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REFERENCE GUIDE

**Serial Interface
of TECON devices**

TECON

09.05.2001

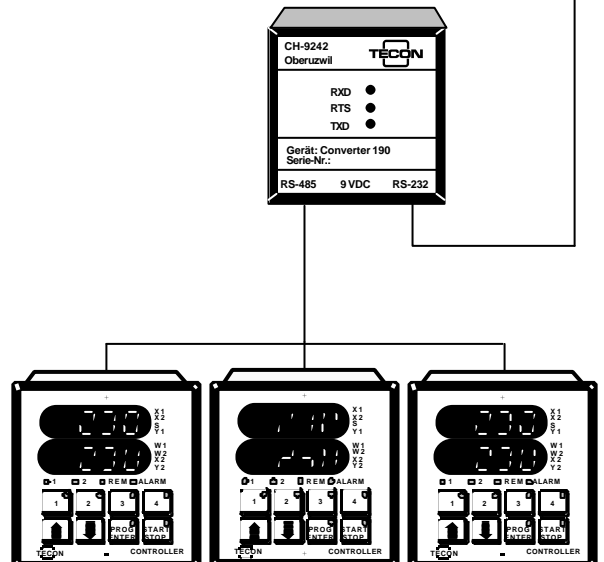
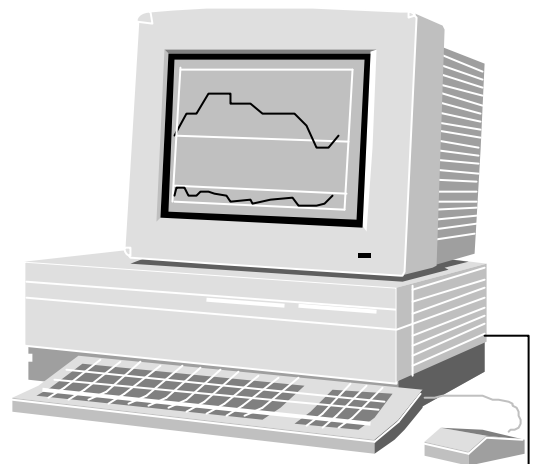


Table Of Contents:

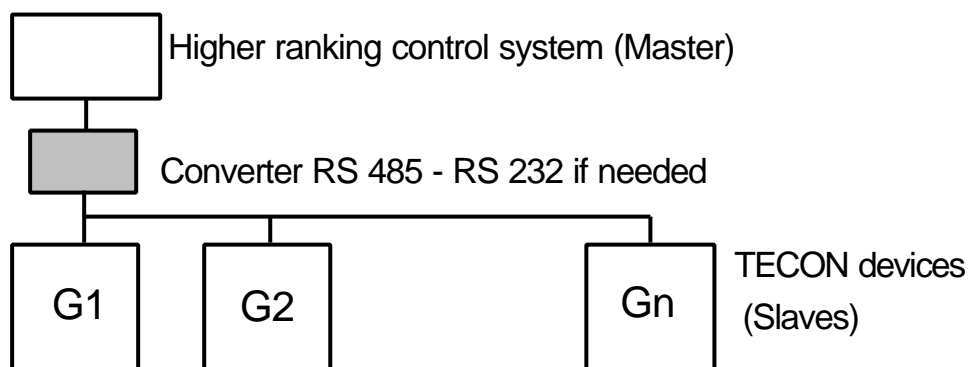
1. General Interface Data	3
1.1. Application of the interface	3
1.2. Interface data.....	3
1.3. Bus terminals on TECON devices	4
1.4. Structure of the TECON message	4
1.4.1. Structure of the message form master to slave	4
1.4.2. Structure of the answer from device to master.....	4
1.5. Timing of the interface.....	5
1.6. ASCII-hex character table	6
1.7. Examples.....	6
1.7.1. Switch device on	6
1.7.2. Setpoint to slave	6
1.7.3. Request actual value	6
1.7.4. Invalid message.....	6
1.7.5. Summation check.....	6
1.8. Hints	7
2. Messages of device families.....	8
2.1 Type and Version.....	8
2.2 Protocol 'C'	8
2.3 Devices Series 100.....	10
2.4 Devices Series 200.....	10
2.5 Devices Series 300.....	10
2.6 Devices Series 500.....	10
3. Alarm- and Program Data, Control parameters	11
3.1 Device list.....	11
3.2 Structure of Data Sets.....	14
3.3 Alarm Parameters (300)	15
3.4 Controlling Parameters (400).....	24
3.5 Process Programs (500)	36
3.6 Alarm Status (700).....	40
3.7 Special protocols	45
3.7.1 Tecon 234, 237 ,238.....	45

1. General Interface Data

1.1. Application of the interface

The standard serial interface of TECON devices is used for supervisory control. Every unit needs an individual address and the proper code for interface function (see manual of the device).

The higher ranking control system, e.g. a PC, communicates via RS 485 bus with the devices. It can send and ask for data. The addressed device answers in any case. So, the control system must take care, not to send new data to the bus before the answer of the last message is received.



If the control system has an RS232 interface, a converter to RS 485 is needed (e.g. TECON 190). Switching between sending and receiving may be done with the RTS-signal (Request To Send) or automatic, depending on the converter type.

1.2. Interface data

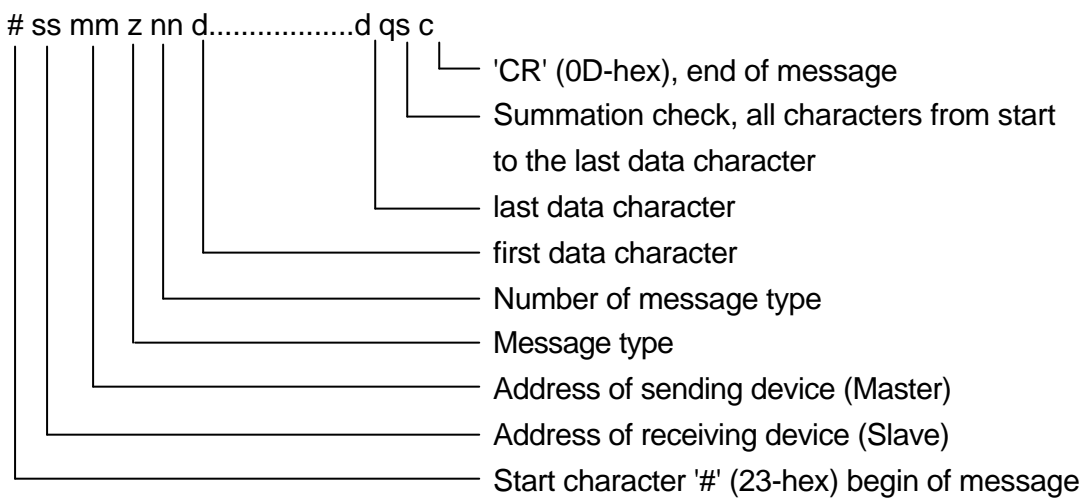
Hardware (EIA Standard)	RS 485, 2-wire
Baud rate	9600
max. number of devices	32
max. bus length	1000 m
Transmission	serial, asynchronous
Word length	1 Start-, 7 Data-, 1 Parity-, 1 Stop bit
Parity	odd

