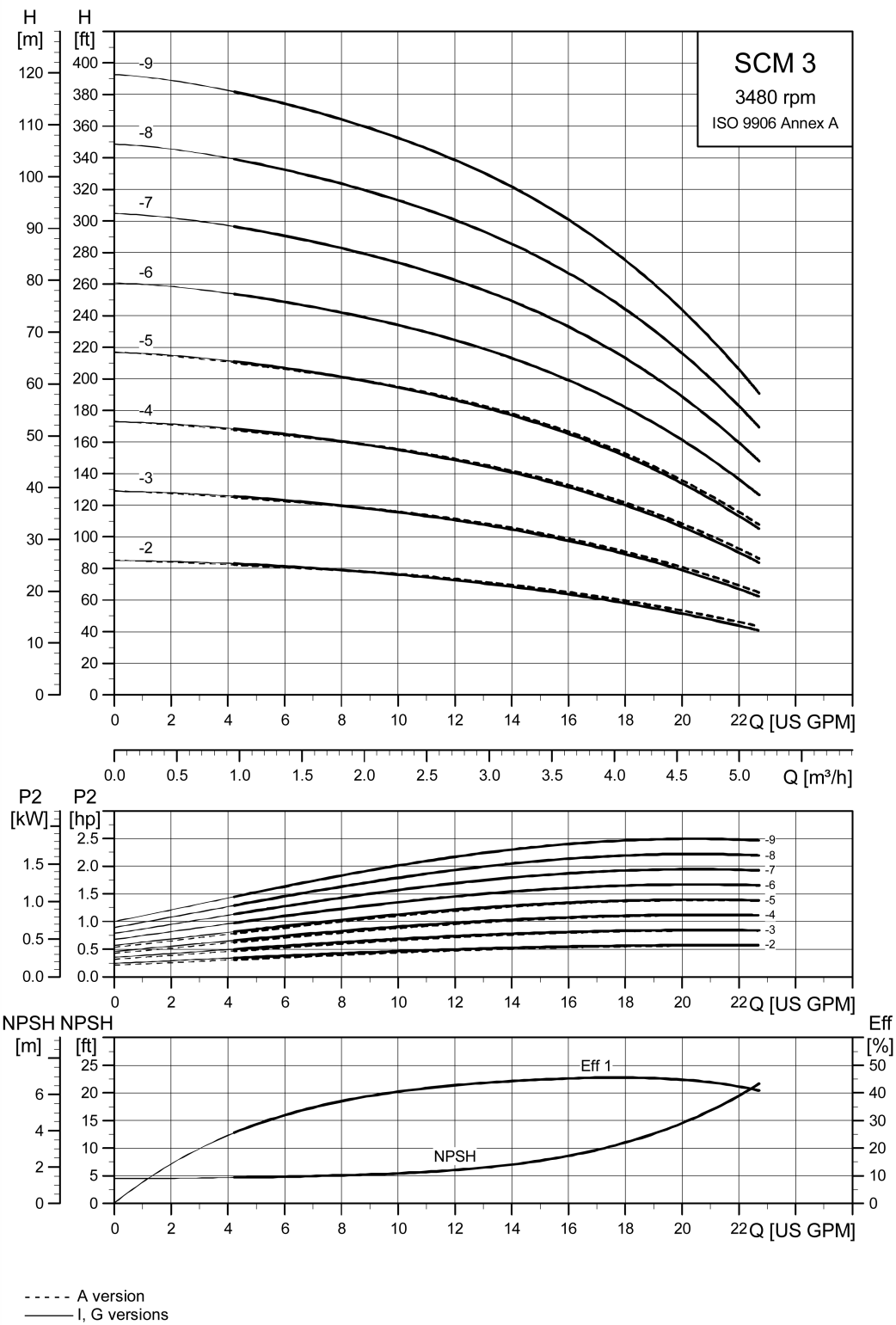
#### SCM 1



# PRESSURE BOOSTER PUMPS

## SCM Series

### SCM 3

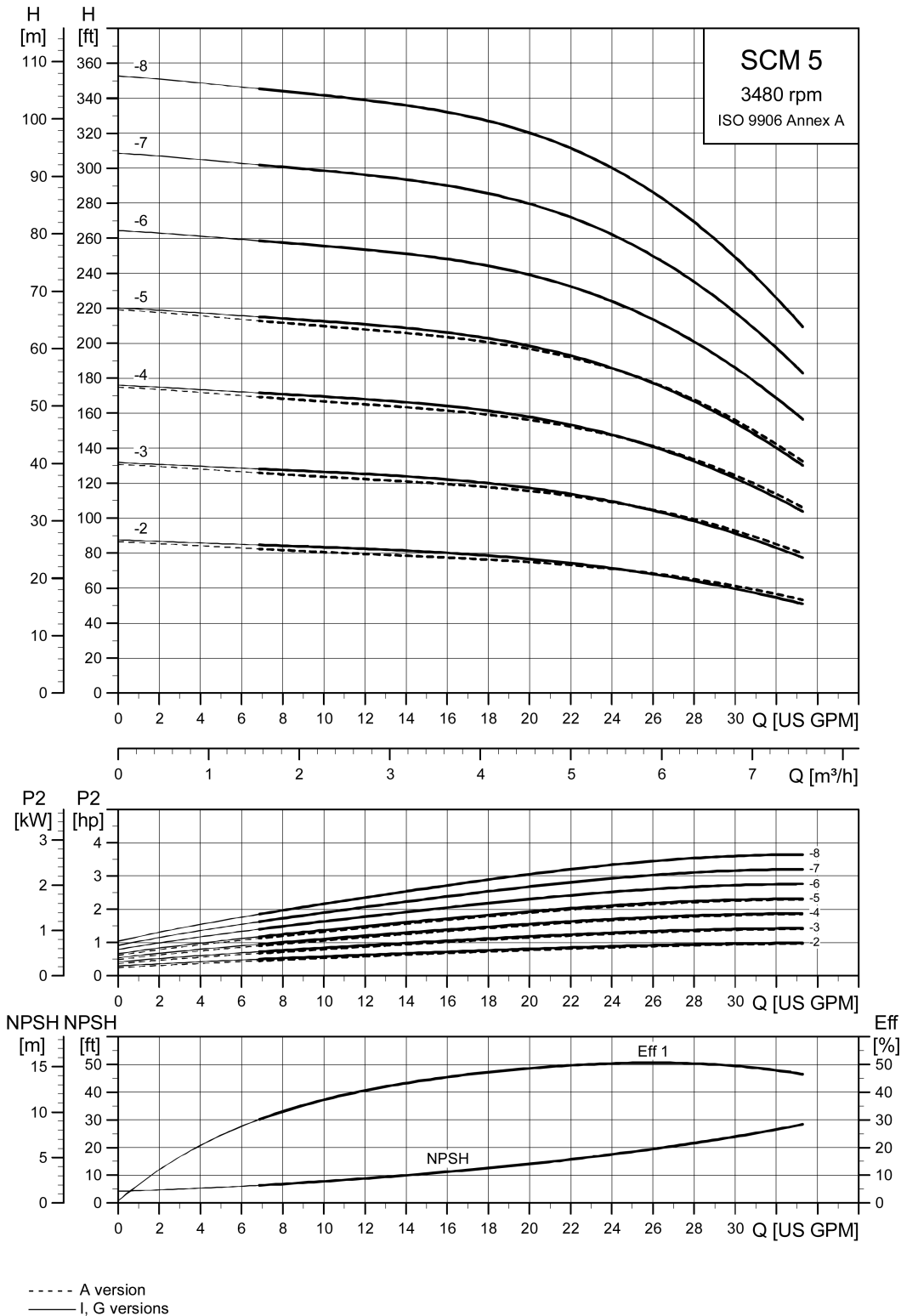


# PRESSURE BOOSTER PUMPS

## SCM Series



### SCM 5

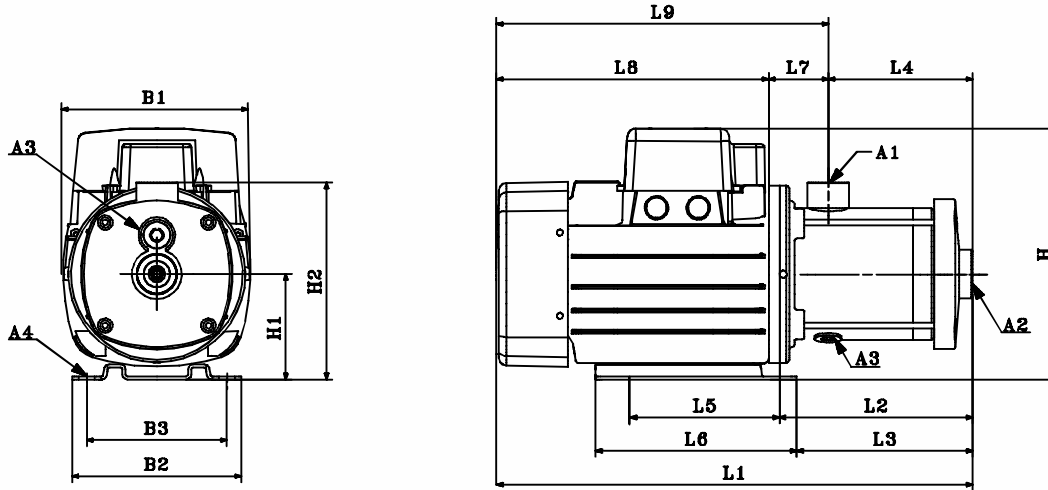


# PRESSURE BOOSTER PUMPS

## SCM Series

### PUMP DIMENSIONS (SCM 50 Hz)

#### SCM 1 - A, I & G



Dimensions																					
1 X 230 V, 50 Hz (Supply voltage A )																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 1-2	SMG -71	0.37	1"	1"	3/8"	10.5	142	163	132	206	75	168	298	123	98	56	97	138	70	175	242
SCM 1-3	SMG -71	0.37	1"	1"	3/8"	10.5	142	163	132	206	75	168	316	141	116	74	97	138	70	175	242
SCM 1-4	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	334	159	134	92	97	138	70	175	242
SCM 1-5	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	352	177	152	110	97	138	70	175	242
SCM 1-6	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	370	195	170	128	97	138	70	175	242
SCM 1-7	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	388	213	188	146	97	138	70	175	242
SCM 1-8	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	406	231	206	164	97	138	70	175	242
SCM 1-9	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	424	249	224	182	97	138	70	175	242
SCM 1-10	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	442	267	242	200	97	138	70	175	242
SCM 1-11	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	460	285	260	218	97	138	70	175	242
SCM 1-12	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	478	303	278	236	97	138	70	175	242
SCM 1-13	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	496	321	296	254	97	138	70	175	242
SCM 1-14	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	570	363	335	287	130	193	70	261	331

