

The **SP** system

**Strength** all  
the way



# The **SP** system

## When water needs to move

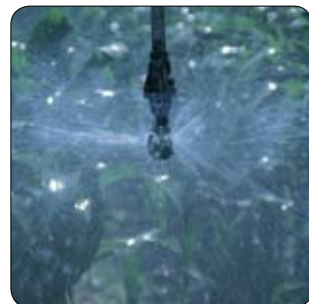
### Complete submersible pump systems

The SP range is your guarantee for high-quality water supply. Capable of handling flows up to 470 m<sup>3</sup>/h and heads up to 810 m, SP systems give you everything you need from a single supplier.

A total system combines a stainless-steel SP submersible pump, an MS/MMS motor made specifically with submersible pump applications in mind, and an MP 204 motor protection unit for added reliability. The complete package gives you complete peace of mind by making sure your water supply application works every time. And all the time.

### Stainless steel to handle all environments

SP systems are used worldwide wherever efficient water handling is called for. The main application areas are irrigation of farmland and groundwater extraction for tap water, but there are many other, more specialised uses. Impressive water fountains and saltwater fish farms are just two examples – see below for more. Wherever you need water to move, SP systems will do it with complete reliability.



### Main application areas

- Groundwater intake/water supply
- Irrigation/raw water supply
- Dewatering (construction sites, mines)
- Thermal waters, pools, and springs
- Fish farming
- Fountains
- Offshore
- Pressure boosting

### SP system highlights

- Superior reliability and efficiency
- Longer lifetime
- Strong, stainless-steel quality
- Everything you need from a single supplier
- Perfect compatibility
- A wide range of accessories

SP systems – comprising a stainless-steel SP pump, a Grundfos-designed motor, and a dedicated electronic motor protection unit – are designed to bring you efficient water supply in any size application.



# SP – the original that stays ahead



## Classic quality, modern performance

The Grundfos SP range has withstood the test of time to stand as the ultimate in submersible pump technology. Made from corrosion-resistant stainless steel, SP pumps are used worldwide for raw water supply, pressure boosting, irrigation, and dewatering – and many industrial applications. When you want it to last, you choose Grundfos SP.



## Durable and efficient

SP pumps combine the very best materials with superior hydraulic design. They work with great efficiency during periods of high demand – an efficiency which lasts even after years of operation. To fully utilise this efficiency in your system, use the SP hydraulics in combination with the MS/MMS range of motors – they fit the optimum duty point of the SP pumps they are designed for.



## Handles tough jobs

High quality quickly becomes apparent when the job gets difficult. It usually does. The SP pump resists sand and other abrasives; it keeps operating when others give up. You can even choose extra high-grade stainless steel for very severe conditions. What is more, a range of protection features prevent damage if things get too tough even for the SP. It's no wonder, that you find SP solutions in the toughest environments – e.g. mines and offshore industries worldwide.

- 100% high-grade stainless steel inside out
- Available in 4, 6, 8, 10 and 12" diameter versions
- Flow rates from 0-470 m<sup>3</sup>/h
- Head up to 810 m
- Superior hydraulics for superior efficiency



## Expert design, expert tests

The current SP pumps are the result of decades of experience and constant improvements. This has let us perfect our production methods to optimise quality, so you can put the SP to the test with complete confidence. In fact, we have done it before you. Every pump is tested before it leaves the factory to make sure that when you choose the original, you get the best.

You can see for yourself what the SP is all about. All the technical documentation you could ever want is available online or from your Grundfos supplier.

## Find full data online

To find full data online, visit your local Grundfos website – or [www.grundfos.com](http://www.grundfos.com) – and follow the link to WebCAPS on the front page.

- Resistant to sand
- Resistant to aggressive water
- Designed and tested by leading experts
- Perfect partner for MS/MMS motors

# MS/MMS – motors that improve performance



## Quality from one of the world's largest motor manufacturers

Grundfos has been making submersible motors for more than 30 years and is now one of the world's largest manufacturers of high-quality submersible motors. The MS and MMS submersible motors are not only rated among the very best on the market for use with submersible pumps of any make – they are also designed to be the perfect fit for the SP pumps, matching their best duty points.



## Canned MS, rewindable MMS

These all-stainless steel, water-filled motors are available in two basic versions in a variety of sizes from 4" to 12". The MS series of canned submersible motors comes in sizes up to 30 kW (40 hp), while the MMS series of rewindable motors come in sizes up to 250 kW (340 hp). Special versions for demanding industrial use are also available.



