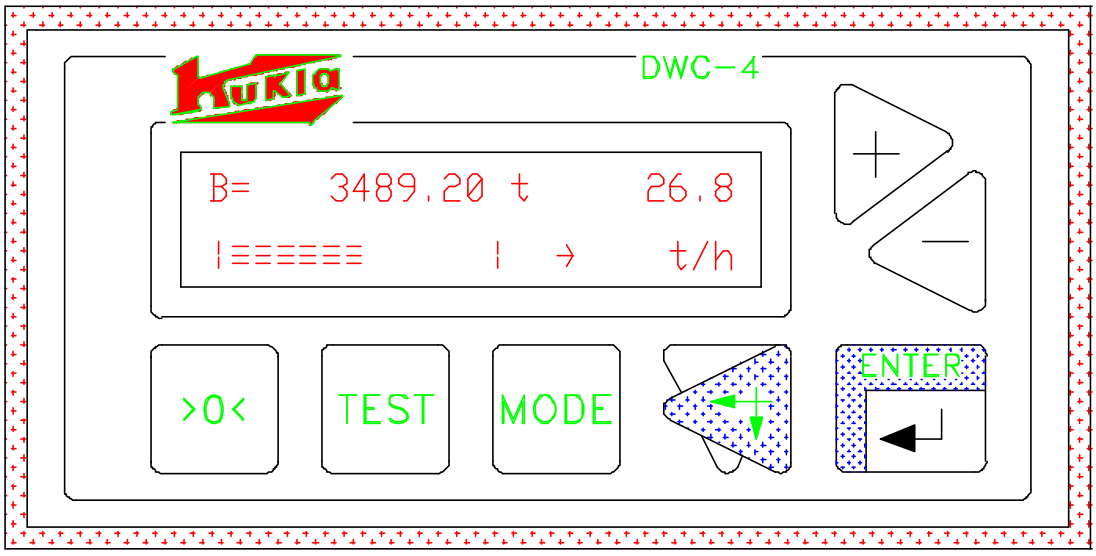
# Weighing computer

## *Manual*

## *Belt scale type EBW-..*
## *with weighing computer DWC-4*

## *T1*




# *DWC-4B*

***Starting***
***Operating***
***Maintenance***

## INDEX

## Software indication

**These instructions are based on Software version L2.30**
**In course of the technical progress changes can be carried out at the software. At subsequent software versions therefore only negligible deviations are possible against these instructions.**

****** SAFETY REGULATIONS ******

**Being under voltage the device must not be opened. Danger of electric shock exists. Service works at the weighing equipment are permitted only for qualified personnel. In case of works at the weighing belt the drive must be switched off.**

KUKLA WAAGENFABRIK
Stefan-Fadingerstrasse 1-11
A-4840 Vöcklabruck



Tel. (0043) 07672-26666-0
Fax (0043) 07672-26666-39

Homepage: www.kukla.co.at
email: office@kukla.co.at

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# 1 STARTING PROCEDURE

## 1.1 Installation of the weighing device resp. erection of the scale.

The belt scale can be designed as built-in-bridge for installation into a local conveying plant or complete with own weighing belt and own drive.

**Generally pay attention to:**

- Erection resp. assembly according to supplied assembly drawing.
- Possible material guidings have to be mounted in a manner not to affect the function of the scale.
- Sealing strips at material guiding sheets must not touch the weighing belt in the area of the measuring device.
- Extraction systems have to be adjusted in a manner not to falsify the weighing results.

### 1.1.1 Indications for installation of the weighing bridge:

- The weighing bridge must be installed and screwed into the belt plant tension-free.
- The measuring length must be kept.
- The fitting position of the weighing bridge must be - at right angles to the conveying plant - exactly horizontal. In longitudinal direction the position of the conveying plant must be kept.
- The measuring idlers of the weighing bridge must be aligned exactly with the carrying idlers arranged in front of and behind the weighing device.
  The securing locks for transport thereby must be removed, as the measuring idlers are lifted by the securing locks for transport.
  The test weight installed at the scale must be activated (laid on) for the alignment.
  Carrying idlers in front of and behind the measuring length must not be above this level. If there is a bend in the conveying belt, this bend must be in such a distance of the scale that no influence on the scale is arising.
- The carrying idlers in front of and behind the scale and the measuring idlers must rotate exactly (max. rotating deviation - according to the size of the belt plant - 0.1 mm up to 0,2 mm).
- The measuring idlers must be unbalanced, the subsequent carrying idlers shall also be possibly well balanced.

### 1.1.2 Indications for erection of a scale with own conveying belt and drive

- The belt scale must be aligned exactly.
- The fixing on the ground is done by screws through the provided fastening-bore-holes.

### 1.1.3 Preparation for first-time-operation

- As there are sensitive measuring provisions installed in the belt scale, the securing locks for transport must not be removed before termination of all mounting and connection works.
- If welding works in the environment of the belt scale have to be taken into account, the weighing belt must be covered until the first-time-operation.
- There must not be conducted any welding currents via the weighing cell(s)!