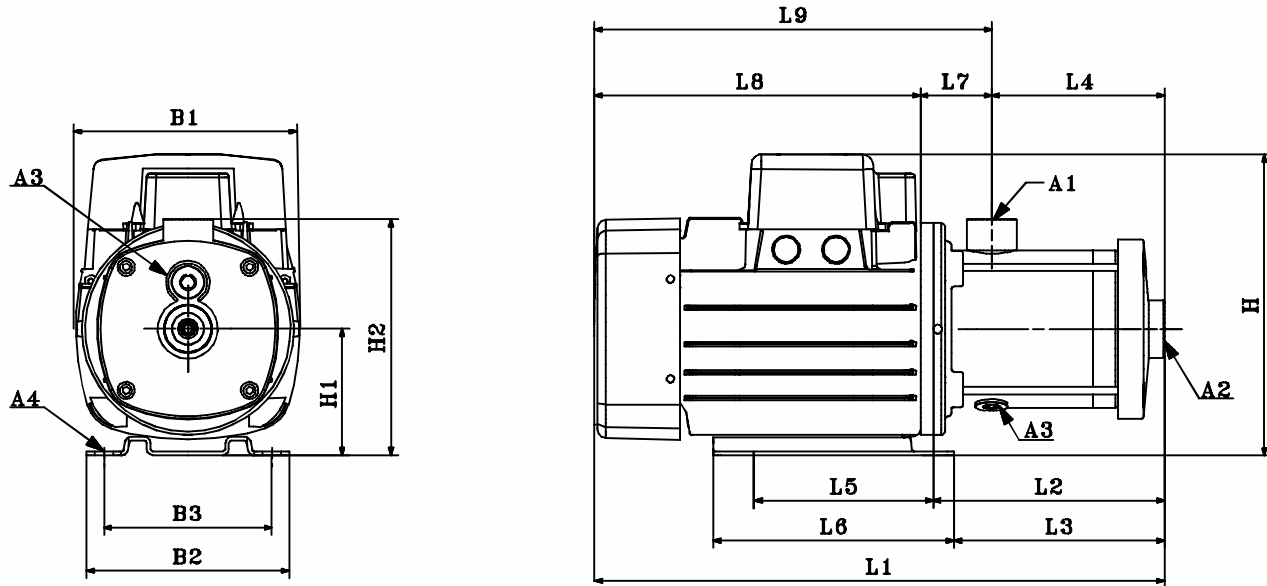
Dimensions																					
3 X 415 V, 50 Hz (Supply voltage C )																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 1-2	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	298	123	98	56	97	138	70	175	242
SCM 1-3	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	316	141	116	74	97	138	70	175	242
SCM 1-4	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	334	159	134	92	97	138	70	175	242
SCM 1-5	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	352	177	152	110	97	138	70	175	242
SCM 1-6	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	370	195	170	128	97	138	70	175	242
SCM 1-7	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	388	213	188	146	97	138	70	175	242
SCM 1-8	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	406	231	206	164	97	138	70	175	242
SCM 1-9	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	424	249	224	182	97	138	70	175	242
SCM 1-10	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	442	267	242	200	97	138	70	175	242
SCM 1-11	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	460	285	260	218	97	138	70	175	242
SCM 1-12	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	478	303	278	236	97	138	70	175	242
SCM 1-13	SMG -90	1.50	1"	1"	3/8"	10.5	142	163	132	206	101	168	540	343	315	267	130	138	70	175	242
SCM 1-14	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	1068	558	361	333	285	130	193	70	261	331

# PRESSURE BOOSTER PUMPS

## SCM Series

### PUMP DIMENSIONS (SCM 60 Hz)

#### SCM 1 -A, I & G



Dimensions																					
1 X 230 V, 60 Hz (Supply voltage A)																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 1-2	SMG -71	0.37	1"	1"	3/8"	10.5	142	163	132	206	75	168	298	123	98	56	97	138	70	175	242
SCM 1-3	SMG -71	0.37	1"	1"	3/8"	10.5	142	163	132	206	75	168	316	141	116	74	97	138	70	175	242
SCM 1-4	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	334	159	134	92	97	138	70	175	242
SCM 1-5	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	352	177	152	110	97	138	70	175	242
SCM 1-6	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	370	195	170	128	97	138	70	175	242
SCM 1-7	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	388	213	188	146	97	138	70	175	242
SCM 1-8	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	406	231	206	164	97	138	70	175	242
SCM 1-9	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	424	249	224	182	97	138	70	175	242

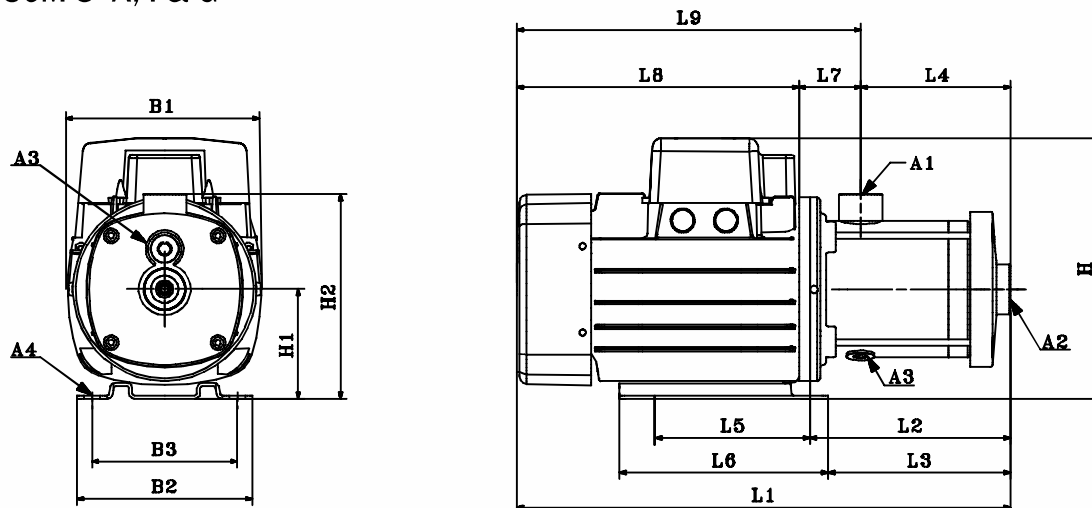
Dimensions																					
3 X 230 V, 60 Hz (Supply voltage E), 3 X 460 V, 60 Hz (Supply voltage D)																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 1-2	SMG -71	0.55	NTP 1	NTP 1	3/8"	10.5	142	163	132	206	75	168	298	123	98	56	97	138	70	175	242
SCM 1-3	SMG -71	0.55	NTP 1	NTP 1	3/8"	10.5	142	163	132	206	75	168	316	141	116	74	97	138	70	175	242
SCM 1-4	SMG -71	0.55	NTP 1	NTP 1	3/8"	10.5	142	163	132	206	75	168	334	159	134	92	97	138	70	175	242
SCM 1-5	SMG -71	0.55	NTP 1	NTP 1	3/8"	10.5	142	163	132	206	75	168	352	177	152	110	97	138	70	175	242
SCM 1-6	SMG -71	0.55	NTP 1	NTP 1	3/8"	10.5	142	163	132	206	75	168	370	195	170	128	97	138	70	175	242
SCM 1-7	SMG -80	0.75	NTP 1	NTP 1	3/8"	10.5	142	163	132	206	75	168	388	213	188	146	97	138	70	175	242
SCM 1-8	SMG -80	0.75	NTP 1	NTP 1	3/8"	10.5	142	163	132	206	75	168	406	231	206	164	97	138	70	175	242
SCM 1-9	SMG -80	0.75	NTP 1	NTP 1	3/8"	10.5	142	163	132	206	75	168	424	249	224	182	97	138	70	175	242

# PRESSURE BOOSTER PUMPS

## SCM Series

### PUMP DIMENSIONS (SCM 50 Hz)

#### SCM 3 -A, I & G



Dimensions																					
1 X 230 V, 50 Hz (Supply voltage B )																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 3-2	SMG -71	0.37	1"	1"	3/8"	10.5	142	163	132	206	75	168	298	123	98	56	97	138	70	175	242
SCM 3-3	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	316	141	116	74	97	138	70	175	242
SCM 3-4	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	334	159	134	92	97	138	70	175	242
SCM 3-5	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	352	177	152	110	97	138	70	175	242
SCM 3-6	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	411	195	170	128	97	138	70	213	283
SCM 3-7	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	429	213	188	146	97	138	70	213	283
SCM 3-8	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	447	231	206	164	97	138	70	213	283
SCM 3-9	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	566	271	224	182	130	193	70	261	330
SCM 3-10	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	584	289	242	200	130	193	70	261	330
SCM 3-11	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	602	307	260	218	130	193	70	261	330
SCM 3-12	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	620	325	278	236	130	193	70	261	330
SCM 3-13	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	638	343	296	254	130	193	70	261	330
SCM 3-14	SMG -90	2.20	1"	1"	3/8"	10.5	178	163	127	243	101	194	656	361	314	272	130	193	70	261	330

