



**EBARA**

CP6101 EA

# **AUTOMATIC TRASH RAKES AND SCREENS**

Model **EK-1**



# WITH A LARGE RAKING CAPACITY, EBARA AUTOMATIC TRASH RAKES AND SCREENS ARE CAPABLE OF WITHSTANDING SEVERE WORKING CONDITIONS AND OF PERFORMING HIGHLY RELIABLE OPERATION.



In recent years, as size of intake and drainage pumping stations is increased, and sewage systems have been pervaded, various types of trash and foreign matter contained in the intake water are causing serious problems on pump operation. To guard against such condition, it is desirable to provide a screen of sufficient raking capacity capable of stable operation under the most of sufficient severe conditions envisioned. The Ebara model EK-1 automatic trash rake and screen can realize highly reliable operation under severe conditions and provide sufficient raking capacity by adopting the epochmaking method for the rake chain movement. Those superlative characteristics meet the customer's requirements, as attested by a supply record spanning many years.

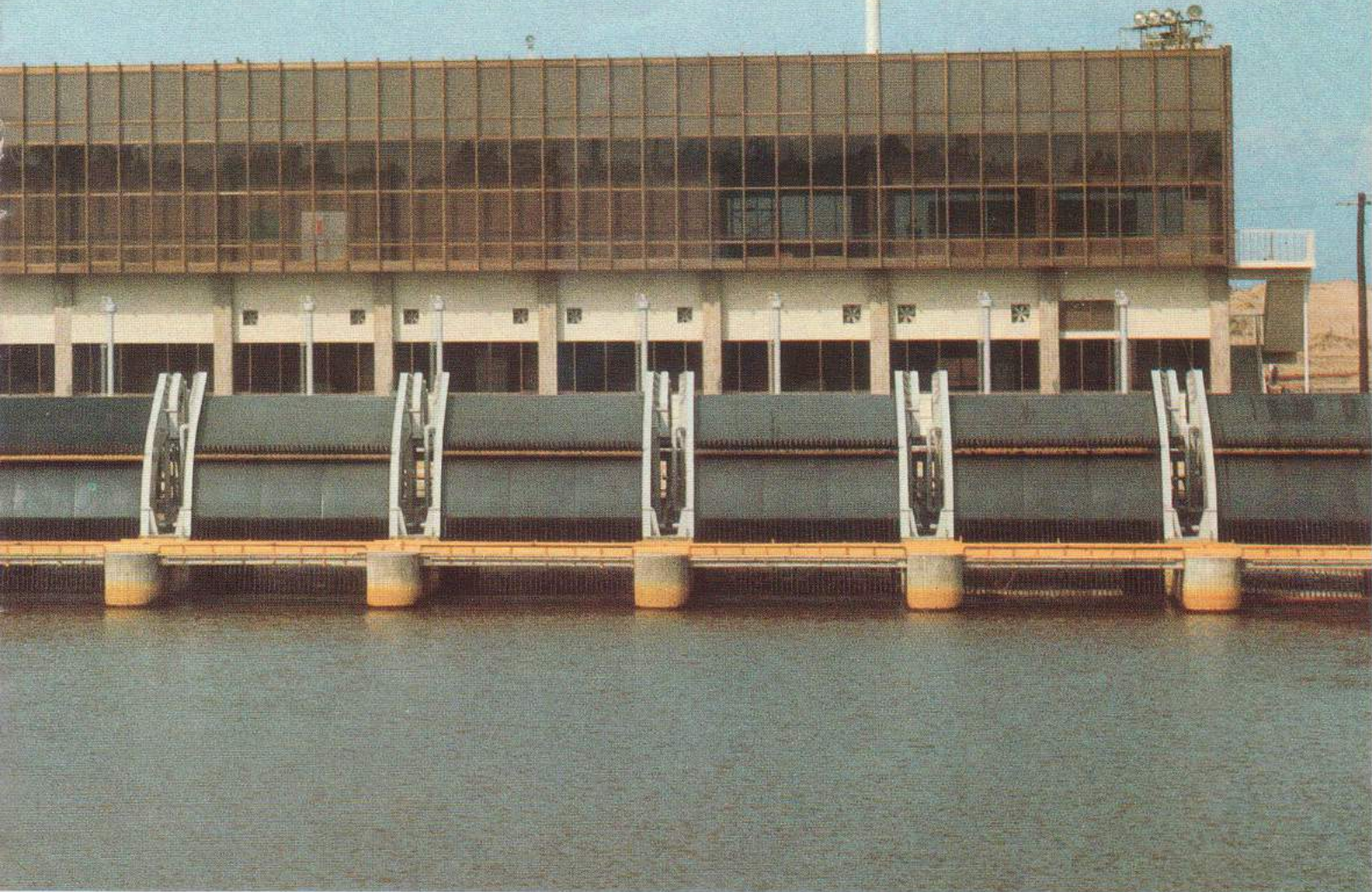
## ITEMS GENERALLY REQUIRED OF AUTOMATIC TRASH RAKES AND SCREENS:

- 1 The raking capacity should be sufficient for the volume and size of trash that may be encountered.
- 2 Raking operation should be continuous and screen losses should be minimum.
- 3 Remote-controlled, unmanned operation should be feasible.
- 4 High operating reliability and ease in maintenance.

Remarks: Automatic trash rake and screen, model EK-1 designed and engineered by Ebara, is equipped with all the requirements mentioned above.

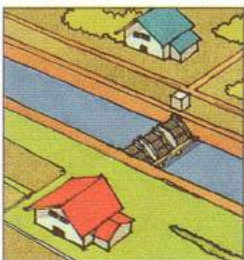
# EBARA AUTOMATIC TRASH RAKES AND SCREENS

## MODEL EK-1



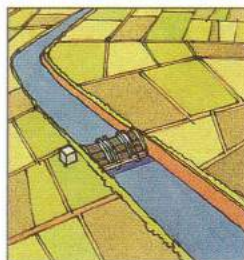
Ebara Automatic Trash Rake and Screen Model EK-1 which can operate in every and all spheres of activities:

### Construction work in general



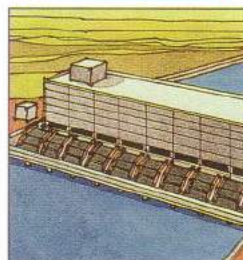
- River Water Drainage
- Flood Countermeasures
- Stored Water Drainage

### Agriculture



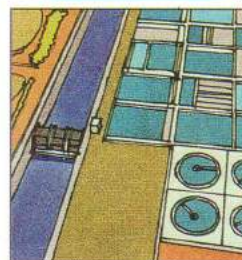
- Drainage
- Irrigation
- Stored Water Drainage