### 1.1.3.1 Works to be done before first-time-operation:

- Remove securing locks for transport of the weighing bridge and, if any, also those of the belt tensioning device and of the belt steering device.
.
- The screws with the securing locks for transport for the test weight also have to be removed. The operating instructions for the mechanic show, where the fuses are situated.
.
- Control of the roller alignment at complete design. The roller alignment has already been adjusted in the factory. Due to transport and mounting a re-adjustment may be necessary. The measuring rollers of the scale have to be exactly in one line with the limiting rollers, which are arranged in front of and behind the weighing device (for alignment lay on test weight). Carrying idlers situated in front of and behind the weighing device must not be above this level.

### 1.1.4 Admissible ambient temperature for the measuring cell

The admissible ambient temperature is -30°C up to +70°C.

## 1.2 Electric connection

The electronic connections and connecting lines have to be established according to the enclosed connection- and wiring diagrams, the valid prescriptions (ÖVE, VDE etc.) and the conditions for connection of the local electric supply company.

Special care has to be paid to a faultless transmission of the measuring signals.

This can be achieved by the following measures:

- Cables, which may produce interference fields (e.g. feed lines to frequency controlled drives), are to be embedded screened.
- Avoid parallel embedding to cables with interference fields.
- Only use special screened cables for transmission of the mV-signal from the load cell to the weighing electronics. Suitable cables can be supplied.
- The cable layout shall avoid extreme temperature fluctuations.

The scale has to be connected to earth via a large cross section.

Check, if the mains voltage corresponds to the connection voltage indicated on the rating plate of the control cabinet.

## 1.3 Starting procedure

When all the preparations are finished, set the control under voltage.
After switching on the supply voltage the text screen is represented (at "**Batch**" the picture **> Batch <**).

### 1.3.1 Checking the parameters

To each impact flow meter a technical data sheet and a parameter list is attached.
The values registered in the parameter list have resulted from the factory test. They correspond to the ordered scaling of the impact flow meter.
To ensure, that all parameters still correspond to the delivery status, the actual values have to be checked with output **> actual param <** from MODE-selection.

#### 1.3.1.1 Calling > actual param <:

- Press key <MODE>.
- Call text **> actual param <** with key <↵>.
- Press key <ENTER>. In the first picture the software version is indicated. Additionally the fabrication number of the scale.
- With key <ENTER> all adjustments are brought to display successively.
  An automatical rolling down can be started with key <+>. Key <-> stops immediately the automatical running down.

### 1.3.2 Starting up of the weighing belt drive

Switch on motor and pay attention to the correct running of the weighing belt.
Reverse of sense of rotation of the motor at wrong conveying direction is effected by exchanging two lines at the motor.

If the belt scale is provided with pneumatic or motoric belt steering device, the proper function of the steering device has to be checked.
If the belt covers the control initiator, the steering roller is misadjusted, so that the belt is running away from the control initiator. If the control initiator becomes free, the steering roller is set to the opposite final position and the weighing belt is running to the control initiator.
The final positions of the steering roller must be selected in a way to ensure, that the belt is guided into the opposite direction.
Finally check the function of the safety cutout by mis-run-monitoring.
If the weighing belt achieves the final position monitored by sensors, the belt drive must be switched off..

### 1.3.3 Belt speed measuring

In the standard design the belt speed is measured by an impulse tacho.
The impulse tacho is designed either with running disc for measuring the belt speed at the returning part of the weighing belt or coupled to the belt motor.

In order to ensure that the speed is measured correctly, the indication "**v**" in picture **> Service <** must be checked at running weighing belt (see page 19).

If no belt speed measuring device is used, at „v-SIMU“ the speed percentage must be adjusted (see instructions part 2 „PARAMETERIZING“).

## 1.3.4 Starting up of the load measuring

At the design with own weighing belt the weighing bridge was calibrated at the factory setting.
At installation in local belts the actual pre-load must be adjusted. This is effected in parameterizing mode by simultaneous pressing of keys <>0<> and <+> at stopped weighing belt.

„**WC-OFFSET**“ is adjusted optimally if it is equal to the tare mean value (control picture B page 18).

In picture **> Service <** the value "**g1**" must be approx. 0%.
Lay on test weight, "**g1**" must approximately indicate the value given in the technical data.

## 1.3.5 Optimization of the weighing accuracy

Before the weighing accuracy of the scale is checked and adjusted, a taration must be done.
Taring is described in chapter "MAINTENANCE INSTRUCTIONS" from page 11 on.

In order to adjust the weighing accuracy, test loads with the material, which shall be measured by the scale later on, have to be carried out.
If this weighing material is not available, the adjustment has to be done with an alternative material very similar in structure and bulk density to the weighing material.

At the testweighings quantities, which are corresponding at least 400 counting steps at the counter of the scale, are to be controlled.
Thereby also must be considered that the control scale used enables a re-weighing of the specimen with an according accuracy. If the control scale has a too coarse counting step, the test quantity must be raised accordingly.

The mentioned tolerance (+/-) must be kept from 20% up to 100% of the max. conveying capacity.

**Proceedings at the test weighings:**
The test weighings can be carried out either in normal operation mode or in the special operation mode „Material test“.
The advantage at material test is a 10-fold higher resolution at the counter of the scale and the possibility for correction by input of the actual weight of the specimen.

