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1 Application areas
The submersible wastewater pumps of the AS series have been designed for the economical and reliable pumping of commercial and industrial sewage and can be installed dry or wet. They are suitable for pumping of the following liquids:
- clear and wastewater, for sewage containing solids and fibrous material
- faecal matter
The AS series is suitable for modern sewage installation systems.

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

1.1 Approvals
Electrical safety of the AS series is CSA and CSA(U) approved.

1.2 Explosion-proof approvals
Explosion-proof motors of the AS series have certification in accordance with Factory Mutual (FM) Class 1 Div. 1 Groups C and D (60 Hz, US), and ATEX 2014/34/EU [II 2G Ex db IIB T4 Gb] (50 Hz).

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.

This unit can be used by children aged 8 years and above, and persons with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, when they have been given supervision or instruction concerning the safe use of the device and understand the hazards involved. Children must not play with the appliance. Cleaning and user maintenance should not be performed by children without supervision.

2.1 Particular comments on the use of explosion-proof pumps in explosive zones.
1. Explosion-proof submersible pumps may only be operated with the thermal sensing system connected.
2. Float switches and seal monitoring (DI) must be connected via an intrinsically safe electrical circuit, Protection Type EX (i), in accordance with IEC 60079-11.
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. Pump 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. Pump motors rated for use with variable frequency or non-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 100 °C for T4 classified machines, or 160 °C for T3 classified machines.
4. 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. Repairs on flameproof joints may only be performed in accordance with the manufacturer’s design specifications.

3 Technical data
Detailed technical information is available in the technical data sheet “Submersible Wastewater Pump Type ABS AS 0530 - 0841” which can be downloaded from www.sulzer.com > Products > Pumps > Submersible Pumps.

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

We recommend that you record the data from the standard nameplate on the pump 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: Ex version**

<table>
<thead>
<tr>
<th>Typ</th>
<th>Pump type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr</td>
<td>Item no.</td>
</tr>
<tr>
<td>Sn</td>
<td>Serial no.</td>
</tr>
<tr>
<td>xx/xxxx</td>
<td>Production date (week/year)</td>
</tr>
<tr>
<td>Un</td>
<td>Rated voltage</td>
</tr>
<tr>
<td>In</td>
<td>Rated current</td>
</tr>
<tr>
<td>Cos φ</td>
<td>Power factor</td>
</tr>
<tr>
<td>Ph</td>
<td>Number of phases</td>
</tr>
<tr>
<td>Hz</td>
<td>Frequency</td>
</tr>
</tbody>
</table>

**Figure 2: Standard version**

<table>
<thead>
<tr>
<th>Typ</th>
<th>Pump type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr</td>
<td>Item no.</td>
</tr>
<tr>
<td>Sn</td>
<td>Serial no.</td>
</tr>
<tr>
<td>xx/xxxx</td>
<td>Production date (week/year)</td>
</tr>
<tr>
<td>Un</td>
<td>Rated voltage</td>
</tr>
<tr>
<td>In</td>
<td>Rated current</td>
</tr>
<tr>
<td>Cos φ</td>
<td>Power factor</td>
</tr>
<tr>
<td>Ph</td>
<td>Number of phases</td>
</tr>
<tr>
<td>Hz</td>
<td>Frequency</td>
</tr>
</tbody>
</table>

**Legend**

- Typ: Pump type
- Nr: Item no.
- Sn: Serial no.
- xx/xxxx: Production date (week/year)
- Un: Rated voltage
- In: Rated current
- Cos φ: Power factor
- Ph: Number of phases
- Hz: Frequency

**Figure 3: FM version**

<table>
<thead>
<tr>
<th>Model (Fig. 3)</th>
<th>Motor type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump type</td>
<td>F.L. Amps</td>
</tr>
<tr>
<td>#</td>
<td>Hz</td>
</tr>
<tr>
<td>Sn</td>
<td>RPM</td>
</tr>
<tr>
<td>Nr</td>
<td>Ph</td>
</tr>
<tr>
<td>xx/xxxx</td>
<td>P2</td>
</tr>
<tr>
<td>Volts</td>
<td>F.L. Amps</td>
</tr>
<tr>
<td>P2</td>
<td>Hz</td>
</tr>
<tr>
<td>Flow Max</td>
<td>Max</td>
</tr>
</tbody>
</table>

