



Flashblend Mixers

Capacity

Powder incorporation rates up to 15,000 kg/hr.

Materials of Construction

All product contact parts are constructed in 316 stainless steel.

Motor Specification

TEFV as standard, ATEX and other types of motors available on request.

Connections

Tri-clamp fittings as standard.

Cleaning

The Flashblend is designed to be Cleaned In Place (CIP) with Sterilise In Place (SIP) as an optional extra.

Electrical

Integral stainless steel control panel.

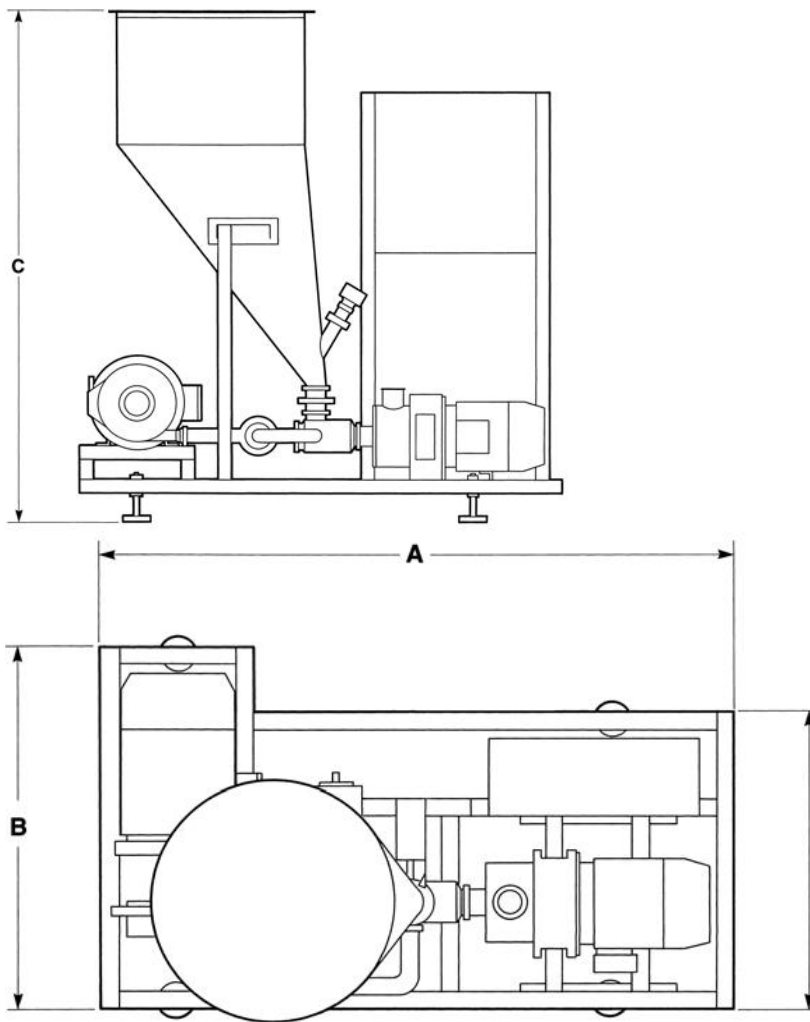
Sealing

Single mechanical shaft seals as standard. Double mechanical shaft seals and specialized arrangements are optional extras.



Powder/Liquid Mixers Technical Info

Model	A	B	C	Total Power kW	Typical Powder Flow Rate kg/hr	Standard Hopper Volume litres
FLB 20	985	645	1450	5.5	900	10
FLB 30	1520	1000	1330	8.5	3000	100
FLB 45	1800	1025	1850	18.5	7000	300
FLB 60	2000	1025	1900	26	15,000	300



All dimensions are in millimetres. Silverson reserves the right to change dimensions and specifications without notice. Powder flowrates are dependent on product characteristics. The dimensions shown are approximate and certified drawings should be used for installation purposes.

INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS MANUAL

FOR

FLASHBLEND POWDER DISPERSING SYSTEM

MODEL FLB30, FLB45 AND FLB60

FLASHBLEND SERIAL NUMBER : _____

SILVERSON REFERENCE : _____



Silverson Machines Ltd . Waterside . Chesham . Bucks . HP5 1PQ . England

Tel:(01494) 786331 . Fax:(01494) 791452

3.0 DESCRIPTION

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- 3.1 The Silverson Flashblend Dissolver Package is designed to rapidly wet out powder into liquid and is designed to process a wide variety of powders, ranging from those that form low viscosity liquids when dissolved to those that hydrate to form a viscous gel.

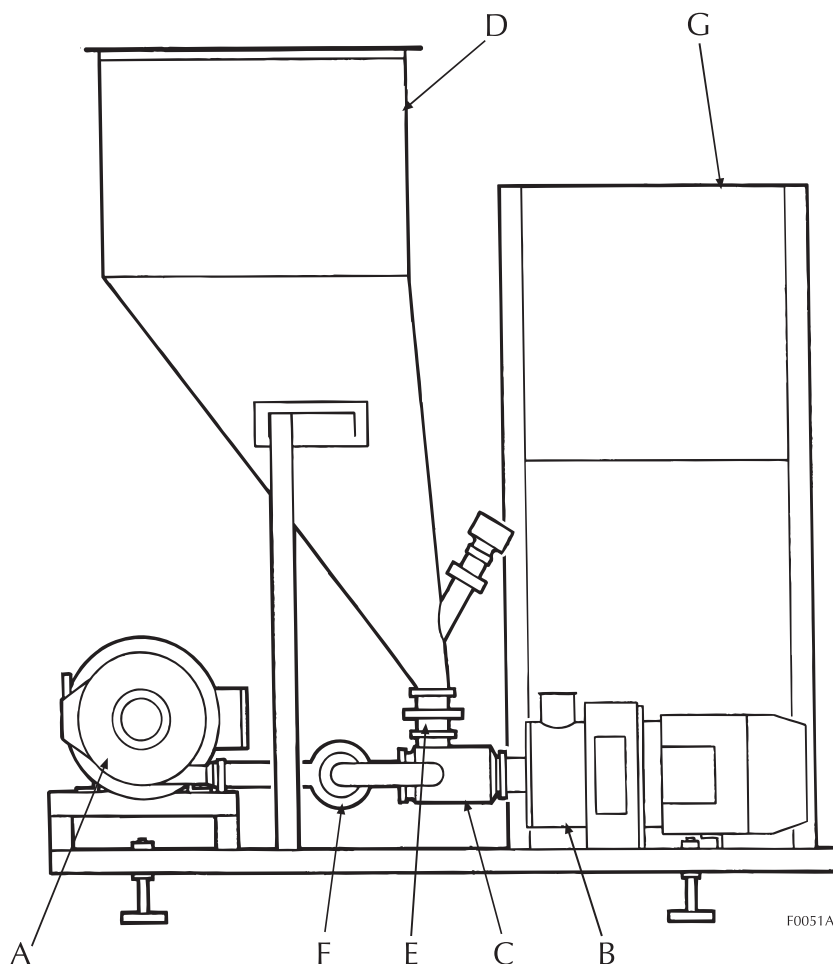
The mixing characteristics of the Flashblend can be altered by simply changing the workhead (stator) in the Inline Mixer. This offers great versatility by allowing the unit to be adapted to process a wide range of different products.

For the range of workheads available see the Inline Mixer Operating and Maintenance section 3.0 and section 5.0 Maintenance for instruction on changing the workhead.

The package consists of :

- A Centrifugal Pump (A)
- A Silverson Inline Mixer (B)
- A Blend Injector (C)
- A Hopper With Level Probe (D)
- A 'powder Feed' Butterfly Valve (E)
- A Diverter Valve For The CIP Facility (F)
- An Electrical Control Panel (G)

all mounted on a stainless steel chassis.