Dimensions																					
3 X 415 V, 50 Hz (Supply voltage C )																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 3-2	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	298	123	98	56	97	138	70	175	242
SCM 3-3	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	316	141	116	74	97	138	70	175	242
SCM 3-4	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	334	159	134	92	97	138	70	175	242
SCM 3-5	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	352	177	152	110	97	138	70	175	242
SCM 3-6	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	411	195	170	128	97	138	70	213	283
SCM 3-7	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	429	213	188	146	97	138	70	213	283
SCM 3-8	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	447	231	206	164	97	138	70	213	283
SCM 3-9	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	566	271	224	182	130	193	70	261	330
SCM 3-10	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	584	289	242	200	130	193	70	261	330
SCM 3-11	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	602	307	260	218	130	193	70	261	330
SCM 3-12	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	620	325	278	236	130	193	70	261	330
SCM 3-13	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	638	343	296	254	130	193	70	261	330
SCM 3-14	SMG -90	2.20	1"	1"	3/8"	10.5	178	163	127	243	101	194	656	361	314	272	130	193	70	261	330

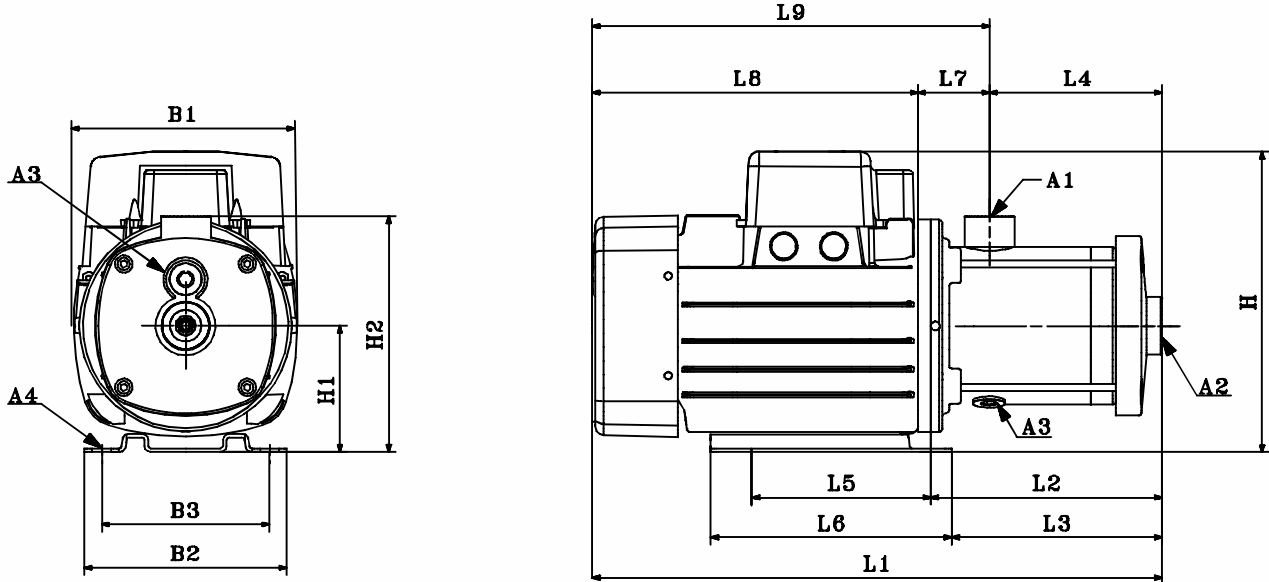


# PRESSURE BOOSTER PUMPS

## SCM Series

### PUMP DIMENSIONS (SCM 60 Hz)

#### SCM 3 -A, I & G



Dimensions																					
1 X 230 V, 60 Hz (Supply voltage A)																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 3-2	SMG -71	0.37	1"	1"	3/8"	10.5	142	163	132	206	75	168	298	123	98	56	97	138	70	175	242
SCM 3-3	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	316	141	116	74	97	138	70	175	242
SCM 3-4	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	334	159	134	92	97	138	70	175	242
SCM 3-5	SMG -71	0.55	1"	1"	3/8"	10.5	142	163	132	206	75	168	352	177	152	110	97	138	70	175	242
SCM 3-6	SMG -80	0.75	1"	1"	3/8"	10.5	142	163	132	206	75	168	411	195	170	128	97	138	70	213	283
SCM 3-7	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	429	213	188	146	97	138	70	213	283
SCM 3-8	SMG -80	1.10	1"	1"	3/8"	10.5	142	163	132	206	75	168	447	231	206	164	97	138	70	213	283
SCM 3-9	SMG -90	1.50	1"	1"	3/8"	10.5	178	163	127	243	101	194	566	271	224	182	130	193	70	261	330

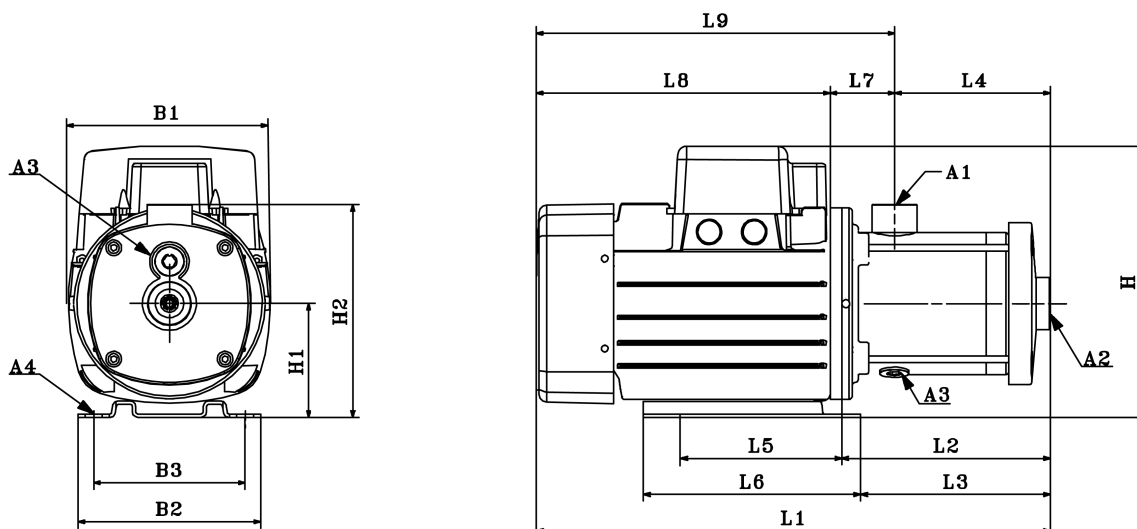
Dimensions																					
3 X 230 V, 60 Hz (Supply voltage E), 3 X 460 V, 60 Hz (Supply voltage D)																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 3-2	SMG -71	0.55	NPT 1	NPT 1	3/8"	10.5	142	163	132	206	75	168	298	123	98	56	97	138	70	175	242
SCM 3-3	SMG -71	0.55	NPT 1	NPT 1	3/8"	10.5	142	163	132	206	75	168	316	141	116	74	97	138	70	175	242
SCM 3-4	SMG -71	0.55	NPT 1	NPT 1	3/8"	10.5	142	163	132	206	75	168	334	159	134	92	97	138	70	175	242
SCM 3-5	SMG -80	0.75	NPT 1	NPT 1	3/8"	10.5	142	163	132	206	75	168	352	177	152	110	97	138	70	175	242
SCM 3-6	SMG -80	0.75	NPT 1	NPT 1	3/8"	10.5	142	163	132	206	75	168	411	195	170	128	97	138	70	213	283
SCM 3-7	SMG -80	1.10	NPT 1	NPT 1	3/8"	10.5	142	163	132	206	75	168	429	213	188	146	97	138	70	213	283
SCM 3-8	SMG -80	1.10	NPT 1	NPT 1	3/8"	10.5	142	163	132	206	75	168	447	231	206	164	97	138	70	213	283

# PRESSURE BOOSTER PUMPS

## SCM Series

### PUMP DIMENSIONS (SCM 50 Hz)

#### SCM 5 -A, I & G



Dimensions																					
1 X 230 V, 50 Hz (Supply voltage B)																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 5-2	SMG -71	0.75	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	342	167	142	101	97	138	70	175	242
SCM 5-3	SMG -71	0.75	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	360	185	160	119	97	138	70	175	242
SCM 5-4	SMG -80	1.00	1"	1 1/4"	3/8"	10.5	142	163	132	203	75	168	378	203	178	137	97	138	70	175	242
SCM 5-5	SMG -80	1.50	1"	1 1/4"	3/8"	10.5	142	163	132	203	75	168	385	221	196	105	97	138	58	215	270
SCM 5-6	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	414	238	214	173	127	193	70	238	326
SCM 5-7	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	538	298	251	209	127	193	70	238	326
SCM 5-8	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	556	316	269	227	127	193	70	238	326
SCM 5-9	SMG -90	3.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	574	334	287	245	127	193	70	238	326
SCM 5-10	SMG -90	3.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	592	352	305	263	127	193	70	238	326
SCM 5-11	SMG -90	3.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	610	370	323	281	127	193	70	238	326