### Potable water system



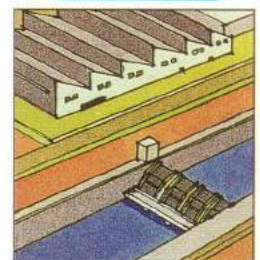
- Water Intake

### Sewage system



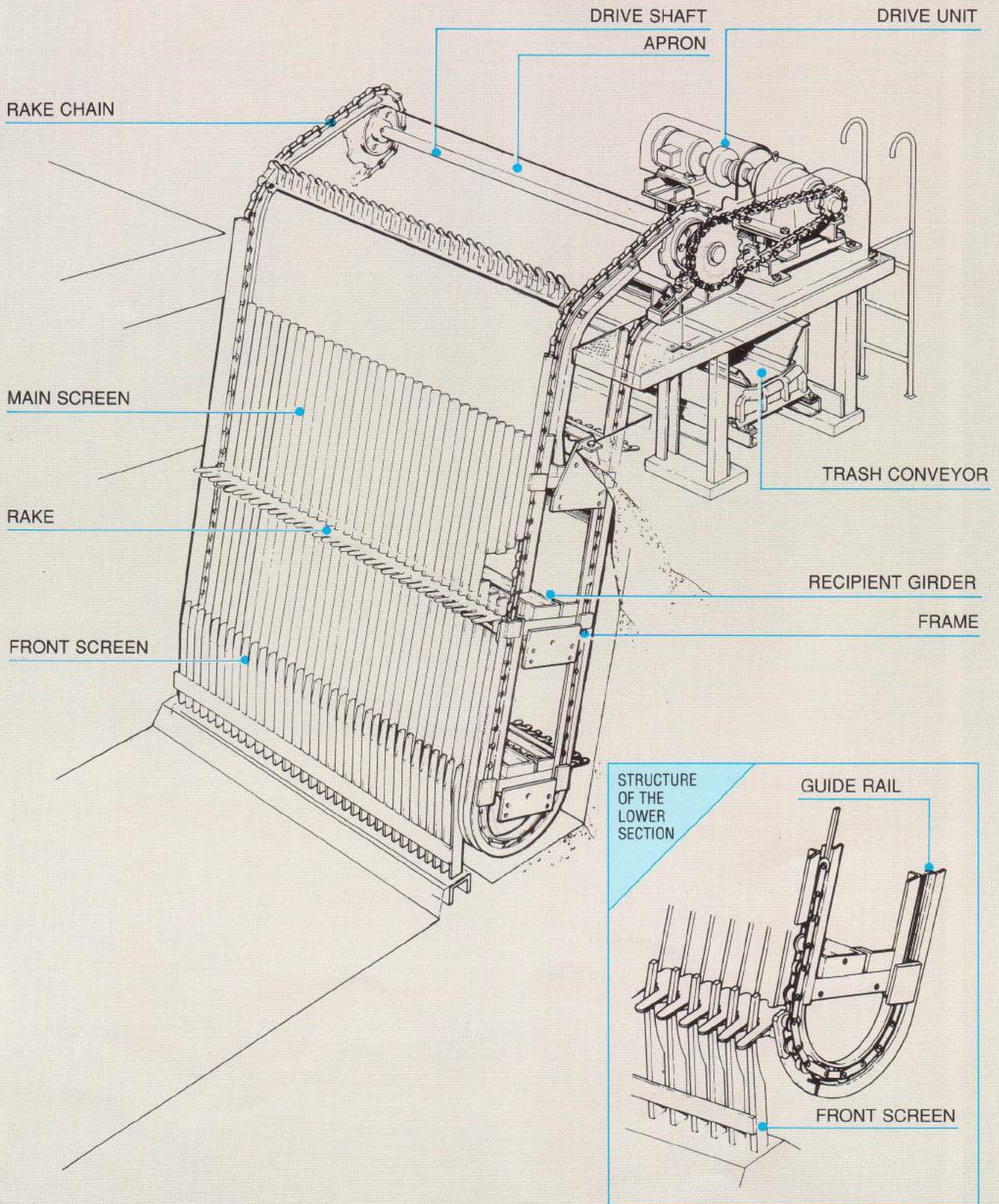
- Sewage Water Boost
- Rain Water Drainage
- Water Treatment

### Others



- Various Canals Requiring Trash Removal

# STRUCTURE OF THE SYSTEM



# FEATURES OF THE SYSTEM

## LARGE RAKE

The large rakes fitted on the endless chain are reversed to the front of the main screen, and will lift up the trash collected on the front screen and continue upward while raking up the trash caught on the main screen.

## NO MAINTENANCE

The endless chain on which the rakes are fitted travels smoothly along the guide rails. As sprocket wheel and bearings are not used in the lower part of the frame no maintenance of the system is necessary even when there is much mud or sludge under the water.

## SIMPLIFIED TRASH DELIVERY MECHANISM

Equipped with an inclined upper frame, the trash that has been raked up can be continuously dropped onto the conveyor by gravity. Consequently, no device for reversing the rake motion and for scrapping the trash off the rake is required.

## NO CLOGGING OF SCREEN

Improved over the conventional type, the screen is of an original shape with a round cross section (key hole shape), and since the fingers of the rake scrape through the opening between the two head sections, clogging of the screen can be totally prevented.

## IMPROVED DURABILITY

The rake chain and the guide rail are made of stainless steel for high durability, and other parts exposed to water are coated with epoxy resin and other materials for full corrosion resistance.

## HIGHLY RELIABLE DRIVE

Sufficient torque will be transmitted through the liquid coupling connected to the drive motor. As a result, this system is protected from abnormal torque through slip of the liquid coupling.

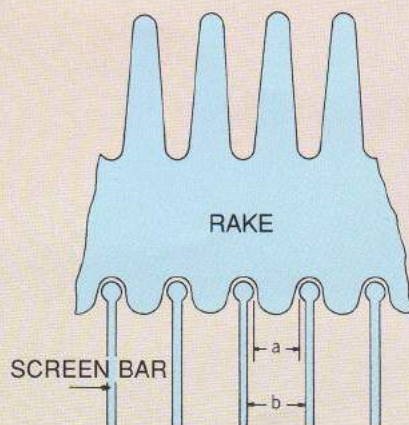
## OPTIMUM FOR REMOTE CONTROL

No operating manpower is required because the continuous rotary system, suitable for raking up large volumes of trash and rubbish is operated by remote control.

