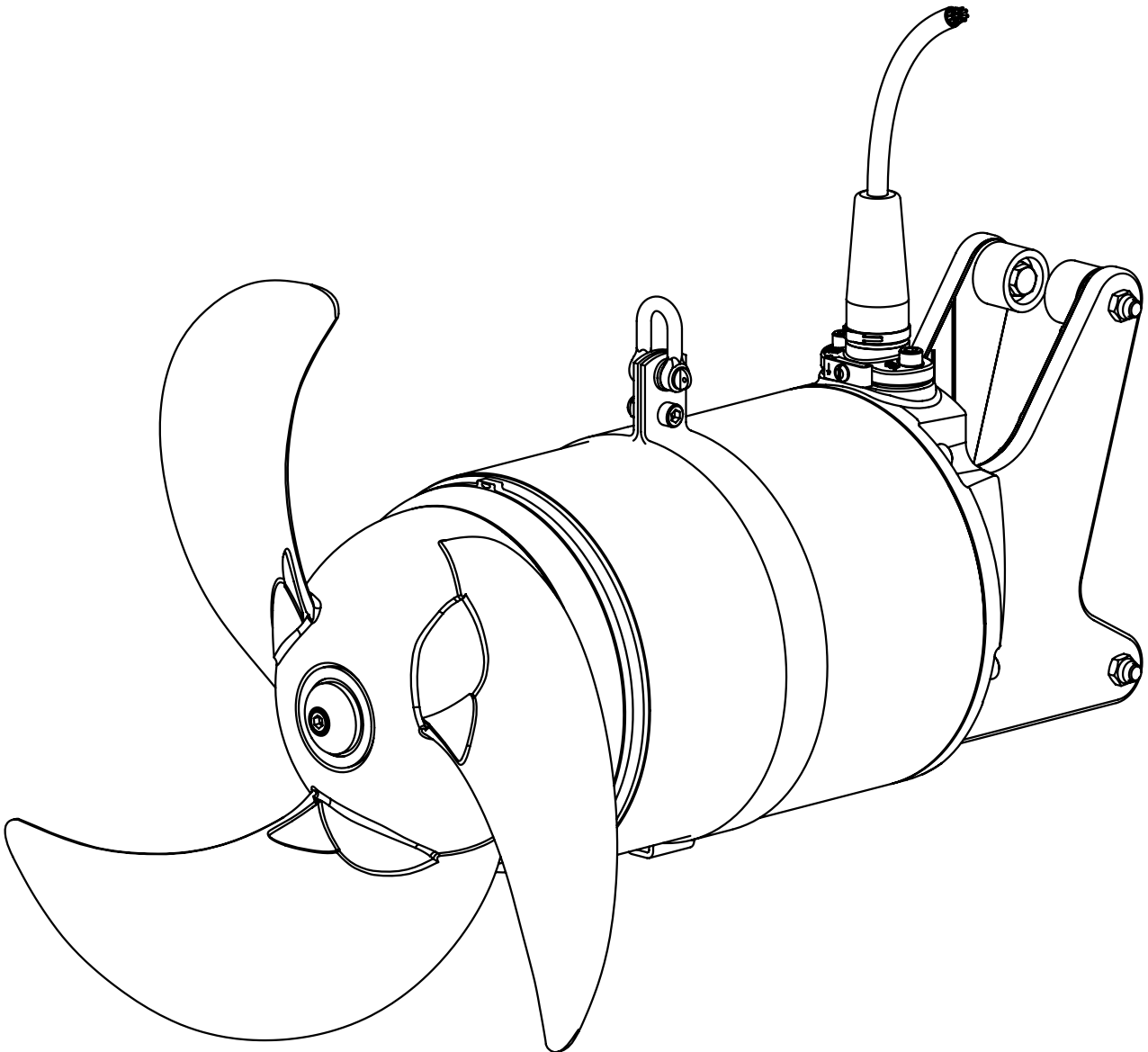


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**Submersible Mixer Type ABS XRW 210 - 900**

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1169-00



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**Installation and Operating Instructions**

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# 1 General

## 1.1 Introduction

These **Installation and Operating Instructions** and the separate booklet “**Safety Instructions for Sulzer Products Type ABS**” contain basic instructions and safety hints which must be observed during transport, installation and commissioning. For this reason it is essential that they are read by the installing technician as well as by relevant skilled operators or users. They should also be always available where the unit is installed.



Safety instructions which might cause danger to life when not observed have been specifically highlighted with this general danger symbol.



The presence of a dangerous voltage is identified with this safety symbol.



This symbol indicates the danger of an explosion occurring.

**ATTENTION** *Appears at safety hints, the non-observance of which could damage the unit or affect its functioning.*

**NOTE** *Used for important pieces of information.*

**ATTENTION** *Leakage of lubricants could result in pollution of the medium being pumped*

Illustrations code; e.g. (3/2). The first digit refers to the figure no. and the second digit to the position in that figure.

## 1.2 Correct usage of the products

Sulzer products have been designed and built in accordance with the latest technology, taking into account the relevant safety regulations. However, improper usage could cause a danger to the user or a third party and cause damage or impair functionality of the unit itself or other items of value.

Sulzer units should only be used if they are in perfect technical condition, taking into account all safety requirements and being conscious of the need to avoid potential dangers. The contents of the **Installation and Operating Instructions** and the “**Safety Instructions for Sulzer Products Type ABS**” manuals must be applied! Any abnormal usage, or usage beyond that specified, will be considered as non-compliance. The manufacturer/supplier will not accept any responsibility for damage as a result of such usage and the risk will be borne by the user. In case of doubt the entire scope of the planned application must be approved by Sulzer.

In the case of any faults arising, the Sulzer units should immediately be taken out of use and secured. The fault should be immediately rectified, or if necessary, contact your Sulzer Service Centre.

## 1.3 Application restrictions of XRW

The XRW can be supplied in standard version and in explosion-proof execution (Ex II 2G Ex h db IIB T4 Gb) for 50 Hz according to the standards (EN ISO 12100:2010, EN 809:1998 + A1:2009 + AC:2010, EN 61000-6-1:2019, EN 61000-6-2:2005-01, EN 61000-6-3:2007, EN 61000-6-4:2007) or FM execution (NEC 500, Class I, Division 1, Group C&D, T3C) for 60 Hz in isolation class H (140).

**Limitations:** The ambient temperature range is 0 °C to + 40 °C (32 °F to 104 °F)  
Immersion depth maximum 20 m (66 ft)

**ATTENTION** *If cable length is less than 20 m, the maximum immersion depth reduces accordingly. In special cases an immersion depth greater than 20 m is possible. However, the maximum number of starts according to the motor datasheet may not be exceeded. In order to do this you need the written approval from the manufacturer Sulzer.*



Pumping of flammable or explosive liquids with these pumps is not allowed!



Only explosion-proof executions may be used in hazardous areas!

**For the operation of units as explosion-proof execution the following applies:**

In hazardous areas care must be taken that during switching on and operation of the unit it is submerged or under water. Other types of operation e.g. snore operation or dry running are not allowed!

**ATTENTION** *XRW with Ex approval is equipped with a DI in the oil chamber in the 60 Hz (FM) version only and not in 50 Hz (ATEX).*

**NOTE!** *Ex protection method type c “Constructional Safety” and k “Liquid immersion” in accordance with EN ISO 80079-36, EN ISO 80079-37 are used.*

**Operation of Ex-XRW**

It must be ensured that the motor of the Ex-XRW is always fully submerged during start-up and operation!

The temperature monitoring of the Ex-XRW has to be carried out by bi-metallic temperature limiters or thermistors according to DIN 44 082 connected to a suitable release device which is certified in accordance with EC directive 2014/34/EU.

**Operation of Ex-XRW with variable frequency drive (VFD) in hazardous areas (ATEX Zone 1 and 2):**

Motors must have direct thermal protection devices fitted. These consist of temperature sensors (PTC DIN 44082) embedded in the windings. These must be connected to a suitable release device which is certified in accordance with EC directive 2014/34/EU.

Machines designated Ex must never, without exception, be operated using a mains frequency that is greater than the maximum 50 Hz or 60 Hz as indicated on the nameplate.

**Operation with frequency inverters**

See section 10.1

**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. All Ex-relevant components and dimensions can be found in the modular workshop manual and the spare parts list.*

**ATTENTION** *After repair work in unauthorized workshops by unqualified personnel the Ex-approvals are no longer valid. After such repair the unit must not be operated in hazardous areas. The Ex-nameplate (see figure 4, 5) has to be removed.*

**1.4 Application areas**

Sulzer submersible mixers, with a water-pressure-tight encapsulated submersible motor, are a high-class quality product for mixing, stirring, and agitation applications in municipal treatment plants, in industry and in agriculture:

**1.5 Identification code:**

e.g. XRW 6531C-PM100/24Ex-CR

**Hydraulics:**

- XRW**.....Mixer series
- 65** ..... Propeller diameter (cm)
- 3** ..... Propeller type\*
- 1** ..... Propeller identification code
- C**..... VFD size (XRW 400 and XRW 650 only)

**Motor:**

- PM** ..... Motor type. PM = Permanent Magnet; PA = Premium efficiency Asynchronous
- 100** ..... Motor power (P<sub>2</sub> [kW] x 10)
- 24** ..... Number of poles
- Ex** ..... Motor designation. Ex = explosion proof; without code = standard motor

**Material:**

- CR** ..... Material. CR = stainless steel; EC = cast iron

\* 1 = mixed flow propeller (without flow ring); 2 = two-blade thrust propeller; 3 = three-blade thrust propeller; 4 = two-blade thrust propeller with flow ring; 5 = three-blade thrust propeller with flow ring.

## 2 Technical data

The maximum noise level of the units of this series is  $\leq 70$  dB(A). In some types of installation it is possible that the noise level of 70 dB(A) or the measured noise level will be exceeded.

Additional technical information is available in the XRW technical data sheets which can be downloaded from [www.sulzer.com](http://www.sulzer.com) > Products > Submersible Mixers.

### 2.1 Technical data XRW 210 and 300

Hydraulics no.	Propeller diameter	Speed	Motor type	Rated input power $P_1$	Rated output power $P_2$	Rated current*	Thrust ISO 21630	Mixing power $P_p$	Power consumption $P_{11}$	Weight
<b>50 Hz</b>	[mm]	[1/min]		[kW]	[kW]	[A]	[N]	[kW]	[kW]	[kg]
2121	210	1424	PA 08/4	0.9	0.8	1.8	156	0.7	0.8	33
2131	210	1437	PA 15/4	1.8	1.5	3.7	207	1.0	1.2	41
2132	210	1437	PA 15/4	1.8	1.5	3.7	285	1.2	1.4	41
2133	210	1437	PA 15/4	1.8	1.5	3.7	304	1.5	1.7	41
2141	210	1424	PA 08/4	0.9	0.8	1.8	-	-	-	39
2151	210	1437	PA 15/4	1.8	1.5	3.7	-	-	-	47
2152	210	1437	PA 15/4	1.8	1.5	3.7	-	-	-	47
2153	210	1437	PA 15/4	1.8	1.5	3.7	-	-	-	47
3021	300	958	PA 15/6	1.8	1.5	3.5	289	0.9	1.1	62
3022	300	958	PA 15/6	1.8	1.5	3.5	350	1.2	1.4	62
3023	300	958	PA 15/6	1.8	1.5	3.5	409	1.3	1.6	62
3031	300	971	PA 29/6	3.5	2.9	7.3	456	1.6	2.1	82
3032	300	971	PA 29/6	3.5	2.9	7.3	564	2.2	2.6	82
3033	300	971	PA 29/6	3.5	2.9	7.3	695	2.7	3.2	82
3041	300	958	PA 15/6	1.8	1.5	3.5	-	-	-	73
3042	300	958	PA 15/6	1.8	1.5	3.5	-	-	-	73
3043	300	958	PA 15/6	1.8	1.5	3.5	-	-	-	73
3051	300	971	PA 29/6	3.5	2.9	7.3	-	-	-	93
3052	300	971	PA 29/6	3.5	2.9	7.3	-	-	-	93
3053	300	971	PA 29/6	3.5	2.9	7.3	-	-	-	93
<b>60 Hz</b>	[mm]	[1/min]		[kW]	[kW/hp]	[A]	[N]	[kW/hp]	[kW/hp]	[kg/lbs]
2121	210	1735	PA 18/4	2.1	1.8 / 2.4	3.5	255	1.1 / 1.5	1.3 / 1.6	41 / 90
2131	210	1735	PA 18/4	2.1	1.8 / 2.4	3.5	310	1.7 / 2.3	2.0 / 2.7	41 / 90
2141	210	1735	PA 18/4	2.1	1.8 / 2.4	3.5	-	-	-	47 / 102
2151	210	1735	PA 18/4	2.1	1.8 / 2.4	3.5	-	-	-	47 / 102
3021	300	1153	PA 18/6	2.2	1.8 / 2.4	3.4	484	1.7 / 2.3	2.1 / 2.8	62 / 131
3022	300	1169	PA 35/6	4.1	3.5 / 4.7	6.9	565	2.1 / 2.8	2.6 / 3.4	82 / 181
3023	300	1169	PA 35/6	4.1	3.5 / 4.7	6.9	660	2.3 / 3.1	2.8 / 3.8	82 / 181
3031	300	1169	PA 35/6	4.1	3.5 / 4.7	6.9	717	3.1 / 4.1	3.6 / 4.9	82 / 181
3041	300	1153	PA 18/6	2.2	1.8 / 2.4	3.4	-	-	-	73 / 162
3042	300	1169	PA 35/6	4.1	3.5 / 4.7	6.9	-	-	-	93 / 206
3043	300	1169	PA 35/6	4.1	3.5 / 4.7	6.9	-	-	-	93 / 206
3051	300	1169	PA 35/6	4.1	3.5 / 4.7	6.9	-	-	-	93 / 206

\*50 Hz at 400 V; 60 Hz at 480 V.