**a) Test weighing in normal operation mode:**

1. Weighing belt runs empty, note down count of the quantity counter. The test weighing can also be started at stopped loaded weighing belt. In this case, however, it is very important that at the end of test weighing the weighing belt is loaded equally as at the start of the test weighing.
2. Start material feeding and convey corresponding material quantity.
3. When the weighing belt has run empty again, determine the quantity registered at the quantity counter (determine the difference between count of the counter before and after the test weighing
4. Determine the actual weight of the test material on the control scale.

If the test weighings result in a deviation higher than the admissible tolerance, the weighing channel of the weighing electronics must be corrected.

**Correction of the belt scale:**
1. Switch on the parameterizing mode at the weighing electronics. This is possible only at opened calibrating lock.
2. Under „**I/O Input**“ there are the adjustments „**TestWeight(TW)**“ and „**WC-SPAN**“ in order to change the determined deviation. If the belt scale counts too much, make the test weight adjustment smaller and „**WC-SPAN**“ bigger. If the belt scale counts too few, make the test weight adjustment bigger and „**WC-SPAN**“ smaller.

**b) Test weighings in the material test operation mode.**

Press key „TEST“. Indicated is:

```
****** TEST **<+>MAT
EMPTY THE SCALE
```

With key „+“ the material test picture is called.

```
MAT-Test**=     0 **
g3=  0.0      0.0kg
```

Further proceedings:

1. Weighing belt runs empty. The test weighing can also be started at stopped loaded weighing belt. In this case, however, it is very important that at the end of test weighing the weighing belt is loaded equally as at the start of the test weighing.
2. Start material feeding and convey corresponding material quantity.
3. After the weighing belt has run empty again (resp. if at loaded weighing belt the weighing belt was stopped), press key „MODE“ Indicated is:

```
RE-WEIGHING      ^
                4562
```

Example of indication at a result of 456,2 kg, if the normal counting step is 1 kg.

4. Determine the actual weight of the test material on the control scale.

If the test weighing result in a deviation higher than the admissible tolerance, a correction must be carried out.

**Correction of the belt scale:**

1. Overwrite the indicated value (e.g. 4562) with the actual weight of the material specimen (e.g. 473,1 kg = 4731). The indicated value is overwritten with keys „+“ „-“ and „╣“ .
2. Press key „ENTER“. The correction is carried out only, if the deviation is not higher than the parameter „**Correction +/-**“. The standard value for „**Correction +/-**“ is 10%.
3. The percentage of the correction carried out is indicated for 4 seconds. Together with the correction of the scale also the percentage of the indication with test weight is changed!

```
RE-WEIGHING      ^
                4731
```

Example of the indication value changed to the actual weight of the material specimen.

```
RE-WEIGHING      ^
CORR Span  3.7
```

Example of correction indication.

# 2 MAINTENANCE INSTRUCTIONS

The belt scale is a sensitive measuring device. As there are often material sediments and thus, interferences may occur, an adequate maintenance is necessary.
The intervals of maintenance are depending on the ambient conditions. After starting up a checking of at least once a week should be carried out. Based on the detected condition, later on the intervals of maintenance can be changed correspondingly.

## 2.1 Status control of scale and conveying belt

The maintenance is largely limited to the checking of the tare In periodical intervals, however, the following checks are to be carried out:

- Status of the drive drums, tensioning drums and of the carrying idlers.
  Each material sediment, which may cause a change of roller alignment or an incorrect speed measuring, must be removed or avoided.
- Function of the final switch off at the design with pneumatic belt steering device. The function of final switch off is very important, as in case of a disturbance at the pneumatic belt steering device the weighing belt very soon will be mis-running and damaged.
- The weighing device must be kept free of sediments. Pay attention to jammed material between weighing bridge and supporting frame!
- The weighing belt must run centric in the roller system.
- The belt tensioning must be correct. Check the proper function of the belt tensioning device.
- The surface of the drive motor must be discharged from material sediments in order to achieve sufficient heat emission.
- Status of the weighing belt. In case of disturbing damage of the weighing belt the weighing belt must be replaced.
  Use original belt!

**ATTENTION!**
**After replacing the weighing belt the scale must be checked resp. adjusted by test weighings!**

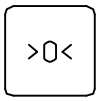
## 2.2 Taring of the scale

To ensure the supply of correct results, the tare of the scale has to be adjusted properly. Tare changes mostly are caused by a sideslip of the belt or by adhering weighing material.

**Attention!**
**Before starting taration, check the scale for disturbing influences.**

Taring always at running belt!

After pressing key




the taring process runs down automatically. At a load measuring higher than the limit value „**Belt empty**“ no taring is possible. The taring process at mean value tare lasts one belt revolution. At absolute value tare the taring process lasts two belt revolutions from the first travel-through of the synchronizing mark.

### Taring process:

- **EMPTY THE SCALE**
  Exit is possible with key <MODE> , if the scale does not recognize "EMPTY" .
  The "EMPTY" -monitoring is done at weight "**g3**".

- **Wait for SYNC**
  Only at absolute value tare

- **SettlingTime**
  If the scale recognizes "EMPTY", a settling time of 5 seconds starts (only at mean value tare).

