FOREWORD

The purpose of this book is to provide the user of the FiboIntercon batching plant with an understanding of the principles of operation, the criteria for which the plant has been designed, and the installation and maintenance procedures. Specific areas where the lack of care or use of incorrect procedures could lead to equipment damage and/or personal injury are highlighted with **WARNING** and/or **CAUTION** notes, and it is important that the contents of this book are read and understood before proceeding to fit or use the batching plant.

The Service, Sales and Technical Staff of FiboIntercon A/S are always ready to assist and reference to the company for advice is welcome.

Warning !

Incorrect installation, operation, servicing or replacement of parts can result in severe personal injury or death, and/or equipment damage.
Service personnel must be qualified to perform electrical and mechanical service.

All FiboIntercon batching plants are supplied with a declaration of conformity for the relevant EC Legislation, typically in the form of a label as shown below.

EC DECLARATION OF CONFORMITY

IN ACCORDANCE WITH THE SUPPLY OF MACHINERY (SAFETY) REGULATIONS 1992 AND THE SUPPLY OF MACHINERY (SAFETY) AMENDMENT REGULATIONS 1994 IMPLEMENTING THE EC MACHINERY DIRECTIVE 89/392/EEC AS AMENDED BY 91/368/EEC.

THIS FIBOINTERCON BATCHING PLANT WAS MANUFACTURED BY FIBOINTERCON A/S, HERNINGVEJ 4, 6920 VIDEBAEK, DENMARK

THIS MACHINERY CONFORMS WITH THE PROVISIONS OF THE SUPPLY OF MACHINERY (SAFETY) REGULATIONS 1992/ MACHINERY DIRECTIVE

FOR AND ON BEHALF OF THE MANUFACTURER

NAME:
POSITION:
.
SIGNATURE

FIBOINTERCON BATCHING PLANT TYPE :
SERIAL NUMBER :

FiboIntercon Batching Plants are designed to mix concrete to within tolerances, by weight, for cement, sand, aggregate and water as specified by British Standard BS3963 and US Standard ASTM C685 - 94.

ELECTROMAGNETIC COMPATIBILTY

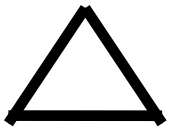
Additional Information

European Union
Council Directive 89/336/EEC

For installations within the European Union, electrical products must meet the requirements of the above directive, and electrical equipment within the FiboIntercon Batching Plant is supplied on the basis that :

- They are to be used for electrical motor drive and associated control of batching plant
- The installation earthing scheme involves connection of the plant's frame to the site protective earth conductor using a minimum practical lead length.
- Maintenance and servicing with anything other than factory supplied or authorised parts will invalidate any FiboIntercon liability for EMC Compliance
- Installation, maintenance and servicing is carried out by adequately trained personnel fully aware of the requirements of the relevant EC directives.

WARNING ! **Warning refers to a hazard or unsafe method or practice which CAN result in severe personal injury or possible death**



Danger ! **Danger refers to immediate hazards which WILL result in severe personal injury or death**

SAFETY PRECAUTIONS

Before operating the batching plant carefully read this manual and become familiar both with the equipment and the manual.

SAFE AND EFFICIENT OPERATION CAN ONLY BE ACHIEVED IF THE EQUIPMENT IS CORRECTLY OPERATED AND MAINTAINED.

Responsible Person(s)

The owner/operator of the batching plant is responsible for ensuring that only authorized and fully instructed personnel who are familiar with the machine and operating instructions, operate and maintain the batching plant.

Limited Use

The batching plant is designed for batching and mixing concrete and mortar with/without additives. Use of the batching plant for batching and mixing other materials is considered to be outwith the limited use for which the batching plant is intended.

Many accidents occur because of failure to follow fundamental rules and precautions.

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

Observe all **WARNING/CAUTION** notices.

- Ensure installation meets all applicable safety and local electrical codes. Have all installations performed by a qualified electrician
- Do not operate the batching plant with protective covers, screens or terminal box covers removed
- Disable Electric Motor or Diesel Engine Starting circuits before carrying out maintenance
- Disable closing circuits and/or place warning notices on any circuit breakers normally used for connection to the mains to avoid accidental closure.

Observe all **IMPORTANT, CAUTION, WARNING and DANGER** notices, defined as :

Important! Important refers to hazard or unsafe method or practice which can result in product damage or related equipment damage.

Caution ! Caution refers to hazard or unsafe method or practice which can result in product damage or personal injury

SECTION 1

1.1 INTRODUCTION

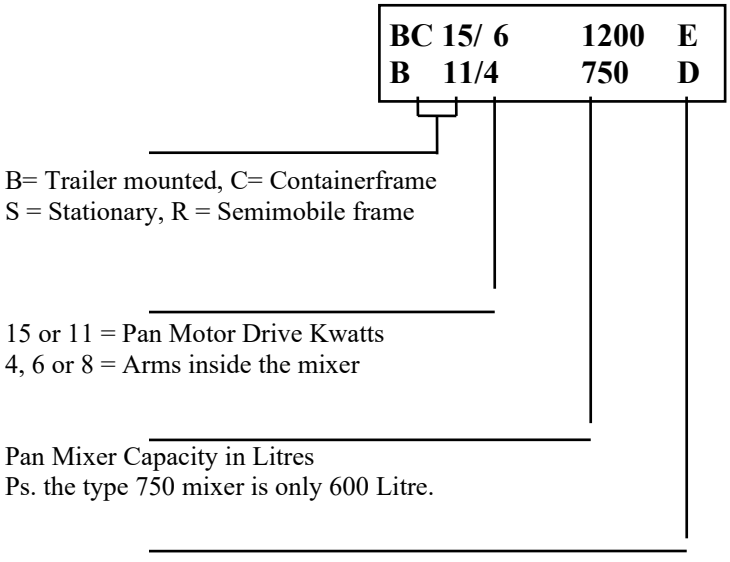
The FiboIntercon range of mobile batching plants are built to meet BS3963 and ASTM C 685-94 International Standards regarding production of concrete and in accordance with the following Safety Standards;