Starting: Direct On Line (D.O.L)

## 2.2 Technical data XRW 400, 650 and 900, 50 Hz

Hydraulics no.	Propeller diameter	Speed	Motor type	Rated input power P <sub>1</sub>	Rated output power P <sub>2</sub>	Rated current at 400 V	Thrust ISO 21630	Mixing power P <sub>p</sub>	Power consumption P <sub>1</sub>	Weight
	[mm]	[1/min]		[kW]	[kW]	[A]	[N]	[kW]	[kW]	[kg]
4031A	400	470	PM 30/10	3.4	3.0	9.9	415	1.2	1.4	80
4032A	400	509	PM 30/10	3.4	3.0	9.9	473	1.5	1.7	80
4033A	400	542	PM 30/10	3.4	3.0	9.9	547	1.8	2.1	80
4034A	400	577	PM 30/10	3.4	3.0	9.9	637	2.2	2.5	80
4035A	400	608	PM 30/10	3.4	3.0	9.9	690	2.6	2.9	80
4031B	400	628	PM 50/10	5.8	5.0	12.9	805	3.0	3.4	80
4032B	400	662	PM 50/10	5.8	5.0	12.9	908	3.5	3.9	80
4033B	400	691	PM 50/10	5.8	5.0	12.9	979	4.0	4.5	80
4034B	400	705	PM 50/10	5.8	5.0	12.9	1028	4.4	5.0	80
4051A	400	470	PM 30/10	3.4	3.0	9.9	378	1.2	1.0	90
4052A	400	509	PM 30/10	3.4	3.0	9.9	449	1.5	1.3	90
4053A	400	542	PM 30/10	3.4	3.0	9.9	507	1.8	1.6	90
4054A	400	577	PM 30/10	3.4	3.0	9.9	562	2.2	1.9	90
4055A	400	608	PM 30/10	3.4	3.0	9.9	643	2.6	2.2	90
4051B	400	628	PM 50/10	5.8	5.0	12.9	670	3.0	2.4	90
4052B	400	662	PM 50/10	5.8	5.0	12.9	750	3.5	2.9	90
4053B	400	691	PM 50/10	5.8	5.0	12.9	823	4.0	3.3	90
4054B	400	705	PM 50/10	5.8	5.0	12.9	838	4.4	3.5	90
6531A	650	314	PM 55/24	6.1	5.5	12.9	952	2.0	2.2	150
6532A	650	338	PM 55/24	6.1	5.5	12.9	1025	2.5	2.8	150
6533A	650	360	PM 55/24	6.1	5.5	12.9	1258	3.0	3.3	150
6534A	650	378	PM 55/24	6.1	5.5	12.9	1384	3.5	3.8	150
6535A	650	396	PM 55/24	6.1	5.5	12.9	1521	4.0	4.4	150
6536A	650	413	PM 55/24	6.1	5.5	12.9	1651	4.5	5.0	150
6530B	650	429	PM 75/24	8.3	7.5	15.8	1761	5.0	5.5	150
6531B	650	442	PM 75/24	8.3	7.5	15.8	1875	5.5	6.1	150
6532B	650	456	PM 75/24	8.3	7.5	15.8	1972	6.0	6.7	150
6533B	650	468	PM 75/24	8.3	7.5	15.8	2077	6.5	7.2	150
6530C	650	480	PM 100/24	11.0	10.0	24.2	2196	7.0	7.8	150
6531C	650	490	PM 100/24	11.0	10.0	24.2	2323	7.5	8.2	150
6532C	650	502	PM 100/24	11.0	10.0	24.2	2421	8.0	8.8	150
6551A	650	314	PM 55/24	6.1	5.5	12.9	647	2.0	1.6	165
6552A	650	338	PM 55/24	6.1	5.5	12.9	742	2.5	2.0	165
6553A	650	360	PM 55/24	6.1	5.5	12.9	845	3.0	2.4	165
6554A	650	378	PM 55/24	6.1	5.5	12.9	939	3.5	2.8	165
6555A	650	396	PM 55/24	6.1	5.5	12.9	1018	4.0	3.2	165
6556A	650	413	PM 55/24	6.1	5.5	12.9	1140	4.5	3.6	165
6550B	650	429	PM 75/24	8.3	7.5	15.8	1221	5.0	3.9	165
6551B	650	442	PM 75/24	8.3	7.5	15.8	1304	5.5	4.3	165
6552B	650	456	PM 75/24	8.3	7.5	15.8	1398	6.0	4.7	165
6553B	650	468	PM 75/24	8.3	7.5	15.8	1467	6.5	5.1	165
6550C	650	480	PM 100/24	11.0	10.0	24.2	1523	7.0	5.5	165
6551C	650	490	PM 100/24	11.0	10.0	24.2	1599	7.5	5.9	165
6552C	650	502	PM 100/24	11.0	10.0	24.2	1679	8.0	6.3	165
9032	900	246 <sup>1</sup>	PA 110/4	12.0	11.0	21.7	3109	7.2	8.0	260
9033	900	246 <sup>1</sup>	PA 110/4	12.0	11.0	21.7	3328	8.1	9.1	260
9034	900	245 <sup>1</sup>	PA 110/4	12.0	11.0	21.7	3449	8.9	9.9	260
9035	900	246 <sup>1</sup>	PA 150/4	16,3	15.0	30.0	3882	10.6	11.9	295
9033	900	294 <sup>2</sup>	PA 150/4	16,3	15.0	30.0	5105	13.1	14.6	295
9035	900	295 <sup>2</sup>	PA 220/4	23,9	22.0	44.8	5223	14.6	16.4	320
9035	900	293 <sup>2</sup>	PA 220/4	23,9	22.0	44.8	6039	18.3	20.4	320

Starting: XRW 400 and 650 = Variable Frequency Drive (VFD), XRW 900 = Star / Delta <sup>1</sup> Gear ratio i = 6, <sup>2</sup> Gear ratio i = 5

## 2.3 Technical data XRW 400, 650 and 900, 60 Hz

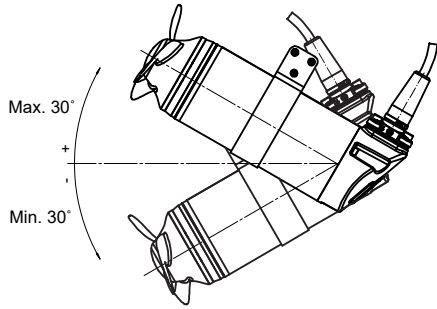
Hydraulics no.	Propeller diameter	Speed	Motor type	Rated input power P <sub>1</sub>	Rated output power P <sub>2</sub>	Rated current at 480 V	Thrust ISO 21630	Mixing power P <sub>p</sub>	Power consumption P <sub>1</sub>	Weight
	[mm]									
4031A	400	470	PM 30/10	3.4	3.0 / 4.0	8.1	415	1.2 / 1.6	1.4 / 1.9	80 / 176
4032A	400	509	PM 30/10	3.4	3.0 / 4.0	8.1	473	1.5 / 2.0	1.7 / 2.3	80 / 176
4033A	400	542	PM 30/10	3.4	3.0 / 4.0	8.1	547	1.8 / 2.4	2.1 / 2.8	80 / 176
4034A	400	577	PM 30/10	3.4	3.0 / 4.0	8.1	637	2.2 / 3.1	2.5 / 3.3	80 / 176
4035A	400	608	PM 30/10	3.4	3.0 / 4.0	8.1	690	2.6 / 3.5	2.9 / 3.9	80 / 176
4031B	400	628	PM 50/10	5.8	5.0 / 6.7	10.9	805	3.0 / 4.0	3.4 / 4.5	80 / 176
4032B	400	662	PM 50/10	5.8	5.0 / 6.7	10.9	908	3.5 / 4.7	3.9 / 5.3	80 / 176
4033B	400	691	PM 50/10	5.8	5.0 / 6.7	10.9	979	4.0 / 5.4	4.5 / 6.1	80 / 176
4034B	400	705	PM 50/10	5.8	5.0 / 6.7	7.9	1028	4.4 / 5.9	5.0 / 6.7	80 / 176
4051A	400	470	PM 30/10	3.4	3.0 / 4.0	9.9	378	1.2 / 1.6	1.4 / 1.9	90 / 198
4052A	400	509	PM 30/10	3.4	3.0 / 4.0	9.9	449	1.5 / 2.0	1.7 / 2.3	90 / 198
4053A	400	542	PM 30/10	3.4	3.0 / 4.0	9.9	507	1.8 / 2.4	2.0 / 2.7	90 / 198
4054A	400	577	PM 30/10	3.4	3.0 / 4.0	9.9	562	2.2 / 3.0	2.5 / 3.3	90 / 198
4055A	400	608	PM 30/10	3.4	3.0 / 4.0	9.9	643	2.6 / 3.5	2.9 / 3.9	90 / 198
4051B	400	628	PM 50/10	5.8	5.0 / 6.7	12.9	670	3.0 / 4.0	3.4 / 4.5	90 / 198
4052B	400	662	PM 50/10	5.8	5.0 / 6.7	12.9	750	3.5 / 4.7	3.9 / 5.3	90 / 198
4053B	400	691	PM 50/10	5.8	5.0 / 6.7	12.9	823	4.0 / 5.4	4.5 / 6.1	90 / 198
4054B	400	705	PM 50/10	5.8	5.0 / 6.7	12.9	838	4.5 / 6.0	5.1 / 6.9	90 / 198
6531A	650	314	PM 55/24	6.1	5.5 / 7.4	10.9	952	2.0 / 2.7	2.2 / 3.0	150 / 331
6532A	650	338	PM 55/24	6.1	5.5 / 7.4	10.9	1025	2.5 / 3.4	2.8 / 3.7	150 / 331
6533A	650	360	PM 55/24	6.1	5.5 / 7.4	10.9	1258	3.0 / 4.0	3.3 / 4.4	150 / 331
6534A	650	378	PM 55/24	6.1	5.5 / 7.4	10.9	1384	3.5 / 4.7	3.8 / 5.1	150 / 331
6535A	650	396	PM 55/24	6.1	5.5 / 7.4	10.9	1521	4.0 / 5.4	4.4 / 5.9	150 / 331
6536A	650	413	PM 55/24	6.1	5.5 / 7.4	10.9	1651	4.5 / 6.0	5.0 / 6.7	150 / 331
6530B	650	429	PM 75/24	8.3	7.5 / 10.1	14.3	1761	5.0 / 6.7	5.5 / 7.4	150 / 331
6531B	650	442	PM 75/24	8.3	7.5 / 10.1	14.3	1875	5.5 / 7.4	6.1 / 8.2	150 / 331
6532B	650	456	PM 75/24	8.3	7.5 / 10.1	14.3	1972	6.0 / 8.1	6.7 / 8.9	150 / 331
6533B	650	468	PM 75/24	8.3	7.5 / 10.1	14.3	2077	6.5 / 8.7	7.2 / 9.7	150 / 331
6530C	650	480	PM 100/24	11.0	10.0 / 13.4	20.9	2196	7.0 / 9.4	7.8 / 10.4	150 / 331
6531C	650	490	PM 100/24	11.0	10.0 / 13.4	20.9	2323	7.5 / 10.1	8.2 / 11.0	150 / 331
6532C	650	502	PM 100/24	11.0	10.0 / 13.4	20.9	2421	8.0 / 10.7	8.8 / 11.8	150 / 331
6551A	650	314	PM 55/24	6.1	5.5 / 7.4	12.9	647	2.0 / 2.7	2.2 / 3.0	165 / 364
6552A	650	338	PM 55/24	6.1	5.5 / 7.4	12.9	742	2.5 / 3.4	2.8 / 3.7	165 / 364
6553A	650	360	PM 55/24	6.1	5.5 / 7.4	12.9	845	3.0 / 4.0	3.3 / 4.4	165 / 364
6554A	650	378	PM 55/24	6.1	5.5 / 7.4	12.9	939	3.5 / 4.7	3.8 / 5.1	165 / 364
6555A	650	396	PM 55/24	6.1	5.5 / 7.4	12.9	1018	4.0 / 5.4	4.4 / 5.9	165 / 364
6556A	650	413	PM 55/24	6.1	5.5 / 7.4	12.9	1140	4.5 / 6.0	5.0 / 6.7	165 / 364
6550B	650	429	PM 75/24	8.3	7.5 / 10.1	15.8	1221	5.0 / 6.7	5.5 / 7.0	150 / 331
6551B	650	442	PM 75/24	8.3	7.5 / 10.1	15.8	1304	5.5 / 7.4	6.1 / 8.2	165 / 364
6552B	650	456	PM 75/24	8.3	7.5 / 10.1	15.8	1398	6.0 / 8.1	6.7 / 8.9	165 / 364
6553B	650	468	PM 75/24	8.3	7.5 / 10.1	15.8	1467	6.5 / 8.7	7.2 / 9.7	165 / 364
6550C	650	480	PM 100/24	11.0	10.0 / 13.4	26.4	1523	7.0 / 9.4	7.8 / 10.4	150 / 331
6551C	650	490	PM 100/24	11.0	10.0 / 13.4	26.4	1599	7.5 / 10.1	8.3 / 11.1	165 / 364
6552C	650	502	PM 100/24	11.0	10.0 / 13.4	26.4	1679	8.0 / 10.7	8.8 / 11.8	165 / 364
9032	900	254 <sup>1</sup>	PA 130/4	14.0	13.0 / 17.4	21.8	3353	8.1 / 10.7	9.0 / 12.1	260 / 573
9033	900	254 <sup>1</sup>	PA 130/4	14.0	13.0 / 17.4	21.8	3641	9.2 / 12.3	10.1 / 13.5	260 / 573
9034	900	254 <sup>1</sup>	PA 130/4	14.0	13.0 / 17.4	21.8	3675	9.8 / 13.1	10.8 / 14.5	260 / 573
9035	900	253 <sup>1</sup>	PA 170/4	18.3	17.0 / 22.8	28.8	4160	11.8 / 15.8	13.0 / 17.4	295 / 650
9033	900	295 <sup>2</sup>	PA 170/4	18.3	17.0 / 22.8	28.8	5131	13.2 / 17.7	14.5 / 19.4	295 / 650
9034	900	296 <sup>2</sup>	PA 250/4	27.0	25.0 / 33.5	43.2	5238	14.6 / 19.6	16.5 / 21.1	320 / 706
9035	900	294 <sup>2</sup>	PA 250/4	27.0	25.0 / 33.5	43.2	6060	18.4 / 24.7	20.5 / 27.5	320 / 706

Starting: XRW 400 and 650 = Variable Frequency Drive (VFD), XRW 900 = Star / Delta, <sup>1</sup> Gear ratio i = 7, <sup>2</sup> Gear ratio i = 6

