

When the Product need to be Stirred

LKR-5 Agitator

Application

Agitator LKR-5 is used in tanks or vessels where the product requires mixing or stirring.

LKR-5 is intended for horizontal installation into the tanks or vessels. LKR-5 is used in process and storage tanks in the food processing industry, dairies, breweries and in the chemical industry.

Standard design

Agitator LKR-5 is fitted with a standard motor and the agitator shaft is directly coupled to the motor shaft. There is a bracket and a front plate between the motor and the welding flange. The welding flange is designed for welding into the tank.

The joint between the front plate and mating flange is fitted with an O-ring which acts as a sanitary seal. The shaft seal is fitted on the product side and is replaceable as a complete unit. The propeller shaft is in solid steel and is fitted onto the motor shaft by means of a compression ring which is adjusted to the correct tension during assembly before delivery. The propeller is a 3-bladed type, statically and dynamically balanced.

The standard motor is suitable for operating in humid conditions. The motor is protected by a stainless steel shroud as standard.

Note! The agitator has to be installed horizontally and perpendicular to the tank. For further details, please see IM70790.

Materials

Product wetted steel parts: Stainless steel 1.4301 (304) or acid-resistant steel 1.4404 (316L).

Other steel parts: Stainless steel 1.4301(304).

Product wetted seals: EPDM rubber.

Shaft seal (spring loaded)

Bellows: EPDM rubber.

Rotating seal ring: Carbon.

Stationary seal ring: Silicon Carbide.

Finish, steel parts: Semi-bright.

Motor and bracket: Painted.



Fig. 1. Agitator LKR-5 with shroud.

Motor

Standard flanged motor acc. to IEC metric standard IP55 (with drain holes with labyrinth plug), insulation class F.

Voltage and frequency for standard motor

3~, 50 Hz, 220-240VΔ/380-420VY	≤ 2.2 kW
3~, 60 Hz, 250-280VΔ/440-480VY	≤ 3 kW
3~, 50 Hz, 380-420VΔ/660-690VY	≥ 3 kW
3~, 60 Hz, 440-480VΔ	≥ 4 kW

Motor size

50Hz: 1.5, 2.2, 3.0, 4.0, 5.5, 7.5 kW.

60Hz: 1.75, 2.5, 3.5, 4.6, 6.3, 8.6 kW.

Selection of LKR-5

Calculation for low viscous products (max. 100 cP - eg. milk, juice, wine etc.):

$$Q = V/Q$$

V = Liquid volume of tank (m³)
 Q = Flow of LKR-5 (m³/min)

Normal agitating time

Agitating: 5-10 min.
 Mixing: 1-2 min.

Installation advice

- Min. distance between agitator and tank bottom: 2 x propeller diameter.
- Max. height of silo tanks: H < 3 x tank diameter.
 If H > 3 x tank diameter, use 2 agitators, one of which is to be placed half way up the tank - note that both agitators are to be placed on the same side.
- Protect the agitator against dry run.
- Select rubber and shaft seal, depending on product/ CIP.

Calculation of change in rpm and impeller diameter

Change in rpm (n):

$$Q_2 = Q_1 \times \frac{n_2}{n_1}$$

$$P_2 = P_1 \times \left[\frac{n_2}{n_1} \right]^3$$

Change in impeller diameter (D):

$$Q_2 = Q_1 \times \left[\frac{D_2}{D_1} \right]^2$$

$$P_2 = P_1 \times \left[\frac{D_2}{D_1} \right]^5$$

Basic agitator calculations

Flow capacity:

$$Q = C_1 \times n \times D^2 \times S$$

Power required:

$$P = C_2 \times r \times n^3 \times D^5 \quad (\text{turbulent flow})$$

- Q = Agitator flow (m³/min)
- P = Power (kW)
- n = Revolution (rpm)
- D = Propeller diameter (m)
- S = Propeller pitch (m)
- r = Density (Kg/m³)
- C₁/C₂ = Factor specific for the propeller

