

CONCRETE BATCHING PLANT

BP 30

**FULL – AUTOMATIC MODEL
IN-LINE HOPPER.**

1. INTRODUCTION

The batching plant BP 30, described below makes the production of wet or dry concrete with high quality and homogeneity. Materials which are inserted in high quality plant and all kinetic moves of machine are controlled over electro-hydraulic and electro-pneumatic units, and also controlled by electronic units made by world recognized manufacturers. Besides that, plant is made in several modules, which gives possibility of adapting of whole equipment according to every specific demand from buyer.

In continue, offer is made by basic needed technical entering parameters of batching plant:

- Planetary concrete mixer 750 liters of output of fresh vibrated inserted concrete;
- Construction type: Cones for hoppers 15 m³;
- Coming construction for support;
- Height of overhang [exhaust] 4 m;
- Production of capacity of 30 m³/h of fresh vibrated inserted transporting concrete in continuous work;
- 5 types of aggregates;
- Weight dosing of cement, aggregates and liquid additives;
- Volumetric dosing of water;
- Control by manual and automatic [by computer] with 100 different programs [different concrete mixtures];



BASIC TECHNICAL DATA OF PLANT	
Model	BP-30
Production capacity of wet concrete	30 m ³ /h
Ambient oversea height	Until 1.000 m
Ambient temperature for work	-10 to 50 °C
Working temperature of machines inside of plant	5 to 35 °C
Maximum allowed wind	120 km/h
Power supply	380-420 V, 50 Hz [EC standard]

MANUFACTURERS OF PARTS INSERTED IN PLANT	
Electronics [PLC]	LAUMAS
Electrics and energetic	SCHRACK
Pneumatics	
Scales	
Redactors	



2. DESCRIPTION OF SOME PARTS OF PLANT

Concrete batching plant is made from next basic elements:

1. Equipment for mixing of concrete;
2. Equipment for storage and dosing of aggregates;
3. Equipment for storage and dosing of cement;
4. Equipment for dosing of water;
5. Electric installation and controlling;
6. Optional equipment;

Complete concrete batching plant, before delivery, is protected with basic color layer and also with two layers of blue color RAL 5005.

2.1 Equipment for mixing of concrete

Equipment consists from 2 [two] mixers with their skips and standing support platform where mixers are located. Mixers are mounted on frame made from metal profiles with support platform where is mounted the protection fence and stairs for approach to mixers.

The reducer for driving of mixer with planetary gear is mentioned for work in heavy duty conditions. The system of mixing is made with star with 3 impellers [buckets] and one peripheral scraper. The construction of impellers [buckets] and covering of mixer is made from anti-wear material. It is possible to make impellers from anti-wear rubber. The system for water distribution into the mixer is made over peripheral side of mixer with inserted nozzles. There are doors with special rubber on the mixer, for mixer inspection. Manual hydraulic pump makes possible opening of the door in case of power failure. Movable skip for loading mixer with proper mixture of aggregates form track dosing device by motor, with redactor which lifts up skip over metal cable. Mechanical and electromechanical safety devices will stop falling down of skip in case of cable ripping of.



Planetary mixer



Skip for mixer



Mixers on support platform

In continue, there are technical data of equipment for concrete mixing.

TECHNICAL DATA OF MIXER	
Volume size of mixer's drum [material 2.400 kg/m ³]	750 l
Output of fresh concrete	600 l
Output of fresh vibrated inserted concrete	500 l
Nominal production capacity of concrete	30 m ³ /h
Internal diameter of mixer's drum	1.820 mm
Maximum weight of concrete	990 kg
Engine power for mixer	18.75 kW
Engine power for hydraulics	1.5 kW
Number of circles of impellers around hand	42.5 rpm
Number of circles of hand	20.5 rpm
Output doors	2 pcs
Covering of bottom – thickness/quality	12 mm / Hardox 500
Covering of walls – thickness/quality	12 mm / Fe 520
Maximum size of aggregate	60 mm
Weight of mixer without skip	2.000 kg
Number of mixing hands	1 pcs
Number of impellers on mixing hand	3 pcs
TECHNICAL DATA FOR MIXER'S SKIP DEVICE	
Volume size of SKIP	825 l
Maximum weight of aggregates	1.000 kg
Number of speeds at moving down	1 speed
Number of speeds at moving up	1 speed
Speed at moving down and moving up	152 /12 m/min
Engine power for skip drive	4.5 kW
Angle of skip's track	75°
Weight of skip	700 kg
Mechanical and electromechanical safety devices	Included
Number of wires in cable / cable diameter	271 pcs / 8.75 mm
Ripping of hardness for cable	8.060 kg
TECHNICAL DATA FOR SUPPORTING FRAME	
Height for construction / exhaust	3.000 mm
Stairways and protection fence	Included
The model of construction	Approachable