1.3. Bus terminals on TECON devices

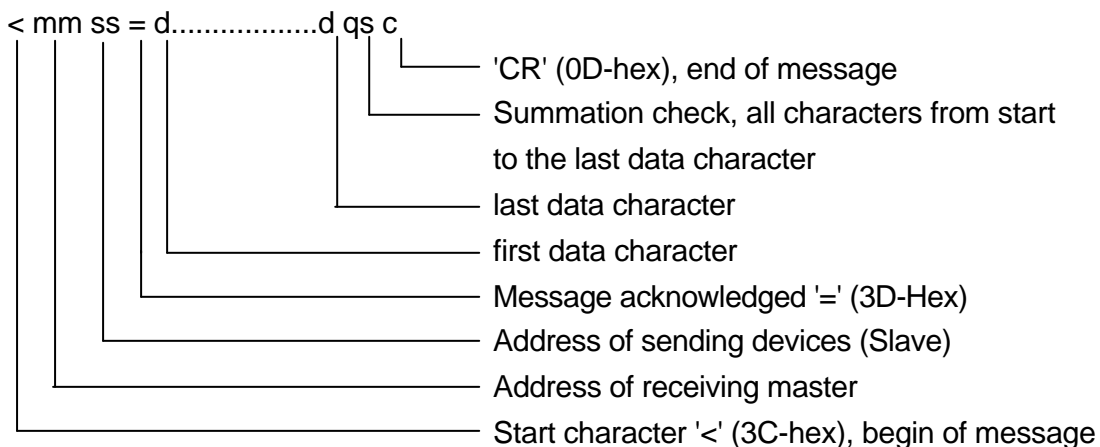
Signal	TECON 100	TECON 200	TECON 300	TECON 500
TxD/RxD +	9	30	16	30
TxD/RxD -	8	29	17	29
Gnd	12	1	18	1

1.4. Structure of the TECON message

1.4.1. Structure of the message form master to slave



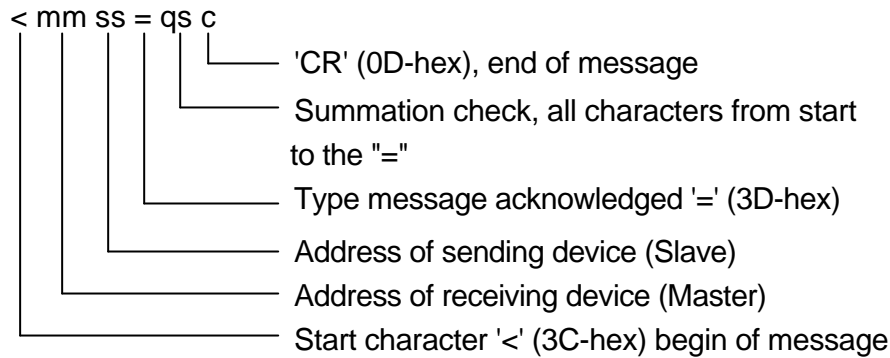
1.4.2. Structure of the answer from device to master



Serial Interface of TECON devices

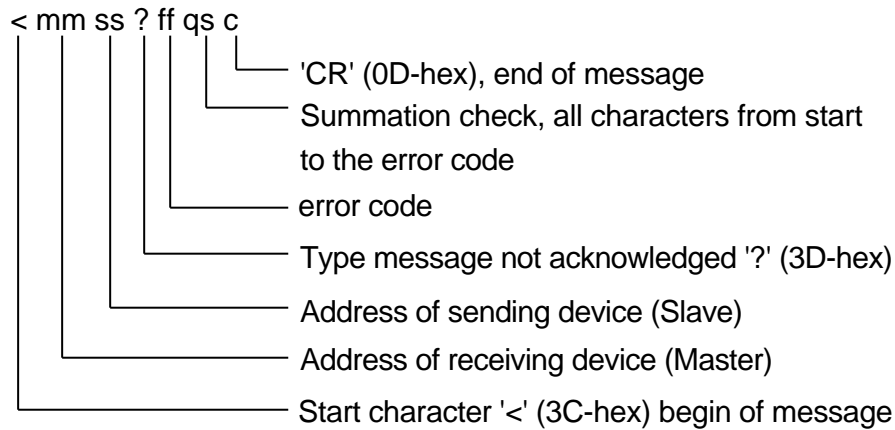
1.4.2.1. Answer 'Message acknowledged'

If the message from the master does not ask for data, the slave sends 'Message acknowledged'



1.4.2.2. Answer 'Message not acknowledged'

If a slave is addressed but the message can not be decoded, the slave sends 'Message not acknowledged' together with an error code.

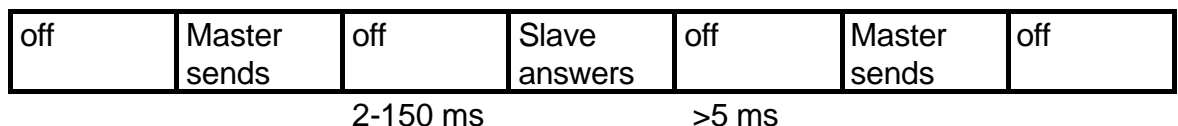


Error codes:

- "04" unknown type of message
- "05" invalid number of data characters
- "06" invalid character
- "07" invalid number of message type

'Message not acknowledged' may follow a request of data too.

1.5. Timing of the interface



('off' means all bus drivers are in high impedance state)

1.6. ASCII-hex character table

All digits (addresses, data, number of message type, error code, summation check) are represented in hex format. The conversion is shown below:

decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
ASCII-hex	30	31	32	33	34	35	36	37	38	39	41	42	43	44	45	46

1.7. Examples

The used unit '°C' is an example only.

cr = Carriage return = 0D hex, terminates all messages.

1.7.1. Switch device on

Master (address 02) sends to slave (address 05) message type "e" with type number 0:

#0502e00AFcr

Slave answers:

<0205=40cr

1.7.2. Setpoint to slave

Master (address 02) sends to slave (address 05) the setpoint value of -12.2°C:
-12.2°C = -122 x 0.1°C = FF86 Hex

#0502W00FF869Bcr

Slave answers:

<0205=40cr

1.7.3. Request actual value

Master (address 02) requests the actual value from slave (address 05):

#0502x01C2cr

Slave answers:

Actual value 1 = 816.2°C (in 0.1°C):

<0205=1FE22Ecr

1.7.4. Invalid message

Master sends invalid number of message type:

#0502W12000064cr

Slave answers:

<0205?07A9cr

Error code 07 = invalid number of message type.

1.7.5. Summation check

The summation check is the 1-byte-sum of all characters from start to the summation check.

2. Messages of device families

On all devices, type and version can be requested and protocol 'C' is available.