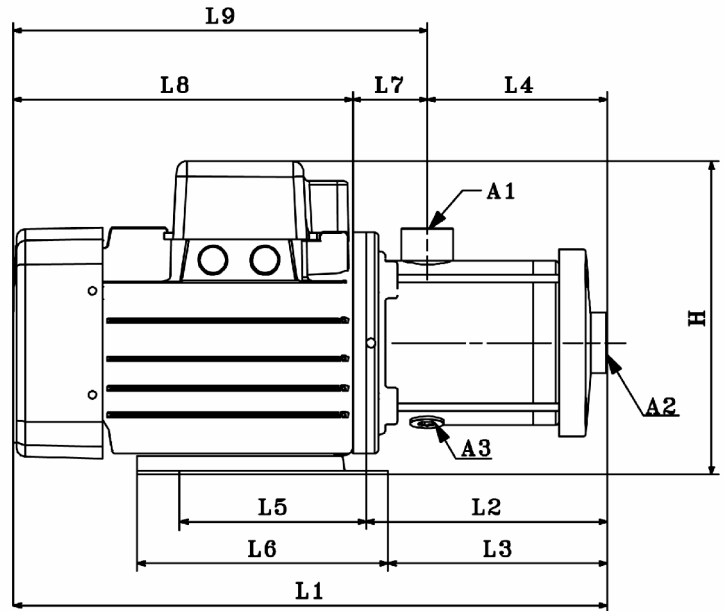
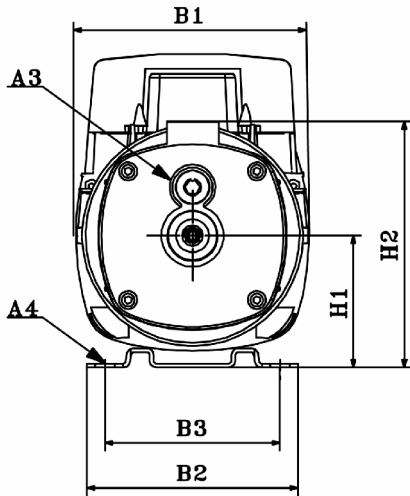
Dimensions																					
3 X 415 V, 50 Hz (Supply voltage C)																					
PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 5-2	SMG -71	0.75	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	342	167	142	101	97	138	70	175	242
SCM 5-3	SMG -80	1.00	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	360	185	160	119	97	138	70	175	242
SCM 5-4	SMG -80	1.50	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	378	203	178	137	97	138	70	175	242
SCM 5-5	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	142	163	132	203	75	168	385	221	196	105	97	138	58	215	270
SCM 5-6	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	414	238	214	173	127	193	70	238	326
SCM 5-7	SMG -90	3.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	538	298	251	209	127	193	70	238	326
SCM 5-8	SMG -90	3.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	556	316	269	227	127	193	70	238	326
SCM 5-9	SMG -90	3.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	574	334	287	245	127	193	70	238	326
SCM 5-10	SMG -90	3.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	592	352	305	263	127	193	70	238	326
SCM 5-11	SMG -90	3.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	610	370	323	281	127	193	70	238	326
SCM 5-12	SMG -100	5.00	1"	1 1/4"	3/8"	10.5	210	163	127	280	101	194	626	387	358	316	127	193	70	238	326
SCM 5-13	SMG -100	5.00	1"	1 1/4"	3/8"	10.5	210	163	127	280	101	194	644	405	376	334	127	193	70	238	326

# PRESSURE BOOSTER PUMPS

## SCM Series

### PUMP DIMENSIONS (SCM 60 Hz)

#### SCM 5 -A, I & G



#### Dimensions

1 X 230 V, 60 Hz (Supply voltage A)

PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 5-2	SMG -71	0.75	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	342	167	142	101	97	138	70	175	242
SCM 5-3	SMG -71	0.75	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	360	185	160	119	97	138	70	175	242
SCM 5-4	SMG -80	1.00	1"	1 1/4"	3/8"	10.5	142	163	132	203	75	168	378	203	178	137	97	138	70	175	242
SCM 5-5	SMG -80	1.50	1"	1 1/4"	3/8"	10.5	142	163	132	203	75	168	385	221	196	105	97	138	58	215	270
SCM 5-6	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	414	238	214	173	127	193	70	238	326
SCM 5-7	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	538	298	251	209	127	193	70	238	326
SCM 5-8	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	556	316	269	227	127	193	70	238	326

#### Dimensions

3 X 230 V, 60 Hz (Supply voltage E), 3 X 460 V, 60 Hz (Supply voltage D)

PUMP TYPE	FRAME SIZE	P <sub>2</sub> [Kw]	Dimensions [mm]																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
SCM 5-2	SMG -71	0.75	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	342	167	142	101	97	138	70	175	242
SCM 5-3	SMG -80	1.00	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	360	185	160	119	97	138	70	175	242
SCM 5-4	SMG -80	1.50	1"	1 1/4"	3/8"	10.5	142	163	127	203	75	168	378	203	178	137	97	138	70	175	242
SCM 5-5	SMG -90	2.00	1"	1 1/4"	3/8"	10.5	178	163	127	242	101	194	385	221	196	105	127	193	58	215	270

# PRESSURE BOOSTER PUMPS

## SCM Series

### 14. WEIGHTS AND SHIPPING VOLUME

#### SCM 1

SUPPLY VOLTAGE	PUMP TYPE	NET WEIGHT		GROSS WEIGHT		SHIPPING VOLUME	
		[kg]	[lb]	[kg]	[lb]	[m³]	[ft³]
1 X 230 V, 50Hz (Supply Voltage B)	SCM 1-2	10.0	22.0	11.8	26.0	0.02	0.7
	SCM 1-3	10.5	23.1	12.4	27.3	0.02	0.7
	SCM 1-4	11.0	24.3	13.0	28.6	0.02	0.7
	SCM 1-5	11.6	25.5	13.7	30.1	0.02	0.7
	SCM 1-6	12.2	26.7	14.3	31.6	0.02	0.7
	SCM 1-7	12.8	28.1	15.1	33.1	0.03	1.1
	SCM 1-8	13.4	29.5	15.8	34.8	0.03	1.1
	SCM 1-9	14.1	31.0	16.6	36.5	0.04	1.4
	SCM 1-10	14.8	32.5	17.4	38.4	0.05	1.8
	SCM 1-11	15.5	34.1	18.3	40.3	0.05	1.8
	SCM 1-12	16.3	35.8	19.2	42.3	0.08	2.8
	SCM 1-13	17.1	37.6	20.2	44.4	0.08	2.8
	SCM 1-14	18.0	39.5	21.2	46.6	0.08	2.8
3 X 380 - 415 V, 50Hz (Supply Voltage C)	SCM 1-2	18.9	41.5	22.3	49.0	0.02	0.7
	SCM 1-3	19.8	43.6	23.4	51.4	0.02	0.7
	SCM 1-4	20.8	45.7	24.5	54.0	0.02	0.7
	SCM 1-5	21.8	48.0	25.8	56.7	0.02	0.7
	SCM 1-6	22.9	50.4	27.0	59.5	0.02	0.7
	SCM 1-7	24.1	52.9	28.4	62.5	0.03	1.1
	SCM 1-8	25.3	55.6	29.8	65.6	0.03	1.1
	SCM 1-9	26.5	58.4	31.3	68.9	0.04	1.4
	SCM 1-10	27.9	61.3	32.9	72.3	0.05	1.8
	SCM 1-11	29.3	64.4	34.5	75.9	0.05	1.8
	SCM 1-12	30.7	67.6	36.2	79.7	0.08	2.8
	SCM 1-13	32.3	71.0	38.1	83.7	0.08	2.8
	SCM 1-14	33.9	74.5	40.0	87.9	0.08	2.8
1 X 230 V, 60 Hz (Supply Voltage A)	SCM 1-2	11.7	25.7	14.2	31.2	0.02	0.7
	SCM 1-3	12	26.4	14.5	31.9	0.02	0.7
	SCM 1-4	12.2	26.8	14.7	32.3	0.02	0.7
	SCM 1-5	12.5	27.5	15	33.0	0.02	0.7
3 X 380 V, 60 Hz (Supply Voltage F)	SCM 1-2	11	24.2	13.5	29.7	0.02	0.7
	SCM 1-3	11.3	24.9	13.8	30.4	0.02	0.7
	SCM 1-4	12.2	26.8	14.7	32.3	0.02	0.7
	SCM 1-5	12.5	27.5	15	33.0	0.02	0.7

# PRESSURE BOOSTER PUMPS

## SCM Series



### SCM 3

SUPPLY VOLTAGE	PUMP TYPE	NET WEIGHT		GROSS WEIGHT		SHIPPING VOLUME	
		[kg]	[lb]	[kg]	[lb]	[m³]	[ft³]
1 X 230 V, 50Hz (Supply Voltage A)	SCM 3-2	11.5	25.3	13.6	29.9	0.02	0.7
	SCM 3-3	12.1	26.6	14.2	31.3	0.02	0.7
	SCM 3-4	12.7	27.9	15.0	32.9	0.03	1.1
	SCM 3-5	13.3	29.3	15.7	34.6	0.03	1.1
	SCM 3-6	14.0	30.8	16.5	36.3	0.03	1.1
	SCM 3-7	14.7	32.3	17.3	38.1	0.03	1.1
	SCM 3-8	15.4	33.9	18.2	40.0	0.04	1.4
	SCM 3-9	16.2	35.6	19.1	42.0	0.04	1.4
	SCM 3-10	17.0	37.4	20.0	44.1	0.05	1.8
	SCM 3-11	17.8	39.2	21.1	46.3	0.05	1.8
	SCM 3-12	18.7	41.2	22.1	48.6	0.05	1.8
	SCM 3-13	19.7	43.3	23.2	51.1	0.08	2.8
	SCM 3-14	20.7	45.4	24.4	53.6	0.08	2.8
3 X 380 - 415 V, 50Hz (Supply Voltage C)	SCM 3-2	21.7	47.7	25.6	56.3	0.02	0.7
	SCM 3-3	22.8	50.1	26.9	59.1	0.02	0.7
	SCM 3-4	23.9	52.6	28.2	62.1	0.03	1.1
	SCM 3-5	25.1	55.2	29.6	65.2	0.03	1.1
	SCM 3-6	26.4	58.0	31.1	68.4	0.03	1.1
	SCM 3-7	27.7	60.9	32.7	71.8	0.03	1.1
	SCM 3-8	29.1	63.9	34.3	75.4	0.04	1.4
	SCM 3-9	30.5	67.1	36.0	79.2	0.04	1.4
	SCM 3-10	32.0	70.5	37.8	83.2	0.05	1.8
	SCM 3-11	33.6	74.0	39.7	87.3	0.05	1.8
	SCM 3-12	35.3	77.7	41.7	91.7	0.05	1.8
	SCM 3-13	37.1	81.6	43.8	96.3	0.08	2.8
	SCM 3-14	38.9	85.7	46.0	101.1	0.08	2.8
1 X 230 V, 60 Hz (Supply Voltage A)	SCM 3-2	11.7	25.7	14.2	31.2	0.02	0.7
	SCM 3-3	12	26.4	14.5	31.9	0.02	0.7
	SCM 3-4	13.6	29.9	14.7	32.3	0.03	1.1
	SCM 3-5	14	30.8	15	33.0	0.03	1.1
3 X 380 V, 60 Hz (Supply Voltage F)	SCM 3-2	11.1	24.4	13.5	29.7	0.02	0.7
	SCM 3-3	11.3	24.9	13.8	30.4	0.02	0.7
	SCM 3-4	12.2	26.8	14.7	32.3	0.03	1.1
	SCM 3-5	12.5	27.5	15	33.0	0.03	1.1