2.2 Equipment for storage and dosing of aggregates

Equipment consists from boxes for storage, cones for hoppers, flaps with pneumatic cylinders, construction support, weighting belt, installation lines for pneumatics and electricians. There are boxes for storage of aggregates on self standing construction. Output for aggregates is over flaps with pneumatic cylinders, which make needed dose of aggregates on track scale, which hangs on measure cells for precise setting of needed amount of aggregates. Mechanical regulation of output diameter of border for opening is insured with manual shutter. There are vibrators mounted on separate plate, on the conical outlets of output hoppers for sand. On the exit of track scale is additional reversible track for splitting aggregates for mixer 1 or 2.



Boxes for storage



Weighting belt for raw material and conveyor belt

In continue, there are technical data of equipment for storage and dosing of aggregates.

TECHNICAL DATA FOR INLINE BOXES	
Storage capacity per box	15 m ³
Number of boxes	5 pcs
Box dimensions	3.500 x 3.000 mm
Total capacity storage	75 m ³
Quality of inserted materials	Fe 360B – Fe 410B
Pneumatic cylinders for dosing of aggregates	4 pcs, dimensions 300 x 80 mm
Maximum size of aggregates	60 mm
Thickness of side sheet metal	4 mm
Thickness of flaps sheet metal	5–8 mm
Vibrator on the conical outlets of boxes for sand	2x 270 W. IP 65. kl. F
TECHNICAL DATA FOR WEIGHTING BELT	
The way of dosing	By weight measuring
Load cells for weight measuring	Electronic ec atest
No. of cells for measuring	4 pcs
Maximum capacity of scaling	3.000 kg
Minimal resolution of scale	5 kg
Output of dozer	Until 1.00 m ³ per cycle
Accuracy of scaling of aggregates	Until 3%
Dimensions of track for emptying	800 mm x 11 m
Thickness for track	12 mm
Breaking off strength of track	630 kP
Number of layers for canvas	4 layers [3 nylon + 1 polyester]
Thickness of upper wearing layer	4 mm
Thickness of down wearing layer	2 mm
TECHNICAL DATA FOR COMPRESSOR	
Volume for reservoir	200 l
Nominal air flow	270 l/min
Working pressure	6 bars
Air prepare group	Included
Safety valve	Inserted on 12 bars
Power of motor for compressor drive	4 kW, LP 65, kl. F

2.3 Equipment for storage and dosing of cement

Equipment consists from cement silo, screw transporter [snail] and scale for cement weighting. Cement silo is monolith made. Montage of silo will be made on the location of plant during installation whole plant. On cone output of cement silo is mounted mechanical butterfly valve which is connected on screw transporter for transporting of cement from silo into dosing scale of same one. Equipment for indication of charge of cement in silo has 1 electrical sensor which emits minimal charge of cement in silo. Equipment for fluidization has role to blow air into cone output how there will not be present clusters of cement and make difficult output of the same one into the screw transporter. Cement silo, supporting eco normative, has to be equipped with needed filter for protection from let off cement in the atmosphere. Filter with mounting on the top of silo has capacity of 18 m³. Filter is last generation of filters for environment protection, because emptying is doing on pneumatic way, not by vibrator device. How silo is property of user, in continue are given technical data of equipment for dosing of cement.

TECHNICAL DATA FOR SCREW TRANSPORTER - SNAIL	
Diameter	198 mm
Length	6.000 mm
Ball joint	Included
Power drive	5 kW, 400 V, 50 Hz, IP 55, kl. F
Nominal capacity	60 t/h
TECHNICAL DATA FOR CEMENT WEIGHTING SCALE	
The way of dosing	By weight
Sensor for weight measuring	Electronic EC attest
Maximum capacity of scaling	400 kg
Geometric volume of basket for scaling	300 l
Minimal resolution of scale	1 kg
Vibrator on output of basket for scaling	180 W, 400 V, 50 Hz, IP 65, kl. F
Opening for cleaning of conveyor	Mounted
Diameter of input into scale	198 mm
Diameter of electro pneumatic valve for emptying	200 mm
Accuracy of scaling	Until 3%
TECHNICAL DATA FOR THE REST OF GEAR INSIDE OF EQUIPMENT FOR CEMENT	
Equipment for indication of minimal charge of cement silo	2 pcs
Type of gear for indication	Electronic 48 V
Equipment for fluidization of cement	Included
Number of pedals for fluidization of cement	6 pcs



2.4 Equipment for dosing of water

Dosing of water is done with an impulse dosing machine which measures water flow and turns it into electric impulses, which are processed electronically. In line with the impulse dosing machine is an electric valve, as well as a water filtering system [a filter].

