

# HANWA KAKOKI CO., LTD.

# INSTRUCTION MANUAL

## HANWA ELECTRIC STIRRER Top Side Entering Mixer Series

The present agitator shall never be operated idly.  
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CAT.NO.ET-H1003-2

<b>PRECAUTION FOR SAFETY OPERATION OF STIRRER</b>	
	<p>Never fail to read through this precaution before using (installing, operating, maintenance and check or inspection) the present machine in order to be operated correctly and safely.</p> <p>The safety precaution here is categorized into “DANGER” and “WARNING”, both of which shall be considered fully and be followed properly.</p> <p>◇ DANGER : Refers to the case, if mishandled, where the operator or staff might be killed or seriously injured.</p> <p>△ WARNING: Refers to the case, if mishandled, where the operator or staff might be injured not seriously but slightly or severer, or material damage exclusively will be caused.</p>

◇ DANGER!	<p>Installation, wiring, operation, maintenance, inspection or the like of the present stirrer shall be carried out by a person with specialized technical knowledge. Otherwise, electric shock, a fire or abnormal operation might be caused resulting in human injury.</p> <p>Never fail to turn off the power supply when making some inspection or repair. The stirrer might be started to cause personal injury.</p> <p>Never get close to nor touch the rotating part of the machine while running. You might be caught in a machine.</p> <p>If lifted the machine for transport or the like, never stand under it. You might be crushed by the fallen machine.</p> <p>If cut off the electricity, turn off the power source without fail. Otherwise, current applied unexpectedly might cause electric shock, injury or damage of the equipment.</p>
△ WARNING!	<p>Make sure, when delivered the machine, it is exactly as the one you have ordered. If installed the machine wrongly delivered, the staff might be injured or the machine itself might be damaged.</p> <p>Never place your fingers nor some other materials at the opening of the stirrer ; you might be injured or the machine will be damaged.</p> <p>Any revamping made by the customers is out of the scope of our guarantee and responsibility.</p> <p>Never carry our overload operation. If operated at rated load or more, the motor may be heated to be burnt out and then to cause a fire.</p> <p>Never get on nor hang from the agitating shaft or the wing of the stirrer. You might be injured.</p> <p>If caused any trouble(s), stop the operation immediately. Otherwise, you might suffer from electric shock, injury or a fire.</p>

As for the safety cautions related to driving mechanism such as the speed changer or reducer, geared motor or motor, refer, without fail, to the attached Instruction Manuals before starting up.

Thank you very much for purchasing HANWA's Stirrer.

The company has manufactured the present stirrer with its greatest care so as to provide its customers with safe and efficient equipment. Please read through this instruction manual before and when utilizing the machine in order to guard against unexpected accident to be caused by mishandling. Keep this manual carefully for your reference at any time.

### 1. ACCEPTANCE (INSPECTION)

When delivered the stirrer to yours, make sure first ;

The stirrer delivered is precisely the same as the ordered one in model, standard, dimensions or size, or number.

△ WARNING If installed wrong equipment, you might be injured or suffer from damage on the machine.

There is no damage to respective components or parts, especially to the main body, agitating shaft, stirrer wings, and check respective bolts and nuts of the stirrer for looseness.

When ordered spare parts, accessories or the like, make sure there are all of them delivered. If there is any inconvenience or shortage, please inform us or our selling agent of such defectiveness.

### 2. SAFEKEEPING

When not used the stirrer immediately after delivered, store the machine taking care of the following points.

Do not store the machine outdoor or in a place where the stirrer would be exposed to humidity, temperature to be varied abruptly or corrosive gases.

Please keep the equipment indoor and clean dry spot.

The storage period shall not exceed one year. If stored for more than one year, please ask us especially.

### 3. TRANSPORT

◇ DANGER ! When lifted the machine for transport, never stand under it. If fallen the machine, it would hurt seriously the staff involved in such accident..

△ WARNING ! When transporting, care shall be taken fully not to be hurt by the machine fallen down or over unexpectedly. If the stirrer main body is equipped

with lifting lug, never fail to utilize such a lug.