# PRESSURE BOOSTER PUMPS

## SCM Series

### SCM 5

SUPPLY VOLTAGE	PUMP TYPE	NET WEIGHT		GROSS WEIGHT		SHIPPING VOLUME	
		[kg]	[lb]	[kg]	[lb]	[m³]	[ft³]
1 X 230 V, 50Hz (Supply Voltage A)	SCM 5-2	13.0	28.6	15.3	33.7	0.02	0.7
	SCM 5-3	13.7	30.0	16.1	35.4	0.03	1.1
	SCM 5-4	14.3	31.5	16.9	37.2	0.03	1.1
	SCM 5-5	15.0	33.1	17.8	39.1	0.04	1.4
	SCM 5-6	15.8	34.8	18.6	41.0	0.04	1.4
	SCM 5-7	16.6	36.5	19.6	43.1	0.04	1.4
	SCM 5-8	17.4	38.3	20.6	45.2	0.05	1.8
	SCM 5-9	18.3	40.2	21.6	47.5	0.05	1.8
	SCM 5-10	19.2	42.3	22.7	49.9	0.08	2.8
	SCM 5-11	20.2	44.4	23.8	52.4	0.08	2.8
	SCM 5-12	21.2	46.6	25.0	55.0	0.08	2.8
	SCM 5-13	22.2	48.9	26.2	57.7	0.08	2.8
	SCM 5-14	23.3	51.4	27.5	60.6	0.08	2.8
3 X 380 - 415 V, 50Hz (Supply Voltage C)	SCM 5-2	24.5	53.9	28.9	63.6	0.02	0.7
	SCM 5-3	25.7	56.6	30.4	66.8	0.03	1.1
	SCM 5-4	27.0	59.5	31.9	70.2	0.03	1.1
	SCM 5-5	28.4	62.4	33.5	73.7	0.04	1.4
	SCM 5-6	29.8	65.6	35.2	77.4	0.04	1.4
	SCM 5-7	31.3	68.8	36.9	81.2	0.04	1.4
	SCM 5-8	32.9	72.3	38.8	85.3	0.05	1.8
	SCM 5-9	34.5	75.9	40.7	89.5	0.05	1.8
	SCM 5-10	36.2	79.7	42.7	94.0	0.08	2.8
	SCM 5-11	38.0	83.7	44.9	98.7	0.08	2.8
	SCM 5-12	39.9	87.8	47.1	103.7	0.08	2.8
	SCM 5-13	41.9	92.2	49.5	108.8	0.08	2.8
	SCM 5-14	44.0	96.8	51.9	114.3	0.08	2.8
1 X 230 V, 60 Hz (Supply Voltage A)	SCM 5-2	11.7	25.7	14.2	31.2	0.02	0.7
	SCM 5-3	14	30.8	17.2	37.8	0.03	1.1
	SCM 5-4	24.3	53.5	26.8	59.0	0.04	1.4
	SCM 5-5	29.4	64.7	32.2	70.8	0.04	1.4
3 X 380 V, 60 Hz (Supply Voltage F)	SCM 5-2	11.7	25.7	14.2	31.2	0.02	0.7
	SCM 5-3	14	30.8	17.2	37.8	0.03	1.1
	SCM 5-4	24.3	53.5	26.8	59.0	0.04	1.4
	SCM 5-5	29.4	64.7	32.2	70.8	0.04	1.4

# PRESSURE BOOSTER PUMPS

## SCM Series

### MOTOR DATA

MAINS - OPEARATED MOTORS, 60 Hz 1 X 230 V, 60Hz (Supply Voltage A)

Frame Size	P <sub>2</sub> [kW]	1 ½ [A]	Cos <sub>μ</sub> 1/1	[%]	[%] [A]	I (START) Speed [min <sup>-1</sup> ]
SMG -71	0.55	3.70	0.99	69.00	14.80	3260
SMG -80	0.75	4.90	0.98	69.40	19.60	3371
SMG -80	1.10	6.80	0.98	72.50	27.20	3290
SMG -90	1.50	10.50	0.99	64.80	42.00	3378
SMG -90	2.20	14.40	0.92	72.00	57.60	3314

MAINS - OPERATED MOTORS, 50 Hz 1 X 230 V, 50 Hz (Supply Voltage B)

Frame Size	P <sub>2</sub> [kW]	1 ½ [A]	Cos <sub>μ</sub> 1/1	[%]	[%] [A]	I (START) Speed [min <sup>-1</sup> ]
SMG -71	0.37	3.40	0.79	59.00	13.60	2847
SMG -71	0.55	4.00	0.95	64.00	16.00	2690
SMG -80	0.75	5.60	0.83	69.80	22.40	2852
SMG -80	1.10	7.40	0.93	68.90	29.60	2740
SMG -90	1.50	9.70	0.94	71.40	38.80	2912
SMG -90	2.20	13.20	0.96	75.70	52.80	2878

MAINS - OPEARATED MOTORS, 50 Hz 3 X 380-415 V, 50 Hz (Supply Voltage C)

Frame Size	P <sub>2</sub> [kW]	1 ½ [A]	Cos <sub>μ</sub> 1/1	[%]	[%] [A]	I (START) Speed [min <sup>-1</sup> ]
SMG -71	0.37	1.10	0.61	76.00	4.40	2862
SMG -71	0.55	1.50	0.69	75.10	6.00	2738
SMG -80	0.75	1.80	0.80	81.20	7.20	2808
SMG -80	1.10	2.50	0.74	81.50	10.00	2800
SMG -90	1.50	3.60	0.71	81.30	14.40	2915
SMG -90	2.20	4.60	0.79	82.90	18.40	2885
SMG -100	3.00	5.70	0.87	86.80	22.80	2905
SMG -100	3.70	7.40	0.79	87.80	29.60	2926
SMG -132	5.50	10.80	0.80	88.40	43.20	2938
SMG -132	7.50	14.70	0.80	89.20	58.80	2931
SMG -160	11.00	18.80	0.92	89.40	75.20	2925
SMG -160	15.00	27.20	0.84	92.60	108.80	2960
SMG -160	18.50	32.30	0.86	92.80	129.20	2946

MAINS - OPEARATED MOTORS, 60 Hz 3 X 460 V, 60 Hz (Supply Voltage D)

Frame Size	P <sub>2</sub> [kW]	1 ½ [A]	Cos <sub>μ</sub> 1/1	[%]	[%] [A]	I (START) Speed [min <sup>-1</sup> ]
SMG -71	0.37	0.90	0.63	77.90	3.60	3432
SMG -71	0.55	1.20	0.73	78.60	4.80	3345
SMG -80	0.75	1.60	0.73	83.10	6.40	3445
SMG -80	1.10	2.20	0.76	83.10	8.80	3385
SMG -90	1.50	3.10	0.71	85.00	12.40	3537
SMG -90	2.20	4.00	0.81	86.60	16.00	3505
SMG -100	3.00	5.20	0.86	83.50	20.80	3532
SMG -100	3.70	6.30	0.86	86.20	25.20	3528
SMG -132	5.50	9.50	0.82	88.60	38.00	3551
SMG -132	7.50	12.70	0.83	89.30	50.80	3540
SMG -160	11.00	16.90	0.93	89.00	67.60	3526



# PRESSURE BOOSTER PUMPS

## SCM Series

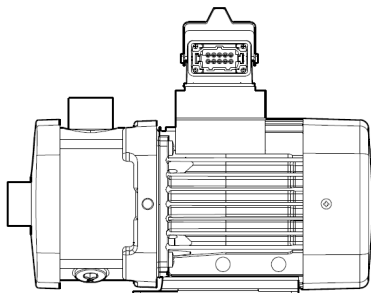
### 15. CUSTOMIZATION

Although the Shakti Pumps SCM product range offers a number of pumps for different applications, customers require specific pump solutions to satisfy their needs. Below are the options available for customising the SCM pumps. Contact Shakti Pumps for further information or for requests other than the ones mentioned below.

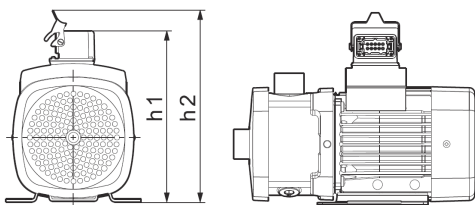
#### Motors

Motor with multi plug connection Mains-operated motors fitted with a 10-pin multi plug connection.

The purpose of a multi plug connection is to facilitate the electrical installation and service of the pump. The multi plug functions as a plug-and-pump device. Figure shows the position of the multi plug on the mains-operated motor.



