



**Grundfos submersible motors  
– in a class of their own**

GRUNDFOS Control Box SA-SPM5







## More than 30 years' experience

Grundfos has been manufacturing quality submersible motors for more than 30 years, and the highly efficient Grundfos MS submersible motors are rated among the very best on the market. The MS motors are based on state-of-the-art technology that comprises highly reliable shaft seals and heavy-duty thrust bearings. High efficiency and a long operating life ensure low long-term Cost of Ownership.

As one of the world's leading pump manufacturers, we know better than anyone what is required of a reliable submersible motor. The Grundfos motors are suitable for all makes of submersible pumps, including the comprehensive Grundfos SP range.

The canned MS motors are available in 4" and 6" versions. A range of specially designed MS industrial versions with increased efficiency and longer operation lifetime is also available.

**Motor head**  
NEMA standard mounting dimensions utilizing four, 5/16" x 24 UNF threaded studs

**Over temperature protection**  
Over temperature protection provided with bi-metallic overloads

**Thrust bearing**  
Heavy-duty 900 lb. Mitchell-type thrust bearing capacities exceeding NEMA ratings

**Cable**  
XLPE cross-linked polyethylene



**Shaft seal**  
Nitrile radial lip/bellows

**Corrosion resistance**  
High-grade materials provide high corrosion resistance. AISI 304 (DIN W.-Nr. 1.4301) stainless steel-*standard*, For aggressive water the motor can be supplied with Viton elastomers vs. standard NBR

**Motor fill fluid**  
SML2 fluid filled motor design provides bearing lubrication

## GRUNDFOS MS 402

4-inch motor, 1/3 HP (.25 kW) to 1 1/2 HP (1.1 kW)

**Enclosure**  
NEMA Type 3R rated suitable for outdoor mounting provided with mounting holes, progressive knockouts, and hinged door. 18 gauge steel construction with a gray colored epoxy coating provides great mechanical properties and corrosion protection

**Product Range**  
Standard: 115 VAC, 0.33 HP to 0.5 HP  
230 VAC, 0.33 HP to 5 HP

Run Cap: 115 VAC, 0.33 HP to 0.5 HP  
230 VAC, 0.33 HP to 1 HP

Deluxe: 230 VAC, 1.5 HP to 5 HP



**Internal wiring**  
Internal wire is 14 AWG, THHN, 105 degrees C, 600 VAC rated insulation.

**Voltage relay**  
UL Recognized General Electric™ voltage relay

**Start capacitor**  
User friendly quick disconnect brackets for UL Recognized Mallory™ start capacitor.

**Pull handle disconnect**  
The pull handle disconnect is available to break voltage between line/service voltage and the starting components and motor leads

## GRUNDFOS CONTROL BOX SA-SPM5

Single-phase, 60 Hz Control Box, 0.33 HP to 5 HP



### Low motor temperature

Due to a unique thin rotor can and close rotor to stator tolerance in the MS motors, internal rotor losses are minimized. Large cooling surfaces and internal fill fluid circulation provides efficient heat transfer resulting in cooler operating temperatures. Lower motor temperature means longer lifetimes.

### Voltage tolerance

To assure adequate voltage is applied to the motor, Grundfos recommends a maximum of 5% cable loss. Supplying the correct voltage to the motor ensures proper starting torque and cooler operating temperatures are achieved.



**Motor head**  
NEMA standard mounting dimensions utilizing four, 5/16" x 24 UNF threaded studs

**Monitoring**  
Motor protection and energy monitoring possible with remote monitoring equipment MTP75 control unit, CU 3 control unit, SM 100 sensor module, R100 remote control, G100 gateway and datalogger

**High efficiency**  
High motor efficiency provides energy savings

**Industrial and warm water versions available**  
Extra high efficiency and increased operation lifetime

**Thrust bearing**  
Heavy-duty 1500 lb. Mitchell-type thrust bearing



**Shaft seal**  
Mechanical ceramic/tungsten carbide shaft seal is standard on MS 4000 and MS 6000. SiC/SiC shaft seal optional on MS 4000 and MS 6000 for water with high sand content

**Motor fill fluid**  
SML2 fluid filled motor design provides bearing lubrication

**Corrosion resistance**  
High-grade materials provide high corrosion resistance. AISI 304 (DIN W.-Nr. 1.4301) stainless steel-*standard*, AISI 904 L (DIN W.-Nr. 1.4539) stainless steel-*optional*. For aggressive water the motor can be supplied with Viton® elastomers vs. standard NBR

**Cable**  
XLPE cross-linked polyethylene

## GRUNDFOS MS 4000

4-inch motor, 2 hp (1.5 kW) to 10 hp (7.5 kW)



The MS 4000 and MS 6000 series are designed for use in a variety of applications in water supply. When equipped with features like oversized motor, temperature measurement, cooling jacket, and SiC/SiC mechanical shaft seals, these versions are suitable for heavy-duty industrial applications such as dewatering operations.

**Temperature monitoring**  
Many submersible pumping applications cause motor equipment to fail due to running the motors at high operating temperatures. MS 4000 or MS 6000 can be equipped with a tempcon temperature transmitter or Pt 100 temperature sensor to provide valuable motor temperature information to a monitoring device such as a CU 3 or MTP 75.

