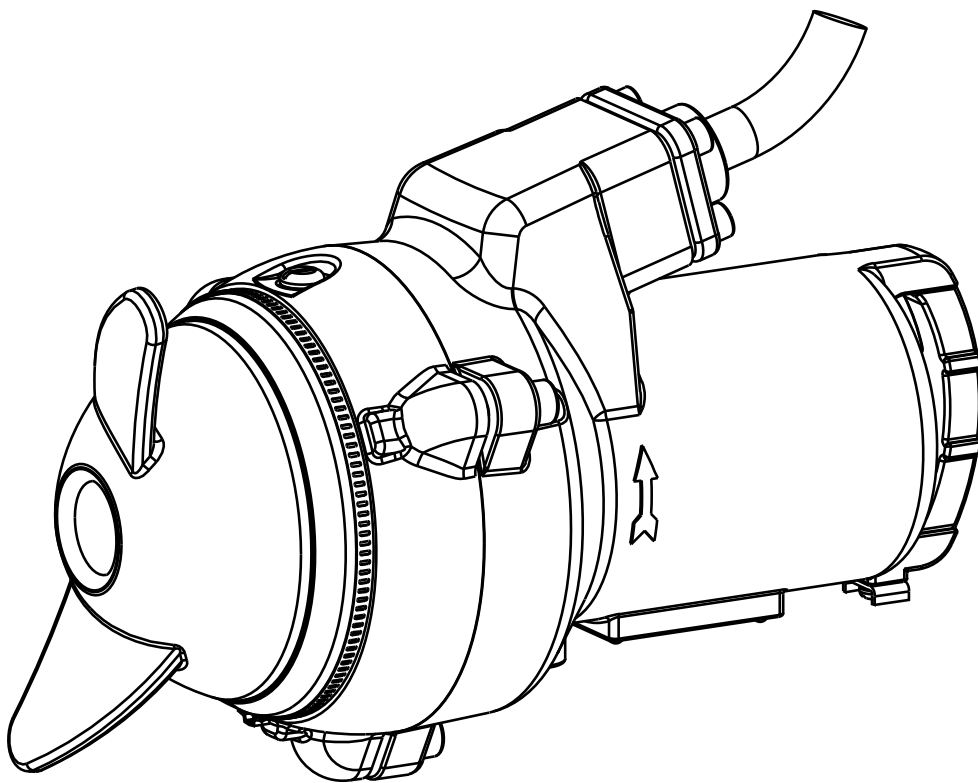


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**Submersible Mixer Type ABS RW 200 and 280**

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**Installation and Operating Instructions**

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[www.sulzer.com](http://www.sulzer.com)

**Mahar Fan**

## Submersible Mixer Type ABS RW

200

280

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Sulzer reserves the right to alter specifications due to technical developments

**Mahar Fan**

## 1 Application areas

The compact submersible mixers of the RW 200-280 series have been designed for a wide range of applications. Apart from the use in pump sumps (for avoidance of deposits and floating crusts) the units are also ideal for a variety of mixing and stirring applications in sewage treatment plants and in industrial areas. The mixers can be installed independently of the tank shape or dimension. Depending on the intensity of mixing required and the flow formation needed, one or more mixers may be installed.

**ATTENTION**      *The maximum allowable temperature of the medium pumped is 40 °C.*

### 1.1 Approvals

Electrical safety of the S-series is CSA and CSA(U) approved.

### 1.2 Explosion-proof approvals

The motors of the S-series have explosion-proof certification in accordance with Factory Mutual Class 1 Div. 1 Groups C and D (60 Hz, US), ATEX 2014/34/EC, Ex II 2G Ex h db IIB T4 Gb.

## 2 Safety

The general and specific health and safety guidelines are described in detail in the “Safety Instructions for Sulzer Products Type ABS” booklet. If anything is not clear or you have any questions as to safety make certain to contact the manufacturer Sulzer.

