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Robot Periodic Maintenance Specification

The Robot Periodic Maintenance Service consists of maintenance and inspection activities with a schedule based on operation time. Please refer to [Robot Periodic Maintenance Schedule] table below for more information.
The following evaluation and maintenance activities will be performed during Robot Periodic Maintenance Service. These activities are in addition to the regular inspection actions / schedules which should be performed by the customer, and which are detailed in the [ROBOT ARM SET-UP & MAINTENANCE] manual relating to each robot type.

Robot Operation Evaluation

Check Servo History, Error History[1] – RT Toolbox 3 / R56TB teach pendant
These checks can indicate possible problems with the operation of the robot, or the need for maintenance actions

Evaluation of Maintenance Forecast Data[2] – RT Toolbox 3 / R56TB teach pendant
This allows the user to reference consumable parts replacement timing (re-greasing, battery and belt replacement) from the operation data collected in the robot controller

Robot Mechanical Inspection and Maintenance[3]

Visually inspect all robot axis joints for grease leaks
As an example, some causes of grease leaks could be either; deterioration in the gear reducer oil seal, too much grease having been previously applied, grease that differs from the specification may have been used

Check lubrication status hours of all robot axis joints[3]

Lubricate robot axis joints (as required)
The requirement for lubrication of the gearing and spindle shafts (SCARA) reflects the usage of the robots. Generally grease is applied with a defined force using specific grease guns. Spindle shafts need to be cleaned and lubricated

Inspect condition and tension of all robot axis timing belts
Incorrectly tensioned or worn timing belts can lead to poor performance over time. Belt wear can be caused by robot overload, heat or incorrect tension. Inspecting the condition of the timing belt is important as potential problems can be detected

Adjust robot timing belt tension (as required)
Belt tension will be adjusted if required to meet specified tension

Inspect each axis for backlash / free play / rough movement / noise
Manually move each axis to detect potential issues with the robot arm such as gearbox wear

Replace all robot arm and controller batteries (yearly)
An absolute encoder is used for the robot position detector, so whilst power of controller is turned off the position must be saved by the backup battery. The robot controller uses a backup battery to save the program, etc. These batteries are installed when the robot is shipped from the factory, but as they are consumable parts, they must be replaced periodically
*NOTE: Confirm prior to battery replacement that customer has completed Robot Backup [4]

- Programs, Parameter Files, System Programs, Origin Parameters, Event History, Error Record, Error History – RT Toolbox 3 / R56TB teach pendant
- Backing up all settings allows quick resumption of operation in the event of battery failure or robot fault

Replace cooling fan filter on robot controller (yearly)
Replacing the robot controller air intake fan filter ensures optimum unit cooling

Customer Responsibilities

It is the customer's responsibility to complete robot backup prior to Robot Periodic Maintenance Service [Programs, parameter files, system programs, origin parameters, servo history, error history] – using RT Toolbox 3 / R56TB teach pendant
Backing up all settings allows quick resumption of operation in the event of battery failure or robot fault

Notes

The Robot Periodic Maintenance Service is not a comprehensive robot test / repair but is limited to those tasks / actions listed in this specification.
Reactive / corrective maintenance services are not included in the Robot Periodic Maintenance Service but can be offered separately.
Any other recommended corrective actions that our engineers observe whilst on site will be noted and a separate quotation will be provided.
Replacement robot arm and controller batteries are included in the Robot Periodic Maintenance Service.
Replacement robot controller fan filter is included in the Robot Periodic Maintenance Service.
Any lubrication grease required is included in the Robot Periodic Maintenance Service.
Any other items are not included in the Robot Periodic Maintenance Service.

1 Following procedures as specified in [Mitsubishi Electric RT ToolBox3 User's Manual Section 15.2] or [Mitsubishi Electric Teaching Pendant User's Manual Section 15.3]

2 Following procedures as specified in [Mitsubishi Electric RT ToolBox3 User's Manual Section 16.3] or [Mitsubishi Electric Teaching Pendant User's Manual Section 16.5]

3 Following procedures as specified in [Mitsubishi Electric Instruction Manual – Robot Arm Setup & Maintenance Section 5.3]

4 Following procedures as specified in [Mitsubishi Electric RT ToolBox3 User's Manual Section 18] or [Mitsubishi Electric Teaching Pendant User's Manual Section 14]

Robot Periodic Maintenance Schedule

The Periodic Maintenance Service actions detailed in this specification will be carried out according to the following schedule

Robot Periodic Maintenance Schedule		
Robot Type	**Catalogue Number**	**Periodic Maintenance Interval (approximate)**
RV-CRL Series	RV-8CRL	6000 Operation Hours or 1 year (Whichever Comes First)
RV-F Series	RV-2F*	6000 Operation Hours or 1 year (Whichever Comes First)
	RV-4F*	1 Year Operation
	RV-7F*	1 Year Operation
	RV-7FLL*	1 Year Operation
	RV-13F*	1 Year Operation
	RV-20F*	1 Year Operation
RV-FR Series	RV-2FR*	6000 Operation Hours or 1 year (Whichever Comes First)
	RV-4FR*	1 Year Operation
	RV-7FR*	1 Year Operation
	RV-7FRLL*	1 Year Operation
	RV-13FR*	1 Year Operation
	RV-20FR*	1 Year Operation
Robot Type	**Catalogue No.**	**Periodic Maintenance Interval (approximate)**
RH-CH Series	RH-3CH*	6000 Operation Hours or 1 year (Whichever Comes First)
	RH-6CH*	6000 Operation Hours or 1 year (Whichever Comes First)
RH-CRH Series	RH-3CRH*	6000 Operation Hours or 1 year (Whichever Comes First)
	RH-6CRH*	6000 Operation Hours or 1 year (Whichever Comes First)
RH-F Series	RH-3FH*	1 Year Operation
	RH-6FH*	1 Year Operation
	RH-12FH*	1 Year Operation
	RH-20FH*	1 Year Operation
RH-FR Series	RH-3FRH*	1 Year Operation
	RH-6FRH*	1 Year Operation
	RH-12FRH*	1 Year Operation
	RH-20FRH*	1 Year Operation
RH-FHR series	RH-1FHR*	1 Year Operation
	RH-3FHR*	6000 Operation Hours or 1 year (Whichever Comes First)
RH-FRHR series	RH-1FRHR*	1 Year Operation
	RH-3FRHR*	6000 Operation Hours or 1 year (Whichever Comes First)

Note: For Horizontal (Scara) Robot types, the customer is responsible for applying a light coat of grease (such as Klubersynth UH1 14-222) to the spindle after approximately 600hr of movement.
The procedures in the [ROBOT ARM SETUP & MAINTENANCE] manual should be followed.