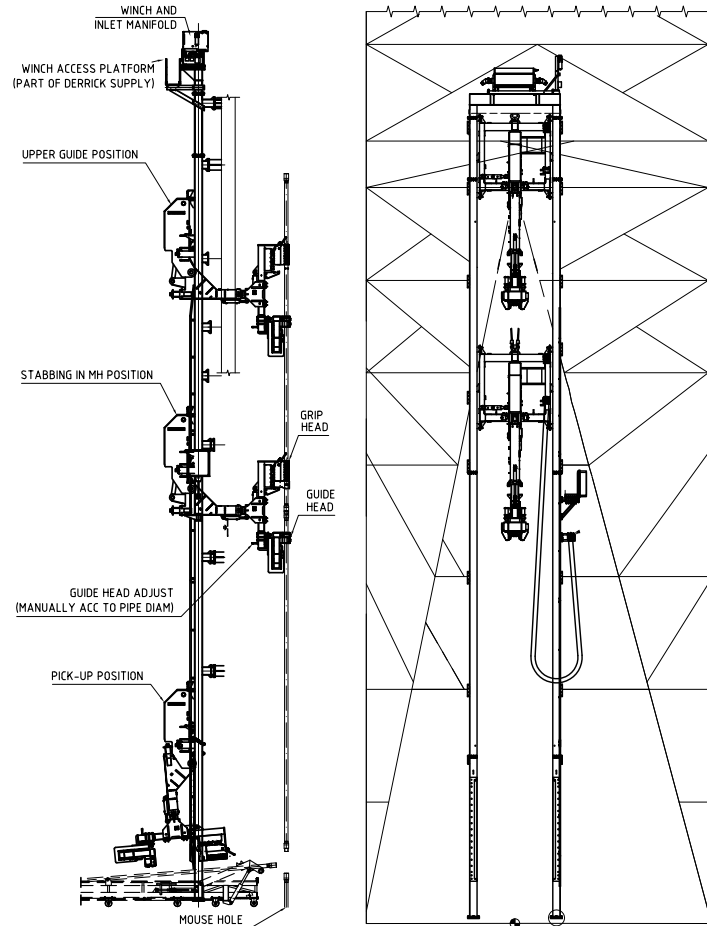


## HTV

The Horizontal To Vertical machine (HTV) is a remote controlled machine designed to bring tubulars from a horizontal Catwalk Machine to a vertical (inside the derrick) position and position the tubulars in the mousehole for building stands. The HTV guide the upper part of the complete stand for handover to the bridge racker. It can also reverse the operation and bring tubulars from a vertical position to the Catwalk Machine.

