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Frank Mohn Services AS

Service Bulletin

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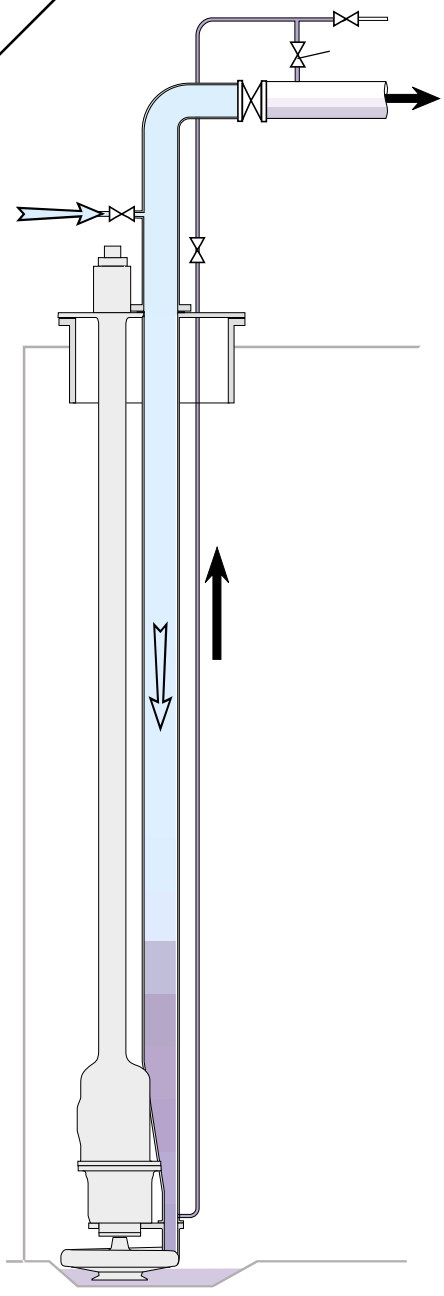
Improved stripping - latest standard available as upgrading kits

FRAMO



- ✓ Less cargo remaining on board
- ✓ Reduced time for tank cleaning
- ✓ Faster turn-around
- ✓ Improved earnings

Dear Customer!

To have a minimum quantity of cargo left on board after a discharge is more and more important. Framo are continuously working to improve the stripping. This has resulted in a new generation of cargo pumps, achieving a considerable reduction of cargo left in the tank after stripping. These new developments are now available as upgrading for existing pumps.

The majority of existing pumps can be upgraded. For specific information on your pumps, please do not hesitate to contact us.

The benefits of an improved stripping result are:

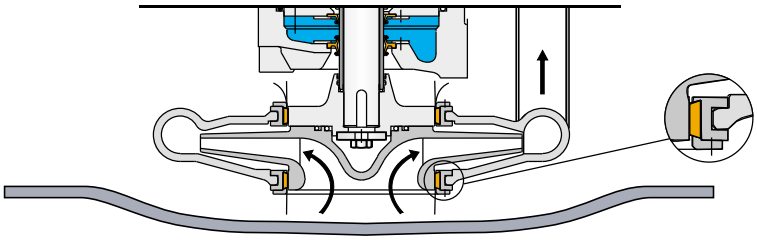
- **Less cargo remaining on board**
  Easier stripping with reduced quantity of cargo left on board after stripping and thus reduced slop handling cost.
- **Reduced time for tank cleaning**
  Less slop will reduce the time needed for tank cleaning.
- **A faster turn-around**
  Less time for tank cleaning will reduce the time needed before the ship is ready to load a new and different cargo.
- **Improved earnings**
  A quicker turn-around will make the ship able to increase the number of voyages per year and thus improve the earnings.

The latest design of impellers on our cargo pumps has today a stripping cone. This can also be installed on previous type of impellers. The main benefit will be that the cargo pump will take suction easier after it has been stopped during the stripping phase, as the stripping cone is feeding the impeller.

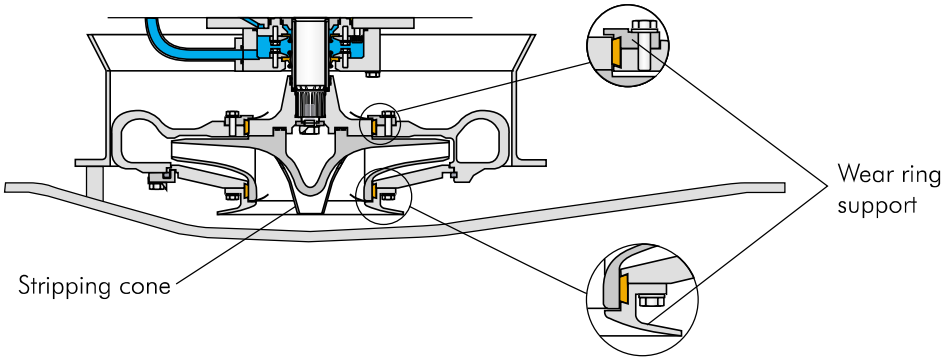
When upgrading previous model impellers, they have to be sent ashore to one of our service stations in Bergen, Houston, Rotterdam or Singapore to ensure the quality. Such an upgrading can also be carried out in connection with a normal reconditioning of the impeller.

