FLYGT

Installation, care and maintenance

4610, 4620

Flygt

ITT Industries

893493/03

CONTENTS

This “Installation, Care and Maintenance” applies to the following versions of the 4600-series:

4610	4620
4610.410	4620.410
4610.490	4620.490

Identification of safety and warning symbols

General Danger:

Non-observance given to safety instructions in this manual, which could cause danger to life have been specifically highlighted with this general danger symbol.

High Voltage:

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

WARNING! Non-observance to this warning could damage the unit or affect its function

NOTES FOR EXPLOSION APPROVED MACHINES

The explosion proof version (Ex-approved) is designed for use in explosive environments in accordance with approvals stated on page 4.

According to rules the Ex-approved mixer must always work completely submerged in the liquid.

Thermal contacts must always be used on Ex-approved machine due to approval conditions.

All work on the explosion-proof motor section must be performed by personnel authorized by Flygt.

Flygt disclaims all responsibility for work done by untrained, unauthorized personnel.

GUARANTEE

Flygt undertakes to remedy faults in products sold by Flygt provided:

— that the fault is due to defects in design, materials or workmanship;

— that the fault is reported to Flygt or Flygt's representative during the guarantee period;

— that the product is used only under conditions described in the care and maintenance instructions and in applications for which it is intended;

— that the monitoring equipment incorporated in the product is correctly connected;

— that all service and repair work is done by a workshop authorized by Flygt;

— that genuine Flygt parts are used.

Hence, the guarantee does not cover faults caused by deficient maintenance, improper installation, incorrectly executed repair work or normal wear and tear.

Flygt assumes no liability for bodily injuries, material damages or economic losses beyond what is stated above.

Official approval applies only providing:

— **that the product is used under condition described in the care and maintenance instructions and in applications for which it is intended;**

— **that the monitoring equipment incorporated in the product is correctly connected;**

— **that all service and repair work is done by a workshop authorized by Flygt;**

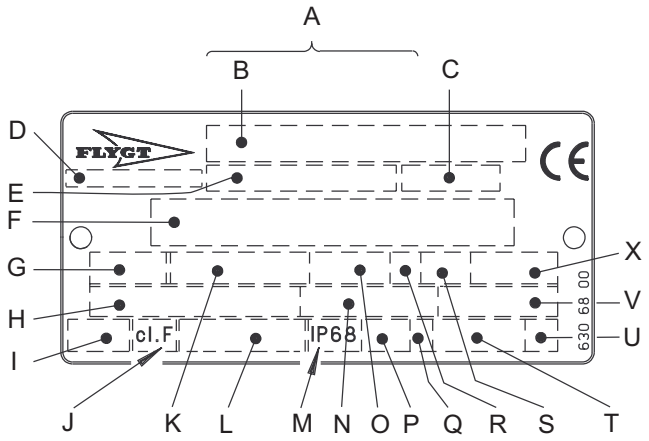
— **that genuine Flygt parts are used.**

Flygt guarantees that a spare parts stock will be kept for 15 years after the manufacture of this product has been discontinued.

The manufacturer reserves the right to alter performance, specification or design without notice.

DATA PLATE INTERPRETATION

GENERAL DATA PLATE

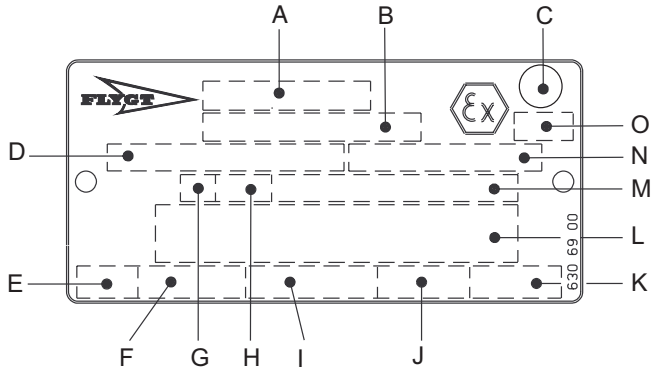


A Serial number
B Product code + Number
C Curve code
D Country of origin
E Product number
F Additional information
G Phase; Type of current; Frequency
H Rated voltage
I Thermal protection
J Thermal class
K Rated shaft power
L International standard
M Degree of protection
N Rated current
O Rated speed
P Max. submergence
Q Direction of rotation: L=left, R=right
R Duty class
S Duty factor
T Product weight
U Locked rotor code letter
V Power factor
X Max. ambient temperature

APPROVAL PLATES

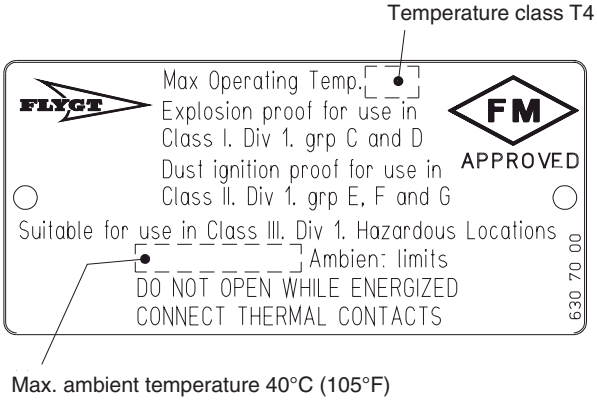
Always together with the general data plate.

EN: European Norm,
ATEX Directive
EN 50 014, EN 50 018, EN 1127-1,
Ex II 2 G EEx dII T4



A Approval
B Approval authority + Approval Number
C Approval for Class I,
D Approved drive unit
E Stall time
F Starting current/Rated current
G Duty class
H Duty factor
I Input power
J Rated speed
K Controller
L Additional information
M Max. ambient temperature
N Serial Number
O ATEX marking

FM: Factory Mutual,
Class I Div. I Grp C and D
Class II and III Div. I Grp E, F and G



PRODUCT DESCRIPTION

General description

These care and maintenance instructions apply to both the standard version and the explosion proof version of the submersible Flygt mixers.

The explosion proof version (Ex-approved) is designed for use in explosive environments in accordance with the approvals, see page 4.

The pH of the liquid: 1—12.

Liquid temperature: max. 40°C (105°F).

Warm liquid version max. 90°C (195°F). This version has model designation ending with -W.

Depth of immersion: max. 20 m (65 ft).

Note, Ex-approved machines are permitted for max liquid temperature 40°C (105°F).

Only Ex-approved machines may be used in explosive or flammable environments or for mixing flammable liquids.

Applications

The mixer is intended to be used in:

— waste water treatment, anaerobic or oxygen saturated water, presence of rags etc.

— industrial processes, heavy environments with high demands of operational security, food and chemical industry.

— industrial sewage processes, some wearing, presence of rags and metallic salt.