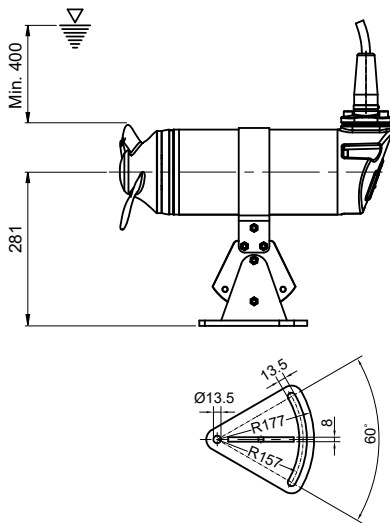


## 2.4 Dimensions (mm)

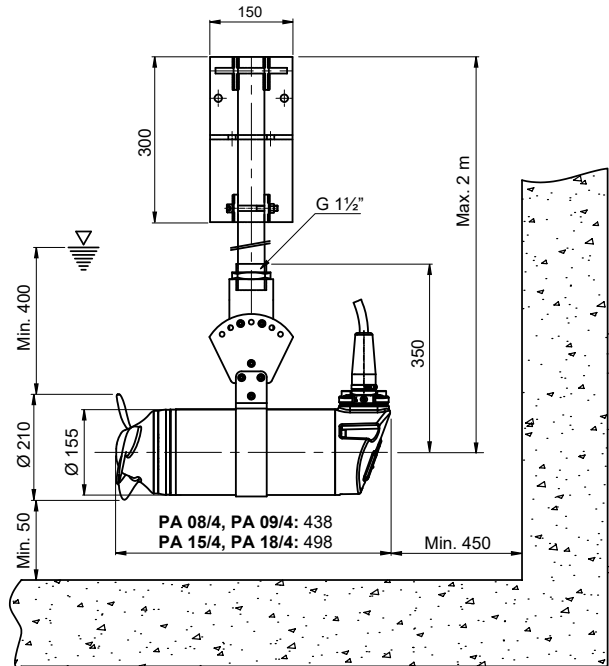
### 2.4.1 XRW 210



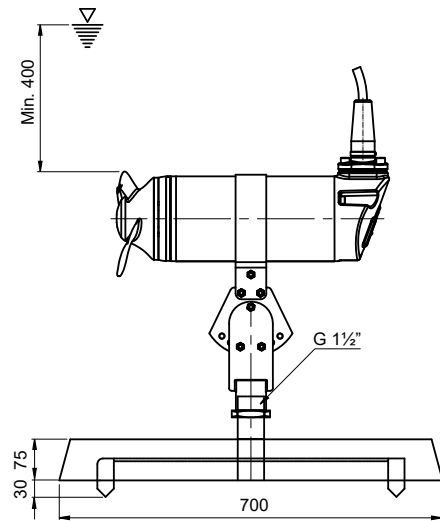
Vertical adjustment limits



Floor mounted on adjustable bracket



Wall mounted on adjustable bracket



Floor mounted on concrete base

1184-01

Figure 1: Dimensions XRW 210

## 2.4.2 XRW 210 (with rail mounting bracket), XRW 300, XRW 400, XRW 650, XRW 900

Dimension	XRW 210 PA 08 (50 Hz) PA 09 (60 Hz)	XRW 210 PA 15 (50 Hz) PA 18 (60 Hz)	XRW 300 PA 15 (50 Hz) PA 18 (60 Hz)	XRW 300 PA 29 (50 Hz) PA 35 (60 Hz)	XRW 400 PM 30, PM 50 (VFD)	XRW 650 PM 55, PM 75, PM 100 (VFD)	XRW 900 PA 110, PA 150, PA 220 (50 Hz) PA 130, PA 170, PA 250 (60 Hz)
$D_1$	ø 210	ø 210	ø 300	ø 300	ø 400	ø 650	ø 900
$D_2$	ø 370	ø 370	ø 461	ø 461	ø 560	ø 811	ø 1150
$d_1$	ø 155	ø 155	ø 196	ø 196	ø 207	ø 279	ø 282
H □ 60	268	268	274.4	274.4	270	-	-
H □ 100	-	-	-	-	310	310	310
$h_1$	400	400	500	500	700	1100	1500
I □ 60	260	260	350	350	350	-	-
I □ 100	-	-	-	-	300	400	-
$L_1$ □ 60	524	584	698.7	798.7	629.6	-	-
$L_1$ □ 100	-	-	-	-	670.6	736	1258
$L_2$ □ 60	534	594	618	718	632.4	-	-
$L_2$ □ 100	-	-	-	-	673	787	1281
$X_1$ □ 60	235	235	278.5	278.5	274	-	-
$X_1$ □ 100	-	-	-	-	293.5	301	570
$X_2$ □ 60	235	235	278.5	278.5	254	-	-
$X_2$ □ 100	-	-	-	-	273.5	289	505

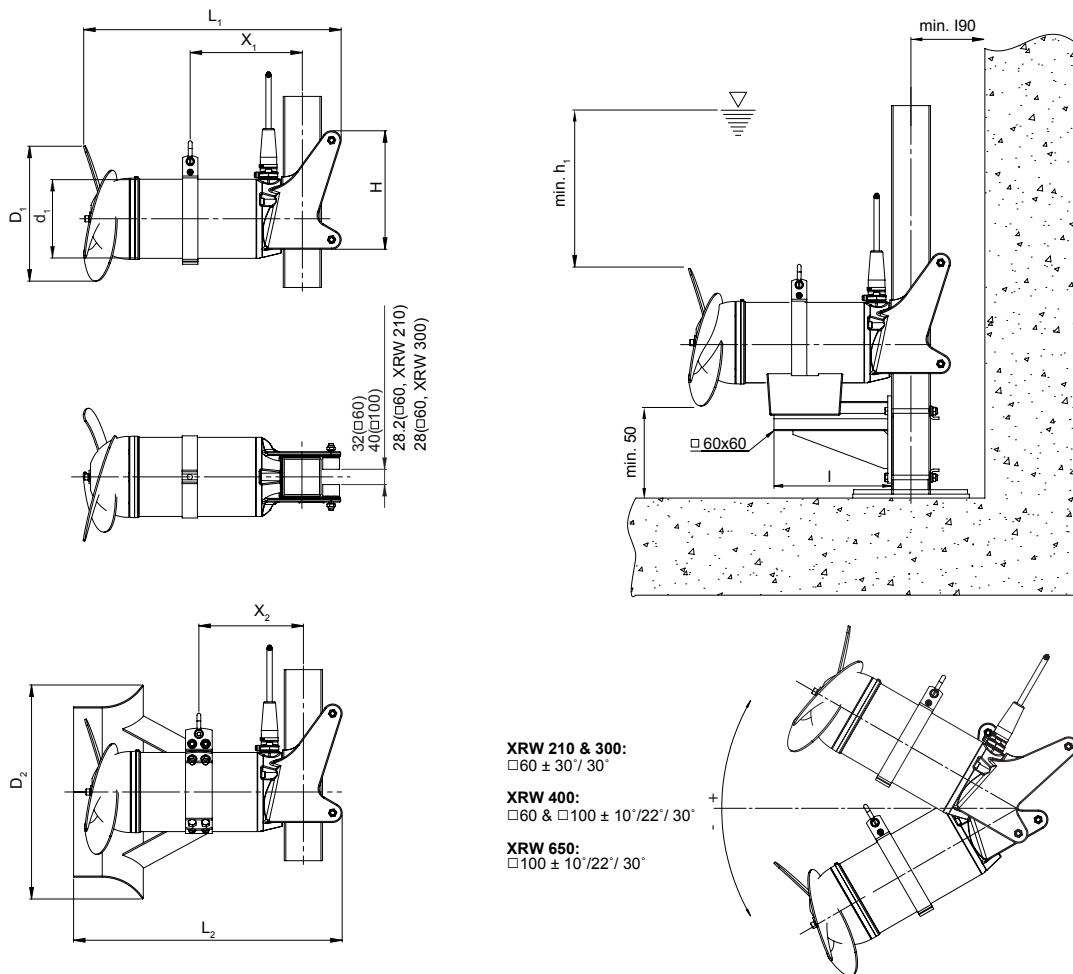


Figure 2: Dimensions XRW 210 - 900 rail mounted

1182-00

## 2.5 Nameplates

We recommend that you record the data from the original nameplate so that you can refer to the data at any time.

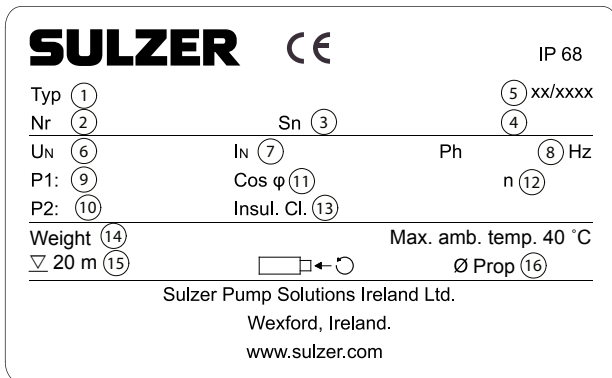


Figure 3: Nameplate XRW

1198-02

### Legend

1	Typ	Mixer type	
2	Nr	Item number	
3	Sn	Serial number	
4		Order number	
5	xx/xxxx	Production date (Week/Year)	
6	UN	Rated voltage	V
7	IN	Rated current	A
8	Hz	Frequency	Hz
9	P1	Rated input power	kW
10	P2	Rated output power	kW
11	Cos φ	Power factor	pf
12	n	Speed	r/min
13	Insul. Cl.	Insulation class	
14	Weight		kg
15	∇	Maximum immersion depth	m
16	Ø Prop	Propeller diameter	mm



Figure 4: Nameplate ATEX

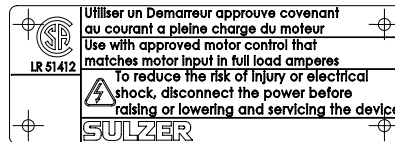


Figure 5: Nameplate CSA / FM

## 3 Safety

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



The safety instructions for the variable frequency drive (VFD) have to be observed during installation or maintenance. The complete motor starter has to be disconnected from the incoming power supply all-pole. The specified waiting time until total discharge of the intermediate circuit must be observed. The function “safety stop” is not activated.



The cable-cross section of the PE cable, connected at terminal 95 (VFD), has to be minimum 10 mm<sup>2</sup>, otherwise two separated earth wires have to be used.



### Residual current protection device (RCD):

Leakage current of the VFD is > 3,5 mA. At power side you have to use RCD's type “B” (universal-current-sensitive).

### Short circuit protection:

From power side the VFD has to be protected against short circuit to avoid danger of electric risk and fire. The VFD output is completely short-circuit-proved.

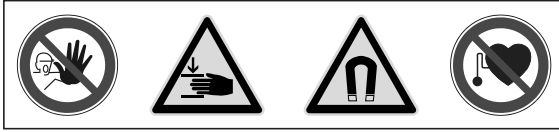


To comply with the EMC directives the use of shielded motor cables (up to 50 m cable category C1 according EN 61800-3) is highly recommended. Avoid pigtailed. The connection of the shield should have the maximum contact area. Disconnections must be continued with the lowest possible HF impedance.



Prior to maintenance of the VFD, the mixer must be lifted out of the medium. This prevents generation of voltages by rotating propeller caused by moving medium.

### 3.1 Safety information for permanent-magnet motors



1227-00

**ATTENTION!**

**High magnetic forces! Do not open the motor.**



Users of heart pacemakers should avoid being near magnets. If a neodymium magnet is placed within 30 mm of a heart pacemaker it will stop working!



Do not use magnets in explosive atmospheres.



Do not use magnets if you are pregnant!



Do not use magnets if you wear an insulin pump.



Modern permanent magnets can attract steel objects or other magnets from large distances and cause trapping injuries. Place non-ferrous (wood / polystyrene / plastic / aluminium) parts between magnets and any steel or other magnet to prevent this hazard.



Many magnets are brittle and may shatter if they are allowed to 'jump' together or onto a steel surface. Always wear eye protection if this is likely to happen.



Strong magnets may affect or interfere with sensitive electronic instruments and can destroy information stored on magnetic media such as credit cards, floppy discs and computer hard drives. Always keep magnets at least 1 m from such devices.



Analogue watches and computer monitors, can be permanently damaged by placing magnets near them.

## 4 Lifting, transport and storage

### 4.1 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.*

## 4.2 Transport



The unit must never be raised by the power cable.

Depending on the version, the units are fitted with a lifting hoop/eyelet, to which a steel rope can be fastened by means of shackles, for transportation, installation or removal.



Take note of the entire weight of the unit (see nameplate: section 2.5). The hoist and steel rope must be adequately dimensioned for the weight of the unit and must comply with the current valid safety regulations. Good technical practice must be observed.



The unit should be protected from rolling over!



The unit is prepared for transportation by placing it on an adequately strong, completely horizontal surface taking care that it cannot topple over.



Do not stay or work in the swivel area of a suspended load!



The lifting hook height must take into consideration the entire height of the unit as well as the length of the steel rope.

## 4.3 Motor connection cable moisture protection

The motor connection cables are protected against the ingress of moisture along the cable by having the ends sealed at manufacture with protective covers.

**ATTENTION!** *The ends of the cables should never be immersed in water as the protective covers only provide protection against water spray or similar (IP44) and are not a water tight seal. The covers should only be removed immediately prior to connecting the pumps electrically.*

During storage or installation, prior to the laying and connection of the power cable, particular attention should be given to the prevention of water damage in locations which could flood.

**ATTENTION!** *If there is a possibility of water ingress then the cable should be secured so that the end is above the maximum possible flood level. Take care not to damage the cable or its insulation when doing this.*

## 4.4 Storage of the units

**ATTENTION** *Sulzer products must be protected from weather influences such as UV from direct sunlight, high humidity, aggressive dust emissions, mechanical damage, frost etc. The Sulzer original packaging with the relevant transport securing devices (where used) ensures optimum protection of the unit. If the units are exposed to temperatures under 0 °C (32 °F) check that there is no water in the hydraulics, cooling system, or other spaces. In the case of heavy frosts, the units and cable should not be moved if possible. When storing under extreme conditions, e.g. in tropical or desert conditions, suitable additional protective steps should be taken. We would be glad to advise you further.*

**NOTE** *Sulzer units do not generally require any particular maintenance during storage. After long storage periods (approx. one year), the transportation locking device on the motor shaft (not with all versions) should be disassembled. By rotating the shaft several times by hand, new lubricating oil, or depending on the version, a small amount of coolant (which also serves to cool or lubricate the mechanical seals) is applied to the sealing surfaces, thus ensuring perfect operation of the mechanical seals. The bearings supporting the motor shaft are maintenance-free.*

## 5 Product description

The XRW mixer is designed as a compact, water-pressure-tight unit, with axially operating propeller.

