Programmable

Mini-Controller

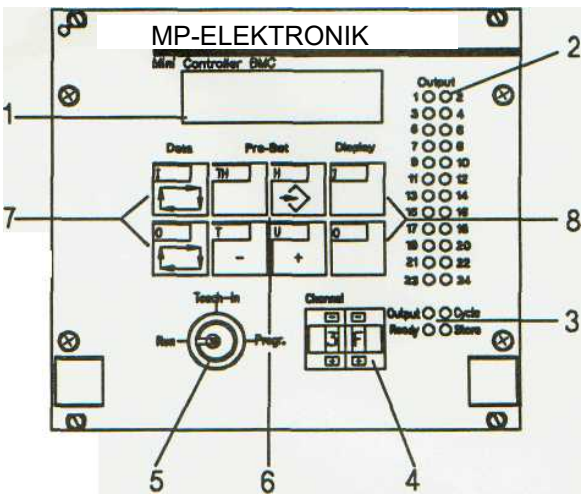
BMC 8-K

BMC 8-E

Mini Controller
BMC 8-E/BMC 8-K

Contents

Front Panel



1 = 6-digit display

2 = Output LED's
on = Output ON off = Output OFF

3 = Information LED's

4 = "Channel" Channel select

switch

5 = Key switch

6 = Programming keypad "Pre-Set"
TH = 1 000
H = 100
T = 10
U = 1

7 = Programming keypad "Data"
I = Setpoint "ON"
0 = Setpoint "OFF"

8 = Programming keypad "Display"
1 = Display setpoint "ON" value
O = Display setpoint "OFF" value

Brief Program Overview

BMC version for variable program number and optional lockout of programming functions.

This version is designed for variable resolution with theencoder in a ränge between 120 and 1024 steps, and input of a null point correction value.

Also available is the option of using a low-cost encoder with 2° resolution (BRG D/E).

BMC 8 as replacement

for previous versions 4, 5. 6 and 7 is described on pages 17,18 and 24.

Setpoint Organization

The unit can be operated with 6, 8,12 or 16 programs, with 8 setpoints programmable for each output. Only the total number of programmed setpoints is limited depending on number of programs. A maximum of 1360 setpoints is possible. These are distributed among all of the programs used. This makes the number of setpoints per program variable.

Number of programs	available setpoints	other conditions
6	226	each output can be programmed a maximum of 8 times
8	170	
12	113	
16	85	

After powering up (or starting), the following information appears in the display in order:

1. LED test display (all LED's are on)
2. Display number of programs set: "xx P"
3. Display which program is set: "P x"

The first program to be loaded is the one which was last active in the Run mode before the last power-off.

After the program display goes off, the unit goes into whichever mode has been selected with the Mode switch.

"RUN" Mode

In this mode the encoder value is cyclically read and the outputs are switched corresponding to the stored setpoint data in the program.

If the program was changed before entering the Run mode, it is first stored in the EEPROM. During the storing process, the "SAVE" message appears in the display.

Note:

During this time the encoder shaft speed may not exceed 70 RPM, so that the Outputs can be correctly switched.

See page 15 for detailed Information concerning RPM ranges.

As soon as the program is stored, "RUN" will appear in the display. Now a rotational speed of up to 1130 RPM (depending on encoder type used and set) is permitted.

If the function "Continuously display encoder value" has been set, the maximum speed is 370 RPM (depending on encoder type).

If "display keys active" has been preselected (DIP switch NR 2 = on), the maximum speed is 130 RPM (depending on encoder type).

"ONLINE/TEACH-IN" Mode

In this mode, setpoints can be entered or changed while the machine is running.

Maximum rotational speed of the encoder is then 70 RPM.

To program, first select the number of setpoints desired. This is done by setting the output number with the channel select key. If an illegal number is entered, the display blinks "C—". If a legal number is entered, the symbol "t" appears on the left side of the display (= "teach-in" function), then a "1" for setpoint #1, followed by a decimal point and the encoder value. Now the Correction-TH key can be used to set the setpoing number. Each time this key is pressed the setpoing number is raised by 1, returning to 1 after 8 is reached.

"TEACH" Condition

After entering a setpoint the unit goes into the "TEACH" condition. "Nockennummer Geberwert" ("Setpoint Number Encoder Value") appears in the display.

Pressing a "Data" key directly accepts the encoder value as a setpoint, with "Data-1" as turn-on point, and "Data-0" as turn-off point. The display of the switchpoint value is held as long as the key is pressed, after which the current encoder value is again displayed.

If this procedure is used to enter a switch point for a not yet defined setpoint, the other switch point automatically receives a value of 0.

Pressing both "Display" keys simultaneously causes the number of the entered program in the form "P x" to appear in the display, whereby x means the program number.

"ONLINE" Condition

Pressing one of the two "Display" keys brings the operator from "TEACH" condition into "ONLINE" condition for changing the programmed switch points incrementally.

Next to the setpoint number in the display, the value of the selected switch point appears ("A" for setpoint begin or "E" for setpoint end, depending on the "Display" key).

Caution!

The "ONLINE" condition is only enabled for individual setpoints. Overlapping setpoints cannot be changed in this mode.

The U/T correction keys are used to increment or decrement the value of the selected switch point. Each pressing of the U-correct key increments the value by 1, and each pressing of the T-correct key decrements by 1. The effect of these keys does not take place, however, if it causes a setpoint to be deleted or to overlap with another setpoing for the same output.

Changed setpoints blink in the display until they are confirmed by pressing the "H" key, which stores the entry in memory.

The switch point to be modified can be selected within the "ONLINE" condition by pressing the "Display" key. However, a new setting of the setpoint or output number returns the operator to the "TEACH" condition, as does the displaying of the program number.

"PROGRAM" Mode

All outputs are locked out in this mode. The switch point values can be entered and programmed as desired using the correction keys. Individual setpoints, all setpoints for an output, or the entire program can be deleted in this mode. In addition, there are functions for locking out programming functions and for initializing the unit.