- **Calibration**

```
*****TARE**>0<******
Cell 256/1500  2850
      1)    2)    3)
```

| | |
|---|---|
| 1) | Actual tare cell |
| 2) | Number of tare cells |
| 3) | Actual measured value from weighing cell |

If at the taring process a deviation higher than „**Belt empty**“ (standard 5%) arises as against the calibration value of the empty scale („**WC-OFFSET**, the taring process is stopped and the error message "**Taration err.**".

## 2.3 The test device

The test device permits the checking of tare with the test weight.

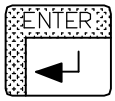
With key


the test routines are called.

```
****** TEST **<+>MAT
LAY ON TESTW.!
```

If the scale is loaded, instead of „**LAY ON TESTW.!**“ the message „**EMPTY THE SCALE**“ appears.
Key „+“ would start the material test!

Lay on the test weight at motoric lay-on-device the test weight can be laid on with key).




After a settling time the test load starts resp. at absolute value tare the message „**Wait for Sync**“ comes .
The test load lasts one belt revolution.

```
                    1)
****** TEST g1= 65.3
Cell   532/1829
          2)    3)
```

| | |
|---|---|
| 1) | Load of the scale |
| 2) | Length counter |
| 3) | Final value for the length counter |

```
**** TEST*ok********
RESULT  **1001**
```

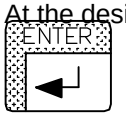
The nominal result is 1000.
Admissible deviation is ± 5.
If the test result was higher than 1010 or lower than 990, The weighing computer signals "**Test wrong**".

With key

the test load can be repeated with already laid-on test weight.

**Attention!**
**In case of an incorrect result the scale must be checked for disturbing influences and a taring is to be done.**

The test load is finished by lifting the test weight.
At the design with motoric lay-on-device the test weight can be lifted with key



## 2.4 Remedy against disturbances

The weighing electronics signals errors by indicating them each 30 seconds for approx. 2 seconds in the operation display. It depends on the selected parameterizing, whether the released errors are indicated at once or after the adjusted delay time and are also possibly stored.
The activated messages in picture "**Error**" are shown permanently.
If several errors are recognized at the same time, only the error with the highest number resp. without number is signalled in the text in clear. Of all recognized errors with number, however, the number is indicated.

Example:

```
Error  0 6
 EEpromProgramm
```

The errors "**Mis-Run**" and "**EEpromProgram**" are active.

According to the parameterizing the relay "**ERROR**" is switched on and the relay "**READY TO OP**" is switched off.

### 2.4.1 Description of the error messages:

```
Error   1
 Drive/tacho
```

Reason: a) The binary input „**Fault motor**“ is activated.
b) The weighing electronics receives the message "Drive switched on", but no tacho pulses can be measured.

Remedy: 1. Check, why the binary input „**Fault motor**“ is activated.
2. Check, if the motor is really running.
3. Check, if the indication changes between 0 and 1 in control picture C under "I" (STRINT) .
4. Check, if the tacho is working..
5. Check, if the wiring connections between weighing electronics and tacho are O.K.

If there is the tacho pulse at the terminals X4:14/12 existing, but no change between 0 and 1 detectable in picture B, the weighing electronics is defective.

**Attention:** Due to the picture repeat frequency of 2s not each tacho pulse is represented.

```
Error   2
 A/D-Error
```

Reason: The measured value at the weighing channel is either lower than 300 or higher than 32.000.

Remedy
1. Check, if a damage can be determined at the scale or at the load cell(s).
2. Check, if the cable connections between weighing electronics and power measuring at the scale are O.K.
3. Check supply voltage for power measuring and measuring signal:
   Connection 2/3: 10VDC
   Connection 1/4: Max. 20mV (see test-protocol)

Possible reasons for a wrong measuring signal:

- The load cell is defective (was overcharged).
- The alignment of the measuring device is not O.K.
- Pollution of the weighing roller(s) resp. limiting rollers.

```
Error   3
 Overheat
```

Reason: The temperature inside the weighing electronics is too high (admissible max. temperature is 68°C).
Remedy: Provide for lower ambient temperature (max. approx. 40°C).

```
Error   5
 Feeder limit.
```

Reason: With the adjusted feeder limit values „**Min load**“ (standard 10%) and „**Max load**“ (standard 100%) the nominal dosing capacity at feeder control cannot be kept according to the adjusted nominal value.
Remedy: Improve feeder adaptation.

```
Error   6
 Mis-Run
```

Reason: The monitoring at the weighing belt signals an incorrect run of the weighing belt.
Remedy: Correct belt run, check belt steering device (possibly the falling out of the compressed air for the control cylinder at pneumatic steering device).

```
Error   7
 Min Load
```

Reason: The adjusted min. belt load cannot be achieved.

```
Error   8
 Max Load
```

Reason: The adjusted max. belt load is exceeded.

```
Error   9
 Belt slip
```

Reason: a) At existence of a control pulse generator the control pulses do not come or come too late.
b) At design „Absolute value tare“ the synchronizing mark does not come or comes too late.
Remedy: If the belt does not really slip, in control picture C must be checked, if the control pulses (SYNCH) do arrive.

```
Error   A
 Test wrong
```