Motor With Multi Plug Connections

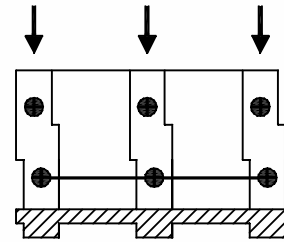


#### DIMENSIONS

Pump type	Frame size	h1	h2
SCM1	71	206	237
SCM3	80	206	237
SCM5	90	263	294
	100	283	314

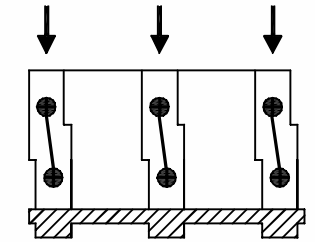
#### PLUG CONNECTIONS

##### 3 PHASE SUPPLY

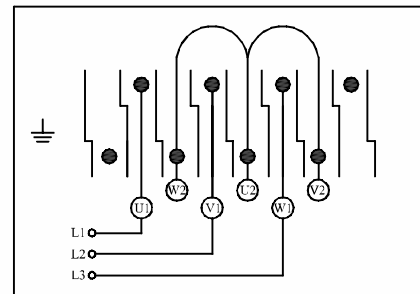


HIGH VOLTAGE  
(STAR CONNECTION)

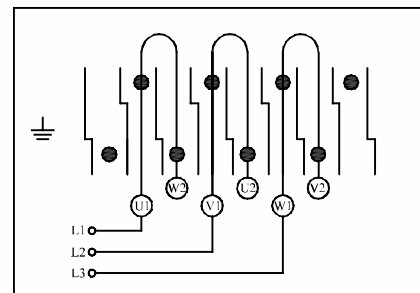
##### 3 PHASE SUPPLY



LOW VOLTAGE  
(DELTA CONNECTION)



STAR CONNECTION



DELTA CONNECTION

Fig. 18 Electrical Connections

# PRESSURE BOOSTER PUMPS

## SCM Series

### MOTOR WITH ANTI-CONDENSATION HEATER SCM



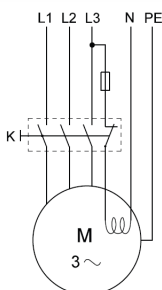
Fig. 19  
Anti Condensation Heater

In applications where condensation in the motor may occur, we recommend to install a motor with an anti-condensation heater on the stator coil ends. The heater keeps the motor temperature higher than the ambient temperature and prevents condensation. In areas with ambient temperatures below +32 °F ( 0°C), it is advisable always to use motors with anti-condensation heater.

High humidity may cause condensation in the motor. Slow condensation occurs as a result of a decreasing ambient temperature; rapid condensation occurs as a result of shock cooling caused by direct sunlight followed by rain.

**Note:** Rapid condensation is not to be confused with the phenomenon which occurs when the pressure inside the motor is lower than the atmospheric pressure. In such cases, moisture is sucked from the atmosphere into the motor through bearings, housings, etc.

In applications with constant humidity levels above 85 %, the drain holes in the drive-end flange must be open. This changes the enclosure class to Ip34. If IP55 protection is required due to operation in dusty environments, it is advisable to install a motor with anti-condensation heater. Figure shows a typical circuit of a three-phase motor with anti-condensation heater.



### LEGEND

Symbol	Designation
K	Contact
M	Motor

**Note:** Connect the anti-condensation heater to the power supply so that it is on when the motor is switched off.

The following motor sizes are available with anti-condensation heater:

Motors, 50/60 Hz	Power of heating unit [W]	
	1 x 24 V	1 x 190-250 V
Frame size		
71/80		23
90	38	31
100		38
112/132	2 x 38	2 x 38

**Note:** Wire bridges for connections are located in the plug.

# PRESSURE BOOSTER PUMPS

## SCM Series

### MOTORS WITH PTC SENSORS



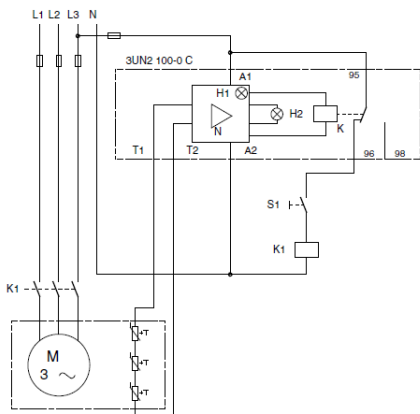
Fig. 20 PTC sensors

Built-in PTC sensors (thermistors) protect the motor against overheating. Single-phase motors are protected against slow and rapid overheating. Three-phase motors are protected against slow overheating. We offer built-in PTC sensors to protect the motor.

Note: PTC sensors must be connected to an external tripping unit connected to the control circuit. Protection according to IEC 60034-11:

- slow and rapid overheating.
- PTC sensors comply with DIN 44082.  
Maximum voltage at the terminals,  
 $U_{max} = 2.5 \text{ VDC}$ .

All tripping units available for DIN 44082 PTC sensors meet this requirement.  
Figure shows a typical circuit of a three-phase motor with PTC sensors.



### LEGEND

Symbol	Designation
S1	On/off switch
K1	Contactor
+T	PTC sensor (thermistor) in motor
M	Motor
3UN2 100-0 C	Tripping unit with automatic resetting
N	Amplifier
K	Output relay
H1	LED "Ready"
H2	LED "Tripped"
A1, A2	Connection for control voltage
T1, T2	Connection for PTC sensor loop

### MOTORS WITH THERMAL SWITCHES (PTO)



Fig. 21 Motor with Thermal Switches (PTO)

Built-in thermal switches protect the motor against overheating. Single-phase motors are protected against slow and rapid overheating. Three-phase motors are protected against slow overheating. We offer mains-operated motors with bimetallic thermal switches in the motor windings.

**Note:** Thermal switches must be connected to an external control circuit to protect the motor against slow overheating. The thermal switches require no tripping unit. Protection according to IEC 60034-11:

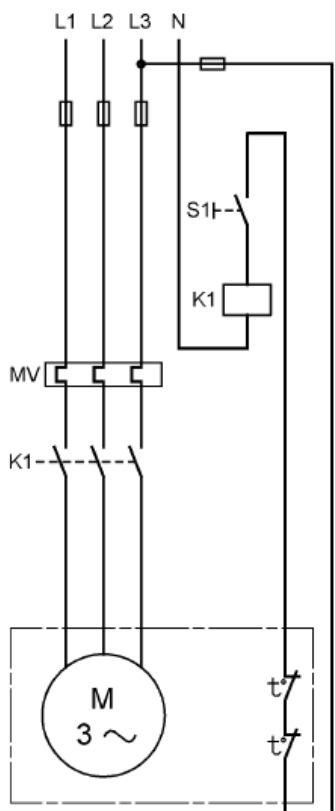
- slow and rapid overheating. As protection against seizure, the motor must be connected to a motor-protective circuit breaker. Thermal switches tolerate the following maximum loads:

$U_{max}$	250 VAC
$I_N$	1.5 A
$I_{max}$	5.0 A (locked-rotor and breaking current)

# PRESSURE BOOSTER PUMPS

## SCM Series

Figure shows a typical circuit of a three-phase motor with built-in bimetallic thermal switches.



### LEGEND

Symbol	Designation
S1	On/off switch
K1	Contactor
t°	Thermal switch in motor
M	Motor
MV	Motor-protective circuit breaker

### UNDERSIZE AND OVERSIZE MOTORS

Undersize and oversize motors are defined as the next kW size below or above the fitted standard motor.

**Note:** The SCM 1, 3 and 5 cannot be combined with frame sizes 112 and 132. It is advisable to use an oversize motor if the operating conditions fall outside the standard conditions.

We especially recommend oversize motors in these cases:

- The pump is installed at an altitude of more than 3280 ft ( 1000 m) above sea level.
- The viscosity or density of the pumped liquid is higher than that of water.
- The ambient temperature exceeds +131 °F (+55 °C) (SCM). It is advisable to use an undersize motor if the operating conditions do not at all reach the standard conditions. We especially recommend undersize motors in these cases:
- The viscosity or density of the pumped liquid is lower than that of water.
- The duty point of the pump is constant, and the flow rate is significantly lower than the recommended maximum flow rate.

### TERMINAL BOX POSITIONS

As standard the terminal box is mounted in 12 o'clock position as shown in fig. SCM pumps with motor frame sizes of 71 and 80 are available with other terminal box positions on special request.

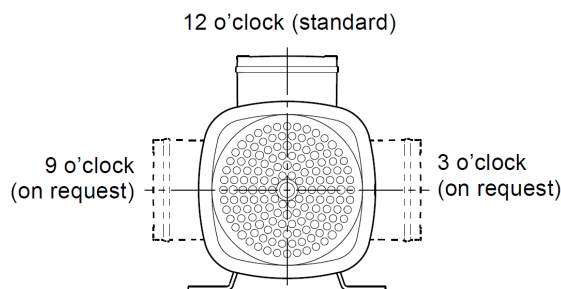


Fig. 22 Terminal box positions of frame sizes 71 and 80

# PRESSURE BOOSTER PUMPS

## SCM Series

### PUMPS

#### Pumping of liquids down to $-22^{\circ}\text{F}$ ( $-30^{\circ}\text{C}$ ).

We offer custom-built pumps for the pumping of liquids down to  $-22^{\circ}\text{F}$  ( $-30^{\circ}\text{C}$ ). The pumps have an oversize neck ring ensuring that impellers do not seize up as a result of thermal expansion. We offer the above solution for SCM in I and G versions (stainless steel).

### SURFACE TREATMENT

#### Cleaned and dried pumps

Cleaned and dried pumps are recommended for use in applications involving strict demands on cleanliness and surface quality, such as low content of silicone. Prior to assembly, all pump parts are cleaned in  $+140^{\circ}\text{F}$  to  $+158^{\circ}\text{F}$  ( $+60$  to  $+70^{\circ}\text{C}$ ) water with a cleaning agent. All pump parts are then thoroughly rinsed in de-ionised water and dried. The pump is assembled without any use of silicone lubricants. Cleaned and dried pumps are not performance-tested.

### ELECTROPOLISHED STAINLESS-STEEL PUMPS

Electropolished pumps are often used in the pharmaceutical industry and in the food and beverage industry where materials and surface quality must meet strict requirements to hygiene or corrosion resistance. Electropolishing removes burrs as well as metallic and non-metallic inclusions, providing a smooth, clean and corrosion-resistant stainless-steel surface. First, all components are pickled in a mixture of nitric and hydrofluoric acid. Subsequently, the components are electropolished in a mixture of sulphuric and phosphoric acid. Finally, the components are passivated in nitric acid. To meet the strict hygienic requirements to material and surface quality, we offer electropolished stainless-steel pumps with the following surface quality:  
Surface quality:  $R_a . 0.8 \text{ f}\hat{\text{E}}\text{m}$ .