— mineral slurries with high wearing characteristics, presence of rags acceptable.

— fish farms and current creating in dams, oxygen supply, demands of environmental approved materials. Sweet or brackish water.

The mixer is designed for use in many different situations where high flow capacity in relation to power consumption is required such as solids suspension and blending application.

The mixing effect is dependent upon the density and the viscosity of the liquid and on the volume/shape of the tank.

More than one mixer is required for larger tanks.

For other applications, contact your nearest Flygt representative for information.

Motor data

Data for liquid max 40°C (105°F)

4610

50 Hz, 0.75 kW, 3 phase, 4 pole, 1385* r/min

Voltage V	Rated current A	Starting current A
200Y	3,5	16
230D	3,0	14
380Y	1,8	7,7
400Y	1,7	8,1
415Y	1,7	8,4
440Y	1,6	7,3
500Y	1,4	6,5
690Y	1,0	4,4

*) 400 V

60 Hz, 0.9 kW (1.2 hp), 3 phase, 4 pole, 1685r/min**

Voltage V	Rated current A	Starting current A
200Y	3,5	16
200Y	4,0	21
220D	3.6	19
230Y	3,6	20
380Y	2,1	11
400Y	2,0	11
460Y	1,7	9
480Y	1,7	9,5
575Y	1,4	7,3
600Y	1,4	7,6

**) 460 V

4620

50 Hz, 1,5 kW, 3 phase, 4 pole, 1390* r/min

Voltage V	Rated current A	Starting current A
200Y	7,2	28
230D	6,3	24
380Y	3,7	13
400Y	3,6	14
415Y	3,7	15
440Y	3,3	13
500Y	2,9	11
690Y	2,1	8,2

*) 400 V

60 Hz, 1,7 kW, (2,3 hp) 3 phase, 4 pole, 1670 r/min**

Voltage V	Rated current A	Starting current A
200Y	7,7	37
220D	7,1	34
230D	7,3	35
380Y	4,1	19
400Y	3,9	18
440Y	3,5	16
460Y	3,3	16
480Y	3,4	17
575Y	2,7	13
600Y	2,7	13

**) 460 V

4620

50 Hz, 0,75 kW, 1 phase, 4 pole, 1435* r/min

Voltage V	Rated current A	Starting current A
115	9,8	46
200	5,7	29
230	4,9	23

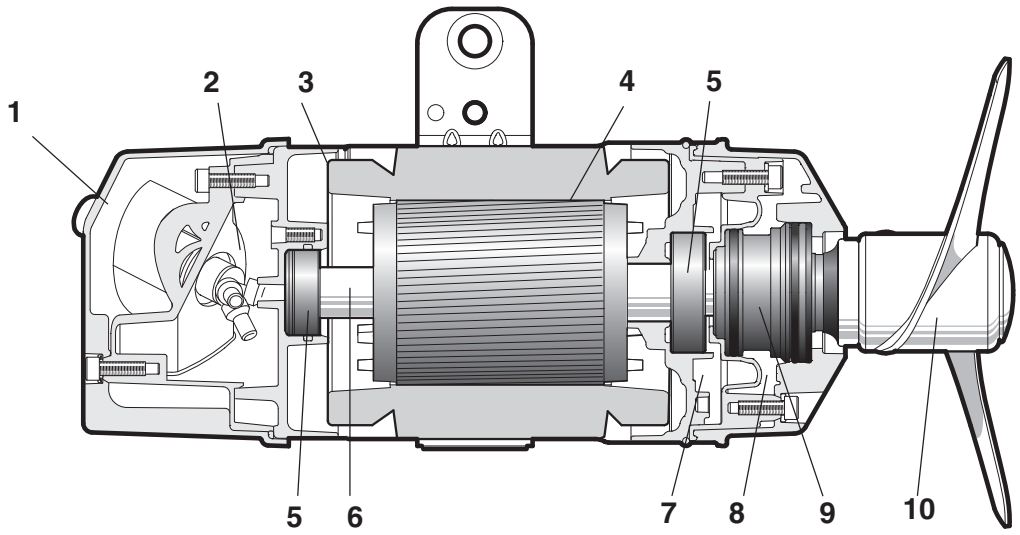
*) 200 V

60 Hz, 0,9 kW (1,2 hp), 1 phase, 4 pole, 1740r/min**

Voltage V	Rated current A	Starting current A
115	11	58
200	6,7	37
220	5,5	27
230	5,5	29

**) 200 V

Design



1. Cable entry

The cable entry has a sleeve and a compressible rubber bushing to seal off and to relieve the cable.

2. Junction box

The junction box is completely sealed off from the surrounding liquid.

3. Monitoring equipment

The stator incorporates three thermal contacts connected in series.

The thermal contacts open at 125°C (260°F).

The thermal contacts should be connected for liquid temperatures up to 40°C (105°F).

NOTE! The thermal contacts must always be connected in Ex-approved mixer.

See also “Electrical connections” and separate instructions for starter equipment.

The mixer can be equipped with leakage detector, FLS 30, for sensing water in the inspection compartment.

4. Motor

Squirrel-cage 3-phase induction motor for 50 Hz or 60 Hz.

The motor is started by means of direct on-line start.

The motor can be run continuously or intermittently with a maximum of 15 evenly spaced starts per hour.

The stator is insulated in accordance with class F (155°C, 310°F). The motor is designed to supply its rated output at ± 5 % variation of the rated voltage. Without overheating the motor, ± 10 % variation of the rated voltage can be accepted provided that the motor does not run continuously at full load. The motor is designed to operate with a voltage imbalance of up to 2 % between the phases.

5. Bearings

The shaft is carried in two prelubricated and enclosed ball bearings.

The bearings are dimensioned for more than 100 000 (L 10 aa) hours of operation.

6. Shaft

The motor shaft is delivered with the rotor as an integral part.

The motor shaft is completely sealed and will not come in contact with the liquid.

7. Inspection chamber

An inspection screw facilitates checking for leakage of liquid into the space behind the plug-in seal.

8. Oil housing

The oil lubricates and cools the seals, and acts as an additional barrier against penetrating liquid.

Pressure build-up within the seal housing is reduced by means of a built-in air volume.

9. Shaft seals

The mixer has a plug-in seal, which combines an inner and an outer seal into one, rigid unit.

10. Propeller

The propeller is two-bladed and the blades have a large width and a thin profile.

Jet ring

The mixer can be operated with or without a jet ring. The jet ring improves the efficiency.

NOTE. Operation without jet ring affects the power consumption.

Jet ring with vortex protective shield

In order to avoid vortex, the machine can be equipped with a jet ring with protective shield.

