Installation Instructions

HEUFT *Spectrum*
Empty Bottle Inspector

Congratulations on purchasing a HEUFT *Spectrum* Empty Bottle Inspection system. With proper preparation prior to installation and performing recommended maintenance at appropriate intervals, your system will give you years of good service. The information that follows will assist you in these preparations.

UTILITIES REQUIREMENTS

Electrical Requirements-InLine *Reflexx* EBI

Power supply (to be provided on site)

The supply line, the connection and the possible official acceptance necessary for an extension to the low-voltage mains have to be carried out by the customer in accordance with VBG4, the VDE standards and the legal regulations of the country.

- Mains: 3-phase current (L1, L2, L3, N, PE)
  optional for external uninterruptible power supply in addition:
  1-phase alternating current (L, N, PE)
- Wiring: TN-S mains according to IEC 60364-4-41 / DIN VDE 0100-410
- Nominal voltage: 400 V ± 10%, 415 V +6%/ -10% (outer conductor voltage)
  230 V ± 10%, 240 V +6%/ -10% (phase voltage)
  Optional for external uninterruptible power supply in addition:
  230 V ± 10%, 240 V +6% / -10%
- Frequency: 50/60 Hz
- To be provided by the customer: 20 A gG/gL fuse protection
  Information: Fuses are stipulated in order to protect the main power switch. Circuit breakers do not limit the maximum current sufficiently.
- Supply line: Max. conductor cross section: 5 x 6 mm^2 (terminals for the main switch).
  Max. cable diameter: 20 mm (cable entry to main power switch).
  Information: The conductor cross section is to be selected by the customer in accordance with IEC60364-5-523 / DIN VDE0298-4. The method of installation, the type of cable, temperatures, cable accumulation and the number of loaded wires must be taken into consideration in addition to the fuse protection stipulated.

Constant output: 1400 W plus 500 W (without cooling unit) per sidewall inspection module (optional) or 1800W plus 870W per sidewall with cooling units.

Compressed Air Requirements

Compressed air supply (to be provided on site)

Compressed air for the HEUFT *InLine* Empty Bottle Inspector

- Air connection: minimum 6 bar, maximum 10 bar
  ½" connection
- Air consumption: Basic unit:: 3 m^3/h
  Bottle base - blowing device: 0,15 standard
- Air quality: in accordance with ISO-DIN 8573-1
  Instrument quality (clean, dry, oil-free)

Solids content	Quality category 2
Pressure dew point	Quality category 4
max. oil content	Quality category 1

Compressed air for positive air (optional)

- Air consumption: approx. 3 m^3/h at 0,1 bar

Compressed air for thread detection (optional)

- Air consumption: approx. 20 m^3/h

Usage: approximately 15 cfm at 500 bpm

Signal connections

All electrical connections to the EBI must be potential free (dry contact)

All output signals from the EBI are provided with an opto-coupler.

All input signals to the EBI must be dry contact-diode protected

Switching power of the opto-coupler:	5A
Signal length:	minimum of 2 ms
Maximum output voltage:	30Vdc
Maximum output current:	50ma
Maximum switching frequency:	1KHz
Number of available outputs:	12

Empty Bottle Inspector

Signals for external line control

The following potential-free signals are available on the HEUFT - EBI:

EMERGENCY STOP: The signal EMERGENCY STOP has to lead to an immediate stop of the conveyor. Hereby the respective driving mechanisms have to be switched off.

RELEASE IN FEED: Stops the infeed conveyors during the adjustment or jog-speed operation as well as during the test bottle request.

AUTO / MANUAL: regulates the Empty Bottle Inspector conveyor speed between the regulated conveyor speed (production) and constant conveyor speed (adjusting operation). This shall provide that the EBI can be operated outside of production hours, as well. During adjustment operation the conveyor speed shall be adjustable and shall stop the infeed Conveyor.

RELEASE EBI: Release of starting and stopping of a regulated operation of the Empty Bottle Inspector.

TOUCH CONTROL: Only the driving mechanism runs with a fixed low speed as long as the signal is active. The speed has to be adjusted during commissioning, together with the HEUFT technician.

Voltage on the external signals up to 42 V DC and 0,15 A resistive load with recovery diode provided.

Analog signals must not be lead to the inspector and back to avoid electrostatic influence. Power supply for the existing switch contacts has to be provided by the customer.

The EMERGENCY STOP - switch has to comply with the regulations of the respective country.

Signal connection to an EMERGENCY OFF safety circuit

Three signals (3 x 2 wires) are provided for connection to an EMERGENCY OFF safety circuit. The EMERGENCY OFF (EMERGENCY STOP) wiring must be in accordance with the regulations of the respective country.

EMERGENCY OFF: The EMERGENCY OFF signal must stop the conveyors immediately. Please note that the voltage to the corresponding drives is disconnected. For this an EMERGENCY OFF safety relay with an auxiliary contact (minimum category 1 in accordance with EN954-1) has to be used by the customer. This EMERGENCY OFF safety relay should only affect the driving conveyor for the empty bottle inspector, and if necessary the conveyor for the infeed check, because the corresponding circuit and signal elements are available on the empty bottle inspector. A separate EMERGENCY OFF safety relay should be provided for the remaining conveyor equipment.

EMERGENCY OFF Message: Acknowledgement from the EMERGENCY OFF safety relay. A potential-free auxiliary contact (make contact) from the EMERGENCY OFF safety relay is required for this.
Closed auxiliary contact => no EMERGENCY OFF

Reset: Resets the EMERGENCY OFF safety relay after an EMERGENCY OFF.

Signal connection to an external conveyor control system

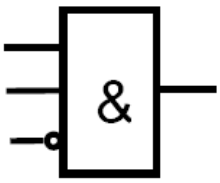
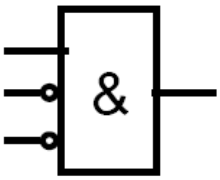
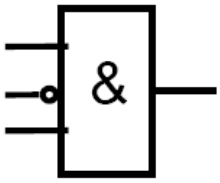
The **START / AUTO / JOG** signals are emitted potential-free for connection to the customer's conveyor control system. The operating conditions **automatic / manual / jog** can be displayed by means of a logical operation in the conveyor control system with these.

Production mode: **(automatic)**
Infeed and inspector conveyor operate at a regulated conveyor speed.

Set-up mode: **(manual)**
The set-up mode is intended to make it possible to operate the inspector outside production times. In this case the inspector conveyor operates at a constant speed and the feeder conveyor to the inspector has stopped.

Set-up mode: **(jog)**
During jog operation only the inspector drive operates at a predetermined speed as long as the signal is available. This speed should be set together with the HEUFT service technician during commissioning.

Connection requirements for the signals to an external conveyor control system

Inspector signals	Connection to the customer's PLC	Operating states
START AUTO JOG		Production mode (automatic)
START AUTO JOG		Set-up mode (manual)
START AUTO JOG		Set-up mode (jog)

Signal connection for the device self-monitoring function

The Empty Bottle Inspector HEUFT *InLine* has an extensive self-monitoring function which makes problems possibly occurring at the device immediately available as a message on the operating surface, as information to databases via the network or as a discrete digital signal connection. The following digital signals are available:

STOP Signals:

There are up to four different potential-free signal outputs available in each device which can be used by the customer for processing e.g. as the STOP for the conveyors. The signals are generated by means of the software of the device self-monitoring function.

The type of signal can either be a pulse (duration 1 - 255 ms) or a permanent signal (reset by confirmation).
The monitoring results can be assigned to the respective signals individually or in groups in accordance with the customer's wishes.
The following fault situations (partial extract) can be identified and processed accordingly:

- reject verification: too many rejections
- reject verification: faulty container not rejected
- test bottle check: test not fulfilled
- test bottle check: test not carried out
- container sequence frequency too high
- encoder: no cycles
- detection rate monitoring: fault rate too high
- detection rate monitoring: fault rate too low

Device Status:

HEUFT distinguishes between three different status levels which are displayed at the device by means of a warning light with the colours GREEN / YELLOW / RED. These three different statuses can be transmitted as potential-free signals in accordance with the customer's requirements. The meaning of the statuses is as follows:

GREEN = normal production mode, device function without disturbances;

YELLOW = limited device function, production runs with faults e.g. too many rejections;

RED = device function disturbed, incorrect device function e.g. rejector deactivated via the work/rest switch.

Count Signals:

All the production and fault counters available in the device can be passed on as counting events to up to eight different digital signal lines in accordance with the customer's requirements. Two different transmission options are available for this:

Edge Triggering = the signal level is switched over for each counting event;

Pulse Triggering = the signal switches from HIGH to LOW for a programmable time period (1 - 255 ms) for each counting event.