### ALTERNATIVE COLOURING

We offer custom-built pumps in any NCS- or RAL-specified colour to suit your requirements! The used paint is water-based. Painted parts correspond to corrosion class III. All pump types and sizes are available with alternative colouring.

### Customised nameplate

We offer additional customised nameplates attached to the pump:

- A nameplate supplied by you.
- A Shakti nameplate customised in terms of a specific duty point.
- A Shakti nameplate with a tag number.

**Note:** The Shakti standard nameplate is always fitted to the pump.

### Shaft seal arrangements

The shaft seal is developed with customization in mind. Depending on media, you may combine the seal faces in any way.

Available stationary seal faces: Q, B.

Available rotating seal faces: Q, V.

Rubber: E, V and K.

### Alternative connection positions

The pump is available with various connection positions on special request. See fig.

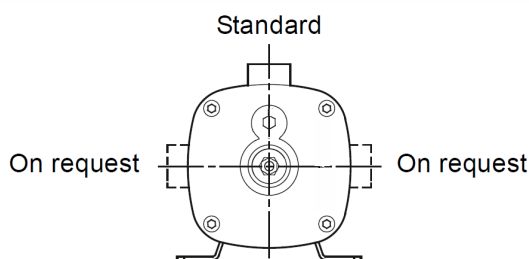


Fig. 23 Alternative connection positions

### Alternative pipe connections

A wide range of pipe connections are available for the SCM pumps:

- Tri-Clamp®
- DIN, JIS, ANSI flange (combi flange)
- Victaulic® coupling
- Whitworth thread Rp
- internal NPT thread.

The available pipe connections are shown in fig.

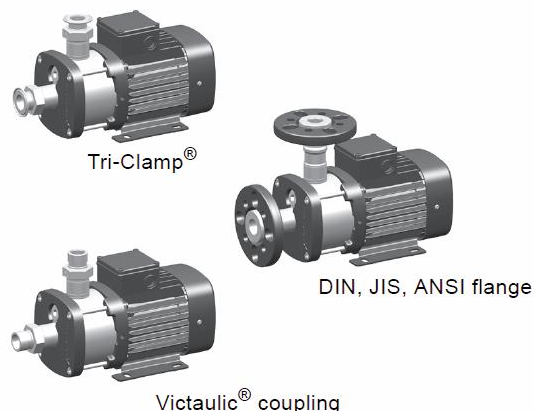


Fig. 24 Example of couplings

# PRESSURE BOOSTER PUMPS

## SCM Series

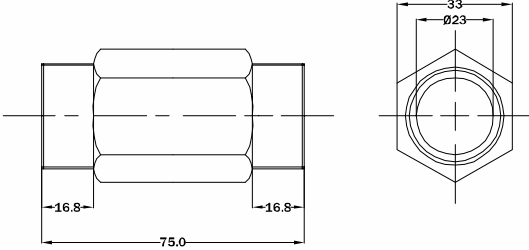
### 16. ACCESSORIES

#### Pipework connections

Various sets of flanges and coupling are available for pipework connection.

#### Distance Piece

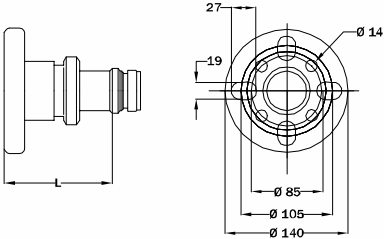
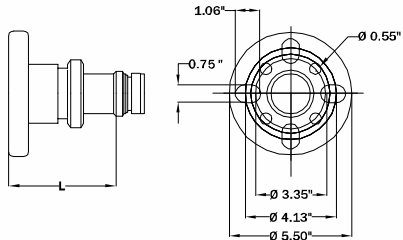
The distance piece is intended for mounting on the discharge port in order to improve the accessibility when connecting the pump to the piping system. The distance piece is made of brass.

Distance Piece	Pump Type	Pipework Connection	Pump thread
	SCM - 1	1"	R <sub>p</sub>
	SCM - 3		
	SCM - 5		

#### Flange sets for SCM (DIN/ANSI/JIS)

All materials in contact with the pumped liquids are made of stainless steel SS AISI 316 / EN 1.4408.

The pipe stub is made of stainless steel SS AISI 316 / EN 1.4408 and the flange part is made of cast iron.

Flange	Pump Type	Pipework Connection	Pump thread	L * (in (mm))	
				Flange mounted on pump inlet	Flange mounted on pump outlet
	SCM - 1	DN 32	R <sub>p</sub>		
	SCM - 3			1.93 "(49.0)	3.07 "(78.0)
	SCM - 5	1 1/4" ANSI 300 lb.	NPT		

\* Length from outer edge of flange to pump suction or discharge port.

Note: Please pay attention to the compatibility between pump and flange before ordering. See tables below.

SCM pumps compatible with ANSI/DIN/JIS flanges

Pump Type	Material Version	MG 71 /80-1 ph	MG 71 /80-3 ph	MG 90 -1 ph	MG 90 -3 ph	MG 100	MG 112
SCM 1 SCM 3 SCM 5	Cast Iron		●	●	●	●	
	Stainless Steel	●	●		●	●	

1) Only 0.39" (10 mm) clearance between flange and terminal box.

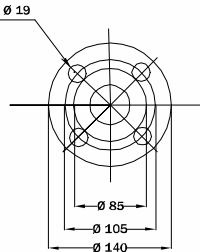
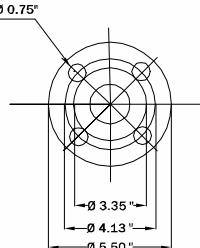
2) Only 0.35" (9 mm) clearance between flange and terminal box.

# PRESSURE BOOSTER PUMPS

## SCM Series

### COUNTER - FLANGES FOR SCM - A

Counter - flanges for SCM are made of Cast Iron.  
A counter - flange set consist of one counter - flange, one gasket, bolts and nuts.

Counter - Flange	Pump Type	Description	Rated Pressure	Pipe Work Connection	
	SCM - 1	<div>Threaded</div> <div>For Welding</div>	16 bar	DN 32	
	SCM - 3				
	SCM - 5				
	SCM - 1		25 bar		
	SCM - 3				
	SCM - 5				
	SCM - 1	<div>Threaded</div> <div>For Welding</div>	232 psi	1 1/4" ANSI 300 lb.	
	SCM - 3				
	SCM - 5				
	SCM - 1		362 psi		
	SCM - 3				
	SCM - 5				

Victaulic <sup>®</sup> Connection	Pump Type	Pump thread	D [ in (mm) ]	L* [ in (mm) ]
	SCM - 1	1" x 1" NPT	1.33"( 33.7)	1.90"(48.5)
	SCM - 3			
	SCM - 5		1.67"( 42.5)	1.90"(48.5)

\* Length from outer edge of Victaulic<sup>®</sup> connection to pump suction or discharge port.

Coupling, pipe stub and gasket for Victaulic Connections

Parts in contact with the pumped liquid are made of stainless steel, SS AISI 316 , and rubber. A Victaulic coupling set consists of two coupling halves , one gasket , one pipe stub. (for welding and threaded), bolts and nuts.

Coupling and pipe stub	Pump Type	Pipe Stub	PipeWork Connection	Rubber Part	Number of coupling sets Required
	SCM - 1	Threaded	R1	EPDM	2
	SCM - 3			FKM	
	SCM - 5			EPDM	
	SCM - 1	For Welding	DN 25	FKM	
	SCM - 3			FKM	
	SCM - 1	For Welding	DN 25	EPDM	
	SCM - 3			FKM	

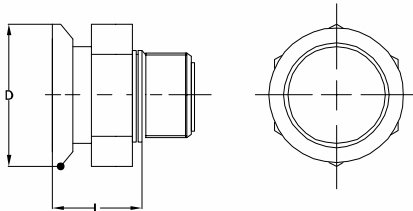


# PRESSURE BOOSTER PUMPS

## SCM Series

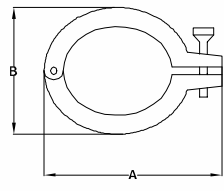
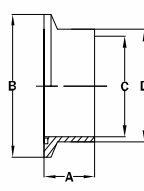
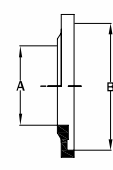
### VICTAULIC® CONNECTIONS FOR SCM(E)

Tri® - Clamp Connection for SCM

Tri - Clamp®	Pump Type	Pump thread	D [ in (mm) ]	L* [ in (mm) ]
	SCM - 1	R <sub>p</sub>	50.4 mm	40.3 mm
	SCM - 3	NPT	2.0"	1.6"
	SCM - 5	R <sub>p</sub> NPT	50.4 mm 2.0"	35.3 mm 1.4"

\* Length from outer edge of Tri® - clamp connection to pump suction or discharge port.

Clamping ring, pipe stub and gasket for Tri®-Clamp connections.

		Clamping Ring		Pipe Stub				Gasket	
									
Pump Type	Nominal diameter [ in (mm) ]	A [ in (mm) ]	B [ in (mm) ]	A [ in (mm) ]	B [ in (mm) ]	C [ in (mm) ]	D [ in (mm) ]	A [ in (mm) ]	B [ in (mm) ]
SCM 1, 3, 5	1.5 " ( 38.0 )	3.7 " ( 92.0 )	2.4 " ( 59.5 )	0.9 " ( 21.5 )	2.9 " ( 72.5 )	1.4 " ( 35.6 )	1.6 " ( 38.6 )	1.4 " ( 35.3 )	2.0 " ( 50.5 )

The clamping ring is made of stainless steel SS AISI 304 / EN 1.4301.

The pipe stub is made of stainless steel SS AISI 316 / EN 1.4401.

The gasket is made of PTFE or EPDM.