Programming Setpoints

To program an individual setpoint, the same procedure as in the "ONLINE" mode is followed for selecting the output number and setpoint number. "Nockennummer.000" (Setpoint Number.000") appears in the display. The value to the right of the setpoint number can then be changed using the Correction U/T/H keys. Each pressing of one of these keys causes the corresponding display digit to increment by 1 (returns to 0 after 9 is reached).

Pressing one of the "Data" keys accepts the set value as an on- or off point for the desired setpoint. If the setpoint was not previously defined, the other switch point of the setpoint receives a value of 0.

Multiple setpoints: After programming the 1st setpoint, press the the TH key. The digit 2 will appear in the display indicating the 2nd setpoint to be programmed —> program the 2nd setpoint. Continue in this manner for up to 8 setpoints.
When one of the "Display" keys is pressed, the programmed value for the corresponding switch point is displayed. If no switch point is programmed for the seiected setpoint, a blinking "-no-" appears momentarily in the display.

Pressing both "Display" keys simultaneously displays the number of the entered program in the form "P x".

Deleting an Output

To delete all setpoints of an output, set the channel select switch to "DO". The display will show "A.dEL". To carry out the delete, press both "Data" keys (display shows "A.SEL").

Now the channel select switch is used to set the number of the output to be deleted, after which both "Data" keys are pressed. As long as both are depressed, "A.clr" is displayed; the setpoints of this output are now all deleted. Releasing the keys returns the Operator back to the setpoint program mode.

If an illegal output number is set while "A.SEL" is displayed and the "Data" keys are pressed, a "-no-" is displayed as long as the keys remain depressed. Nothing is deleted. Otherwise, the display blinks "C—".

Deleting the Entire Program

To delete all the programmed setpoints of an entire program, set the channel select switch to "D1". The display shows "P.dEL", after which the function must be confirmed by pressing both "Data" keys.

During this confirmation the display blinks "P.clr", whereby the "Data" keys must remain depressed for 10 blink cydles. If one of the keys is released earlier, "-no-" is displayed and nothing is deleted. If both keys remain depressed, "P.clr" will finally be displayed indicating that the program has been deleted.

Changing Programs

Depending on the setting of the unit, 6, 8,12 or 16 different programs can be stored. In order to run a program other than the one currently active, the new one must first be loaded from the EEPROM into RAM. To do this, set the left position of the Channel select switch to "A", and the right position to the desired program number.

Available program numbers:

Setting	available program numbers
6 programs	A, B, C, D, E, F
8 programs	A, B, C, D, E, F, 0, 1
12 programs	A, B, C, D, E, F, 0,1, 2, 3, 4, 5
16 programs	A, B, C, D, E, F, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

After a program has been selected as described, the currently loaded program is displayed. To change to another program, press both "Data" keys.

If a non-permitted program number was set on the right side of the select switch, "-no-" is displayed until both keys are released.

If the entered program number is available, and nothing has been altered in the loaded program since it was loaded, the selected program is loaded and its number displayed. If changes were made in the loaded program, it must first be stored. This is indicated by the blinking display "SAVE". To carry out the change to the new program, the "Data" keys must now be pressed for 20 blink cycles.

If this is the case, the "SAVE" stops blinking to indicate the current program is being stored, and the keys can be released. After storing is complete the new program is loaded and its number displayed.

Locking out Programming Functions

To prevent programming of critical outputs by unauthorized personnel, programming of a number of outputs can be made to first require a code number. This procedure is handled as follows:

- **Setting the Program Lockout**

This function is used to make the programming of all outputs from the previous enable dependent on entry of a code number defined here.

The function is selected by setting the channel select switch to "FB" ("in.cd" appears in the display) and press both "Data" keys.

Now "cOOO" is displayed, with the right 3 places representing the actual code number, which can be set as desired using the Correction U/T/H keys. Once the desired code is entered, confirm by pressing both "Data" keys.

The display now flashed the word "code" alternating with the selected code number. For final confirmation the code must then be entered by pressing "Anfang Display", "Ende Data", "Ende Display" and "Anfang Data" in order. If not done in that exact sequence, the display shows "-no-" and the function is broken off. If carried out properly, the display shows "-ok-" as long as the last key remains depressed.

The programming lockout is now activated for all outputs. If subsequently another number of locked outputs (beginning with output 1) is desired, note the sections on "Deleting Programming Lockout" and "Determining Locked Outputs".

Besides Operation in Run mode, only new selection of the set program and displaying of switch point values is possible without prior identification by the code number. If the user attempts to carry out locked functions, the display shows "Lock" and the processing of the function is broken off.

- Releasing the Programming Lockout

In order to carry out locked programming functions, the programming lockout must first be released by entering the code number. To do this, set the Channel select switch to "FA" (--> display "code") and press both "Data" keys.

As in the case of "Set Lockout", the display shows "cOOO" and a code number can be entered and then confirmed by pressing both "Data" keys.

If the entered code number is the same as that which was set for lockout, "-ok-" is displayed and the locked functions are now released. If an incorrect code number is entered, a "-no-" is displayed and the lockout remains in effect.

A released lockout is reactivated when switching into the Run mode or when the unit is tumed off and on again.

- **Determining Locked Outputs**

If it is desired to lock some but not all of the Outputs, this function can be used to determine the number of Outputs affected by the lockout. In this case, programming of outputs 1 up to the indicated number is locked out.

Set the channel switch to "FC" (--> display "A.Lok") and press the "Data" keys. As with deleting an output, the display shows "A.SEL", after which the channel select switch is used to set the highest output number to be included in the lockout. Confirm this by pressing both "Data" keys and both "Display" keys simultaneously (first the "Data keys and then, without releasing them, the "Display" keys!), after which "xx" and "lock" flashes alternately in the display. The programming lockout is then limited to outputs 1 through xx.