**Motor head**  
NEMA standard mounting head  
utilizing four, 1/2" x 20 UNF  
threaded bolts

**Monitoring**  
Motor protection and energy  
monitoring possible with  
remote monitoring equipment  
MTP75 control unit, CU 3  
control unit, SM 100 sensor  
module, R100 remote control,  
G100 gateway and datalogger

**High efficiency**  
High motor efficiency  
provides energy savings

**Industrial and warm water  
versions available**  
Extra high efficiency and  
increased operation lifetime

**Thrust bearing**  
Heavy-duty 4400 lb. Mitchell-  
type thrust bearing



**Shaft seal**  
Mechanical ceramic/tungsten  
carbide shaft seal is standard on  
MS 4000 and MS 6000. SiC/SiC  
shaft seal optional on MS 4000  
and MS 6000 for water with  
high sand content

**Motor fill fluid**  
SML2 fluid filled motor design  
provides bearing lubrication

**Corrosion resistance**  
High-grade materials provide  
high corrosion resistance.  
AISI 304 (DIN W.-Nr. 1.4301)  
stainless steel-*standard*,  
AISI 904 L (DIN W.-Nr. 1.4539)  
stainless steel-*optional*.  
For aggressive water the motor  
can be supplied with Viton®  
elastomers vs. standard NBR

**Cable**  
XLPE cross-linked polyethylene

## GRUNDFOS MS 6000

6-inch motor, 7 1/2 hp (5.5 kW) to 40 hp (30 kW)

### Surge protection

The MS family of motors are capable of withstanding transients as defined by IEEE and UL surge suppression standards. This natural immunity makes the motor resistant to damage from high voltage surges.

### High thrust capacity

The Mitchell-type thrust bearings feature 4 or 6 carbon pads and one ceramic thrust runner for high thrust capacity. This type of bearing is unique in the way that the lapping of the rotating parts ensure a quick build-up of a water film in the thrust bearing during start up. The design of the bearing allows for bi-directional rotation (CW or CCW).





## Get in complete control

### Online monitoring and control

The Grundfos CU 3 control unit, is an electronic motor protection device capable of monitoring the motor and the pump performance via the handheld R100, remote control. The CU 3 control unit can provide online information of vital motor and pump data to a PC tool or to a monitoring system (SCADA), either directly or via the Grundfos G100 gateway and data logger. With sensors installed, the water table and cost per pumped volume of water can be monitored.

### CU 3 control unit enables protection against:

- Dry running and overload
- Operation against a closed valve or discharge pipe
- Insufficient flow of water past the motor
- Too high temperature of the pumped water
- Deposits on the motor, which may compromise cooling of the motor
- Overvoltage or undervoltage
- Phase imbalance
- Motor overheating

# Technical data

## MS 402

Horsepower:	1/3 HP-1 1/2 HP
Phase:	1 and 3 phase
Start/run methods:	1 phase: 2W, 3W 3 phase: DOL
Frequency:	50 Hz and 60 Hz
Voltage:	115-575 VAC
Thrust load:	Max. 900 lbs.
Efficiency:	57-77%
Insulation class:	B
Ambient temperature:	104° F (40° C) @ minimum flow past motor
Mechanical connection:	4" Nema flange
Material:	Stainless steel DIN W.-Nr. 1.4301 (AISI 304)

## MS 4000

Horsepower:	2 HP-10 HP
Phase:	1 and 3 phase
Start/run methods:	1 phase: 3W 3 phase: DOL
Frequency:	50 and 60 Hz
Voltage:	208-575 VAC
Thrust load:	1400 lbs.
Efficiency:	75-81%
Insulation class:	F
Ambient temperature:	104° F (40° C) @ minimum flow past motor
Mechanical connection:	4" Nema flange
Material:	Stainless steel DIN W.-Nr. 1.4301 (AISI 304) + W.-Nr. 1.4539 (AISI 904L)

## MS 6000

Horsepower:	7 1/2 HP-40 HP
Phase:	3 phase
Start/run methods:	3 phase: DOL
Frequency:	50 and 60 Hz
Voltage:	230-575 VAC
Thrust load:	4400 lbs.
Efficiency:	81-86%
Insulation class:	F
Ambient temperature:	104° F (40° C) @ minimum flow past motor
Mechanical connection:	6" Nema flange.
Material:	Stainless steel DIN W.-Nr. 1.4301 (AISI 304) + W.-Nr. 1.4539 (AISI 904L)

## SA-SPM5 Control Box

Horsepower:	1/3 HP-5 HP
Phase:	1 phase
Voltage:	115 VAC or 230 VAC
Enclosure:	NEMA 3R
Wiring:	THHN, 221° F (105° C), 600 VAC rated
Conduit connection:	Progressive knockout diameter 1/2", 3/4" 1"



L-SP-SL-018	Rev. 5/05
PRINTED IN THE USA	

U.S.A.  
GRUNDFOS Pumps Corporation  
17100 West 118th Terrace  
Olathe, Kansas 66061  
Phone: (913) 227-3400  
Telefax: (913) 227-3500

Canada  
GRUNDFOS Canada Inc.  
2941 Brighton Road  
Oakville, Ontario L6H 6C9  
Phone: (905) 829-9533  
Telefax: (905) 829-9512

Mexico  
Bombas GRUNDFOS de Mexico S.A. de C.V.  
Boulevard TLC No. 15, Parque Industrial Stiva Aeropuerto  
C.P. 66600 Apodaca, N.L. Mexico  
Phone: 011-52-81-8144 4000  
Telefax: 011-52-81-8144 4010