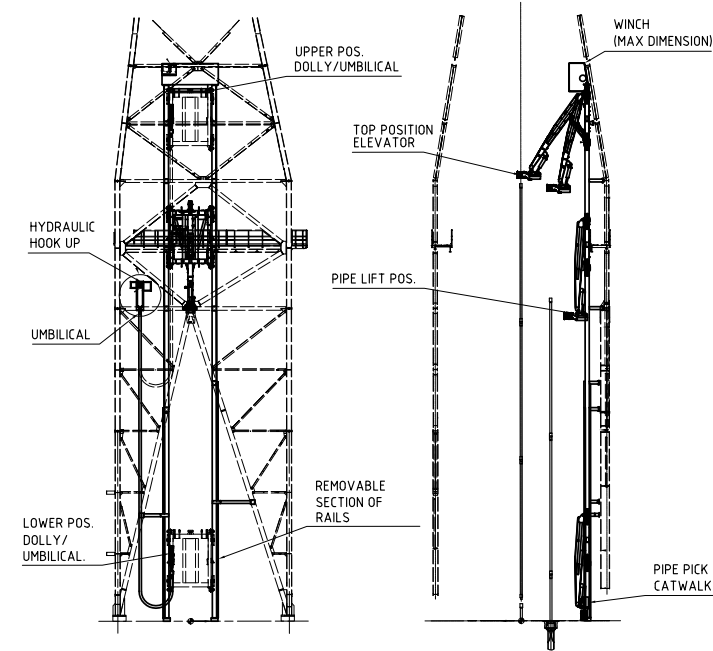


### Technical Specifications

HTV DESIGN DATA	
Service	Horizontal to vertical tubular handling
Area classification	IEC Zone 2
Design standards	NS3472 / ENV 1993-1-1 (Eurocode 3), FEM
Rules and regulations	ABS MODU
Safe Working Load (SWL)	7,000 kg (Vertical lifting only) 3,500 kg (Horizontal to vertical lifting or vice versa)
Weight, dry	28,400 kg (including weight of rails)
WINCH	
Weight, dry	1,710 kg
Safe Working Load (SWL)	20,000 kg
Safety	Fail safe brakes. 2 off.
Wire Diameter	25 mm
GRIPPER AND GUIDE HEADS	
Gripper head options	3 1/2" - 13 3/4" and 14"-22"
Guide head options	3 1/2" - 13 3/4" and 14"-22"
UTILITY CONSUMPTION	
Max. hydraulic flow rate	400 l/min
Min. working pressure	180 barg.
Max. operating pressure	207 barg.

## VDM

The V-Door Machine (VDM) is a remotely controlled machine primarily designed to trip drill pipe from pipe chute to well center. It can also be used for bringing tubulars from a horizontal Catwalk Machine to a vertical (inside the derrick) position, and position the tubulars in the mousehole for building stands. The machine is remotely operated from the drillers cabin. The VDM consist of a main support frame with an arm controlled by a hydraulic cylinder. The arm can accommodate both an elevator or gripper head. The elevator is primarily used during tripping of drill pipe, but can also be used during stand building of drill pipe up to 6 3/8". The gripper heads are used during stand building and casing handling up to 22". The machine travels vertically inside the V-door and is hoisted by an electrical winch with a dual drum. It is guided by two guide rails mounted on the derrick wall.

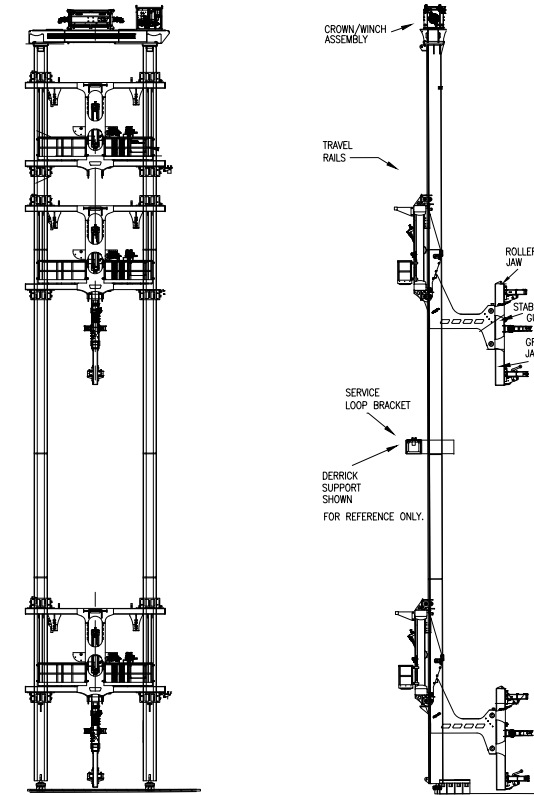


### Technical Specifications

VDM DESIGN DATA	
Service	Horizontal to vertical tubular handling
Area classification	IEC Zone 1
Design standards	NS3472 / ENV 1993-1-1 (Eurocode 3), FEM
Safe Working Load (SWL)	4,500 kg
Weight, dry	8,750 kg (excluding weight of rails)
Weight, dry	28,400 kg (including weight of rails)
WINCH	
Weight, dry	2,500 kg
Safe Working Load (SWL)	21,000 kg
Safety	Fail safe brakes. 2 off.
Wire diameter	25 mm (2 off)
TRIPPING ELEVATOR	
Tubular handling range	3 1/2" - 6 3/8"
Safe Working Load (SWL)	4,500 kg
GRIPPER HEAD OPTIONS	
Gripper head option	3 1/2" - 13 3/4" SWL: 10,000kg, 14"-22" SWL: 6,000 kg
Gripper head option	3 1/2" - 9 3/4" SWL: 4,500
Max. hydraulic flow rate	470 l/min
Min. working pressure	180 barg.
Max. operating pressure	207 barg.

## PLS-5

The Pickup Laydown System with 5 metric ton capacity (PLS-5) is a pick up and lay down arm for transferring tubulars from a horizontal position on a conveyor to a vertical position either at the well center or at the mousehole and return.