TECHNICAL DATA FOR EQUIPMENT FOR DOSING OF WATER	
Way of dosing	Volumetric
Diameter of output pipe	2"
Measuring resolution	1 liter
Capacity of dosing	500 l/min



2.5 Electric installation and controlling

All installations and safety devices are made by EC regulations, protection IP 67, both way of work, manual or automatic. Owner of the plant has responsibility to install needed electrical power line until control panel unit in cabin. Manufacturer will provide needed drawing for that purpose. Controlling of whole plant is by **PLC Siemens** controller which gives returning connections of the system which are part of safety demands.

Controlling gives setting up the sequence of dosing of every each aggregate, cement, additives and water, needed for getting optimal work and production of concrete batching plant.

TECHNICAL DATA FOR CONTROL UNIT OF PLANT	
Manufacturer of PLC controller	Siemens
Number of different concrete mixtures	100 programs
Other electronic components	ABB, Siemens
THE VIEW OF TOTAL INSTALLED POWER	
Mixer	30 kW
Skip	7.5 kW
Pump for hydraulics	2.2 kW
Track scale	7.5 kW
Screw transporter for cement [snail]	5.0 kW
Transport track for concrete	7.5 kW
Vibrators on exhaust of sand from boxes – 2 pcs	0.54 kW
Vibrator on exhaust of cement from scale	0.18 kW
PLC, electronics and electrics in control panel unit	1.45 kW
TOTAL	62.00 kW



All devices are not working in some moment and that's why the highest power need is about 49 kW.

3. OPTIONAL EQUIPMENT

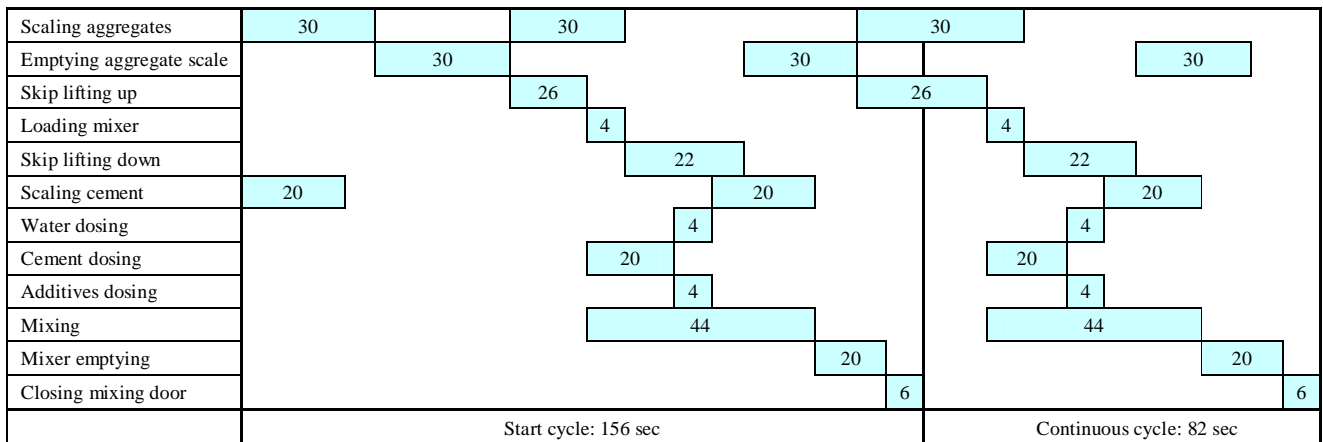
3.1 Equipment for cement filtering

Cement silo, supporting eco normative, has to be equipped with needed filter for protection from let off cement in the atmosphere. Filter with mounting on the top of silo has capacity of 18 m³. Filter is last generation of filters for environment protection, because emptying is doing on pneumatic way, not by vibrator device.

