Automatic, Remotely Controllable Transfer Crane

MACHINERY & STEEL STRUCTURES HEADQUARTERS
CRANE & MATERIAL HANDLING SYSTEM BUSINESS UNIT

For the first time in the world, Mitsubishi Heavy Industries, Ltd. (MHI) has succeeded in commercializing a rubber tyred gantry crane (RTG) capable of completely automatic and remotely controlled unmanned operation. This RTG is designed to achieve automated operations such as automatic gantry steering to cancel tyre deformation, gantry micro positioning, and so on. This RTG provides the most suitable and efficient arrangement for the crane operator, extensive features for improvement of the environment, and a highly systematized approach to terminal operation.

1. Product specifications

Table 1 shows the main specifications for twelve fully automatic, remotely controllable RTGs delivered to the Tobishima Pier South Side Container Terminal in Nagoya Port. All twelve are performing well in service.

2. Characteristics

Conventional RTGs are manned by operators and manually controlled. The new RTG is fully automatic and can be remotely controlled from a control room. The only operations to be performed manually are the loading and unloading to and from chassis trailers (**Fig. 1**).

Table 1 Main specifications for the automated, remotely controllable RTG

Type			6 container rows & 2 chassis lanes 4 container stacks +1 clear height
Rated load		(t)	40.6
Speed	Main hoist	(m/min)	23 – 53
	Trolley travel	(m/min)	70
	Gantry travel	(m/min)	135
Automatic operation function			▪ Automatic container stacking (Landing accuracy: within ±30 mm) ▪ Automatic gantry steering / positioning ▪ Remote control for chassis container handing ▪ Optimum cycle path with stack profile sensor
Remote control function			▪ 5 control consoles /12 cranes ▪ Video signal transmission: Radio techniques ▪ Data transmission: Wireless LAN

The automatic, remote-control capabilities provide the most suitable and efficient arrangement for the crane operator, based on real-time terminal operation. The required number of operators does not depend on the number of working RTGs, hence manpower deployment can be kept to a minimum during off-time, such as at night. The operator cab environment changes from a noisy, vibrating cab mounted on the crane itself to a quiet, vibration-free office. The improvement in the work environment for operators is drastic (**Fig. 2**).

The automation will also facilitate the efficient operation of the terminal by enabling advanced work scheduling, progress management, and highly efficient crane operation with improved throughput.

We hope that this product will improve the competitiveness of our customers at ports and harbors in the future.

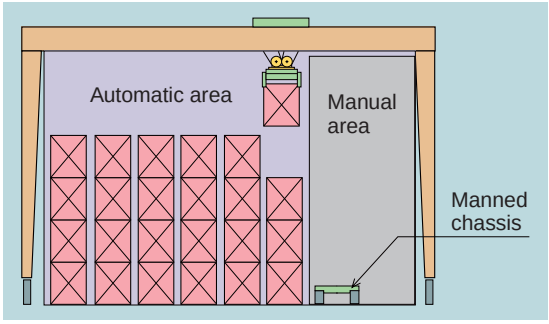

Fig. 1 Operation area demarcation for automated, remotely controllable RTG

Fig. 2 State of operation in the remote control room