## The motor is as important as the pump

When you require high efficiency, the motor is just as important as the pump. Hydraulic efficiency will not do it alone. The MS and MMS motors match the advanced hydraulics of the SP range. And they will continue to do so: Durable shaft seals and heavy-duty thrust bearings are just two of the features which make the MS and MMS pumps so long-lived.

- Canned MS motors, 4" and 6", up to 30 kW
- Rewindable MMS motors, 6" - 12", up to 250 kW
- Ideal fit for the SP range and MP 204
- High efficiency
- All-stainless steel for high corrosion resistance
- Heavy-duty bearings with high thrust capacity



## MS: Compact and efficient

The MS range of canned submersible motors comes in sizes of 4" and 6" in two main versions: MS 402 and MS 4000/MS 6.

### MS 402

MS 402 is designed for the domestic ground water market and covers outputs up to 2.2 kW (3 hp).

### MS 4000/MS 6

The MS 4000 and MS 6 series cover a range of water supply applications that require power up to 30 kW.

All external surfaces of Grundfos MS motors in contact with water are made of stainless steel DIN W. Nr. 1.4301 (AISI 304) unless otherwise specified. R-versions made from DIN W. Nr. 1.4539 (AISI 904 L) are also available for aggressive water.

MS motors are fitted with a built-in Tempcon sensor to prevent overheating – a solution which together with a Grundfos MP 204 eliminates the need for external temperature sensors.

## MMS: Powerful, efficient, and easy to repair

The MMS range of rewindable motors is available in sizes 6", 8", 10", and 12" up to 250kW. They are suitable for any submersible installation, including heavy-duty industrial applications and dewatering operations.

- Water-filled motors and drinking water-approved cables prevent water contamination
- Overheating protection with Tempcon (MS) or Pt 100 on request
- Mechanical ceramic/carbon shaft seal – SiC/SiC shaft seal optional for high sand resistance
- Warm water versions available – up to 60°C

# A closer look ...



## SP

### Corrosion resistant

AISI 304 stainless steel inside out makes the SP very resistant to corrosion. Extra high-grade steel versions for aggressive liquids also available.

### Sand flushed out

Less abrasive wear: Octagonal bearings and sand flush channels remove particles with the pumped water

### Optimised hydraulics

For better performance and fewer breakdowns

### Customised solutions

Need something extra special? Ask us!

### Built-in non-return valve

All SP pumps are delivered with a non-return valve to minimise the risk of water hammering damage.

### Viton® rubber parts

This option makes the SP suitable for slightly contaminated water, e.g. oil

### Stop ring

Protect the pump in case of up thrust

### Failure rate close to zero

Durable and well-protected: Statistics compiled since 1967 show that SP pumps have a failure rate close to zero.

## MS/MMS



### Re-usable cable plug

The innovative cable plug used in the MS6 motors facilitates easy replacement of the motor and minimises service costs.

### Corrosion resistant

The MS/MMS motors are available in steel versions to match the corrosion resistance of the SP pump units. Extra high-grade steel versions for aggressive liquids also available.

### Rewindable motor (MMS)

In MMS motors the stator can be rewound locally, ensuring minimal cost and downtime.

### High thrust capacity

Michell-type thrust bearings with high thrust capacity. Quickly builds up a water film during start-up to ensure high thrust capacity.

### Exchangable shaft seal

The standard mechanical shaft seal used in the MS/MMS motors are very easy to service and replace. For applications that involve sand or abrasives, a SiC/SiC sand-resistant shaft seal is also available.

### Tempcon sensor (MS)

MS motors are available with a built-in Tempcon temperature sensor, eliminating the need for extra cables or sensors.

### Motor protection and monitoring

Optimise reliability and monitor performance with the MP 204, IO112 and R100.

### Warm water versions

Warm water versions are available in both the MS and MMS motor series.

## Facts you can't fake

Only the SP gives you the reliability and system compatibility you need for a high-quality solution.

It was the first submersible pump of its type, so no-one quite matches Grundfos' level of expertise within the field.

And no-one has created such perfectly compatible motors, protection units and accessories to supplement their pumps.

SP solutions have that extra touch of know-how and pride in a well-made product that just cannot be faked.

## Buy the original. Look for:

- The Grundfos logo engraved on the pump chambers
- The Grundfos name and logo on the cable guard
- The identification number on the number plate



# MP 204 – perfect protection for motors



## Electronic pump protection made simple

Even the strongest pump motors can benefit from extra protection against external threats. The MP 204 motor protection unit has been made especially for pumps by pump specialists. It is designed to bring you pump protection that is as simple to use as it is efficient. After just 120 seconds of setting, the unit is ready to go.