It is possible to preset whether signal triggering should occur for each individual event or for each n-th event for each counting event so that the customer can process the signals.

Ambient conditions in the inspection area

The following requirements must be met in order to ensure that the inspector is functioning optimally:

- The inspector is driven by the conveyor motor of the outfeed conveyor of the inspector. The belt drive and infeed conveyor are driven by means of a mechanical block operation in the inspector. The inspector does not have its own drive motor.
- The inspector requires a tensile force of 700 N excluding the infeed and outfeed conveyors. The output of the drive motor on the outfeed side should not be less than 1,8 kW.
- The slat conveyor chain at the drive must be tightened to avoid the chains vibrating.
- The outfeed conveyor of the inspector from the outfeed to the rejection system as well as the conveyors in the rejection area must be level and without edges. The chains of the infeed and outfeed conveyors must be 82,5 mm wide. Pitch: 38,1mm.
- The acceleration and brake ramps during standard controlled operation must be arranged so that the bottles do not slip around on the conveyor chain regardless of the line situation. The EMERGENCY OFF situation is an exception when the drives are switched off immediately without ramps (the maximum acceleration/deceleration during normal starting and stopping should not exceed 0,4 m/s^2).
- The conveyor speed at the inspector outfeed conveyor should not exceed the value "Vmax" as per the project drawing during any line situation. A closed, dense bottle supply which is nevertheless free of impact pressure from the combiner to the inspector makes sense.
- An unsteady bottle flow should be avoided: the use of drive motors with slip-on mitre gears and the installation of a free-running sprocket (not a standard deflection pulley) in the deflection unit of the infeed conveyor of the inspector makes sense in this connection.
- A tailback of bottles from the filler to the HEUFT rejection control should be avoided.
- Only water (without additives) should be used to lubricate the infeed conveyor. The outfeed conveyor should be lubricated with conventional conveyor lubricant.

Environmental conditions of the Empty Bottle Inspector

To assure best performance of the inspector, the following conditions must be met:

– The wear strips of the discharge conveyor chain have to be installed such that there are no disruptions in container flow.

– The discharge conveyor and the first rejection belt have to run synchronously.

– The table-top chain of the drive has to correspond to the specifications as follows:
"Sanded, rust and acid-resisting according to ISO - No. C 13 S - 4" (Cr - Ni - Steel 18/8).
The sprocket at the drive has to be selected according to DIN 8153.

– The table-top chain of the drive has to be tightened in a way that the chain runs vibration free.

- The discharge conveyor may be lubricated with the usual conveyor lubricant.

– The ambient air temperatures must fall between 50ºF and 104ºF.

–The relative air humidity has to be between 20 % to 80% (non-condensing).

Ambient conditions in the inspection area

The following conditions should be observed in order to ensure that the full container checks function properly:

• The container flow should be pressure-less in the detection and rejection areas.

• The maximum permitted conveyor speed must be observed (see project drawing or order confirmation).

• The containers must not slip when starting or stopping the conveyors in the area between the inspection and the Rejector. If necessary, the complete inspection area should use variable frequency drives to limit acceleration and deceleration during normal starting and braking.

• The conveyors in the rejection area should be flat and not have any dead-plates. They should have a gradient of approximately 5° in the rejection direction. A design free of vibration and container instability must be provided.

• The wear strips of the conveyor chains in the rejection area must be continuous without joints or middle studs.

• Conveyor chain may be either metal or plastic depending on the application. On all applications, chain stretch must be held to a minimum. On HF applications, metal chain is preferred for grounding reasons.

• All containers should fall within the tolerances specified on the container drawing.

• The container conveyor chain beneath the detections and the first rejection belt must run synchronously with each other. The remaining rejection belts must run gradually slower (see recommendations in table 1).

Output (cpm)	600	800	1000	≥1000
Number of belts	4	5-6	6	6
Length of rejection table	6 ft.	10 ft.	10 ft.	13 ft.
With Sampling	Conveyor 1+2 +3+4 synchronous	Conveyor 5+6 -20%	Conveyor 6 synchronous	Conveyor 7+8 -20%
Without Sampling	Conveyor 1+2 Synchronous 3+4 -20%	Conveyor 5+6 -20%	Conveyor -20%	Conveyor 7+8 -20%
Quality of the conveyors	Conveyor 1-3 polished	Conveyor 1-4 polished	Conveyor 1-6 polished	Conveyor 1-6 polished

Electrical connections necessary for the SPECTRUM

Utility power is to be routed via rigid conduit to within two feet of the *Spectrum* support column. The wiring is routed from the rigid conduit, via "seal-tite" into and up the support column to the main disconnect at the lower rear on the *Spectrum* electronics housing.

Very Important: The *Spectrum* EBI must not have power removed from it unless it has been powered down in a controlled manner. Failure to provide the *Spectrum* with a dedicated “Always ON” source of power will result in data storage device failures.

The supply wiring and connection(s) should follow the applicable state and local codes in effect for the installation location. These codes should be followed by the customer with regard to the low voltage wiring as well.

Signal lines shall not be run in ducts or together with power cables (e.g. supply main or high voltage line)! Be especially careful of VFD cabling as they may contain significant amounts of harmful harmonics.

Cabling for the Rejector & Encoder

Cabling, to each Rejector(s) and Encoder, (located on the end of the drive shaft for the tabletop chain traveling directly under the *Spectrum* electronics housing) and Seal-tite is provided by HEUFT and is routed through the main *Spectrum* support column. All of these are 24 VDC milliamp level signals. If desired, rigid conduit may be supplied in these locations, but it is not required by HEUFT

Dry contacts:

Outputs:

Output voltage:	max. +30V
Output current:	max. 20mA, short circuit-proof
Potential difference:	max. 2.8V
Sampling frequency:	1KHz max.

Inputs:

Input voltage:	min. 10V, bipolar, max. 30V
Sampling frequency:	max.1KHz

Conductor size:	2x0.5mm² (20 ga.) per signal with shielding
Maximum conductor length:	100 m (300 ft.) max.

Discrete Outputs Available

There are 4 Stop Outputs and 2 Count Outputs which are referenced to the HEUFT *Spectrum* internal 24VDC power supply.

Stop Outputs:

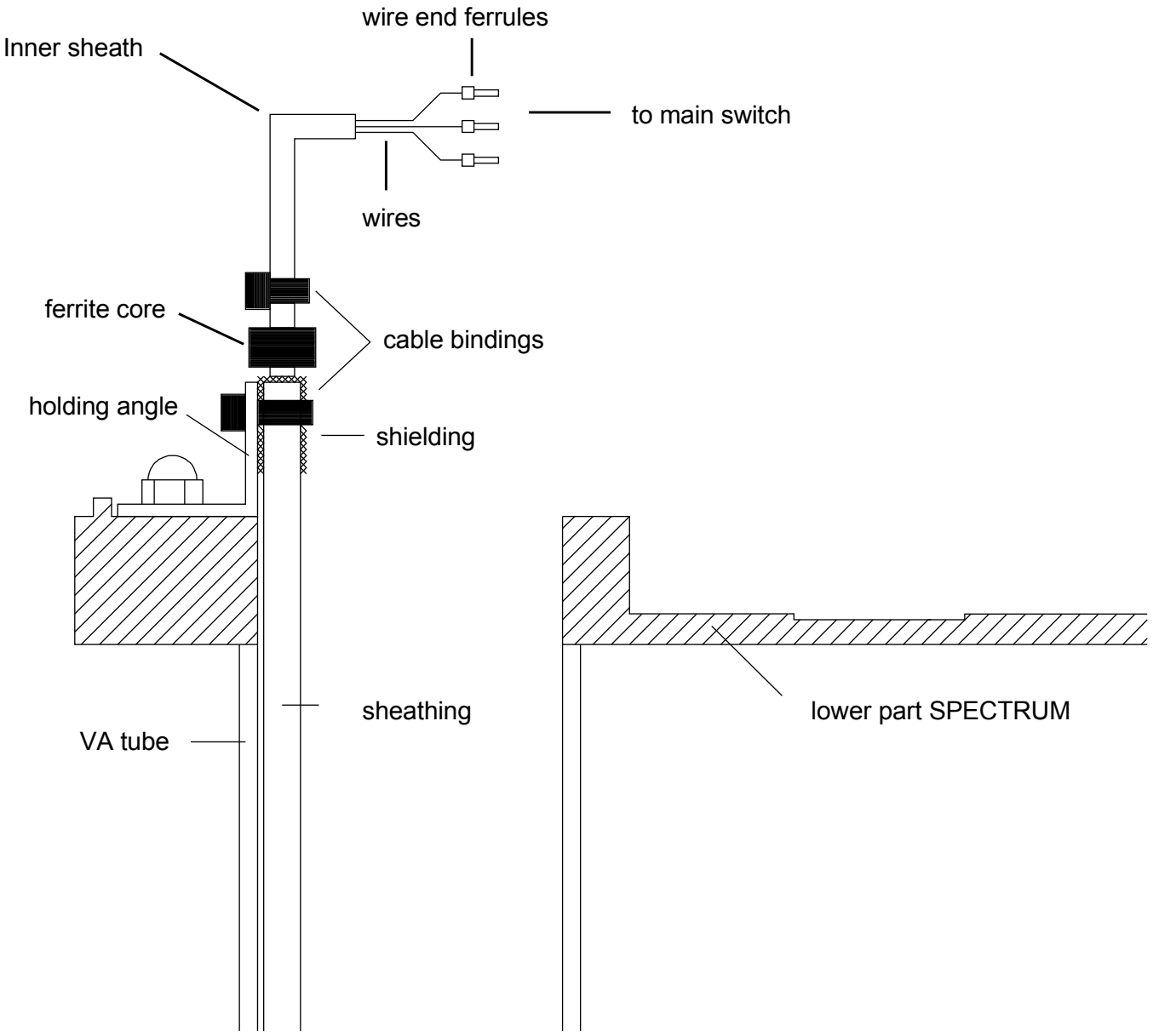
1. “HEUFT READY” to PLC.
2. “Too Many Rejects”
3. Assignable (i.e. Label Serial Fault, etc)
4. Assignable.