4.0 OPERATION

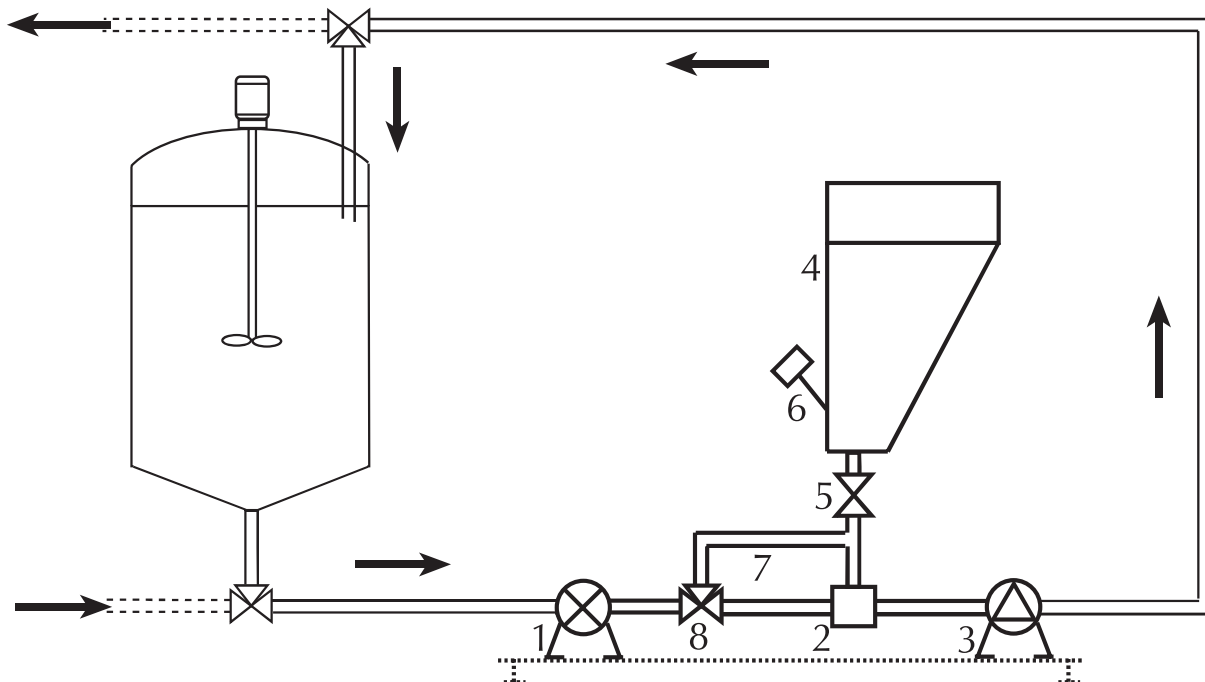
4.1 GENERAL OPERATING SEQUENCE

Liquid is forced through the Flashblend by the pump (1). The action of this flow through the blend injector (2) creates a vacuum which is then boosted by the pumping action of the Inline Mixer (3) which also returns the resulting product back to the vessel. The blend injector is separated from the powder Hopper (4) by an air actuated hygienic butterfly valve (5) which is controlled by the Low Level Probe (6). When powder is present in the hopper the valve can be opened and powder will be sucked into the liquid stream into the blend injector by the vacuum.

The liquid/powder mix immediately passes into the High Shear Rotor/Stator system of the Inline Mixer where it is subjected to intense mechanical and hydraulic shear. This ensures that it is completely dispersed and agglomerate free. The resultant product is then passed back to the process vessel. Once the powder batch is absorbed and the hopper is empty, the Low Level Probe will shut the air actuated butterfly valve so minimising aeration.

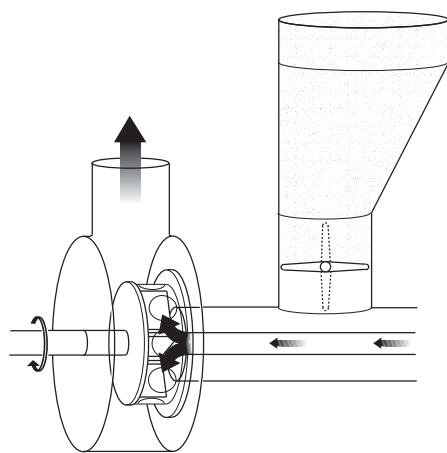
Integral with the blend injector is a by-pass loop (7) which ensures that the Blend injector assembly is kept free from any possible powder build-up. When the Powder Feed, Butterfly Valve is closed by the Low Level Probe the Diverter Valve (8) is actuated which sends the product around the outside of the blend injector nozzle. The flowrate is much higher in this mode than in the powder absorbing mode. This increased throughput ensures a scouring action of the blend injector housing and guarantees that the area is kept totally free of any build up of partially wetted powder. The by-pass position is also used for Cleaning In Place (CIP). The high throughput exceeds accepted CIP velocities ensuring that the blend injector area is cleaned to as higher standard as normal sanitary pipework.

