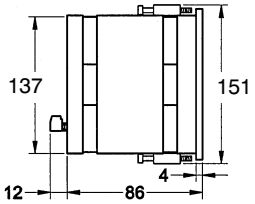
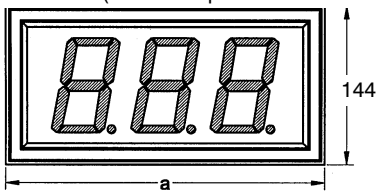
DGA / DGP / DGS 100

side view



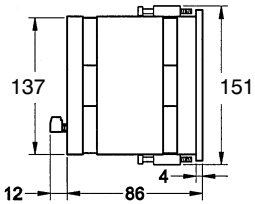
front view (width **a** depends on number of digits)



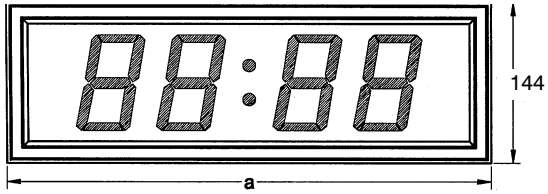
	Aluminium mounting case, powder-coated, black Case depth (including terminals) 86 mm (98 mm)		Front bezel width [a]	Front panel cutout w x h
DGA/DGP/DGS100	DGA/DGP/DGS100–D	DGA/DGP/DGS100–D1		
30 888			336	330x138
40 8888	30 888 °C		432	426x138
50 88888	40 8888 °C	30 888 km/h	528	522x138
	50 88888 °C	40 8888 km/h	624	618x138
		50 88888 km/h	720	714x138

DGU 100

side view



front view (width **a** depends on number of digits)



Aluminium mounting case, powder-coated, black Case depth (including terminals) 86 mm (98 mm) DGU 100		Front bezel width [a]	Front panel cutout w x h
Time indication	Date indication		
40 88:88	40 88.88	480	474x138
60 88:88:88	60 88.88.88	720	714x138

– Specifications subject to change without notice; date of issue 10/03 –

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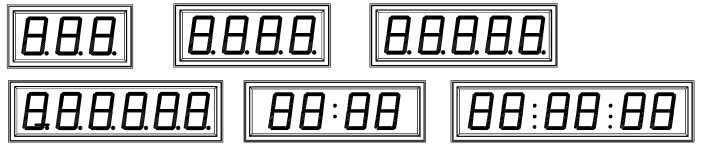
Operating Instructions

Digital Large-Sized Displays, Programmable, Parallel, Serial, Date, Time, DCF 77

DGA 57/100
DGP 57/100
DGS 57/100
DGU 57/100
DCF–EBG



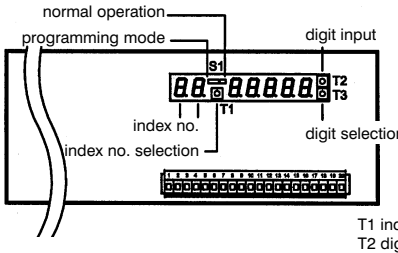
Product Outline

mA / V DC	**DGA**	**57** **100**	**–**	**30** **40** **50**	**A**	**1** **2**	**0** **x**	**R** **G**	**–** **–D** **–D1**	
multiplex active high 24V parallel active high 24V	**DGP**	**57** **100**	**–**	**30** **40** **50**	**A**	**1** **2**	**–**	**R** **G**	**–** **–D** **–D1**	
RS232C / TTY / RS485	**DGS**	**57** **100**	**–**	**30** **40** **50** **60**	**A**	**1** **2**	**–**	**R** **G**	**–** **–D** **–D1**	(DGS 57 only)
Quartz Clock	**DGU**	**57** **100**	**–**	**40** **60**	**D**	**1** **2**	**0** **x**	**R** **G**	**–**	
DCF 77	**DCF**	**–EBG**								