EN953:1998	Guards, Gen. requirements for design of fixed and removable guards
EN954-1:1997	Safety Related parts of control systems. General Principles for design
EN999:1999	Positioning of protective equipment
EN1050:1997	Principles for risk assessment
EN1088:1996	Interlocking devices associated with guards

EN 12151	Machinery and plant for the preparation of concrete and mortar – safety requirements
EN 292	Safety of machinery – basic concepts – General principles for design
EN 294	Safety of machinery- distances to avoid danger zones being reached by the upper limbs
EN 410	Code of Practice for Loads for the Design of Structures
EN 412	Code of Practice for Loads for the Design off Steel structures
EN 14122-1,2,3	Safety of machinery – Permanent means of access to machinery

FiboIntercon Batching Plants are available for concrete production between 2 and 45m^3 / hour. Mixing Pan and material feed augers/belts are powered by individual electric or hydraulic motors, hydraulic motors are supplied from common hydraulic pump driven either by 3 phase electric motor or diesel engine.
The standard batching plant incorporates 1 pan mixer (600, 1200 or 2200L capacity) 1,2 or 4 aggregate hoppers and 1 integral or separate cement hopper. Additional hoppers may be added to increase options for blending a variety of aggregates and cements.

1.2 DESIGNATION



1.3 SERIAL NUMBER LOCATION

Each Mixer has it's unique serial number located on the main frame below the control panel

SECTION 2
Principle of Operation

2.1 Load Cell Supported Pan Mixers

The 750,1200 or 2200Litre Pan mixer is supported on 3 x Load cells suitably rated for the mixers size. Aggregates, sand, cement and water are sequentially conveyed, augered and pumped in to the mixing pan. The control system enables weights of each ingredient to be pre specified such that when that ingredient weight is reached the system stops the appropriate conveyor, auger or pump, tares the load cells reading and automatically starts the next conveyor, auger or pump until the loading sequence is completed. The mixer continues to run for a pre set period following which the discharge conveyor (if fitted) starts, discharge gate opens (if automatic discharge fitted) and concrete is discharged.

Once concrete has been discharged to a pre set residual weight (e.g. 10 to 30Kgs) the discharge gate will close, discharge conveyor will stop and batching plant will be ready for following batch.
If a printer is fitted batch ticket may be printed to display; date, batch number, weight of ingredients specified and mixed together with total weight of batch.

2.3 Accessories

The function, adjustment and maintenance of accessories e.g. additive pump, are described in separate instructions for specific accessories supplied.

SECTION 3
APPLICATION OF THE BATCHING PLANT

The batching plants may be operated at ambient temperatures limited by electric motor or diesel engine ratings. Ambients in excess of 40deg C and altitudes above 1000metres can be tolerated with reduced ratings in that power output from electric motor/ diesel engine will be reduced. In this event it is recommended that loads in hoppers and mixing pan are reduced to counter reduced power output or minimize overheating of electric motors. thus limiting hydraulic power and throughput of mixer.

If hydraulic drive is fitted the hydraulic reservoir and system generates a proportion of waste heat which is dissipated by the volume of hydraulic fluid and surface area of reservoir.
When operating the plant in ambient temperatures above 30 deg C, particularly where the hydraulic reservoir is exposed to radiant heat / direct sun frequent checks on the Oil temperature should be made.
As a rule, the oil temperature in the hydraulic oil reservoir should not exceed 50deg C in static (Industrial) Systems and 60 deg C in mobile systems.

Important! Reduction in cooling air flow or inadequate protection to the electric motor(s) /diesel engine and hydraulic reservoir can result in damage or failure of windings / cooling system

The main vibration frequencies produced by the electric motor drive option are 25Hz
Diesel Drive 30Hz

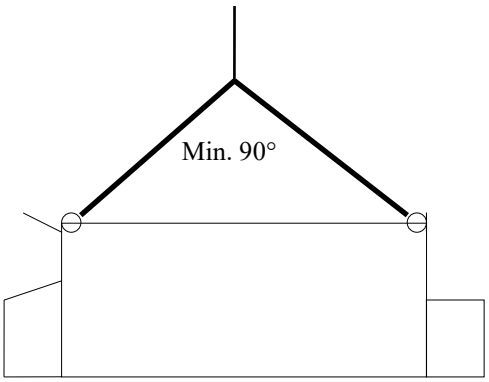
Secondary frequencies will be generated dependent upon mixing pan speed, type and size of aggregates being mixed. It is important to ensure that the mixer baseplate is firmly secured to support stand or foundations. The hydraulic pump/ diesel or electric motors are close coupled making them independent of any distortion or flexing of the baseplate. Electrically powered sand and aggregate conveyors are driven by motors integral with the head roller. Mixing paddles and scrapers are driven via close coupled electric or hydraulic motor/co axial gearbox again independent of minor baseplate distortion or flexing.

SECTION 4
INSTALLATION & TRANSPORT

4.1 LIFTING

Warning ! Incorrect lifting or inadequate lifting capacity can result in severe personal injury or equipment damage. MINIMUM LIFTING CAPACITY REQUIRED IS INDICATED ON THE LIFTING LABEL.