A typical re-circulation method is shown below which, in most applications, will give the best mixing results.



4.0 OPERATION

4.2 PRINCIPLES OF OPERATION



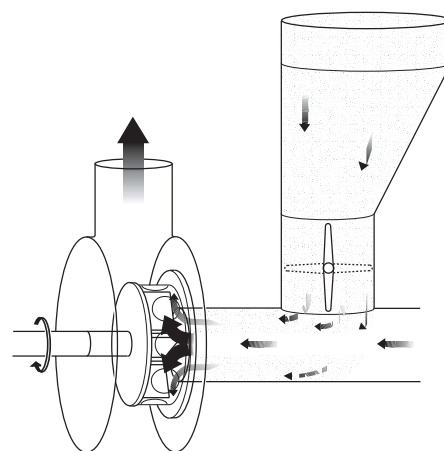
Stage 1

4.2.1 Stage 1

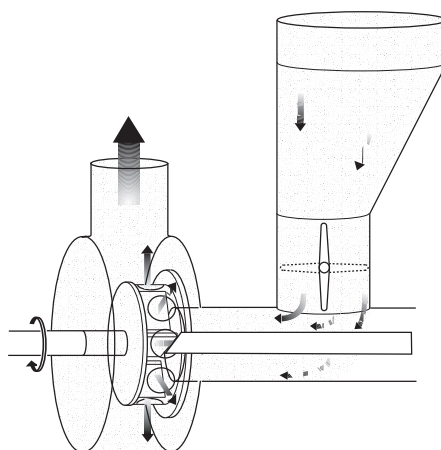
The process liquid is pumped at high velocity into the blend injector chamber and passes into the Inline Mixer. The combination of the pump, blend injector and the pumping action of the Inline Mixer creates a high vacuum in the blend injector chamber.

4.2.2 Stage 2

When powder is present in the hopper, the powder feed valve can be opened. The vacuum rapidly draws powder down into the blend injector chamber where it passes with the liquid stream at high velocity into the rotor/stator assembly of the Inline Mixer.