TECHNICAL DATA FOR EQUIPMENT FOR OUT DUSTING	
Cement filter	1 pcs – mounting on the top of the cement silo.
Capacity of out dusting of filter for cement	18 m ³
Emptying of filter	Pneumatic

4. PRODUCTION CAPACITY

Measuring of capacity is into continuous work which presents production of concrete without stopping of work in automatic mode with standard quality wet concrete. Picture of technologic time flow of concrete mixture production:



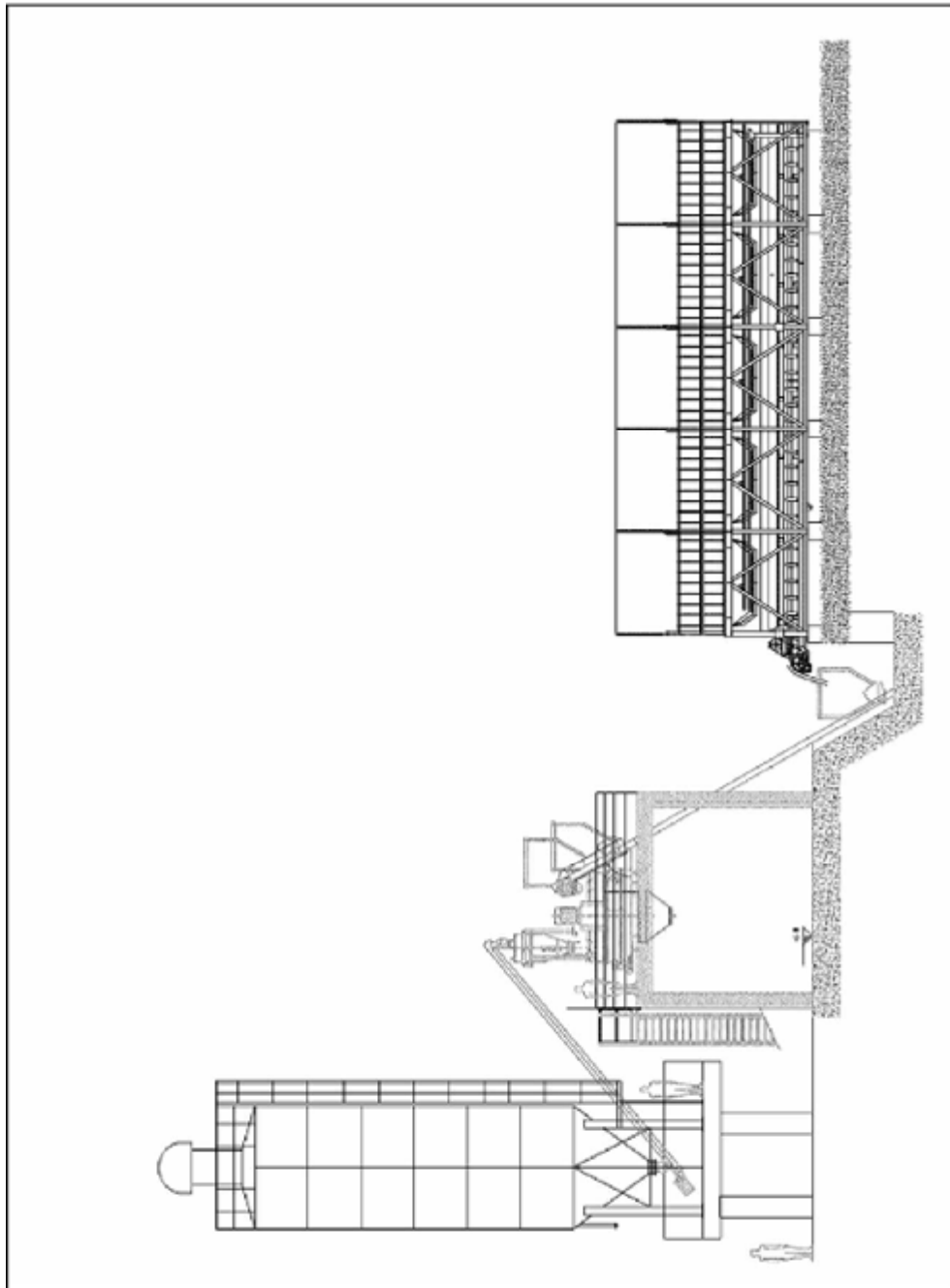
Production capacity of concrete in automatic mode can be observed on 3 possible ways, depending from the type of work modes.