2.1 Type and Version

Message type: v

Number of the message type: 00

Example:

Master (address 02) sends to slave (address 05) character "v" with number 00:

#0502v00C0cr

Slave answers with: <0205=230-000ED7cr

Key: 230-: Type TECON 230
000E (hex): Version 1.4

2.2 Protocol 'C'

Master sends supervisory data and receives a number of actual process data. With , Mostly, this protocol is sufficient to control the devices. If a value of the protocol is not used, it may be replaced by the corresponding number of * .

Protocol C of master:

Message type: C

Number of message type: 00

Setpoint 1: xxxxxxxx or *****

Setpoint 2: xxxxxxxx or *****

Alarm acknowledge: 00 (no ackn.), 01 (ackn.) or **

Controlling mode: 00 (off), 01 (on) or **

digital outputs: xx or **

actual program number: xx or **

not used: ****

Answer of slave:

Setpoint 1: xxxxxxxx or *****

Setpoint 2: xxxxxxxx or *****

Actual value 1: xxxxxxxx or *****

Actual value 2: xxxxxxxx or *****

Output 1: xxxx or ****

Output 2: xxxx or ****

Alarm status: xx

Controlling mode: xx

Digital in- and outputs: xxxx or *****

Actual program number: xx or **

Serial Interface of TECON devices

Example

Master (address 02) sends to slave (address 05)
 character "C" with number 00
 Setpoint 1= 1000[1/10°C] = 100°C = 000003E8 hex
 Setpoint 2: ***** (not used)
 no alarm acknowledge
 controlling on
 no digital outputs
 actual program number not changed:

#0502C00C00000003E8*****01*****82cr

Slave answers with:

<0205=000003E8*****000003CB*****007D****0001****0064cr

Setpoint 1:	1000[1/10°C]
Setpoint 2:	not available
Actual value 1:	97.1[°C]
Actual value 2:	not available
Output 1:	12.5[%]
Output 2:	not available
Alarm status:	00 (no alarm)
Controlling mode:	01 (controlling on)
Digital in- and outputs:	not available
Actual program number:	00

Key for alarm status see paragraph 3.

Key for digital in- and outputs:

Digital inputs:	Digital outputs:
additional input 1 = 2 ⁶ (= 64)	additional output 1 = 2 ⁶ (= 64)
additional input 2 = 2 ³ (= 8)	additional output 2 = 2 ³ (= 8)
additional input 3 = 2 ⁷ (= 128)	additional output 3 = 2 ⁷ (= 128)
additional input 4 = 2 ² (= 4)	additional output 4 = 2 ² (= 4)
	additional output 5 = 2 ⁰ (= 1)
	additional output 6 = 2 ¹ (= 2)

2.3 Devices Series 100

Additional messages:

switch controlling on	# ss mm e 00 qs cr
switch controlling off	# ss mm a 00 qs cr
setpoint to slave	# ss mm W 01 nnnn qs cr
request actual value	# ss mm x 01 nnnn qs cr
set start program number *	# ss mm N 00 nn qs cr

*: devices with process programs only

2.4 Devices Series 200

Additional messages:

switch controlling on	# ss mm e 00 qs cr
switch controlling off	# ss mm a 00 qs cr
setpoint 1 to slave	# ss mm W 01 nnnn qs cr
setpoint 2 to slave	# ss mm W 02 nnnn qs cr
request actual value 1	# ss mm x 01 nnnn qs cr
request actual value 2	# ss mm x 02 nnnn qs cr
set start program number *	# ss mm N 00 nn qs cr

*: devices with process programs only

2.5 Devices Series 300

Additional messages:

switch controlling on	# ss mm e 00 qs cr
switch controlling off	# ss mm a 00 qs cr

2.6 Devices Series 500

Additional messages:

switch controlling on	# ss mm e 00 qs cr
switch controlling off	# ss mm a 00 qs cr
setpoint 1 to slave	# ss mm W 01 nnnn qs cr
setpoint 2 to slave	# ss mm W 02 nnnn qs cr
request actual value 1	# ss mm x 01 nnnn qs cr
request actual value 2	# ss mm x 02 nnnn qs cr
request output 1	# ss mm y 01 nnnn qs cr
request output 2	# ss mm y 02 nnnn qs cr
request alarm status	# ss mm f 00 nn qs cr
alarm acknowledge	# ss mm F 00 qs cr
request actual program number *	# ss mm n 00 nn qs cr
set start program number *	# ss mm N 00 nn qs cr

*: devices with process programs only

3. Alarm- and Program Data, Control parameters

According to device function, alarm data, control parameters, program data, and alarm codes are available. In the following list of device types, the numbers of the data sets are shown. The data sets are listed in the following paragraphs.

3.1 Device list

If data set number is 000 then no data set exists.

```
;PC=Protocol-C (identical for all devices)
;AP=AlarmParameters
;RP=ControllingParameters
;PP=ProcessProgram
;PV=ProgramRange (Controllers with Process Programs, see Par. 2)
;AT=AlarmTable
```

[Device]

PC,	AP,	RP,	PP,	PV,	AT		;additional available
090-0010=201,	337,	440,	000,	000,	702		; v,a,e,W,C *
017-0010=201,	337,	440,	000,	000,	702		; v,a,e,W,C *
112-0010=201,	304,	403,	000,	000,	702		; v,a,e,W,C *
112-0020=201,	304,	403,	000,	000,	702		; v,a,e,W,C *
130-0010=201,	305,	402,	502,	601,	702		; v,a,e,N,W,C
131-0012=201,	306,	404,	000,	000,	702		; v,a,e,W,C
131-0013=201,	305,	404,	000,	000,	702		; v,a,e,W,C
131-0015=201,	307,	404,	000,	000,	702		; v,a,e,W,C *
131-0020=201,	308,	404,	000,	000,	702		; v,a,e,W,C
131-0021=201,	307,	404,	503,	601,	703		; v,a,e,W,C
131-0025=201,	309,	404,	503,	601,	703		; v,a,e,W,C *
132-0010=201,	305,	404,	000,	000,	702		; v,a,e,W,C
132-0011=201,	307,	404,	000,	000,	702		; v,a,e,W,C *
132-0020=201,	307,	404,	503,	601,	703		; v,a,e,W,C
132-0021=201,	309,	404,	503,	601,	703		; v,a,e,W,C *
132-0030=201,	309,	404,	503,	601,	703		; v,a,e,W,C *
133-0010=201,	305,	404,	502,	601,	702		; v,a,e,N,W,C *
134-0010=201,	305,	404,	502,	601,	702		; v,a,e,N,W,C *
151-0010=201,	000,	000,	000,	000,	000		; v,W,C
151-0011=201,	000,	000,	000,	000,	704		; v,W,C *
151-0020=201,	000,	000,	000,	000,	000		; v,W,C *
151-0030=201,	000,	000,	000,	000,	702		; v,W,C *
160-0010=201,	000,	405,	000,	000,	000		
192-0024=201,	000,	406,	000,	000,	705		
192-0025=201,	000,	407,	000,	000,	706		
202-0010=201,	310,	408,	501,	601,	707		; v,a,e,N,W,C
202-0012=201,	311,	402,	502,	601,	707		; v,a,e,N,W,C
202-0014=201,	303,	402,	502,	601,	707		; v,a,e,N,W,C *
203-0010=201,	312,	409,	000,	000,	707		; v,a,e,N,W,C *
210-0010=201,	000,	000,	000,	000,	000		; v,a,e,N,W,C
210-0200=201,	000,	000,	000,	000,	000		; v,a,e,N,W,C
210-0300=201,	000,	000,	000,	000,	000		; v,a,e,N,W,C
210-1000=201,	000,	000,	000,	000,	000		; v,a,e,N,W,C
230-0010=201,	310,	408,	501,	601,	707		; v,a,e,N,W,C
230-0012=201,	311,	402,	502,	601,	707		; v,a,e,N,W,C
230-0015=201,	303,	402,	502,	601,	707		; v,a,e,N,W,C
230-0016=201,	303,	409,	502,	601,	707		; v,a,e,N,W,C
230-0019=201,	313,	409,	502,	601,	707		; v,a,e,N,W,C *
230-0100=201,	313,	409,	502,	601,	707		; v,a,e,N,W,C
230-0020=201,	311,	402,	502,	601,	707		; v,a,e,N,W,C