Stage 2



Stage 3

4.2.3 Stage 3

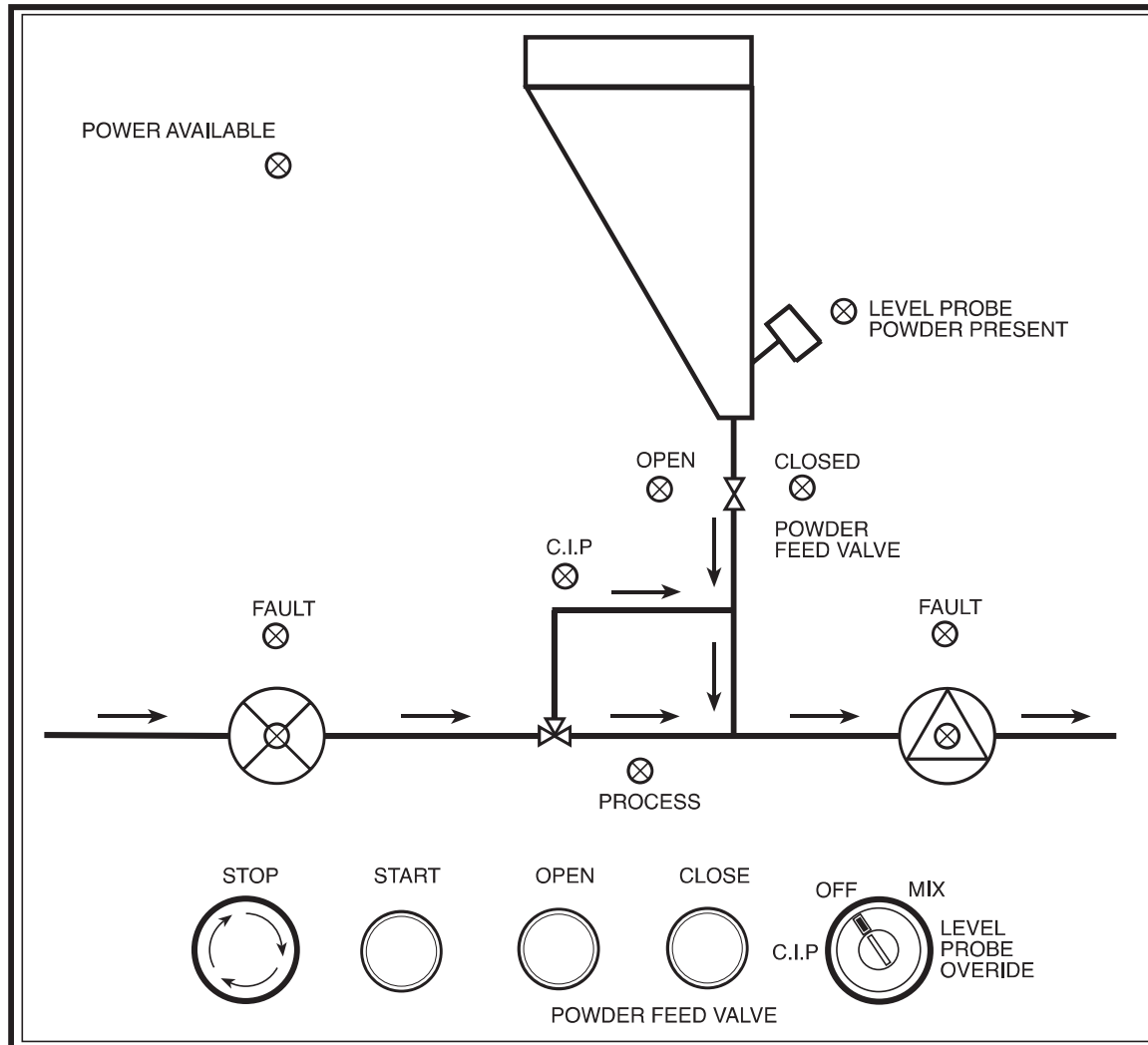
The liquid/powder mix is then subjected to intense mechanical and hydraulic shear which ensures that it is completely dispersed and agglomerate free. The resultant product is then passed back to the process vessel by the pumping action of the Inline Mixer and the discharge pump.

4.0 OPERATION

4.3 OPERATING INSTRUCTIONS



CAUTION: NEVER ALLOW THE FLASHBLEND MIXER TO RUN 'DRY'. THE MANUFACTURER WILL NOT ACCEPT RESPONSIBILITY FOR DAMAGE IF THIS PRECAUTION IS NOT OBSERVED.



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4.3.1 Key switch Position - OFF

This is a maintenance position. It is not possible to start the unit or open any valves but the panel is not electrically isolated. The panel should be isolated elsewhere and the key should be in the possession of the responsible person concerned.

4.0 OPERATION

4.3.2 Key switch Position - MIX (Automatic Operation)

1. Release the lock STOP button.
2. Press the START button
3. The pump starts, followed after 6 seconds by the Inline Mixer. Run status is indicated by green lights for the PUMP and INLINE MIXER.
4. After a further 6 seconds, the green PROCESS light is lit, and the status of the level probe is checked. If powder is detected by the probe, the yellow LEVEL PROBE - POWDER PRESENT lamp is lit.
5. The powder feed valve can now be opened by pressing the POWDER FEED VALVE OPEN button. This will cause the powder feed valve to open, drawing powder into the liquid stream.
6. When powder has been dispersed, the level probe will indicate that there is no powder and automatically close the powder feed valve.
7. After 10 seconds, the CIP valve will automatically operate and flush the blend injector area.
8. After 5 minutes, the Flashblend will reset itself to point 3 above; this time can be adjusted during commissioning if required.
9. To stop the unit at any time, press STOP.



CAUTION: DO NOT PRESS THE STOP BUTTON WHILE THE POWDER FEED VALVE IS OPEN EXCEPT IN AN EMERGENCY AS THE LIQUID FLOW CAN WET POWDER IN THE HOPPER.

