SUBTLEWEIGH

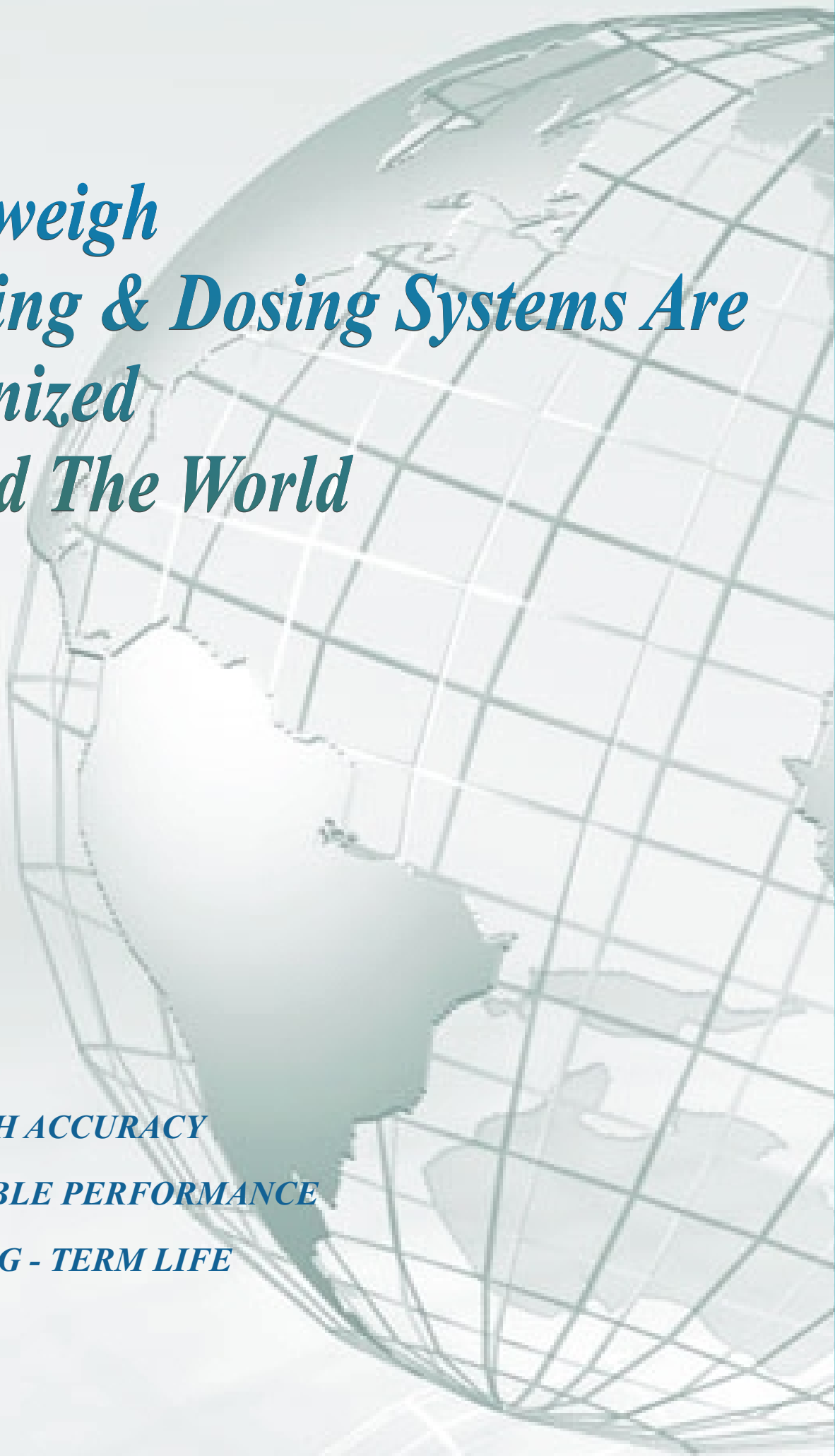
Product Guide

Weighing & Dosing
for Industrial Processes

CE ISO 9001

SUBTLEWEIGH
Electric (India) Pvt. Ltd.

Subtleweigh Weighing & Dosing Systems Are Recognized Around The World



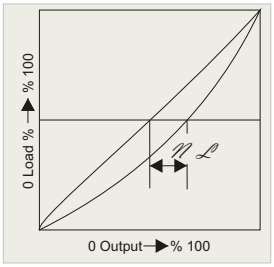
- *HIGH ACCURACY*
- *STABLE PERFORMANCE*
- *LONG - TERM LIFE*

TECHNICAL DEFINITIONS OF TERMINOLOGY

1. RATED CAPACITY (R.C)
The maximum axial load cell is designed to measure within its specification.

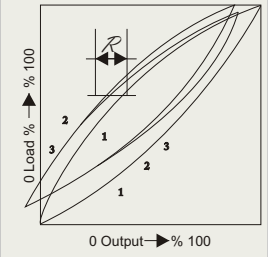
2. RATED OUTPUT (R.O)
The algebraic difference between the outputs at no-load and at rated load. Usually load cell output is specified in milli-volts per volt at rated capacity.

3. NON LINEARITY



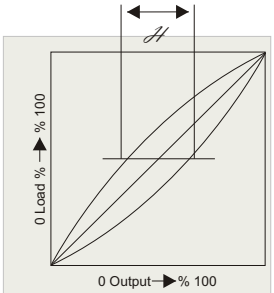
The maximum deviation of the calibration curve from a straight line between zero and rated load outputs, expressed as a percent of the rated output and measured on increasing load only.

4. HYSTERESIS



The maximum difference between output readings for the same applied load one point obtained while increasing from zero and the other while decreasing from rated output.
The points are taken on the same continuous cycle. The deviation is expressed as a percent of rated output.

5. REPEATABILITY



The ability of a load cell to reproduce output readings when the same load is applied to it consecutively, under the same direction. Repeatability is expressed as the maximum difference between output readings as a percent of rated output.

6. ZERO BALANCE
The output signal of the load cell with rated excitation and with no load applied, usually expressed in percent of rated output.

7. TEMPERATURE RANGE COMPENSATED
The range of temperature over which a load cell is compensated to maintain rated output and zero balance within specific limits.

8. TEMPERATURE RANGE, SAFE
The range of temperature over which a load cell may be safely operated up to full scale without causing failure but specifications may not be met.

9. TEMPERATURE EFFECT ON RATED OUTPUT
The change in rated output due to a change in ambient temperature. Usually expressed as + /- a percentage change in rated output per degree C change in ambient temperature, over the compensated temperature range.

10. TEMPERATURE EFFECT ON ZERO BALANCE
The change in zero balance due to a change in ambient temperature.Usually expressed as +/- a percentage change in rated output per degree C change in ambient temperature over the compensated temperature range.

11. TERMINAL RESISTANCE, INPUT
The resistance of the load cell circuit measured at the excitation terminal, at standard temperature, with no-load applied, and with the output terminals open-circuited.

12. TERMINAL RESISTANCE, OUTPUT
The resistance of the load cell circuit measured at the output signal terminals, at standard temperature, with no-load applied, and with the excitation terminals open-circuited.

13. INSULATION RESISTANCE
The DC resistance expressed in ohms measured between any electrical connector pin or lead wire and the load cell body or case. Normally measured at 50 v DC.

14. EXCITATION
The voltage or current applied to the input terminals of the load cell.

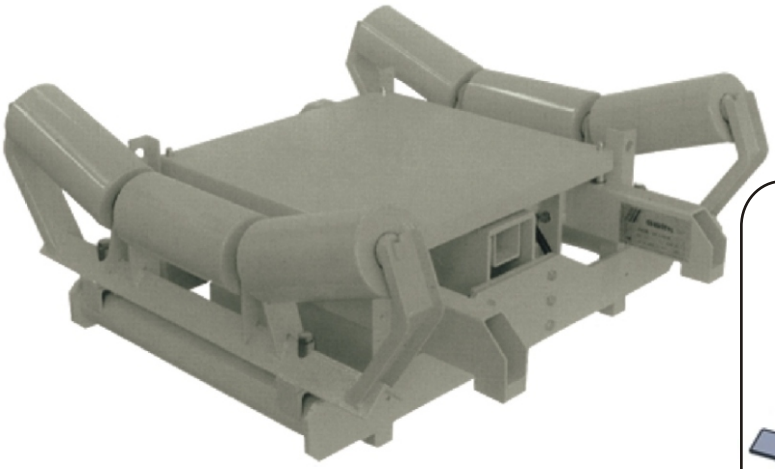
15. SAFE OVERLOAD
The maximum load in percent of rated capacity which can be applied without causing a permanent change in the performance specifications.

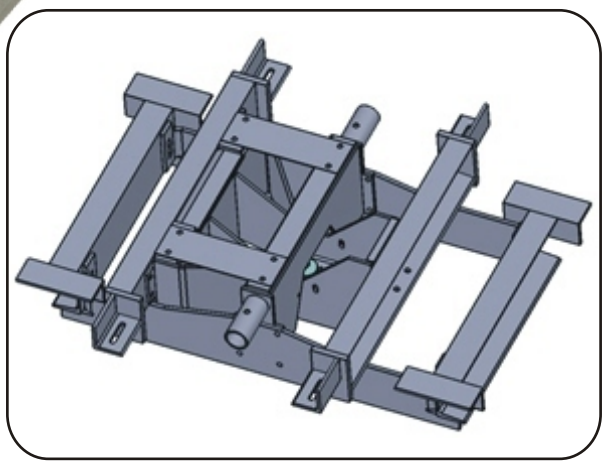
16. ULTIMATE OVERLOAD
The minimum breaking load in percent of rated capacity at structural failure.

17. CREEP
The change in load cell output occurring with time, while under load, and with all environmental conditions and other variables remaining constant.Usually measured with rated load applied and expressed as a percent of rated output over a specific period of time.