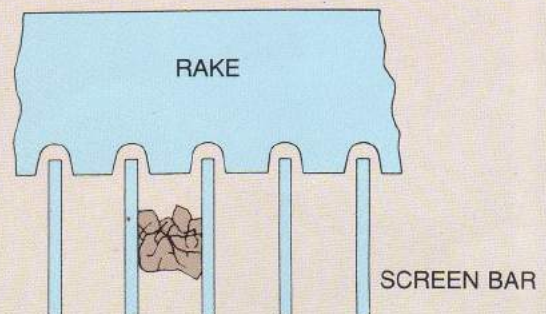
## EASE OF INSTALLING THE SYSTEM IN AN EXISTING WATER CHANNEL

When the system needs to be located in an existing water channel, it can be installed with ease by burying anchor plates in the side of the water channel.

SCREEN BAR OF EBARA EK-1  
( $a < b$ )



CONVENTIONAL TYPE SCREEN BAR

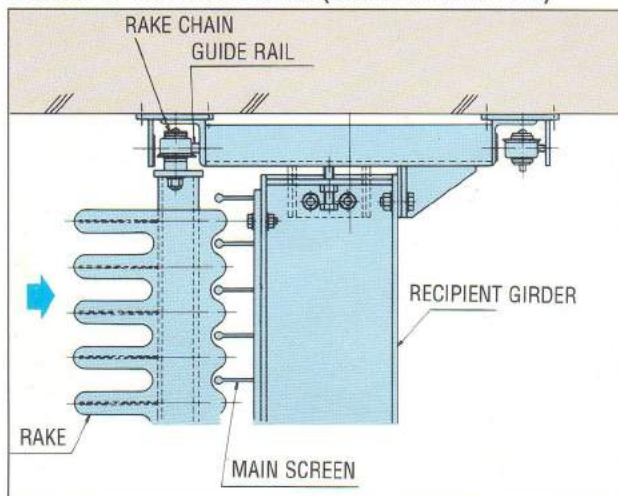


# VIEW OF SYSTEM IN OPERATION

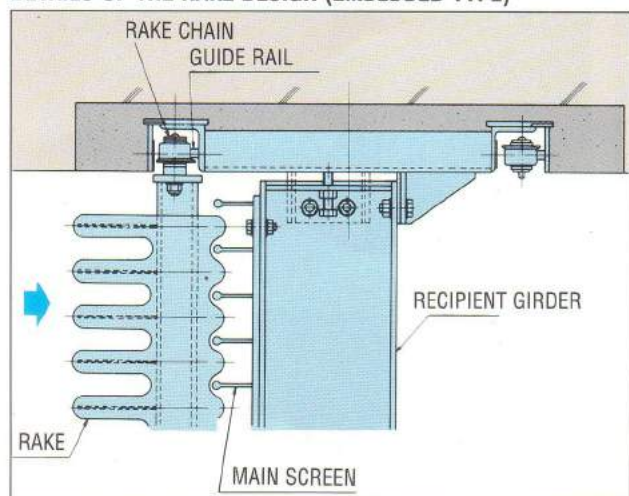


LARGE-SIZE RAKE

## DETAILS OF THE RAKE DESIGN (ANCHOR PLATE TYPE)



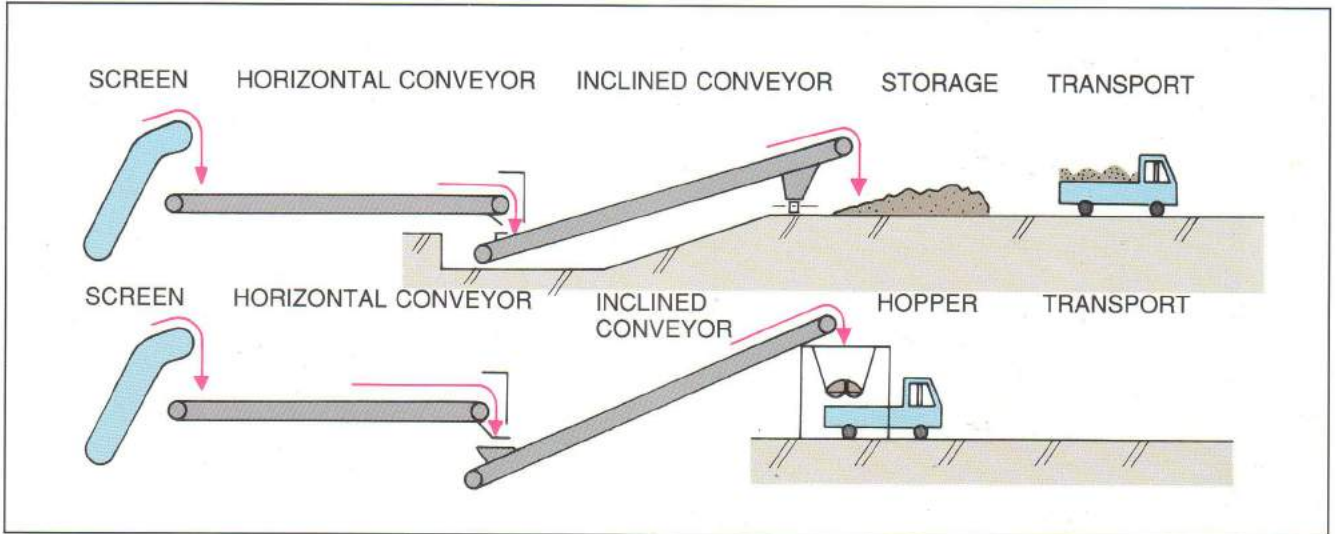
## DETAILS OF THE RAKE DESIGN (EMBEDDED TYPE)



# DELIVERY OF RAKED TRASH

The method and procedures for delivery of raked trash and rubbish may be planned and established depending on the conditions at the location where the system is installed whether the system is installed indoors or outdoors, the method

used for disposal of the trash, site conditions surrounding the pumping station, etc. Ebara is prepared to design and fabricate the delivery system compatible with automatic trash rakes and screens.



## WIDTH OF THE HORIZONTAL CONVEYOR AND INCLINED CONVEYOR

The standard width of conveyor belts is from 600 mm to 900 mm.

## STANDARD TYPES OF CONVEYOR BELTS SUPPLIED

As horizontal conveyor belt, 20° trough 3-roller flat belt is used, and as inclined conveyor belt, 30° trough 2-roller belt with fins is used.