### 2.1 Particular comments on the use of explosion-proof mixers in explosive zones.

1. Explosion-proof submersible mixers may only be operated with the thermal sensing system connected.
2. If ball type float switches are used, these must be connected to an intrinsically safe electrical circuit “Protection type EX (i)” in accordance with VDE 0165.
3. Dismantling and repair of submersible explosion-proof motors may only be carried out by approved personnel in specially approved work shops.

### 2.2 Special conditions for safe use of S-type, explosion-proof motors.

1. The integral supply cable shall be suitably protected from mechanical damage and terminated within an appropriate termination facility.
2. Motors rated for use with 50/60 Hz sinusoidal supplies shall have the thermal protection devices connected in such a way that the machine is isolated from the supply in the event of the stator reaching 130 °C.
3. These motor units are not intended for user service or repair, any operation that may affect the explosion protection characteristics should be referred to the manufacturer. The maximum permitted flamepath gaps are tighter than those specified in EN 60079-1:2014.

### 3 Technical data

Maximum noise level ≤ 70 dB. This may be exceeded in certain circumstances.

Detailed technical information is available in the technical data sheet “Submersible Mixer Type ABS RW 200 and 280” which can be downloaded from [www.sulzer.com](http://www.sulzer.com) > Products & Services > Pumps and Systems.

#### 3.1 Nameplate

We recommend that you record the data from the original nameplate on the mixer in the corresponding form below, and maintain it as a source of reference for the ordering of spare parts, repeat orders and general queries.

Always state the pump type, item number and serial number in all communications.

Figure 1: Nameplate Ex Version

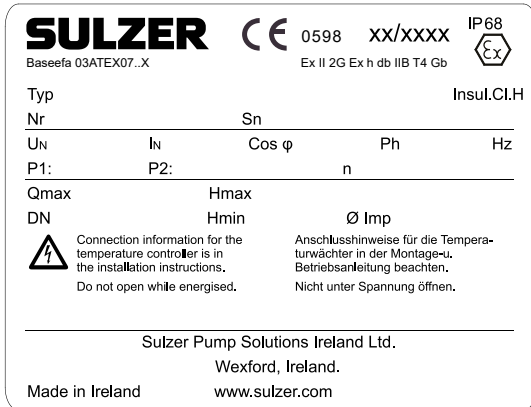
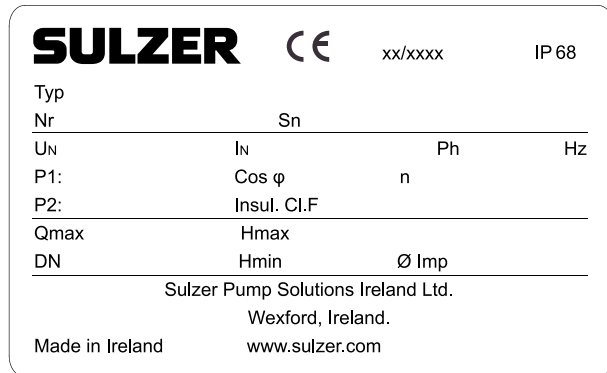


Figure 2: Nameplate Standard Version



#### Legend

Typ	Mixer type	
Nr./Sn	Item number/Serial number	
xx/xxxx	Production date (week/year)	
$U_N$	Rated voltage	V
$I_N$	Rated current	A
Hz	Frequency	Hz
P1	Rated input power	kW

P2	Rated output power	kW
n	Speed	r/min
Cos φ	Power factor	pf
Insul. Cl	Insulation class	
Ø Imp.	Propeller diameter	mm
IP	Protection type	