This programming lockout is activated when switching into the Run mode or when the unit is turned off and on again.

If the setting "00" was selected, the programming lockout is cancelled. To relock, a new code number must first be entered.

If an illegal output number is entered or a wrong key is pressed, the display shows "-no-" as long as a key remains depressed.

Programming Number of Programs

When the unit is first started up, an Error 001 will be displayed, since the correct program number is not correctly set in the EEPROM. If the error display is acknowledged by pressing both "Data" keys, the unit initializes itself for 6 programs.

If the unit needs to be set for a different number of programs (possible only if no outputs are locked out), it must be newly initialized, which will also cause all previously stored programs to be erased.

To initialize, set the channel select switch to "FD". The display shows the number of programs the unit is set for. If then both "Data" keys are pressed, the display will flash and the ·Correction-TH key can be used to set the new number of programs. To initialize the unit with the new number, confirm by pressing the "Data" and "Display" keys simultaneously (first both "Data" keys, then, without releasing these, both Display keys). "ALL" and "P.clr" will then flash alternately in the display, since the initialization will erase all programs. If the 4 depressed keys are held for 20 blink cycles, the display will show
"init" and, after releasing the keys, the newly set number of programs. This cancels all programs as well as any previously set program lockout.

Setting System Resolution

This capability is only applicable when encoder feedback devices with binary code and odd parity as output signals are used.
To set resolution, set the channel select switch to "CF". The resolution of the encoder can only be set or changed if the correct operating mode (DIP switch 3 = on) is set and if no outputs are locked out.

If the wrong operating mode is set, the display shows "fail". If any outputs are locked out, the display shows "lock".
Otherwise, the presently set resolution is displayed. A "c" is also displayed as a designator.

The "U", "T" and "H" keys are now used to select any step number between 1024 and 120. As soon as the setting is begun the "c" designator goes out. To confirm and store after successful entry, press both "Data" keys together.

Caution!

All setpoint values are canceled *when the resolution is changed.*

The text message "init" and then "test" is displayed. To confirm after "test", press both "Data" keys together.

If the step size is too small, an error message "14 Err" appears. If the step size is too large, the message "15 Err" appears as long as both "Data" keys are depressed. The currently set step size is not changed.

To correct: enter a valid step size.

Factory setting: "360 steps"

Inputting Null Point Correction Value

To input the null point correction value, set the Chanel select switch to "CO".

The null point correction value can only be set or changed if the correct operating mode (DIP switch 5 = "on") and if no Outputs are locked out.

If the operating mode is incorrectly set, the display shows "fail". If any Outputs are locked out, an additional "n" is displayed.

Otherwise the currently set null point correction value is displayed. An additional "n" is displayed as a designator.

There are two methods for inputting the null point correction value.

Caution!
be sure that the zero point correction value is set only after all other operating conditions are set

Method 1:
The "U", "T" and "H" keys are used to set any step number up to the max. resolution of the encoder. The "n" goes out as soon as the input process begins. After the resolution is entered, confirm by pressing both "Display" keys togther. This step count corresponds to any desired position. Starting at this Position, the Minicon-troller operates at the resolution of the encoder.

—> **Programming any reference point**

After a valid valid has been entered, the corresponding offset value appears in the display. If an invalid value was entered, the display flashes "16 Err" as long as both "Display" keys are pressed. The presently set step count does not change.

Action: set correct step count The

factory setting is "0000 Steps".

Method 2:
If both "Data" keys are pressed simultaneously, the current encoder value is used asthe null point correction value and displayed with an additional "n".

—> **Automatic null point programming**

If instead of this encoder value display a flashing "-no-" appears, no valid encoder value is present.

Action:
Turn key switch briefly to the "TEACH-IN" position and repeat the procedure for using the encoder value as null point correction value.

About the displayed encoder value

There are 2 possibilities for determining the way in which the encoder value is displayed:

- Display of the encoder value is RPM-dependent (factory setting)
- Encoder value is always displayed

Selection of the desired function is made as follows:

Set channel select switch to "EO" and key switch to "PROG". Use the correction key "TH" to select option "Yes" or "No".

"Yes" means—> encoder value always displayed
"No" means —> encoder value displayed depending on rotational speed

Error Display

If an error occurs during operation which makes continued operation impossible, the program is interrupted. All outputs are locked out and the error is displayed by alternate flashing of "Err" and an error number.

Error Cancelling

Pressing both "Data" keys cancels the error and the program is restarted.

Error Numbers and Definitions

1	incorrect program number set (see Start-Up)
2	Error in program memory
3	Illegal restart
4	Error in data security (Mode)
5	Invalid program number (external program select)
9	Encoder value cannot be correctly read
10	Parity error or encoder cable break
11	Encoder resolution > set step count
12	Invalid parity setting
14	Resolution set too fine
15	Resolution set too coarse
16	Null point correction value too large

Other Error Messages

"fail"	- The DIP switch was incorrectly set - The desired function was not selected (From 2018 used DIP-switch - "on" - opposite side)
"lock"	- The desired function is currently not available because there are locked outputs
"-no-"	- The desired function is currently not available
"C—"	- The selected channel is not programmed
"bad"	- The channel select switch is incorrectly set
FULL"	- The key switch did not make full contact or it is defective
"Cycle"	- This display appears when all available setpoints in a program are programmed. The function "AUSGANG LOESCHEN" can be used to cancel outputs with equal values for setpoint on and setpoint off. This creates memory capacity for programming new values. Note: "AUSGANG LOESCHEN" means "Cancel Output" - When this LED is on it indicates a program error. The unit is no longer in program mode. A restart must be attempted by brief interruption of supply voltage. If this LED comes on again, the Mini Controller must be returned to the factory for repair. When the "Cycle" LED comes on, the "READY" output is turned off so that the machine stops.
"Output"	- When this LED is on, it indicates that some output was overloaded. In this case the "READY" output is turned off, so that the machine stops. In this operating condition the "Display" keys and the channel select switch as well as the key switch remain active. This allows the operator to identify the overloaded output and make if necessary turn it off by programming.
"Select"	- No DIP switch set = factory setting. Set desired BMC model, see page 17.