Materials

Denomination	Material	Flygt No	EN	ASTM
Propeller, Jet ring, Support, Lifting device:	Stainless steel	0344. 2343.02	1.4432	316L
Propeller[1)]	Stainless steel Hi-Chrome			
Shaft:	Stainless steel	0344. 2321.03	1.4057	431
Seal housing, Entrance cover:	Vinylester SMC CR30	0544. 9585.70	—	—
O-rings, Cable entry, Seal and rubber sleeve:	Nitrile rubber (NBR) 70°IRH (black)	0516. 2637.04	—	—
O-rings, Gasket, Cable entry, Seal and rubber sleeve:	Fluorinated-rubber (FPM) 70°IRH (green)	0516. 2677.32	—	—

Shaft seals:

Inner seals	Outer seals	O-rings
WCCR/WCCR	RSiC/RSiC	FPM
AL_2O_3/WCCR	WCCR/WCCR	FPM
AL_2O_3/CSb	AL_2O_3/WCCR	NBR

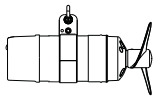
Corrosion resistant cemented carbide	(WCCR)
Aluminium oxid	(AL_2O_3)
Silicon carbide	(RSiC)
Carbon	(CSb)

[1)] only 4620 3-phase

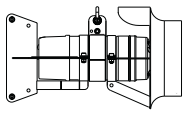
Weights

Weight of mixer without motor cable is:

	Min. kg (lb)
4610	11,5 (24,2)
4620	12,8 (26,5)



	Max*. kg (lb)
4610	15,5 (35,3)
4620	17,0 (37,5)



*Incl. Jetring, vortex protection shield and guide claw unit

TRANSPORTATION AND STORAGE

WARNING! Always lift the machine by the lifting device, never by the motor cable.

Make sure that the mixer can't roll or fall over and injure people or damage property.

For a longer periods of storage, the mixer must be protected against moisture and heat. The propeller should be rotated by hand occasionally to prevent the seals from sticking together. If the mixer is stored for more than 6 months, this rotating is mandatory.

After a long period of storage, the mixer should be inspected before it is put into operation. Pay special attention to the seals and the cable entry.

INSTALLATION

Ex version!

Installation of the explosion-proof mixer must be performed by authorized personnel.

Safety precautions

In order to minimize the risk of accidents in connection with the service and installation work, the following rules should be followed:

1. Never work alone. Use a lifting harness (part No. 84 33 02), a safety line (part No. 84 33 03) and a respirator (part No. 84 33 01), as required. Do not ignore the risk of drowning!
2. Make sure that there is sufficient oxygen and that there are no poisonous gases present.
3. Check the explosion risk before welding or using electric hand tools.
4. Do not ignore health hazards. Observe strict cleanliness.
5. Bear in mind the risk of electrical accidents.
6 Make sure that the lifting equipment is in good condition.
7. Provide a suitable barrier around the work area, for example a guard rail.
8. Make sure that you have a clear path of retreat!
9. Use a safety helmet, safety goggles and protective shoes/gloves.
10. All personnel who work with sewage systems should be vaccinated against diseases that can occur.
11. A first-aid kit must be available.

Follow all other health and safety rules and local codes and practices.

For some installations, and at certain operating points on the performance curve, the noise level 70 dB or the noise level specified for the actual machine can be exceeded.

To reduce the risk of electric shock, see chapter "Installation" and "Electrical connections".

The tank of a sewage treatment plant must be vented in accordance with local plumbing codes.

The machine is not to be installed in locations classified as hazardous in accordance with the national electric code, ANSI7NFPA 70-1990.

CAUTION!
This machine is intended to run fully submerged. Level sensing equipment should be installed if there is a possibility that the machine could be operated at less than the "minimum submergence depth".

In order to avoid accidents, warning signs for rotating propellers and machines that start automatically must be positioned visibly. The area in the proximinity of the machines should be fenced off.

When mixing near a lake (jetties, beaches and ponds etc.) a safety distance of at least 20 meters (65 ft) between the person and the machine is necessary. The machine must never be placed directly in a swimming pool. If used in connection with swimming pools, special safety regulations apply.

Handling equipment

Lifting equipment will facilitate handling of the mixer.

Normally the mixer can easily be installed without any special lifting equipment.

WARNING! Always lift the machine by the lifting device, never by the motor cable.

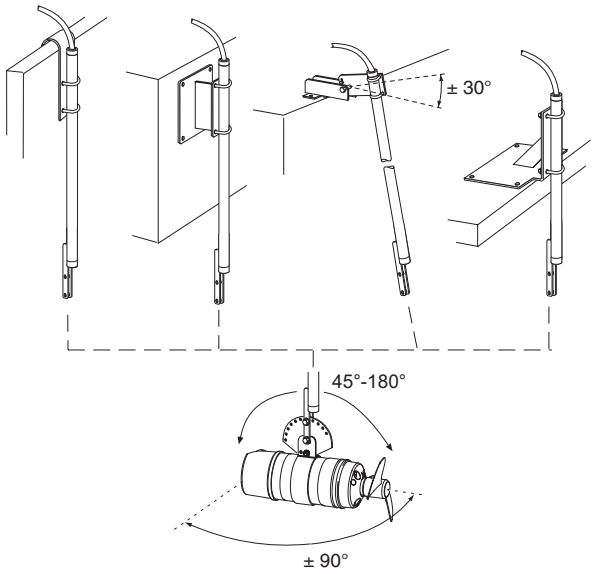
Keep out from suspended loads.

Make sure that the machine can't roll or fall over and injure people or damage property.

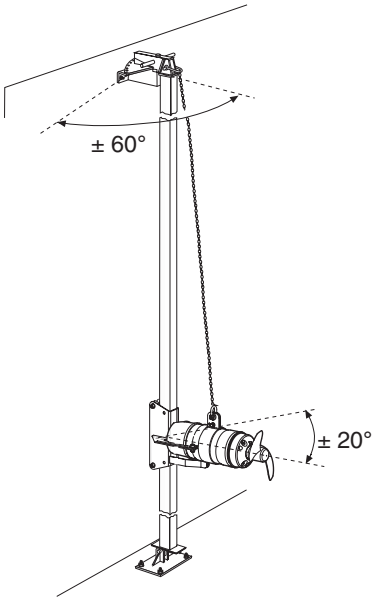
Installation alternatives

Flygt supplies equipment for the below methods of installation which permit mixing over the horizontal and the vertical plane.

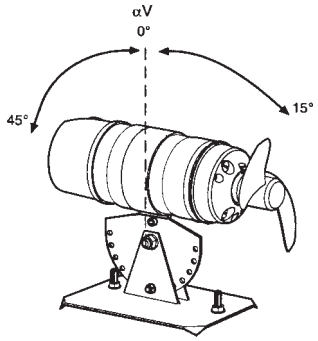
The "Cantilever system"



The "Single guide bar system"



The "Bottom fixing bracket system"



Avoid installations where:

— there are obstacles in front of the mixer,
— the flow on the suction side of the mixer is obstructed due to the design of the tank,
— the propeller can suck down air - vortex,
— directly over bottom diffusers.