HORIZONTAL AND INCLINED BELT CONVEYORS

# STANDARD SPECIFICATIONS

## STANDARD SPECIFICATION

ITEM	DESCRIPTION
WIDTH OF WATER CHANNEL	Standard 6 m or less, maximum 7.5 m
DEPTH OF WATER CHANNEL	12 m or less
SPACE FOR INSTALLATION	Refer to the sectional drawing for installation
VELOCITY THROUGH SCREEN	About 0.5 m/sec.
SCREEN ANGLE	Standard screen angle is 75°. However, an angle up to 85° is acceptable depending on the space available for installation.
SCREEN FINGER OPENING	The standard opening of screen fingers will be 1/20 to 1/30 of the pump bore to prevent pump clogging.
RAKE DIMENSION	The standard dimension is from 200 to 300 mm.
NUMBER OF RAKES	The standard number of rakes are 2 to 4.
RIGIDITY OF THE BODY	The standard rigidity of the body will be such that the distortion of the recipient girder will be 1/600 to 1/800 of the width of the water channel when the water head is 600 to 1000 mm.
DRIVE SYSTEM	A combination of motors and cycle reduction gears (refer to the data for output selection.)
PROTECTIVE SYSTEM	A slip detector system is provided for the protection of the system.
STANDARD ACCESSORIES	(a) Tools (b) Anchor bolts and nuts (c) Motor cover (d) Protective devices
STANDARD PAINTING	Preparation of metal surface – SSPC SP-10 wet area – tar epoxy dried area – rust preventive finish paint (phthalic acid paint)