## Protect your pumps against external threats

The MP 204 protects pump motors against undervoltage, overvoltage and other variations in power supply. So even if your external power supply is not entirely steady, your SP pump will remain as reliable as ever.

Very importantly, the extra protection also reduces wear and prolongs the motor's lifespan.



## Temperature monitoring – a special SP feature

When used with the SP/MS configuration, the Tempcon sensor lets MP 204 keep an eye on the motor temperature at all times. If the temperature reaches 60°C it will issue a warning signal. If it reaches 75°C, the MP 204 will stop the motor to prevent damage.



## Dry-running protection

Reduced power consumption is a strong indication that the pump is about to run dry, so the MP 204 will immediately stop the pump if the power consumption drops below 60%.

## True RMS measurement for maximum accuracy

The MP 204 uses true RMS measurement by sampling each cycle 256 times. This ensures accurate measuring of current and voltage – even in very adverse conditions where heavy loads disturb the power grid.

## Handles currents up to 999A

On its own, the MP 204 will handle currents up to 120A. For currents up to 999A, the unit can be fitted with external current transformers available from stock at Grundfos.

## Designed for submersible pumps

Designing a motor protection unit specifically for pumps allowed us to introduce very specific advantages. For example, the MP 204 includes a trip class developed especially for pumps. The result? Better protection than you'll find with any other protection unit.

### Protection and monitoring parameters

- |   |  |
|---|--|
| • Insulation resistance before start-up                   | • Power factor ( $\cos \varphi$ )        |
| • Temperature (Tempcon, PT sensor and PTC thermal switch) | • Power consumption                      |
| • Overload / underload                                    | • Harmonic distortion                    |
| • Overvoltage / undervoltage                              | • Current asymmetry                      |
| • Phase sequence  | • Run and start capacitor (single-phase) |
| • Phase missing   | • Operating hours and number of starts   |

### Access more functions with the R 100 remote control

The R 100 remote control lets you adjust factory settings, carry out service and troubleshooting, access data stored in the MP 204 unit, and more.

### Ready for bus communication

The MP 204 allows for monitoring and communication via GENibus – a special Grundfos BUS for exchange of pump data, alarms, status information, and setpoints, e.g. in SCADA systems.

# Your complete solution provider

When looking to establish an efficient water supply, you need to focus on the total lifecycle costs of the entire system. When choosing Grundfos as your partner, you can count on our skilled assistance in all facets of the job. We'll help analyze your existing water system, offer guidance on dimensioning and pump selection, give you the tools to monitor pump operation, and even provide service, when the times comes.

## Analysing the system

It all starts with establishing your water needs. Our experienced staff will help measure your existing system, analyse overall performance, and then find the points in your water system that need improvement.

## System design

We'll guide you through total system optimisation, rather than sub-optimizing your components.

WinCAPS, Grundfos' own PC-based pump selection and sizing tool featuring over 200,000 products is the perfect tool for system creation. Only through the right design and system setup can the lowest life cycle cost be found.

## Installation

A correct installation is crucial to secure years of trouble-free operation. Grundfos therefore offers complete commissioning of your installation as an optional extra.

## Monitoring and protection

Pumping conditions such as water table level or water demand may vary over time. Monitoring is necessary to track these changes and protect your pump. The Grundfos MP204 offers simple, excellent motor protection and monitoring

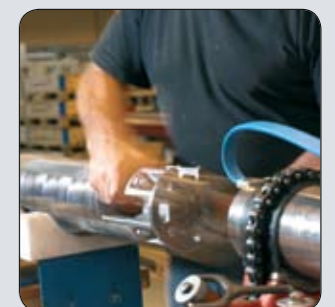
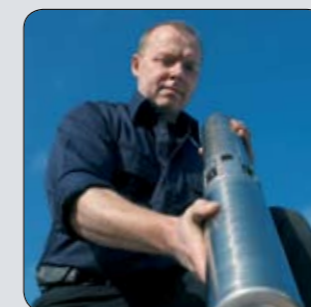
## Service

Monitoring can indicate when your installation needs adjustment or when the pump should be pulled for service or replacement. Grundfos' extensive service programme offers parts and guidance on when and how to maintain your pump.