4.3.3 Key switch Position - LEVEL PROBE OVERRIDE (Manual Operation)

1. Release the lock STOP button.
2. Press the START button
3. The pump starts, followed after 6 seconds by the Inline Mixer. Run status is indicated by green lights for the PUMP and INLINE MIXER.
4. After a further 6 seconds, the Flashblend is ready for manual operation of the POWDER FEED VALVE. The green process light will not light in this position.
5. When the POWDER FEED VALVE OPEN button is pressed, the powder feed valve will open allowing powder in the hopper to be drawn into the liquid stream.
6. Pressing the POWDER FEED VALVE CLOSE button will shut the valve. The valve can be opened and closed any number of times in this way.
7. To stop the unit at any time, press STOP.



CAUTION: DO NOT PRESS THE STOP BUTTON WHILE THE POWDER FEED VALVE IS OPEN EXCEPT IN AN EMERGENCY AS THE LIQUID FLOW CAN WET POWDER IN THE HOPPER.

4.0 OPERATION

4.3.4 Key switch Position - CIP (Cleaning)

1. Release the lock STOP button.
2. Press the START button
3. The pump starts, followed after 6 seconds by the Inline mixer. Run status is indicated by green lights for the PUMP and INLINE MIXER.
4. After 10 seconds, the CIP valve will operate to clean out the blend injector powder passage.
5. To stop the unit at any time, press STOP.

4.3.5 Fault Lamps

1. If a failure of the Inline Mixer or the Pump occurs, the Flashblend will automatically shut down and the area of the fault will be indicated by the fault lamps.
2. Disconnect the Flashblend unit from the power and air supply.
3. Investigate and rectify the fault, maintenance instructions for all components can be found in the relevant section of the data manual.
4. Reconnect the unit to the power and air supply and press the reset buttons on the overloads inside the control panel before restarting the Flashblend.



WARNING: ANY ELECTRICAL WORK SHOULD BE CARRIED OUT BY A SUITABLY QUALIFIED ELECTRICIAN.

5.0 INSTALLATION

5.1 Handling/Unpacking/Lifting

- 5.1.1 The Flashblend Skid is packed in a large wooden case which is screwed together. The skid is held down by wooden battens which are fixed to the base of the case by coach screws.
- 5.1.2 The Flashblend should only be unpacked when it is ready for installation.
- 5.1.3 The front of the case (indicated) should be removed first, followed by the top and rear of the case. Remove the cardboard carton. Remove the timbers which support / retain the hopper and carefully lift out the hopper. Unscrew and remove the cross brace timbers from the case. Remove the four bolts that secure the chassis to the floor of the case and carefully lift the chassis either from below by Fork Lift or from above by crane or a Fork Lift with a jib arm. In either case great care must be taken not to damage any fittings. Whilst the unit is safely suspended fit the levelling feet to the chassis; these are contained within the cardboard carton.



CAUTION: DO NOT REMOVE ANY PIPE LINE PLUGS OR BLANK PLATES AS THE INSIDE SURFACE FINISH COULD BE DAMAGED BY INGRESS OF FOREIGN MATTER.



WARNING: ALWAYS USE LIFTING EQUIPMENT WHERE NECESSARY; SOME COMPONENTS ARE HEAVY AND CAN BE DANGEROUS TO HANDLE WITHOUT THE CORRECT LIFTING EQUIPMENT.

5.2 Installation-Mechanical

- 5.2.1 The Flashblend skid should be mounted on a firm and level surface. It is fitted with non-slip adjustable feet which allow approx. 100mm vertical adjustment. The feet are mounted in ball sockets which will take up a certain amount of slope if the floor falls to drain. The Flashblend skid **MUST** be level in both planes.
- 5.2.2 Only remove the pipe line blanks immediately prior to installation.

5.0 INSTALLATION

5.3 Installation - Pipework

- 5.3.1 For satisfactory operation of the Flashblend it is imperative that pipeline losses are kept to an absolute minimum. This is especially important where viscous liquids or powders that increase product viscosity are being processed.
- 5.3.2 The feed to the Flashblend should be as short as possible and must be at least the same diameter as the pump inlet. Any valves installed in the inlet pipe must be full bore type and should not have a high pressure drop across them. See table below for flow rates.
- 5.3.3 The outlet pipeline should be at least the same diameter as the Inline mixer outlet. Any valves installed in the outlet pipe must be full bore type and should not have a high pressure drop across them. See table below for flow rates.
- 5.3.4 Pipeline sizes may need to be increased if the product has a high viscosity or the pipelines are longer than desirable.