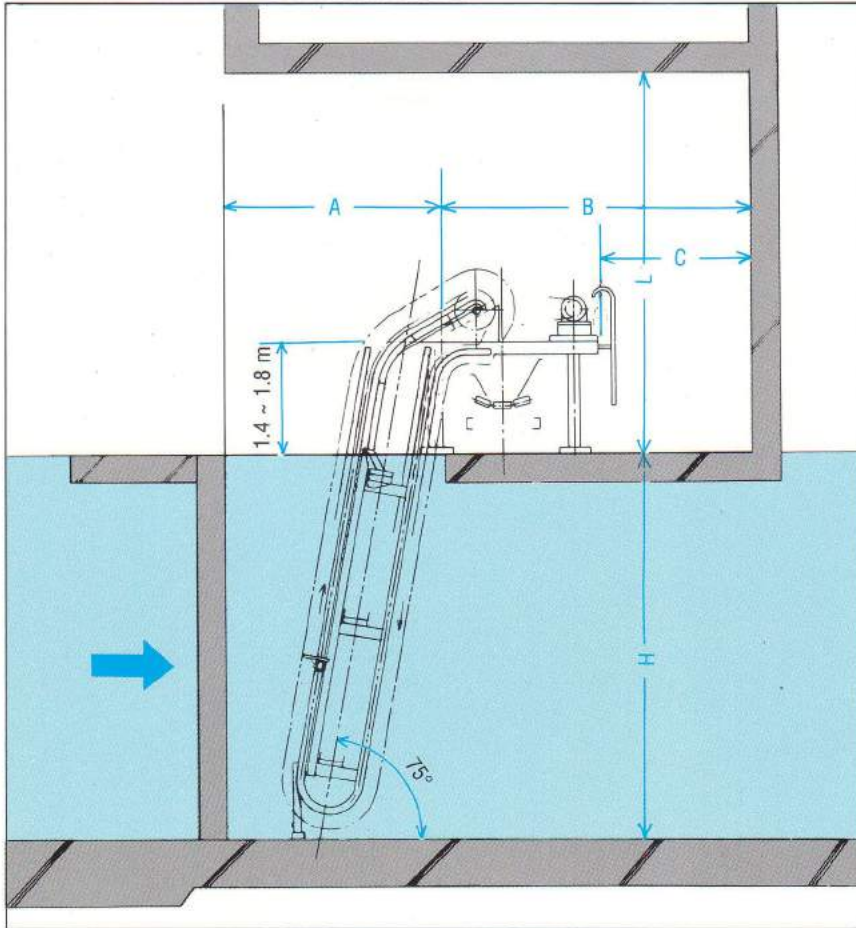
## PUMP BORE AND SCREEN EFFECTIVE OPENING

PUMP BORE : mm	EFFECTIVE OPENING : mm
200	25
250	25
300	25
350	25
400	25
500	30
600	30
700	30
800	40
900	40
1000	50
1200	50
1350	50
1500	60
1650	60
1800	60
2000	70
2200	70
2400	80
2600	80
2800	90
3000	100
3600	120
4600	150

Queries on any particular specification relating to usage conditions are welcome in connection with design and plan.



**SECTIONAL DRAWING FOR INSTALLATION**



**STANDARD DIMENSIONS FOR INSTALLATION**

unit: m

H	MinA	B	C	MinL
~ 2.0	2.5	4.0	1.0	4.0
~ 4.0	3.0	4.0	1.0	4.0
~ 6.0	3.6	4.0	1.0	4.0
~ 8.0	4.1	4.0	1.0	4.0
~ 10.0	4.8	4.0	1.0	4.0
~ 12.0	5.2	4.0	1.0	4.0

When the space is not sufficient to meet the above standard dimensions, please consult with our agent or supplier.

**SYSTEM IN OPERATION - 1**

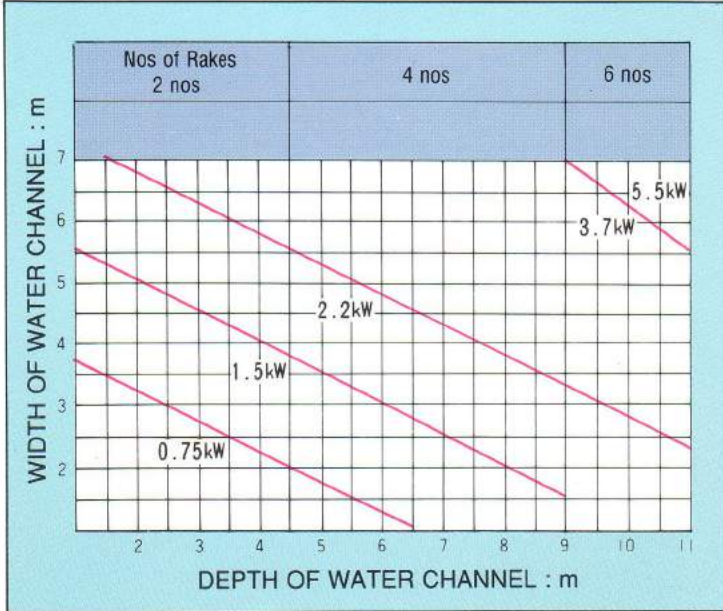


**SYSTEM IN OPERATION - 2**



# DATA FOR OUTPUT SELECTION

## AUTOMATIC TRASH RAKE & SCREEN MODEL EK-1



NOTE: When the rake speed is 5 m/min.