Serial Interface of TECON devices

230-0022=201, 314, 410, 504, 601, 707	; v,a,e,N,W,C
230-0072=201, 311, 411, 505, 601, 707	; v,a,e,N,W,C
230-0080=201, 311, 000, 000, 601, 707	; v,a,e,N,W,C
230-0090=201, 315, 412, 502, 601, 707	; v,a,e,N,W,C
230-3000=201, 313, 409, 502, 601, 707	; v,a,e,N,W,C
231-0010=201, 310, 408, 501, 601, 707	; v,a,e,W,C
231-0012=201, 311, 402, 000, 000, 707	; v,a,e,W,C
231-0013=201, 312, 402, 000, 000, 707	; v,a,e,W,C
231-0016=201, 312, 409, 000, 000, 707	; v,a,e,W,C
231-0021=201, 314, 413, 501, 601, 707	; v,a,e,W,C
231-0022=201, 311, 402, 503, 601, 707	; v,a,e,W,C
231-0050=201, 316, 414, 000, 000, 707	; v,a,e,W,C
231-0060=201, 314, 000, 000, 000, 707	; v,a,e,W,C
231-0100=201, 312, 409, 000, 000, 707	; v,a,e,W,C
231-0110=201, 312, 409, 000, 000, 707	; v,a,e,W,C
231-1100=201, 312, 408, 000, 000, 707	; v,a,e,W,C
231-1200=201, 312, 402, 000, 000, 707	; v,a,e,W,C
231-4100=201, 312, 403, 000, 000, 707	; v,a,e,W,C
232-0010=201, 303, 402, 502, 601, 707	; v,a,e,N,W,C
232-0040=201, 303, 000, 502, 601, 707	; v,a,e,N,W,C
234-0010=201, 317, 416, 000, 000, 707	; v,a,e,W,C+spez
235-0010=201, 330, 417, 521, 601, 707	; v,a,e,N,W,C
235-0020=201, 330, 417, 521, 601, 707	; v,a,e,N,W,C
235-0050=201, 330, 417, 526, 601, 707	; v,a,e,N,W,C
235-0060=201, 330, 417, 521, 601, 707	; v,a,e,N,W,C
236-0010=201, 340, 417, 000, 000, 707	; v,a,e,N,W,C
236-4100=201, 340, 417, 000, 000, 707	; v,a,e,N,W,C
237-0010=201, 319, 418, 000, 000, 701	; v,a,e,N,W,C
237-0300=201, 319, 418, 000, 000, 701	; v,a,e,N,W,C
238-0015=201, 301, 401, 000, 000, 701	; v,a,e,W,C,o+spez
238-0040=201, 301, 401, 000, 000, 701	; v,a,e,W,C,o+spez
239-0011=201, 312, 403, 000, 000, 707	; v,a,e,W,C
241-0010=201, 334, 434, 000, 000, 707	; v,a,e,W,C,+spez
241-0011=201, 334, 436, 000, 000, 707	; v,a,e,W,C,+spez
245-0010=201, 333, 435, 522, 601, 708	; v,a,e,W,C,+spez
245-1000=201, 333, 435, 522, 601, 708	; v,a,e,W,C,+spez
246-0010=201, 338, 441, 524, 601, 708	; v,a,e,W,C,+spez
249-0010=201, 336, 438, 522, 601, 708	; v,a,e,W,C,+spez
330-0010=201, 000, 000, 000, 000, 000	; v,a,e,W,C
330-0030=201, 000, 000, 000, 000, 000	; v,a,e,W,C
350-0010=201, 000, 000, 000, 000, 000	; v,C,r,R
350-1000=201, 000, 000, 000, 000, 000	; v,C,r,R
501-1022=201, 314, 419, 509, 601, 707	; v,a,e,N,W,C+spez
501-1024=201, 314, 433, 509, 601, 707	; v,a,e,N,W,C+spez
501-1062=201, 320, 403, 507, 601, 708	; v,a,e,N,W,C+spez
501-1220=201, 314, 402, 509, 601, 707	; v,a,e,N,W,C+spez
501-1230=201, 314, 402, 508, 601, 707	; v,a,e,N,W,C+spez
501-1240=201, 314, 402, 509, 601, 707	; v,a,e,N,W,C+spez
501-1250=201, 314, 402, 508, 601, 707	; v,a,e,N,W,C+spez
501-1300=201, 314, 402, 510, 601, 707	; v,a,e,N,W,C+spez
501-1310=201, 314, 402, 511, 601, 707	; v,a,e,N,W,C+spez
501-1350=201, 321, 420, 512, 601, 707	; v,a,e,N,W,C+spez
501-1400=201, 314, 402, 509, 601, 707	; v,a,e,N,W,C+spez
501-4190=201, 314, 421, 509, 601, 707	; v,a,e,N,W,C+spez
501A1020=201, 314, 437, 509, 601, 707	; v,a,e,N,W,C+spez
501A1220=201, 314, 402, 509, 601, 707	; v,a,e,N,W,C+spez
501A1230=201, 314, 402, 508, 601, 707	; v,a,e,N,W,C+spez
501A1240=201, 314, 402, 509, 601, 707	; v,a,e,N,W,C+spez
501A1250=201, 314, 402, 508, 601, 707	; v,a,e,N,W,C+spez
501A1390=201, 314, 402, 508, 601, 707	; v,a,e,N,W,C+spez
521A1100=201, 335, 439, 509, 601, 713	; v,a,e,N,W,C+spez
501A4010=201, 339, 403, 525, 601, 713	; v,a,e,N,W,C+spez

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Serial Interface of TECON devices