Count Outputs:

1. Definable to any Counter based on Inspection Configuration.

Also available are these same signals as dry contacts. When chosen, a card with 12 optically isolated outputs is supplied.

Incoming power cables



Information regarding the application of the inspector

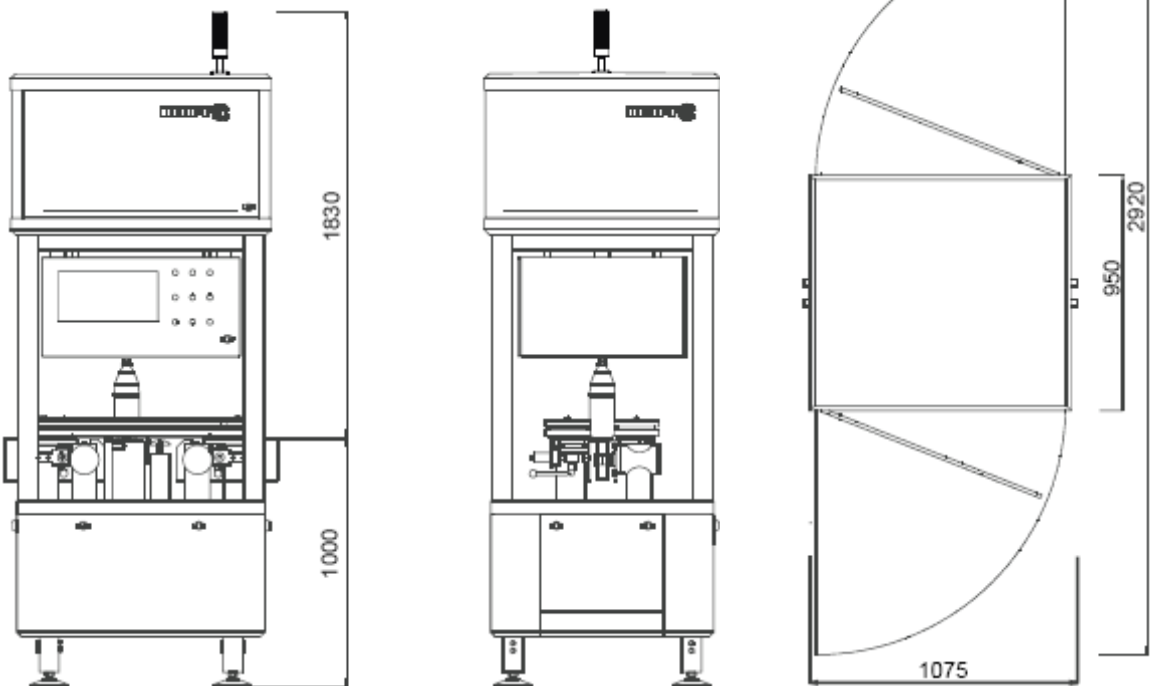
Length: 1100 mm

Width: 950 mm

Height: 1830 mm

Conveyor Height Range: 1000 – 1500 mm

The doors on the front and rear side of the inspector must be opened for the purpose of conversion, maintenance and cleaning. Therefore, a minimum distance of 1000mm to other machines, devices or immovable obstacles must be kept clear.

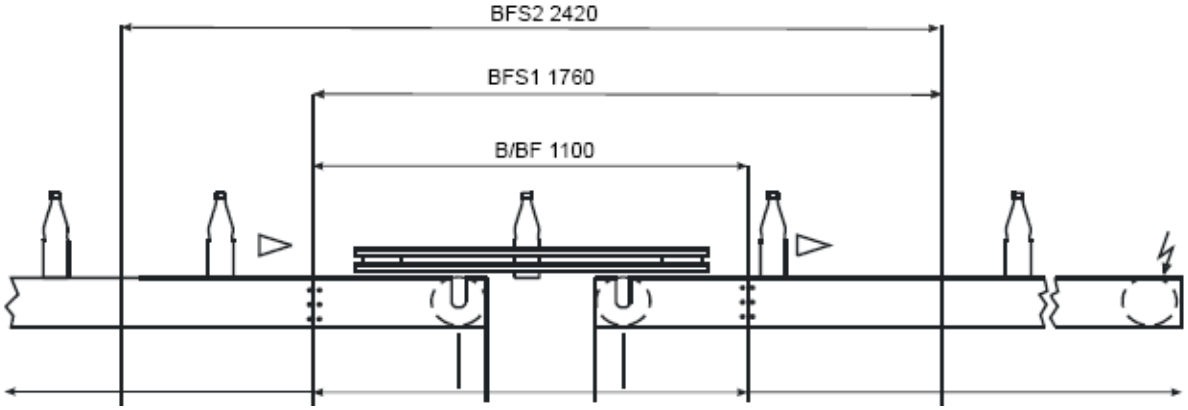


The HEUFT EBI (Base and/or Finish Inspection) is delivered with (2) conveyor sections which protrude from the device by 50mm on either side.

They are used to flange-mount the in-feed conveyor and the out-feed conveyor provided by the customer. This results in the overall length of 1100mm.

Conveyor Chain specification for use in the application of the EBI is 3-1/4" Stainless Steel (specification= DIN 8153/ISO 4348, C 13 S-4).

In the case of device configurations that include additional sidewall inspections, the conveyor length increases to accommodate the addition of the sidewall inspection cabinets.



Additional space is required for each Rejector. Up to two rejectors can be installed after the EBI. Conveyors of sufficient length or collecting tables must be provided for the installation. A minimum distance or 300mm is required between the rejector and the last upstream detection module.

CONTRACTOR SUPPLIED MATERIALS FOR EMPTY BOTTLE INSPECTION UNITS

Compressed Air:
½" air line with vented ball valve shut-off lockable handle to within 12" of the rejector location(s). These will terminate with ½" ID hose connection and stainless hose clamps. Operating pressure to be 85 psi **clean**, **dry** plant air. The Rejector will use approximately .008 scfm per rejection cycle.

Electrical Power:
Conduit from source (instrument power panel) to a position at the inspection electronics stand, 12" below the discharge tabletop chain and 8" inside of the conveyor (the side away from the operator). This will terminate in 3 ft. long Seal-tite, which will terminate in side the *Spectrum* housing. The wire and circuit breaker at the source instrument power panel is supplied by the contractor. (120VAC 5A)

Encoder:
Conduit between the encoder (supplied by HEUFT) and the *Spectrum* housing will terminate in 3 ft. long Seal-tite, which will terminate inside the Spectrum Housing. On the encoder side, about a 2 ft. length of Seal-tite is required. HEUFT will supply an adapter from the NPT connection to the encoder plug. The drive shaft for the filler discharge chain must be drilled and tapped (8mm thread) for mounting of the encoder. The shaft should be removed if possible for drilling and tapping to insure that the hole is centered.

Rejector:
Seal-tite between the Rejector assembly and Spectrum electronics housing (cable supplied by HEUFT). Contractor must modify (cut out) a section of guide rail to accommodate placement/mounting of the Rejector. The Rejector installation will require that the guide rails are adjusted so that all containers are presented (within 1/8") to the first Rejector segment in a consistent manner. The contractor should supply and install any guide-rail needed to close any gaps.