18. ACCURACY
Stated as a limit tolerance which defines the average deviation between the actual output versus theoretical output.
In practical load cell applications, the potential errors of nonlinearity, hysteresis, repeatability and temperature effects do not normally occur simultaneously, nor are they necessarily additive.
Therefore, accuracy is calculated based upon the RMS value of potential errors, assuming a temperature band °æ 10°…. Full rated load applied, and proper set up and calibration.
Potential errors of the readout, cross talk, or creep effects are not included.

Belt Weighing System





Multi-idler Belt Weighing Scale

The multi-idler Belt Weighing Scales have been especially designed for continuous acquisition of flow rates & totalized amount of solid materials of all sizes moving on a conveyor belt. These are designed to suit a large variety of conveyor belt widths and capacity and to endure severe industrial environments.

The Belt Scale consists of a weigh mechanics fitted with load cell that is mounted on the conveyor frame and connected to a microprocessor based measurement & control system SWC32 to translate the weight readings into flow rate and totalized weight. The weighing platform is so designed that the existing idlers of the conveyor can be accommodated. For belt width above 1400 mm, 2 nos. load cells are used and for conveyor speed over 2.0 mtr/sec, twin mechanics are used for accurately measuring the flow rate and totalized weights.

Capacity Range : 10 TPH to 3000 TPH

The mechanical structure is specially designed to assure the best translation of the weight of the material on the belt, even under conditions of irregular load and particle size, and for high speed motion. The measurement of speed is taken from the return belt by means of a friction wheel and carried out by a digital tachometer using optical sensor housed in a IP:67 enclosure.

Precession Class : from ± 0.5 to ± 1% based on the application.

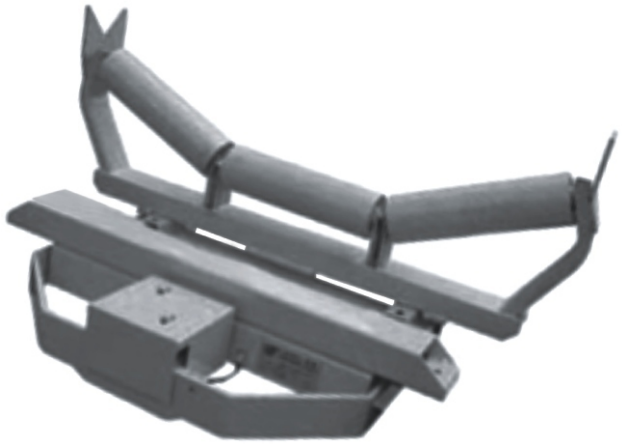
Applications

- Instantaneous and totalized measurement of flow rate
- Final balance of consumption or production quantities
- Feeding for batch systems
- Loading system for trucks or wagons
- Instantaneous control of overloading for conveyor belts
- Automatic adjustment system for flow rate

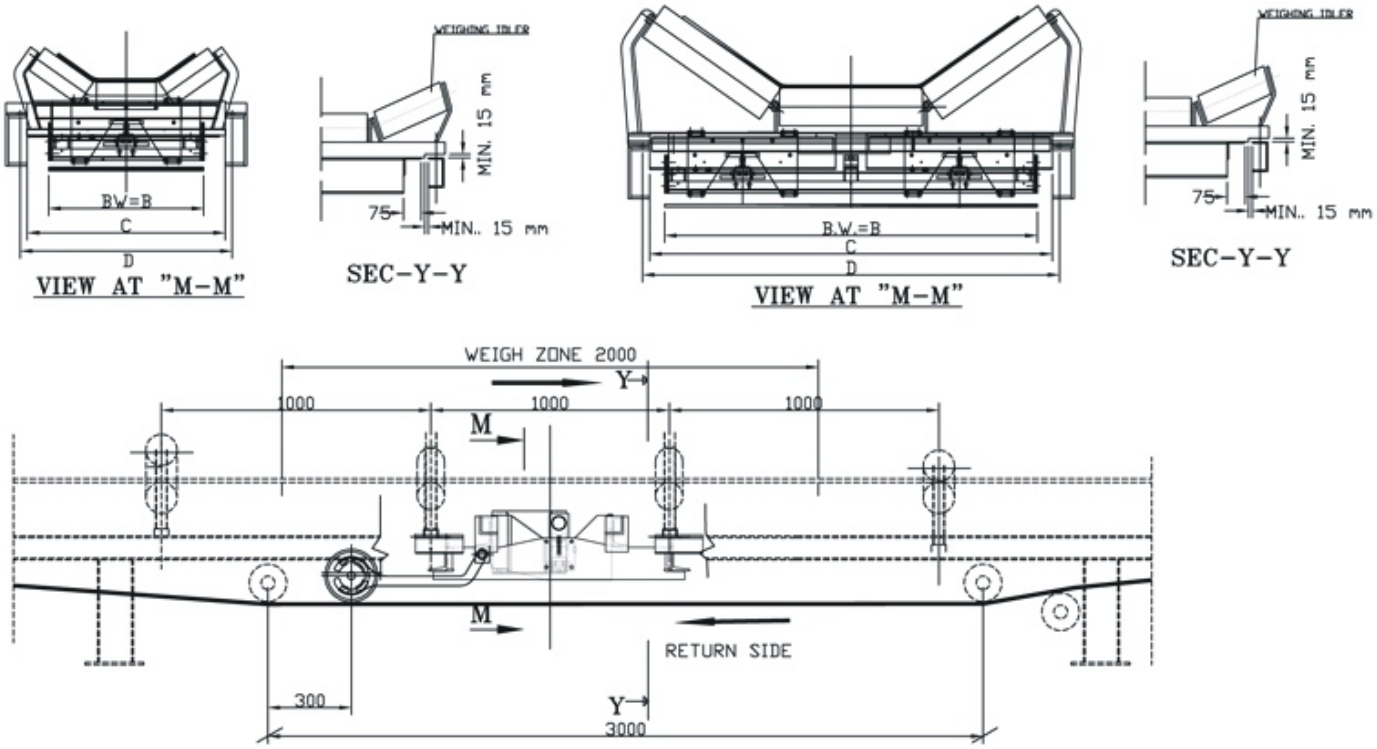
SWC-32 + SWD-32 for Belt Weighing System

Single-idler Belt Weighing Scale

For certain special applications with short conveyor lengths, we can provide single idler belt scales for measuring instantaneous and totalized flow of materials being conveyed in the belt.



Typical Dimension



Model no. based on Belt Width & Belt Speed

TYPE	B	No. of Load Cells	D	C	Belt Speed	No of Machines
BW0500-1M1	500	1	740	630	< 2 m/sec	1
BW0600-1M1	600	1	890	780	< 2 m/sec	1
BW0800-1M1	800	1	1040	930	< 2 m/sec	1
BW1000-1M1	1000	1	1240	1130	< 2 m/sec	1
BW1200-1M1	1200	1	1450	1340	< 2 m/sec	1
BW1400-1M1	1400	1	1650	1540	< 2 m/sec	1
BW1400-2M1	1400	2	1900	1790	< 2 m/sec	1
BW1600-2M1	1600	2	2190	2080	< 2 m/sec	1
BW1800-2M1	1800	2	2440	2330	< 2 m/sec	1
BW1800-2M2	1800	4	2190	2080	> 2 m/sec	2
BW2000-2M2	2000	4	2440	2330	> 2 m/sec	2

Weigh Belt Feeders

Weigh Feeder is a variable speed conveyor incorporating belt weighing and speed control for installation directly under the storage silo, suited for industrial environments with particularly heavy duty conditions. The flow rate is held constant by varying the speed of the conveyor inversely with respect to belt load by means of a VVVF Drive.

Material is fed into the weigh feeder via a feed hopper equipped with a manually adjustable profile gate which controls the material bed height on the feeder belt. The weighing assembly built into the feeder measures the gravimetric force applied by the material travelling down the belt and converts this force into mV signal which is proportional to the loading on the belt. A digital speed sensor continuously monitors the belt speed and the microprocessor based measurement & control system SWC32 integrates these two signals to give you an instantaneous rate of flow and totalized weight of material that has passed through the feeder.

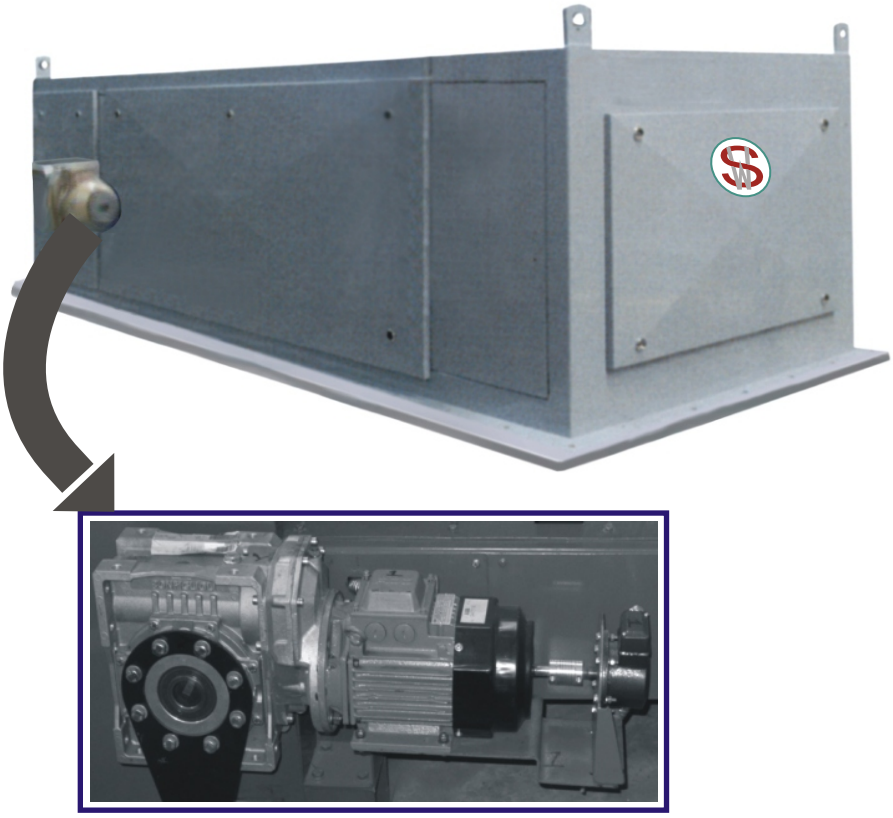
Capacity Range : from 100 Kgs/Hr to 1000 TPH