- Hydraulically optimized propeller with high wear-resistance.
- The motor shaft is supported in lubricated-for-life, maintenance-free, ball bearings.
- The shaft is sealed on the medium side by means of a high quality mechanical seal, which is independent of direction of rotation.
- The oil chamber is filled with lubricating oil.

### Motor

- XRW 210, XRW 300, XRW 900: Premium Efficiency asynchronous.  
XRW 400 and XRW 650: permanent-magnet.
- Rated voltage: 400 V, 3~ ,50 Hz / 480 V, 3~ , 60 Hz (other voltages available on request).
- Starting: XRW 210 and XRW 300: direct on line (D.O.L).  
XRW 900: star delta (SD)  
XRW 400 and XRW 650: variable frequency drive (VFD)
- Protection type IP68.

## 6 Structural design

### Legend

1	Guide rail bracket	5	Stator	9	Propeller
2	Cable inlet	6	Lifting band	10	Shaft end with key
3	Connection chamber	7	Motor housing	11	Solids deflection (SD) ring
4	Motor chamber seal	8	Mechanical seal	12	Shaft with rotor and bearings
				13	Planetary gearbox

### 6.1 XRW 210

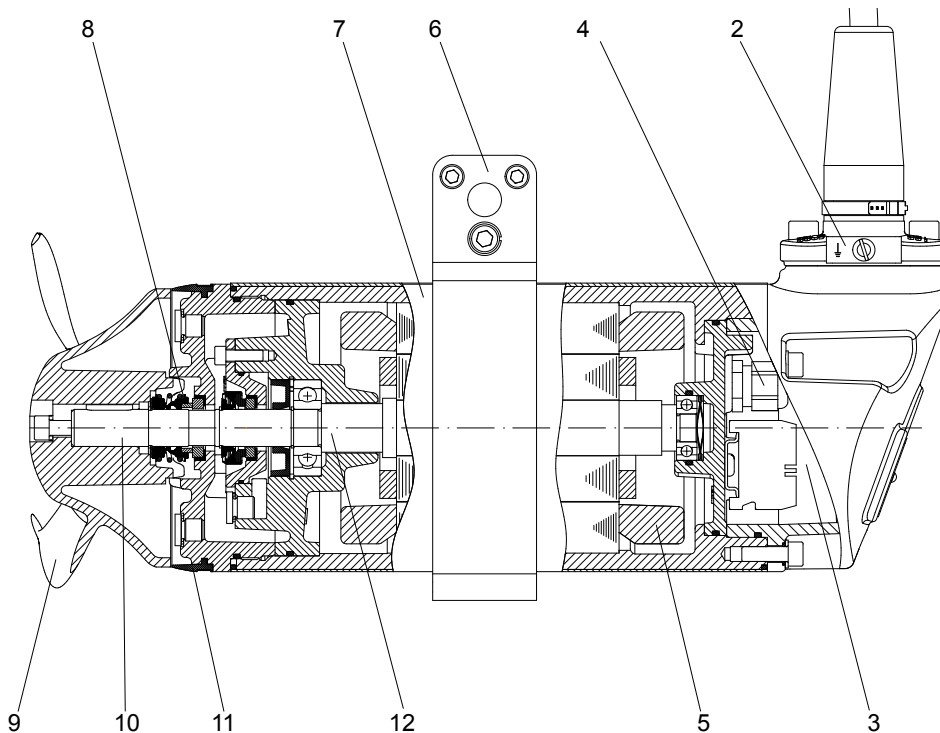
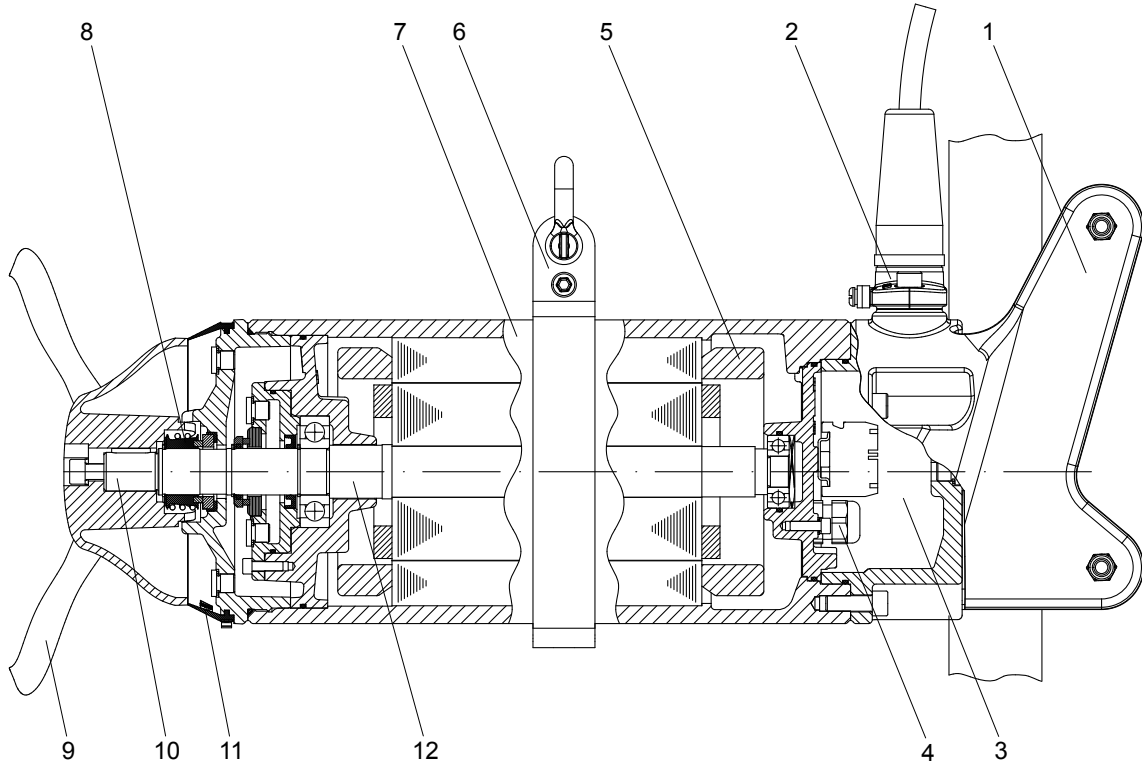


Figure 6: XRW 210

1170-00

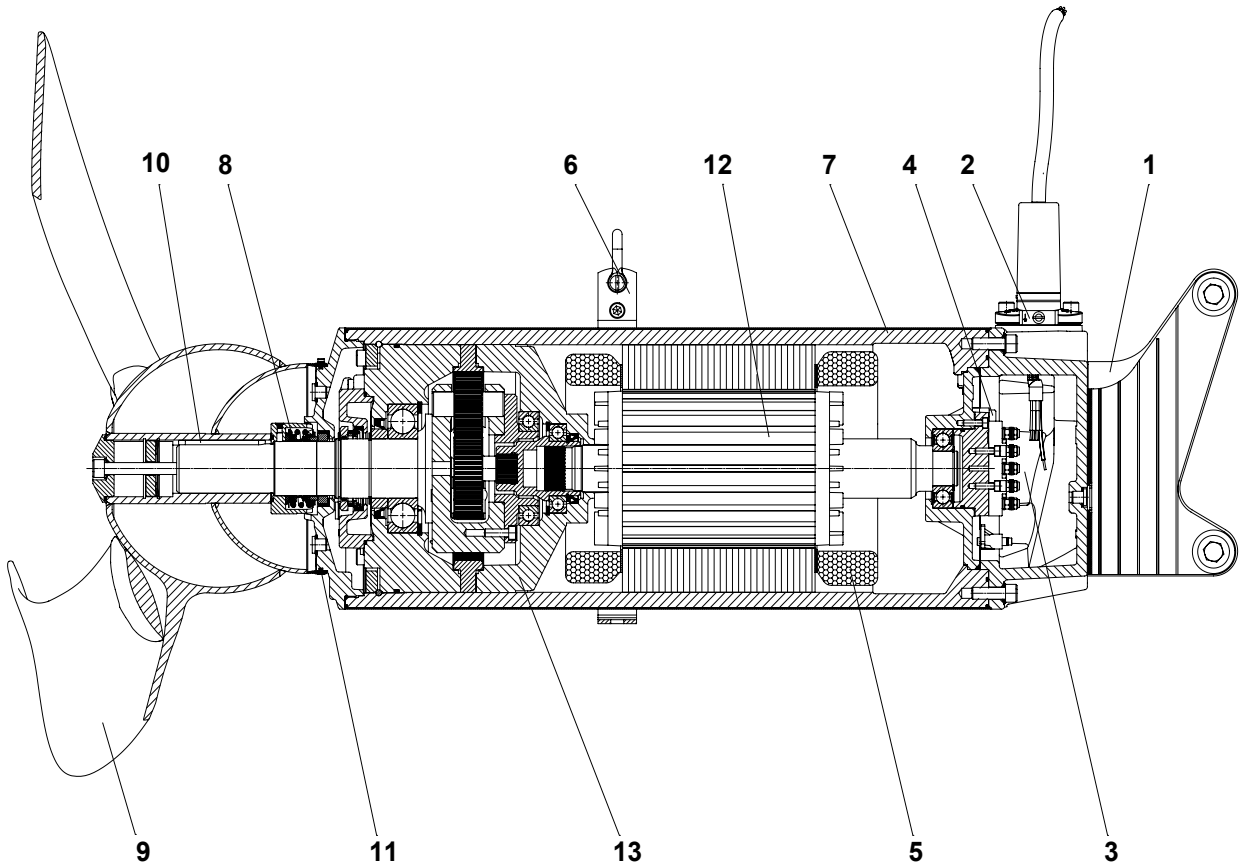
**6.2 XRW 300/400/650**



1171-00

Figure 7: XRW 300/400/650

**6.3 XRW 900**



1228-00

Figure 8: XRW 900

## 7 Propeller assembly XRW

### Legend

1	Socket head screw	4	Propeller washer	7	Shaft key
2	Securing washer	5	O-ring		
3	O-ring	6	O-ring		

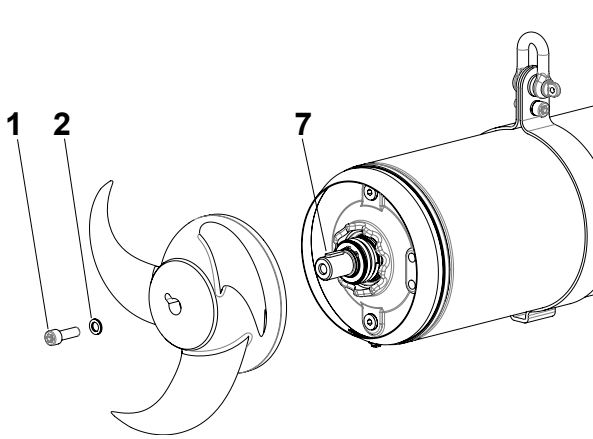


Figure 9: XRW 210 & 300

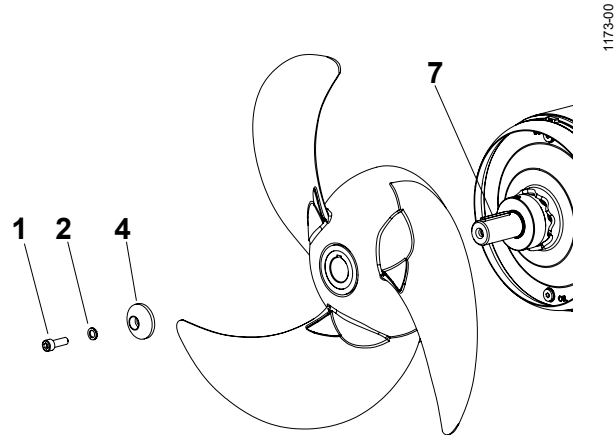


Figure 10: XRW 400 & 650

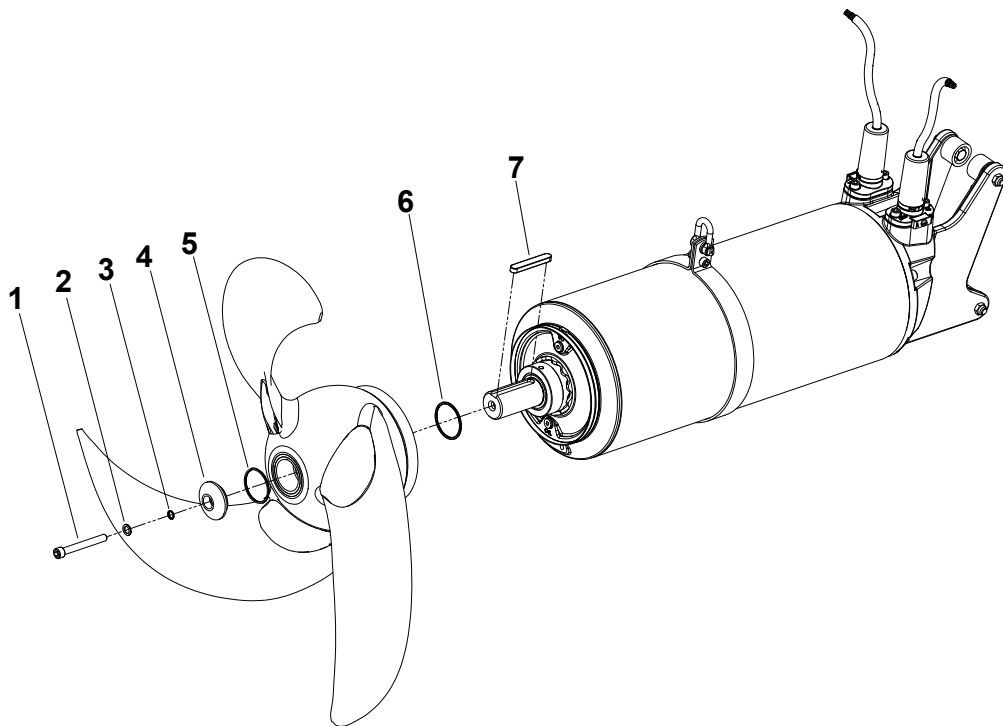


Figure 11: XRW 900

### Dismantling

- Loosen and remove socket head screw (1), security washer (2), o-ring (3 & 5) [XRW 900] and propeller washer (4) [XRW 400, 650 & 900].
- Withdraw the propeller from the propeller shaft.