501A4020=201, 339, 403, 525, 601, 713	; v,a,e,N,W,C+spez	
530-1151=201, 328, 422, 513, 601, 707	; v,a,e,N,W,C+spez	
530-1290=201, 318, 423, 513, 601, 707	; v,a,e,N,W,C+spez	
530-1320=201, 318, 424, 514, 601, 707	; v,a,e,N,W,C+spez	
530-1330=201, 318, 424, 515, 601, 707	; v,a,e,N,W,C+spez	
530-4162=201, 318, 424, 513, 601, 707	; v,a,e,N,W,C+spez	
530-4180=201, 318, 425, 513, 601, 707	; v,a,e,N,W,C+spez	
530-4182=201, 318, 424, 513, 601, 707	; v,a,e,N,W,C+spez	
530A4160=201, 318, 424, 513, 601, 707	; v,a,e,N,W,C+spez	
530A4170=201, 330, 442, 527, 601, 707	; v,a,e,N,W,C+spez	
530A4180=201, 318, 425, 513, 601, 707	; v,a,e,N,W,C+spez	
530A4200=201, 330, 442, 527, 601, 707	; v,a,e,N,W,C+spez	
531-1360=201, 322, 426, 516, 601, 709		
534-1280=201, 328, 422, 513, 601, 707	; v,a,e,N,W,C+spez	
541-1163=201, 329, 427, 529, 601, 710	; v,a,e,N,W,C+spez	
541-1211=201, 323, 427, 509, 601, 710	; v,a,e,N,W,C+spez	
551-1036=201, 324, 428, 517, 601, 707	; v,a,e,N,W,C+spez	
551-1144=201, 325, 429, 518, 601, 710	; v,a,e,N,W,C+spez	
564-0014=201, 326, 430, 519, 601, 711	; v,a,e,N,W,C+spez	
590-0012=201, 327, 431, 520, 601, 708	; v,a,e,N,W,C+spez	
10020013=201, 331, 408, 502, 601, 707	; v,a,e,N,W,C	
10020020=201, 331, 408, 502, 601, 707	; v,a,e,N,W,C	
10020040=201, 331, 403, 502, 601, 707	; v,a,e,N,W,C	
10520100=201, 332, 432, 521, 601, 707	; v,a,e,N,W,C	
23100001=201, 341, 443, 528, 601, 714	; v,a,e,N,W,C	
23100013=201, 341, 444, 528, 601, 714	; v,a,e,N,W,C	
23200010=201, 341, 445, 528, 601, 714	; v,a,e,N,W,C	
UNI-0001=201, 000, 000, 000, 000, 712	; v,C	
d5000020=201, 313, 409, 502, 601, 707	; v,a,e,N,W,C	*
d2000020=201, 313, 409, 502, 601, 707	; v,a,e,N,W,C	*
d3000020=201, 313, 409, 502, 601, 707	; v,a,e,N,W,C	*
d3010020=201, 313, 409, 502, 601, 707	; v,a,e,N,W,C	*
d5000100=201, 313, 409, 502, 601, 707	; v,a,e,N,W,C	*
20020020=201, 313, 409, 502, 601, 707	; v,a,e,N,W,C	*

3.2 Structure of Data Sets

Example:

```
[AlarmParameter-320];          basis 310
Def=A,c,0,01,36,36,09,09
01=Sensor 1 ,Upper Limit      ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit     ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Sensor 2 ,Upper Limit     ,°C , 0.1 , -0200.00, 2000.00, 09, 04
04=Sensor 2 ,Lower Limit     ,°C , 0.1 , -0200.00, 2000.00, 13, 04
05=Setpoint 1,Overflow       ,°C , 0.1 , 0000.00, 0099.00, 17, 04
06=Setpoint 1,Underflow     ,°C , 0.1 , 0000.00, 0099.00, 21, 04
07=Setpoint 2,Overflow       ,°C , 0.1 , 0000.00, 0099.00, 25, 04
08=Setpoint 2,Underflow     ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=-          ,Alarm Code    ,   , 1   , 0000.00, 0031.00, 33, 04
```

Key:

Comment: ; after semicolon

Name and number of data set: [AlarmParameter-301]

Structure of header: Def=d1,d2,d3,d4,d5,d6,d7,d8

- d1 Message type character from master to slave
- d2 Message type character from slave to master
- d3 First number of message type
- d4 Number of message types
- d5 Number of data characters from master to slave
- d6 Number of data characters from slave to master
- d7 Number of values from master to slave
- d8 Number of values from slave to master

Structure of table: 01=t1,t2,e1,f1,w1,w2,s1,l1

- 01= Value number
- t1,t2 Names of values
- e1 Unit
- f1 Factor (displayed value = transmitted value * f1)
- w1 Lower limit
- w2 Upper limit
- s1 Startposition of first character of the value
- l1 Number of characters of the value

3.3 Alarm Parameters (300)

[AlarmParameter-301]

Def=A,c,0,01,20,20,05,05

01=Sensor 1-8,Upper Limit	,°C ,	0.1	,-0200.00,	2000.00,	01,	04
02=Sensor 1-8,Lower Limit	,°C ,	0.1	,-0200.00,	2000.00,	05,	04
03=Setpoint ,Overflow	,°C ,	0.1	, 0000.00,	0099.00,	09,	04
04=Setpoint ,Underflow	,°C ,	0.1	, 0000.00,	0099.00,	13,	04
05=- ,Alarm Code	, ,	1	, 0000.00,	0004.00,	17,	04

[AlarmParameter-302]

Def=A,c,0,01,44,44,11,11

01=Sensor 1 ,Upper Limit	,°C ,	0.1	,-0200.00,	2000.00,	01,	04
02=Sensor 1 ,Lower Limit	,°C ,	0.1	,-0200.00,	2000.00,	05,	04
03=Setpoint 1,Overflow	,°C ,	0.1	, 0000.00,	0099.00,	09,	04
04=Setpoint 1,Underflow	,°C ,	0.1	, 0000.00,	0099.00,	13,	04
05=- ,Alarm Code 1	, ,	1	, 0000.00,	0004.00,	17,	04
06=Sensor 2 ,Upper Limit	,°C ,	0.1	,-0200.00,	2000.00,	21,	04
07=Sensor 2 ,Lower Limit	,°C ,	0.1	,-0200.00,	2000.00,	25,	04
08=Setpoint 2,Overflow	,°C ,	0.1	, 0000.00,	0099.00,	29,	04
09=Setpoint 2,Underflow	,°C ,	0.1	, 0000.00,	0099.00,	33,	04
10=- ,Alarm Code 2	, ,	1	, 0000.00,	0004.00,	37,	04
11=- ,Alarm Code 3	, ,	1	, 0000.00,	0007.00,	41,	04

[AlarmParameter-303]

Def=A,c,0,01,48,48,12,12

01=Sensor 1 ,Upper Limit	,°C ,	0.1	,-0200.00,	2000.00,	01,	04
02=Sensor 1 ,Lower Limit	,°C ,	0.1	,-0200.00,	2000.00,	05,	04
03=Setpoint 1,Overflow	,°C ,	0.1	, 0000.00,	0099.00,	09,	04
04=Setpoint 1,Underflow	,°C ,	0.1	, 0000.00,	0099.00,	13,	04
05=- ,Alarm Code 1	, ,	1	, 0000.00,	0004.00,	17,	04
06=Sensor 2 ,Upper Limit	,°C ,	0.1	,-0200.00,	2000.00,	21,	04
07=Sensor 2 ,Lower Limit	,°C ,	0.1	,-0200.00,	2000.00,	25,	04
08=Setpoint 2,Overflow	,°C ,	0.1	, 0000.00,	0099.00,	29,	04
09=Setpoint 2,Underflow	,°C ,	0.1	, 0000.00,	0099.00,	33,	04
10=- ,Alarm Code 2	, ,	1	, 0000.00,	0004.00,	37,	04
11=- ,Alarm Code 3	, ,	1	, 0000.00,	0007.00,	41,	04
12=- ,Treshold	,°C ,	0.1	,-0200.00,	2000.00,	45,	04