Lifting points are provided for use with a shackle and pin type lifting aid. Chains of suitable length and lifting capacity must be used. Lifting points are designed to position the craneage point as close to the centre of gravity of the batching plant as possible, but due to design restrictions it is not possible to ensure that the frame will remain horizontal while lifting.
Care is therefore needed to avoid personal injury or equipment damage.
The correct lifting arrangement is shown on the label attached to the lifting lug. (see sample below).
Please refer to the specific drawing on the final page of this instruction book for lifting points.



4.2 ASSEMBLY TO FOUNDATIONS/STEEL SUPPORT FRAME

Warning ! Incorrect or inadequate fixing of plant frame to support frame or foundations may result in severe personal injury or equipment damage.

4.2 Continued
Care should be taken when installing the mixer to ensure any support structure is adequate to support the full weight of the plant plus material (Sand, aggregate, cement and any additional accessories, additive tanks. Should aggregate supplied to the mixer be of varying moisture content , account of the worst case bulk density of sand or aggregate when saturated should be taken into account.

Important ! Extending the hoppers in order to increase capacity may result in overloading feed conveyors and will invalidate the guarantee.

If the aggregate and sand hoppers are to be loaded with mechanical shovel any support frame should cater for accidental impact .

4.3 Electrical and Water Supply Connections (Electrically Driven Mixers only)

4.3.1 Electrical A single 3 phase 415V plus earth connection to the main control panel is required, all models built post 1999 are suitable for operation on both 50 and 60Hz.

Model	11/4-750	Requires 25Amp Red CEE plug
Model	15/6-1200	Requires 32Amp Red CEE plug
Model	30/8-1800	Requires 63 Amp. Red CEE plug.
Model	55/8-2200	Requires 125Amp Red CEE plug

Warning !

Incorrect installation can result in personal injury and/or equipment damage.

Installers must be qualified to perform electrical installation work.

4.3.1.1 Protection

It is the responsibility of the end user and his contractor/contractors to ensure that the overall system protection meets the needs of any inspectorate, local electricity authority salient rules pertaining to the site location.

4.3.2 Water

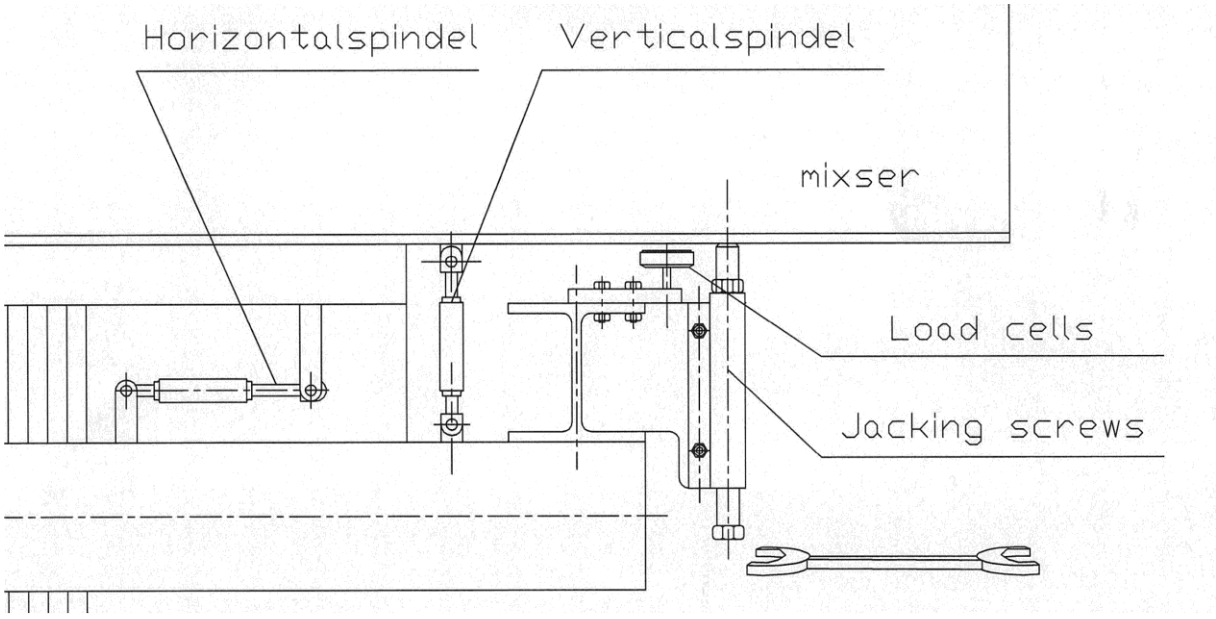
A single connection either to the integral tank where fitted or to the solenoid valve is required. Integral tanks have either level control float switch or ball cock to isolate supply when tank is full. Integral pump(s) in the tank then supply mixing pan when required. Simpler machines with no tank rely on supply to feed mixing pan when control sequence opens solenoid valve. Note that low flow from end user's supply will lengthen filling and hence overall batch cycle time.

Dependent upon available pressure (2 bar minimum recommended) a supplementary pump and header tank may be required to provide sufficient flow.
Liquid additive may be added via additional pumps which discharge direct to mixing pan. Calibration of these pumps for individual additives is necessary as the additive is dispensed by specifying number of seconds pump will run.

4.4 Transport

4.4.1 **None Braked Trailer Mounted** units may only be towed on public road by suitably rated vehicle at 20Km/hour maximum when empty. Ensure that all hoppers, silos and water tank are empty before towing.