**XRW 210, 300 and 900:** Use 10 mm (min. length 75 mm), 12 mm (min. length 75 mm) and 16 mm (min. length 80 mm) jacking bolts respectively. Pull impeller from shaft by tightening jacking bolt against the shaft through the threaded bore of the propeller hub.



Note: To protect the shaft bore threads from damage by the jacking bolt, place an adequately sized metal blank or washer at the opening of the shaft bore, against which the jacking bolt can be tightened. Otherwise the shaft bore may need to be re-tapped before the socket head screw can be re-fitted.

**XRW 400 and 650:** Carefully prise the propeller hub from the motor housing using two screwdrivers at opposite sides.

- Remove key (7) from the end of the shaft.

### Assembly

- Clean carefully shaft and boss. Lightly oil shaft and boss.
- Fit the key to the shaft end.
- Bring the groove of the propeller hub into line with the shaft key and push the propeller carefully to a stop.
- Fit the securing washer and the propeller washer (where applicable) to the socket head screw. Ensure the correct fitting position of the securing washers (see Section 8.3).
- Screw in the socket head screw and tighten it to the specified tightening torque (see Section 8.2).

**ATTENTION** Do not use any products containing molybdenum disulphide!

## 8 Installation



The safety hints in the previous sections must be observed!

### 8.1 Installation XRW



Care must be taken that the connection cables are positioned that they cannot get caught up in the propeller blades and that they are not subjected to tension.



The electrical connection is carried out in accordance with Section 10: "Electrical connection".

**NOTE** We recommend that Sulzer installation accessories are used for the installation of the XRW mixer.

### 8.2 Tightening torques

Tightening torque for stainless steel screws A4-70:

Thread	M6	M8	M10	M12	M16	M20	M24
Tightening torque	6.9 Nm	17 Nm	33 Nm	56 Nm	136 Nm	267 Nm	460 Nm

### 8.3 Correct fitting position of the Nord-Lock® washer

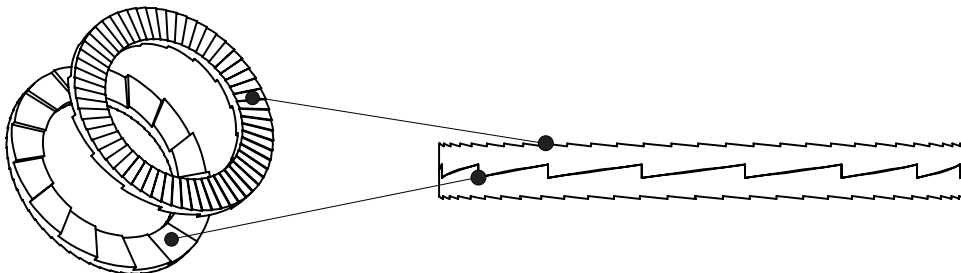


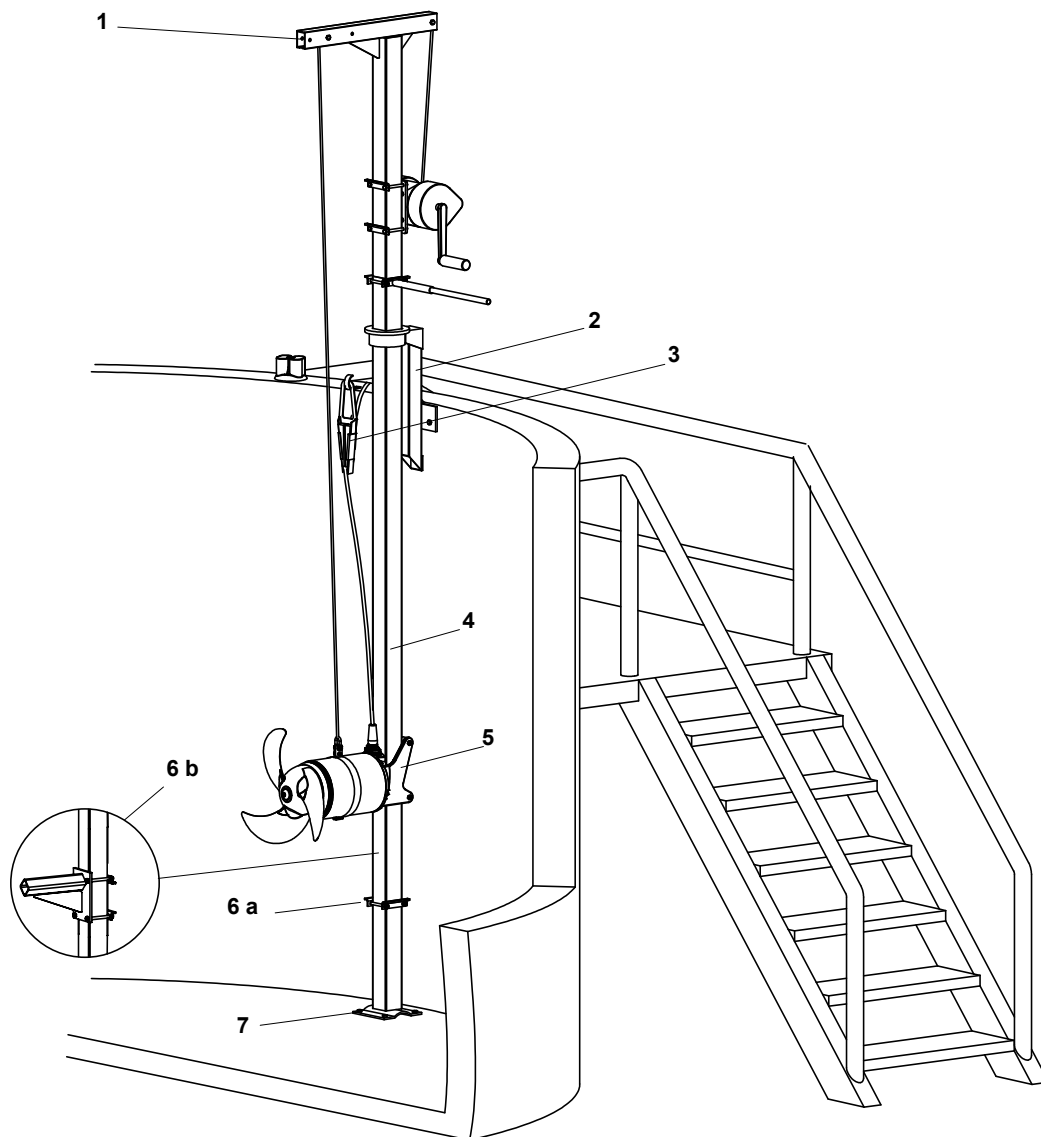
Figure 12: Correct fitting position of the Nord-Lock® securing washers

1176-00

## 8.4 Installation examples XRW

### 8.4.1 Installation example with existing accessories

We recommend that the closed bracket be used for this type of installation (see *Figure 16: closed bracket*).



1183-00

Figure 13: Installation example with existing accessories

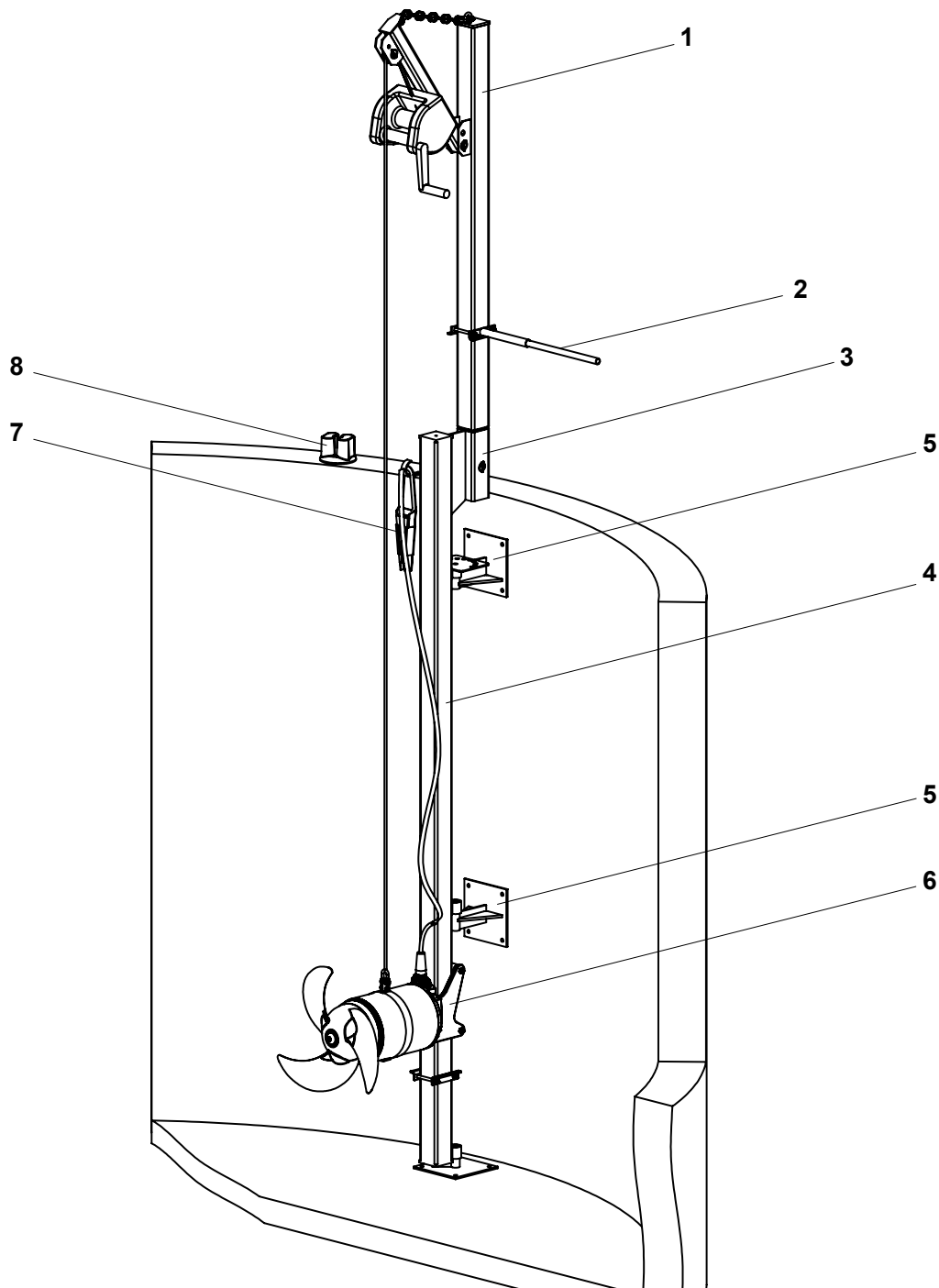
#### Legend

- 1 Hoist with winch and rope
- 2 Upper bracket with locking plate
- 3 Cable clamp with cable hook
- 4 Swivelling square guide tube
- 5 Closed bracket
- 6 a Safety stop clamp
- 6 b Safety stop for use when mixer is fitted with optional vibration damper
- 7 Bottom plate

6006573-03

### 8.4.2 Installation example with alternative fixing possibilities

We recommend that the open bracket be used for this type of installation (see *Figure 16: open bracket*).



1188-00

Figure 14: Installation example with alternative fixing possibilities

#### Legend

- 1 Transportable lifting unit
- 2 Swivel handle
- 3 Socket (fixed installed)
- 4 Swivelling square guide tube
- 5 Swivelling wall mounted bracket
- 6 Open bracket
- 7 Cable clamp with cable hook
- 8 Rope block

### 8.4.3 Fixed installation with vibration damper

If the mixer is to be installed at a fixed point in the tank, then we recommend that the console with the vibration damper is used. In this case a further square tube must be used as a console on the guide tube.

The vibration damper kit is supplied as an accessory with XRW 210 - 650 and as standard with XRW 900.

Vibration damper listing

Mixer	XRW 210	XRW 300	XRW 400	XRW 650
Part no.:	61625000	61625001	61625001	61625003

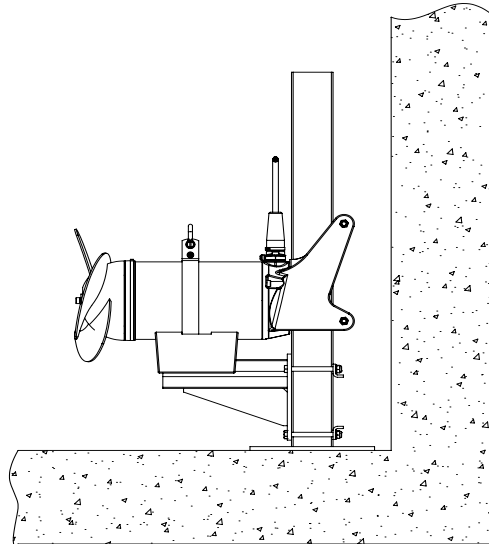
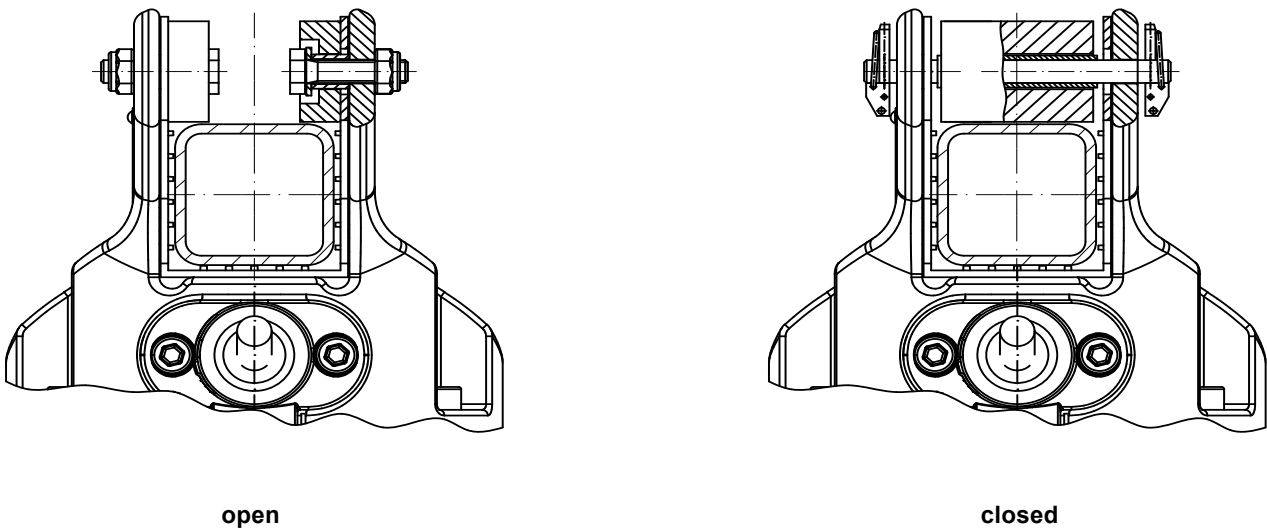