Dynamic Range : 1 : 10

Unique Features

- Bulk density variation compensation within a range of ± 30%
- Dual load cell design for better accuracy
- Head & Tail driven dependent upon the application
- Enclosed or open construction
- Designed for hazardous or non-hazardous applications
- High accuracy
- Corrosion resistant components
- Simple installation, easy to clean & maintain

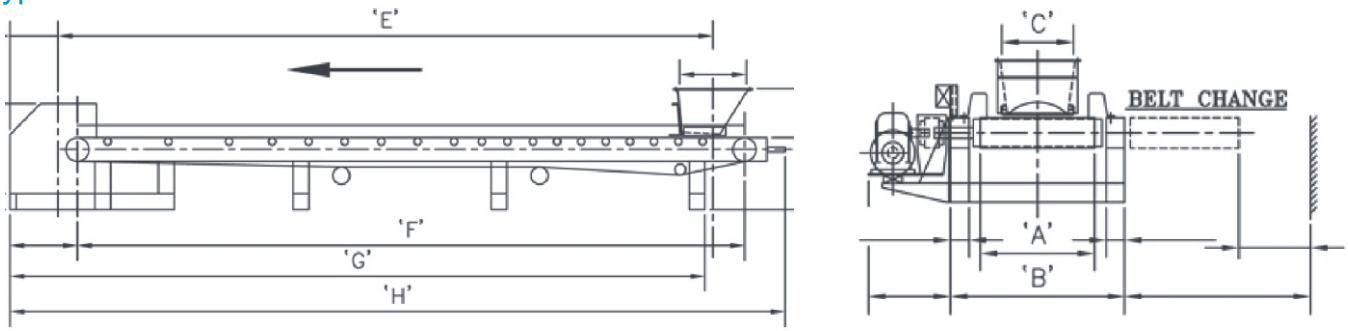
SWC-32 + SWD-32 for Weigh Belt Feeder



For small-size granulated materials and particularly for the chemical and foodstuff industries, we can provide completely enclosed weigh feeders.

The supporting structure is an integral part that encloses the weighfeeder mechanics, thus guaranteeing completely dust-tight protection and, if needed, making pressure-proofing possible.

Typical Dimension



Model No. Based On Belt Width & Pulley Centers

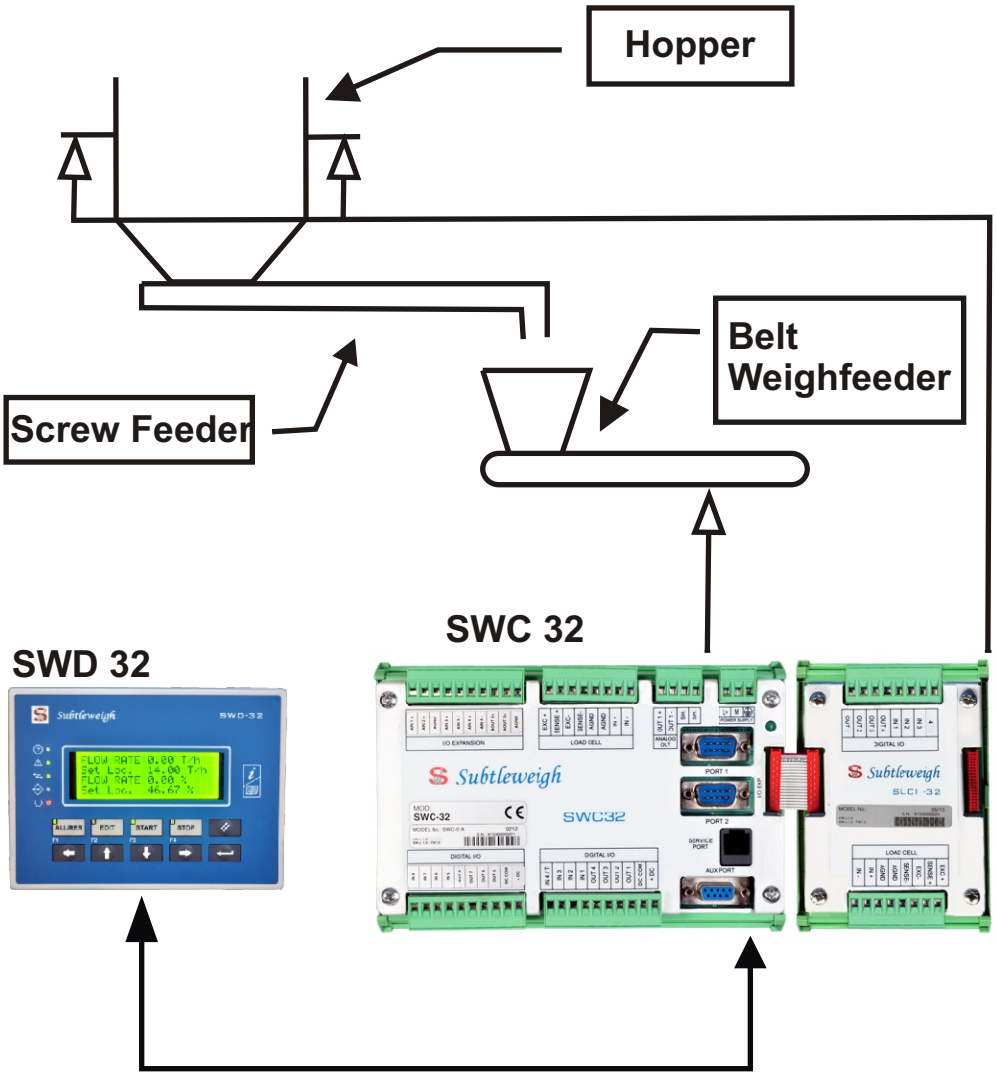
TYPE	A	B	F
BWF0650-2C20	650	1020	2000
BWF0800-2C25	800	1220	2500
BWF0800-2C30	800	1220	3000
BWF1000-2C35	1000	1420	3500
BWF1200-2C40	1200	1620	4000
BWF1400-2C50	1400	1910	5000
BWF1600-2C20	1600	2110	2000
BWF1800-2C25	1800	2310	2500

Suffix after model no. will indicate the following

T - normal infeed hopper
V - infeed hopper with Vibratory Motor
S - infeed hopper with Settling Chamber

On-line Check Weighing System

In case where taking drop test is not practically possible or where interruption of the process is not permissible for taking drop test, an on-line check weighing system can be installed along with Subtleweigh Weighfeeders for dynamically cross-checking the weighfeeder performance and inserting the correction factor thereafter online.



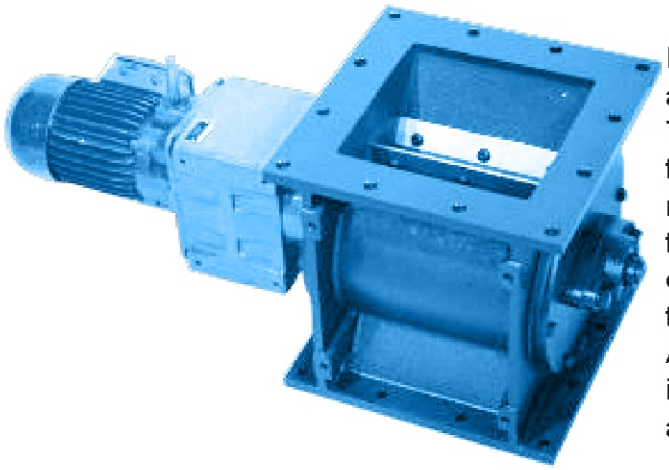
In case of on-line check weighing, the storage silo is placed on load cells at each of its support points and the output from these load cells are fed into the weighfeeder controller, which in this case will have an additional weigh module.

The operator has to press a “check weighing start” button. This will automatically turn off silo feeding. Silo feeding can be re-started once on-line calibration procedure is complete. At the end of the pre-determined sampling time the operator will have to press the “check weighing stop” button. The loss in weight from the silo is accurately measured by the controller and compared with the totalized weight of discharge from the weighfeeder during this period. The correction factor is automatically generated and can be inserted at the operator's discretion.

Pre Feeders

Depending of the material property, it is often required to install a pre-feeder before the weigh feeder. There are various types of pre-feeders for various applications.

Rotary Vane Feeder (RVF)



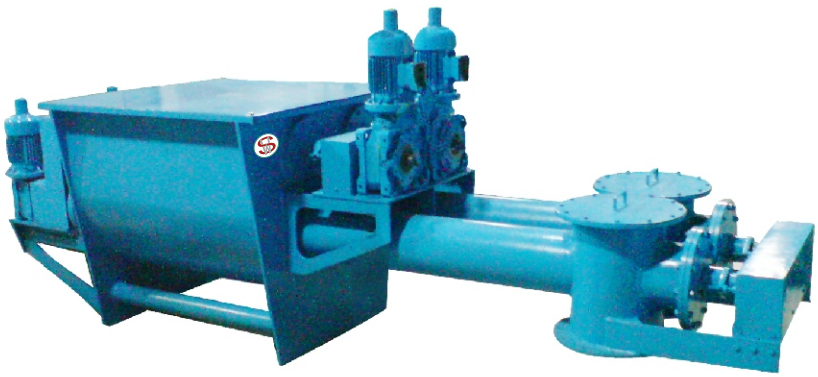
RVF is used for pulverized/ powdery materials, often aerated, to prevent flushing downstream.
These are designed to extract and regulate uniform feed of powdery materials from the storage bins. The rotary vane feeder consists of shaft mounted vanes fitted with adjustable spring steel tips in an enclosed casing. When the shaft revolves, the vanes spaces in the upper part of the feeder allows the materials to fill. As rotation continues, the material is carried around, inside the enclosed casing and discharged by gravity at the bottom of the feeder.