Separator/Rejection Wedge:
The Separator/Rejection Wedge and Conveyor Mounting hardware will be supplied by HEUFT. The wedge should be installed such that the tip of the wedge is 10" from the last segment of the Rejector. The contractor must supply guide rail and brackets to extend from the separator wedge to the existing guide-rail.

Reject Table:
The existing reject table will be used whenever possible. If the existing table is reused, the contractor must adjust the height of the table so that it is even or slightly below the height of the discharge chain. It must not extend above the chain, as this would cause containers to trip and fall.

Compressed-Air Supply

There are two uses for compressed air when installing a ***Spectrum*** with a **Delta (series) Rejector**.

1) Regulated Cooling and Positive Air Pressure for the *Spectrum* Hood assembly (housing the *Spectrum* electronics).
2) Air Pressure for the operation of the Rejector(s).

Compressed Air for the Rejector: **min. 8 bar / max. 10 bar**
Conductor Cross-section: **½ inch**

All compressed air flows through a HEUFT supplied Regulator. From the Regulator, the air supply for the Rejector is routed to the Rejector while the cooling air for the *Spectrum* is piped to the HEUFT supplied desiccant drier then into the *Spectrum* Hood Assembly.

Compressed air for rejection systems

Supply Pressure:	85 psig (6 bar above atmospheric)	
Operating Pressure:	60 psig (4 bar above atmospheric)	
Line size & Air Consumption:	DELTA-FW ½“ approx. .008 scf (.5 Nl) per rejection	
Air quality according to ISO-DIS 8573-	solids content	class 2
	pressure dew point	class 4
	max. oil content	class 4
Air Type:	Plant Air	

General Conveying Conditions:

The *Spectrum* system operates on the principal of taking a series of measurements every 2mm (.080") of conveyor movement, then averaging these measurements. A rotating shaft encoder, which generates a defined number of pulses per rotation of the drive shaft, is used as a clock source. By direct linking the encoder shaft and the drive shaft of the conveyor chain sprocket, one rotation of the sprocket always corresponds to the same number of encoder pulses. The rotation of the drive sprocket also corresponds to a defined distance of conveyor travel. This interaction allows very accurate container tracking on the conveyor and serves as the backbone of our inspection and rejection accuracy. As an encoder-based system, container slippage on the conveyor must be kept to an absolute minimum, especially once the container has passed the HEUFT *Spectrum* Main Trigger. It is important that the conveyor chain provide smooth and stable movement of the containers through the HEUFT Inspection /Detection Area.

Proper guide-rail placement is crucial in consistently centering the container to the HEUFT *Spectrum* Detection module(s) through to within 1/8" of the Rejector face. It is especially important that the guide rails are set so that there is no influence on conveyance of the containers once the containers have entered the Inspection and Rejection areas.

The system that you have purchased was specified according to the production conditions known at the time of the quotation. These conditions included a maximum conveyor speed of 293ft/min (1.5m/s) and a 1/8" minimum spacing between containers.

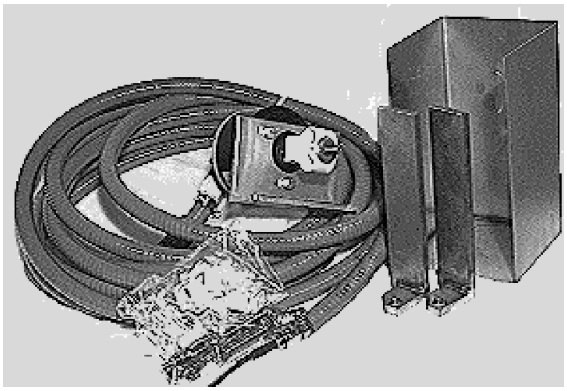
Encoder mounting:

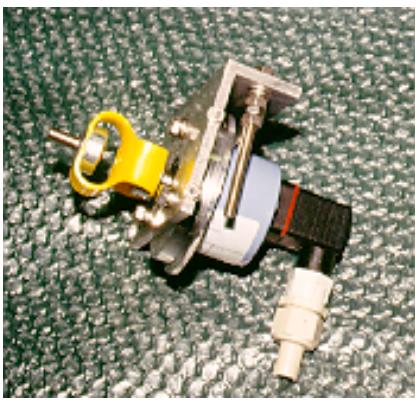
The encoder shall be connected to the Drive shaft, not an Idler or Return shaft, of the conveyor that passes through the HEUFT *Spectrum* device and Rejector.

The following bit/piece parts are necessary to mount the encoder. Please locate all necessary parts.

Encoder parts

The following pages cover the steps for properly mounting the encoder in the correct order:





Please do not proceed unless you are familiar with the proper tools and have the machinist skills necessary to complete the mounting.

Mounting the Encoder:

A rotating shaft encoder, which generates a defined number of pulse per rotation on the drive shaft is used as a clock source for the shift register. By directly linking the encoder shaft and the drive shaft of the conveyor chain sprocket, on rotation if the sprocket corresponds to the same number encoder pulses. The rotation of the drive sprocket also corresponds to a direct distance of conveyor travel. This interact allows very accurate tracking on the conveyor and services as the *heartbeat* of our inspection and rejection accuracy. (Figure 1)

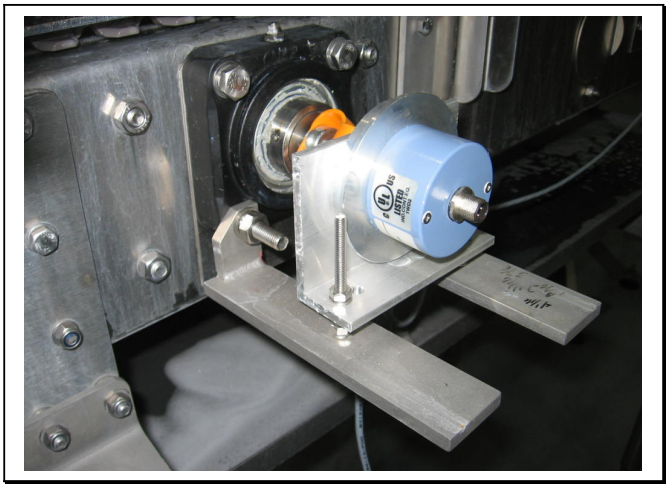
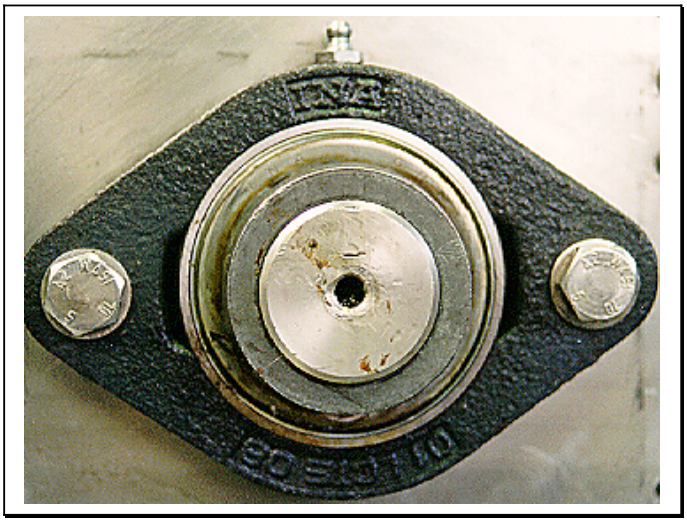


Figure 1

1. Preparation of the drive shaft



a. Determine the conveyor shaft to be used. When mounting the encoder, pay close attention that it is connected to the drive shaft of the conveyor that passes through the Spectrum device and rejector.

b. Find the center of the drive shaft and mark it with a center punch.
c. Drill a 7 mm x 20 mm deep hole - remove any burrs.
d. Cut 15 mm deep M8-1.25 thread in the hole.