RPM Table for Various BMC Models

These rotational speed are minimum values and are referenced to a setpoint length of 1 step (count). The max. value is at 5 % above these values.

The following rotational speeds are derived for the "RUN" mode:

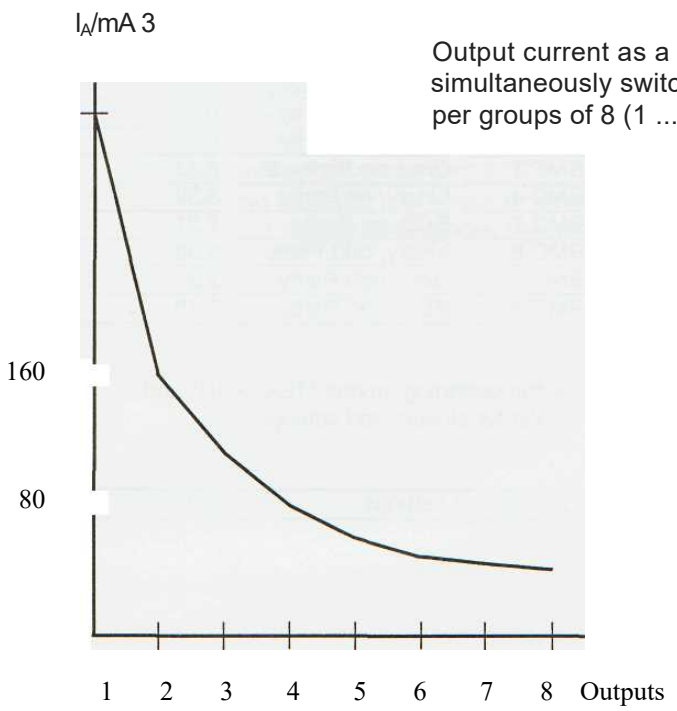
Model	Encoder Output Code	Frequency of the LSB (kHz)	Speed (RPM)	Mode
				Encoder value
BMC 4	binary, no Parity	1.11	185	always
BMC 7	BCD, no Parity	1.00	160	displayed
BMC 8	binary, odd Parity	1.00	160	
BMC 8	Gray, odd Parity	1.05	175	
BMC 8	BCD, odd Parity	1.00	160	
				Encoder value
BMC 4	binary, no Parity	4.11	685	display
BMC 7	BCD, no Parity	2.52	420	alternates
BMC 8	binary, odd Parity	3.96	660	with "RUN"
BMC 8	Gray, odd Parity	3.16	527	
BMC 8	BCD, odd Parity	2.32	386	
				Display keys
BMC 4	binary, no Parity	0.38	63	are active
BMC 7	BCD, no Parity	0.38	63	
BMC 8	binary, odd Parity	0.38	63	
BMC 8	Gray, odd Parity	0.38	63	
BMC 8	BCD, odd Parity	0.38	63	
				With null point
BMC 4	binary, no Parity	3.39	565	correction
BMC 7	BCD, no Parity	2.21	368	
BMC 8	binary, odd Parity	3.39	565	
BMC 8	Gray, odd Parity	2.21	368	
BMC 8	BCD, odd Parity	2.10	350	

For the operating modes "TEACH-IN"[1] and "ONLINE", the following rotational speed is valid for all permited settings:

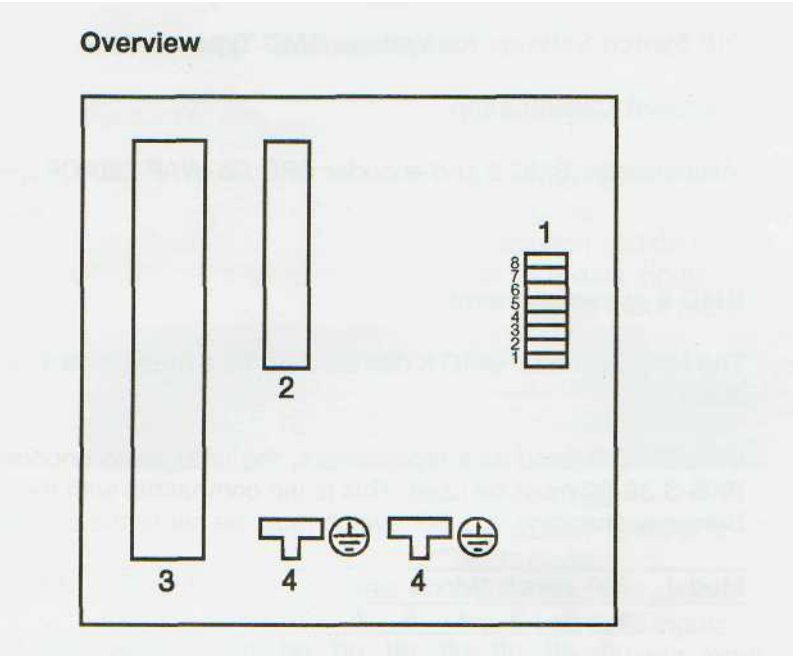
all permitted settings	0.42	70

Electrical Data

Supply Voltage U_p	15… 30VDC
Ripple	<10%
Current draw	< 200 mA at 24 V DC no load on Outputs
max. slewing speed when set for 360 Steps	see previous page
Number of programs	selectable 6, 8, 12,16
Cable length between absolute encoder and BMC	max. 50 m
Input voltage	30 V > U_{in} > 10 V (High-Level) 0V<U_{In}< 7V(Low-
Input impedance	12 k… 14kOhm
Number of Outputs	24 PNP, short circuit protected
Multiple switch points	each output can be programmed up to 8 times (see page 3 - "available setpoints"
Output voltage	$U_A = U_B$-3,3 V_{max} (High-Level)
Output current	40 mA min., see below
Operating temperature	0... +60 °C
Storage temperature	- 20 ... +70 °C



Output current as a function of simultaneously switched outputs per groups of 8 (1 ... 8, 9 ... 16, 17 ... 24)



1. **DIP Switch**
   For setting various BMC types
   Page 17 (From 2018 used DIP-switch - "on" - opposite side)

2. **Connector BKS-S 52-00**
   Encoder System - separate
   Page 18, 19, 20

3. **Connector BKS-S 39-00**
   Outputs, supply voltage, new program
   Pages 21 ... 24
   Encoder System -integrated
   Installation in 19" rack
   Page 24 - BMC as replacement

4. **Grounding Connector**
   Carry ground through to star point (at least 6 mm^2)

Caution!