CAUTION: IF THE PRESSURE DROP IN THE OUTLET PIPE EXCEEDS 1 BAR IT IS POSSIBLE FOR LIQUID TO BE FORCED INTO THE POWDER FEED HOPPER.

- 5.3.5 The pipework to and from the Flashblend should not be sprung in any plane; this is especially important for the outlet of the Inline mixer as excessive loading on the nozzle can cause the rotor to rub on the stator causing internal damage to the working parts. Pipework should be independently supported close to the outlet of the Inline mixer. Allowances should be made for thermal expansion.
- 5.3.6 Sufficient room should be left around the Flashblend unit to allow for easy dismantling of pipework and for inspection and maintenance.

MODEL	STANDARD PUMP INLET SIZE	STANDARD INLINE MIXER OUTLET SIZE	RECOMMENDED PIPE SIZE		NOMINAL FLOW RATES (LITRE / HOUR)	
			>1000CPS	<1000CPS	MIX	CIP
FLB30	2"	2"	2"	2.1/2" **	18000	32000
FLB45	3"	3"	3"	3" *	26000	45000
FLB60	3"	3"	3"	3" *	26000	45000

Notes:

**Silverson Machines should be contacted prior to installation if it is anticipated that the inlet pipework will be greater than 5 meters in length or that the outlet pipework will be greater than 10 meters in length.*

***The pump inlet should also be increased in size to 2.1/2" dia.*

5.0 INSTALLATION

5.4 Installation - Electrical



WARNING: ANY ELECTRICAL WORK SHOULD ONLY BE CARRIED OUT BY A SUITABLY QUALIFIED ELECTRICIAN. ALL NATIONAL, LOCAL AND SITE REGULATIONS SHOULD BE OBSERVED. WHEN MAKING ELECTRICAL CONNECTIONS THE MAIN SUPPLY TO THE FLASHBLEND MUST BE ISOLATED WITH THE FUSES REMOVED AND THE FUSE BOX LOCKED SHUT AND THE KEYS IN THE POSSESSION OF THE ELECTRICIAN UNTIL WORK IS COMPLETED.

5.4.1 The system has been pre-wired and tested. Power connection is made at one point in the panel. Refer to wiring diagram.

5.4.2 Before connecting the Flashblend the following checks should be made.

Checks and Precautions

5.4.3 All cables etc. should be sized according to the relevant codes of practice and site regulations.

5.4.4 Always follow the motor manufacturer's instructions and wiring diagram.

5.5 Control wiring

5.5.1 Any control equipment must be wired according to the relevant codes of practice and site standards.

5.5.2 All wiring should be connected in accordance with the wiring diagram supplied.

5.6 Direction of Rotation



CAUTION: COMPLETE PLANT I.E. PUMP AND MIXER MUST BE FILLED WITH WATER OR OTHER SUITABLE LIQUID BEFORE THE DIRECTION CHECK. FAILURE TO OBSERVE THIS PRECAUTION WILL RESULT IN SEAL FAILURE EVEN IF THE MOTORS ARE ONLY SPUN BRIEFLY.



CAUTION: IT IS IMPERATIVE THAT IF THE MOTORS RUN IN THE WRONG DIRECTION THEY ARE SWITCHED OFF IMMEDIATELY AS IT IS POSSIBLE TO LOOSEN THE ROTOR NUTS IF THEY ARE RUN IN THE REVERSE DIRECTION.

5.6.1 The motors should be tested separately.

5.7 Installation - Pneumatic

5.7.1 The unit requires a supply of dry filtered air to operate the valves, the minimum air pressure required is 80 psi. The solenoids operating these valves are housed within the valve control unit on the top of the actuators. They are pre-wired and are connected pneumatically, the pipe being run through the chassis into the panel.

5.7.2 The valves exhaust to atmosphere when air pressure is removed from them. There is no additional pneumatic installation required.