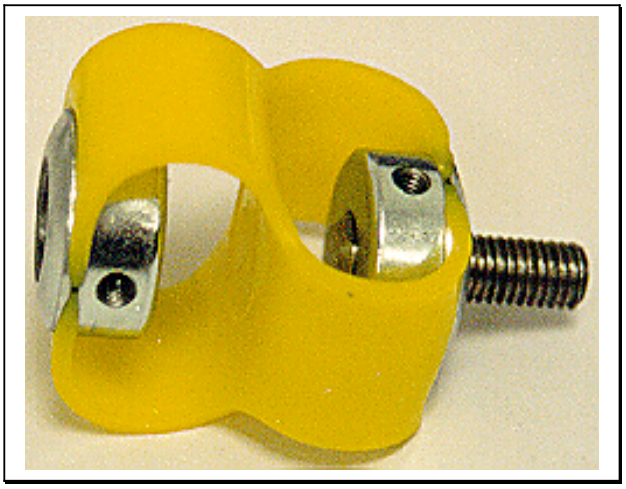
2. Coupling attachment

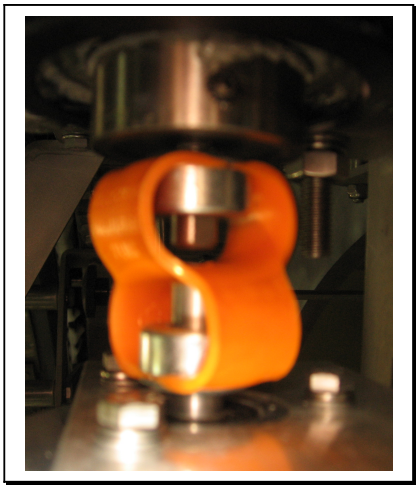
2.1. Unscrew the coupling from the encoder.

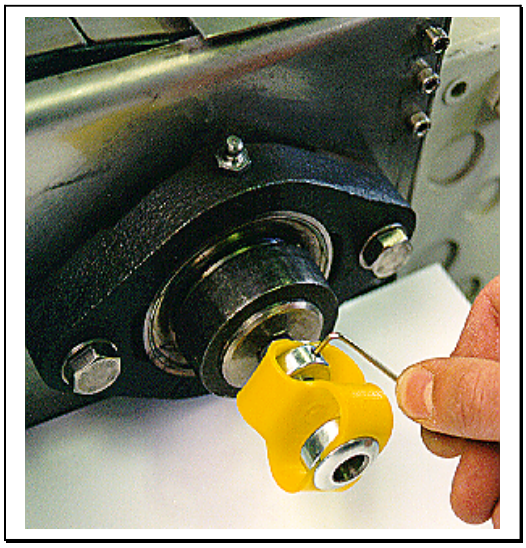
2.2. Detach the coupling from the drive stud.

2.3. Screw the stud into the M8 thread of the drive shaft, secure with locking compound.

2.4. Place the coupling onto the drive stud so that it is flush with the outside edge of the collar, and so that the socket screw engages the flat surface of the drive stud.







Driver with flat surface

3. Attachment of the support

3.1. Slide the encoder shaft into the coupling so that the encoder shaft is flush with the coupling and the socket screw is engaged in the groove of the encoder shaft.

3.2. Loosen the left attachment bolt of the conveyor drive bearing (possibly flange bearing) from the drive shaft.

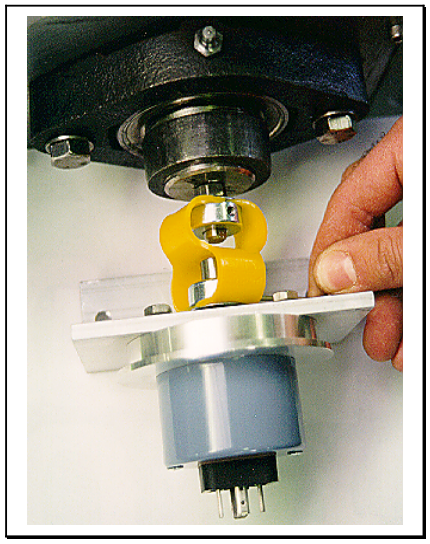
3.3. Hold the support horizontally to the bearing and transfer the distance from the support angle to the bracket, transpose this dimension to the second support bracket and shorten both accordingly.

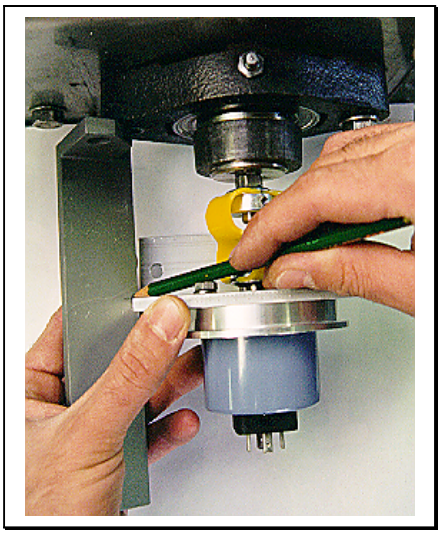
3.4. Mount the support horizontally to the bearing by using the bolt loosened in step 3.2. *(a longer bolt may be required - not included with supplied parts).

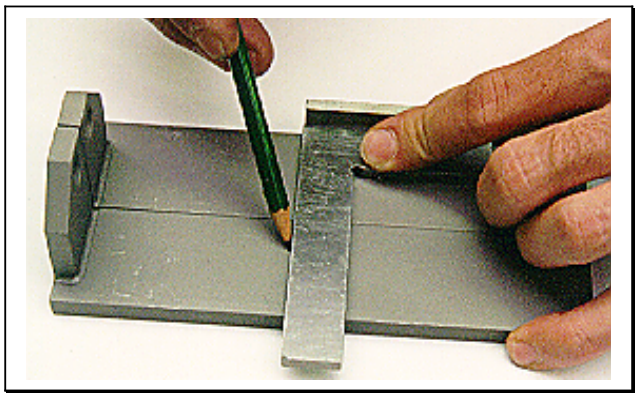
3.5. Tighten the attachment bolt again.

Depending on local conditions, the encoder supports may also be installed in a different manner.

3.6 Attach the right hand support bracket under the other bearing attachment bolt (as described from 3.4. to 3.5.).



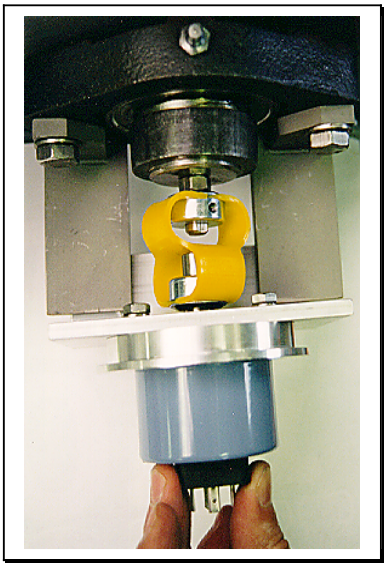


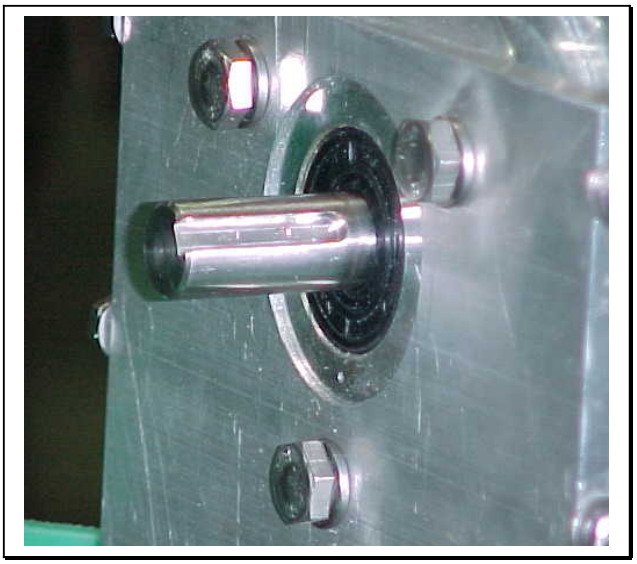


4. Drilling the supports

4.1. Hold the encoder and the attachment angle to the support brackets.

4.2. Slide the encoder shaft into the coupling making sure the encoder shaft is flush with the coupling and the hex socket screw engages in the groove of the encoder shaft.