Type	Opening	Length (mm)	Max. RPM	Capacity (M^3/Hr)
RVF-1	200 x 200	276	21.4	7
RVF-2	200 x 250	326	21.4	17
RVF-3	300 x 300	396	21.4	25
RVF-4	350 x 350	446	21.4	45
RVF-5	400 x 400	496	21.4	65
RVF-6	500 x 500	596	21.4	90
RVF-7	550 x 550	646	21.4	120
RVF-8	600 x 600	696	21.4	180

Screw Feeder

For application like pulvarised coal, lime, etc. with large bunker openings, screw feeder is used for accurately regulating material feed in to the weighfeeder infeed hopper.

Screw feeder consists of a tubular trough section with screw flight, single or twin agitator for flow assistance and a drive assembly. The length and diameter of the screw varies with application and capacity.



Type	Screw Dia (mm)	Pitch (max)	Max RPM	Capacity (m3/hr)	Feed to Discharge (mm)
SF-1	3.15	178	60	68.5	3500
SF-2	250	68	60	48.5	2500
SF-3	160	48	60	12	1600

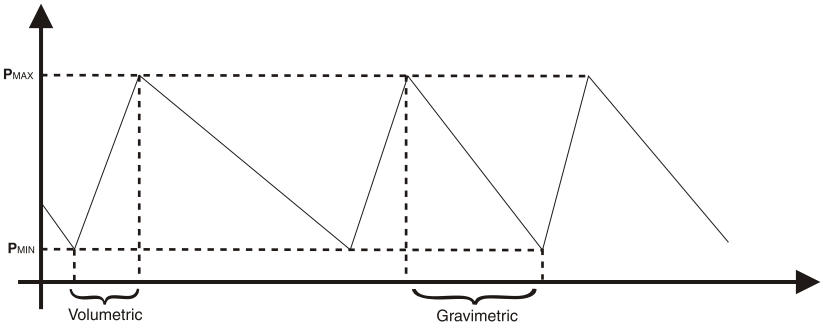
Loss-in-Weight Feeder

A loss-in-weight feeder is a gravimetric metering device that receives material from an upstream supply and accurately doses the material into a process at a predetermined feed rate. The LIW is particularly suited for continuous regulation of the flow rate of powdery or fine granular material. The measurement of the flow rate is obtained from the loss of weight of a hopper positioned on high precession load cells, from which the material to be fed is extracted by means of a variable speed screw or a vibrating feeder.

The totally enclosed structure of the LIW feeder makes it possible to handle dangerous materials in complete safety.

The machines can be supplied, if necessary, in an explosion-proof version and also with an entirely stainless steel structure.

The devise is supplied complete with a microprocessor based measurement & control system SWC32 which continuously measures the loss in weight of the material from the hopper and compares it with the discharge rate from the screw or vibratory feeder and corrects the same accordingly.



$Q = \frac{dP}{Dt}$ Feed rate measurement with loss in weight principle

SWC-32 + SWD-32 for Loss-in-Weight Feeder

Technical Characteristics

Flow rate : 0.5 TPH to 50 TPH

Precision : ± 0.5% of the set flow rate

Higher capacity on demand by using multiple screw.

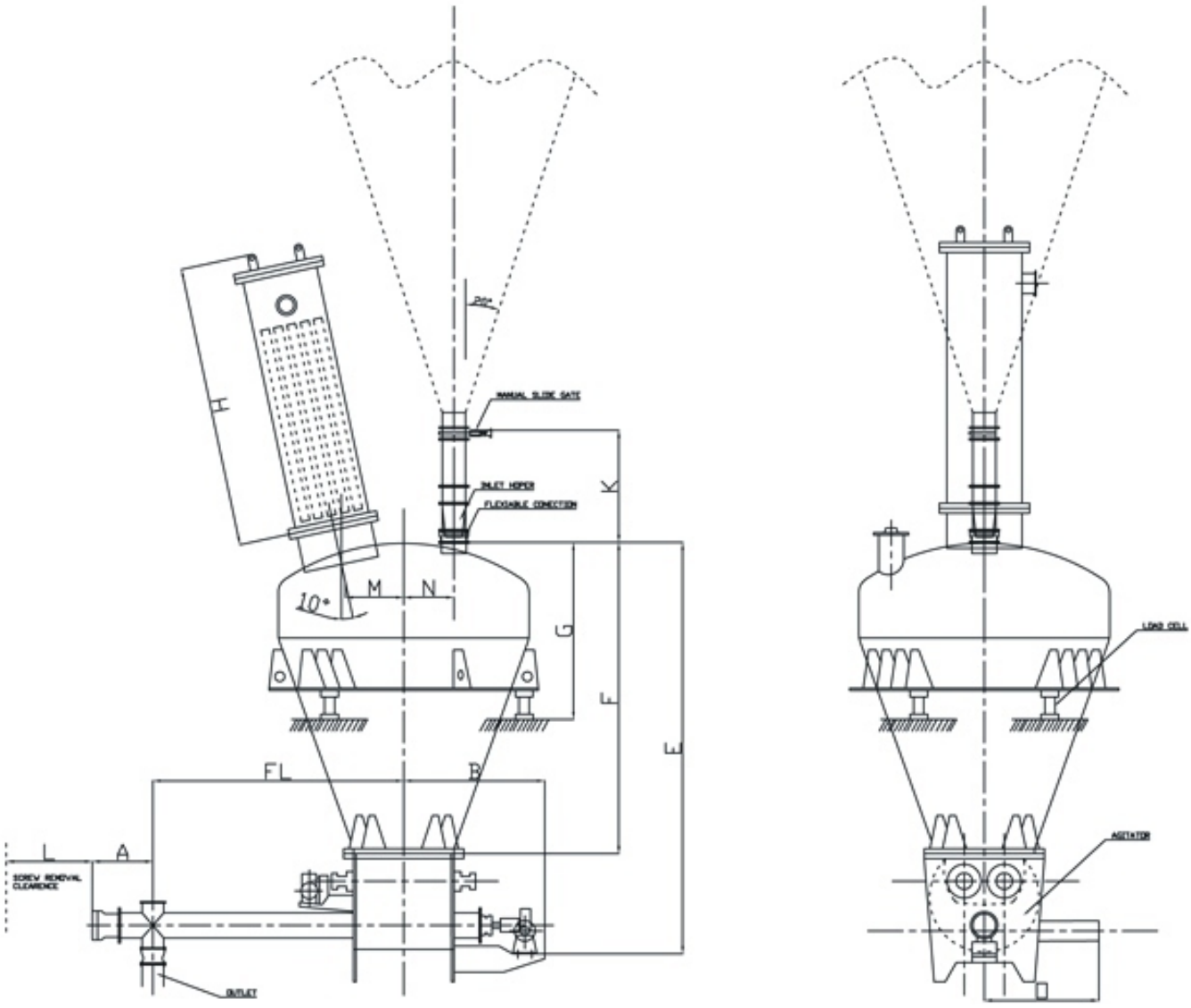
Feed Range : 1 : 10

Totally enclosed housing, ensuring pollution less environment

Special explosion proof or stainless steel versions.

Vast range of accessories (Butterfly Valves, Screws, Agitators, Bin Aeration System)

Typical Dimension



Type	Screw Data	FL	E	X
LIW315C35	315	3500	4255	1100
LIW250C25	250	2500	3105	1100
LIW200C20	200	2000	2755	1100
LIW150C15	150	1500	2500	1100

Mass Flow Meter/ Feeder

When the application of Belt Weighers & Weigh Feeders are not suitable for too high material temperature, too much dust formation, or for reasons of unavailability of head room etc., installation of Mass Flow Feeders are the best solution.

Application

Continuous measurement and feed of bulk material streams up to approx.1200 cu.mtr/hr at material temperature up to 500 deg.

- Iron & Steel
- Cement
- Dry Powder Chemicals
- Building Materials

Design Advantages

There are no knife edges or bearings and no articulated joints & hence no wear & tear. The flow rate is determined with the aid of a maintenance free strain gauge type Load Cell. Other advantages are fully dust free operation & low space requirements. Pre feeders used are for instance Star feeder (RVF), Dosing Valve, Pneumatic Valve, Vibrating feeder or Feed Screw.

Typical applications

Measure free flowing bulk solids such as Cement, Fly Ash, etc. during Load Out.

Measure recycles from Cement Grinding Mills when the measuring signal may be used to control the addition of fresh material.