- 4.4.1.1 Check tyre pressures and ensure supporting stands are retracted and secured before towing and that lights of trailer and towing vehicle are functioning. Secure or remove all loose objects on batching plant and ensure no items extend beyond wheelbase width of trailer.
- 4.4.1.2 Prior to towing or transport ensure that the 3 x Jacking screws (pos. 1) (M30/M36) are taking the weight of the mixing pan, not the three load cells. Remember to retighten the nut (pos. 1) so the spindel can't fall down under. This will ensure no shock loads are transmitted to load cells during transport. Ensure load returned to Load Cells prior to use.
- 4.4.1.3 The mixer pan must not be lifted more than ½cm. above the loadcell (pos. 3), otherwise it may be possible for the rubber ring between load cell and pan base to fall out.
- 4.4.1.4. Unless it becomes necessary to change the position of the mixer (in the event it is in contact with the frame) do not adjust the horizontal adjustable screws (Pos. 5).



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- 4.4.1.6 Always drive slowly over uneven ground, particularly when turning.

4.4.2 Skid or Hook Frame Mounted

Batching plants mounted on hook frames or sub frames designed for direct mounting on truck chassis should be loaded to within limits specified by the truck manufacturer. Particular care should be taken to ensure sand/aggregate hoppers are not overfilled as this may raise the center of gravity of the machine and payload, decreasing stability particularly when cornering. As with static plants, allowance should be made for additional weight resulting from sand and aggregates becoming saturated during or after heavy rain if hoppers are not covered.

Points 4.4.1.2 and 4.4.1.3 & 4 should be followed for skid or hook frame mounted units.

Section 5

Commissioning

General

For unbraked trailer mounted batching plants –

- Ensure all supporting stands are lowered and that mixer is level using pads to spread load on soft ground if necessary.
- Allow adequate area around batching plant to enable safe and clear access for loading hoppers
- Check mixer is still level after hoppers are filled with aggregate/sand
- Ensure mixing pan jacking screws are not supporting pan and that full weight of mixing pan sits on three load cells.
- Ensure no loose objects are on the mixing pan covers to give spurious load cell readings.
- Ensure no unauthorized personnel are close to the mixer prior to start up.

5.1 Electrical Systems

The batching plant being trailer/baseplate mounted requires only electrical and water connections.
Units fitted with Diesel Generators or Diesel/Hydraulic power packs are self contained with integral fuel and water tanks.

Ensure that power cable and water pipe are shielded or buried and protected to avoid damage

If integral power source not fitted ensure that direction of motor rotation is correct BEFORE LOADING AGGREGATES AND CEMENT INTO HOPPERS/SILOS – If direction is incorrect change two of three phases in supply connector.

Incorrect rotation of conveyors/auger(s) may result in equipment damage

Warning !

Note that all motor directions are checked prior to leaving factory therefore do not change individual motor rotations.
Access to control panel should not be necessary during normal operation.

Access to interior of panel without isolation of supply may result in severe personal injury or death

Danger !

5.2 Hydraulic Systems (where fitted)

The batching plant's hydraulic system has been pre-commissioned and flushed before despatch, however prior to initially starting the hydraulic pump please ensure;

- Hydraulic Oil level (tank sight glass) is above minimum
- All shut off valves are fully open
- Any personnel not required should leave the immediate vicinity of the mixer to avoid danger from potential leakage.

Trial Run

- Start pump briefly and check direction of rotation of prime mover matches that of pump. **DO NOT AT THIS STAGE ENERGISE CONTROL PANEL**

Incorrect rotation of hydraulic pump will result in equipment damage

Warning !

- Check complete system to ensure there is no leakage of hydraulic oil
- In the event of leakage, switch off pump, tighten unions ensuring no torque is transmitted to hydraulic pipes.

Tighten only when system is not under pressure

Warning !

- All hydraulic motors may be operated manually using levers integral with Solenoid valves. Check each motor operation in turn both clockwise and anti-clockwise to ensure drives are operating correctly. Manual operation of hydraulic valves allows conveyors/augers to be reversed in the event of them becoming jammed. Some noise may be generated from cement auger with empty silo due to tolerance of augers in trough/tube.
- Run system under no load until hydraulic oil is warm, re check for leaks.

5.3 Control System

5.3.1 General

FiboIntercon Batching Plants are supplied with three types of control systems;

- Digital display of load cell weight
- Touch screen Control/Display
- PLC Computer control (Special machines only)

Reference should be made to appropriate supplementary instruction book relating to control system fitted to specific machine.

Digital and Touch screen control systems have a number of common features i.e.;

- Emergency Stop Buttons/Circuits
- Manual/Off/Auto switches for all motors (or manual levers on hydraulic solenoid valves)
- Isolating switch on front of control panel which isolates supply when panel opened

WARNING ! **Mixer pan cover is fitted with safety switch which results in emergency stop if cover opened during operation. Operation of the mixer with safety switch isolated may result in severe personal injury.**

5.3.2 Safety Precautions initial start up

DO NOT FILL HOPPERS, SILO(S) OR TANKS FOR INITIAL START UP

1. Ensure all “Manual/Off/Auto” switches are set to “Off”
2. Check all Emergency Stop Buttons are out i.e.not activated
3. Ensure Red CEE power plug inserted into socket in panel
4. Switch on panel isolating switch, there should be no power to the panel when the switch is in the “O” position, except for supplementary “Repair” plug on side of panel. If this main isolating switch does not function correctly consult a competent electrician before operating the panel further.
5. After the red main isolating switch is put in the “1” position, the “system” switch must be in “on” position before the operating system is active. Most models built post 2002 need to wait for about 10 seconds before the “system” switch can be turned from the middle position to the “on” position to comply with EC regulations.
6. A display should appear on either the Touch screen or digital display.
7. Check Emergency Stops by switching mixer pan motor to “Manual” (Note! Pan Motor starter is Star/Delta thus two stage contacts will be heard engaging in panel), this starting sequence takes about 3 seconds and the mixer should now be running. Press E Stop button(s), mixer should STOP. Switch pan mixer to “Off”. Open E Stop by turning red button counter clockwise then pull out button. Note! On some panels there is also a “RESET” illuminated button.
8. Restart mixer, lift pan mixer cover(s) thus disengaging safety microswitch(es) on cover(s), again Mixer should stop. In the event that the mixer does not stop do not operate further until competent electrician has rectified the fault.
9. NOTE THAT POWER IS STILL CONNECTED TO PANEL WHEN E STOP IS ACTIVATED
10. Switch one of conveyors to “MANUAL” and check belt is running in correct direction. If this is not the case two of three phases in CEE Red plug require changing to reverse motor rotation.
11. Run conveyors in turn and ensure belt is tracking correctly on head and tail rollers i.e. belts do not foul any structural part of machine. Adjustment may be made to belt tensioners to ensure correct tracking.