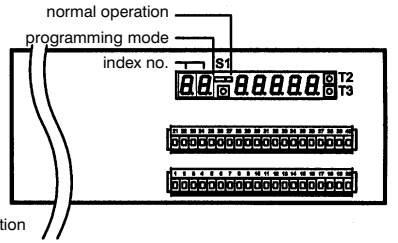
Technical Data refer to Product Guide No. 730.U.001.##

Operating Elements and Displays

DGA 57/100



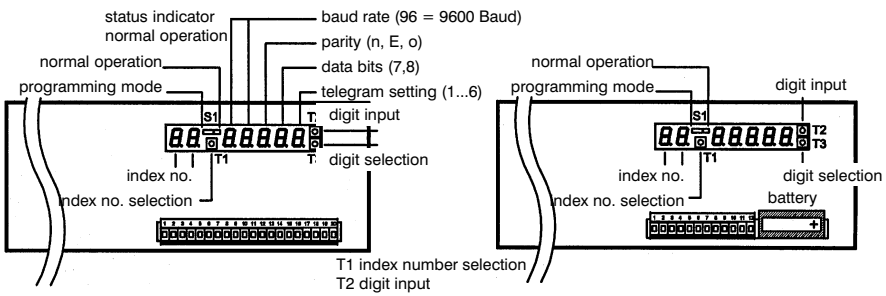
DGP 57/100



T1 index number selection
T2 digit input
T3 digit selection
S1 On programming mode
Off normal operation

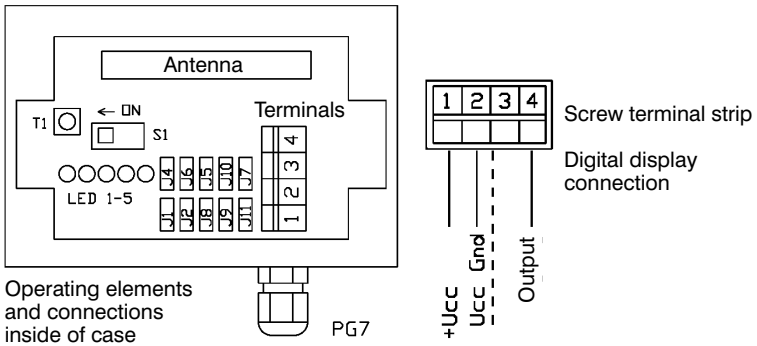
Operating elements on rear side of case

DGS 57/100 **DGU 57/100**



Operating elements on rear side of case

DCF – EBG



Operating elements and connections inside of case

Screw terminal strip

Digital display connection

Installation

Technical Data refer to Product Guide No. 730.U.001.##
Connection Diagrams refer to Product Guide No. 730.U.001.##

Panel Mounting

Insert meter through cutout from the front of the panel. Fit the screw-clamps supplied to the guide groove and tighten the screw-spindles.

Connection

Caution All connection leads shall be voltage-free prior to connecting the device.

Verify input configuration and auxiliary supply (see type label on the device).

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Operating Instructions

Digital Large-Sized Displays, Programmable, Parallel, Serial, Date, Time, DCF 77

Note To avoid impairments by interference voltages, use – if necessary – screened or twisted leads positioned away from interference-subjected lines.

Terminals screw terminals on terminal block
Wire Cross-Section 2.5 mm^2 max.

Connect the meter following the pin assignment on the type label.

Caution Verify meter connections before applying power. Adjust an activated meter by means of an **isolated screw driver** only.

Battery DGU 57/100

Clocks are provided with an internal battery to buffer the clock-quartz ICs. This battery should be replaced after approx. 5 years.

Battery Type: CR 1/2 AA 6127 Varta

Caution Only use type-identical, leak-proof lithium batteries.
Observe correct polarity when inserting battery.

Programming DGA 57/100

The display- and input signal-ranges are determined by setting the minimum and maximum display value and by applying the minimum and maximum input signal to the meter input (in case of negative minimum display value, however, the value of the input signal assigned to the display zero).

A small control display on the rear of the case provides an easier calibration. The menu item selected will be indicated as index number on a small two-digit display.

