Problem statement
Changing of conveyor rollers in loading areas and skirted areas is difficult due to the inability to lift the belt sufficiently due to the presence of chutes and skirts.
An idler frame is required to simply and safely solve this problem.
Rollers to be used should be standard rollers used in the run of conveyor.

Possible solutions
Possible solutions are proposed

Melco Retractable Idler

Melco “Jack Down idler”

As a typical idler for comparison, a 1800 mm BW idler, 5 roll is considered.

These options can be evaluated on the following criterion
- Ease of use
- Speed of use
- Safety
- Equipment required
Retractable idler

The Melco Retractable Idler allows for the replacement of rollers by the splitting of the idler frame into 2 sections which can then be retracted to allow for access to the rollers.

A small packer plate is first removed from below the idler frame foot plate to allow the idler frame to drop away from the belt before retraction.

The retractable idler sliding surfaces are manufactured with inverted angle sections for smaller belt widths and back-to-back channel sections for larger belt widths.

![Idler in CLOSED Position](image1)

![Idler in RETRACTED Position](image2)

![Detailed view](image3)

![Approx dimensions](image4)
Jack Down idler

The Melco Jack Down idler allows for the replacement of the rollers by lowering the frame below the belt using 2 standard Bottle Jacks. 1 Ton bottle jacks should be more than suitable.

This allows approximately 100-150 mm clearance beneath the belt for replacement rollers.
# Advantages and Disadvantages

## Retractable Idler

| Ease of use | Removal of any chute skirting is **not** required.  
Simple operation to perform on site. 4 Bolts (2 on each side) need to be removed and the frame retracted.  
Forces required to retract and return frame possibly increase over time and with dirt retarding the sliding action.  
Rollers are well clear of belt for easy removal and replacement especially important on large belt widths with heavy rollers at center position.  
Space is required on both sides of the conveyor (750 mm max).  
Gantry walkways would be required on both sides with elevated conveyors. |
|---|---|
| Maintainability of equipment | No maintenance required.  
Possible build-up of dirt over time. |
| Complexity for manufacture | Relatively complex with a number of components.  
Longer lead time for supply |
| Additional equipment required | None. Unless additional force required to retract or return frame. |
| Safety | Safe operation with retracting frame and changing rollers.  
Retracted frame is always supported by guides. |
| Cost | Price premium over standard frames but not significant considering reduction on maintenance downtime. |

## Jack Down Idlers

| Ease of use | Removal of any chute skirting is **not** required.  
Simple operation to perform on site.  
Rollers are dropped by ±100-150 mm.  
Rollers still must be replaced from below the center of the belt.  
On larger belts the distance from the outer limits of the conveyor stringers to the center roll may result in difficulty in removal and replacement especially with heavy rollers. |
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<td>Maintainability of equipment</td>
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| Complexity for manufacture | Relatively simple with few components.  
Frame is heavier than other frames, but simpler and faster to manufacture. |
| Additional equipment required | 2 Bottle jacks required which are generally available in maintenance workshops. |
| Safety | Safe operation to jack down frame.  
Roller removal and replacement still requires work below the belt. |
| Cost | Price premium over standard frames but not significant considering reduction on maintenance downtime. |

## Recommendation

Melco considers both the retractable idler and the jack-down idler to be safe and easy-to-use idler designs for loading and skirted areas on conveyors. Both systems allow for removal and replacement of rollers without the need to lift the belt and remove the skirts.

- Retractable idlers are possibly slightly more difficult to retract and return, but allow for easier roller replacement once retracted.

- Jack-down idlers are simple to drop away from the belt, but require roller handing to be done below the belt.