OXYFLEX® - MF650
Membrane-Plate-Diffuser
For the fine bubble aeration of fluids

Installation instructions

List of individual parts
① Bolt M6x22
② Gasket 38/30 diameter x 10 EPDM
③ Diffuser OXYFLEX MF650
④ Washer 6.4 DIN 9021
⑤ Self-locking nut M6 DIN 985

INSTALLATION

Description
OXYFLEX® - MF membrane-plate-diffusers consist of a flat, heavily ribbed, fibreglass-reinforced, polypropylene base plate and a mounted membrane (EPDM standard).
The two-part frame, which is made of fibreglass-reinforced polypropylene, firmly holds the membrane on the base plate. This frame has side lugs with bores. The base plate has a supply air connector of 29 mm diameter for a centric bore of 30 mm diameter for mounting to the square manifold from above.
For the OXYFLEX® - MF membrane-plate-diffuser type "AS" the top part of a clamp saddle is welded to the base plate.
The bottom part of this clamp is used for fixing the OXYFLEX® - MF membrane-plate-diffuser type "AS" to the round manifold pipe. The clamp saddle is locked with a screw connection.
The distance between the diffusers on the manifold pipes (connection bore axis) must be at least 225 mm and must not exceed 1,000 mm.

Dimensions
OXYFLEX® - MF 650:
Width: 215 mm, length: 675 mm, height: 21 mm (incl. rounded corners)
Free membrane area: 650 mm, width: 150 mm (0.1 m²)
The OXYFLEX® - MF 650 type "B" is fixed with four M6 x 22 mm threaded bolts, which are welded to the square pipe (width 60 mm minimum). The distance between the bolts is 190 x 30 mm (see sketch). Then the supply air connector (29 mm diameter) is inserted into the 30 mm diameter bore from the top and screwed to the protruding threaded bolts from the top using self-locking M6 nuts (8 Nm).

The OXYFLEX® - MF 650 type "AS" is fixed with a clamp saddle. The clamp saddle has a hinge so that it can be swung open. The clamp is inserted into the existing 20 mm diameter bore with the supply air connector (16 mm diameter) from above. Now the clamp saddle is closed and screwed using an M8 x 65 mm hexagonal screw (10 Nm).

Possible dimensions of the round pipe manifold:
- Stainless steel design: DN 50 / 60.3 mm, DN 65 / 76.1 mm, DN 80 / 88.9 mm
- Plastic design: OD 63 mm / OD 75 mm / OD 90 mm / OD 110 mm

The OXYFLEX® - MF 650 type "SA" is fixed to square manifold pipes using a side adapter. The side adapter is inserted sideways into the existing 35 to 45 mm diameter bores and screwed to the counterpiece on the opposite side using an M10 hexagonal through-screw (9 Nm).

Dimensions of the square manifold:
- Height: 80 or 100 mm
- Width: 60 to 120 mm (other sizes are available on request)

The OXYFLEX® - MF650 type "G" has a 1" external thread and is screwed to the manifold pipes on existing connections.
Storage
Store the diffusers in their packaging in a dry and ventilated room.
DIN 7716 provisions must be observed.

Preparation
Prior to installing the OXYFLEX®-MF membrane-plate-diffusers you need to check that the pipework is clean. All drilling chippings, dirt, etc. must be removed when the fans are switched on, otherwise they get carried into the diffusers. Here they can cause significant impairment or even damage to the diffusers.

Levelling
OXYFLEX®-MF membrane-plate-diffusers are mounted on manifold pipes. The pipe system must be levelled to a maximum of ±10 mm. If the diffuser grids can be lifted out (i.e. removed), please contact Supratec GmbH with regard to arresting/latching options, possible lift counterweights, etc.

OPERATION

Functional check and leakage check
After the OXYFLEX®-MF membrane-plate-diffusers have been installed, their functioning and leak-tightness must be checked. Fill the tank with clean water up to a maximum of 10 cm above the diffuser top edge and apply air to the diffusers.
Specific load: see table on the next page.
Then check and document the leak-tightness and function of the diffusers.
Important: The diffusers must not be switched off between first the “functional and leakage check” and second the “diffuser run-in” so that the membrane can rise from the supply air connector of the base plate.

Diffuser run-in
After the functional and leakage check has been completed, the OXYFLEX®-MF membrane-plate-diffusers must be operated continuously for at least another 60 hours.
Specific load: see table on the next page.
You need to increase the water level to approx. 100 cm above the diffuser top edge as quickly as possible.
Important: The diffusers must not be switched off during the run-in as this is the only way to ensure that all membrane slots are continuously open.

Bubble image
The bubble image should be assessed at the earliest after the “run-in” of the diffusers has been completed. For this purpose the diffusers are operated from the maximum down to the medium specific load.
Check the evenness of the filling (bubble image test) when the tank is filled to a level of approx. 60-100 cm of water above the diffuser top edge.
Specific load: see table on the next page.
Checking the evenness of the aeration for minimum specific loads is only possible at a water temperature of above 10°C.