Note Observe number of digits of the front display when setting the display values!
The control display always has 5 places. Only the corresponding places from the right are valid, e.g. 3-digit display → adjust the last three places of the control display.

Operating Elements

Slide Switch S1	Switch over between normal operation and programming mode.
Key T1	Selection of index number (programming step)
Key T3	Select digit / decimal point / polarity sign to be set. (The digit selected will be accentuated by the flashing decimal point.) resp. take over applied input signal at index numbers 1 and 3.
Key T2	Set selected digit.

Display Programming

– Select programming mode / **index number 0**:	bring slide switch S1 to position "programming mode".
– Set minimum display-value:	select digit by T3 and adjust by T2.
For negative minimum display-value:	adjust value "0" (see *).
– Select **index number 1**:	press key T1
– Take over minimum input signal:	apply min. input signal to measuring input and press key T3.

– Short-circuit measuring input when minimum input signal comes to 0 V / 0 mA.
For all other values (e.g. 4 mA) apply the respective measuring signal to the input.

* For displaying negative minimum value, it is important not to apply the minimum input signal to the measuring input but, apply the input signal related to the display value "0":

$$E_0 = E_{min} + \frac{-A_{min}}{A_{max} - A_{min}} (E_{max} - E_{min})$$

i.e.
A_{max} : maximum display value
A_{min} : minimum display value
E_{max} : maximum input signal
E_{min} : minimum input signal
E_0 : input signal related to display value 0

Example: display range −50.0 ... +50.0; input signal 4 ... 20 mA ⇒ E_0 = 12 mA
In the index number 0: the value "0" will have to be set,
in the index number 1: apply 12 mA.

The input signal applied will be assigned to the minimum display-value set under index number 0.
The device confirms takeover on the display by: " P − L"

– Select **index number 2**: press key T1

– Set maximum display-value and decimal point: select digit / decimal point by T3 and adjust by T2.

Note When requiring a decimal point in the standard mode, it must be placed on the corresponding position before leaving this programming step.

– Select **index number 3**: press key T1

– Take over maximum input signal: apply maximum input signal to measuring input and press key T3.

The input signal applied will be assigned to the maximum display-value set under index number 2.
The indicator confirms takeover on the display by: " P − H"

– Select **index number 4**: press key T1

– Set mean-value formation: select number of measurements (1 − 99) select 1st and 2nd digit by T3 and adjust by T2.

The meter performs the selected number of measurements,
forms the mean-value of it and indicates it. (The value influences display only.)

Note If you expect heavily fluctuating measuring signals, you may stabilize display by this parameter.

– Setting line-break display: line-break display when falling 25% below measuring value (– = no, L = yes) select 3rd digit by T3 and adjust by T2.

– Select **index number 5**: press key T1

– Adjust rounding: select rounding last position (0 − 2 − 5 − 10) select digit by T3 and adjust by T2. (The value influences display only.)

Explanatory Note:
0 = no rounding
2 = rounding to 2 / 4 / 6 / 8 / 0
5 = rounding to 5 / 0
10 = last place always indicates 0

– **Restore standard mode:** bring slide switch S1 into position "standard mode"

The display indicates "Pr" for approx. 10 seconds.
Within this time, the parameters set before will be written into the EEPROM.

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Operating Instructions

Digital Large-Sized Displays, Programmable, Parallel, Serial, Date, Time, DCF 77

Summary Programming

Index Number	Display	Description
0		Input display initial value. Select digit by T3, set digit by T2 The minimum display-value must be positive (≥ 0).
1	P − L	Take over minimum input signal by T3 (applying at measuring input).
2		Input display end value and decimal point Select digit by T3, set digit by T2
3	P − H	Take over maximum input signal by T3 (applying at measuring input).
4	_ _ 1 ... _ 9 9 L _ _	Mean-value formation from alternatively 1 to 99 measurements line-break display when falling 25% below measuring value (– = no, L = yes)
5	_ _ 0 _ _ 2 _ _ 5 _ 1 0	Rounding of last position none in steps two by two in steps five by five in steps ten by ten

Display – Indications in the Standard Mode

Display	Description
Pr	Programming EEPROM
– – – – –	Overflow (center LED segments flash)
– | | –	Line-break display (falling below measuring value, possible with measuring signal 4 ... 20 mA only!)