To avoid vortex use a vortex protective shield or place the mixer deeper in the liquid.

This is an absolute requirement for continuously operating mixers.

The mixer can be mounted on fixed structures, pillars, stands, gratings, an anchored raft etc.

When installing, keep in mind the reaction force of the mixer, which can be up to, for: 4610 260 N
4620 420 N

Run the cables so that they do not have any sharp bends and are not pinched.

NOTE! The end of the cable may not be submerged. Leads must be above flood level, as water may penetrate through the cable into the junction box or the motor.

Consult your nearest Flygt representative regarding:

— choice of peripheral equipment.

— other problems in connection with installation.

In all installations, make sure that the motor cable cannot be drawn into the propeller.

Treat the cable as fragile, beware that no sharp bends occure during installation procedures, especially at the entrance flange.

NOTE!
If the mixer is operated without a jet ring, there must be a stop function on the guide bar to avoid the propeller from being swung into the wall during operation.

Don´t position the mixer when it is operating.

All welded joints must be pickled and polished before they come into contact with the liquid.

ELECTRICAL CONNECTIONS

Ex version!

Electrical connection of the explosion-proof mixer must be performed by authorized personnel.

Before starting work on the machine, make sure that the machine is insulated from the power supply and cannot be energized.

Flygt disclaims all responsibility for work done by untrained, unauthorized personnel.

All electrical work must be carried out under the supervision of an authorized electrician.

Local codes and regulations must be observed.

Check that the voltage and frequency on the data plate agree with your actual power supply.

The motor can´t be connected for different voltages. If intermittent operation is prescribed (see data plate), the mixer should be provided with control equipment that provides such operation.

To avoid leakage into the mixer check:

— that the cable entry seal sleeve and washers conform to the outside diameter of the cable. See the parts list.

— that the outer sheath on the cable is not damaged. When refitting a cable which has been used before, always cut off a short piece of the cable so that the cable entry sleeve does not compress the cable at the same point again.

Remember that the starting surge can be up to 3.5 times higher than the rated current. Make sure that the fuses or circuit breakers are of the proper amperage.

The table (see “Product Description”) gives rated current and starting current. Fuse amperage and cable must be selected in accordance with local rules and regulations.

The overload protection (motor protection breaker) shall be set to the motor’s rated current as given on the data plate. With a clockwise phase sequence L1-L2-L3 (R-S-T), the propeller will rotate correctly, i.e. clockwise as viewed from the motor side. Check the phase sequence in the main (line) using a phase sequence indicator.

Three thermal contacts are incorporated in the stator and are normally closed. The thermal contacts can be connected to maximum of 250 volts, breaking at 4 amps. current at maximum.

Connect the thermal contacts to the starter.

Thermal contacts must always be used on Ex-approved machine due to approval conditions.

Motor cable

CAUTION!
If the machine is intended for use with a Variable Frequency Drive (VFD), be careful in choosing a motor cable. The VFD might require a screened cable.

Please, read the manufacturer’s instruction for the VFD.

If necessary, contact your ITT Flygt representative.

Available motor cable are SUBCAB® ,SUBCAB® AWG or a chemically resistant cable e.g. HCR.

Connect the motor cable to the terminal board as illustrated in the figure “Direct on-line start”.

Connect the leads from the motor control circuit to T1 and T2.

Tighten the screws so that the cable entry unit forms an effective seal.

Connect the motor cable to the starter equipment. Check the direction of rotation, see “Before starting”.

If the direction of rotation is wrong, transpose two of the phase leads, only for 3 phase.

For 1 phase mixers rotating in wrong direction, please contact your nearest Flygt reprensative.

NOTE! With long cables, the voltage drop must be taken into consideration, since the motor’s rated voltage is the voltage measured at the terminal board in the machine.

NOTE! For safety reasons, the earth lead should be longer than the phase leads. If the motor cable is jerked loose by mistake, the earth lead should be the last to come loose from its terminal. This applies to both ends of the cable.

Make sure that the mixer is correctly earthed (grounded).

WARNING!
If persons are likely to come into physical contact with the machine or mixed media (liquid) the earthed (grounded) socket must have an additional earth-(ground-)fault protection device (GFI) connected.

Cable connection

The motor cable is connected to the stator leads with closed end splices according to the figures.

All electrical equipment must be earthed (grounded). This concerns the machine as well as any control or monitoring equipment. It is an extreme danger to life not to follow the above warning. Ensure that the ground connection is actually completed back to ground by testing the ground circuit.

Leads not in use must be isolated

Cable

Cable leads colour	Connection starter	Cable leads colour	Connect. starter
SUBCAB® 4x1.5+2x1,5 mm		**SUBCAB® 14AWG/7**	
brown	L1	red	L1
blue	L2	white	L2
black	L3	black	L3
yellow/green	earth	yellow	GC**
black T1	T1*	yellow/green	earth
black T2	T2*	orange	T1*
		blue	T2*

HCR SO7E6E5-7 [1)]

black 1	L1
black 2	L2
black 3	L3
black 4	T1*
black 5	T2*
black 6	–
yellow/green	earth

Stator

Stator leads colour

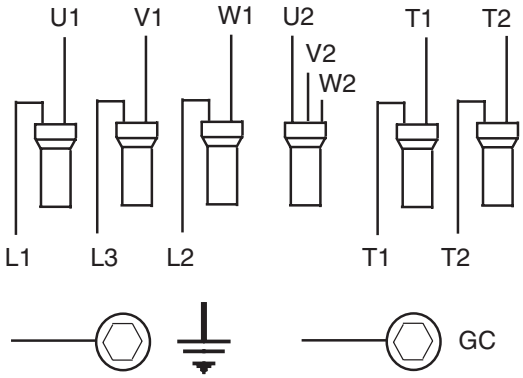
3 phase		*1 phase*	
U1	Red	U1	Red
V1	Brown	U2	Brown
W1	Yellow	Z1	Yellow
U2	Green	Z2	Black
V2	Blue	T1*	White
W2	Black	T2*	White
T1*	White		
T2*	White		

* Terminal for connection of thermal switches in motor and monitoring equipment.