Set code before starting up.

Model	DIP switch "Mode select"								Meaning of the selected function
	1	2	3	4	5	6	7	8	
	off	off	off	off	off	off	off	off	Factory Setting
BMC 1	on	x			x				Resolution: 180 counts, Gray Code (180C38)
BMC 4		x		on	x				Resolution: 360 counts, binary coded
BMC 6		x			x	on			Resolution: 360 counts, binary coded, ONLINE, no Teach-in
BMC 7		x			x		on		Resolution: 360 counts, BCD coded
BMC 8		x	x		x			on	Resolution: 360 counts, binary coded, Odd Parity
BMC 8	on	x			x			on	Resolution: 360 counts, Gray Code (360C76), Odd Parity
BMC 8		x			x		on	on	Resolution: 360 counts, BCD coded, Odd Parity

on = factory setting
x = possible option

Gray Code
Display keys
Variable resolution
Null point correcti
BCD Code
Parity OP

DIP Switch Settings for Various BMC Types

Standard Combination

Minicontroller BMC 8 and encoder BRG C5-WAP 260-OP...—> DIP switch "8" on.

BMC 8 as replacement

The Mini Controller BMC 8 can be used as a replacement for BMC types 4, 5, 6 and 7.

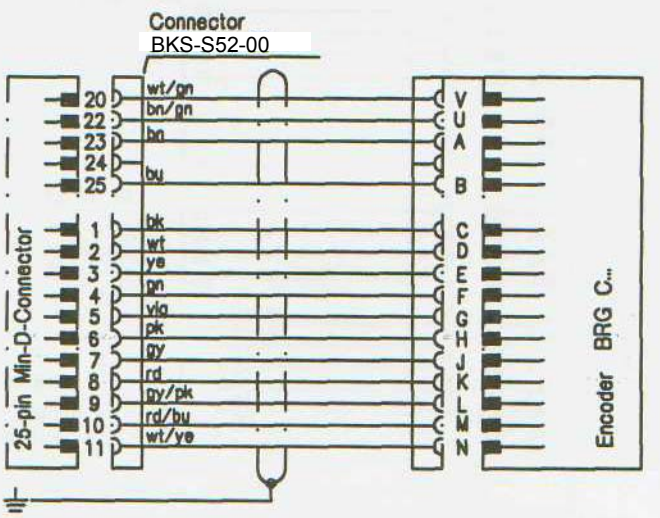
If the BMC is used as a replacement, the "integrated encoder connection" BKS-S 39-00 must be used. This is pin compatible with the previous models. Before exchanging, the DIP switch must be set to the corresponding BMC model.

BKS-S52-00 - Encoder System

Caution!

Use only shielded cable (14 x 0,34 mm² per DIN 47 100). Ground shield only on BMC side. Max. length 50 m.

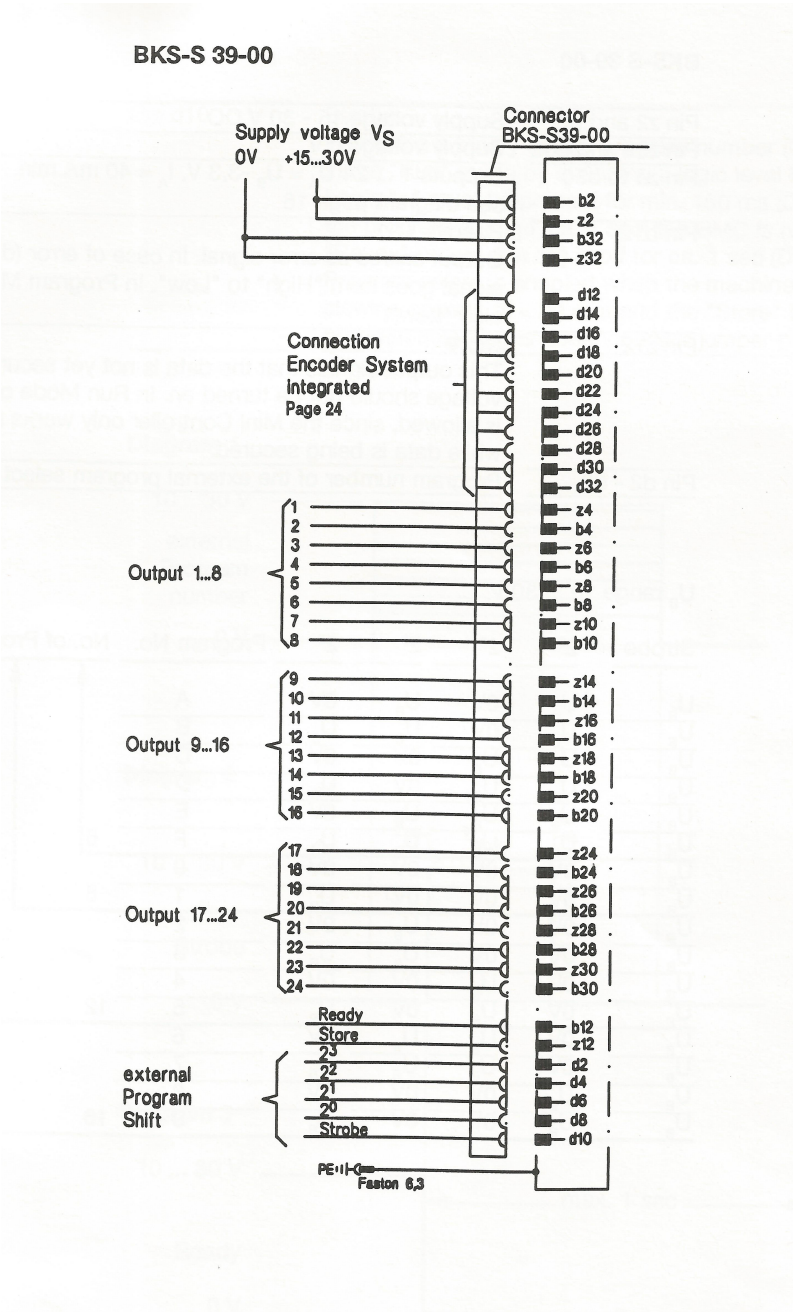
Pin 1 - 11	Bit inputs from the encoder system Binary Code Resolution 8 Bit (128 - 256 counts) Gray Code Resolution 180 counts Pin 1 - 8 data inputs Pin 9 parity input (odd)
Standard, 360 counts (1°) Encodcer system BRG C5-WAP 360-OP-G ...	Binary Code Resolution 9 Bit (256 - 512 counts) Pin 1 - 9 data inputs Pin 10 parity input (odd)
	Binary Code Resolution 10 Bit (512 - 1024 counts) BCD Code Resolution 360 counts Pin 1 - 10 Data inputs Pin 11 parity input (odd)
Pin 22/24	right/left (10 ... 30 V/0 V)
Pin 23	U_B (supply voltage for encoder)
Pin 25	0 V (supply voltage for encoder)