[AlarmParameter-304]

Def=A,c,0,01,60,60,15,15

01=Sensor ,	, ,	1	, 0000.00,	0009.00,	01,	04
02=Current in,Range Lower Limit	,°C ,	0.1	,-0200.00,	2000.00,	05,	04
03=Current in,Range Upper Limit	,°C ,	0.1	,-0200.00,	2000.00,	09,	04
04=Setpoint ,Lower Limit	,°C ,	0.1	,-0200.00,	2000.00,	13,	04
05=Setpoint ,Upper Limit	,°C ,	0.1	,-0200.00,	2000.00,	17,	04
06=Filter ,Time Constant	,s ,	0.1	, 0000.00,	0099.00,	21,	04
07=Sensor ,Offset	,°C ,	0.1	,-0099.00,	0099.00,	25,	04
08=- ,Threshold	,°C ,	0.1	,-0200.00,	2000.00,	29,	04
09=Relays 1&2,Hysteresis	,°C ,	0.1	, 0000.00,	0099.00,	33,	04
10=Alarm Code,	, ,	1	, 0000.00,	0002.00,	37,	04
11=Combi- ,Input Code	, ,	1	, 0000.00,	0002.00,	41,	04
12=Controller,Code	, ,	1	, 0000.00,	0009.00,	45,	04
13=Relay 1 ,Code	, ,	1	, 0000.00,	0001.00,	49,	04
14=Relay 2 ,Code	, ,	1	, 0000.00,	0001.00,	53,	04
15=Timeout ,Serial Interface	,s ,	1	, 0000.00,	0999.00,	57,	04

Serial Interface of TECON devices

[AlarmParameter-305]

Def=A,c,0,01,28,28,07,07

01=Sensor	,Upper Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 01,	04
02=Sensor	,Lower Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 05,	04
03=Setpoint	,Overflow	,°C	, 0.1	, 0000.00	, 0099.00	, 09,	04
04=Setpoint	,Underflow	,°C	, 0.1	, 0000.00	, 0099.00	, 13,	04
05=-	,Alarm Code 1	,	, 1	, 0000.00	, 0009.00	, 17,	04
06=-	,Alarm Code 2	,	, 1	, 0000.00	, 0001.00	, 21,	04
07=-	,Treshold	,°C	, 0.1	,-0200.00	, 2000.00	, 25,	04

[AlarmParameter-306]

Def=A,c,0,01,24,24,06,06

01=Sensor	,Upper Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 01,	04
02=Sensor	,Lower Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 05,	04
03=Setpoint	,Overflow	,°C	, 0.1	, 0000.00	, 0099.00	, 09,	04
04=Setpoint	,Underflow	,°C	, 0.1	, 0000.00	, 0099.00	, 13,	04
05=-	,Alarm Code 1	,	, 1	, 0000.00	, 0009.00	, 17,	04
06=-	,Treshold	,°C	, 0.1	,-0200.00	, 2000.00	, 21,	04

[AlarmParameter-307]

Def=A,c,0,01,28,28,07,07

01=Sensor 1	,Upper Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 01,	04
02=Sensor 1	,Lower Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 05,	04
03=Setpoint	,Overflow	,°C	, 0.1	, 0000.00	, 0099.00	, 09,	04
04=Setpoint	,Underflow	,°C	, 0.1	, 0000.00	, 0099.00	, 13,	04
05=-	,Alarm Code 1	,	, 1	, 0000.00	, 0009.00	, 17,	04
06=-	,Alarm Code 2	,	, 1	, 0000.00	, 0003.00	, 21,	04
07=-	,Treshold	,°C	, 0.1	,-0200.00	, 2000.00	, 25,	04

[AlarmParameter-308]

Def=A,c,0,01,24,24,06,06

01=Sensor	,Upper Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 01,	04
02=Sensor	,Lower Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 05,	04
03=Setpoint	,Overflow	,°C	, 0.1	, 0000.00	, 0099.00	, 09,	04
04=Setpoint	,Underflow	,°C	, 0.1	, 0000.00	, 0099.00	, 13,	04
05=-	,Alarm Code 1	,	, 1	, 0000.00	, 0015.00	, 17,	04
06=-	,Treshold	,°C	, 0.1	,-0200.00	, 2000.00	, 21,	04

[AlarmParameter-309]

Def=A,c,0,01,28,28,07,07

01=Sensor	,Upper Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 01,	04
02=Sensor	,Lower Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 05,	04
03=Setpoint	,Overflow	,°C	, 0.1	, 0000.00	, 0099.00	, 09,	04
04=Setpoint	,Underflow	,°C	, 0.1	, 0000.00	, 0099.00	, 13,	04
05=-	,Alarm Code 1	,	, 1	, 0000.00	, 0009.00	, 17,	04
06=-	,Alarm Code 2	,	, 1	, 0000.00	, 0007.00	, 21,	04
07=-	,Treshold	,°C	, 0.1	,-0200.00	, 2000.00	, 25,	04

[AlarmParameter-310]

Def=A,c,0,01,36,36,09,09

01=Sensor 1	,Upper Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 01,	04
02=Sensor 1	,Lower Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 05,	04
03=Sensor 2	,Upper Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 09,	04
04=Sensor 2	,Lower Limit	,°C	, 0.1	,-0200.00	, 2000.00	, 13,	04
05=Setpoint 1	,Overflow	,°C	, 0.1	, 0000.00	, 0099.00	, 17,	04
06=Setpoint 1	,Underflow	,°C	, 0.1	, 0000.00	, 0099.00	, 21,	04
07=Setpoint 2	,Overflow	,°C	, 0.1	, 0000.00	, 0099.00	, 25,	04