**Legend**

- Model (Fig. 3): Motor type
- Pump type: F.L. Amps
- Hz: Frequency
- RPM: Speed
- Ph: Number of phases
- Imp. Dia: Impeller diameter
- Flow Max: Rated discharge

**Figure 4: Standard version (Canada)**

<table>
<thead>
<tr>
<th>Model (Fig. 4)</th>
<th>Pump type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump type</td>
<td>Hz</td>
</tr>
<tr>
<td>#</td>
<td>Frequency</td>
</tr>
<tr>
<td>Sn</td>
<td>RPM</td>
</tr>
<tr>
<td>Nr</td>
<td>Ph</td>
</tr>
<tr>
<td>xx/xxxx</td>
<td>P2</td>
</tr>
<tr>
<td>Volts</td>
<td>Hz</td>
</tr>
<tr>
<td>P2</td>
<td>Max</td>
</tr>
<tr>
<td>Flow Max</td>
<td>Max</td>
</tr>
</tbody>
</table>

**Legend**

- Model (Fig. 4): Pump type
- Pump type: Hz
- RPM: Speed
- Ph: Number of phases
- Imp. Dia: Impeller diameter
- Flow Max: Rated discharge

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Sulzer Pump Solutions Ireland Ltd.
Wexford, Ireland.
Made in Ireland [www.sulzer.com](http://www.sulzer.com)
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 Set-up and installation

ATTENTION All relevant regulations covering sewage pumping installations, and where applicable, explosion-proof installations, must be complied with.

The cable duct to the control panel should be made gas-tight by filling with foam after the power supply and control circuit cables have been laid.

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 Discharge line

The discharge line must be installed in compliance with the relevant regulations. DIN 1986/100 and EN 12056 applies in particular to the following:

- The discharge line should be fitted with a backwash loop (180° bend) located above the backwash level and should then flow by gravity into the collection line or sewer.
- The discharge line should not be connected to a down pipe.
- No other inflows or discharge lines should be connected to this discharge line.

ATTENTION The discharge line should be installed so that it is not affected by frost.

5.2 Installation example, concrete sump

Legend

1 Sump cover
2 Venting line
3 Sump cover
4 Sleeve for cable protective duct to the control panel
5 Chain
6 Inflow line
7 Ball type float switch
8 Submersible pump
9 Concrete sump.
10 Pedestal
11 Guide tube.
12 Discharge line
13 Non-return valve
14 Gate valve
15 Power cable to motor

Figure 5: Installation example, concrete sump
5.3 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 pump.

The incoming power supply, as well as the connection of the pump 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 regulations apply:

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

In all installations, the power supply to the pump must be via a residual current device (e.g. RCD, ELCB, RCBO etc.) with a rated residual operating current not exceeding 30 mA. For installations not having a fixed residual current device the pump must be plugged into the power supply through a portable version of the device.

**Three phase:** Risk of electrical shock. Do not remove cord and strain relief and do not connect conduit to pump. This pump 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 pump.

**Single phase:** Risk of electrical shock. This pump 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 pump. This pump has not been investigated for use in swimming pools.

**NOTE** Please consult your electrician.
5.3.1 Wiring diagrams

**Figure 6:** Three phase wiring

**Figure 7:** Three phase wiring with temperature limiter

**Figure 8:** Three phase wiring with temperature limiter and DI

**Figure 9:** Single phase wiring

**Figure 10:** Single phase wiring with temperature limiter

**Figure 11:** Single phase wiring with temperature limiter and DI

### Three phase

**AS 50 Hz:**
- S12/2 D, S13/4 D, S17/2 D, S22/4 D, S26/2 D, S30/2 D,
- S10/4 D, S16/2 D, S13/4 D, S16/4 D, S17/2 D, S18/2 D,
- S22/4 D, S25/4 D, S26/2 D, S30/2 D, S35/2 D

**AS 60 Hz:**
- S10/4 D, S16/2 D, S13/4 D, S16/4 D, S17/2 D, S18/2 D,
- S22/4 D, S25/4 D, S26/2 D, S30/2 D, S35/2 D

### Single phase

**AS 50 Hz:**
- S10/4 W, S12/2 W

**AS 60 Hz:**
- S10/4 W, S16/2 W, S18/2 W

**NOTE:**
- U, V, W = Live
- PE = Earth
- gr/yel = Green/yellow
- blk = Black
- gry = Grey
- br = Brown
- F1/F0 = Thermal sensor
- R = Run
- C = Common (Neutral)
- S = Start
- Di = Seal monitor

**NOTE: USA**
- U, V, W = T1, T2, T3
- F1 = 1
- F0 = 2
- Di = 3

**ATTENTION**

Explosion-proof pumps may only be used in explosive zones with the thermal sensors fitted (leads: FO, F1).

