Preform Feed Assembly

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Introduction

Located at the top of the tower, the Preform assembly is designed to drive the preform into the furnace during the fibre drawing process. The Preform Clamp assembly comprises a front loading vee block preform holder, designed to securely clamp Preforms of varying weights and handle diameters up to 50mm, fitted on a support bracket.

The clamp, driven by two separate motors via a ball screw, is mounted on a vertically traversing carriage mechanism. The first motor operates “fast lift / lower” i.e. retraction and insertion of the preform into and out of the furnace. The second motor operates “process feed” i.e. slow insertion of the preform into the furnace during fibre drawing. A clutch mechanism automatically disengages the process feed motor when the fast lift motor is selected and vice versa. Motor driven X-Y slides facilitate accurate centring of the fibre.

(Drawing numbers 380121A, 380193A & 380221A refer).

Description

The Preform Clamp assembly is mounted beneath a motor driven X-Y co-ordinate table and the combined unit is installed on the slide platform of the preform feed unit. The assembly is moved vertically by a drive mechanism, its speed being governed by a motor and gearbox driving a ball screw via a drive belt to give a stroke of 1200mm.

The slow precision motor used for preform feed during fibre drawing is mounted immediately behind the ball screw and can be disengaged by a clutch when the fast motor is activated. The precision feed rate is 0-25 mm/min with a speed resolution better than 0.1mm/min. The fast motor, located further behind the ball screw is used for preform loading and unloading and has a fast traverse speed of 1000 mm/min.

Unlike the slow motor, which is controlled from the touch screen operator interface, this motor is driven by a pendant control box, mounted off the side of the tower. This has a fast and slow up / down buttons in addition to an emergency stop switch. This control remains available even when the slow motor is running, automatically disengaging the clutch. It can therefore be used for course “jogging” of preform position during process. In addition to the fine jog facility using the slow motor.

Limits of movement of the preform feed mechanism are provided by top and bottom crash switches. These are mounted on a slide rail allowing their position to be adjusted as required. However care must be taken to ensure no physical damage can result as a consequence.

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Operation

Adjustment

To prepare the clamp assembly perform the following steps:

Warning ***Failure to carry out the following checks and adjustments can lead to operator injury, catastrophic failure of the Preform and damage to the equipment.***

Preform handle size

Caution ***Failure to carry out the following procedure may result in the preform falling from the clamp.***

Caution ***Ensure the preform has a solid or thickwall (eg. 10mm) tube handle as a thin wall tube handle could be crushed by the clamping force.***

Open the vee block preform holder, insert a preform handle into the block and close. The preform holder uses a spring applied gripping force to ensure that there is no preform slippage even when there is thermal expansion For added security against slippage it is recommended that the top end of the handle is “belled” out so it can’t pass through the vee block unless it is opened. For preform removal ensure its weight is fully supported before releasing the clamp.

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Maintenance

General

The preform clamp assembly requires on-condition servicing dependant on the results of routine maintenance inspections.

Routine

The following inspections and servicing procedures are to be carried out. The frequency of these inspections and servicing may be varied dependant on preform clamp usage, the working environment and the results of routine maintenance inspections.

Daily

Check for general cleanliness, smoothness of operation of clamp and X-Y slides.

3 monthly

Perform the following steps:

Clamp

Apply a little light machine oil to moving parts of the clamp and exercise them to work it in.

X-Y Slides

Apply a little light machine oil to bearing parts and exercise the slide mechanism to work it in.

Linear Rails

Apply a grease gun to the linear rails grease nipple.

Ball Screw

Apply a grease gun to the ball screw grease nipple.

Ball Screw Support Bearings

Apply a little light machine oil and keep clean

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