Reason: At the test load with test weight the desired number 1000 was not achieved by more than the permitted tolerance (+/-1%)
Remedy: Tare the scale and repeat the test. If the deviation remains the same, check the scale.

```
Error   B
 Taration err.
```

Reason: During the taring process a value lower than 300 or a value higher than „**WC-OFFSET**“ plus the parameter „**Belt empty**“ (standard 5%) was measured by the weighing channel AD-converter.
Remedy: Check/clean the scale.

```
Error   C
 Belt stopped
```

Reason: No tacho pulses arrive (drive is switched off).
Remedy: If "**Belt stopped**" is indicated at running belt, check proper tacho-function (also see "**Drive/ Tacho**").

```
Error   D
 Bad set value
```

Reason: At feeder control the pre-set dosing capacity set value is not within the admissible limits.
Error message at:
Higher than 2% and lower than "**MinSet value**".
Higher than 102% of the scale's "**Nom. capacity**".
Remedy: Provide for a correct nominal value.

```
 Data lost
```

Reason: Because of data loss in the RAM the parameters were re-charged from the EEPROM.

**Attention! At the re-charging the tare is adjusted to "WC-OFFSET". Therefore a taring is to be done.**

```
 EEpromProgram
```

Reason: The parameterizing mode was left without data-securing.
Remedy: Switch on parameterizing mode and leave it with data-securing.

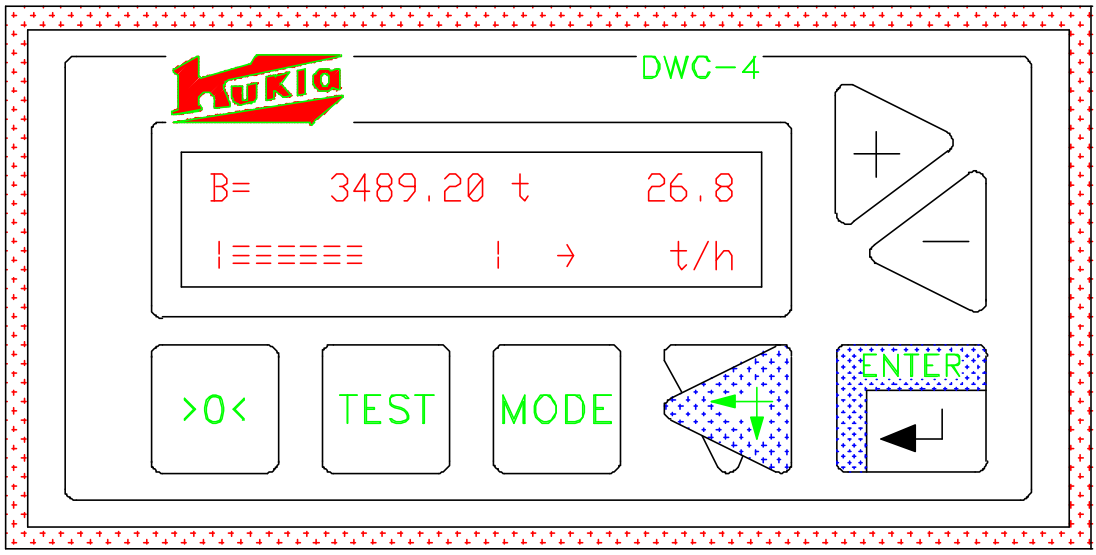
## 2.5 Battery-RAM

The digital electronics is using a momentary write/read memory (SRAM) with integrated battery as working memory.
The durability of the battery in the RAM is at least 10 years. After that time the battery-RAM should be replaced in the factory or by a service technician.
A battery, which is working no longer, can be recognized, if the error message "**Data lost**" appears after an interruption of power supply and the counters **A** and **B** were set to zero.

# 3 OPERATION

The operation of the scale is done via the weighing electronics. At the display the actual operating values can be read.
If the weighing electronics has recognized an error, the error is indicated in the text in clear approx. each 30s for a period of approx. 2s at the display.
Taring process and test are started via the input keys. At the test load the test weight has to be laid-on at the weighing bridge after starting the test load.

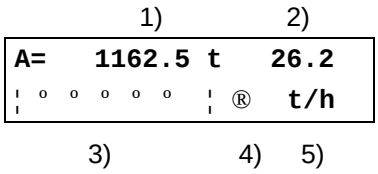
## 3.1 Description of function for input keys and display (TEXT Screen)




| | |
|---|---|
| >0< | Start key for taring process |
| ENTER | Overtaking-resp. confirmation key , calling of picture "Service" |
| TEST | Call of TEST-selection |
| | Call of control picture B |
| MODE | Call of selection menu |
| | Call of control picture A |
| | Call of control picture C |

## 3.2 Text screen

After switching on the power supply in the standard application the „**TEXT Screen**“ is represented.
If charge operation mode is activated, the picture „**Batch**“ is indicated (see page 21).




| | |
|---|---|
| 1) | Quantity counter „A“ |
| 2) | actual conveying capacity (t/h) |
| 3) | actual conveying capacity as beam (%) |
| 4) | ® indication conveying belt runs;<br>®ç conveying belt stopped |
| 5) | unit for conveying capacity (kg/h, t/h) |

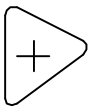
## 3.3 Control pictures A, B, C and Service picture

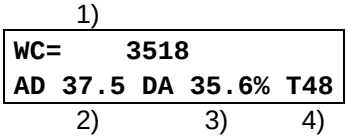
By means of the control pictures the inputs and outputs can be checked and the system data can be scanned. The call is possible from standard operation mode.