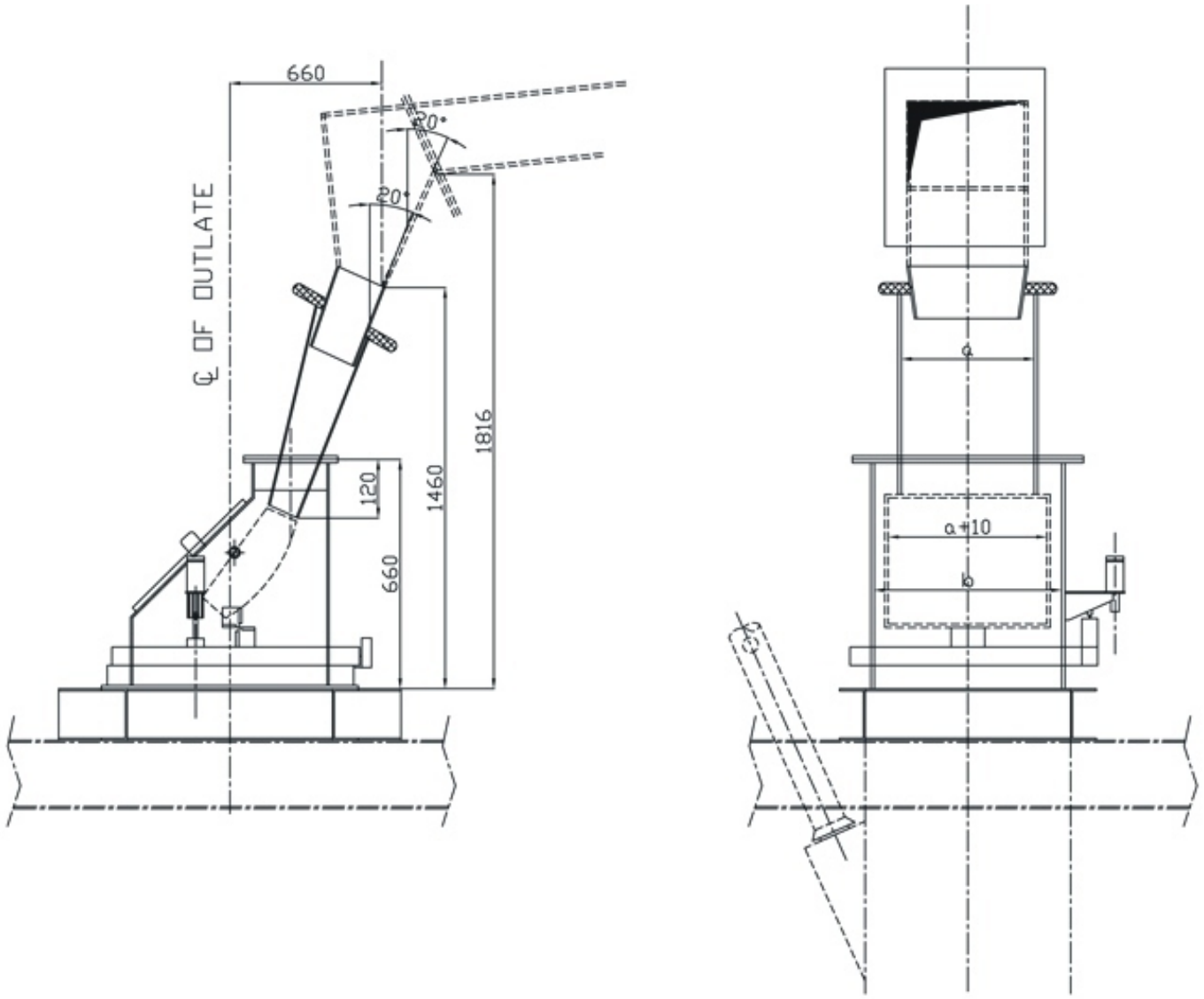
Feed Raw Meal to Heat Exchanger or Rotary Kin in Cement Factories

Accuracy

A regular accuracy check using a check weigh bin, an automatic check - and - correct system, is available which ensures that a feeding and measuring accuracy of ± 0.5% to ± 1% will be achieved.

SWC-32 + SWD-32 for Mass Flow Meter/ Feeder

Typical Dimension



TYPE	CAPACITY (M^3/Hr)	a	b
MFM1.5/ MFF1.5	20 - 75	150	300
MFM2.5/ MFF2.5	50 - 125	250	400
MFM5.0/ MFF5.0	100 - 300	500	650
MFM6.5/ MFF6.5	200 - 600	650	800
MFM10/ MFF10	400 - 900	1000	1150
MFM12/ MFF12	600 - 1200	1200	1350

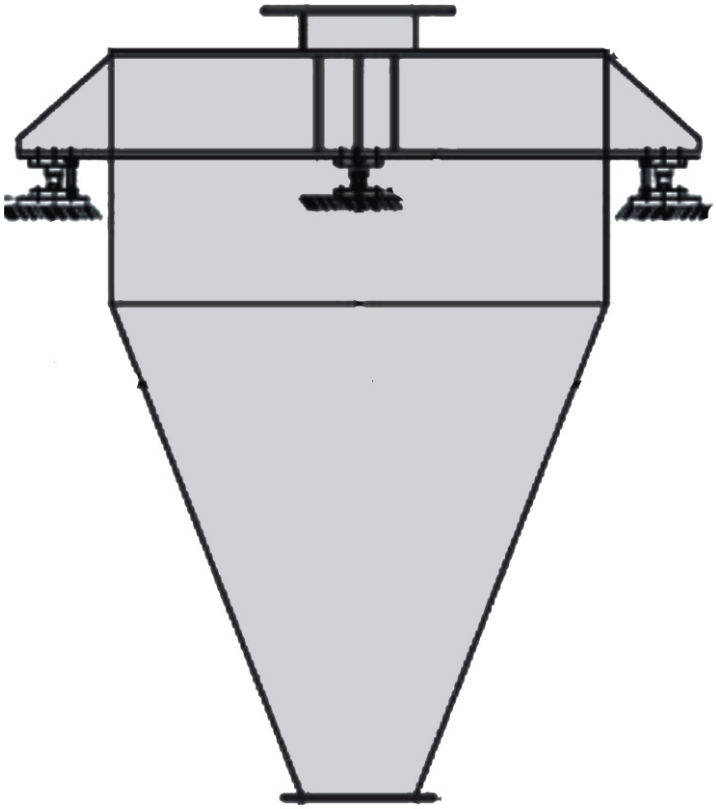
Hopper Weighing System

A hopper weighing system measures and also controls the amount of bulk material that enters or exists a hopper/container. The hopper is placed on load cells, one at each of its support points so that the entire weight of the hopper and its contents pass through these load cells.

A typical weigh hopper may have 3 or 4 support points. The summation of these load cell values are processed in a microprocessor based digital weighing indicator which converts the mV signal received from the load cells to weight data. The signal from the digital indicator can be used to open/close infill or discharge gates at desired set weights.

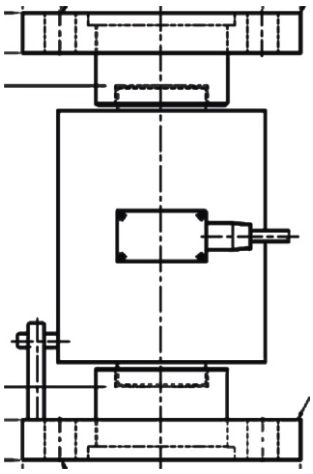
High precession load cells coupled with specially designed mounting kits ensure very accurate weighing results.

Hopper weighing systems can be provided for a wide capacity range from 500 Kg to 1500 Ton gross weight.



Bin Level Measuring System

When only level measurement of large silos is required, the same can be achieved by using only one or two load cells and replacing the balance with dummy. The weights correspondence to empty and full hopper needs to be taken and the entire span is calibrated accordingly, so that the weight at any point of time will give the status of the container, i.e, the level of material in the hopper. HI-level & LOW-level signals will be given from the micro-processor controller for closing & opening of the infill gate.



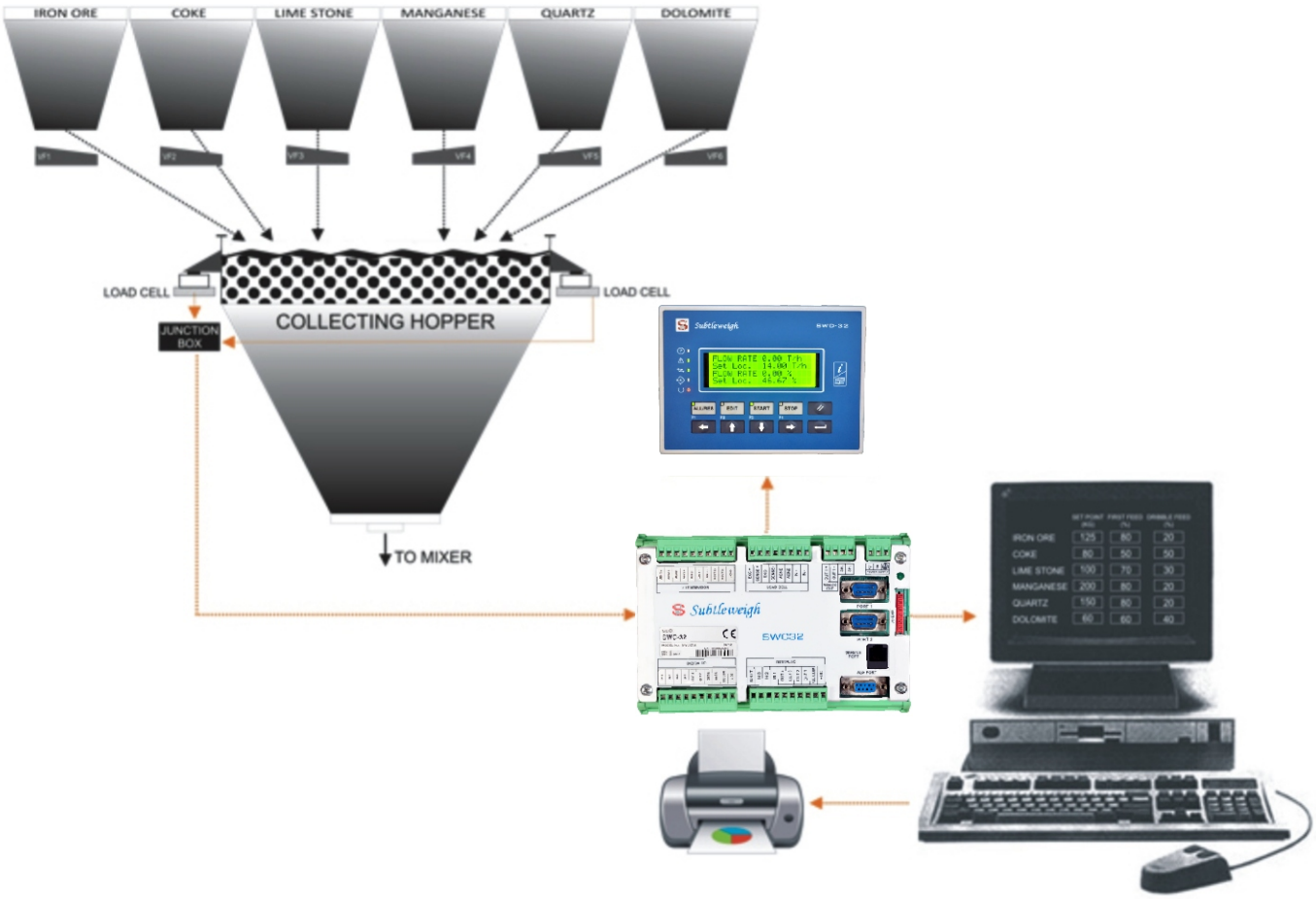
SWC-32 + SWD-32 for Hopper Weighing System

