

# Kenics Static Mixer Installation, Operation and Maintenance Manual

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Model:

**KMX STATIC MIXERS**

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Unit Serial No.:

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Equipment No.:

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Manual No.:

**813**

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For service and Information contact:

IOM-813

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## 1.0 GENERAL

Your Kenics Mixer is a rugged piece of process mixing equipment manufactured to demanding design and quality standards. This manual has been provided to assist you in the storage, handling, installation, and operation of your mixer and should be reviewed carefully before removing the mixer from the package. Adherence to a very few precautions will assure a highly satisfactory installation and years of trouble free service.

The few difficulties encountered with Kenics Mixers most often result from improper handling, installation, and operating procedures. The following quick check list should assist you in avoiding any difficulties:

1. Flanged mixers should not be bolted into systems where mis-alignment or gaps exist between the mixer and mating flanges. This can be especially critical to plastic (FRP, PVC, or CPVC) mixers. Follow flange tightening instructions later in the manual.
2. Plastic (FRP, PVC, CPVC) mixers must be handled and stored with care. Never use chains, cables, or fork lifts in direct contact with the mixer. If the mixer is too large or heavy to be moved manually, use a web sling or two heavy cloth straps spaced at least 1/2 the mixer length apart. Lifting lugs, if provided, should be used. Never drag or push the mixer; always lift it.
3. Mixers should be operated within process and pressure/temperature limits specified. Consult your local representative or the factory prior to changing operating conditions.
4. Injection of side streams prior to the mixer can be very important to operation of the mixer where large viscosity density, or volumetric differences exist. Refer to the Operation Section of this manual or consult your local representative or the factory for specific recommendations.
5. Some Kenics Mixers are equipped with loose, removable internal components as specified on the equipment order drawing.

**EXTREME CARE SHOULD BE EXERCISED IN HANDLING AND LIFTING IN ORDER TO AVOID DAMAGE AND PERSONAL INJURY.**

For dimensional and construction information, refer to the equipment order drawing supplied with your mixer.

## **2.0 INSPECTION AND/OR SHIPPING DAMAGE**

Your Kenics Mixer was carefully packaged, crated, or protected for shipment. However, upon receipt, it should be carefully inspected for any shipping damage. Any damage should be reported immediately and a claim filed with the responsible carrier. Your local Chemineer Kenics representative or the factory Customer Order Service Department can assist with claims.

Shipping package contents should be inspected for conformity with your order and for proper unit quantities. Any discrepancies should be reported to the factory Customer Order Service Department within one week of receipt.

## **3.0 STORAGE AND HANDLING**

All Kenics Mixers should be stored indoors in clean, well ventilated storage areas. Care should be taken to see that excessive loads are not applied to the mixer during storage. Sealing surfaces (thread and flanges) should be protected. The original shipping container is adequate protection for most storage conditions. A rust preventative paint is applied to carbon steel external surfaces prior to shipment. For extended storage in harsh environments, additional coating or protection may be required.

Mixers must be handled with appropriate care. Careless handling may result in permanent damage.

## **4.0 FIELD MODIFICATION TO KENICS MIXERS**

No field modifications (cutting to length, addition of fittings, etc.) to Kenics Mixers should be made without prior consultation with your local representative or the factory. Integrity of the mixing elements can be seriously altered without proper instructions.



## 5.0 INSTALLATION

Kenics mixers can be located anywhere in your piping system and may be installed vertically, horizontally, or at any intermediate angle. The mixing action produced by the mixer continues for some distance downstream, and it is desirable to leave considerable distance after the mixer to achieve maximum benefit. Where the mixer is used to achieve uniformity, such as in sampling, or prior to manifold and disengagement of phases can occur, the mixer should be located no more than 1-2 pipe diameters from the desired result.

Note For KMX mixers, the proper direction of flow is essential. Please note the direction of flow as stated on the flow decal.