Figure 15: Fixed installation with vibration damper

1181-00

### 8.5 Brackets XRW

Brackets which can be swivelled vertically (optional) are available for both open and closed models of the brackets for all mixers of the series XRW.



open

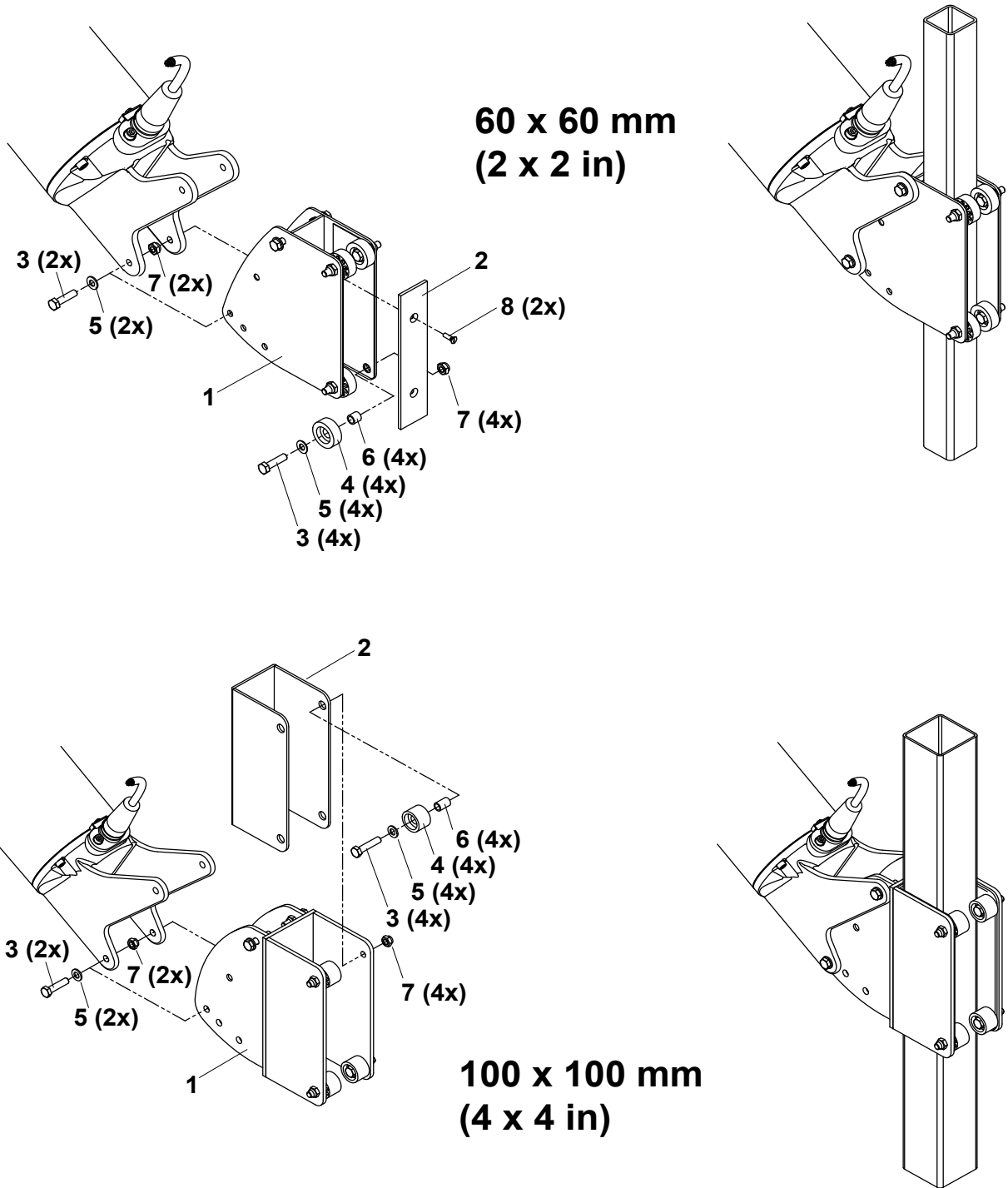
closed

Figure 16: Open bracket / closed bracket

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8.5.1 Fitting of the open bracket with vertical swivelling (option)



1189-00

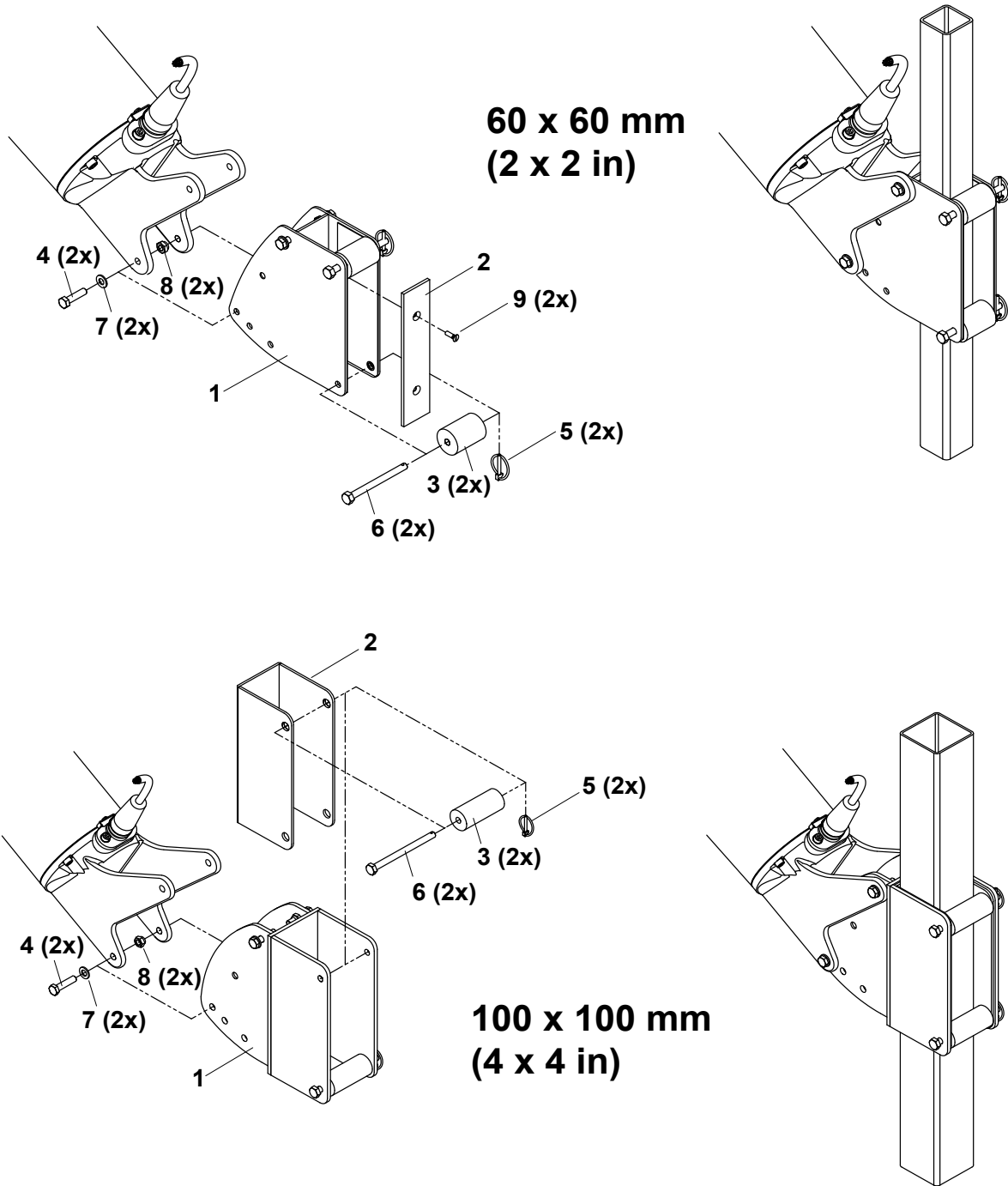
Figure 17: Open bracket with vertical swivelling

**Legend**

- |             |                     |
|-------------|---------------------|
| 1 Bracket   | 5 Washer            |
| 2 Cladding  | 6 Tube              |
| 3 Hex bolts | 7 Hex nut           |
| 4 Roller    | 8 Socket head screw |

**NOTE** See section 8.5.3.

8.5.2 Fitting of the closed bracket with vertical swivelling (option)



1190-00

Figure 18: Closed bracket with vertical swivelling

**Legend**

- |              |                     |
|--------------|---------------------|
| 1 Bracket    | 6 Long bolt         |
| 2 Cladding   | 7 Washer            |
| 3 Roller     | 8 Hex nut           |
| 4 Short bolt | 9 Socket head screw |
| 5 Linch pin  |                     |

**NOTE** See section 8.5.3.

### 8.5.3 Bracket alignment on guide rail

The mixer must be set up freely suspended with bracket fully mounted so that the bracket points vertically towards the ground. When doing this the clamp of the mixer should be moved until the desired slope of the mixer is achieved. This ensures that the mixer can slide up and down easily on the guide tube after it is fitted.

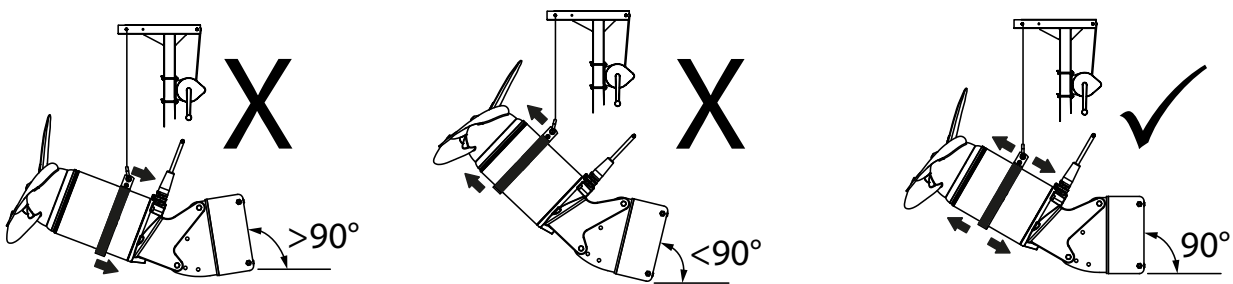


Figure 19: Setting up with fully mounted bracket

**ATTENTION** Damage to bracket liner due to incorrect alignment setup will not be covered under warranty.

### 8.6 Guide tube lengths (square tube)

The table below shows the maximum lengths of the guide tubes - based on the maximum allowable bending  $1/300$  th. of the length of the guide tubes. These values have been determined in clean water of density  $1000 \text{ kg/m}^3$  for the maximum thrust of the most powerful mixer.

Mixer	Maximum guide tube length (L) for an installation with square guide tube		
	with push in type lifting unit	with separate lifting unit	guide tube with additional wall fixing
XRW 300	□ 2" x 3/16". L ≤ 5 m	□ 2" x 3/16". L ≤ 5 m	□ 2" x 3/16". L ≤ 5 m
	□ 60 x 60 x 4. L ≤ 5 m	□ 60 x 60 x 4. L ≤ 5 m	□ 60 x 60 x 4. L ≤ 5 m
XRW 400	□ 2" x 3/16". L ≤ 5 m	□ 2" x 3/16". L ≤ 5 m	□ 2" x 3/16". L ≤ 5 m
	□ 60 x 60 x 4. L ≤ 4 m	□ 60 x 60 x 4. L ≤ 5 m	□ 60 x 60 x 4. L ≤ 5 m
	□ 100 x 100 x 4. L ≤ 9 m	□ 100 x 100 x 4. L ≤ 10 m	□ 100 x 100 x 4. L ≤ 10 m
XRW 650	□ 100 x 100 x 4. L ≤ 5 m	□ 100 x 100 x 4. L ≤ 6 m	□ 100 x 100 x 4. L ≤ 6 m
	□ 100 x 100 x 6. L ≤ 6 m	□ 100 x 100 x 6. L ≤ 7 m	□ 100 x 100 x 4. L ≤ 6 m
	□ 100 x 100 x 8. L ≤ 7 m	□ 100 x 100 x 8. L ≤ 8 m	□ 100 x 100 x 4. L ≤ 6 m
XRW 900 ≤ 15 kW	□ 100 x 100 x 6. L ≤ 5 m	□ 100 x 100 x 6. L ≤ 6 m	□ 100 x 100 x 6. L ≤ 6 m
	□ 100 x 100 x 10. L ≤ 7 m	□ 100 x 100 x 10. L ≤ 7 m	□ 100 x 100 x 6. L ≤ 6 m
XRW 900 > 15 kW only with special installation!			

## 9 Electrical connection



The safety hints in the previous sections must be observed!

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.*

**ATTENTION** *Before start up of the XRW 400 and XRW 650 the date and time must be set on the VFD via the Quick Menu display. For details please refer to the Danfoss FC 202 Operating Instructions. These clock settings must be made after every power failure, switch-off of the power supply, or before reinstallation.*



The incoming power supply as well as the connection of the unit 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.

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

In pump stations/tanks potential bonding must be carried out in accordance with EN 60079-14:2014 [Ex] or IEC 60364-5-54 [non-Ex] (Regulations for the installation of pipe lines, protective measures in power plants).

In the case of units supplied with a standard control panel this must be protected from dampness and installed above flood level by means of a correctly fitted CEE earthed socket.