12. Manually run all motors in turn including ancillary equipment e.g. Discharge conveyor, cement auger, additive pump(s) to ensure no damage incurred during shipment and that external motors correctly connected. Note! if ancillary equipment not supplied by FiboIntercon direction of rotation will also need confirming. Ensure that none FiboIntercon ancillary equipment is within rating of designated contactors within panel.
13. Water Tank and Pump – connect hose to tank, open isolating valve and fill tank. Tanks have either ball cock or float switch/isolating valve which shuts off water supply when tank is full. Pump(s) are electro submersible type mounted inside tank. Check pump(s) operating satisfactorily by switching pump to "MANUAL" briefly.

WARNING ! If machine fitted with automatic discharge gate ensure no personnel are in vicinity of gate during operation, particularly in automatic mode As rapid gate operation may result in severe personal injury.

5.4 Initial Operation

5.4.1 General

Refer to supplementary instructions relevant to the control panel installed in the machine. The loading, mixing and discharge sequence may be controlled manually referring to the digital or touch screen display of total weight in the mixing pan and noting reading after each ingredient is loaded. Having loaded the aggregate, sand and cement hoppers/silo and filled water and additive tanks the batching plant is now ready to produce concrete.

Note! It is important that the responsible person operating the machine is fully familiar with the controls and operating sequence plus the calibration and compensation (material in flight) features, printer, mix recipes and general principles of concrete/mortar production.

FiboIntercon Batching Plants will produce concrete to the same quality as larger static plants as both systems rely on calibrated load cells to weigh ingredients.

Ultimate concrete strengths will therefore be dependent upon operator's experience, quality of ingredients as FiboIntercon weighing systems will load ingredients to within +/-2% as required by European, UK and US Standards for mixing concrete.

5.4.2 Load Cell Calibration, Material in Flight & Residual Weight

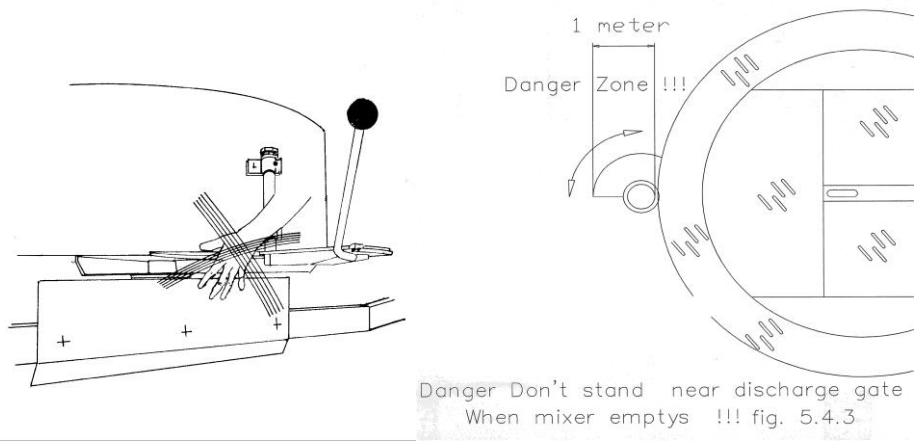
Both the digital and touch screen display systems have the facility to ;

- Ensure load cells are calibrated and tared prior to mixing
- Compensate for "Material in Flight" i.e. if 700Kgs of aggregate is required load cells and control will stop aggregate conveyor when weight of 700Kgs reached, however there will be some aggregate "in flight" between conveyor and pan thus resulting in total weight aggregate in excess of 700Kgs. This facility enables conveyor to stop prior to 700Kgs such that "in flight" material results in required weight.
- Adjust Residual Weight facility, for automatic mixing facility recognizes that mixing pan will have small residual weight of concrete in pan after discharge and if set at say 20Kgs discharge gate will close once weight falls below that figure.

Reference to control instructions gives details on above facilities, which should be set prior to batching.

5.4.3 When Operating Mixer

- Ensure no unauthorized personnel are close to discharge gate or discharge conveyor particularly when plant set for automatic operation.



Danger Don't stand near discharge gate
When mixer emptys !!! fig. 5.4.3

- Note that the mixer motor may not start with full mixing pan. Do not stop the mixing pan until fully or partially empty.
- The open/close position of the discharge gate may be adjusted by moving the steel cam that is fitted to the M16mm. spindle above the gearbox (see drawing pos. 6+7) The uppermost cam (pos.6) sets the "open" position and the lower cam (Pos.7) is for the "close" position.
- The third cam (pos. 8) switch isolates power to the discharge gate motor in the event the gate is jammed by aggregate between the gate and base of the pan mixer. The M12mm. bolt that is activating the switch must be in a distance of 1-2 mm. from the switch when the gearbox is unloaded.