Batch Weighing System

Batch weighing is an extension of the hopper weighing system, where two or more materials are desired to be mixed in a fixed proportion. Here either each of the storage hoppers for all the materials are individually weighed or as a standard practice, a common weigh hopper is positioned below the storage bins.

The operational sequence is such that after the first material has been filled in the common weigh hopper up to the set weight, the signal from the weight indicator will close the discharge gate of the first storage bin and open the discharge gate of the second storage bin. Again when the batch weight of the second material has been reached, the signal from the weight indicator will close the discharge gate of the second storage bin and open that of the third, and so on.

Depending on the requirement of end user the operation sequence can be fully automatic or semi-automatic.



Laddle Weighing System

A Ladle Weighing System can be used to increase the safety and efficiency in the production process. Weighbeams are installed between the base structure and the weighbridge, without need for modifications of the ladle supporting structure. This will give the precise net weight of the molten metal in the ladle.

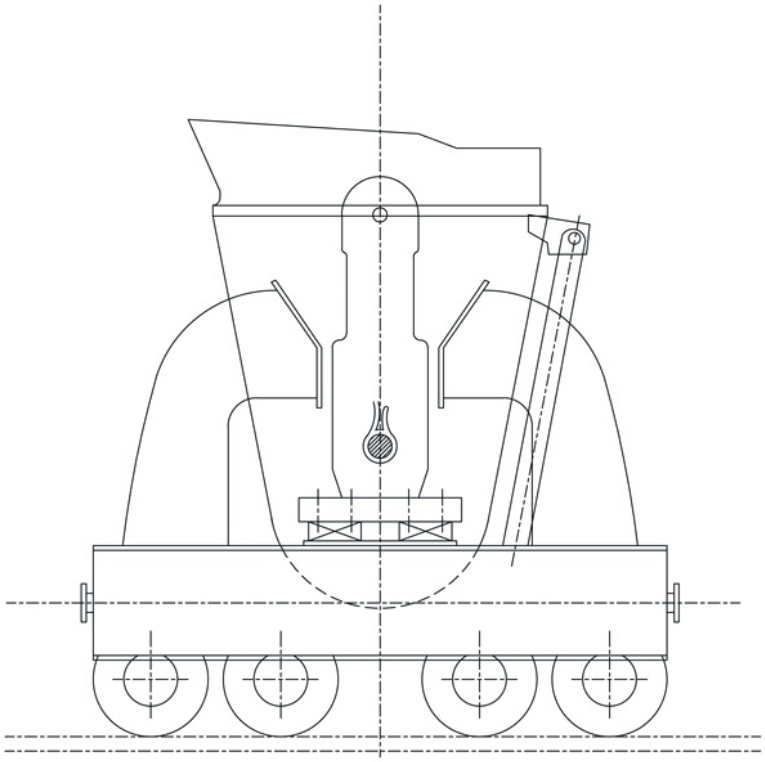
Weighing accuracy ± 0.5 % of full scale.

Knowing the precise net weight of each ladle will allow

- Supervise and control the whole steel making process
- Efficiently calculate the amount of scrap and alloys to be used
- Reduce spillage during the filling and pouring process

Typical Applications

- Ladle Turrets
- Ladle Ferries
- Fixed Mount Ladle Supports



Benefits

- Compact design
- Simple installation
- Suitable for harsh environment
- Maintenance free

SWC-32 + SWD-32 for Laddle Weighing System

SWC-32 Weighing Controller

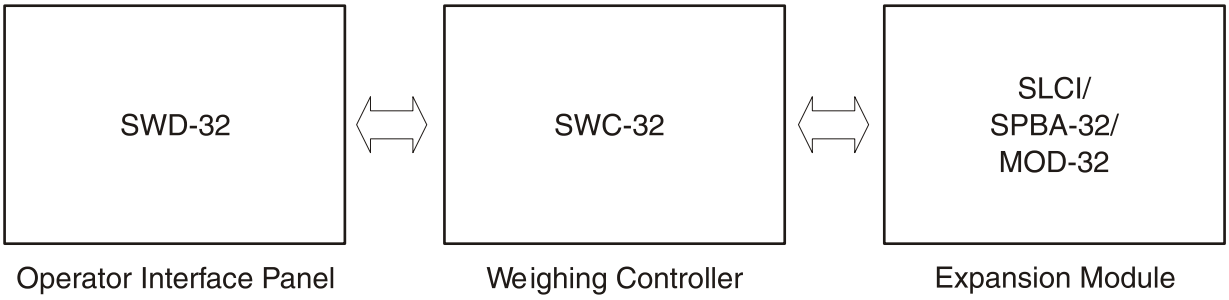
SWC-32 weighing Controllers are for use on industrial environments for several applications.

Static Weighing, Dynamic Weighing, Dosing System, Loss In Weight and for other custom applications.

Systems are made by SWC-32 central control unit, that reads load cell signal & if necessary speed signal from a tachometric genetator. A set of analog & digital inputs and outputs allows data exchange between SWC-32 & field.

An operator interface panel SWD-32 can be connected for configuration & display purposes.

Expansion modules SLCI,SPBA-32, & MOD-32 can be added, the first one is for reading another load cell input, the second one is for profibus DP communication with PLC/DCS and the third one is for modbus communication with PLC/DCS.



The basic modular system is available in the following standard configuration

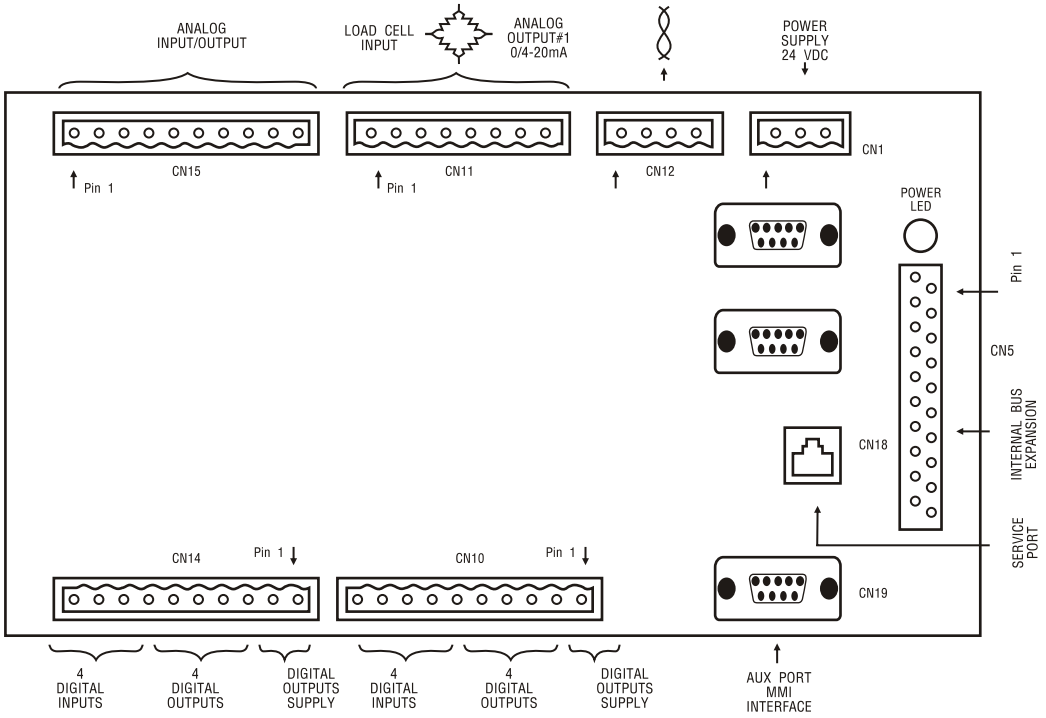
Module	Function
SWC-32/S	Static Weighing
SWC-32/SB	Static Weighing & Batching
SWC-32/B	Belt Weighing
SWC-32/D	Belt Weigh Feeder
SWC-32/L	Loss In Weight Feeder
SWC-32/C	Mass Flow Meter & Feeder