## HORIZONTAL BELT CONVEYOR

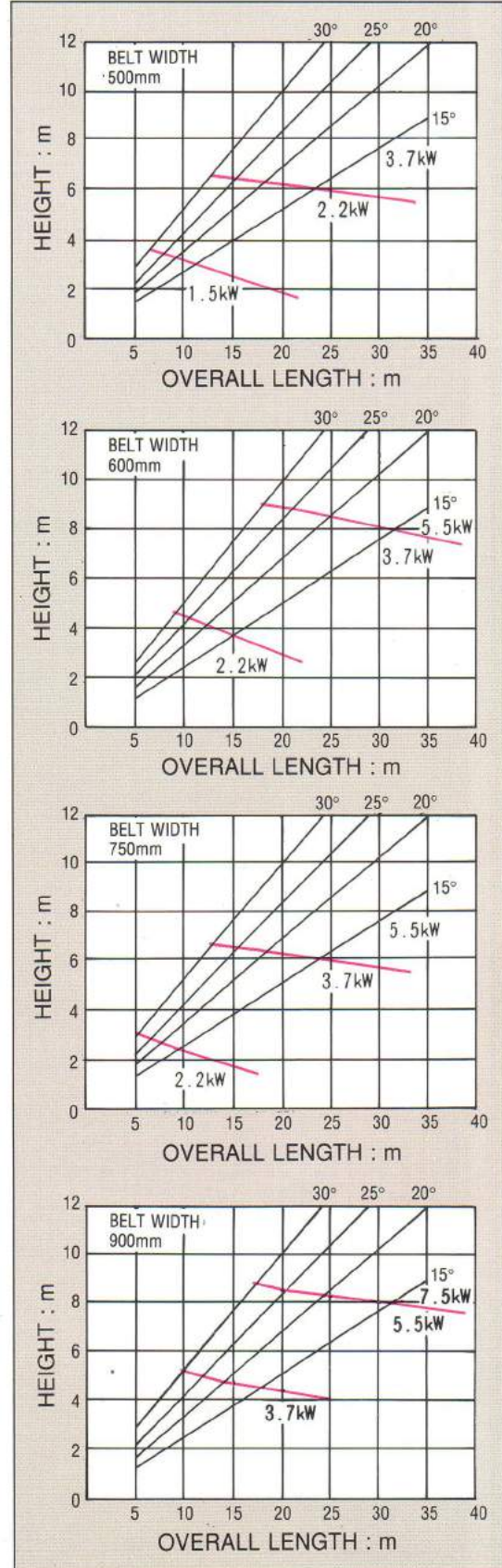
OVERALL LENGTH (m)		5	10	15	20	25	30	35	40	45	50		
BELT WIDTH	500mm	1.5kW									2.2kW		
	600mm	1.5kW								2.2kW			
	750mm	1.5kW					2.2kW					3.7kW	
	900mm	1.5kW				2.2kW					3.7kW		

NOTE: The above requirements are applicable for three or less trash removal systems.

## HOPPER

CAPACITY (m <sup>3</sup> )	RATED THRUST Kgf (kN)	MOTOR OUTPUT kW
2	1000 (9.81) x 2 units	0.4 x 2 units
3	↓	↓
4	↓	↓
5	1000 (9.81) x 2 units	0.4 x 2 units
6	2000 (19.61) x 2 units	0.75 x 2 units
8	2000 (19.61) x 2 units	0.75 x 2 units
10	4000 (39.23) x 2 units	1.5 x 2 units