The switching-back to the original picture is done with the call-key. A direct change into another control picture resp. into the service picture is also possible.

### 3.3.1 Control picture A

Analog measured values, measured value BCD-input, analog output value.
Call with key

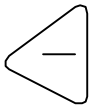





| | | |
|---|---|---|
| 1) | Weighing channel<br>empty scale<br>Weighing cell fully utilised | <br>approx. 4.000 (<300 = **A/D-Error**)<br>approx. 25.000 (>32.000= **A/D-Error**) |
| 2) | Analog input in per cent | |
| 3) | Analog output in per cent | |
| 4) | Temperature inside the device (°C) | Error message „**Overheat**“ at measured value higher than 68°C |

### 3.3.2 Control picture B

System information.
Call with key



```
     1)        2)      3)
[2167] FB= 0 C=   0
NC= 0 RA1098 EE1098
     4)    5)      6)
```

| | |
|---|---|
| 1) | Averaged tare measured value of one belt revolution. |
| 2) | Error byte of the data check (in hexa-decimal).<br>The checksum RAM is formed and stored at leaving the parameterizing mode, the EEPROM check sum after "**Data securing**". |
| 10 = | Marker, if RAM-memory was re-charged.<br>Error message "**Data lost**". |
| 20 = | Check sums RAM and EEPROM unequal.<br>Error message ____ "**EEPROM program**" |
| 40 = | Actual RAM-check sum and stored RAM-check sum are unequal.<br>Error message ____ "**Data lost**"<br>If the actual EEPROM-check sum is equal to that which has been stored at the latest data securing, the RAM-memory is re-charged automatically (The re-charge-counter NC counts +1).<br>40 therefore is hardly visible. |
| 80 = | Actual and stored EEPROM-check sum are unequal.<br>Error message ____ "**EEPROM program**" |
| A0 = | 20 + 80<br>Error message ____ "**EEPROM program**" |
| C0 = | 40 + 80<br>Error message ____ "**Parameter input**" |
| 3). | Internal information |
| 4) | Re-charge counter. Registers, how often the RAM-memory was re-charged from the EEPROM because of wrong RAM-check sum. |
| 5) | Check sum RAM-memory |
| 6) | Check sum EEPROM-memory |

### 3.3.3 Control picture C

Switch statused with digital inputs and outputs.
Call with key

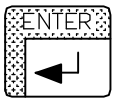
1)2) 3) 4) 5) 6)

```
IS-U1234-V-K123- BCD
00  0100 0  100    0
```

| | |
|---|---|
| 1) | Input "**STRINT**" (line interrupt = Tacho) |
| 2) | Input "**SYNCH**" Control pulse) |
| 3) | Inputs "**U1/2/3/4**" |
| 4) | Pre-switch-off-calculation. Indication, which pre-switch-off value is used (0 - 3) |
| 5) | Relay "**K1/2/3**" |
| In the row at the bottom the switch statuses of the inputs and relays are indicated (Invertings are not considered at the display). | |

### 3.3.4 Service picture

In this picture the most important operation information is indicated.
Call with key




1) 2)

```
g1= 38.2%  g3= 34.5%
v=103.3% p= 35.6% A→
```

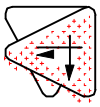
3) 4) 5) 6)

| | | | |
|---|---|---|---|
| 1) | Actual belt load | | |
| 2) | Belt load at point "**g3**" (discharge end). | | |
| 3) | Actual belt speed | | |
| 4) | Actual conveying capacity (at point "**g3**") | | |
| 5) | A= | Belt empty | (Monitoring at weight "**g1**") |
| | B= | Min-limit value | (Monitoring at weight "**g1**") |
| | C= | Max-limit value | (Monitoring at weight "**g1**") |
| 6) | -> | Belt runs | |
| | ->¦ | Belt stopped | |

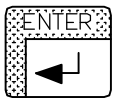
## 3.4 Calling of the information indications and input pictures

If in standard operation mode key


is pressed, entrance picture "**MODE**" and "**TEXT Screen**" appears.
With key



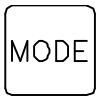
further information indications and input pictures can be called.
The respectively indicated picture is activated with key




The input pictures "**Batch**", "**Dosing**", "**Cap.set value**", "**Charge Quant**" and "**PreSwitch**" only appear, if at the parameterizing a corresponding adjustment has been chosen.

```
> TEXT Screen    <
> Counter        <
> Charge         <
> Dosing         <
> Error          <
> actual param   <
> Cap.set value  <
> Charge Quant   <
> PreSwitch  0-3 <
> Service 2      <
```