Figure 3: Nameplate FM Version

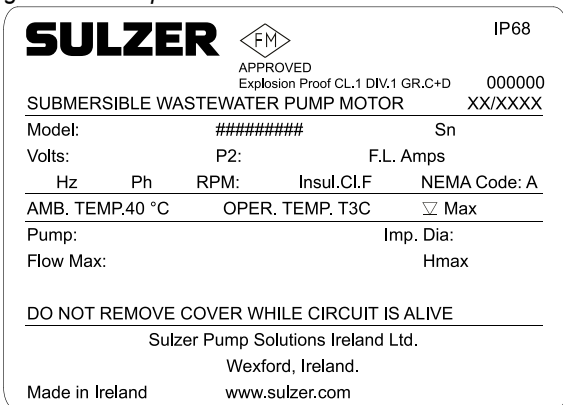
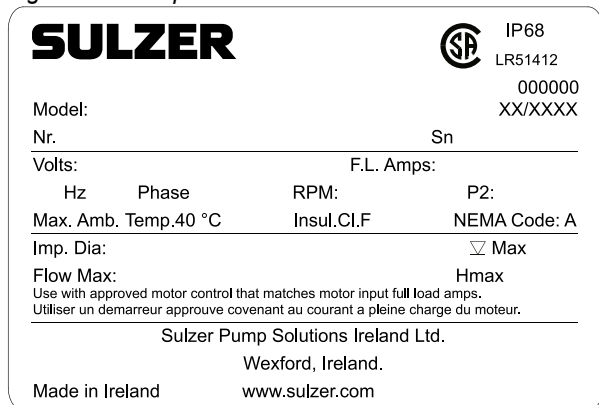


Figure 4: Nameplate Standard Version



#### Legend

Model	Mixer type/ Item number	
Sn	Serial number	
Volts	Rated voltage	V
P2	Rated output power	HP
F.L.Amps	Full load amps	A
Hz	Frequency	Hz

Ph	Three/single phase	
RPM	Speed	rpm
Imp. dia	Propeller diameter	mm
Max. ∇	Max submersible depth	ft
Insul. Cl.	Insulation class	
NEMA Code		

## 4 Transport



During transport the unit should not be dropped or thrown.



The unit should never be raised or lowered by the power cable.

The unit is fitted with a lifting device to which a chain and shackle may be attached for transport purposes.



Any hoist used must be adequately dimensioned for the weight of the unit.

All relevant safety regulators as well as general good technical practice must be complied with.

## 5 Mounting and installation

### NOTE

*We recommend that original Sulzer installation accessories be used for mounting and installation of the mixer.*



Particular attention must be paid to the safety regulations covering work in closed areas in sewage plants as well as good general technical practices.