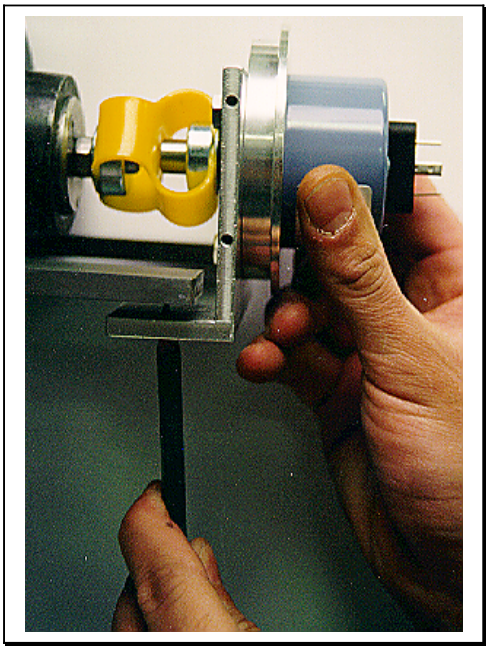


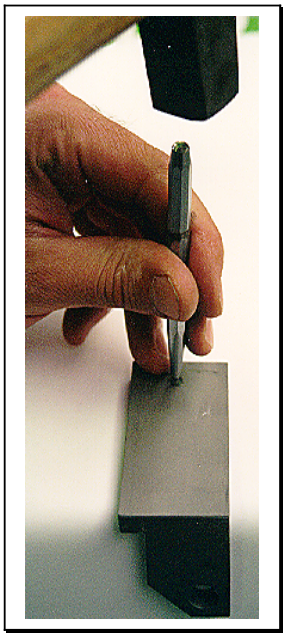


4.3. Transpose the hole positions from the attachment angle to the support brackets.

4.4. Remove the encoder.

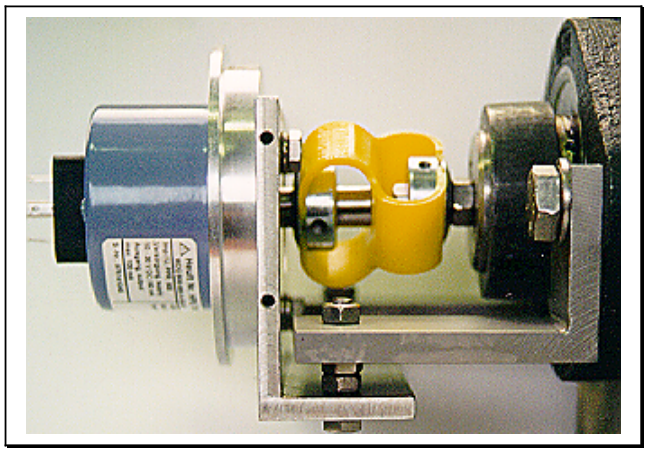
4.5. Center punch the hole locations and drill 6.5 mm holes - remove any burrs.

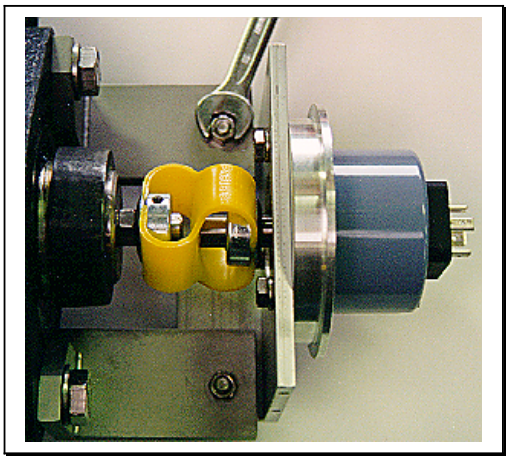




4.6. Attach the encoder to the supports using the provided M6 x 75 mm bolt, nut, counter nut and spring washer.
The drive shafts of encoder and conveyor must be aligned.
Height differences due to local conditions must be compensated for by additional washers, shims or spacers.
When the drive shafts of encoder and conveyor are not correctly aligned, the runout at the encoder shaft will shorten the life of the encoder coupling.

4.7. Place the encoder as in step 4.2. and attach the coupling with the screw (2mm hexagon socket).





4.8. Check for an unbalanced mass and, if applicable, eliminate it as described in step 4.6.

To do this, run the conveyor and visually check the encoder to see if it runs true.

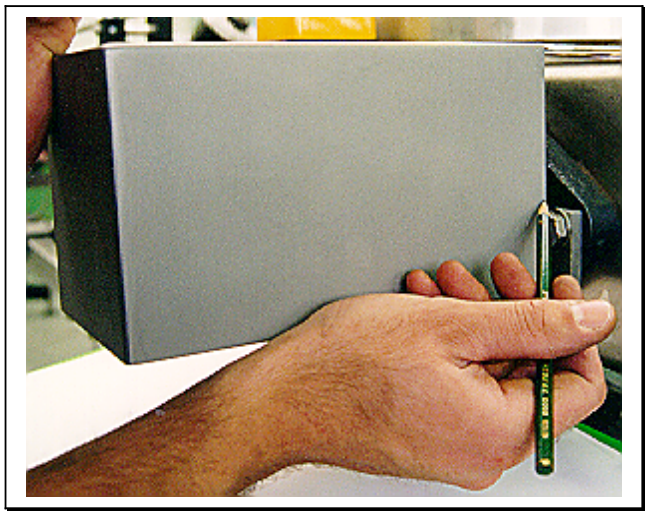
4.9. Shorten the ends of the mounting bolts.

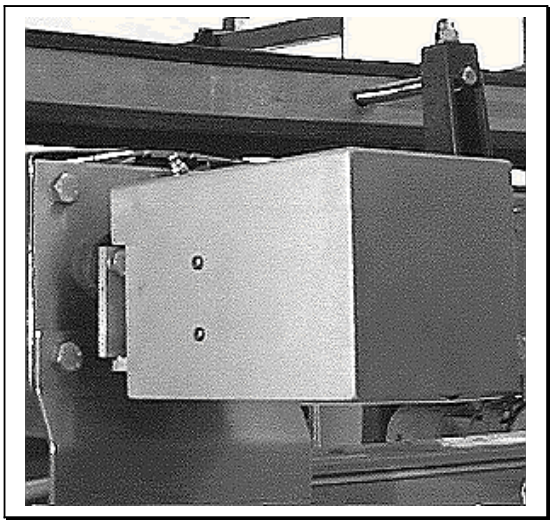
5. Mounting of the cover

5.1. Place the cover over the encoder assembly getting as close as possible to the conveyor with the cover resting on the encoder body.

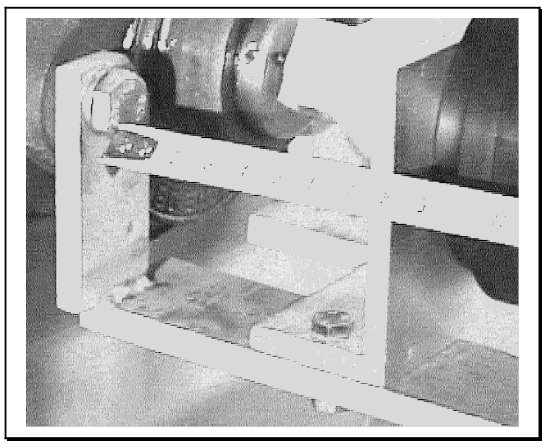
Depending on local conditions, changes may be required to fit the encoder cover assembly so that there is no danger possible from rotating parts.

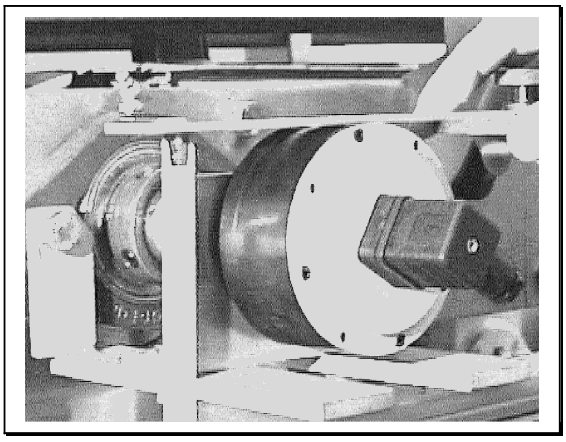
This example shows the trimming of the cover to match this requirement.





5.2. Attachment of the cover to the encoder brackets:
* transfer the existing holes in the support angle of the encoder,
* mark the positions of the attachment screws on the cover; two attachment points for each side are required.





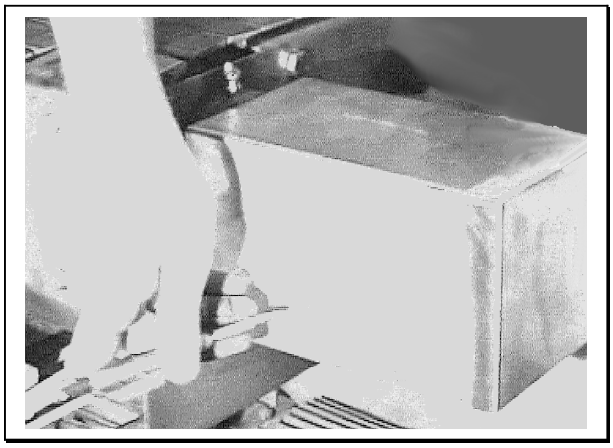
Take the measurements of the assembly completed so far, the 1st hole in the support angle on each side is 10 mm away from the upper edge and the second hole is 50 mm away.