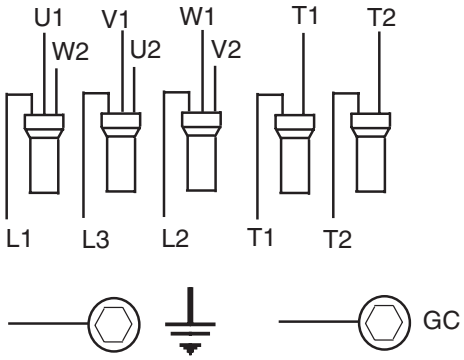
** GC = Ground Check

[1)] Not applicable for Ex

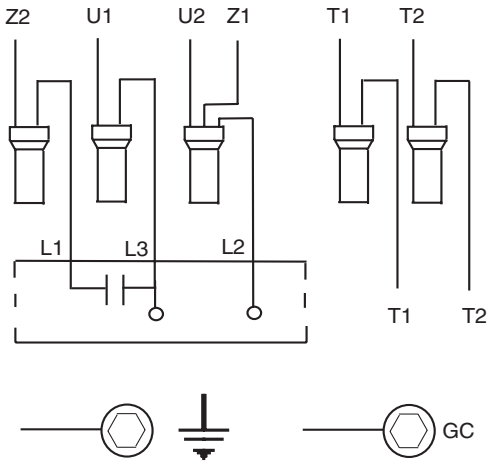
3 phase 6 lead stator, Y



3 phase 6 lead stator, Δ



1 phase, 4 lead stator



Monitoring equipment

Make sure that the monitoring equipment incorporated in the product is correctly connected.

Leakage detectors FLS

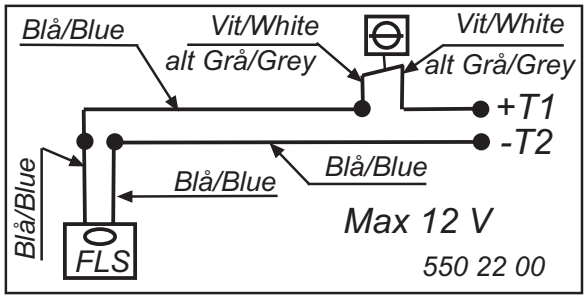
The FLS sensor consists of a small float switch for sensing water in the junction casing and stator casing.

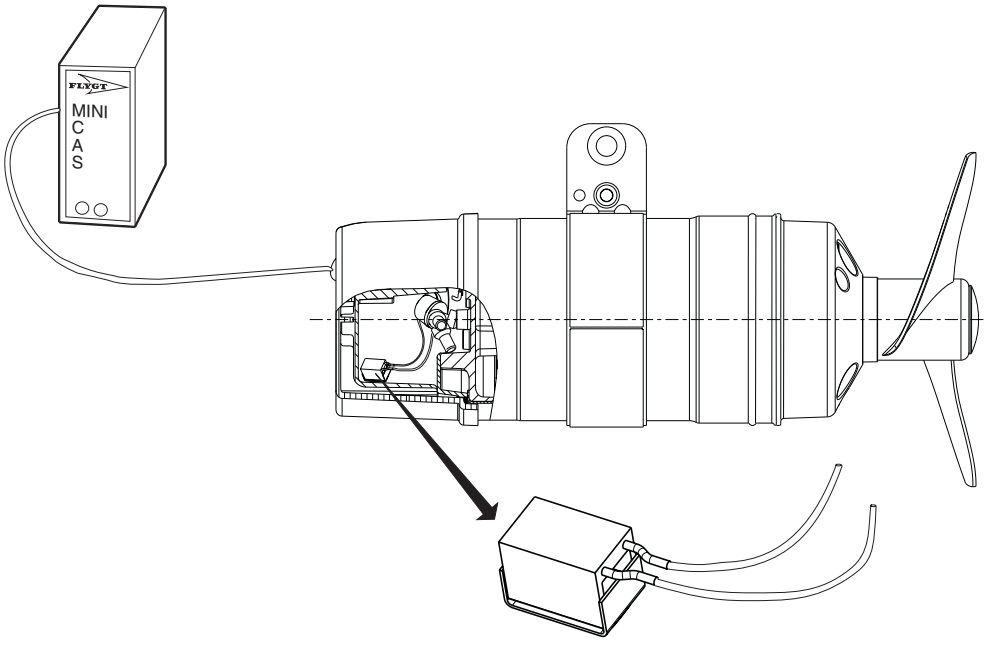
The FLS sensor is installed in the bottom of the junction casing.

The signal is fully compatible with MiniCas.

NOTE! In order to function properly the mixer can be positioned up to ± 30° vertical angle.

NOTE! FM approved mixers must be provided with FLS due the approval.





OPERATION

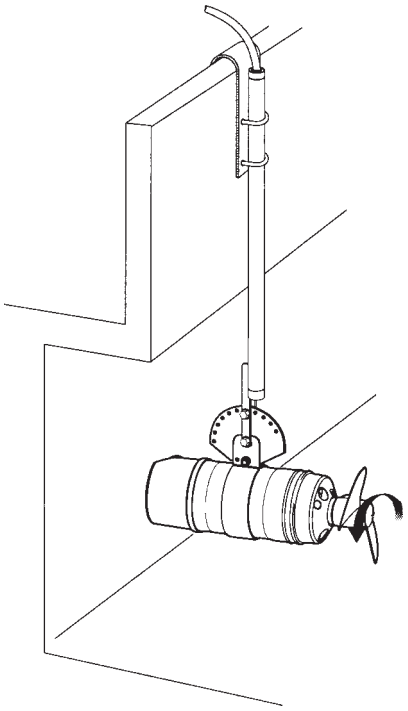
Before starting

Check the seal casing, the mixer is not allowed to work without liquid/a dry seal casing.

Remove the fuses or open the circuit breaker and check that the propeller can be rotated by hand.

Check that the cable entry is securely tightened.

Check that the monitoring equipment (if any) works.



Check the direction of rotation. See the figure. The propeller should rotate clockwise, as viewed from the motor side.

The machine shall be fixed to the guide bar during test.

Watch out for the propeller and for the starting jerk, which can be powerful.

During operation

Watch out for the propeller in rotation.

The mixer is intended to operate with or without a jet ring, according to its main application area. Operating without jet ring means that strict care must be observed at test starting and in operation.

Test-run the mixer and note the current surge during start-up. At the instant of starting, it is normal for the current to exceed the operating current by 10—20 % for a few seconds. The steady-state current should be less than the rated current.

Excessive current consumption may be caused by high viscosity or density of the liquid or an improperly adjusted mixer.

Check that the mixer does not vibrate. Vibration can occur when mixing is too vigorous in a small tank volume, or when the inflow or outflow of liquid is impaired, by damaged and unbalanced propellers or by air sucked down by the propeller.

Vibration can also occur due to interference between several mixers.

For another operating direction for the mixer, contact Flygt.

In continuous operation, air must not be drawn down by the propeller (a vortex may not form).

NOTE!
In order to avoid overheating the machine, it must alvays work comletely surmerged in the liquid.

CARE AND MAINTENANCE

Safety precautions

Before starting work on the machine, make sure that the machine is isolated from the power supply and cannot be energized.