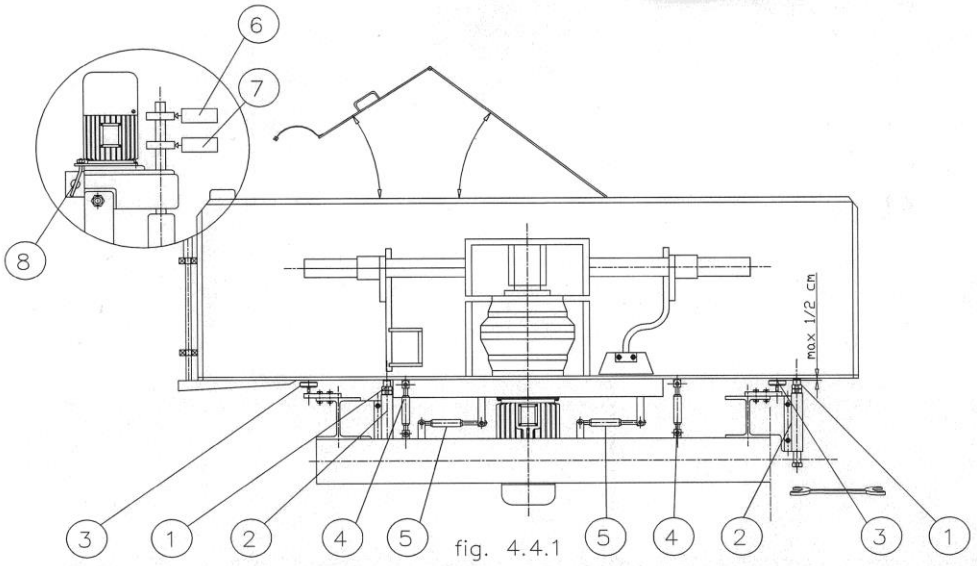


fig. 4.4.1

- Note that the mixing pan is the weigh vessel therefore *NO PART OF THE MIXING PAN MUST TOUCH ANY OTHER PART OF BATCHING PLANT AND NO OBJECT PLACED ON PAN COVER* An erratic weight reading may indicate some part of the batching plant is fouling the mixing pan. Make frequent checks to remove any build up of material on mixing arms.
- Always empty hoppers on unbraked trailer units before moving unit.

Section 6

Accessories

6.1 General

Accessories may be fitted to the batching plant to satisfy requirements to mix a wide variety of concretes and mortars.

6.2 Additive Pump

Small volumes of liquid additive may be added to the mix by a precise metering gear pump which runs concurrently with water pump(s). Dosing of liquid additive is volumetric i.e. time, requiring the pump to be calibrated for the particular additive used.

To calibrate the pump; remove hose at "T" into larger water hose, insert suction hose into additive container ensuring foot valve is fixed to end of suction hose. The pump is not self priming thus to prime pump water may have to be poured into discharge hose until steady liquid flow achieved.

When steady flow is achieved, run pump for 15 or 30 seconds and measure discharge in Litres/Pints. This will thus provide discharge rate per sec. for pump enabling control panel time to be set for volume required by mix recipe.

WARNING! To avoid damage to additive pump in cold weather ensure pump, plus suction and discharge hoses are fully drained.

6.3 High Pressure Cleaner Always drain the Cleaner if temperature anticipated falling below zero. Run the pump without water for 3 seconds and then activate the emergency stop adjacent to the cleaner. The cleaner must not run without water for more than 30 seconds or the pump may be damaged.

6.5 Air Compressor

6.6 Discharge Conveyor (Integral, folding)

6.7 Cement Silo, Feed Auger and Vibrator

Various sizes of cement silos/containers are available up to 1 to 40Tonnes, refer to attached instructions if machine supplied with silo/container. Batching plant control panel contains contactors and controls to operate cement auger/vibrator.

Section 7

Service & Maintenance

7.1 Isolate Power

Do not clean, maintain or repair batching plant with power on. The repair plugs on side of control panel are for repair purposes only. The main isolating switch on the front of the control panel must be in the off "O" position and locked with padlock.

7.2 Cleaning

Regular cleaning (minimum once per day) of the mixing pan is recommended to reduce build up and weight on the load cells. Where fitted, a high pressure cleaner is recommended, care must be taken to minimize water/moisture at cement outlet. Where possible remove cement outlet prior to cleaning. Always clean the mixer after operating. Pay attention around cable connections, load cells. High-pressure water can damaging all electronic components.

Always isolate power supply before cleaning. Ensure load cells are clear of any obstruction.

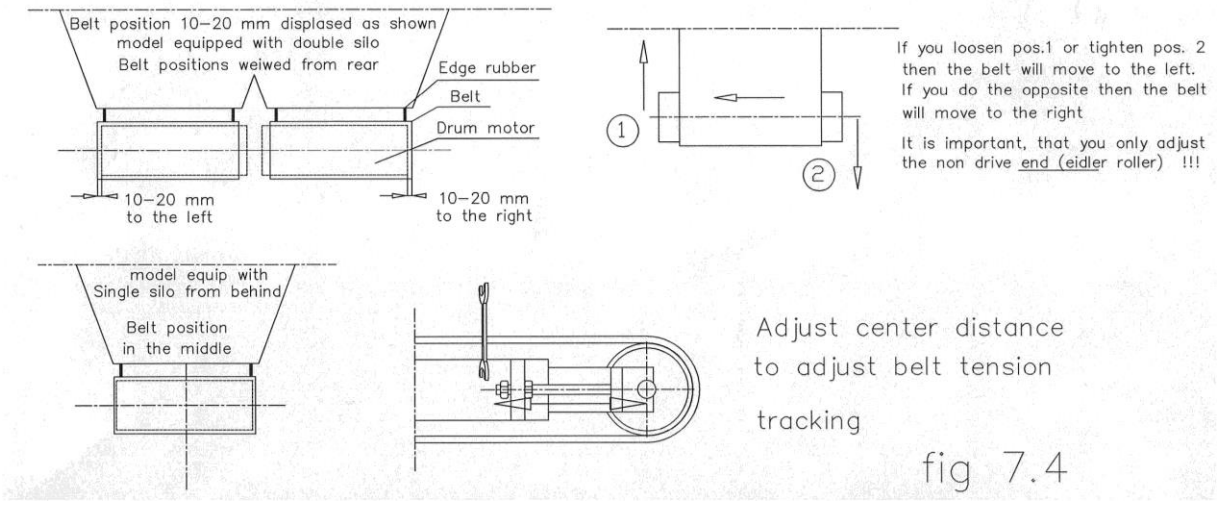
If cement auger is to be out of use for an extended period, particularly in humid/damp environment, it is recommended that auger/silo is emptied or auger discharge is sealed. Ensure that mixing pan is cleaned regularly. If the mixer is used in high ambient temperatures it should be cleaned more frequently as higher temperatures will accelerate hydration of cement and thus setting of concrete. The mixer can be damaged if it is started with solidified concrete inside the pan.