### 5.1 Installation example, concrete sump

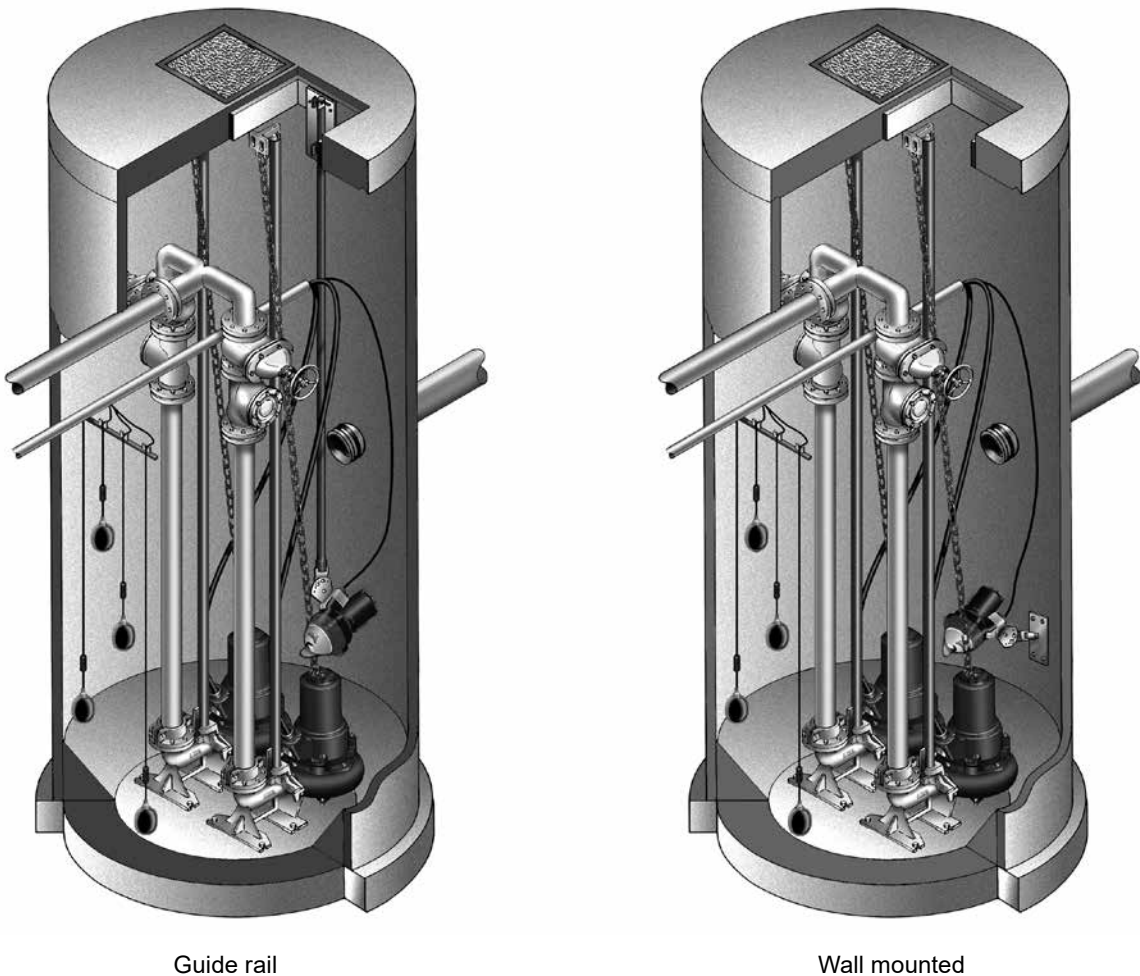


Figure 5: Installation example concrete sump

## 6 Electrical connection



Before commissioning, an expert should check that one of the necessary electrical protective devices is available. Earthing, neutral, earth leakage circuit breakers, etc. must comply with the regulations of the local electricity supply authority and a qualified person should check that these are in perfect order.

**ATTENTION** *The power supply system on site must comply with local regulations with regard to cross-sectional area and maximum voltage drop. The voltage stated on the nameplate of the pump must correspond to that of the mains*

The power supply cable must be protected by an adequately dimensioned slow-blow fuse corresponding to the rated power of the mixer.



The incoming power supply as well as the connection of the mixer itself to the terminals on the control panel must comply with the circuit diagram of the control panel as well as the motor connection diagrams and must be carried out by a qualified person. All relevant safety regulators as well as general good technical practice must be complied with.

**ATTENTION** *For use in the open air, the following VDE regulations apply:*

Submersible mixers used outdoors must be fitted with a power cable of at least 10 m length. Other regulations may apply in different countries.



**Three phase:** Risk of electrical shock. Do not remove cord and strain relief and do not connect conduit to mixer. This mixer is not provided with a supply connection, therefore one of the following means must be provided by the installer: (1) a suitably rated, grounding-type attachment plug must be provided for connection to the branch circuit supply, or (2) a listed junction box, listed outlet box, or listed wiring compartment and their associated fittings must be provided by the installer for supply connection. This provision must reduce the likelihood of water entry during temporary, limited submersion. Only qualified personnel shall install the mixer.



**Single phase:** Risk of electrical shock. This mixer is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electrical shock, be certain that it is connected only to a properly grounded, grounding receptacle, and that the motor is thermally protected. To reduce risk of electrical shock, pull plug before servicing this mixer. This mixer has not been investigated for use in swimming pools.