Serial Interface of TECON devices

```
08=Setpoint 2,Underflow           ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=-                               , , 1 , 0000.00, 0004.00, 33, 04
```

```
[AlarmParameter-311];           Basis 303
```

```
Def=A,c,0,01,48,48,12,12
01=Sensor 1 ,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-                               , , 1 , 0000.00, 0004.00, 17, 04
06=Sensor 2 ,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower Limit         ,°C , 0.1 , -0200.00, 2000.00, 25, 04
08=Setpoint 2,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=Setpoint 2,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=-                               , , 1 , 0000.00, 0004.00, 37, 04
11=-                               , , 1 , 0000.00, 0003.00, 41, 04
12=-                               ,°C , 0.1 , -0200.00, 2000.00, 45, 04
```

```
[AlarmParameter-312];           Basis 303
```

```
Def=A,c,0,01,48,48,12,12
01=Sensor 1 ,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-                               , , 1 , 0000.00, 0008.00, 17, 04
06=Sensor 2 ,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower Limit         ,°C , 0.1 , -0200.00, 2000.00, 25, 04
08=Setpoint 2,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=Setpoint 2,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=-                               , , 1 , 0000.00, 0008.00, 37, 04
11=-                               , , 1 , 0000.00, 0003.00, 41, 04
12=-                               ,°C , 0.1 , -0200.00, 2000.00, 45, 04
```

```
[AlarmParameter-313];           Basis 303
```

```
Def=A,c,0,01,48,48,12,12
01=Sensor 1 ,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-                               , , 1 , 0000.00, 0004.00, 17, 04
06=Sensor 2 ,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower Limit         ,°C , 0.1 , -0200.00, 2000.00, 25, 04
08=Setpoint 2,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=Setpoint 2,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=-                               , , 1 , 0000.00, 0004.00, 37, 04
11=-                               , , 1 , 0000.00, 0008.00, 41, 04
12=-                               ,°C , 0.1 , -0200.00, 2000.00, 45, 04
```

```
[AlarmParameter-314];           basis 302
```

```
Def=A,c,0,01,44,44,11,11
01=Sensor 1 ,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-                               , , 1 , 0000.00, 0004.00, 17, 04
06=Sensor 2 ,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower Limit         ,°C , 0.1 , -0200.00, 2000.00, 25, 04
08=Setpoint 2,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 29, 04
```

Serial Interface of TECON devices

```

09=Setpoint 2,Underflow           ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=-                               ,   ,   1   , 0000.00, 0004.00, 37, 04
11=-                               ,   ,   1   , 0000.00, 0003.00, 41, 04

```

[AlarmParameter-315]

Def=A,c,0,01,16,16,04,04

```

01=Sensor 1-8,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1-8,Lower Limit        ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Setpoint ,Overflow             ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint ,Underflow           ,°C , 0.1 , 0000.00, 0099.00, 13, 04

```

[AlarmParameter-316]

Def=A,c,0,01,24,24,06,06

```

01=Sensor ,Upper Limit            ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor ,Lower Limit           ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Setpoint ,Overflow            ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint ,Underflow           ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-                               ,   ,   1   , 0000.00, 0004.00, 17, 04
06=-                               ,   ,   1   , 0000.00, 0003.00, 21, 04

```

[AlarmParameter-317]

Def=A,c,0,01,44,44,11,11

```

01=Sensor 1-2,Upper Limit         ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1-2,Lower Limit        ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Sensor 3-4,Upper Limit        ,°C , 0.1 , -0200.00, 2000.00, 09, 04
04=Sensor 3-4,Lower Limit        ,°C , 0.1 , -0200.00, 2000.00, 13, 04
05=Sensor 5-6,Upper Limit        ,°C , 0.1 , -0200.00, 2000.00, 17, 04
06=Sensor 5-6,Lower Limit        ,°C , 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 7-8,Upper Limit        ,°C , 0.1 , -0200.00, 2000.00, 25, 04
08=Sensor 7-8,Lower Limit        ,°C , 0.1 , -0200.00, 2000.00, 29, 04
09=Setpoint ,Overflow            ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=Setpoint ,Underflow           ,°C , 0.1 , 0000.00, 0099.00, 37, 04
11=-                               ,   ,   1   , 0000.00, 0007.00, 41, 04

```

[AlarmParameter-318]

Def=B,b,0,01,48,48,12,12

```

01=Sensor 1 ,Upper Limit          ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit          ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow            ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow           ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-                               ,   ,   1   , 0000.00, 0004.00, 17, 04
06=Sensor 2 ,Upper Limit          ,°C , 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower Limit          ,°C , 0.1 , -0200.00, 2000.00, 25, 04
08=Setpoint 2,Overflow            ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=Setpoint 2,Underflow           ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=-                               ,   ,   1   , 0000.00, 0004.00, 37, 04
11=-                               ,   ,   1   , 0000.00, 0003.00, 41, 04
12=-                               ,   ,   1   , 0000.00, 0002.00, 45, 04

```

[AlarmParameter-319]

Def=A,c,0,01,68,68,17,17

```

01=Sensor 1 ,Upper Limit          ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit          ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Sensor 2 ,Upper Limit          ,°C , 0.1 , -0200.00, 2000.00, 09, 04
04=Sensor 2 ,Lower Limit          ,°C , 0.1 , -0200.00, 2000.00, 13, 04
05=Sensor 3 ,Upper Limit          ,°C , 0.1 , -0200.00, 2000.00, 17, 04
06=Sensor 3 ,Lower Limit          ,°C , 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 4 ,Upper Limit          ,°C , 0.1 , -0200.00, 2000.00, 25, 04

```

Serial Interface of TECON devices

```

08=Sensor 4 ,Lower Limit           ,°C , 0.1 , -0200.00, 2000.00, 29, 04
09=Sensor 5 ,Upper Limit           ,°C , 0.1 , -0200.00, 2000.00, 33, 04
10=Sensor 5 ,Lower Limit           ,°C , 0.1 , -0200.00, 2000.00, 37, 04
11=Sensor 6 ,Upper Limit           ,°C , 0.1 , -0200.00, 2000.00, 41, 04
12=Sensor 6 ,Lower Limit           ,°C , 0.1 , -0200.00, 2000.00, 45, 04
13=Sensor 7 ,Upper Limit           ,°C , 0.1 , -0200.00, 2000.00, 49, 04
14=Sensor 7 ,Lower Limit           ,°C , 0.1 , -0200.00, 2000.00, 53, 04
15=Sensor 8 ,Upper Limit           ,°C , 0.1 , -0200.00, 2000.00, 57, 04
16=Sensor 7 ,Lower Limit           ,°C , 0.1 , -0200.00, 2000.00, 61, 04
17=-      ,Alarm Code 1           , , 1 , 0000.00, 0004.00, 65, 04

```

```

[AlarmParameter-320];                basis 310
Def=A,c,0,01,36,36,09,09
01=Sensor 1 ,Upper Limit           ,°C , 0.1 , -0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit           ,°C , 0.1 , -0200.00, 2000.00, 05, 04
03=Sensor 2 ,Upper Limit           ,°C , 0.1 , -0200.00, 2000.00, 09, 04
04=Sensor 2 ,Lower Limit           ,°C , 0.1 , -0200.00, 2000.00, 13, 04
05=Setpoint 1,Overflow             ,°C , 0.1 , 0000.00, 0099.00, 17, 04
06=Setpoint 1,Underflow            ,°C , 0.1 , 0000.00, 0099.00, 21, 04
07=Setpoint 2,Overflow             ,°C , 0.1 , 0000.00, 0099.00, 25, 04
08=Setpoint 2,Underflow            ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=-      ,Alarm Code             , , 1 , 0000.00, 0031.00, 33, 04