Technical data

Propeller size diam. (mm)	Rev. (rpm)	Motor (kW)	Max. current at 380 V (A)	Measured current at 380 V (A)	Max. static pressure	Max temp. seal: EPDM (° C)	Max temp. seal: Nitril (NBR) (° C)	Max. temp. seal: Flourinated rubber FPM (° C)	Q (m ³ /min.)	c _m (m/sec.)	Weight (kg)
200	950	1.5	4.1	2.7	500 kPa 5 bar	120	90	135	4.5	3.1	30
200	1430	2.2	4.96	4.8					6.8	4.7	28
200	1430	3.0	6.61	5.0					6.8	4.7	31
250	940	2.2	5.4	4.7					8.5	3.8	56
250	960	3.0	7.1	6.0					8.5	3.8	69
250	960	4.0	8.9	6.0					8.5	3.8	76
250	1450	5.5	11.5	10.0					13.5	5.9	70
250	1450	7.5	15.3	10.0					13.5	5.9	78
300	720	3.0	7.8	7.0					11.5	3.5	80
300	960	5.5	12.2	11.0					15.0	4.2	80

The data is valid for agitation in water (20° C) and for 50 Hz only.

Q - Theoretical mixing capacity.

c_m - Theoretical jet velocity on the delivery side of the propeller.

Note! At 60 Hz the rpm will be increased with 20% and need more power (kW). Contact Alfa Laval for advice.

Note! It is recommended to turn the terminal box downwards. Please weld-in the flange accordingly.

Note! For further details, see also PD 65036.

Dimensions (mm)

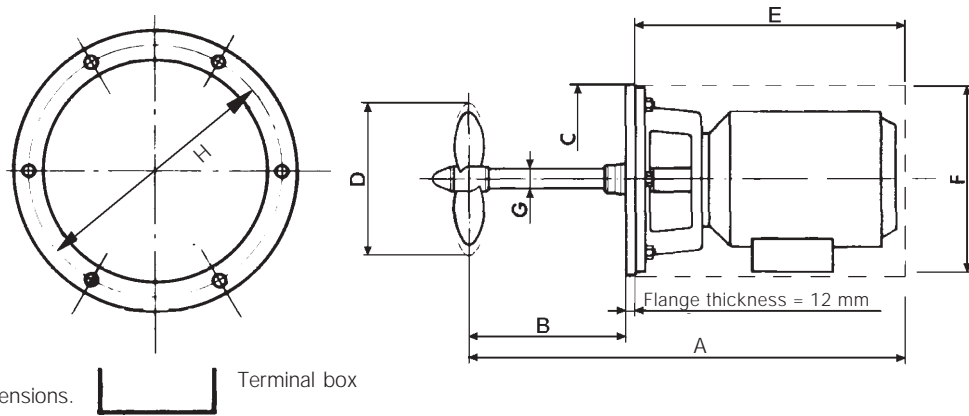


Fig. 2. Dimensions.

Dimensions (mm)

Prop.size(D)	200	250	250 (940rpm/2.2kW)	300
A*	622	837	714	837
B	200	300	250	300
C	260	330	330	330
E*	410	525	452	525
F*	234	304	304	304
G	30	35	30	35
H	200	270	270	270
Thread	M 10	M 12	M 12	M 12
Weight	30	70	56	80

* Agitator fitted with shroud.

Options

- A) Supplied without shroud.
- B) Motors for other voltage or frequency.
- C) Other shaft seal combinations and other product wetted rubber types:
 - Shaft seal carbon/silicon carbide/NBR rubber.
 - Shaft seal carbon/silicon carbide/FPM rubber.
 - Shaft seal silicon carbide/silicon carbide/EPDM rubber.
 - Shaft seal silicon carbide/silicon carbide/NBR rubber.
 - Shaft seal silicon carbide/silicon carbide/FPM rubber.

Ordering

Please state the following when ordering:

- Agitator type LKR-5.
- Propeller diameter.
- Motor power and speed.
- Options.