Return to **"MODE"** with key




### 3.4.1 Counter

In the „**TEXT Screen**" only the counter "**A**" is indicated. In picture "**Counter**" additionally counter "**B**" is available.

```
      1)              3)
A=123456789 t  125.3
B=123456789 t    t/h
      2)
```

| | |
|---|---|
| 1) | Quantity counter "**A**", for re-setting press simultaneously keys „+". and „-" |
| 2) | Quantity counter "**B**", re-set with key <->.<br>Counter "**B**" also is represented in "Text screen". |
| 3) | Indication of the actual conveying capacity |
| During the test and during the taring process the quantity counter and the counting pulse output are blocked. | |

### 3.4.2 Batch

Operation picture, if charge operation is activated.
The charge is started with OPTO "**Start batch**". With OPTO "**Break batch**" a running charge can be terminated prematurely.
Batch with emptying of the scale also see page 24 „Pre-switch-off-value (PreSwitch 0 - 3)

The running-off-steps of the charge-control are represented in picture „Service 2“ (see page 24).

```
                1)
Charge       123456kg
CS 12345kg VA 1234kg
    2)          3)
```

| | | |
|---|---|---|
| 1) | Charge actual value (is set to zero at batch start) | |
| 2) | CS = Charge set value (before charge start)<br>CR = Charge residual set value (if charge is running) | |
| 3) | Pre-switch-off value only at "with emptying". Is calculated from the quantity adjusted at "**PreSwitch**" (see page 24) and the percentage of the actual belt load. | |

At charge end a data output via the serial interface is done.

If the printer IPP 144-40 E is used, the charge weight is printed out with date and time (adjustment of the data interface see page23):

**Printing pattern at printer IPP-144-40 E:**

```
B=       3556kg
12.10.94  10:47:36
```

**Printing pattern at printer IPP-144-40 resp. serial output:**

```
B=       3556kg
```

At plants where the charge operation is not used, the printer output can also be started with OPTO-input „**B=>0 print**.

### 3.4.3 Dosing

Information picture at activated feeder control. At according parameterizing via a binary input can be selected between the capacity set values „**INTERNAL**“ and „**EXTERNAL**“.
Picture „Service 2“ offers additional information (see page24).

```
      1)          2)
Sint  15.0  Z= 25.3%
P=    50.8 t/h   129
      3)          4)
```

| | |
|---|---|
| 1) | **Sint**= set value **INTERNAL** |
| | **Sext**= set value **EXTERNAL** |
| 2) | actual feeder variable |
| 3) | actual conveying capacity |
| 4) | Dead length counter of feeder control |

### 3.4.4 Errors

Information picture about activated error messages.

```
                1)      2)
Error   2 5 7 C   M
 A/D-Error     <->
        3)          4)
```

| | |
|---|---|
| 1) | Indication of the activated errors (Error number in hexa-decimal). Max. 6 errors can be indicated. If more than 6 errors are recognized, the higher numbers are suppressed. |
| 2) | If there are one or several errors with programmed memory function at the errors indicated, upper right “**M**“ is indicated. |
| 3) | In the text in clear the error with the highest number is indicated. Additional to the errors numbered in hexa-decimal there are also program errors without numbers in the error picture (The error number of the program error is indicated in control picture [B] [FB=xx]). At the indication texts the program errors have priority. |
| 4) | Note: Stored errors can be deleted with key <->. |

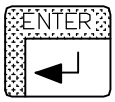
The error messages (error description from page 13 on : „Description of the error messages:“):

```
1 Drive/tacho       8 Max Load
2 A/D-Error         9 Belt slip
3 Overheat          A Test wrong
5 Feeder limit.     B Taration err.
6 Mis-Run           C Belt stopped
7 Min Load          D Bad set value
```

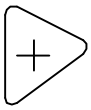
**EEpromprogram**: ___ Actual and stored EEPROM-check sum are unequal, or RAM and EEPROM-check sum are unequal.
**Data lost**: _____ Actual and stored RAM-check sum are unequal.
**Parameterinput**: ___ **Data lost + EEpromprogram**

### 3.4.5 Actual param/Parameter printout

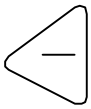
After calling this menu point the complete parameter adjustment can be scanned step by step with key




An automatical run-through is possible with key



The automatical run-through is stopped with key



Find indications for software version in picture 1.

```
      1)          2)
DWC4 L2.0h  FN: xxxx
Sep 15 1998- D /___-
      3)      4)  5)
```

| | |
|---|---|
| 1) | Software version |
| 2) | Fabrication number of the scale (is put in at "Data input" ) |
| 3) | Date of issue of the software version |
| 4) | Indication about the adjusted language<br>D= German<br>GB= English<br>F= French |
| 5) | Space for indicating the language adjusted for supply at the German printout. |

At the same time with the indication at the display also the parameters are put out via the serial interface.

### 3.4.6 Capacity set value (Cap.set value)

At feeder control with set value "**INTERNAL**" = "**Display**" here the capacity set value can be adjusted. It is not possible to adjust set values higher than the scale's "**Nominal capacity**". In case of set values which are lower than the limit "**MinSet Value**" , the error message „**D Bad Set value**“ appears.