#### 4. INSTALLATION

##### (1) Cautions before installation

- ① The installation mount for the stirrer shall be perfectly horizontal. Otherwise, the stirrer or agitating shaft will be leaned in revolution, which is to generate oscillation and then to cause some failure. Never fail to confirm the level.
- ② Check the installation surface of the stirrer for distortion, or mark or trace left by hitting. If the surface is not completely flat, please correct or process the surface.
- ③ The stirring wings and agitating shaft are examined when delivered and shall not be transported roughly nor used as support for some other materials before installation.

As for the agitating shaft bent or stirring wings damaged due to a rough handling, we will not be responsible. Please be careful not to cause such damages.

- ④ Never use the agitating shaft or stirring wings as a ladder or a stepladder on which you step when going in and out of the tank under construction at site.
- ⑤ When using or handling agitating shaft equipped with rubber-lined or other type of lined stirring wings, use soft material like nylon sling or equivalent without fail not to hurt the lined surface.

When lifting, never fail to use two strings and never make one-string lifting.

##### (2) Installation

Installation of the stirrer is to be varied in accordance with the site where to set on, indoor, outdoor, or the conditions. Most of the large-sized stirrers are to be installed by means of a wrecker or chain blocks. In case where agitating shaft diameter is large and heavy hard to be supported by human being, wrecker, a two car truck or a crane shall be used.

- ① In case where the indoor space has a ceiling high enough to install the stirrer with wings fixed to the agitating shaft whose diameter is to be inserted through the installation base or the frame, the wings shall be set firmly first of all and then follow the procedure given below ④. This is the easiest way.
- ② **In case of outdoor tank**, both of the agitating shaft and the stirrer wings shall be set completely to the main body out side of the tank to be lifted by a wrecker or the like. If put through installation base or the frame ID, refer to the procedure

shown below ④.

③ If the stirrer wings having the shape of paddle plate whose diameter is too large to be set and therefore to be inserted, the stirrer wings shall be set first to the tank base through another manhole or nozzle hole. Then install both the stirrer wings and the main body according to the instructions given below in ④. After installing both of them, go into the tank and to set firmly at the concave of the set bolt of the agitating shaft.

④ Usual installation procedure of the agitating shaft with shaft coupling is as follows;

a) If the agitating shaft is thick and long, use two ropes (nylon sling are more preferable than wire ropes) to hang one of them on the root of the agitating shaft on the shaft coupling side and the other on the part around upper stirrer wings fitting point of the agitating shaft so as to be parallel each other as shown below. Lift the agitating shaft horizontally up to the point where the shaft can be put up vertically and then loosen gradually the rope hung on the part around upper stirrer wings fitting point of the agitating shaft to lower the agitating shaft so as to be put up almost vertically and then take off the rope on the wing side.

Special care shall be taken to keep enough space between the stirrer and the ground till the stirrer is installed completely and not to handle the shaft roughly dragging it on the ground or arching it.

Otherwise, rubber lined surface, especially, will be peeled off the agitating Shaft, which shall be covered with used blanket or the like during the careful installation work.

b) Make sure tank stirrer installing base is horizontal and place sheet packing on the pipe base especially if it is the case. Place two rectangular lumbers (A) and (B) (75m/m × 100~200m/m approx.) as shown below and then put the agitating shaft described above in a) slowly into the tank to set immediately under the shaft coupling tentatively between the two rectangular lumbers.

c) As for the stirrer main body installation, lift it vertically by a rope to fix tentatively the coupling on the main body slowly with bolts taking care of the joint of the spigot. Lift up the whole stirrer gradually, take off the said rectangular lumbers, fasten the bolt described above firmly, and then put

down the stirrer slowly to be installed to the base with set bolts placing sheet packing between the tank base and the main body base (make sure the material of SUS).

i) Cautions immediately before the joint of coupling

If there is any flaw or hit mark on both sides of the coupling or the stirrer side and the agitating shaft side, correct and remove it by file and check the surface carefully for foreign materials stuck. Then clamp the set bolts firmly so as to fit completely without any clearance between (which might cause shaft oscillation).