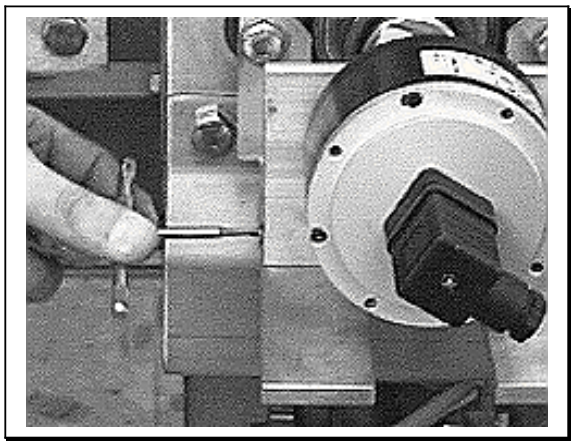
It may be possible that there are no holes in the support angle or that the assembly does not fit. In this case proceed as described in 5.4.

5.3. Drill 5 mm holes in the cover. After the angle support has been tapped, continue mounting with step (5.7)

5.4. Mark the holes for the cover on the angle support of the encoder.

5.5. Drill four 3.2 mm holes, 15 mm deep into the angle support.

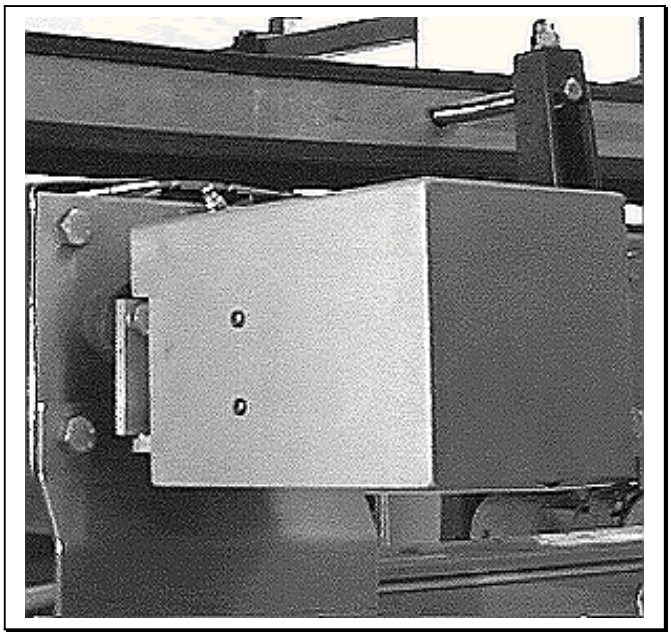




5.6. Tap the holes with M4 threads approximately 10 mm deep.

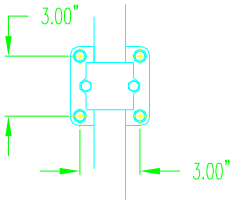
5.7. Connect the encoder cable if it was removed.

5.8. Attach the cover with M4 screws.

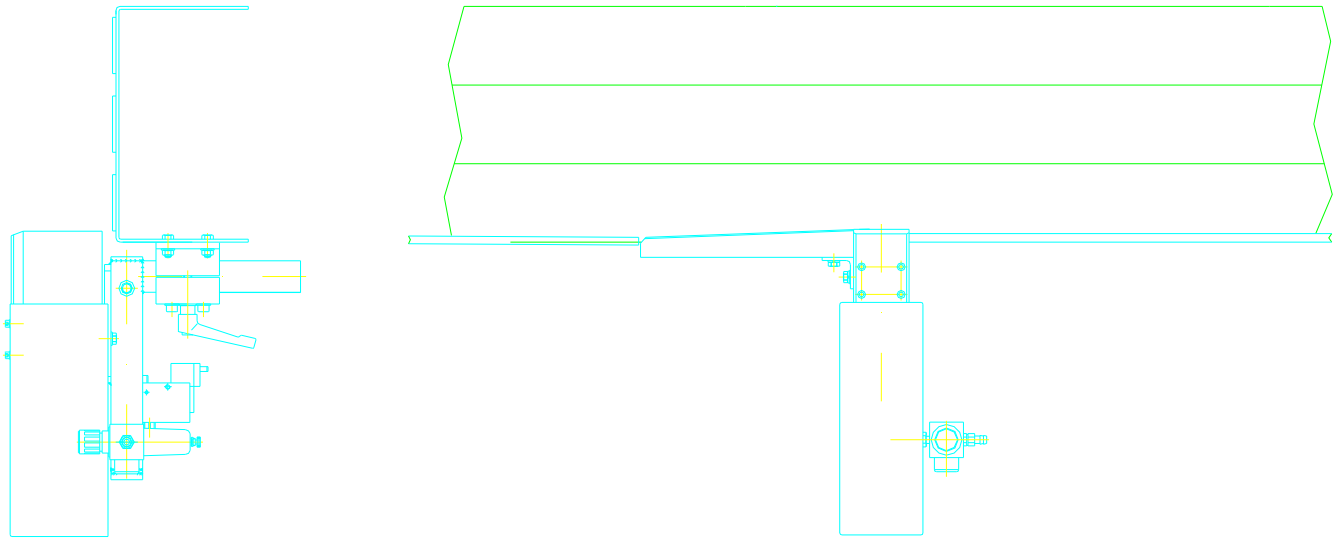


Rejector Mounting Diagram

<< Refer to the AutoCAD dwg(s) incase of project specific changes>>



Typical conveyor bracket – verify style used with specific order



HEUFT Rejector Installation

1. Presentation of the bottle and installation of the Rejector is paramount to smooth consistent rejection! The Rejector must be installed in accordance with the following recommendations. **Specific attention MUST be given to the following points**;
   a. Height above conveyor (5-10mm)
   b. Alignment/Angle of the Rejector head (with flow of bottles and tilted slightly – 5 degrees - towards top of bottle)
   c. The bottles **must consistently** approach the Rejector head to within 1/8" of the Rejector segments. The Rejector segments extend to perform a curve to allow the smooth transition of containers from the production stream. If the Rejector is properly set-up, as noted above, the bottles will be guided to the rejection area. If the bottles are not consistently within 1/8", the bottle will hit the curve formed by the extended Rejector segments (listen for the "clink" as it hits) and the bottle may be unstable as it is being rejected.
2. There are other factors besides the Rejector installation and bottle presentation that will also affect the proper rejection of the containers;
   a. The production chain and the 1st rejection chain **must** at least run at the same speed. The 1st rejection chain can run up to 10% faster, but never slower. If the 1st rejection chain runs slower, during rejection the friction caused by the slower chain may cause the bottle fall over.
   b. There must be the minimum possible gap between the conveyor chains; i.e. no dead-plates if possible. Any gap between the chains may cause the edge of the bottles base to catch the conveyor chains edge and cause it to fall over.
   c. The level height of the production conveyor and any rejection chains must be equal or slightly less. Positive angles in the chains are to be avoided. If any angle is present, it should be slightly negative (going down and away). Any positive angles will induce friction to bottles transitioning from the Production stream inducing instability.
   d. We prescribe Preventative Maintenance on a weekly basis for the HEUFT Rejection System. The Rejector piston rods must be cleaned and oiled regularly (a 5-minute procedure) to ensure smooth operation.
   e. The Rejector Air Pressure Regulator **must** be set to 60psi (4 BAR).
3. Within the HEUFT programming, there are 3 parameters that will detrimentally affect proper rejection;
   a. The encoder must be reading the conveyor speed accurately. There should be less than 20mm fluctuation of the encoder pulse signals. If the fluctuation is greater than this, there is a problem with the encoder, the encoder coupling or the mounting of the encoder. This must be fixed to correctly detect, inspect and reject containers.
   b. The entered bottle diameter must be equal to or slightly larger than the actual bottle diameter. This parameter entry is used for the Rejector to accurately judge the timing of the segment extension and retraction. The Rejector segments are programmed to be extended and in place slightly before the containers arrival. By entering the correct bottle diameter, we ensure the segments are extended and retracted in time as not to disturb other bottles and are in place at the correct time for the rejected bottle.

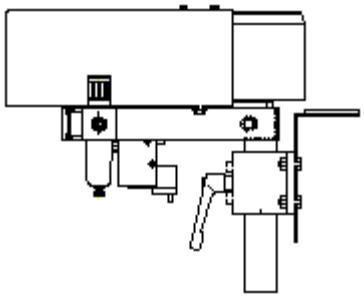
c. The distance to the Rejector **must** be correct. This distance can be modified slightly to ensure that the segments are extended at the correct time for a clean rejection. By adjusting this distance (and having the correct bottle diameter entered) we can ensure that the segments are properly extended and retracted for the rejected container.