### 3.4.7 Charge quantity

If the scale is employed for charge weighing and the charge set value need not be easily changeable, "**Display**" can be used as source of the charge set value.
Max. a 6-digit pre-set is possible.

### 3.4.8 Pre-switch-off-value (PreSwitch 0 - 3)

If the scale must be empty after each charge, it is necessary to stop the material feeding from the silo before the end of the charge. The silo discharge is controlled via the relay "**Batch mode**", if at the OPTO-inputs the function "**Emptying**" is activated.
From the quantity adjusted at "**PreSwitch**" (this is the quantity, which is on the way between silo and scale at "**Nominal capacity**") the residual quantity, at which the silo discharge is stopped, is calculated.
4 pre-switch-off-quantities for 4 silos can be adjusted („**PreSwitch 0 - 3**").

### 3.4.9 Service 2 (Batch/feeder controller)

In this picture information about the charge run-down and the feeder controller is offered.
The pre-switch-off-values are represented only if the charge operation mode „with emptying" is activated..

```
  1)      2)      3)
SC0 VA 0.25 t= 81.6
ZR100.0          29
    4)           5)
```

| | | |
|---|---|---|
| 1) | Step counter of the charge control (SC). | |
| | 0 | Wait for Start, overtake set value. |
| | 1 | Started, re-set B-counter. |
| | 2 | Switch on contact outputs „**Batch drive**" and „**Batch mode**" (not visible). |
| | 3 | Charge runs.<br>Final condition at without emptying: CB equal nominal quantity.<br>„**Batch mode**" and „**Batch drive**" switch off.<br>Step 5<br>Final condition with emptying: CB equal nominal quantity less value „**VA**".<br>„**Batch mode**" switches off.<br>Step 4 |
| | 4 | Wait for „**Belt empty**". With „**Belt empty**" the post-runtime starts, then „**Batch drive**" switches off. |
| | 5 | Start settling time (not visible). |
| | 6 | Settling time 5s. |
| | 7 | Printer output (Timeout after 5s). |
| | 8 | Set charge step counter to 0. |
| 2) | Pre-switch-off-value at operation mode with emptying. | |
| 3) | Percentage of the feeder variable. | |
| 4) | Dead length factor of the feeder controller.<br>At discharge from several silos along with the appertaining pre-switch-off-value also the dead length counter is corrected proportionally to the pre-switch-off-value of silo 1 to the silos 2-4. | |
| 5) | Dead length counter of the feeder controller. | |

In case of employment of the printer the batch weight is printed out with date and time

```
04.10.2000 15:05:39
*014* B=     1.13 t
```

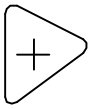
The data set is printed with a current number which cannot manipulated. Only a printer with serial interface can be employed.

At plants where the batch operation mode is not used the printer output can be started also with OPTO-input „**B=>0 print**".

## 3.4.10 Real-time clock

The belt scale computers of the series DWC-4B are provided with an installed real-time clock. If at the print-out a deviation of the printing time from the real time should occur, the real-time clock has to be re-set. Thereto the tumbler switch at the rear side of the scale computer has to be switched into position PA.

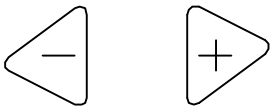
In the main menu of the data input key



must be pressed.

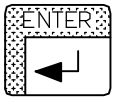
```
Time          ^
year/jahr      00
```

With keys



the marked position can be switched further. Thereto it is necessary to press the double-arrow-key.

Key




switches on to the further time indications (month , day , hour, minute and second ) .
Finally the parameterizing level has to be left by pressing twice key MODE.
After a data securing the PA-switch can be switched back into the middle position.

The real-time clock continues working even when the scale computer is not connected to the supply voltage. After a period of about 10 years the battery necessary thereto has to be exchanged

# 4 TECHNICAL DATA

| | |
|---|---|
| Processor | Intel-80C196KB |
| Operation software memory | EPROM 64K |
| Safety memory | EEPROM 1K |
| User software memory | SRAM 8K with buffer battery |
| Digital inputs | OPTO-coupler |
| Digital outputs | Relay |
| Counting pulse output | potential free, max. 60V, max. 150mA |
| additional analog input | 0..10VDC, 0(4)..20mA; resolution 10bit |
| Analog output | 0..10VDC, 0(4)..20mA; resolution 8bit |
| Weighing channel | 0..30mVDC |
| other interfaces | BCD 4-digit, 4-data lines, 4-scanning lines<br>serial V24 (parameter printout, counter „**B**“) |
| Mains connection voltage | 90 to 250VAC, 47 to 440Hz<br>110 to 250VDC |
| Nominal capacity | 30W |
| Inrush current | 20A |
| Installed fuse | 2Atr 5*20mm |
| Admissible ambient temperature | at operation _____ 0 to 35°C<br>at storage and transport _____ -20 to +70°C |
| Type of protection | Operation- and display unit _____ IP50<br>with protective window _____ IP55<br>housing/terminals _____ IP20 |
| Dimensions in mm (W*H*D) | 144*72*215 (225 with Sub-D-plug) |
| Switchboard cut-out in mm | 137*66,5 |