This applies to the control circuit as well.

To prevent injury watch out for damaged and worn parts.

NOTE! This applies to the control circuit as well.

The following points are important in connection with work on the machine:

— make sure that the machine has been thoroughly cleaned.

— observe good personal hygiene.

— beware of risk of infection.

— follow local safety regulations.

The mixer is designed for use in liquids which can be hazardous to health. In order to prevent injury to the eyes and skin, observe the following points when working on the machine:

— always wear goggles and rubber gloves.

— rinse the mixer thoroughly with clean water before starting work.

— rinse the components in water after disassembly.

— hold a rag over the seal housing screw when removing it. Otherwise, pressure that may have built up in the mixer due to leakage of liquid into the mixer may cause splatter into the eyes or onto the skin.

Proceed as follows if you get hazardous chemicals in your eyes:

— rinse immediately in running water for 15 minutes. Hold your eyelids apart with your fingers.

— contact an eye doctor.

on your skin:

— remove contaminated clothes.

— wash skin with soap and water.

— seek medical attention if required.

Make sure that the machine (or parts of the machine) can't roll or fall over and injure people or damage property.

In some installations, the machine surface and the surrounding liquid may be hot. Bear in mind the risk of burn injures.

Service

Ex version!

All work on the explosion-proof motor section must be performed by personnel authorized by Flygt.

Do not open the mixer when energized or in explosive gas atmosphere

Inspections and service intervals

Regular inspection and preventive maintenance ensure more reliable operation. The maintenance schedule below gives the recommended period of time when the machine should pass inspection and major overhaul.

The maintenance schedule is divided into two groups A and B, depending on wear and temperature.

Group	Wear/Temperature	Inspection	Major overhaul
A	• None or moderate/ 40°C (104°F)	Every 8000 hours or once a year	Once every five years or every 50 000 hours
B	• None or moderate/ 40°C - 90°C (104°F-194°F) • Heavy 40°C (104°F) • Csb inner seal	Every 4000 hours or twice a year	Once every two years or every 20 000 hours or when inspection indicates.

Major overhaul of the mixer should be made in a service workshop.

Tendency to clog can easily be observed by means of an ampere meter.

NOTE! Check the propeller. If the propeller is hard worn and has a uneven leading edge, the motor can be overloaded, because of clogging.

Inspection

Inspection involves that the following will be checked and measured if required;

— replacement of all worn components.
— check all screw connections.
— check quantity and condition of the oil.
— check if there is liquid in the inspection chamber.
— check the cable entry and condition of the cable.
— functional check of the start equipment.
— functional check of monitoring equipment.
— check of direction of rotation.
— check the lifting device and guide bars (clearance and wear).
— check of electrical insulation.
— replace all O-rings which were removed for inspection.
— check and rinse the space around the seals. See also “Recommended inspection”

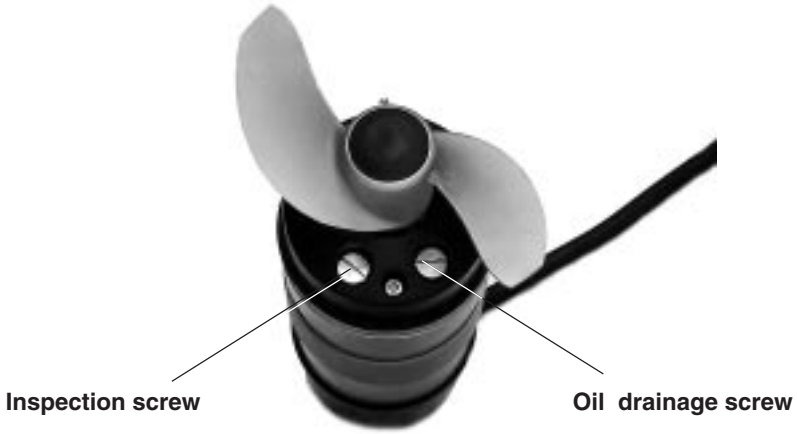
Major overhaul
This requires special tools and should be done by an authorized service shop. Workshop overhaul involves, in addition to the inspection, the following:

— replacement of bearing.
— replacement of shaft seal.
— replacement of oil.
— replacement of O-rings.
— replacement of seals in cable entry and moving the entry position of the cable.
— replacement of cable.

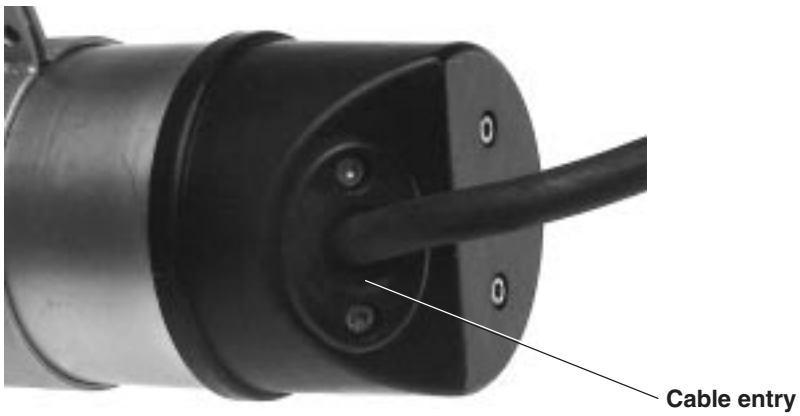
Service contract

Flygt or its agent normally offers service agreements in accordance with a preventive maintenance plan. For further information, please contact your Flygt representative.

Recommended inspections

Inspection of	Action
Visible parts on mixer and installation	Replace or fix worn and damaged parts. Make sure that all screws, bolts and nuts are tight. Check the condition of lifting device/lifting eyes, chains and wires. Check that the guide bar is vertical. Replace worn parts if they impair function.
Oil quantity	 **WARNING.** If the seal leaks, the oil housing may be under pressure. Hold a rag over the barroer fluid screw in order to prevent splatter. See “Safety precautions” for additional information.  **Inspection screw** **Oil drainage screw** Check the oil housing, the mixer is not allowed to work without oil/a dry oil housing. Check the conditions of the oil in the oil housing, if the oil is much miscoloured or mainly contains the ambient liquid, change the oil. Run the mixer 8000 h or one year, check the oil, and if it contains too much from the ambient liquid again, the fault may be; — that the plug-in seal is defect. Contact a Flygt service shop
Inspection chamber	Unscrew the inspection screw and check if there is liquid in the inspection casing. If leakage has filled the inspection casing the fault may be: — that the plug-in seal is damaged. Contact a Flygt service shop.