**ATTENTION** *The only method of starting allowed is that specified in Section 5 “Product description” or on the nameplate. If you want to use other starting methods please consult the manufacturer.*

*In the case where a control panel is not supplied as standard, the unit must only be operated with a motor protection switch with overload relay and thermal sensors connected.*

## 10 Operation by variable frequency drive (VFD)

VFD control is optional with XRWs 210, 300, 900, and supplied as standard with XRWs 400 and 650.

**ATTENTION** *Before installing the VFD; for important instructions concerning the mounting and cooling of the unit it is necessary to refer to the installation section of the unit’s operating instructions.*

**ATTENTION** *When operating at altitudes above 1000 m the VFD should be derated in accordance with the guidelines of the VFD supplier’s Design Guide manual, which can be downloaded at the supplier homepage.*

**Observe the EMC-Directive and the installation and operating instructions of the VFD manufacturer!**



## 10.1 Operation of XRW 210, 300 and 900 by variable frequency drive (VFD)

In the case of XRW 210, 300, 900 motors (PA range) it is essential that the following conditions are met:

- The guidelines for EMC (electromagnetic compatibility) are complied with.
- Speed/torque curves for motors driven by frequency inverters can be found in our product selection range.
- Explosion-proof motors must be equipped with PTC temperature sensors.
- Machines designated as Ex machines may never, without exception, be operated using a mains frequency that is greater than the maximum of 50- or 60 Hz as indicated on the nameplate. Make sure that the rated current specified on the type plate is not exceeded after starting the motors. The maximum number of starts according to the motor datasheet may not be exceeded.
- Machines that are not designated as Ex machines may only be operated using the mains frequency indicated on the nameplate. Greater frequencies can be used but only after consulting with, and receiving permission from, the manufacturer Sulzer.
- For operation of Ex-motors by VFD, special requirements in relation to the tripping times of the thermo-control elements, must be observed.
- The lowest frequency must be set so that it is not falling below 25 Hz.
- The maximum frequency must be set so that the rated power of the motor is not exceeded.

Modern VFDs use higher wave frequencies and a steeper rise on the flanks of the voltage wave. This means that motor losses and motor noise is reduced. Unfortunately these inverter output signals cause higher voltage spikes in the stator. Experience has shown that, depending on rated voltage and the length of the cable between the VFD and the motor, these voltage spikes can adversely affect the life of the motor. In order to avoid this, VFDs of this type must be equipped with sinus filters when used in the critical zone (see *Figure 20*). The sinus filter chosen must be suitable for the VFD with regard to rated voltage, VFD wave frequency, rated current of the VFD, and maximum VFD output frequency. Make sure that the rated voltage is supplied to the terminal board of the motor.

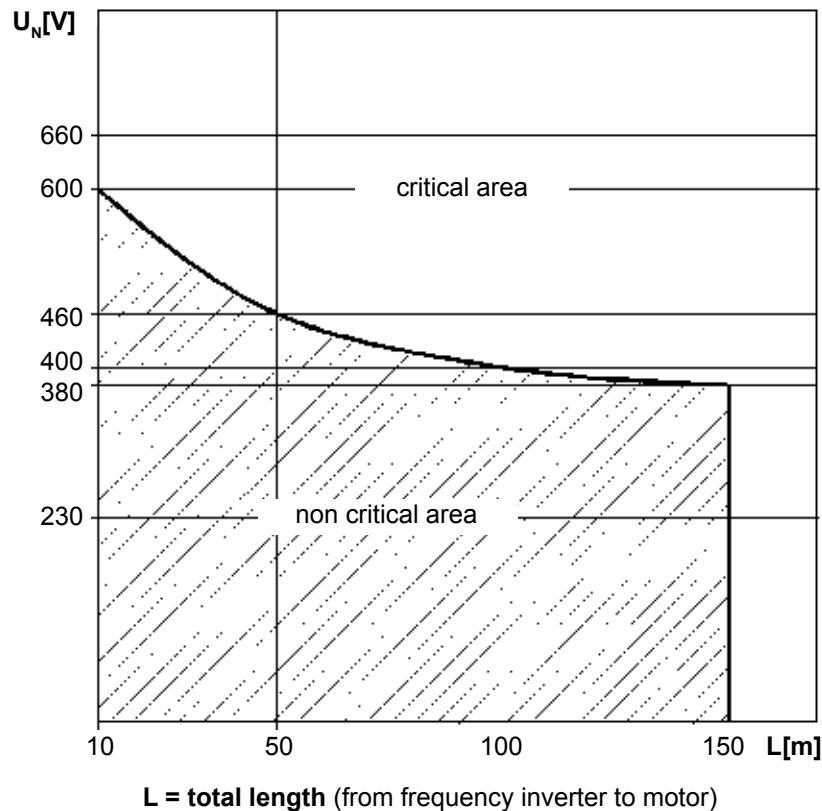
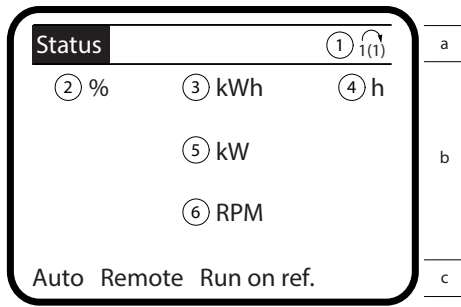


Figure 20: Critical / non-critical area

1180-00

### 10.2 VFD display panel (XRW 400 / XRW 650)

For monitoring of the mixer performance the main operating variables are pre-programmed to display on the VFD control panel.

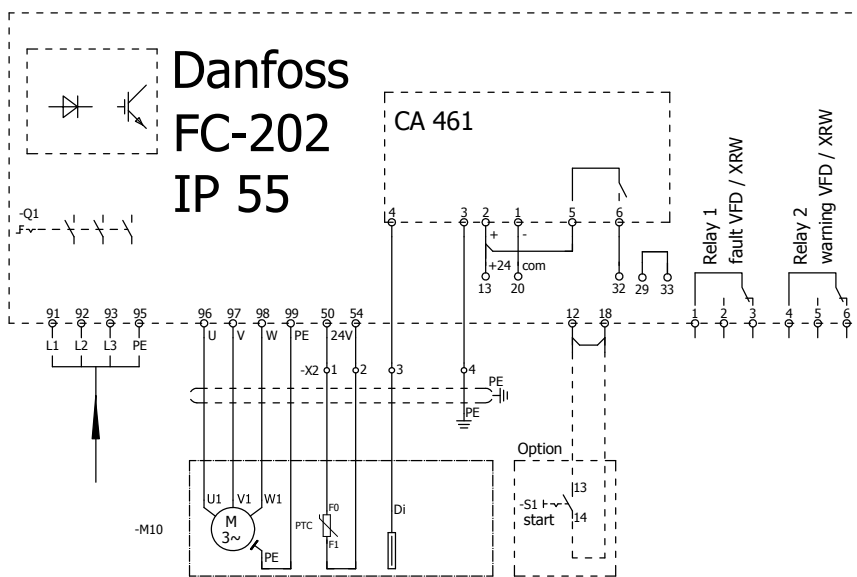


- a. Status line 1.
  - b. Data field.
  - c. Status line 2.
1. Parameter setting
  2. Motor efficiency
  3. Energy consumption.
  4. Run time.
  5. Motor power.
  6. Speed.

1230-00

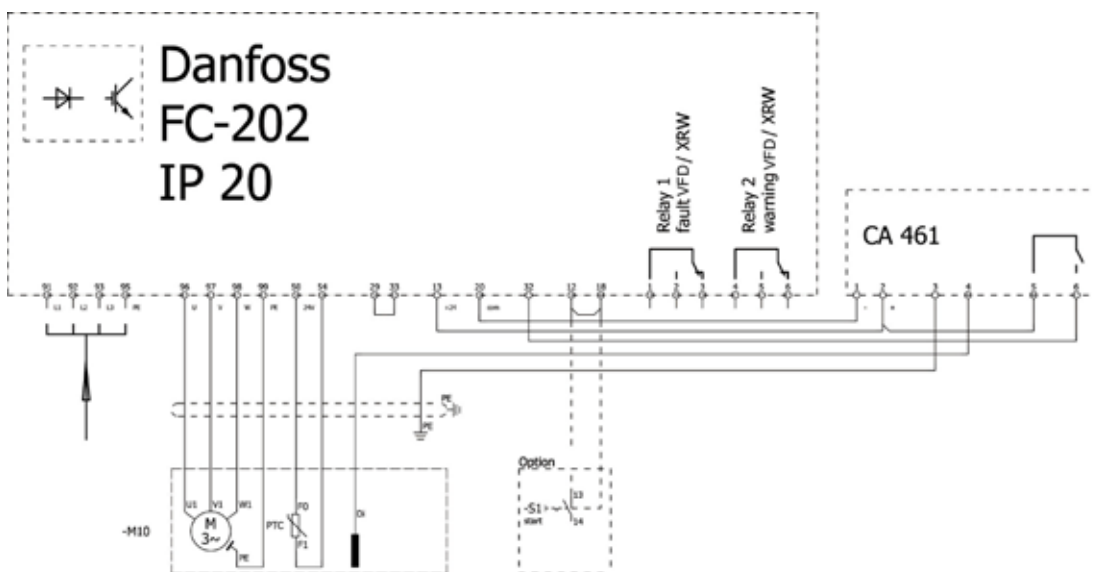
Figure 21: mixer operating variables displayed on VFD

### 10.3 Connection diagram VFD XRW 400 / 650



- 1179-00 Supply line  
L1 / L2 / L3 / PE
- Motor cable (7 x 1.5 mm<sup>2</sup>)  
U1 / V1 / W1 / PE /  
Shielding  
F0 / F1  
DI

Figure 22: Connection diagram VFD IP 55



Supply line L1 / L2 / L3 / PE; Motor cable (7 x 1,5 mm<sup>2</sup>) U1 / V1 / W1 / PE; Shielding F0 / F1 DI

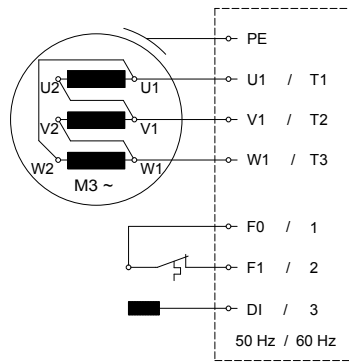
Figure 23 Connection diagram VFD IP 20

2508-0021

## 10.4 Standard connection diagrams XRW 210, 300 and 900

### **XRW 210, XRW 300**

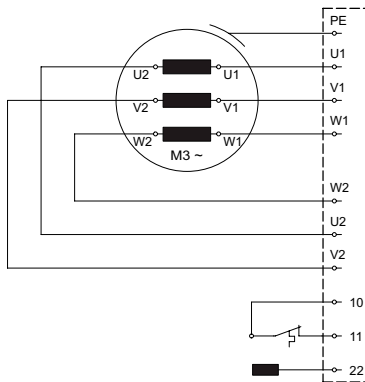
One power cable with integrated control leads (internal connection in the motor)



1197-01

### **XRW 900**

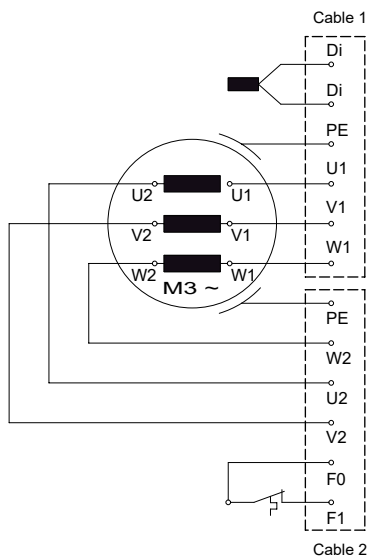
One power cable with integrated control leads



0551-0032

### **XRW 900**

Two power cables with integrated control leads



0551-0033

Figure 24: Connection diagrams

PE = Earth

U1, V1, W1, / T1, T2, T3 = Live

F0, F1 / 1, 2 = Thermal sensor

DI / 3 = Seal monitor

## 10.5 Motor monitoring

All motors are fitted with temperature monitors which switch off the motor in the case of excessive temperatures. The sensors must be correctly wired into the control panel.

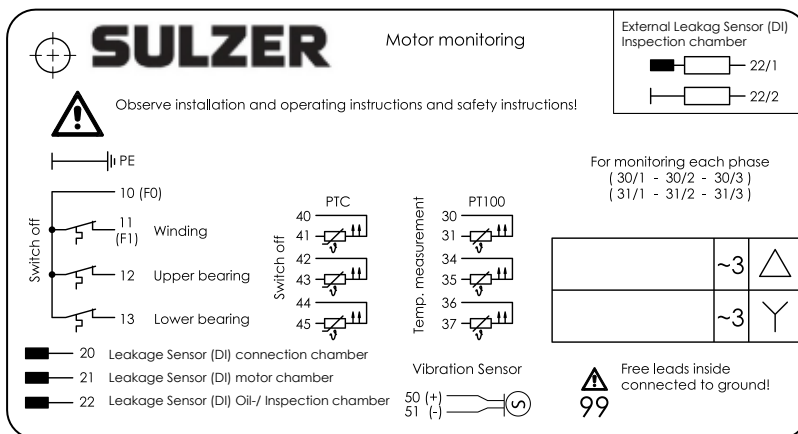


The thermal monitoring circuit (F1) must be wired into the motor contactors in such a manner that a manual reset is required.

**ATTENTION** *The temperature limiting switches may only be operated as specified by the manufacturer (see following table).*

Operating voltage...AC	100V to 500 V ~
Rated voltage AC	250 V
Rated current AC $\cos \varphi = 1.0$	2.5 A
Rated current AC $\cos \varphi = 0.6$	1.6 A
Max. switching current at $I_N$	5.0 A

## 10.6 Connection of the control circuit leads



2590-0004

### Control circuit leads for submersible mixers

- 10 = Common lead
- 11 = Stator upper
- 12 = Bearing upper
- 13 = Bearing lower
- 20 = DI-connection chamber
- 21 = DI-Motor chamber
- 22 = DI-Oil chamber

= PE (green/yellow)

Figure 25 Designation of control circuit leads

## 10.7 Connection of the seal monitoring unit to XRW 210, 300 and 900 control panel

XRW 210, 300 and 900 are fitted as standard with DI seal monitors in the oil, motor and connection chambers (only in motor and connection chambers in Ex 50 Hz version). The DI-electrode carries out the seal monitoring function and signals the ingress of moisture by means of a special electronic device. In order to integrate the DI electrode into the control panel it is necessary to fit an Sulzer DI module and connect it in accordance with the wiring diagrams (see fig.26).