Parallel Displays DGP 57/100

Input Pin Assignment (depending on display settings)

plug-in screw terminal strip 20-contacts, double-row

KZ	Display	Input																																						
00	___00	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
BCD	Multiplex 01 02	Ucc			Gnd	ST	A	B	C	D	DT	LE	DP	DT	LE	DP	DT	LE	DP	DT	LE	DP	DT	LE	DP																
Hex	Multiplex 03 04						BCD				10^0			10^1			10^2			10^3			10^4																		
BCD	Parallel 11 12	Ucc			Gnd	A	B	C	D	DT	LE	DP	A	B	C	D	DT	LE	DP	A	B	C	D	DT	LE	DP	A	B	C	D	DT	LE	DP	A	B	C	D	DT	LE	DP		
Hex	Parallel 13 14						BCD 10^0							BCD 10^1						BCD 10^2							BCD 10^3							BCD 10^4						

Comment on Input Pin Assignment-Table

Display 01/02/03/04 multiplex mode, i.e. one BCD bus for all positions
Display 11/12/13/14 parallel mode, i.e. a separate BCD bus input for each position

– BCD bus inputs 10^0 = place to one
10^1 = place to ten
10^2 = place to hundred
10^3 = place to thousand
10^4 = place to tenthousand
The connections are available resp. not available depending on number of places.
input A = valence 2^0
input B = valence 2^1
input C = valence 2^2
input D = valence 2^3

– Signal level (active high) HIGH = 10 ... 35 V, LOW = 0 ... 7 V

– Input resistance 15 kΩ

– Critical frequency 500 Hz

– Pulse width 2 ms min.

Functional Inputs active high, independent of BCD signals)

Note In the version "active high", the functional inputs should not be connected if a L signal is permanently desired.

signal / functional inputs		H signal	L signal
ST	segment test	all segments and DP light	normal operation
DT	blanking	display blanked	display visible
DP	decimal point	DP lights	DP blanked
LE	latch enable	display ≠ BCD input After changing from L to H the display stores the information which existed before changing the signal at the BCD input.	display = BCD input

ST has first priority

DT has second priority

BCD Codes

Index number 00	Display 00000	Parallel ___1x	Multiplex ___0x	Input code A B C D	Data inputs L H L H	L H L H	L H L H	L H L H
BCD	___11	___01	Display	L L L L	0 1 2 3	4 5 6 7	8 9	
BCD	___12	___02	Display 1st digit	L L L H	0 1 2 3 1 4 -	4 5 6 7	8 9	
Hex	___13	___03	Display	L L H L	0 1 2 3	4 5 6 7	8 9 A b	C d E F
Hex	___14	___04	Display 1st digit	L L H H	0 1 2 3 1 4 -	4 5 6 7	8 9 A b	C d E F
				H H H H	H H H H	H H H H	H H H H	H H H H

Functional Inputs (X = H or L)			
DT	H	L	X
LE	X	H	X
ST	L	L	H
Data	X	X	X
Display	blank	latch	test