Inspection of	Action

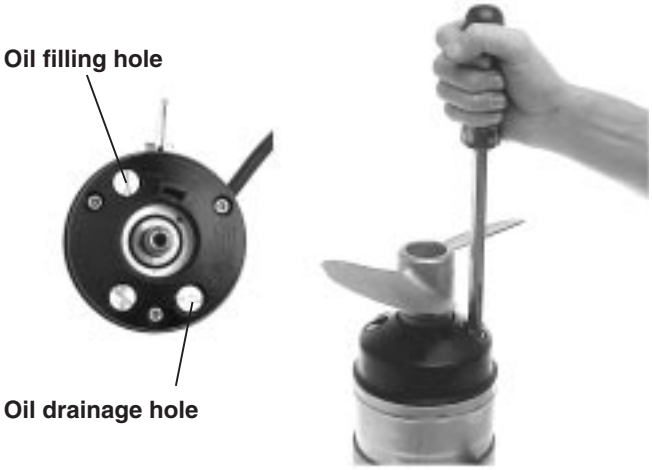


Cable entry	Make sure that the cable entry is tight. If the cable entry leaks: — check that the entry is tightened and forms an effective seal. — cut a piece of the cable off so that the seal sleeve seals onto a new position on the cable. — replace the seal sleeves. — check that the gasket, seal sleeves and the washers, conform to the outside diameter of the cable.
Cable	Replace the cable if the outer sheath is damaged. Make sure that the cables do not have any sharp bends and are not pinched.
Starter equipment	If the starter equipment is faulty, contact an electrician.
Monitoring equipment (should be checked often)	Follow the instructions for monitoring equipment. Check: — signals and tripping function. — that relays, lamps, fuses and connections are intact. Replace defective equipment.
Rotation direction of mixer (requires voltage)	Transpose two phase leads if the propeller does not rotate clockwise as viewed from the motor side. Rotation in the wrong direction reduces the capacity of the mixer and the motor may be overloaded. Check the direction of rotation every time the mixer is reconnected.
Insulation resistance in the stator	Use an insulation tester. With a 1000 V-DC megger the insulation between the phases and between any phase and earth (ground) should **not be less** than 1 MΩ.

Changing the oil

Oil drainage

The barrier fluid casing may be under pressure. Hold a rag over the barrier fluid plug to prevent splatter.



Unscrew the two oil screws.
Hold the mixer over a cup and allow the oil to run out.

Oil refill

Fill up with new oil in the oil filling hole, the mixer should be in a vertical position. Always replace the O-rings of the barrier fluid hole screws.
Put the screws back and tighten them. Tightening torque **10 Nm (7.4 ft lb)**.

Recommended barrier fluid quantities for the mixers 4610 and 4620 is **15 centiliters**.

Oil

We recommend that Mobil Whiterex or Shell Ondina, with viscosity class ISO VG15 to 32, be used.

In media where paraffin oil is not required, a mineral oil, i.e. compressor oil or hydraulic oil with (the same) viscosity class VG15 to 32, should be used. Regular motor oil, e.g. SAE 5(W) up to SAE 25(W) can also be used.

The machine is delivered from factory with this type of oil, a tasteless and odourless paraffin oil suitable for raw or clean-water applications.

This oil is authorized according to FDA 172.878, (FDA = Food and Drug Administration authority in US).

Replacing the propeller

Removing the propeller

Worn propeller can have very sharp edges.
Use protective gloves!

Remove the protective cover.

Insert an M8 Allen key into the hub screw and remove the propeller screw.

Lift off the propeller.

Installing the propeller

Make sure that the end of the shaft is clean and free of burrs. Polish off any flaws with fine emery cloth.
Grease the end of the shaft and the propeller hub.

Check that the seal ring is correctly positioned.

Lift the propeller onto the shaft.

Fit the washer onto the screw. Fit the unit and tighten. Tightening torque 17 Nm.

Mount the protect cover.

Check that the propeller can be rotated by hand.

Fault Tracing (Troubleshooting)

A universal instrument (VOM), a test lamp (continuity tester) and a wiring diagram are required in order to carry out fault tracing on the electrical equipment.

Fault tracing should be done with the power supply disconnected and locked off, except for those checks which cannot be performed without voltage.

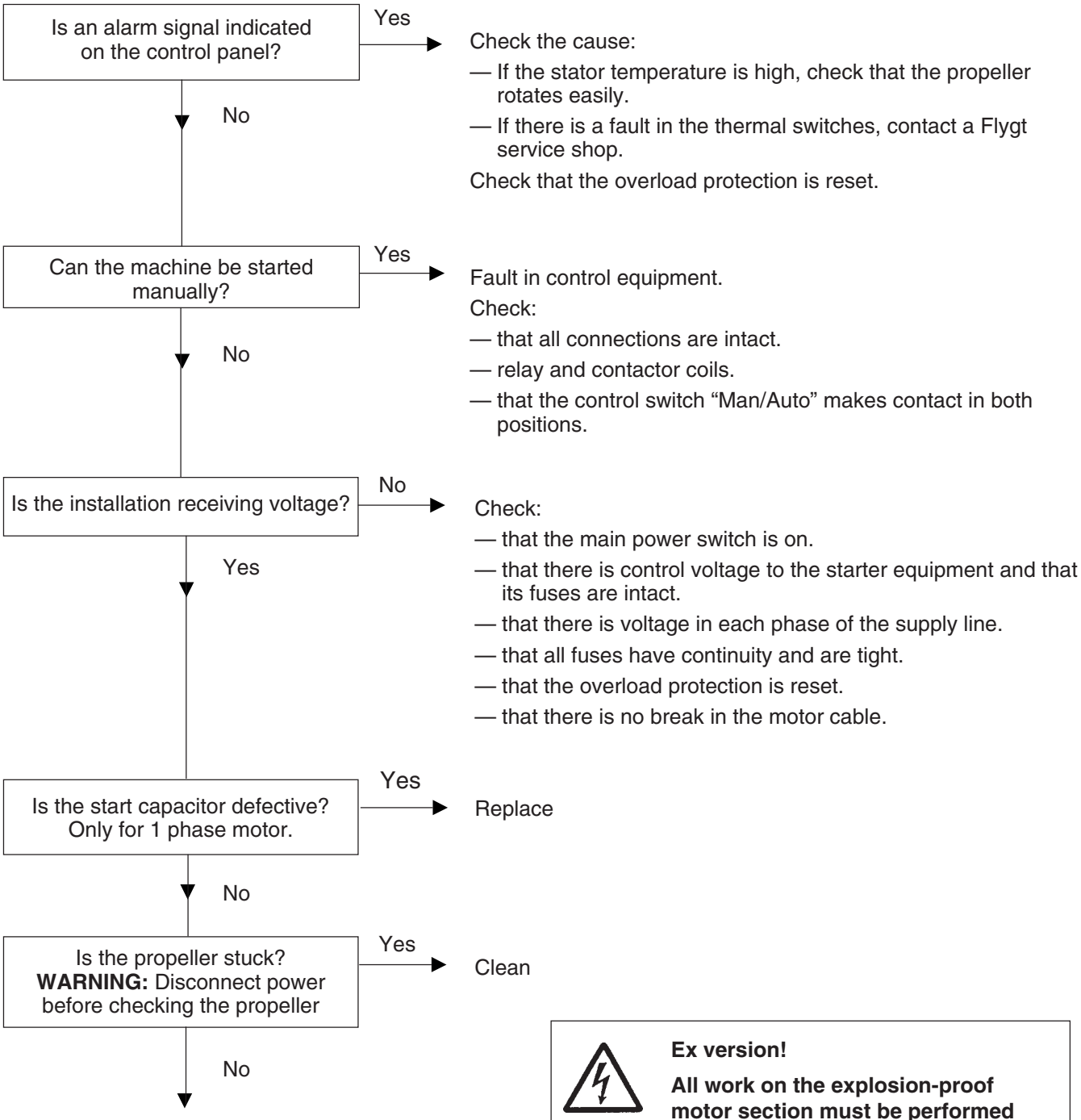
Always make sure that there is no one near the machine when the power supply is turned on.