Connecting example for Encoder BRG C5 ...

Rotary Shaft Encoder BRG C (wiring)

Pin 1 - 11	Bit and parity inputs (see previous page) black through white/yellow (Pin C through N, BRG)
Pin 22 or 24	Right/Left (10 ... 30 V/0 V) Direction select for encoder brown/green (Pin U, BRG) to Pin 22 for right brown/green (Pin U, BRG) to Pin 24 for left
Pin 20	Select white/green (Pin V, BRG) Select
Pin 23	U_B (supply voltage) brown (Pin A, BRG)
Pin 25	0 V (supply voltage) blue (Pin B, BRG)


BKS-S 39-00
Supply voltage V_S
0V +15...30V
Connector
BKS-S39-00
b2
z2
b32
z32
d12
d14
d16
d18
d20
d22
d24
d26
d28
d30
d32
Connection
Encoder System
integrated
Page 24
Output 1...8
1
2
3
4
5
6
7
8
z4
b4
z6
b6
z8
b8
z10
b10
Output 9...16
9
10
11
12
13
14
15
16
z14
b14
z16
b16
z18
b18
z20
b20
Output 17...24
17
18
19
20
21
22
23
24
z24
b24
z26
b26
z28
b28
z30
b30
Ready
Store
23
22
21
20
Strobe
external
Program
Shift
b12
z12
d2
d4
d6
d8
d10
PE
Faston 6,3

BKS-S 39-00

Pin z2 and b2	Supply voltage 15 - 30 V DC
Pin z32 and b32	Supply voltage 0 V
Pin z4 to b30	Outputs 1 ... 24 $U_A = U_B$ -3,3 V, I_A = 40 mA min. see diagram page 16
Pin b12	Ready Output serves as error signal. In case of error (display Err), the signal goes from "High" to "Low". In Program Mode the signal is also "Low".
Pin z12	Store This output signals that the data is not yet secured. Supply voltage should not be turned on. In Run Mode only creep speed is allowed, since the Mini Controller only works at low RPM's while data is being secured.
Pin d2 - d8	Program number of the external program select

U_B range 10 ... 30 V

Strobe	2^3	2^2	2^1	2^0	Program No.	No. of Programs
U_B	U_B	0V	U_B	0V	A	
U_B	U_B	0V	U_B	U_B	B	
U_B	U_B	U_B	0V	0V	C	
U_B	U_B	U_B	0V	U_B	D	
U_B	U_B	U_B	U_B	0V	E	
U_B	U_B	U_B	U_B	U_B	F	6
U_B	0V	0V	0V	0V	0	
U_B	0V	0V	0V	U_B	1	8
U_B	0V	0V	U_B	0V	2	
U_B	0V	0V	U_B	U_B	3	
U_B	0V	U_B	0V	0V	4	
U_B	0V	U_B	0V	U_B	5	12
U_B	0V	U_B	U_B	0V	6	
U_B	0V	U_B	U_B	U_B	7	
U_B	U_B	0V	0V	0V	8	
U_B	U_B	0V	0V	U_B	9	16

Pin d10	Strobe Retrieving a binary coded program number (Diagram 1) is done in the "Run" mode by changing a logic level from "0" to "1". Logic "1" must be present for min. 150 ms (Diagram 2). During the program change (ca. 1 sec) the BMC is not running, and the "Ready" output (pin 15) is off for ca. 1 sec (Diagram 3). Program select is enabled when the machine is stopped or at slewing speeds of < 20 rpm and the "Store" LED is off. If no program selecting is done, connect jumper pin d10 and z32.