Metal mixers are designed for installation in commonly used piping systems and are available for welded, threaded, and a variety of flanged installations. Refer to your equipment order drawing for the specific end option hardware supplied.

Before installation, purge process lines to remove foreign material and debris. In most new construction or modifications to process piping, there is a high probability of foreign material within the system, which if not removed, could damage the mixer.

### 5.1 Flanged Mixers

Mixers can be provided with raised face slip-on, raised face weld neck or lap joint flanges in all standard pressure ratings or drillings. Refer to your equipment order drawing for the type of rating of flange supplied.

Unless specified otherwise on the equipment order drawing, flange facing finish is either a serrated-concentric or a serrated-spiral with a surface finish of approximately 250 - 500 micro-inch.

A wide variety of gasketing materials can be used depending upon plant standards, materials being handled, or gasket supplier recommendations. Local gasket distributors should be contacted for specific recommendations.

Flanged mixers should fit snugly into your piping system without gaps or misalignment at either end. It is poor practice to go over tightened flange bolts in order to compensate for misalignment or gaps in the piping system. Flange distortion or housing to flange joint fracture may occur.

Sound engineering practice and plant standards should be followed in flange bolt tightening, especially in high pressure service or those employing special gasketing.



## 5.2 Threaded End Mixers

Kenics mixers with threaded ends are provided with die cut NPT threads, which are cut to high quality standards. Little difficulty should be encountered in achieving sound, leak free joints if good pipe fitting practice is followed and mating threads are of equal quality. A high quality thread sealing compound will help to assure leak free joints.

## 5.3 Weld Prepped or Plain End Mixers

Weld prepped mixers are supplied with standard 37 1/2° weld prepped ends for field installation of flanges or direct installation in the piping system.

All field welding should be performed by welders qualified for the class of service and materials specified.

Plain end mixers are supplied for field beveling and welding, threading, or other desired customer uses.

## 6.0 REMOVABLE ELEMENT STYLE, SPECIAL INSTRUCTIONS

Some mixers have removable element assemblies for inspection or periodic cleaning. Refer to your equipment order drawing for option supplied.

Removable element mixers should be installed with the retained end of the mixer (either rod or ring) downstream so that the element assembly is forced onto the retention rod or ring. A flow decal on the mixer and the PARTS DRAWING show proper flow orientation. Vertical upflow installation is not recommended unless the assembly is retained by a ring or is tack welded in place.

With rod retention, the element assembly has a slip fit into the mixer housing, and back flow of fluid in the piping system could dislodge the mixing elements causing damage upstream. To avoid this, the element assembly can be tack welded to the housing or an obstruction such as an elbow or rod installed immediately upstream of the mixer.

With ring retention, a gasket is required on both sides of the retention ring as shown on the PARTS DRAWING.

## 7.0 OPERATION

There are a few special operating instructions required with Kenics mixers. Your mixer was designed based upon the flow rate specified and most efficient performance will occur at that rate. The mixer, however, will accommodate wide flow variations in most processes. Consult your local representative or the factory for specific recommendations.

The nameplate on your mixer and the equipment order drawing include product pressure/temperature rating information. These ratings should not be exceeded. For service conditions other than the specified ratings, consult your local representative or the factory.

Note: For KMX mixers, the direction of flow towards the concave side of the blade is essential. Please note the direction of flow as stated on the flow decal.

## 8.0 MAINTENANCE

Kenics mixers require no routine maintenance other than sealing joint care typical to the rest of the piping system. For mixers with removable elements, the element assembly may be removed for periodic cleaning or inspection by disconnecting the adjacent downstream component, which must be as long as the mixer in order to extract the mixing element. Otherwise, both ends of the mixer must be disconnected and the mixer removed from the pipe line.

If the mixer supplied contains removable elements, note the warning below.

# **CAUTION**

THIS EQUIPMENT CONTAINS REMOVABLE  
INTERNAL COMPONENTS, HANDLE WITH  
CARE TO PREVENT DAMAGE OR INJURY.