After completed the joint, if possible, make sure with clearance gauge.

ii) As for the sling fitting, use safety and strong one taking into consideration the weight of the stirrer to be lifted up so as to realize safe work under it.

a : Nylon Sling or Wire    b : Wire    c : Gasket Packing    d : Rectangular Lumbers    e : Fig (A) Fig (B)

⑤ Make Sure of Agitating Shaft Oscillation

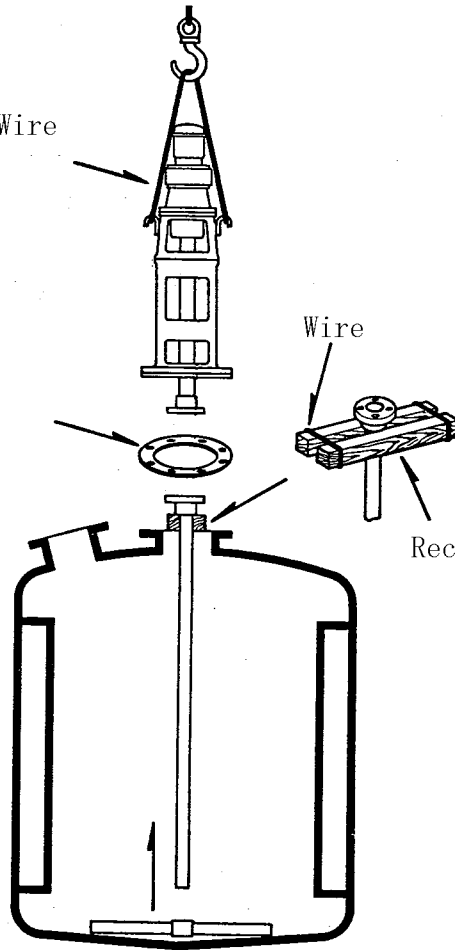
The installation work is finished with the procedure ④ above mentioned. However, it is necessary to make sure of the oscillation in the agitating shaft after fixed the stirrer to the tank. First of all, rotate the shaft by hand (in case of driving system equipped with cycle speed reducer, take off the top cover of the fan and rotate the shaft by hand) to make sure visually there is no trouble. In case of the rubber-lined one or the like, special care shall be taken (because of the stirrer wings welded to be fixed).

⑥ When fitting the one with ground packing and mechanical seal, carry out all the works carefully not to hurt the seal and set completely before installing according to the procedure above described.

⑦ After installed the tank, clean it without fail both inside and outside. If there is any foreign matters twining round the agitating shaft and the stirrer wings, such foreign materials will wind round the shaft in the liquid resulting in lost balance to cause broken or bent shaft; take them off completely if any. Never put anything on the top of or around the tank to be kept clean at any time so as not to leave fall foreign materials.

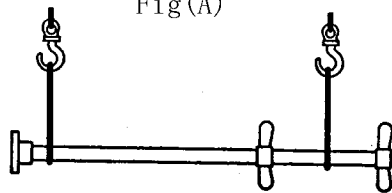
⑧ As for the procedure to take off the stirrer, do it precisely in the opposite order of

Nylon Sling or Wire



Rectangular lumbers

Fig(A)



the installation described here.

## 5. WIRING

The connection for the electrically powered equipment shall be made so as to allow the stirrer wings to rotate “in the direction indicated with arrow on the Name Plate of the stirrer main body”. When doing wiring work, make sure without fail the rated current of the equipment and never fail to place the wire from the power source being water-resistant of cap tire cable or the like with ampere capacity over the standard. Carry out the wiring and grounding for the power supply to the equipment correctly according to Electrical Equipment Technical Standard and Extension Standard.

Never allow a person unauthorized or unqualified to do the wiring and grounding work, which is an illegal and dangerous action.

Fault current breaker and protector against overload are to be equipped according to laws and regulation for the prevention of electric shock and a fire.

## 6. OPERATION

### 6-1 ) Cautions before Start-up

- (1) First make sure the tank and its frame are fixed firmly without any “oscillation” nor “shake”. If the tank is unstable or the frame is not strong, the resonance might cause bent agitating shaft or serious failure, which shall be avoided by all means.
- (2) Make sure the stirrer fitting bolts are fastened firmly and completely.
- (3) Generally speaking, as for the type of oil lubricating, oil might be leaked during the transport. Therefore, when delivered, there is no oil in the equipment. Please fill it as provided before starting the machine.
- (4) For the rotation check by hand, take off the fan cover of the motor, and rotate the stirrer wings by hand to make sure it is rotated normally and without shake of the shaft as well as checking for foreign materials cushioning in the tank.
- (5) Make sure the wiring for the electric system is placed correctly and properly.
- (6) Turn on the power source by inching to make sure the agitating shaft is rotating in direction as planned. At this moment, except idling permitted model, the liquid level shall be up to the top of the stirrer wings in the tank.