Hardware Features : SWC-32 Microprocessor Unit

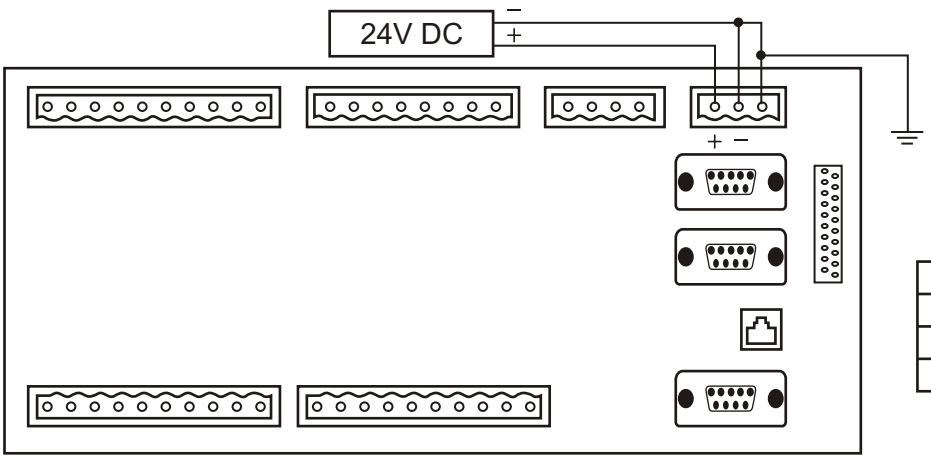
Power Supply	24 V DC, Consumption 5 VA
CPU	RISC 32 bit
Clock	80 MHz
Memory Flash	2 MB, RAM 4 MB
Load Cell Input	One, 24 bit Sigma-Delta ADC
Analog Input	Two (0-10V), Two (4-20 mA), 12 bit
Analog Output	Three (0-10V or 4-20mA Selectable), 12 bit
Digital Input	Eight (24V DC, opto isolated)*
Digital Output	Eight (max 1A, opto isolated)*
Communication Ports	Two numbers RS232 port for external link One AUX Port for operator panel One Service Port for Firmware
Expansion Modules	Expansion modules for Second Load Cell,Frequency, MODBUS, Profibus DP, CAN Bus are available
Environmental Conditions	Operating Temp. : 0 to +50 Deg. C Storage Temp. : -40 to +70 Deg. C Operating Humidity : 0 to 95% of relative humidity
Frequency Input	80 KHz @ 5V DC

*Four nos. for Belt Scale & Solid Flow Meter

Connection Diagram



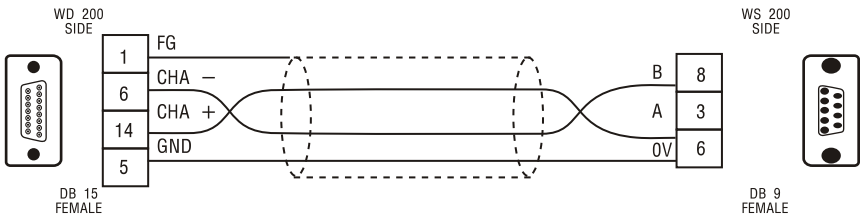
Supply - Auxiliary Power Supply (CN1) (the equipment must be suitably earthed)



PIN	SIGNAL	DESCRIPTION
1	L+	+24Vdc
2	M	GND 0V
3	⏚	GROUND

Aux Port - Auxiliary Serial Communication Port (CN 19)

Connector type D - female nine-pin connector

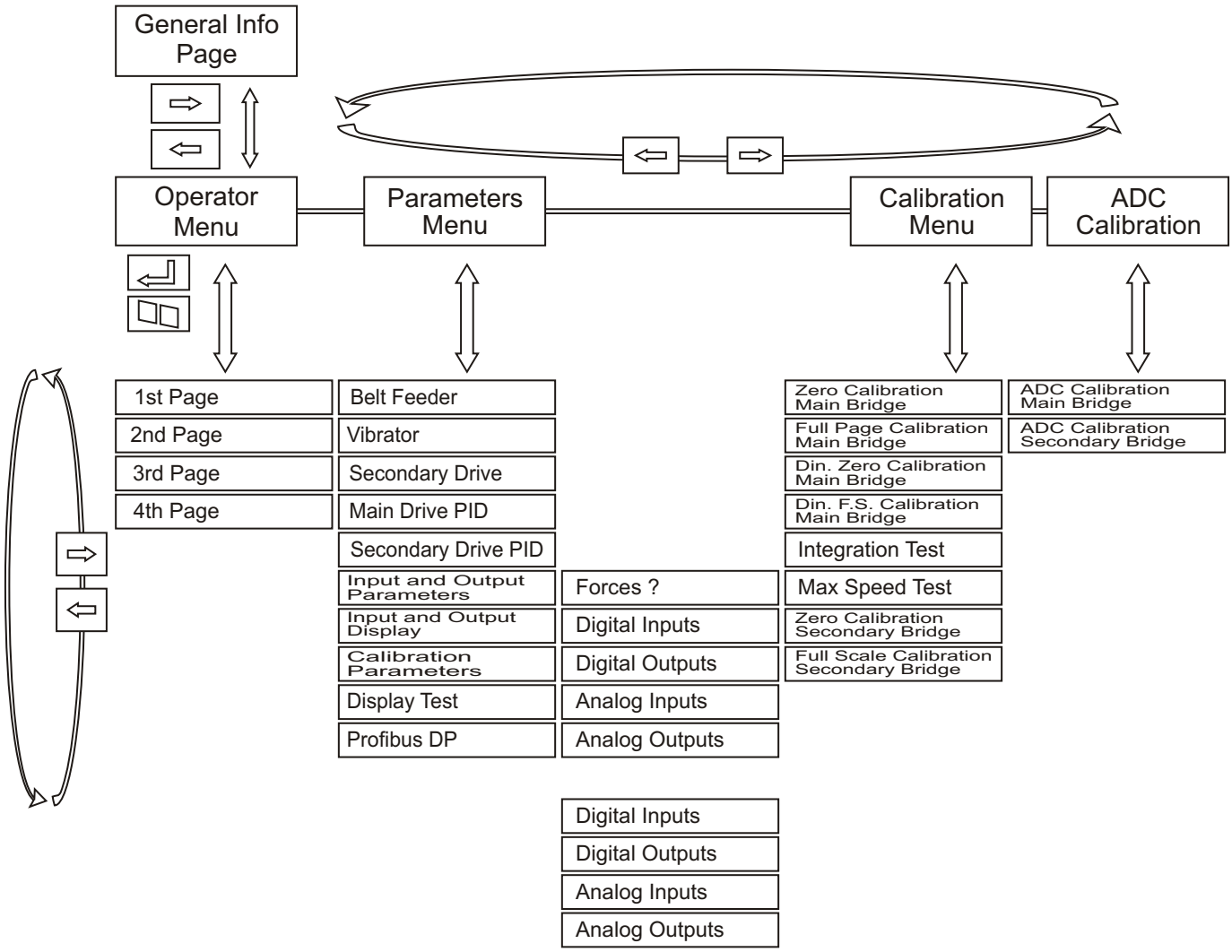


PIN	SIGNAL
1	RESERVED
2	RESERVED
3	CHA +
4	RESERVED
5	RESERVED
6	GND
7	RESERVED
8	CHA –
9	RESERVED

SWD-32 Operator Terminal

The operator terminal is very user friendly, with text messh 4 lines 20 character LCD display & 10 functionage in simple english language. It is equipped wital keys, which have different operation with respect to different operative modes.

The operator terminal actively guides through the various modes, well structured pages & operator menu and assists in parameter setting, visualization, calibration, fault indication & trouble shooting.



High Precession Digital Weighing Indicator – CP 200

CP-200 digital weighing indicators are suitable for use in harsh industrial environment for various static weighing & batching applications.

Features

- Appropriate for weight and measurement system
- 24 bit Sigma-Delta A/D converter for high accuracy
- Simple full digital calibration
- Simulative (mV/V memory) or live load calibration
- 3 Set point relay output
- Hold, peak hold and auto zero
- Optional analog output

Technical Specification

Analog Input & A/D Conversion:

Analog Signal Input Range	0 mV ~ ±20 mV
Non-Linearity	0.01% F.S. max
Max. Display Resolution	1/20,000
Min. Input Sensitivity	0.5μV/Digit (min.)
Temperature Drift	Zero: ±0.1 μV/oC max.
Load Cell Excitation Voltage	DC 5V ±5%, 60mA Up to 4 x 350 ohm load cells
Input Noise	±0.3 μV p.p or less
Input Impedance	10 MΩ (Min.)
A/D Converter	24 bit Sigma-Delta ADC
A/D Internal Resolution	Approximately 2000,000 counts
A/D Sampling Speed	50 times/sec

High Precession Digital Weighing Indicator – CP 200

Technical

Power Supply	24 V DC
Data Memory	10 year
Operation temperature	-10 °C ~ + 50 °C
Humidity	85% RH max.
Overall dimensions	96(W) x 48(H) x 136(D)
Weight	200 g

Digital Part

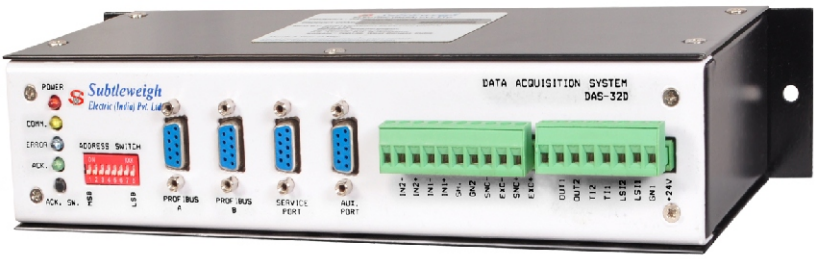
Display	7 Segment LED, 5-Digits, 14.1 mm Height
Display Below Zero	“-” minus signal
Display speed	50 times/sec ~ 1 times/sec
Additional symbols	Hold, Zero, Stable,Relay point(LO, OK, HI)
Decimal Point	Auto

Option

Standard	Relay 3 CH Output
Optional	Analog Output : DC 4 ~ 20mA

Data Acquisition Systems (DAS-32)

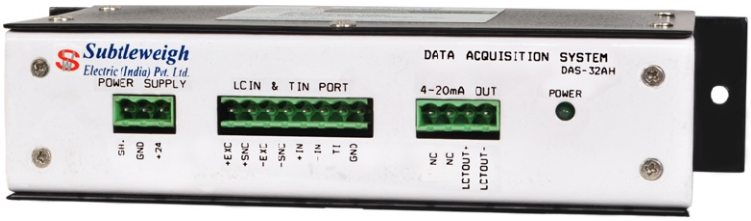
DAS-32 Data Acquisition Systems read the mV signal from the load cells and frequency from speed sensors (if applicable) and convert it to its equivalent digital output (in case of Profibus DP Communication) or equivalent analog 4-20 mA output in a linear fashion.