**ATTENTION**

It is important to use the correct capacitors with single phase pumps. Use of incorrect capacitors will lead to motor burn-out.
5.4 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 impeller or by the resulting air flow. Do not place your hand into the hydraulic system!

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 impeller/propeller rotates in a clockwise manner when viewing down from the top of the placed unit.

NOTE If a number of pumps 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.

5.4.1 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.

Figure 12: Rotor rotation
6 Commissioning

The safety hints in the previous sections must be observed!

In explosive zones care must be taken that during switching on and operation of the pumps, the pump section is filled with water (dry running) or alternatively is submerged or under water (wet installation). Ensure in this case that the minimum submergence given in the data sheet is observed. Other types of operation e.g. snore operation or dry running are not allowed.

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 gate valves (where fitted) open?
- Do the non-return valves (where fitted) function easily?
- Have the hydraulics been vented in the case of dry installed pumps?
- Has the volute been vented (see Sec. 7.5) ?

7 Maintenance and service

To avoid danger if the power cable is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person.

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.

Servicing must only be carried out by qualified personnel.

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 pratices should be followed.

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.
7.1 General maintenance hints

Sulzer submersible pumps are reliable quality products each being subjected to careful final inspection. Lubricated-for-life ball bearings together with monitoring devices ensure optimum pump reliability provided that the pump 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 pump 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.

NOTE When carrying out repairs, only original spare parts supplied by the manufacturer should be used.

WARNING: ATEX- and FM-rated AS pumps are approved for use in hazardous locations. If an Ex-rated pump is serviced or repaired in a workshop that is not Ex-approved then it must no longer be used in hazardous locations. In that case the Ex nameplate must be removed and replaced by the standard nameplate, or where instead a standard and a secondary Ex nameplate is fitted to the pump the secondary nameplate must be removed.

7.2 Commentary on maintenance of lifting stations in accordance with EN 12056.

It is recommended that the lifting station be inspected monthly and its function checked.

In accordance with EN regulations, the lifting station should be maintained by a qualified person at the following intervals:
- in commercial premises every three months.
- in apartment blocks every six months.
- in a single family home once a year.

In addition we recommend that a maintenance contract be taken out with a qualified company.
### 7.3 Oil filling and changing

The oil chamber between the motor and the hydraulic section has been filled at manufacture with lubricating oil.

<table>
<thead>
<tr>
<th>Pump Type</th>
<th>Litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 0530 S12/2</td>
<td>0.48</td>
</tr>
<tr>
<td>AS 0530 S17/2</td>
<td>0.48</td>
</tr>
<tr>
<td>AS 0530 S26/2</td>
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</tr>
<tr>
<td>AS 0630 S10/4</td>
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<tr>
<td>AS 0630 S13/4</td>
<td>0.56</td>
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<tr>
<td>AS 0630 S22/4</td>
<td>0.56</td>
</tr>
<tr>
<td>AS 0631 S12/2</td>
<td>0.48</td>
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<tr>
<td>AS 0631 S17/2</td>
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<td>AS 0641 S30/2</td>
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<tr>
<td>AS 0841 S22/4</td>
<td>0.56</td>
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</tbody>
</table>

An oil change is only necessary if a fault occurs.

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Repair work on explosion-proof motors may only be carried out in authorized workshops by qualified personnel using original spare 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 pumps are in the AS Workshop Manual and must be adhered to.

### 7.4 Cleaning

If the pump is used for transportable applications then it should be cleaned after each usage by pumping clear water in order to avoid deposits of dirt and encrustation. In the case of fixed installation, we recommend that the functioning of the automatic level control system be checked regularly. By switching the selection switch (switch setting “HAND”) the sump will be emptied. If deposits of dirt are visible on the floats then these should be cleaned. After cleaning, the pump should be rinsed out with clear water and a number of automatic pumping cycles carried out.

### 7.5 Venting of the volute

After lowering the pump into a sump full of water, an air lock may occur in the volute and cause pumping problems. In that case, shake or raise and lower the pump repeatedly until resulting air bubbles cease to appear at surface level. If necessary, repeat this venting procedure.

We strongly recommend that dry-installed AS pumps be vented back into the sump by means of the drilled and tapped hole provided in the volute.