Serial Displays DGS 57/100

DGS Functions

Index number	Display 00000	Description
0	0	Interface RS232
	1	20mA/TTY
	2	RS485
	3	RS422
1	1200	Baudrate 1200 Baud
	2400	2400 Baud
	4800	4800 Baud
	9600	9600 Baud
	19200	19200 Baud
2		Data format / Parity / Data bits
	1	n none 8 Bit
	2	E even 7 Bit
	3	o odd 7 Bit
	4	E even 8 Bit
	5	o odd 8 Bit
3		Telegram structure
	1	D1 ... Dn — time difference between 2 telegrams: min. 200 ms
	2	STX D1 ... Dn ETX
	3	STX Adresse Adresse D1 ... Dn ETX
	4	SOH Adresse Adresse STX D1 ... Dn ETX
	5	D1 ... Dn CR/LF
	6	D1 ... Dn CR
4	0 0	Device address 00...99 (100 addresses adjustable)
	– 1	Address 1: one digit (-0 ... -9)
	9 9	Address 99: two digits (00 ... 99)
5		Suppression of forwarding zeros: 0=disabled, 1=enabled
	0	Write direction right to left
	1	Write direction left to right
6	0 0 9 9	Suppression of up to 99 leading characters
7	0	0 = without decimal point
	–	1...n = decimal point 10^1...10^n (2^{nd} to n^{th} digit)
	0	when negative: underscores off
	1	when negative: minus and underscores on – ____
8	0 0	Timeout function disabled
	0 1	01...99 seconds after receiving the last telegram,
	9 9	the display indicates – – –//– –

If a one-digit address (-0 ... -9) is set in index no. 4 the telegram setup is shortened accordingly.

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Software Functions

Function	ASCII	Description
segment-test	$0	segment-test on (until the next telegram follows)
forwarding zeros	$1	forwarding zeros are displayed
	$2	forwarding zeros are not displayed
symbols flashing	$3 28	28 flashes
display flashing	$4	flashing on
	$5	flashing off
write direction	$6	left → right
	$7	right → left

Symbols

Hex	20	2C	2D	2E	30	31	32	33	34	35	36	37	38	39	3D	41	43	45	46	48	4C	50	55	5D	5F	62	63	64	68	6E	6F	72	75	78	7E
Digit		.	-	.	0	1	2	3	4	5	6	7	8	9	=	A	C	E	F	H	L	P	U	J	_	b	c	d	h	n	o	r	u	°	Y

unknown symbol: Ξ

Setting Date and Time DGU 57/100

Adjusting the date and time is performed either automatically in case the DCF 77 reception module has been connected, or it may be effected as described under ”Display Programming”.

A small control display on the rear of the case provides an easier calibration. The menu item selected will be indicated as index number on a small two-digit display.

Operating Elements

Slide Switch S1	Switch over between standard mode and programming mode.
Key T1	Selection of index number (programming step)
Key T3	Select digit to be set. (The digit selected will be accentuated by the flashing decimal point.) resp. take over date and time at index number 3.
Key T2	Set digit selected.

Display Programming

– Select programming mode / **index number 0**: bring slide switch S1 to position ”programming mode”.
– Set time-of-day (hours/minutes): select digit by T3 and adjust by T2.
– Select **index number 1**: press key T1
– Set date (day/month): select digit by T3 and adjust by T2.
– Select **index number 2**: press key T1
– Set year (4-digit): select digit by T3 and adjust by T2.
– Select **index number 3**: press key T1
– Take over values adjusted: press key T3

The values adjusted under index number 0, 1, 2 will be taken over.

The meter confirms takeover on the display by: ”P ”

– Select **index number 4**: press key T1
– Select display mode: select digit by T3 and adjust by T2. (2 digits from the right)

Settings as follows are possible:
”00” = date and time-of-day are indicated alternately
”01” = time-of-day only is indicated
”02” = date only is indicated

– Select **index number 5**: press key T1
– Select duration of display for time-of-day: select digit by T3 and adjust by T2. (2 digits from the right)

Settings as follows are possible:
”01” to ”99” = display-duration of time in seconds

– Select **index number 6**: press key T1
– Select duration of display for date: select digit by T3 and adjust by T2. (2 digits from the right)

Settings as follows are possible:
”01” to ”99” = display-duration of date in seconds

Note An entry under index number 5 and 6 shows effect on the display only, if setting ”00” (date / time alternately) was selected under index number 4.

– Select **index number 7**: press key T1
– Adjust display brightness: select digit by T3 and adjust by T2. (1 digit from the right)

Settings as follows are possible:
”1” = bright ”9” = dark

– **Restore standard mode:** bring slide switch S1 into position ”standard mode”

The display indicates ”EEP” for approx. 10 seconds.
Within this time, the parameters set before will be written into the EEPROM.