**ATTENTION** *If the DI seal monitor is activated the unit must be immediately taken out of service. Please contact your Sulzer Service Centre.*

**NOTE** *Running the pump with the thermal and/or moisture sensors disconnected will invalidate related warranty claims.*

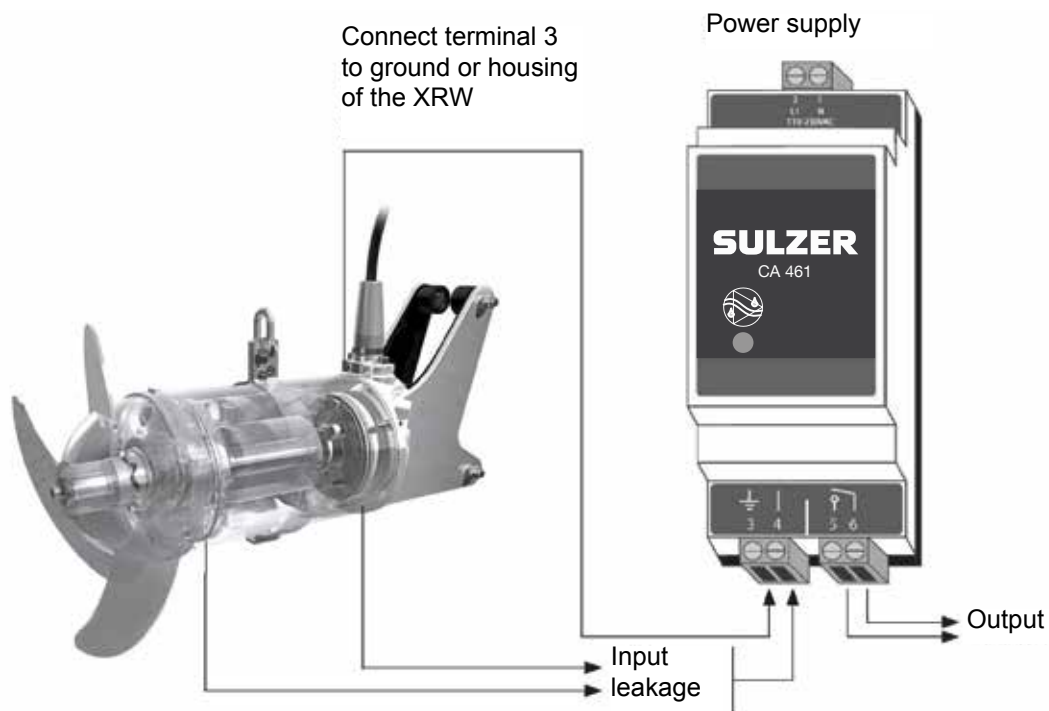


Figure 26: Electronic amplifier with collective signalling

### Electronic amplifier for 50/60 Hz

110 - 230 V AC (CSA) (Part No.: 1 690 7010)

18 - 36 V DC (CSA) (Part No.: 1 690 7011)

**ATTENTION!** *Maximum relay contact loading: 2 Ampere*

**ATTENTION!** *It is very important to note that with the connection example above it is not possible to identify which sensor/alarm is being activated. As an alternative Sulzer highly recommends to use a separate CA 461 module for each sensor/input, to allow not only identification but also to prompt to the appropriate response to the alarm category/severity.*

Multiple-input leakage control modules are also available. Please consult with your local Sulzer representative.

**ATTENTION!** *If the leakage sensor (DI) is activated the unit must be immediately taken out of service. Please contact your Sulzer service centre.*

## 11 Checking direction of rotation

When the 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.

The direction of rotation (propeller rotation) is correct if the propeller rotates in a clockwise manner when viewed from the rear over the motor housing (see arrow).

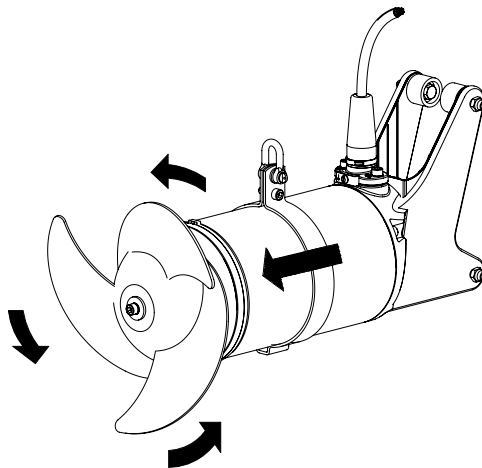


Figure 27: Checking direction of rotation



When checking the direction of rotation take care that no injury can be caused by the rotation of the propeller or the resulting airflow. Do not place a hand or other part of the body near the propeller or the hydraulics!



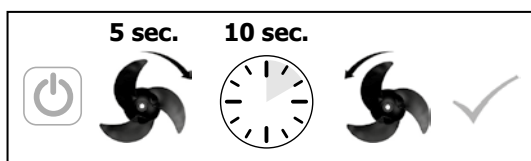
The direction of rotation should only be altered by a qualified person.



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.

### 11.1 Pre-start (XRW 400 and XRW 650)

During pre-start, a de-ragging function is automatically employed to free the propeller from any items that may have become entangled on it. To begin, the propeller rotates in reverse rotation for five seconds. It then stops for ten seconds before re-starting fully in the correct rotation. The process repeats automatically every 6 hrs.



Be aware that the propeller will stop for only 10 seconds and then re-start. Do not handle the mixer or place a hand in the contact area of the propeller during de-rag stoppage!

Figure 28: De-ragging

#### NOTE

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

#### ATTENTION

**The mains supply in the control panel must have a clockwise sense of rotation. If the units are connected in accordance with the wiring diagram and the lead designations the direction of rotation will be correct.**

## 11.2 Changing direction of rotation



The safety hints in the previous sections must be observed!



Changing direction of rotation must only be carried out 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.*

## 12 Commissioning

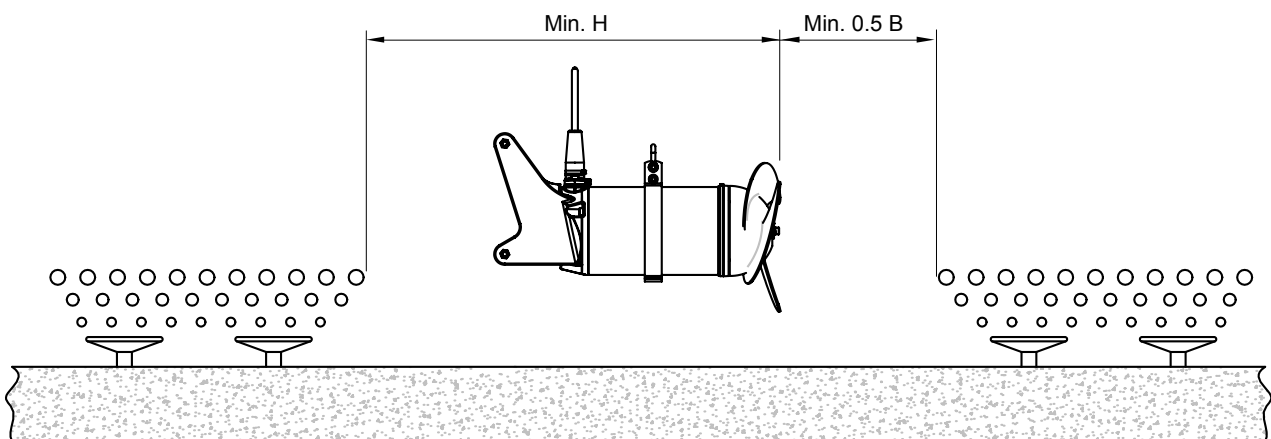


The safety hints in the previous sections must be observed!

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/limiters been connected?
- Is the seal monitoring device correctly installed?
- Is the motor overload switch correctly set?
- Have the power and control circuit cables been correctly fitted?
- Has the motor connection cable been laid in such a manner that it cannot be caught up by the rotating body?
- Has the minimum submergence level been observed? (see section 2.4 Dimensions).

### 12.1 Types of operation



1178-00

B = Tank width; H = Water depth

Figure 29: Installation example with aeration

**ATTENTION** *The illustration is only an example. For the correct installation please contact Sulzer.*

**ATTENTION** *Operation within the directly aerated area is not allowed!*

**ATTENTION** *The units must work fully submerged in the fluid. During operation no air should be drawn in by the propeller. Ensure that there is a smooth medium flow. The unit should not vibrate heavily when in operation.*

### Uneven flow formation and vibrations can occur if:

- Overactive mixing in small tanks.
- Prevention of free inflow or outflow in the area of the flow ring where fitted. Changing the position or direction of the mixer may assist.

## 13 Maintenance and service



The safety hints in the previous sections must be observed!

In particular, the advice regarding maintenance in paragraph 3.2 of the separate booklet "Safety Instructions for Sulzer Products Type ABS" is to be observed.

### 13.1 General maintenance hints



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.

#### NOTE

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



Repair work on explosion-proof motors may only be carried out in approved workshops by approved personnel using original parts supplied by the manufacturer. Otherwise, the Ex-approvals no longer apply.

Sulzer units 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 unit 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/limiters of the thermo-control system, or by the DI seal monitoring system.

#### ATTENTION

***Steel ropes and shackles should be visually checked at regular intervals (approx. every 3 months) for wear and corrosion. These parts should be replaced if required!***

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

#### NOTE

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

#### ATTENTION

***Regular checks, and other prescribed regulatory checks after specific intervals, are highly recommended. This ensures a long lifetime and trouble-free operation of the units.***

#### NOTE

***In the case of repair work, „Table 1“ from IEC 60079-1 may not be applied. In this case please contact Sulzer after sales service!***



## 13.2 Maintenance XRW



The safety hints in the previous sections must be observed!

Inspections carried through at regular intervals, and preventive maintenance, guarantee trouble-free operation. For this reason the complete unit should be cleaned thoroughly, maintained and inspected, on a regular basis. For this purpose special care must be taken that all parts of the unit are in a good condition and that the operational security of the unit is guaranteed. The inspection period is determined by the type of usage of the unit, but should however not exceed one year.

The maintenance and inspection work must be carried through corresponding to the subsequent inspection plan (see section 13.3). The executed work must be documented in the inspection list (page 32). In case of non-observance the manufacturer's warranty does not apply!

### 13.2.1 Faults

In addition to the maintenance and inspection tasks described in Section 13.3 "Inspection and maintenance intervals for XRW", an urgent check of the unit and installation should be carried out if heavy vibrations develop or uneven flow patterns occur.

#### Possible causes:

- Minimum liquid coverage of the propeller is not present.
- Aeration in the propeller area.
- Wrong direction of rotation of the propeller.
- Propeller is damaged.
- Restriction to the free inflow or outflow in the area of the XRW flow ring.
- Parts of the installation, such as bracket or coupling parts have become defective or become loose.

In these cases the unit should be immediately switched off and inspected. If no fault can be found, or the fault remains after it has apparently been corrected, the unit should be left switched off. The same applies also if the current overload in the control panel regularly trips where the DI seal monitor or the temperature sensors in the stator are activated. We recommend that in such cases you contact the local Sulzer Service Centre.

### 13.3 Inspection and maintenance intervals for XRW



The safety hints in the previous sections must be observed!

<b>PERIOD OF TIME:</b>	<b>Regulation: once a month</b>
ACTIVITY:	Cleaning and inspection of the power and control circuit cables.
DESCRIPTION:	Once a month (more frequently - for example - in difficult application cases where the medium is heavily polluted with fibrous matter) the power and control circuit cables should be cleaned. In particular, fibrous materials must be removed. Part of the regular maintenance is also the inspection of the motor cables. These must be checked for scratches, fissures, bubbles or crushing.
MEASURE:	Damaged power and control circuit cables must be replaced in all cases. Please contact your local Sulzer Service Centre.

<b>PERIOD OF TIME:</b>	<b>Recommendation: once a month</b>
ACTIVITY:	Check the current consumption at the ampere meter.
DESCRIPTION:	With normal operation the current consumption is constant. Occasional current fluctuations result from the constitution of the material being mixed.
MEASURE:	If the current consumption is too high for a longer period during normal operation please contact your local Sulzer Service Centre.

<b>PERIOD OF TIME:</b>	<b>Regulation: every 3 months</b>
ACTIVITY:	Cleaning and inspection of the shackles and the lifting equipment.
DESCRIPTION:	Lift the unit out of the tank and clean it. Lifting hoists, shackles, wire ropes and wire clamps etc. must undergo a visual examination at regular intervals for wear and corrosion.
MEASURE:	Worn or damaged parts should be replaced. Please contact your local Sulzer Service Centre.
ACTIVITY:	Inspection of the propeller and the SD ring (Solids-Deflection-Ring).
DESCRIPTION:	The propeller should be inspected carefully. The propeller might show spots of rupture and wear due to strongly abrasive or aggressive mixing material. In both cases the flow formation is reduced considerably and the propeller must be replaced. The SD ring must also be checked. If wear or scoring is visible on the propeller boss these parts must be replaced also.
MEASURE:	If you find out any cases of the damage described above please contact your local Sulzer Service Centre.

<b>PERIOD OF TIME:</b>	<b>Recommendation: every 6 months</b>
ACTIVITY:	Insulation resistance check.
DESCRIPTION:	Within the scope of the maintenance work the insulation resistance of the motor winding should be measured every 4,000 hours, and/or at least once a year. If the proper insulation resistance level is not reached, moisture might have got into the motor.
MEASURE:	The unit must be taken out of operation and may not be started again. Please contact your local Sulzer Service Centre.
ACTIVITY:	Functional testing of the monitoring devices.
DESCRIPTION:	In the scope of the maintenance measures functional testing of all monitoring devices must be carried through every 4,000 hours and/or at least once a year. For these functional tests the unit must have cooled down to the ambient temperature. The electrical connecting line of the monitoring device must be disconnected at the control box. These measurements must be carried through by means of an ohm meter at the respective cable ends.
MEASURE:	In any case of any functional problems on the monitoring devices please contact your local Sulzer Service Centre.

<b>PERIOD OF TIME:</b>	<b>Recommendation: once a year</b>
ACTIVITY:	Checking of the tightening torques of the screws and nuts.
DESCRIPTION:	For safety reasons we recommend that all screws are checked for their perfect positioning once a year.
MEASURE:	Tighten screws with correct tightening torques (see 9.2).