## Global presence

The Grundfos Service set-up is designed to accommodate local service needs on a global level. An efficient flow of knowledge between local, regional and global service professionals ensures that you get optimal support, tailored to your needs. Highlights include:

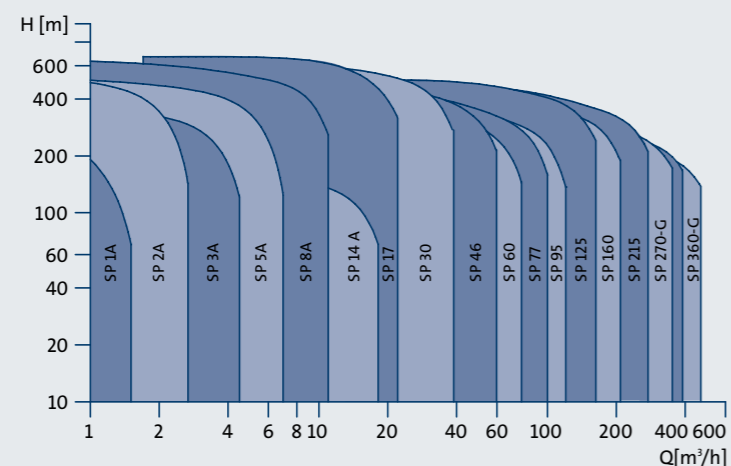
- Emergency access to service personnel outside normal working hours
- Service mailboxes where you can leave service requests as it suits you.



## Technical data – SP submersible pumps

These pages provide an overview of the SP system's technical specifications- Complete documentation is available in data booklets or via the Grundfos Computer Aided Product Selection tool (CAPS).

To access full information online, follow the link to WebCAPS from [www.grundfos.com](http://www.grundfos.com) or your local Grundfos website.



## Technical data – MP 204 motor protection unit

<b>MP 204</b>	
Enclosure class:	IP 20
Ambient temperature:	-20 to +60 °C
Relative humidity:	99%
Voltage range:	80-610VAC
Current range:	3-999A
Frequency:	47-63 Hz
IEC trip class:	1-45
Special Grundfos trip class:	0.1-30 s
Voltage variations:	-25/+15% of nominal voltage
Approvals:	EN 760947, EN 60355, UL/CSA 508
Marking:	SE, cUL, C-tick

## Technical data – MS/MMS motors

<b>MS 402</b>	
Phase:	1 and 3 phase
Start/run methods:	1 phase: PSC, 2W, 3W
3 phase:	DOL
Frequency:	50 Hz and 60 Hz
Voltage:	115-575 V
Thrust load:	Max. 3.5 kN
Efficiency:	57-77
Insulation class:	B
Ambient temperature:	See Grundfos documentation
Mechanical connection:	4" Nema flange
Material:	Stainless steel DIN W.-Nr. 1.4301 (AISI 304)
Certification:	UL and CSA available

<b>MS 4000</b>	
Phase:	1 and 3 phase
Start/run methods:	1 phase: 3W
3 phase:	DOL
Frequency:	50 and 60 Hz
Voltage:	208-575 V
Thrust load:	2.2 kN or 4.4 kN
Efficiency:	75-81
Insulation class:	F
Ambient temperature:	See Grundfos documentation
Mechanical connection:	4" Nema flange
Material:	Stainless steel DIN W.-Nr. 1.4301 (AISI 304) + W.-Nr. 1.4539 (AISI 904L)
Certification:	CSA available

<b>MS 6</b>	
Phase:	3 phase
Start/run methods:	DOL, SD
Frequency:	50 and 60 Hz
Voltage:	200-575 V
Thrust load:	6.5 kN or 27.5 kN
Efficiency:	81-86
Insulation class:	F
Ambient temperature:	See Grundfos documentation
Mechanical connection:	6" Nema flange.
Material:	Stainless steel DIN W.-Nr. 1.4301 (AISI 304) + W.-Nr. 1.4539 (AISI 904L)
Certification:	cCSAus available

<b>MMS</b>	
Phase:	3 phase
Startmethods:	DOL, SD
Frequency:	50 and 60 Hz
Voltage:	200-1000 V
Thrust load:	6", 15 kN or 27.5 kN 8" and 10", 50 kN 12", 70 kN
Efficiency:	70-91
Insulation class:	Y, possible A
Ambient temperature:	See Grundfos documentation
Connection:	6" and 8" with Nema flange
Material:	Stainless steel DIN W.-Nr. 1.4401 (AISI 316L) stator tube with cast iron endbells EN-JL-1040, all-stainless steel DIN W.-Nr. 1.4401 (AISI 316L), or all-stainless steel DIN W.-Nr.1.4539 (AISI 904L)



BE > THINK > INNOVATE >

Being responsible is our foundation  
Thinking ahead makes it possible  
Innovation is the essence

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