Summary

Index Number	Display	Description
0	0 0 0 0	set time-of-day
1	0 0 0 0	set date
2	0 0 0 0	set year
3	– –P–	take over date and time by T3
4	_ _ 0 0 _ _ 0 1 _ _ 0 2	date/time alternately indication of time only indication of date only
5	9 9 max.	duration of time display in seconds
6	9 9 max.	duration of date display in seconds
7	9 max.	display brightness 0=bright, 9=dark

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Operating Instructions

Digital Large-Sized Displays, Programmable, Parallel, Serial, Date, Time, DCF 77

DCF 77 – Reception Module

Operating Elements and Displays

Slide Switch S1	Reception test on/off
Key T1	Start reception test
LED 1 – 5	Display of reception quality
Jumper	Settings

Settings

The following settings are possible by jumpers: (x = jumper fixed)

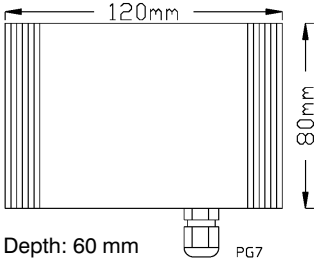
Jumper 1	2	8	9	11	Function
		x		x	DCF signal original
x					DCF signal tested
	x		x		send time log (RS 232)
	x		x		factory setting

Jumper 4	5	6	7	10	Function
	x			x	voltage output Low–active
	x		x		voltage output High–active
x		x			current loop Low: I < 5 mA, High: I > 10 mA voltage drop $U_{min} \leq 8$ V
	x	x	x		factory setting

Display Reception Quality

– Bring switch S1 (test) to position ON.
– Press Key T1.
  A reception test is started during which the reception quality is rated for approx. 3 minutes.
  The red LEDs indicate reception interferences during this time.
– Align the module in such a way that all red LEDs are erased.
– Bring switch S1 (test) to position OFF.

Dimensions

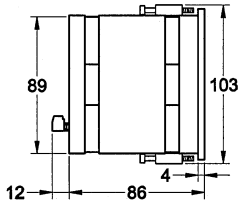


Depth: 60 mm

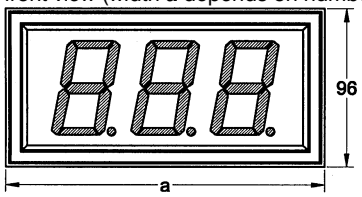
Dimensions

DGA / DGP / DGS 57

side view



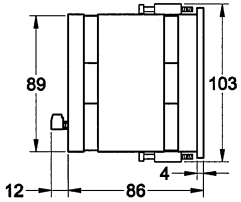
front view (width **a** depends on number of digits)



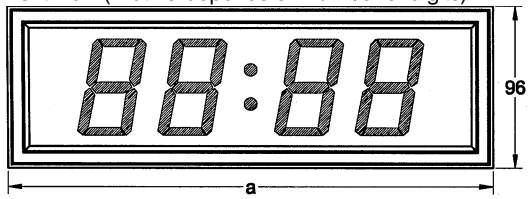
	Aluminium mounting case, powder-coated, black Case depth (including terminals) 86 mm (98 mm)		Front bezel width [a]	Front panel cutout w x h
DGA/DGP/DGS 57	DGA/DGP/DGS 57–D	DGA/DGP/DGS 57–D1		
30 888			192	186x90
40 8888	30 888 °C		240	234x90
50 88888	40 8888 °C	30 888 km/h	288	282x90
60 888888	50 88888 °C	40 8888 km/h	336	330x90
	60 888888 °C	50 88888 km/h	384	378x90
		60 888888 km/h	432	426x90

DGU 57

side view



front view (width **a** depends on number of digits)



Aluminium mounting case, powder-coated, black Case depth (including terminals) 86 mm (98 mm) DGU 57		Front bezel width [a]	Front panel cutout w x h
Time indication	Date indication		
40 88:88	40 88.88	288	282x90
60 88:88:88	60 88.88.88	384	378x90

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