### 6-2 ) Cautions during Operation

- (1) As for the model prohibited to idling operation, it is indispensable for the failure



prevention to fill the tank with liquid so as to soak the stirrer wings during the operation in order to prevent failure. If kept idling for a long time, the agitating

shaft is to suffer imbalance load and be bent by larger oscillation resulting in failure which shall be avoided by all means.

- (2) Make idle operation by filling the tank with liquid filled up to the usual level for one or two minutes to make sure of the oscillation on the main body and abnormal noise or sound. If there is no failure nor inconvenience, start normal operation to make sure of the stirring capacity.

Never touch the stirrer while it is working because it is too dangerous.

In case of checkout, never fail to turn off the power supply to top the equipment before carrying out the work.

- (3) If the viscosity of the liquid is increased or different from the one indicated in the contract, overload operation might be the result; take care and inform us of the situation.

- (4) If inserted by mistake larger solids or foreign matters in the tank, stop the operation immediately to take off such materials and then make sure there is no trouble in the agitating shaft or stirrer wings before starting again the stirrer. Otherwise, the shaft might be bent and broken to cause failure.

- (5) The present machine is the stirrer to be used under the specifications agreed by the contract and therefore the customers shall not change in form nor in shape of the shaft and the wings.

If necessary to change them, due to any conditions or the like changed after contracted, never fail to inform us of such necessity. In case the customer change them without our authorization, we will not be responsible for the accident because of such revamping.

## 7. MAINTENANCE

### 7-1 ) Daily Inspection

It is indispensable to realize daily checkout in order to keep utilizing the stirrer normally. If neglected such inspections as listed below, some troubles or serious accident will be caused. Never fail to check the stirrer every day.

When carrying out inspection, never fail to turn off the power supply at the main switch to make sure the machine is stopped and then check this.

	CHECKPOINTS	CONFIRMATION AND CHECKOUT
①	LOAD	The current is the same as the description as rated on the Name Plate or under.
②	NOISE	Check bearing, gear, motor, speed reducer or the like for abnormal noise or sudden change.
③	OSCILLATION	Check the stirrer main body for abnormal oscillation or sudden change.
④	SURFACE TEMPERATURE	Check bearing, gear, motor, speed reducer/changer or the like for abnormal temperature rise or sudden change.
⑤	LOOSENED SET BOLTS	Check respective set bolts of the stirrer for looseness.
⑥	LUBRICANT AMOUNT if specified	Make sure oil level is at the upper red line of the oil gauge while the machine is not working.
⑦	LUBRICANT LEAKAGE	Check bearing, gear case, speed reducer/changer or the like for grease or oil leakage.
⑧	WEAR AND LOOSENESS (V-belt specified type)	Check V-belt for wear. For looseness as well.

If found any trouble in daily inspection, take countermeasure according to “Causes of Failure and Troubleshooting”.

#### 7-2 ) Lubricant List Recommended by HANWA (for Stirrer Main Body)

Never fail to use the lubricating oil recommended by HANWA listed below.

OIL COMPANY	Bearing Grease (JIS: 3 types of grease for antifriction bearing)
COSMO	Cosmo Dinamax EP No.2
SHOWA SHELL	Albania Grease No.2
IDEMITSU	Duffny Colonex Grease No. 2
ESSO	Listan No.2
JAPAN ENERGY	Rizonix Grease No.2
GENERAL	Zemico Grease No.2
NIPPON OIL	Multinox Grease No.2
MITSUBISHI	Diamond Multipurpose Grease No.2
MOVIL	Movilux EP No.2

The bearing component and the bearing case of the stirrer main body shall be supplied with grease above listed to the grease nipple every 4 (four) to 8 (eight) months. The other parts are equipped with oilless bearing and need not to be lubricated.

Grease application is a dangerous work and never fail to make sure the stirrer is stopped before oiling.