On our newer pumps the support rings for the wear rings have a special shape in order to prevent the wear ring losses from spraying out on the tank top.

Modified support rings are part of the upgrading kit in order to improve the stripping result. Another benefit from this modification is to avoid erosion marks on the coating in the suction well, as the wear ring losses are guided into the suction inlet of the impeller.



Previous model



New design

Additional drain line

In addition to the built-in stripping system, a separate drain line can be arranged on the cargo pump for connection to a vacuum system on deck.

By this solution the suction well can be completely emptied after tank cleaning. The vacuum drain line is equipped with a nozzle. The nozzle mixes the remaining liquid in the drain line with the internal tank atmosphere. This will reduce the weight of the liquid column. Consequently, the remaining liquid column can be emptied by means of a "vacuum" system on deck.

The "vacuum" system on deck can be arranged in several ways. One possibility is to arrange the piping as shown on fig. 2, then use the stripping medium to drive the ejector and use the cargo line as a reservoir for the remaining cargo.

The drainpipe has a flanged connection in the bottom and can be blanked off before loading of a high viscous cargo.

This is a modification that can also be implemented onto previous pump models.

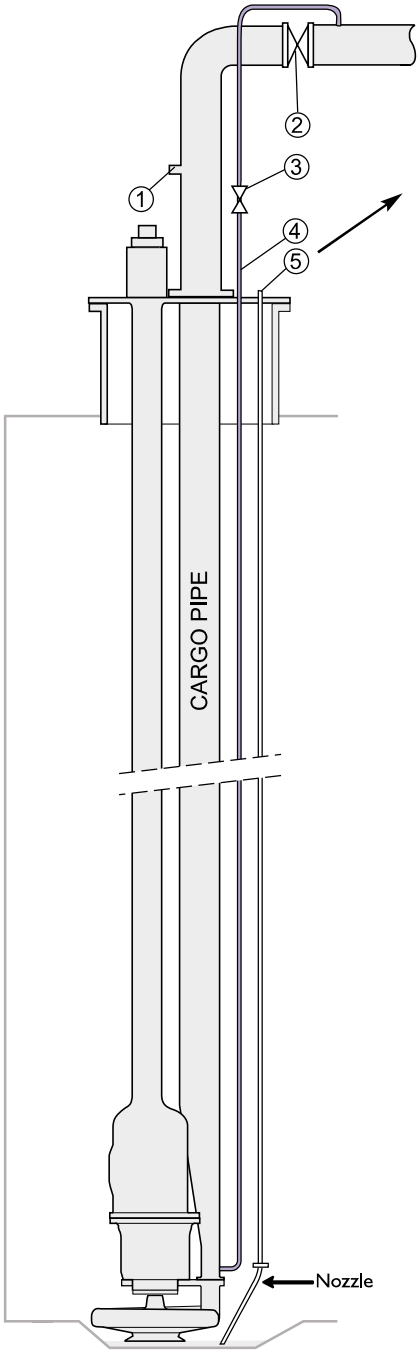


Fig. 1

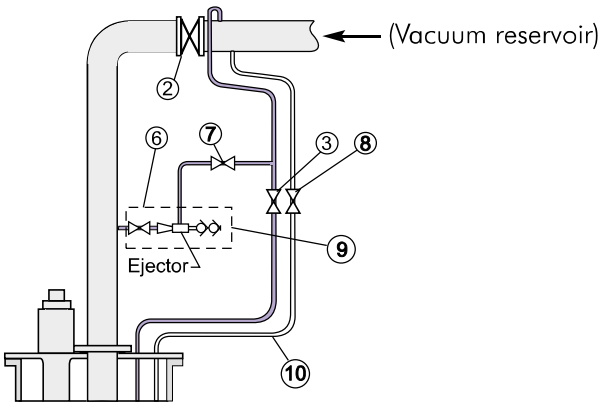


Fig. 2

A standard cargo pump installation consists of:

1. Cargo pipe purging connection.
2. Cargo valve.
   Butterfly- or ball valve type, remotely and/or manually operated. If the valve is manually operated, it should have gear to control the closing time.
3. Stripping valve.
   Ball valve type, manually operated.
   This valve must be easy to operate and located close to the purging connection, item 1.
4. Stripping pipe.

Additional items for vacuum drain line:

5. Vacuum drain connection.
6. Evacuating arrangement
7. Vacuum valve.
8. Drain valve.
9. Cargo Purging connection.
10. Vacuum pipe.

Valves, item 7 - 9, to be manually operated ball valves. They must be easy to operate and located close to the purging connection, item 9.

If you need any further information or assistance, please do not hesitate to contact us!

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