

ITEM OPPORTUNITY SYNOPSIS

Name of the item to be scouted: Turnout System including Derailer

State item to be used in: Nevada

Describe the Item:

Please describe the item application/the end use of item. Turnout System including Derailer as an integral part of the Signaling System. For further description please see attachment. Please note that the equipment will be installed and shall be delivered to California and Nevada.

Supplier Information:

Type of Supplier being sought (select from list below)

Manufacturer

Contract Manufacturer

Distributor

Other (please specify)

Reason for scouting submission (select from list below)

2nd Supplier

Price

Re-Shore

Past supplier no longer available

New Product Startup

BABA

Other (please specify)

Summary of Technical Specifications and Performance Requirements:

Describe the manufacturing processes (elaborate to provide as much detail as possible). Please see attachment.

Provide dimensions / size / tolerances / performance specifications of the item. Please see attachment.

List required materials needed to make the product, including materials of product components, if applicable. Please see attachment.

Are there applicable certification requirements?

Yes

No

Please Explain: Please see attachment.

Are there any applicable regulations that apply to the production of this item?

Yes

No

Please Explain: Please see attachment.

Are there any other standards, requirements?

Yes

No

Please Explain: Please see attachment.

Additional Comments:

Additional technical comments: Please see attachment.

Volume and Pricing:

Estimated Potential Business Volume (i.e. #Units per day, month, year): Please see attachment.

Estimated Target Price / Unit Cost Information: Target Price to be determined upon further analysis and review with possible manufacturer.

Delivery Requirements:

When is it needed by? (Immediate, 30 days, 6 months, etc) Please see attachment.

Describe packaging requirements (i.e., individually/ group packaging). Please see attachment.

Where will this item be shipped? Nevada and California site

Information for the National Institute of Standards and Technology – Manufacturing Extension Partnership (NIST-MEP) scouting

Wayside equipment for Signaling Applications
with operational speed up to 220 mph

1 Turnout System including Derailer

The turnout operating system shall consist of various tested and approved components that will ensure safe high-speed operation on the planned lines. This system includes the point machine, the end position detector, the paw locks and the derailer required on certain locations.

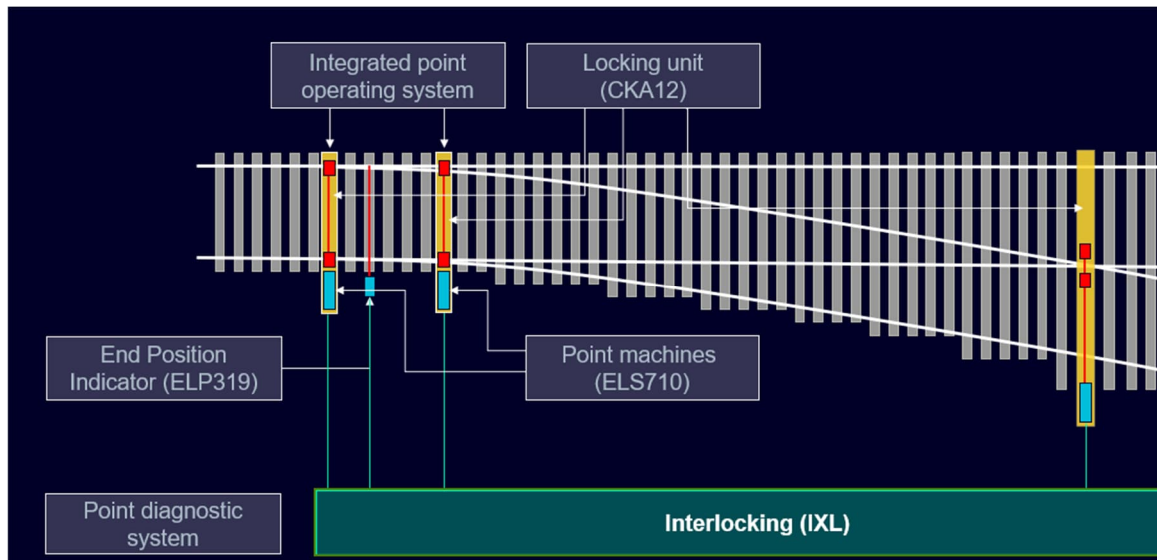


Figure 1: Turnout System

Specific conditions for high-speed operation:

If turnouts are to be operated safely at a high-speed branch, they must be built longer than turnouts used in the normal speed range. This ensures that trains can change track without a significant reduction in speed. This requires higher forces for the changeover of the switch tongue, which in turn must be realized by several synchronized point machines. Furthermore, the application of additional end position detectors is required to detect the safe position of the rail tongue under all circumstances.

The control system of the interlocking therefore must work precisely and synchronously to prevent bending of the switch blade during the turning process, to reduce wear and to ensure safe locking in the end position.

The point operating system which is introduced with the project consists of sub-components which are proven for the specific requirements of high-speed operation ensuring the highest level of safety.

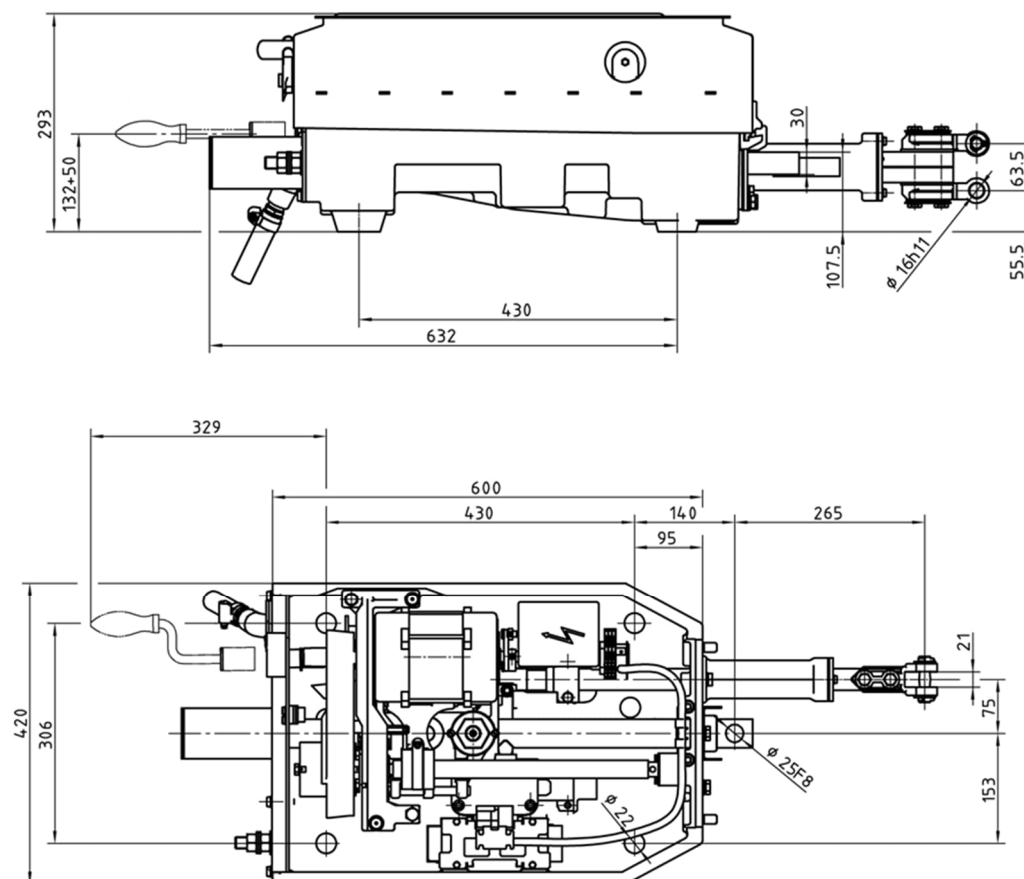
1.1 Point Machine

The point machine shall be integrated in the overall signaling system and is used to set the points safely and reliably under all circumstances. Due to the high-speed requirements, a drive and locking concept with external locking device is required. Such external locking principle is used in the international environment from a speed of approx. 160 kph to lock the rail tongues firmly and stable to the stock rail.