DAS-32D

The converted data along with two limit switch data (if applicable) are sent to the PLC/DCS through Profibus network or analog 4-20 mA output.

A local Electronic Control Panel (CP-100) can be connected to the DAS-32D/DAS-32DH for local display of the process values & receiving the local commands from the field. The command received by the CP-100 will go to PLC/DCS connected with the system through Profibus DP network.



DAS-32A/DAS-32AH

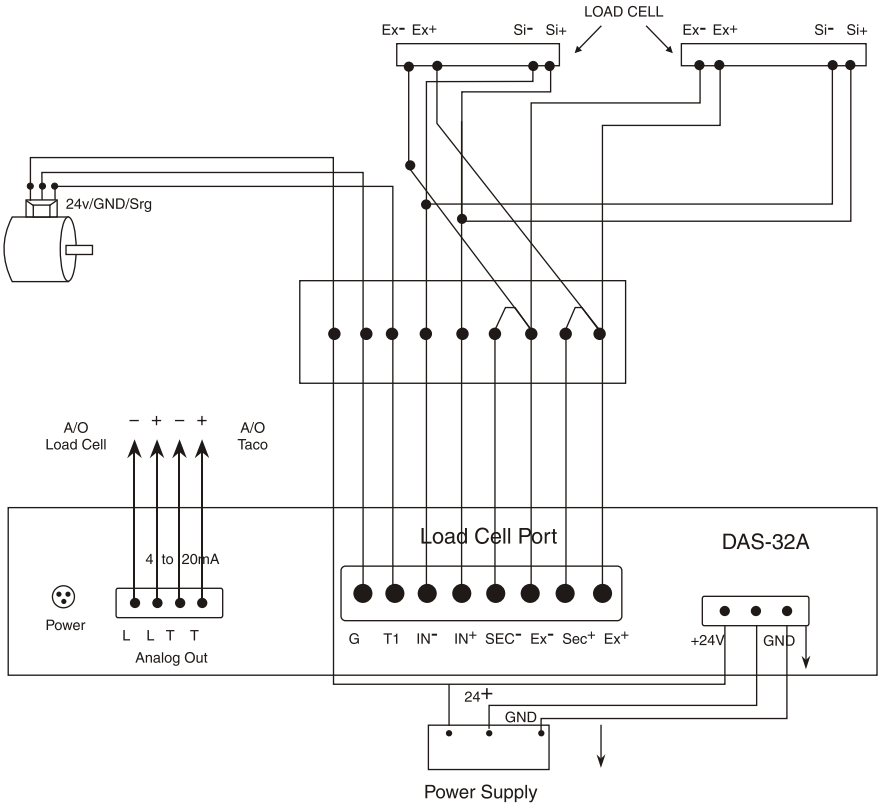
The basic modular system is available in the following standard configuration

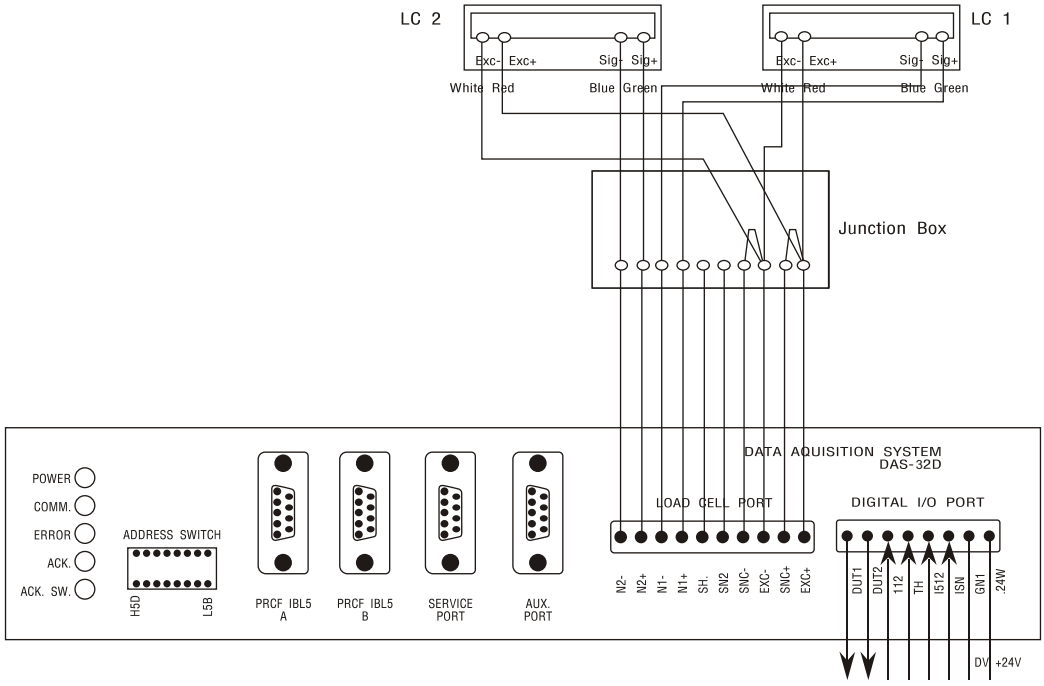
Module	Communication	Input(s)	Applications
DAS-32D	Profibus DP	2- Load Cells 2- Speed Sensors 2- Limit Switchs	Dynamic Weighing Systems like Weigh Feeder, Belt Scale etc.
DAS-32A	4-20 mA analog	1- Load Cell 1- Speed Sensor	Dynamic Weighing Systems like Weigh Feeder, Belt Scale etc.
DAS-32DH	Profibus DP	1- Load Cell	Static Weighing Systems, BIN Level Measuring, Batching, Hopper Weighing Systems
DAS-32AH	4-20 mA analog	1- Load Cell	Static Weighing Systems, BIN Level Measuring, Batching, Hopper Weighing Systems

Features

- Power Supply : 24 VDC, 1.5A.
- Data Aquisition system with load cell(s), speed sensor(s) & limit switch input.
  Output goes to PLC/DCS through Profibus DP or 4-20mA analog output.
- 32 bit processor based design for higher resolution and accuracy.
- Uses high precision instrumentation Amplifier.
- Zero signal distortion during transmission.
- Compatible with strain gauge transducers, with a maximum bridge resistance of 350 Ω.
- Accepts 0-20mV input from transducers.
- Accepts 5Hz~80KHz @5V input from speed scensor.
- Auto baud rate detection for Profibus communication.
- Maximum communication speed upto 12 Mbps.
- Station ID ranges from 2 to 125.
- Parallel Redundancy.
- Local Electric Control Panel CP-100 (Optional).
- GSD file included for PLC/DCS.

Connection Diagram





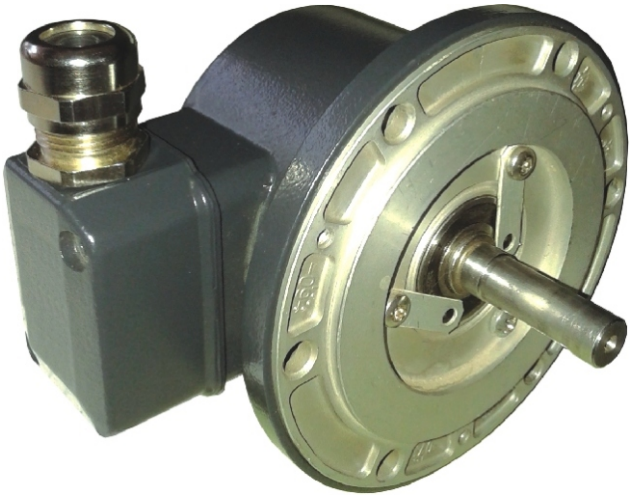
Control Panel – CP 100

CP 100 local control panel with digital display unit is used in conjunction with DAS32D & DAS32DH for local control & display. Any two parameters can be displayed simultaneously in CP 100 and the same can be used for local operation of the weighfeeder.

Hardware Features

Power Supply	24 V DC
CPU	RISC 32 Bit
Clock	80 MHz
Flash Memory	512K x 16 bit
Display	7 segment LED 4 digits, 2 line, 14.1 mm height
Analog Input	One (0 – 5 V DC),12 bit
Digital Input	Four (24V DC, opto isolated)
Communication Ports	Two nos. RS232 Port for External Link One AUX Port for Operator Panel One Service port for Firmware
Environment Conditions	Operating Temp : 0 - +50 Deg C Storage Temp : - 40 to +70 Deg C Operating Humidity : 0 to 95% of relative humidity

Tachometers



The Tachometers are used for speed sensing applications. It is used for measuring the belt speed. The tachometer is usually attached with the saft of the motor & its output is sampled & multiplied with a correction factor to determine the belt speed.

The system is available in the following standard configuration :

Module	Pulse Per Revoluation	Part No.	Diameter of the shaft (mm).
Tachometer	36	OPG-15D-36	15
Tachometer	1024	OPG-15D-1024	15

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