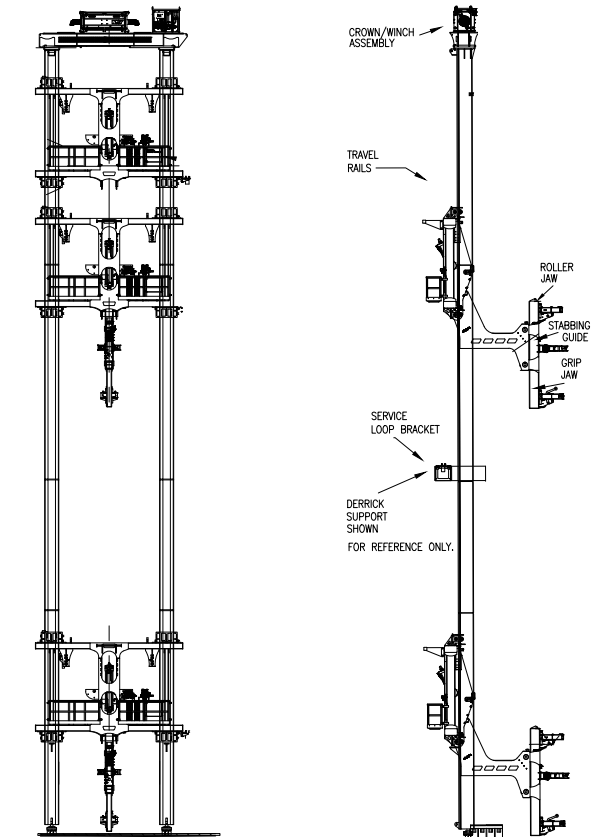


### Technical Specifications

PLS-5 DESIGN DATA	
Service - Horizontal to vertical tubular handling	
Design standards - "Rules for certification - lifting appliances" - DNV, "Code for lifting appliances in a marine environment" Lloyds register of shipping, Varco dynamic design loading specifications	
Reach: CL column to CL well bore	240 in
Reach: CL column to CL mousehole	156 in
Tubular size OD	3 1/2 in - 20 in
Hoist capacity at max vessel dynamic conditions	3,200 kg
Hoist capacity at reduced vessel dynamic conditions	4,550 kg
Total weight, carriage and lifting boom	9,000 kg
Total stationary weight, hoist winch, columns, crossbeam:	36,300 kg
STABILIZER ARM	
Gripping jaw OD range options	3 1/2" - 9 3/4" and 10" - 20"
Middle jaw OD range options	Lighter weight tubulars (casing) down to 9 3/4"
Roller jaw OD range options	3 1/2" - 9 3/4" and 10" - 20"
SPEED	
Hoisting speed up to 1,590 kg live load	0.8 ft/sec
Hoist speed over 1,590 kg	0.4 ft/sec
Pivoting speed up to 1,590 kg	5.6 °/sec
Pivoting speed over 1,590 kg	3.5 °/sec
Smooth speed change control	0.05 g max accel.
UTILITY CONSUMPTION	
Max. hydraulic flow rate	570 l/min
Max. operating pressure	207 barg.
Hydraulic power	300 hp
Electrical power	120 VAC, single phase, 50/60 hertz, 15 amps

## PLS-7

The Pickup Laydown System with 7 metric ton capacity (PLS-7) includes columns, crown, winch, carriage, pivoting boom and telescopic arm. The PLS-7 is one component of a stand building system that is used to deliver single range II or range III tubulars from a horizontal position on a conveyor to a vertical position either at the well center or at the mousehole.



### Technical Specifications

PLS-7 DESIGN DATA	
Service - Horizontal to vertical tubular handling	
Boom extension reach	275 in - 295 in
Retraction limit reach	150 in - 170 in
Tubular size OD	3 1/2" - 22"
Safe Working Load (SWL)	7,000 kg
Total weight, carriage and lifting boom	15,900 kg
Total stationary weight, hoist winch, columns, crossbeam:	36,300 kg
STABILIZER ARM	
Gripping jaw OD range options	3 1/2" - 9 3/4", 10" - 20" and 15" - 22"
Middle jaw OD range options	Lighter weight tubulars (casing) down to 9 3/4"
Roller jaw OD range options	3 1/2" - 9 3/4", 10" - 20" and 15" - 22"
UTILITY CONSUMPTION	
Max. hydraulic flow rate	760 l/min
Max. operating pressure	207 barg.
Hydraulic power	400 hp
Electrical power	120 VAC, single phase, 50/60 hertz, 15 amps