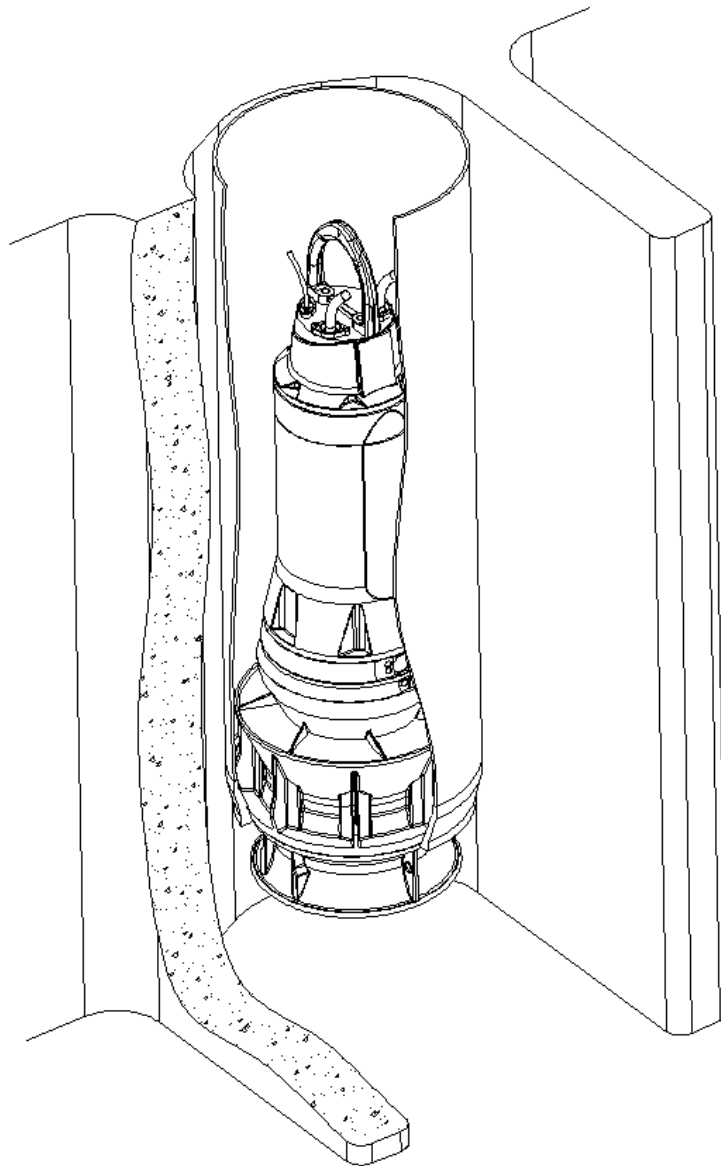

Coupling ring DN 600 to DN 1400



1 Safety

Personnel can face a variety of hazards, including exposure to harmful fumes and gases, electric shock, fire and explosions, during the welding process. Before commencing work, a risk assessment of the work area should be carried out and the required controls should be in place to ensure compliance with local safety regulations. Personnel must take the time to ensure they know how to perform the given task safely.

1.1 Personal protective equipment

It is obligatory that appropriate personal protective equipment (PPE) is used. The minimum requirement is the wearing of flame-resistant outerwear, gloves to protect hands and lower parts of the arms, and welding shoes, hoods and goggles. However, an on-site risk assessment should always be carried out to determine if additional equipment is required e.g. safety harness, breathing equipment etc.

1.2 Qualification of personnel

All welding procedures should only be performed by qualified personnel who hold a locally recognized welding certification, are aware of local safety requirements and legislation, and who regularly undergo any training necessary to ensure that the current and required levels of procedural competence and safety awareness are maintained.

1.3 Lifting

ATTENTION! *Observe the total weight of the Sulzer units and their attached components! (see nameplate for weight of base unit).*

The duplicate nameplate provided must always be located and visible close to where the pump is installed (e.g. at the terminal boxes / control panel where the pump cables are connected).

NOTE! *Lifting equipment must be used if the total unit weight and attached accessories exceeds local manual lifting safety regulations.*

The total weight of the unit and accessories must be observed when specifying the safe working load of any lifting equipment! The lifting equipment, e.g. crane and chains, must have adequate lifting capacity. The hoist must be adequately dimensioned for the total weight of the Sulzer units (including lifting chains or steel ropes, and all accessories which may be attached). The end user assumes sole responsibility that lifting equipment is certified, in good condition, and inspected regularly by a competent person at intervals in accordance with local regulations. Worn or damaged lifting equipment must not be used and must be properly disposed of. Lifting equipment must also comply with the local safety rules and regulations

NOTE! *The guidelines for the safe use of chains, ropes and shackles supplied by Sulzer are outlined in the Lifting Equipment manual provided with the items and must be fully adhered to.*

2 General installation information

The following aspects should be considered during the design phase of a pump station using propeller pumps:

1. A separate pump inflow chamber has to be provided for each pump.
2. The flow to the pump should be from the front. Turbulences should be avoided.
3. Structures in the inflow area such as supports, walls, etc. cause vortices or switching flows which could have a negative effect on the performance of the pumps.
4. Getting air entrainment in the water due to turbulent flow must be avoided. This can be done by the use of settling chambers or baffles in the inflow area of the pump sump.
5. Propeller pumps are not suitable for the pumping of solid matter. These can damage the propeller blades and block the pump. For this reason installations where solid particles can be present should be provided with a screen at the inflow of the sump. Sulzer recommends the following screen size for VUPX installations.

| | Clear water | Combined-, river*-, process-, rain- water | Primary sedimentation, recirculation |
|---|----------------|---|--------------------------------------|
| | Clear gap (mm) | Clear gap (mm) | Clear gap (mm) |
| VUPX 0400 | ≤ 30 | ≤ 25 | ≤ 6 |
| VUPX 0500 | ≤ 40 | | |
| VUPX 0600 | ≤ 50 | | |
| VUPX 0800 | ≤ 60 | | |
| VUPX 1000 | ≤ 80 | | |
| VUPX 1200 | ≤ 80 | | |
| *AFLX: only for river water a ≤ 25 screen is recommended to protect against floating wood | | | |

2.1 Pump inflow chamber

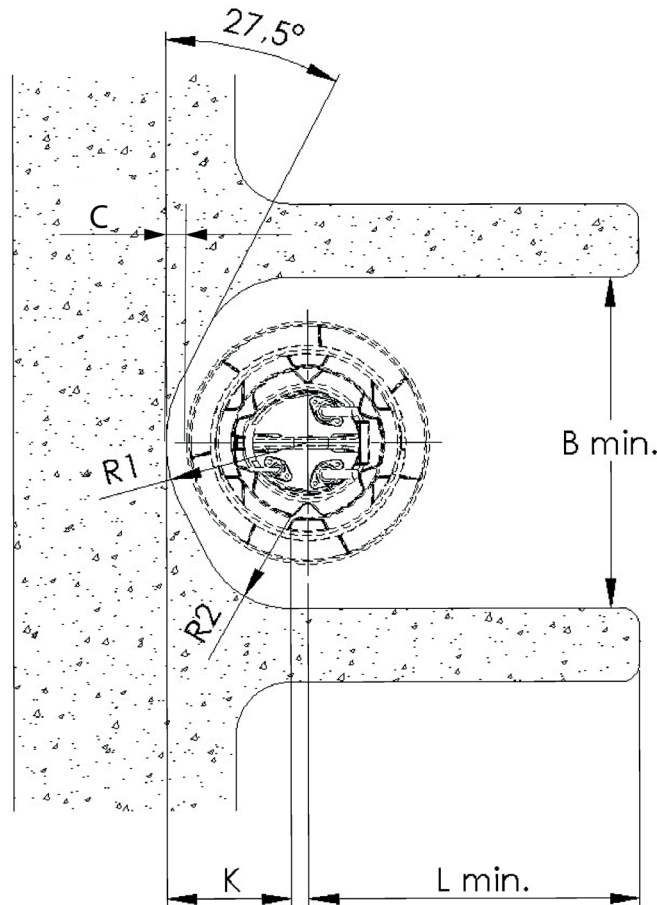
Axial pumps are very sensitive to turbulence in the inflow area. For this reason it is essential that when designing the pump sump a separate inflow chamber is provided for each unit. The inflow chamber improves the flow to the pump and should fulfill the following conditions:

- No swirls
- Avoidance of air entraining vortices
- Free of cavitation
- Avoidance of submerged floor and wall vortices
- Uniform flow profile

2.2 Optimization of the suction behavior

A specific profile for the back wall has been developed and the optimum position for the pump in the inflow chamber has been determined. The suction inlet of the pump should be located as closely as possible to the back wall. This arrangement prevents the development of swirls and results in a more even flow, the water surface shows little turbulence, and the pump runs silently. Please contact Sulzer for detailed design information.

Top view into pump inflow chamber (mm)



| | Hydraulic | | | | | | |
|-------------------------|-----------|---|------|------|------|------|------|
| | AFLX | 0600 | 0700 | 0800 | - | 1200 | - |
| | VUPX | 0400 | 0500 | 0600 | 0800 | 1000 | 1200 |
| Radius to back wall | R1 | 330 | 380 | 440 | 540 | 650 | 750 |
| Radius | R2 | 200 | 250 | 300 | 400 | 500 | 600 |
| Annular gap | C | 24 | 25 | 30 | 30 | 40 | 40 |
| Dimension | K | Please contact Sulzer for detailed design information | | | | | |
| Chamber width | B min | | | | | | |
| Length of dividing wall | L min | | | | | | |

3 Welding

When welding the coupling ring to the riser, please note the following:

1. All welding must be completed by a certified welding specialist.
2. A suitable welding process must be selected to join the components.
3. The weld seam should be sized appropriately, accounting for but not limited to, joint type, material, thickness, and maximum foreseeable load conditions. Please refer to ISO 5817 for guidance.
4. Weld seams must be protected after welding to prevent corrosion.