Use the following checklist as an aid to fault tracing. It is assumed that the mixer and installation have formerly functioned satisfactorily.

Electrical work should be performed by an authorized electrician.

Follow local safety regulations and observe recommended safety precautions.

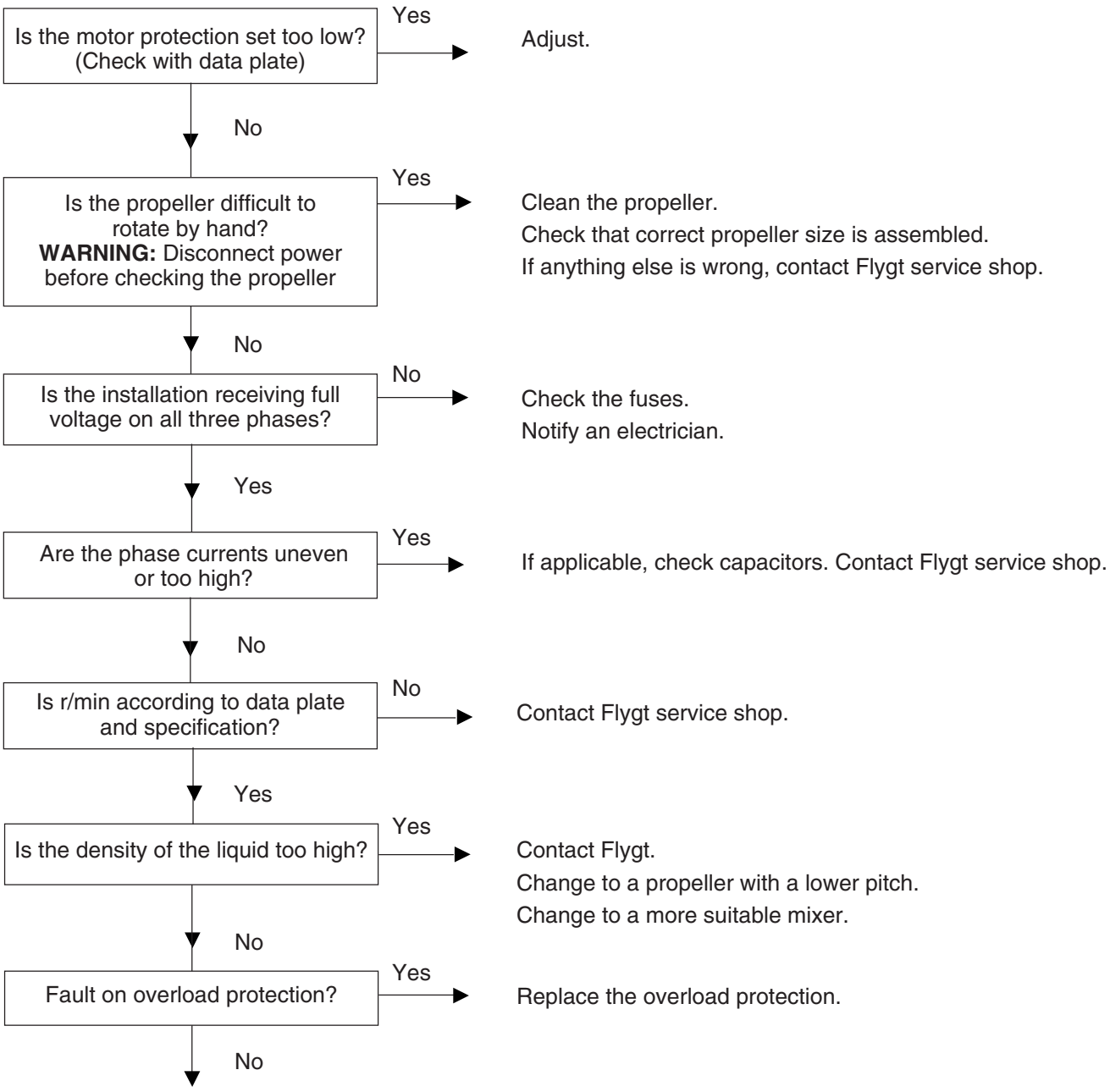
1.The machine fails to start



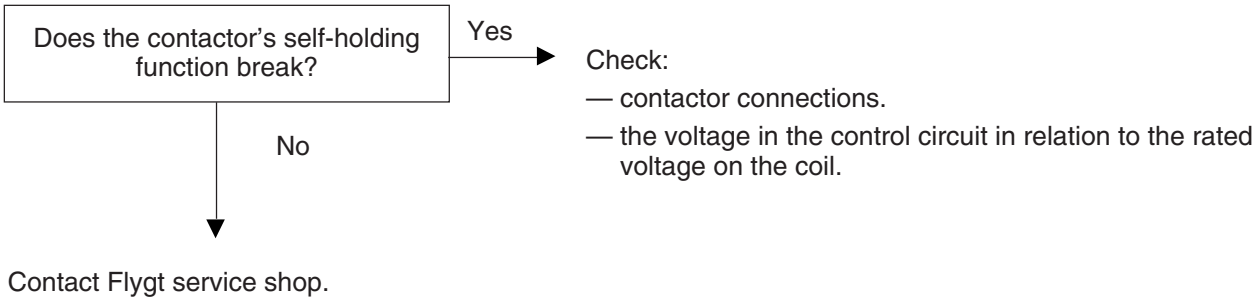
Ex version!

All work on the explosion-proof motor section must be performed by personnel authorized by Flygt.

2.The machine starts but motor protection trips



3.The machine starts-stops-starts in rapid sequence



Do not override the motor protection repeatedly if it has tripped.

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