Oxygen transfer efficiency test
Prior to carrying out an oxygen transfer test as proof of the efficiency of the OXYFLEX®-MF membrane-plate-diffuser the above steps must have been completed. The run-in of the diffusers (see above), in particular, should have been carried out over the entire duration of 60 hours without interruption.
The oxygen transfer test can be carried out according to acknowledged regulations (e.g. ATV guideline) subject to the clean water method or waste water method. The warrantee values must be specifically operated and tested. A calibrated and exact measurement of the air volume is required.

Commissioning
The diffuser can be commissioned after a successful oxygen transfer test has been completed. If commissioning is delayed, make sure that the diffusers are sufficiently covered by water (at least 100 cm) so that the OXYFLEX®-MF membrane-plate-diffusers are protected against strong sun and/or frost.
During the diffuser operation the following air volumes must be maintained: see table on the next page.

Maintenance
OXYFLEX®-MF membrane-plate-diffusers are low-maintenance units. Under normal circumstances a weekly operation of 30 minutes with maximum air flow is sufficient, whereby each individual OXYFLEX®-MF membrane-plate-diffuser is charged with the following specific air loads:
see table on the next page.
In order to do this it might be sufficient to slide-clean individual strings. This is also used for removing deposits after longer periods of inactivity and longer-term operation with low specific loads.
The OXYFLEX®-MF membrane-plate-diffusers must be visually checked at least once every year. During this check you should pay special attention to possible deposits. If deposits are present, these must be carefully removed.
Overview table

Table: Specific loads for the OXYFLEX® MF 650 membrane-plate-diffuser with EPDM membrane [in Nm³/h per tank]

<table>
<thead>
<tr>
<th>Diffuser design</th>
<th>Max Efficient</th>
<th>High Efficient</th>
<th>Efficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional check and leakage check</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Diffuser run-in</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Bubble image</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Minimum specific load</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Nom. operating range</td>
<td>1 - 4</td>
<td>2 - 6</td>
<td>3 - 8</td>
</tr>
<tr>
<td>Maximum continuous specific load</td>
<td>5</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Maximum short-term specific load</td>
<td>6</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>

Monitoring
The bubble image must be checked daily and is carried out from the maximum down to medium specific load. The pressure loss must be checked and documented every month. Significant changes of the bubble image and/or pressure loss must be reported to Supratec GmbH immediately. Especially for plants with intermittent operating mode, damaged OXYFLEX®-MF membrane-plate-diffusers bear the risk that live sludge ingresses into the entire pipework system. This means that all OXYFLEX®-MF membrane-plate-diffusers might become impaired with regard to functioning and service life.

Cleaning
In general, dirt and contamination (deposits, sludge, plaque, etc.) on the membranes can easily be removed. Depending on the type and composition of the dirt, one of the following methods or a combination of several methods might be required:

• Manually: Cleaning with water and a soft brush (no pressure washers!)
• Alkaline solutions: In general alkaline cleaning agents can be used in diluted form. The compatibility must always be checked first, otherwise contact Supratec GmbH.
• Acids: In some cases it might be necessary to add weak acids to the compressed air (see below) or to clean the membranes with diluted acids. For relevant information please contact Supratec GmbH.
• Oil-containing solvents and other solvents: These must not be used because all membrane types are non-resistant towards a broad range of such solvents.

These solvents must always be tested for compatibility and successful results for the individual membranes.

Excessive pressure increase of the diffuser is often an indication for limescale on the membranes. For the removal of limescale we recommend the use of 85% formic acid.

Acid dosing
If there is limescale on the diffuser surface, we recommend that you dose formic acid in the following concentration: according to the load 1 to 2 g of 85% formic acid per membrane per day. The dosing interval is between 2 weeks and 3 months depending on the load. Please contact us if you have further questions regarding the use of formic acid dosing and the required dosage station.

Warranty
Supratec GmbH gives a 24-month warranty on OXYFLEX®-MF membrane-plate-diffusers. Any longer warranty periods can be agreed between the operator and Supratec GmbH subject to a special agreement.

Damage and/or external influences are expressly excluded from the warranty. The warranty expires if the waste water partial flows are predominantly of an industrial nature and/or the damaging effect of the waste water on the membrane diffusers had been known, but Supratec GmbH had not been notified accordingly. In this case please contact Supratec GmbH to request a warranty confirmation.

The correction of defects within the warranty period shall be determined subject to an acceptance on site. At that point a 2-year warranty period for the relevant performance begins. If the original warranty supersedes the 2-year warranty on correction of defects, the original warranty continues to be valid.

The general sales terms and conditions and warranty conditions of Supratec GmbH (please visit www.supratec.cc) shall apply.

We reserve the right to make technical alterations.

(As of date November 2011)