Pump Type	Pipe Work Connection	Connection Material	Gasket	Pressure psi [ bar ]	Number of coupling sets Required
SCM 1, 3, 5	DN 32	Stainless Steel	EPDM PTFE	232 ( 16 )	2

# PRESSURE BOOSTER PUMPS

## SCM Series

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### 17. PUMPED LIQUIDS

Thin, non-explosive liquids, not containing solid particles or fibres. The liquid must not chemically attack the pump materials. When pumping liquids with a density and/or viscosity higher than those of water, oversized motors must be used, if required. Whether a pump is suitable for a particular liquid depends on a number of factors of which the most important are the chloride content, pH value, temperature and content of chemicals and oils.

Please note that aggressive liquids (for instance seawater and some acids) may attack or dissolve the protective oxide film of the stainless steel and thus cause corrosion.

#### LIST OF PUMPED LIQUIDS

A number of typical liquids are listed below. Other pump versions may be applicable, but those stated in the list are considered to be the best choices. The table is intended as a general guide only and cannot replace actual testing of the pumped liquids and pump materials under specific working conditions. The list should, however, be applied with some caution as factors such as concentration of the pumped liquid, liquid temperature or pressure may affect the chemical resistance of a specific pump version. Safety precautions must be taken when pumping dangerous liquids.

#### NOTES

- A To minimize the risk of corrosion the pump must be running continuously, i.e. stand stills must not exceed 6- 8 hours.
- B May contain additives or impurities which can cause shaft seal problems.
- C The density and viscosity may differ from those of water. Consider this when calculating motor and pump performance.
- D In order to avoid corrosion, the liquid must be free of oxygen.
- E Flammable or combustible liquid. Safety precautions must be considered to ensure safe handling of flammable liquids. Handling the liquid above the flash point and/or boiling point will require the greatest restrictions. A seal-less pump may be required. Contact Shakti Pumps.
- F Risk of crystallization / precipitation on the shaft seal.
- G If oil residues are present, EPDM cannot be used.
- H As no protective deposits are formed in demineralized water, a slight increase in the corrosion rate must be expected. If impurities (e.g. contamination with metal ions) in the pumped liquid are unacceptable, cast iron or copper containing metals should not be used. If the CO<sub>2</sub> content is high, cast iron is unsuitable for use.
- I Special conditions related to the properties of demineralized water with a conductivity less than 2 microS/cm makes a SiC/ SiC shaft seal unsuitable for use. Use the ceramic/carbon shaft seal combination instead.

# PRESSURE BOOSTER PUMPS

## SCM Series

Pumped liquids	Chemical formula	Notes	Additional information	Cast iron (CI FG 260)	Stainless steel (AISI 304)	Stainless steel (AISI 316)
<b>Coolants</b>						
Calcium chloride	CaCl <sub>2</sub>	b, c, d, f	< 0 °C, 30 %		AQQE	AQQE
Ethylene glycol	C <sub>2</sub> H <sub>4</sub> (OH) <sub>2</sub>	b, c		AQQE	AQQE	AQQE
Glycerine (glycerol)	C <sub>3</sub> H <sub>5</sub> (OH) <sub>3</sub>	b, c		AQQE	AQQE	AQQE
Hydrocarbon-based coolant		c, e		AQQV	AQQV	AQQV
Potassium acetate (inhibited)	CH <sub>3</sub> COOK	b, c, d, f		AQQE	AQQE	AQQE
Potassium formate (inhibited)	HCOOK	b, c, d, f		AQQE	AQQE	AQQE
Propylene glycol	CH <sub>3</sub> CHOHCH <sub>2</sub> OH	b, c		AQQE	AQQE	AQQE
Sodium chloride	NaCl	b, c, d, f	< 0 °C, 30 %		AQQE	AQQE
<b>Fuels</b>						
Diesel oil		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Jet fuel		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Kerosene		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Naphta		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Petrol		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Biodiesel		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
<b>Mineral oils</b>						
Crude oil		b, c, e	< 20 °C	AQQV	AQQV	AQQV
Mineral lubricating oil		c, e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Mineral motor oil		c, e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
<b>Synthetic oils</b>						
Synthetic lubricating oil		c, e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Synthetic motor oil		c, e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Silicone oil		c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
<b>Vegetable oils</b>						
Corn oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Olive oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Peanut oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Rapeseed oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Soy oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
<b>Cleaning</b>						
Alkaline degreasing agent		b, g		AQQE	AQQE	AQQE
Soap (salts of fatty acids)		b	< 80 °C	AQQV	AQQV	AQQV
<b>Organic solvents</b>						
Acetone	C <sub>3</sub> H <sub>6</sub> O	e		AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Ethyl alcohol (ethanol)	C <sub>2</sub> H <sub>6</sub> O	e		AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Isopropyl alcohol	C <sub>3</sub> H <sub>7</sub> OH	e		AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Methyl alcohol (methanol)	CH <sub>3</sub> OH	e		AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
<b>Oxidants</b>						
Hydrogen peroxide	H <sub>2</sub> O <sub>2</sub>	c	20 °C, 25 %		AQQE	AQQE
<b>Salts</b>						
Ammonium bicarbonate	NH <sub>4</sub> HCO <sub>3</sub>	b, c	20 °C, 15 % 60 °C, 30 %	AQQE		
Copper sulphate	CuSO <sub>4</sub>	b, c, f	60 °C, 30 %		AQQE/AQQV	AQQE/AQQV
Ferric sulphate	Fe <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	b, c, f	20 °C, 30 %		AQQE/AQQV	AQQE/AQQV
Potassium bicarbonate	KHCO <sub>3</sub>	b, c	20 °C, 20 % 60 °C, 30 %	AQQE/AQQV		
Sodium carbonate	Na <sub>2</sub> CO <sub>3</sub>	b, c, f	20 °C, 20 % 60 °C, 30 %	AQQE	AQQE/AQQV	AQQE/AQQV
Potassium permanganate	KMnO <sub>4</sub>	b, c	60 °C, 10 %		AQQE	AQQE
Sodium nitrate	NaNO <sub>3</sub>	b, c	20 °C, 5 % 60 °C, 30 %	AQQE/AQQV		
Sodium nitrite	NaNO <sub>2</sub>	b, c	20 °C, 20 % 60 °C, 30 %	AQQE/AQQV	AQQE/AQQV	AQQE/AQQV
Sodium phosphate (mono)	NaH <sub>2</sub> PO <sub>4</sub>	b, c, f	60 °C, 20 %		AQQE/AQQV	AQQE/AQQV

# PRESSURE BOOSTER PUMPS

## SCM Series

Pumped liquids	Chemical formula	Notes	Additional information	Cast iron (CI FG 260)	Stainless steel (AISI 304)	Stainless steel (AISI 316)
Sodium phosphate (di)	Na <sub>2</sub> HPO <sub>4</sub>	b, c, f	30 °C, 30 %	AQQE/AQQV		
			60 °C, 30 %		AQQE/AQQV	AQQE/AQQV
Sodium phosphate (tri)	Na <sub>3</sub> PO <sub>4</sub>	b, c, f	20 °C, 10 %	AQQE/AQQV		
			70 °C, 20 %		AQQE/AQQV	AQQE/AQQV
Sodium sulphate	Na <sub>2</sub> SO <sub>4</sub>	b, c, f	60 °C, 30 %		AQQE/AQQV	AQQE/AQQV
Sodium sulphite	Na <sub>2</sub> SO <sub>3</sub>	b, c, f	20 °C, 1 %	AQQE/AQQV		
			60 °C, 20 %		AQQE/AQQV	AQQE/AQQV
Acids						
Acetic acid	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>		20 °C, 15 %		AQQE	AQQE
			60 °C, 50 %		AQQK	AQQK
Citric acid	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>	c, f	40 °C, 50 %		AQQE	AQQE
Formic acid	CH <sub>2</sub> O <sub>2</sub>	c	20 °C, 30 %		AQQE	AQQE
			40 °C, 30 %			AQQK
Nitric acid	HNO <sub>3</sub>	c	25 °C, 40 %		AQQE	AQQE
			40 °C, 40 %		AQQK	AQQK
Oxalic acid		f	20 °C, 10 %		AQQE	AQQE
			50 °C, 10 %		AQQK	AQQK
Phosphoric acid	H <sub>3</sub> PO <sub>4</sub>	b, c, f	70 °C, 40 %		AQQE/AQQV	AQQE/AQQV
Sulphuric acid	H <sub>2</sub> SO <sub>4</sub>	b	20 °C, 1 %		AQQE/AQQV	
			20 °C, 5 %			AQQE/AQQV
Sulphurous acid			20 °C, 10 %		AQQE	AQQE
			50 °C, 10 %		AQQK	AQQK
Alkalies						
Ammonium hydroxide	NH <sub>4</sub> OH		30 °C, 30 %	AQQE	AQQE	AQQE
Calcium hydroxide	Ca(OH) <sub>2</sub>	b	30 °C, 5 %	AQQE	AQQE	AQQE
Potassium hydroxide	KOH	c, f	20 °C, 20 %	AQQE		
			60 °C, 20 %		AQQE	AQQE
Sodium hydroxide	NaOH	c, f	20 °C, 20 %	AQQE		
			80 °C, 20 %		AQQE	AQQE

# PRESSURE BOOSTER PUMPS

## SCM Series



Water						
Boiler feed water Brackish water		a	30 °C, 2000 ppm chloride	AVBE/AQQE AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Condensate				AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Cooling and cutting lubricant Groundwater		b	<300 ppm chloride	AQQV AVBE/AQQE	AQQV AVBE/AQQE	AQQV AVBE/AQQE
Demineralized water		h	> 2 microS/cm	AQQE	AQQE	AQQE
Demineralized water		h,	i < 2 microS/cm	AVBE	AVBE	AVBE
District heating water				AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Oil-containing water				AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Softened water				AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Swimming pool water, chlorinated			40 °C, 150 ppm chloride, < 2 ppm free chlorine		AVBE/AQQE	AVBE/AQQE



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