Diagram 1

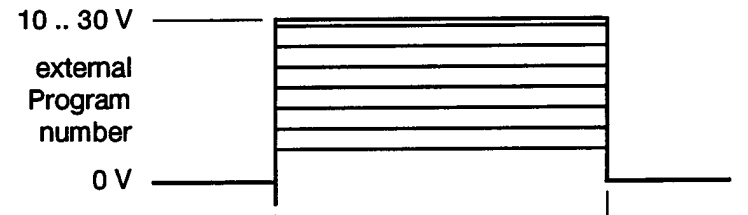


Diagram 2

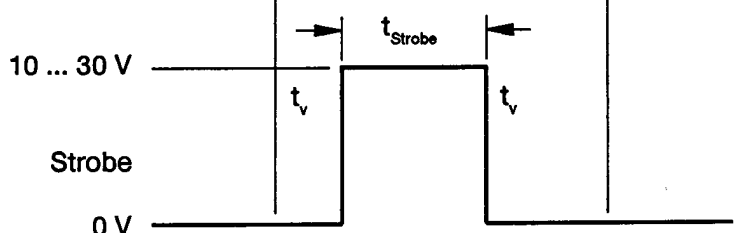
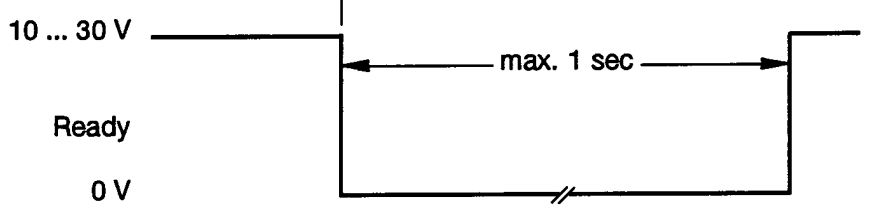


Diagram 3



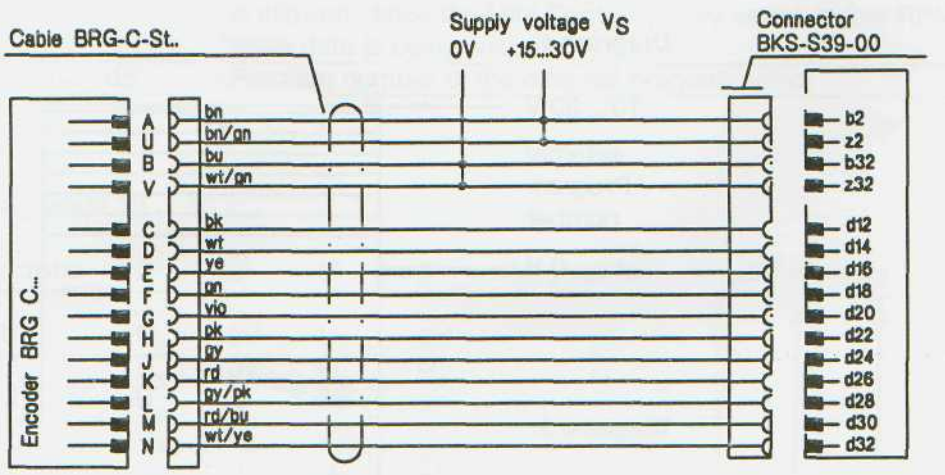
t_v = 10 ms
t_{Strobe} = 150 ms

BKS-S 39-00 - Encoder System integrated

Use "integrated" Option for

BMC 8-K Installation in 19" rack
BMC 8 as replacement for BMC models 4, 5, 6 and 7
"Integrated Encoder Connection" is pin compatible with previous models.

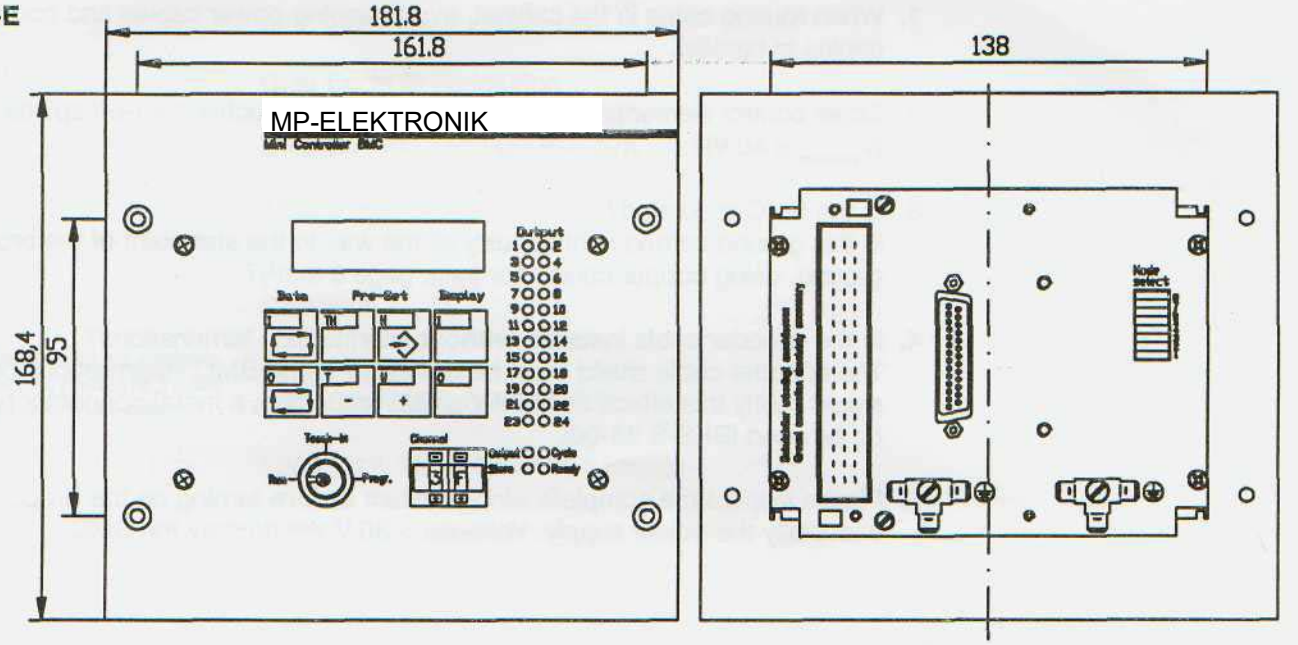
For other applications we recommend using the BKS-S 52-00 connector to connect the encoder. See Page 19.