**NOTE** *Please consult your electrician.*

## 6.1 Wiring diagrams

Three phase - RW S13/4D, S25/4D, S16/4D, S28/4D

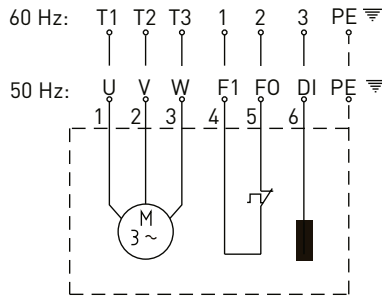


Figure 6 Wiring diagram three phase

U (T1), V (T2), W (T3) = Live  
 PE = Earth  
 F1 (1) / F0 (2) = Thermal sensor  
 DI (3) = Seal Monitor  
 R = Run  
 S = Start  
 C = Common (Neutral)

Single phase - RW S18/4W

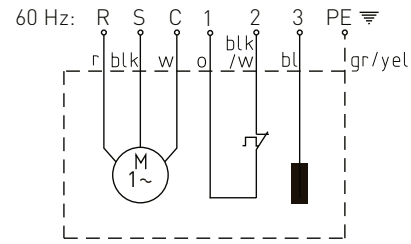


Figure 7 Wiring diagram single phase

r = red  
 blk = black  
 w = white  
 o = orange  
 blk/w = black/white  
 bl = blue  
 gr/yel = green/yellow

**ATTENTION** *Explosion-proof motors may only be used in explosive zones with the thermal sensors fitted (Leads: F0, F1).*

**ATTENTION** *It is important to use the correct capacitors with single phase pumps, use of incorrect capacitors will lead to motor burn-out.*

## 7 Checking direction of rotation



The safety hints in the previous sections must be observed!

When three-phase units are being commissioned for the first time, and also when used on a new site, the direction of rotation must be carefully checked by a qualified person.



When checking the direction of rotation, the unit should be secured in such a manner that no danger to personnel is caused by the rotating propeller, or by the resulting air flow.



The direction of rotation should only be altered by a qualified person.



When carrying out the direction of rotation check as well as when starting the unit pay attention to the **START REACTION**. This can be very powerful.

### ATTENTION

The direction of rotation is correct if the propeller rotates in a clockwise manner when viewing down from the top of the placed unit.



1020-00

### ATTENTION

The start reaction is anti-clockwise.

Figure 8: Rotor rotation

### NOTE

*If a number of units are connected to a single control panel then each unit must be individually checked.*

### ATTENTION

*The mains supply to the control panel should have a clockwise rotation. If the leads are connected in accordance with the circuit diagram and lead designations, the direction of rotation will be correct.*

## 7.1 Changing direction of rotation



The safety hints in the previous sections must be observed!



The direction of rotation should only be altered by a qualified person.

If the direction of rotation is incorrect then this is altered by changing over two phases of the power supply cable in the control panel. The direction of rotation should then be rechecked.

### NOTE

*The direction of rotation measuring device monitors the direction of rotation of the mains supply or that of an emergency generator.*



## 8 Commissioning



The safety hints in the previous sections must be observed!

Before commissioning, the unit should be checked and a functional test carried out. Particular attention should be paid to the following:

- Have the electrical connections been carried out in accordance with regulations?
- Have the thermal sensors been connected?
- Is the seal monitoring device (where fitted) correctly installed?
- Is the motor overload switch correctly set?
- Have the power and control circuit cables been correctly fitted?
- Was the sump cleaned out?
- Have the inflow and outflows of the pump station been cleaned and checked?
- Is the direction of rotation correct - even if run via an emergency generator?
- Are the level controls functioning correctly?
- Are the required gates valves (where fitted) open?
- Do the non-return valves (where fitted) function easily?
- Has the motor connection cable been laid in such a manner that it cannot be caught up in the propeller?
- Is there adequate water coverage over the propeller?

## 9 Types of operating

Mixers may only be operated fully submerged.

**ATTENTION**     *The mixer must be fully submerged in the medium. During operation no air must be drawn in by the propeller. A quiet flowing action in the medium must occur. The mixer must not vibrate excessively.*

Uneven liquid flow and vibrations may be caused by over-active mixing in small tanks. Changing position or direction of the mixer may assist.

## 10 Maintenance



Before commencing any maintenance work the unit should be completely disconnected from the mains by a qualified person and care should be taken that it cannot be inadvertently switched back on.