## INCLINED CONVEYOR



# IN SENDING YOUR INQUIRY

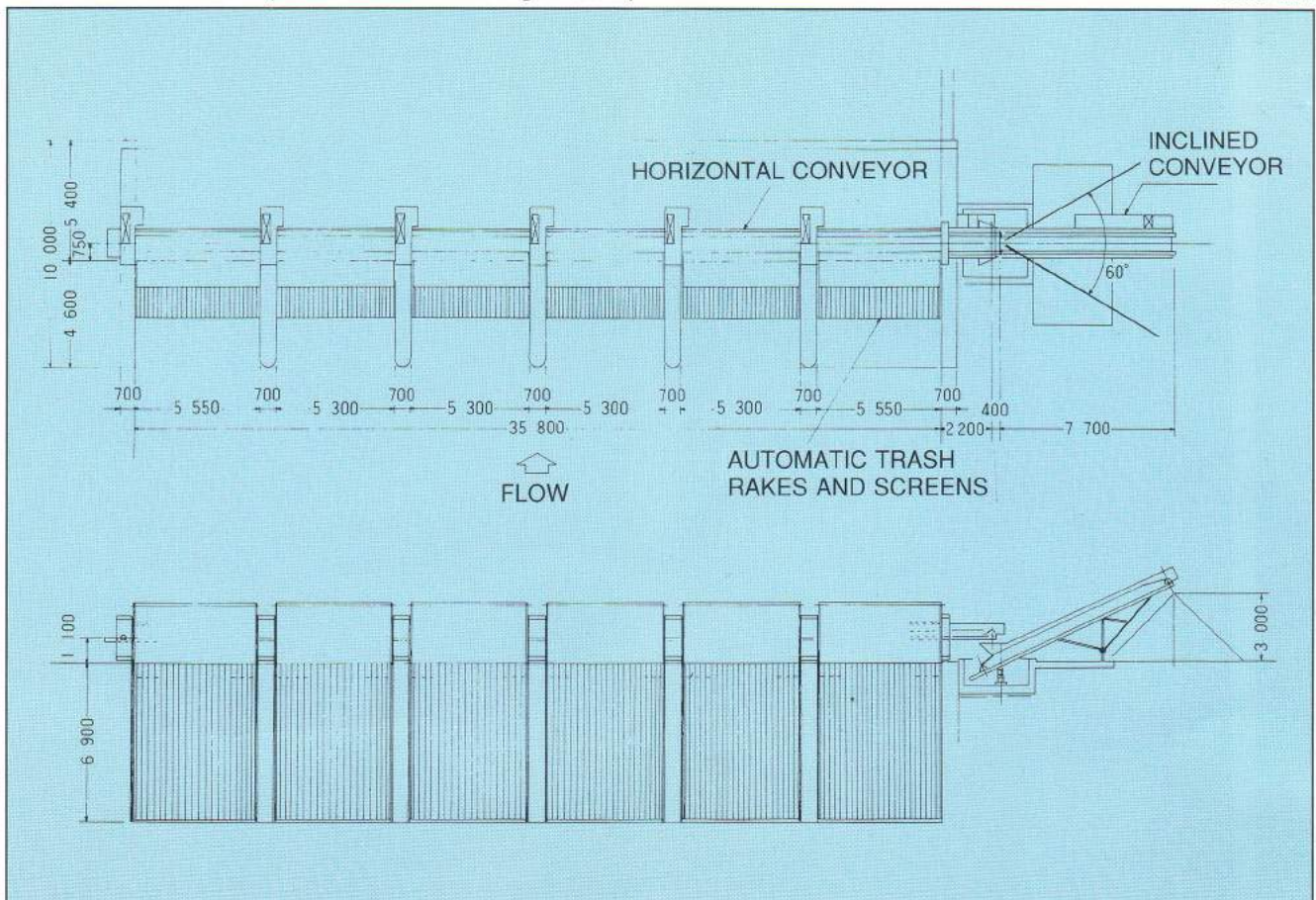
In sending your inquiry to us, please indicate the follow-details to enable us to recommend a trash removal system with highest efficiency for your own requirements:

<b>1</b>	Layout and other details of your pumping station, and the purpose of your pumping station.
<b>2</b>	Type of influent (water for normal use, waste water, rain water, sewage, etc.)
<b>3</b>	Type and specific gravity of trash
<b>4</b>	Water channel dimensions, water levels and flow rates
<b>5</b>	Opening of screen fingers
<b>6</b>	Head for screen design
<b>7</b>	Method of trash removal from site
<b>8</b>	Power source and system for operation desired
<b>9</b>	Installation of such type screen as fixed or pull up to type.

Queries of any kind related to the system are welcome in connection with design and plan.

## A TYPICAL LAYOUT – (for Ushikunuma Drainage Station)

Unit: mm





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