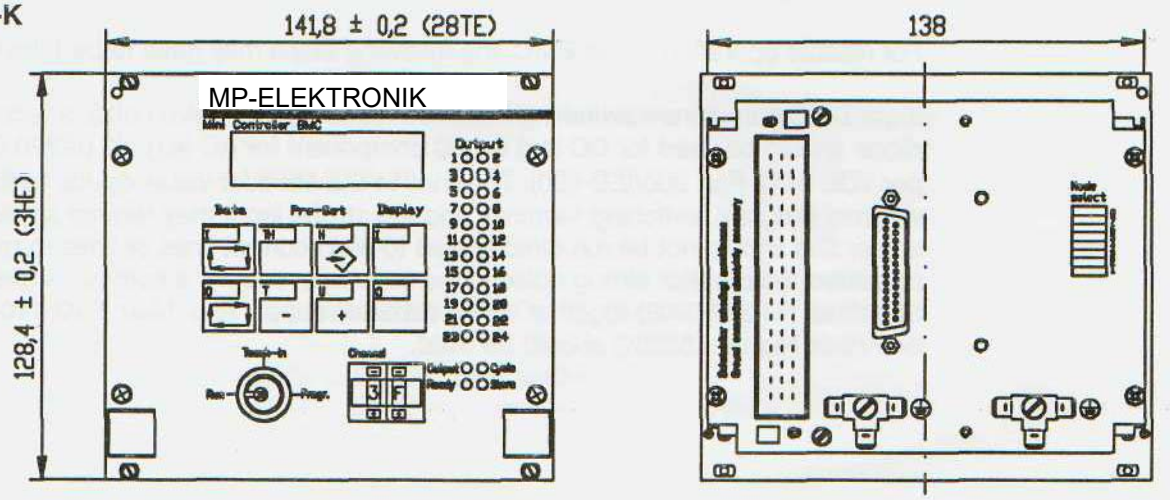
Connecting example for Encoder BRG C5 ...

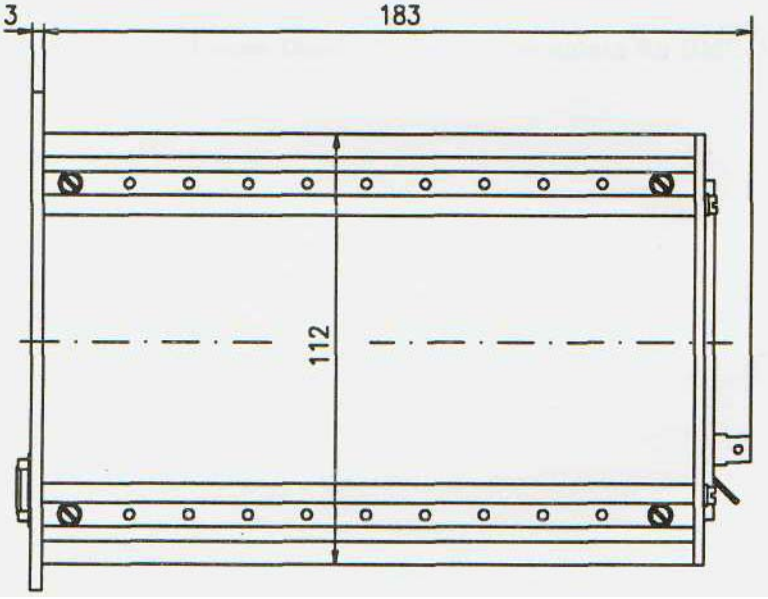
Installation Dimensions

BMC 8-E



BMC 8-K





Notes

1. When routing cable in the cabinet, avoid running power cables and control cables in parallel.

2. Do all control elements have protection against inductive turn-off spikes ($V_{inductive}$<40 V)?

3. Is the BMC grounded?
   Is this ground carried continuously all the way to the star point of the protective ground, using copper conductor (min. gage 6 mm^2)?

4. Is the encoder cable installed **without** intermediate terminations?
   The encoder cable shield must be grounded to the BMC. Interruptions of the shield nullify this effect. For better shield grounding, a metal connector housing can be used (BKS-S 63-00).

5. Please inspect the complete wiring system **before** turning on the BMC, especially the power supply. Voltages > 30 V will destroy the BMC.

Eliminating Noise

For reliable operation of the BMC, the following steps may have to be taken:

If the BMC outputs are switching inductive loads (relays, valve coils), a recovery diode should be used for DC and an RC component for AC (e.g. 22 µf/220 Ohm per VDE 0113 Part 200/IEC 550). The lines to the encoder value inputs, to the external program switching terminal, and the strobe input may require shielded cable, and should not be run directiy next to weld current lines or lines to rpm-regulated motors. For strong noise in the commons supply, a commons filter (e.g. Schaffner FN 342-3/05) together with a separate supply (e.g. Murr TNG 170-220/ 24 Article Number 85262) should be used.

Rotary Encoder Systems (Angle Position Encoders)

Low Cost:

Gray Code 2° Resolution
BRG E1-WAE-180-00-P-R-S/K
BRG D0-WAD-180-00-P-R-S/K

180 counts

Note:

Separate brochures are available for BRG or BTL products. Please consult these for more detailed information.

Standard:

Binary Code
BRG C5-WAP-*-OP-G-O-S/K

* 360, 512, 720, 1000, 1024 counts

Digital Display

BDD-04-01

Expander Module for Connection the Digital Display

BPC-EXP-00

Connector for Mini Controller

BKS-S52-00 from encoder

BKS-S 39-00 for outputs

Linear Displacement Transducers for BMC, lengths from 100 to 1000 mm

Mini Controller
BMC 8-E
BMC 8-K

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