When carrying out any repair or maintenance work, the safety regulations covering work in enclosed areas of sewage installations as well as good general technical practices should be followed.



Servicing must only be carried out by qualified personnel.

**NOTE**     *The maintenance hints given here are not designed for “do-it-yourself” repairs as special technical knowledge is required.*

**NOTE**     *A maintenance contract with our Service Department will guarantee you the best technical service under all circumstances.*

## 10.1 General maintenance hints

Sulzer submersible mixers are reliable quality products each being subjected to careful final inspection. Lubricated-for-life ball bearings together with monitoring devices ensure optimum mixer reliability provided that the mixer has been connected and operated in accordance with the operating instructions.

Should, nevertheless, a malfunction occur, do not improvise but ask your Sulzer customer service department for assistance.

This applies particularly if the unit is continually switched off by the current overload in the control panel, by the thermal sensors of the thermo-control system or by the seal monitoring system (DI).

Regular inspection and care is recommended to ensure a long service life.

**NOTE**                    *The Sulzer Service Organisation would be pleased to advise you on any applications you may have and to assist you in solving your pumping problems.*

**NOTE**                    *The Sulzer warranty conditions are only valid provided that any repair work has been carried out in Sulzer approved workshop and where original Sulzer spare parts have been used.*

**ATTENTION**            *Repair work on explosion-proof motors may only be carried out in authorized workshops by qualified personnel using original parts supplied by the manufacturer. Otherwise the ex-approvals are no longer valid. Detailed guidelines, instructions and dimensional drawings for the service and repair of Ex-approved mixers are in the RW 200 and 280 Workshop Manual.*

## 10.2 Oil filling and changing

Waste oil must be disposed of in the proper manner.

## 10.3 Filling oil into the oil chamber

The mixers have been filled at manufacture with oil. These oils are not injurious to the environment. An oil change is only necessary if a fault occurs. When carrying out repairs only original spare parts, supplied by the manufacturer, should be used.

## 10.4 Cleaning

**ATTENTION**            *Make certain the propeller has completely stopped rotating before approaching the mixer.*

In order to clean the propeller blades of fibrous material it is permissible to run the mixer in the opposite direction (incorrect direction) for a short period.



Changing the direction of rotation on control panels not fitted with a direction of rotation change-over switch may only be carried out by a qualified person, and for this reason this procedure is not authorised as a method of cleaning the propeller.

If the mixer is to be taken out of commission then it should be cleaned by hosing it down with clear water. If the unit is to remain out of service for a prolonged period then it should be stored in a dry and frost-proof location. If the unit is to be reinstalled after a prolonged period out of use then proceed as per Sections 5 - 9.

# SERVICE LOG

Mixer Type:

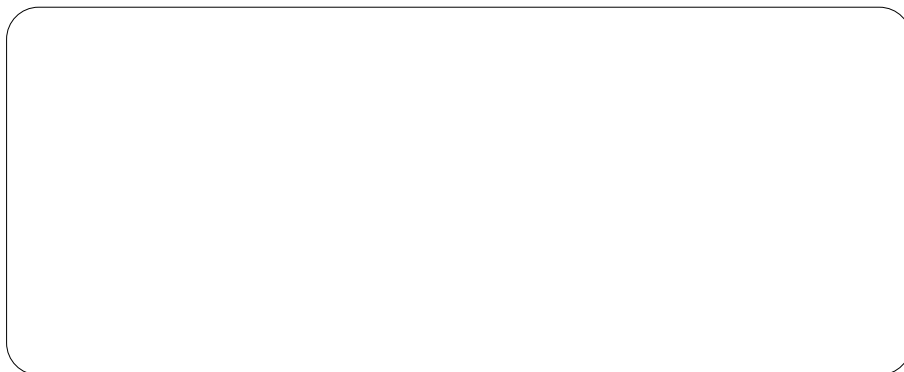
Serial No:

Date

Hours of  
Operation

Comments

Sign



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***Mahar Fan***