The point machine shall be a compact and light weighted component. It must be designed for a live time of 1 Mio strokes and provide minimum life cycle costs. The main modules shall be exchangeable by a single person in the field.

The point machines applied in this project need to be precisely matched to the control system used to ensure safe operation. This is because the interfaces to the interlockings have been developed in accordance with CENELEC guidelines and standards and therefore offer the highest possible SIL4 safety integrity level according to EN50129.



Technical characteristics/Requirements of the point machine:

Weight	110 kg
Temperature range	-40 °C to +80 °C
Width	420 mm
Length	1050 mm (with point detector)
Height	293 mm
Point opening	Various: 76 mm - 81 mm, 105 mm, 120 mm, 160 mm
Retention force of trailable point machine	7000 N ± 500 N
Retention force of non-trailable point machine	> 30 kN
Alternative locking force of detector slides	> 10 kN
Trailing resistance	9000 N + 500 N (static)
Throwing stroke	150 mm, 220 mm, 240 mm
Throwing force	5000 N / 5500 N, 7000 N / 8250 N
Throwing time	4-6 s (depending on version)
IP rating	IP55 as per EN 60529
Protection class	1 as per VDE 0100
Type of current	Three-phase AC
Operating voltage of point machine motor	400V three-phase AC
Rated voltage	400 V AC 50/60 Hz ± 2%
Test voltage	2500 V 50 Hz as per VDE 0831
Power consumption	400 Watt
Safety Level	SIL4
Features	<ul style="list-style-type: none"> - External Locking – High Speed - Simple mounting and handling – fits with most existing installations (Auxiliary tools available) - Key modules exchangeable onsite by single person in short time - All components easy to access. - Long lifetime through innovative materials (1 Mio strokes) - Long inspection intervals (12 months) - Manual operation arrangement optimized for track-worker safety - Ecologically safe and sustainable

Scope and delivery dates

Qty: ~160

The delivery dates, ex-works are February 2025.

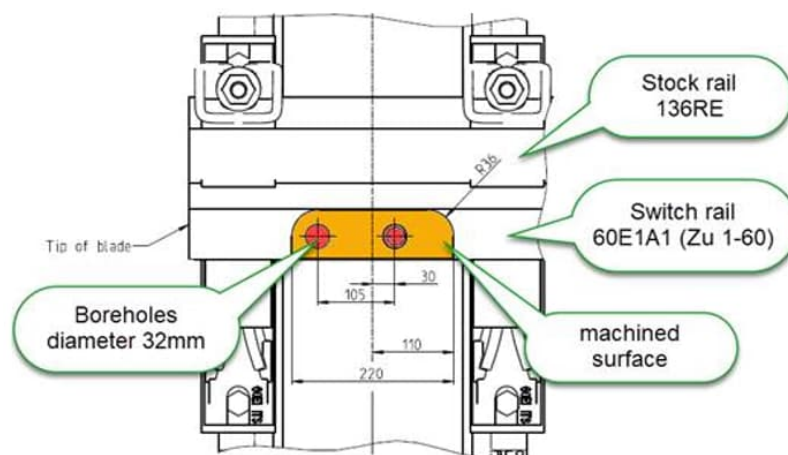
1.2 Paw Locks



The locking units are used to operate and close the switch rails in the end positions. One paw lock shall be used to operate the swing nose crossing.

Interface to the switch rails

The following illustration shows the interface to the switch rails and the boreholes needed to install the external locking units.