7.3 Water Tank

Always drain water tank if temperature anticipated falling below zero. After emptying tank run pump for further 10 seconds to empty pump and discharge hose. Remove supply hose from tank. If power washer fitted ensure hoses and pump clear of water. If compressor fitted or other source of compressed air is available it is recommended that hoses are "blown through" to expel any water remaining in the system.

7.4 Conveyor Belts

When the belt is new it is recommended that they are checked every m^3,- thereafter check belts after every $100m^3$ of concrete produced to ensure they are tracked correctly on head and tail rollers. Drive head rollers (electric drive) contain sealed for life "Interoll" motors. Check no aggregate has built up causing wear to belt or idler rollers . Where batching plant is operated in sub zero temperatures it is recommended that the hoppers are emptied each day to avoid wet aggregate freezing solid in the hoppers.



7.5 Mixing Paddles/Arms

Check for wear on mixing paddles, arms and scrapers, adjust paddles and scrapers to minimize build up in mixing pan. It is recommend that the distance between the bottom of the mixer pan and the mixing paddles is sufficiently close that the mixer pan is fully emptied but with clearance such that there is no noise due to aggregates being squeezed between the pan bottom and mixing paddles.

7.6 Trailer Mounted Units

Check trailer wheel nuts are tightened and tire pressure (70psi), check all supporting stands every ($300m^3$) ensure locking bolt is correctly positioned, threads greased and pins free.

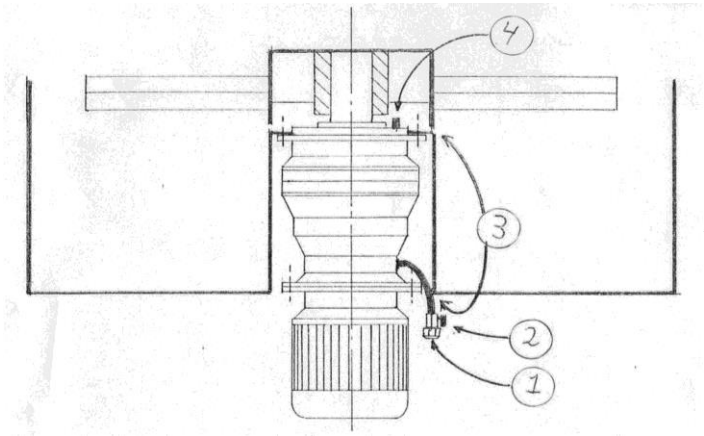
7.7 Lubrication

Grease Points **No important Points.**

7.7.1 Gearbox Oil **Shell "Omala 150" changed annually**

Pan Mixer Epicyclic Gear; 11/4-750 = 8 Litres; 15/6-1200 = 12 Litres; 55/8-2200 = 20 Litres
Cement Auger Gearbox 4 Litres

Note! Do not use synthetic oil, check that replacement oil is miscible with existing oil before changing. Changing Pan Mixer Epicyclic Gear Oil; (Change after 3 months initial use, thereafter annually)



Isolating valve (2) and pipe is located beneath gearbox, sealed with ½" threaded cap (1), remove cap and open valve to drain oil (capacities as above). Drainage will take between 30 and 60 minutes.

To refill gearbox; use a 3m length of ½" hose and funnel, pour oil slowly to avoid air bubbles in oil. Attach pipe to valve (2) position funnel approx. 1m above top of gearbox. As oil is replaced in gearbox air is expelled via 1mm hole drilled in air release screw (4). When gearbox is full (15 – 60 minutes)surplus oil will flow from air release screw (4). Close valve (2) when oil is observed running down inside of center tube of pan or underneath gearbox.

Run the gearbox/pan for 5 minutes to expel entrapped air from oil, following which top up gearbox until surplus observed from air screw (4). When full close valve (2), remove pipe, replace cap (1) sealing thread with gasket.

Contact FiboIntercon or FiboIntercon Agent if in excess of 0.2L oil discharged from gearbox when in use

7.8 Hydraulic System

7.8.1 Check fluid level daily for first week following commissioning, thereafter weekly

7.8.2 Frequently check for oil leaks from unions. **DO NOT TIGHTEN WHEN SYSTEM PRESSURISED, DO NOT SUBMIT HYDRAULIC HOSES/PIPES TO TORSIONAL LOAD**

7.8.3 Check filters daily during first week following commissioning, thereafter as necessary dependent upon operating environment

7.8.4 Service suction filters, Suction filters require careful servicing. After initial running in time they should be checked and if necessary cleaned at least once per week.