As for the recommended lubricants for driving system of the speed reducer/changer, refer to “Instruction Manual” for the makers provided separately (initial filling and oiling shall be made by the customers).

### 7-3) Consumables

It is indispensable to replace consumables with new ones in order to keep normal operation of the stirrer. Replace parts under the conditions described hereinafter or at the recommended interval.

CONSUMABLES	STANDARD	RECOMMENDED INTERVAL
BEARING	If heard and found abnormal noise, grease leakage or at overhaul	Every two years
V-BELT (if specified)	If belt is worn excessively or at overhaul	Every one or two years
GROUND PACKING	If not stopped leakage even if tightened	Every half or one year
OIL SEAL	At overhaul	Every two years
MECHANICAL SEAL	If found leakage, at overhaul, check it and replace with new spare parts preferably	Every two to five years
BEARING METAL AT TANK BOTTOM	When oscillation gets stronger or at overhaul, check and replace if worn heavily	Every one to two years

### 8. CAUSES OF FAILURE AND TROUBLESHOOTING

As for the points listed below are for general troubles on standard model and other troubles not listed here shall be informed to us.

TROUBLE	CAUSES	TROUBLESHOOTING
Motor will not work	?Starting conditions on control panel are not satisfied. ?Motor is out of order. ?There is some trouble in power supply. ?Seizing at sliding part of the motor, speed reducer and/and the main body. ?Foreign materials at sliding part.	?Check every points. ?Repair or replace motor. ?Check or repair. ?Repair or replace. ?Take off foreign materials
Agitating shaft sakes	?The shaft bent during transport is used. ?Idling in the liquid level varied and the shaft was bent.  ? Set bolts are not set correctly when attached stirrer wings to the agitating shaft. ?The stirrer is set close to the tank wall.  ?Large solid is put.  ?Set bolts for spindle and agitating shaft are loosened. ?Operated when not given levelness to tank stirrer section.	?Correct or replace ?Correct or replace ?Take care of the liquid level to prevent idling ?Set at concave hole of the shaft correctly till it fits properly. ? Set again to the tank center or as specified. ? Change as specified ant start operation. ?Tighten completely to fix.  ?Install horizontally

	?Bolts of joint for coupling and agitating shaft are loosened. ? Clamped when spigot is not placed completely in coupling of agitating shaft. ?Foreign materials stuck to coupling joint. ?Flaw on coupling joint surface.	?Tighten completely to fix.  ?Tighten completely bolts and nuts to spigot. ?Take off foreign materials ? Correct coupling joint surface to be smooth
Stirring is so strong that liquid overflows	?Liquid condition is different from the one at contract. ?Stirrer wings might be set in reverse direction	?Correct as specified.  ?Set in the right direction.
Stirring performance is not good	?Stirrer wings might be set in reverse direction ?Stirrer wings are fallen. ? Agitating shaft rotating direction is wrong.  ?Stirring capacity is too large ?Liquid conditions are different from those at contract.	?Set in the right direction.  ?Install stirrer wings to be fixed firmly with set bolts. ? Change wiring connection to be in right direction ?Reduce feeding amount into the contracted one. ?Change as specified.
There is oscillation	?Agitating shaft sakes. ?Stirrer frame is weak. ?Stirring is too strong. ?Locking bolts are loosened. ?Bearings are broken.	?As aforesaid ?Strengthen the frame ?As aforesaid ?Tighten bolts and nuts. ?Replace with new ones.
Heard abnormal noise	?Oscillation of agitating shaft and stirrer. ?Broken bearings. ?Lack in lubricants. ?Locking bolts are loosened.	?As aforesaid ?As aforesaid ?Apply grease or oil. ?As aforesaid

### © REPAIR

When repairing in case of failure other than listed above, disassemble and repair shall be made by a experienced and qualified person. Clean fully the part to be repaired with spindle oil taking care not to let foreign materials mix into.

If not possible to repair with ease, please inform us or our selling agent of the detail in your case.

Never fail to clarify when informing us ;

1. Manufacturing No. on Name Plate, Model, Machine No., Manufacturing Date and Output KW.
2. Parts name(s) concerned and Part No. in the drawing for approval if possible.
3. Detail of the failure and situations.

Agitates and Creates 21<sup>st</sup>. Century's Industry

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