Characteristics/Requirements of the Paw Locks:

Features	
Wide range of applications	<ul style="list-style-type: none"> • Single switches • Single and double slip switches • Movable frogs • Facing-point locks and auxiliary locks • It can be installed in hollow ties or between ties
Switch machine types	Compatible with electric or hydraulic switch machines, as well as with manually operated and trailable one-way switches
Rail profiles	Suitable for all stock rail and switch blade profiles, including vertical and inclined rail profiles (UIC profiles and high blades)
Trailability	Up to 40 km/h
Fine adjustment	Switch blade clearance adjustable within 8 mm by means of eccentric bolt
Twist protection	Prevents excessive gap tolerance even in case of gauge widening
Switch blade creep	Up to ± 25 mm, without disrupting locking function
Visible profile	No parts stand out above tie surface at track center
Ambient conditions	Full functionality in snow and ice

The pawl lock is an external locking and ensures a force-locking and formlocking connection between the point blade and the stock rail.

Storage of the paw lock

The paw lock must be stored in the manufacturer's packaging on a clean and dry surface at a weather-protected location. The maximum storage time shall be two years.

Dimensions and weight

CKA 12 (Normal gauge)	Length: approx. 2220 mm	Width: approx. 250 mm	Net weight: approx. 90 kg
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Scope and delivery dates

Quantity: ~140

The delivery dates, ex-works are February 2025.

1.3 End position detector - Fail-safe detection of points

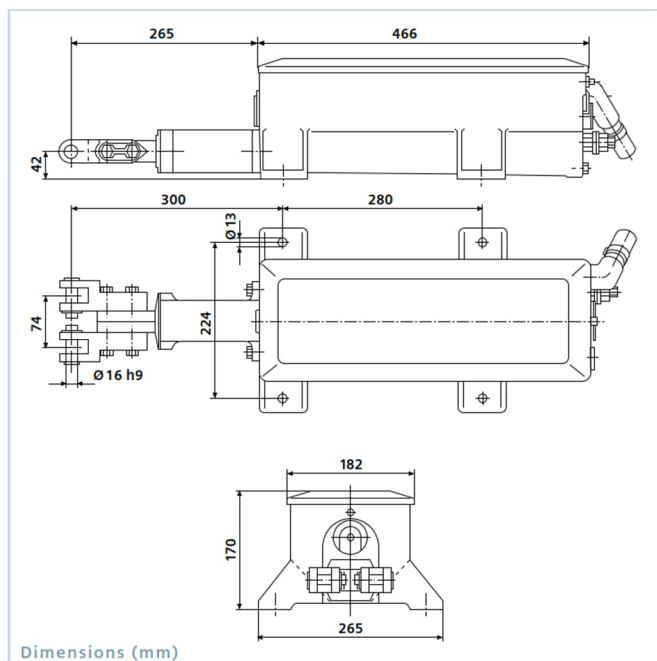
The end position detector shall detect the end position of the following components:

- points with mid-blade locking
- high-speed points
- manually operated points
- spring return points
- mechanical locking units
- movable frogs and frog wing rails



The end position detector shall satisfy the following requirements:

- detection of open and closed point blades
- control of point opening
- control of locking function
- indication of point trailing operations
- detection of gage narrowing



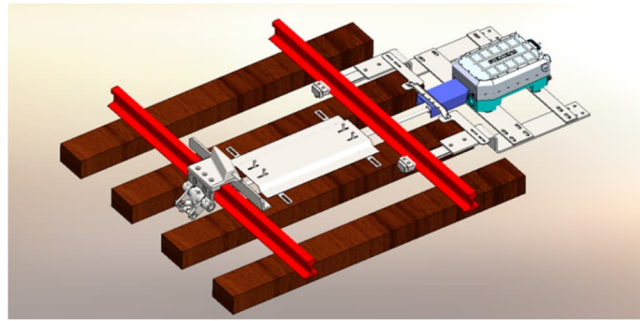
Scope and delivery dates

Quantity: ~80

The delivery dates, ex-works are February 2025.

1.4 Derailer

The derailer shall be fully compatible with the point machine and Siemens Westrace Interlocking and shall bring all required proofs including the compatibility with CENELEC SIL4 requirements. It shall be designed to enable derailment of rolling stock in either left or right direction of travel.



Scope and delivery dates

Quantity: ~7

The delivery dates, ex-works are February 2025.