7.8.5 **Service system fluid**, servicing is dependent upon several operating factors

Oil level (e.g. water in oil, severely aged oil)
operating temperature
Volume of oil

- After long shutdown periods drain off water deposits (in the morning before start up)
- Drain and renew when in warm operating condition, clean tank.
- Severely aged or contaminated oil cannot be improved by topping up with fresh oil
- Use filter when filling , with mesh width of 0.06mm , preferably fill via system filter
- Take laboratory samples of system oil and have inspected for particle type, size and quantity; document findings.
- When the oil is not continuously monitored, change every 1000 -5000 operating hours, or at least once a year or as indicated by laboratory tests.

7.8.6 Check oil operating temperature, rising operating temperature is an indication of increasing friction and leakage.

7.8.7 **Pumps, Motors and valves**

When returning components for service or repair ensure all ports are blanked to eliminate ingress of contamination.

SECTION 8
Spares and after sales service

8.1 Recommended Spares

We recommend the following for service and maintenance. In critical applications a set of these service spares should be held with the mixer.

1. Set of plastic mixing pads,arms and scrapers
2. Set of Load Cells (3)

These items are normally available ex stock from both FiboIntercon and agents listed below

When ordering parts the mixer Serial Number and type should be quoted, together with the part description. the serial number is located on the main frame under the control panel.

Orders and enquiries for parts should be addressed to;

Denmark	**UK&Ireland**	**Germany**	**France**
FiboIntercon A/S	IDC Mixers Limited		
Akirkebyvej 6,	Fell Barn, Rathmell		
DK-7400 Herning	Settle, North Yorks		
Tel.+4597126188	BD24 0JX		
Fax +4597126148	Tel +441729823020		
info@inter-con.dk	Fax+441729824240		

8.2 After Sales Service

A full technical advice and on site service facility is available from our Service Department at Herning, Denmark or from our agents .

SECTION 9
Automatic Control System

SECTION 10
Fault Finding

FAULT	*POSSIBLE CAUSE & REMEDIAL ACTION*
No power to panel	*Check isolator from supply is "on" Check panel isolator switch in "I" position. If there is no power to the repair plugs, or the optional High-pressure cleanerdoes not start, check the supply fuses or the connection to the mixer. Check all E Stop buttons de activated Check mixing pan cover safety switch connected*
Belt or Cement Auger not turning.	*If system set to run in automatic mode check that the relevant "MAN/OFF/AUTO" switch is switched to "AUT" position? If motor does not operate in MANUAL mode, isolate power to control panel and check thermal overload relay. All motors have thermal relays for overload protection purposes. The themal relays will automatically disconnect the motors if this load is exceeded. If one of the small red reset buttons is not positioned as the others, the relay will disconnect the motor. This disconnection typically occurs if a motor is jammed (e.g. stones in the auger) or if an input fuse blows. Find the error and correct it. If there is power to the repair plugs then the input fuses are OK.* *If none integral cement silo/auger ensure electrical connection to relevant plug in FiboIntercon panel Check auger discharge and silo to determine if cement solidified in auger/hopper If a stone/solid cement is inside the auger it might solve the problem to change the phases of the auger motor run the auger in reverse for 3 revs, and try forwards again.*
Conveyor(s) not operating	*Check belts are tracking correctly and not fouling Frame. Ensure hoppers not overfilled, weight on conveyors too great. Overload relay in conveyor motor tripped, determine cause for overload before re setting trip. If the drum motor is turning but belt slipping tighten the belt by adjusting screws. If belt continues to slip or motor repeatedly trips and belts are correctly tracked/tensioned it is likely oversize aggregate has jammed the belt, It will thus be necessary to empty the hopper and locate blockage. If the hopper has been overfilled and particularly if aggregate saturated or frozen, excess load on conveyor drum will result in slippage or thermal overload ,- in this case consult the technical engineerat FiboIntercon (+45 20217182) or the dealer.*
Motors Overheating, Control system malfunction	*The Batching plant is built to operate with 3x380 – 430 Volt supply. The main mixer motor is at maximum load just before water is added, if at this point in time supply voltage drops to 360 Volts problems will be experienced with the drive motors and possibly control system. The motors may overheat, and the control system will malfunction. The problem might be solved by mixing 10% less in each batch. Check the power cables (a 50 meter 4x4mm² cable will lose about 15 volts under a 32amp load)*
The motor cannot open/close the discharge gate.	*Check thermal relays, and clean the "track" in the outlet of the mixer where the gate is supported. Check the position sensors over the gearbox of the discharge gate motorto ensure they are*

	correctly positioned. Some control systems will not allow the mixing pan to empty before the mixing process is complete.
The dosage of the mixer is not precise.	*A dosage motor must be running for a minimum of 5 seconds to ensure precise dosage,- consequently due to the high delivery rate of conveyors, augers and pumps small volumes/weights of ingredients are impractical. Throttling discharge of water pump will overcome this problem if only small quantities of water are required.*
.	*If theload cell reading is fluctuating more than +/- 10 kg. (especially when the mixer is full) it may be due to the mixer being in contact with the frame,- a belt or the cement auger. Remove concrete, stones or other parts that are jammed between the mixer and the frame. It may also be the dosage belt that needs to be adjusted. The mixermay also be moved (a few cm.) by lifting the transport jacking screws freeing the loadcells, and changing the position of the horizontal adjusting screws under the mixer. Apply a known weight to the top cover of the mixer pan in the 3 "corners" above each loadcell, and determine if the reading is within +/- 2kg. If one of the cells reading differs widely from the other 2 it is faulty and should be changedt.*
The Computer will not finish a mix	*Has the mixing time been greatly increased? Check that hopper or silo are not empty Refer to appropriate control system instruction book.*