Calculation for all 3 ways of measuring:

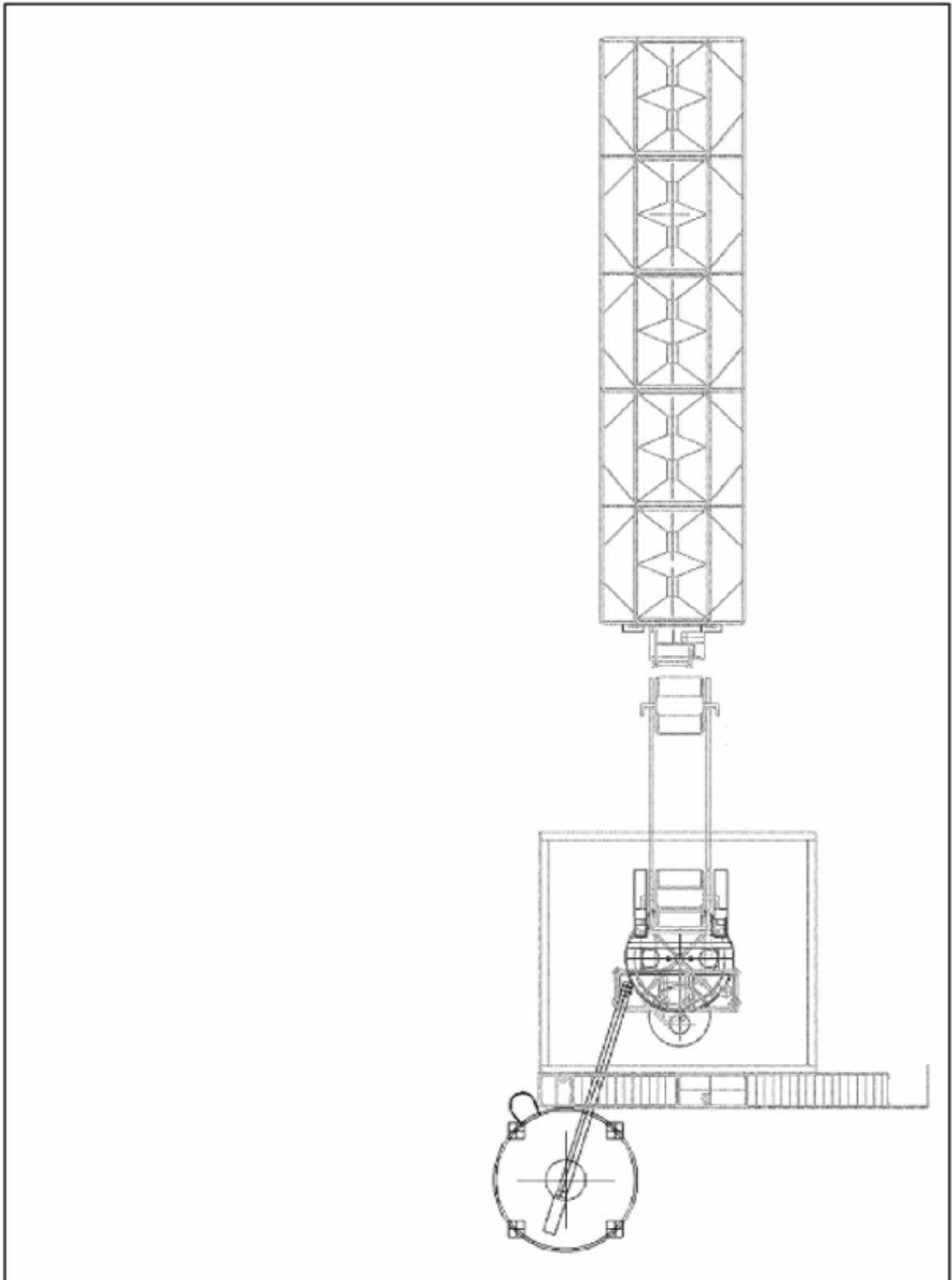
1. Concrete mixing in automatic mode – 1 cycle: 0.75 m³
2. Concrete mixing in automatic mode – 12 cycles: 9 m³ [standard auto-mixer]
3. Concrete mixing in automatic mode – continuous.

Production capacity of concrete in m ³ /h			
	1 cycle	12 cycles	Continuous
Theoretical	16.5	30	33
In real production	15	27	30





Scheme of plant with 1 cement silos, planetary mixer with 2 exit holes, and 5 boxes.



Scheme for plant with 1 cement silo, planetary mixer with 2 exit holes and 5 boxes.