Rejector Preventative Maintenance

Mono Rejectors

Daily:

1. Check the air pressure on the gauge mounted at the side of the rejector, ensuring it is set to **60psi**. Adjust as needed.
2. Check the rejector inspection glass mounted at the side of the rejector for condensed water and drain if necessary.



Weekly:

1. Check the rejector inspection glass mounted at the side of the rejector for condensed water and drain if necessary.
2. Clean the rejector.
    a. Turn off air pressure to the rejector system and purge all air still held in the rejector's air reservoir using the port located at the base of the inspection glass. *Ensure lock-out/tag-out procedures are followed.
    b. Depress the "rejector disable" button located on the conveyor, to ensure that no signal will be sent to the rejector.
    c. Remove the two 4mm Allen head screws from the top of the rejector cover and lift the cover straight up to remove.
    d. Remove the four 4mm Allen head screws from the cover over the rejector segment and remove this cover.
    e. Apply lightweight machine oil to the rear piston rod of the cylinder. Then move the piston forward and apply oil to the front portion of the rod.
    f. Using a clean dry cloth, wipe down the piston rods of all cylinders, front and back (Figure 2). Slide and rotate the rubber damper on each rod to ensure cleaning of the whole rod.
    g. Check the rubber dampers for any signs of wear due to compression. Replace if necessary.
    h. Place the segment tip cover back into position and tighten the screws.
    i. Place the rejector cover back into position and tighten the screws.
    j. Turn air back on to rejector.
    k. Pull out the "rejector disable" button.

Monthly:

1. Perform the weekly maintenance to clean the rejector, but prior to placing the covers back into place, perform the following:
    a. Check all electrical connections. Ensure all wires are not pinched or have exposed wire. Ensure each connection is tight.
    b. Check all pneumatic parts and connections. Ensure all cylinders, hoses and valves are securely attached, tightened, and not bent or pinched.
    c. Check to ensure all mounting screws are securely fastened. Tighten as needed.
    d. Prior to installing the covers, turn on the air supply to the rejector. Listen and feel for any air leakage. If any leaks are identified, repair as needed.
    e. Place the segment tip cover back into position and tighten screws.
    f. Place the rejector cover back into position and tighten screws.
    g. Pull out the “rejector disable” button.

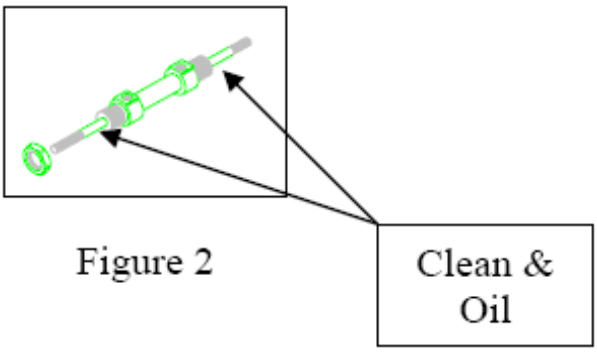


Figure 2

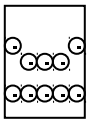
Encoder Preventative Maintenance

Daily:

1. None

Weekly:

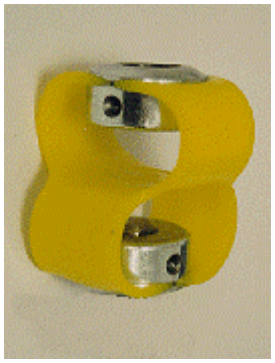
1. Check to ensure the encoder value, “Actual Speed”, is not fluctuating more than +/- 30mm/s (See figure below). If fluctuations are greater than 30mm/s, place a tachometer on the conveyor and see if the encoder is correctly reading the fluctuation of the conveyor itself. If it is, then there are no problems. If the tachometer is reading little or no fluctuations, then you must check the encoder coupling and mounting as outlined in the monthly preventative maintenance for the encoder.



Path 1

Monthly:

1. Secure the conveyor, following lock-out/tag-out procedures.
2. Remove the housing cover protecting the encoder.
3. Ensure the stud-bolt is securely mounted into the shaft of the conveyor and plastic coupling.
4. Examine the plastic coupling for signs of stress and perforations (Figure 2).
5. Tighten the mounting bolts for the encoder mounting bracket, ensuring that the encoder, coupling and shaft are still perfectly aligned (Figure 3).
6. Tighten the electrical connector into the end of the encoder.
7. Re-install the housing cover removed in step 2 and tighten screws.
8. Initialize the conveyor.
9. Following the steps for the weekly encoder PMS, check to ensure you are receiving a steady encoder reading.



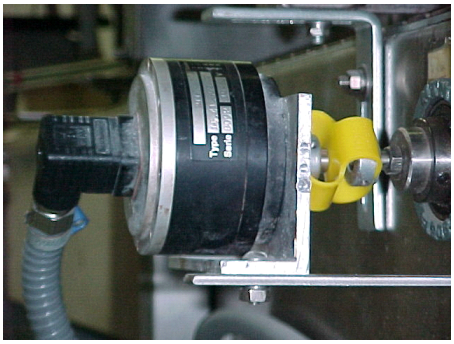


Figure 2

Figure 3

Heuft Troubleshooting Guide

Problem:

Heuft unit is not counting containers.

Solutions:

A. The main trigger is not set to the correct height and the containers are not being seen by the photo-eyes. Check to ensure you're in the right program and set the main trigger bridge height to the number indicated in the diagram under "Brand Change".
B. The main trigger eyes are clogged with water or food grease. Wipe the ends of the photo-eyes clean with a dry cloth.
C. The encoder is not working properly. Check to ensure that you are getting an encoder value reading the conveyor speed. You check this from the icon "Check Encoder" from the main screen page.

Problem:

Heuft unit is not rejecting containers.

Solutions:

A. Check to make sure the system is counting first. If the system is not counting, go through the steps above.
B. Check to ensure that the "work-rest" (Rejector disable) button is not depressed.
C. Check to ensure you have 60 psi (4 bar) of air-line pressure going into the Rejector.

Problem:

The Rejector segments are always out rejecting all containers.

Solutions:

A. The main trigger is blocked by water or food grease and all containers are being rejected as bottom barrier rejects. Clean off the photo-eyes with a clean dry cloth.
B. Look at the Counters screen and check to see what the containers are being rejected for. Look at this inspection module to see if it's working correctly.

Problem:

The Rejector segments are always out and only come in to allow a good container to go by.

Solutions:

A. The bottom barrier photocell is blocked. Clear obstruction and/or adjust the sensitivity of the photocell.

Problem:

HEUFT Rejector is not cleanly rejecting containers.

Solutions:

A. If this is happening for every rejected container, check to see that nobody has modified the "Distance to Rejector" setting. Your distance measurement was provided to the plant in the installation data sheets following the installation.
B. Determine the last time maintenance was performed on this Rejector? The Rejector should be cleaned and lubricated on a weekly basis. Sticky/sluggish segment movement can show a need of maintenance.
C. Is the air pressure correctly set to 60 psi? If the air pressure is lower than 60 psi, then the segments will not have enough pressure to come out and retract in time for a clean rejection at speed.
D. If this is occasional, ensure that containers are not slipping past the Main Trigger, causing the distance measurement to be inaccurate. Excessive guide-rail contact can also cause this.
E. Check the encoder to ensure that the reading for the conveyor speed is fairly consistent (+/- 20 mm/s). If this value is fluctuating by more than +/- 20 mm/s, check the connections and mountings for the encoder to ensure a stable/good connection/mount. (Is it properly mounted on the drive shaft of the production conveyor?)
F. Are the containers traveling on the conveyor within 1/8" of the Rejector segment face? If there is a gap in excess of 1/8", adjust the rails and/or Rejector so there is a minimal gap (less than 1/8") between the Rejector segment face and the container flow.

HEUFT *Spectrum* "Quick Tips"

At the beginning of a shift, please check the following:

1. Are the containers slipping under the HEUFT *Spectrum*? Yes – Call Maintenance.
2. Are the containers traveling straight and in the center of the inspection bridges? No – Call Maintenance.
3. Are you in the correct "Program" for the container you are running? No – Change to the correct program.

4. Are the bridge heights correct for the Program you are running? No – Change the bridge heights to the specified heights for that program.

Is the Rejector air pressure set to 60 psi? No – Call Maintenance or adjust to 60 psi.