```

```

[AlarmParameter-321];                basis 302
Def=A,c,0,01,44,44,11,11
01=Sensor 1 ,Upper Limit           ,%rF, 0.1 , 0000.00, 0100.00, 01, 04
02=Sensor 1 ,Lower Limit           ,%rF, 0.1 , 0000.00, 0100.00, 05, 04
03=Setpoint 1,Overflow             ,%rF, 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow            ,%rF, 0.1 , 0000.00, 0099.00, 13, 04
05=-      ,Alarm Code 1           , , 1 , 0000.00, 0004.00, 17, 04
06=Sensor 2 ,Upper Limit           ,%rF, 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower Limit           ,%rF, 0.1 , -0200.00, 2000.00, 25, 04
08=Setpoint 2,Overflow             ,%rF, 0.1 , 0000.00, 0099.00, 29, 04
09=Setpoint 2,Underflow            ,%rF, 0.1 , 0000.00, 0099.00, 33, 04
10=-      ,Alarm Code 2           , , 1 , 0000.00, 0004.00, 37, 04
11=-      ,Alarm Code 3           , , 1 , 0000.00, 0003.00, 41, 04

```

```

[AlarmParameter-322]
Def=A,c,0,01,48,48,12,12
01=Sensor 1 ,Alarm Code           , , 1 , 0000.00, 0022.00, 01, 04
02=Sensor 1 ,Alarm Limit           , , 1 , 0000.00, 2000.00, 05, 04
03=Sensor 1 ,Alarm Value           , , 1 , 0000.00, 2000.00, 09, 04
04=Sensor 2 ,Alarm Code           , , 1 , 0000.00, 0022.00, 13, 04
05=Sensor 2 ,Alarm Limit           , , 1 , 0000.00, 2000.00, 17, 04
06=Sensor 2 ,Alarm Value           , , 1 , 0000.00, 2000.00, 21, 04
07=Sensor 3 ,Alarm Code           , , 1 , 0000.00, 0022.00, 25, 04
08=Sensor 3 ,Alarm Limit           , , 1 , 0000.00, 2000.00, 29, 04
09=Sensor 3 ,Alarm Value           , , 1 , 0000.00, 2000.00, 33, 04
10=Sensor 4 ,Alarm Code           , , 1 , 0000.00, 0022.00, 37, 04
11=Sensor 4 ,Alarm Limit           , , 1 , 0000.00, 2000.00, 41, 04
12=Sensor 4 ,Alarm Value           , , 1 , 0000.00, 2000.00, 45, 04

```

```

[AlarmParameter-323]
Def=A,c,0,01,20,20,05,05
01=Sensor 1-8,Upper Limit         ,mb , , 0.1 , 0000.00, 1200.00, 01, 04
02=Sensor 1-8,Lower Limit         ,mb , , 0.1 , 0000.00, 1200.00, 05, 04
03=Setpoint ,Overflow             ,mb , , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint ,Underflow            ,mb , , 0.1 , 0000.00, 0099.00, 13, 04

```

Serial Interface of TECON devices

```

05=-          ,Alarm Code          ,  , 1  , 0000.00, 0031.00, 17, 04

[AlarmParameter-324]
Def=H,h,0,01,24,24,06,06
01=Sensor     ,Upper Limit         ,m/M, 0.001, 0000.00, 0010.00, 01, 04
02=Sensor     ,Lower Limit         ,m/M, 0.001, 0000.00, 0009.99, 05, 04
03=Setpoint   ,Overflow            ,m/M, 0.0001, 0000.00, 0000.99, 09, 04
04=Setpoint   ,Underflow           ,m/M, 0.0001, 0000.00, 0000.99, 13, 04
05=-          ,Alarm Code 1       ,  , 1  , 0000.00, 0004.00, 17, 04
06=-          ,Alarm Code 3       ,  , 1  , 0000.00, 0003.00, 21, 04

[AlarmParameter-325]
Def=A,c,0,01,24,24,06,06
01=Sensor     ,Upper Limit         ,rpm, 1     , 0000.00, 3000.00, 01, 04
02=Sensor     ,Lower Limit         ,rpm, 1     , 0000.00, 3000.00, 05, 04
03=Setpoint   ,Overflow            ,rpm, 0.1   , 0000.00, 0999.00, 09, 04
04=Setpoint   ,Underflow           ,rpm, 0.1   , 0000.00, 0999.00, 13, 04
05=-          ,Alarm Code 1       ,  , 1  , 0000.00, 0031.00, 17, 04
07=-          ,Treshold            ,rpm, 0.1   , 0000.00, 3000.00, 21, 04

[AlarmParameter-326]
Def=H,h,0,01,12,12,03,03
01=-          ,Upper Limit         ,  , 1     , 0000.00, 9999.00, 01, 04
02=Setpoint   ,Overflow            ,  , 0.01  , 0000.00, 0009.99, 05, 04
03=-          ,Alarm Code          ,  , 1     , 0000.00, 0007.00, 09, 04

[AlarmParameter-327]
Def=A,c,0,01,28,28,07,07
01=Sensor     ,Upper Limit         ,pH , 0.01  , 0000.00, 0014.00, 01, 04
02=Sensor     ,Lower Limit         ,pH , 0.01  , 0000.00, 0014.00, 05, 04
03=Sensor     ,Upper Limit         ,°C , 0.1   , -0100.00, 0100.00, 09, 04
04=Sensor     ,Lower Limit         ,°C , 0.1   , -0100.00, 0100.00, 13, 04
05=Setpoint   ,Overflow            ,pH , 0.01  , 0000.00, 0014.00, 17, 04
06=Setpoint   ,Underflow           ,pH , 0.01  , 0000.00, 0014.00, 21, 04
07=-          ,Alarm Code 1       ,  , 1     , 0000.00, 0031.00, 25, 04

[AlarmParameter-328]
Def=B,b,0,01,36,36,09,09
01=Sensor 1   ,Upper Limit         ,°C , 0.1   , -0200.00, 2000.00, 01, 04
02=Sensor 1   ,Lower Limit         ,°C , 0.1   , -0200.00, 2000.00, 05, 04
03=Sensor 2   ,Upper Limit         ,°C , 0.1   , -0200.00, 2000.00, 09, 04
04=Sensor 2   ,Lower Limit         ,°C , 0.1   , -0200.00, 2000.00, 13, 04
05=Setpoint 1 ,Overflow            ,°C , 0.1   , 0000.00, 0099.00, 17, 04
06=Setpoint 1 ,Underflow           ,°C , 0.1   , 0000.00, 0099.00, 21, 04
07=Setpoint 2 ,Overflow            ,°C , 0.1   , 0000.00, 0099.00, 25, 04
08=Setpoint 2 ,Underflow           ,°C , 0.1   , 0000.00, 0099.00, 29, 04
09=-          ,Alarm Code          ,  , 1     , 0000.00, 0004.00, 33, 04

[AlarmParameter-329];
Def=D,d,0,01,44,44,11,11
01=Sensor 1   ,Upper Limit         ,mb , 1     , 0000.00, 0100.00, 01, 04
02=Sensor 1   ,Lower Limit         ,mb , 1     , 0000.00, 0100.00, 05, 04
03=Setpoint 1 ,Overflow            ,mb , 1     , 0000.00, 0099.00, 09, 04
04=Setpoint 1 ,Underflow           ,mb , 1     , 0000.00, 0099.00, 13, 04
05=-          ,Alarm Code 1       ,  , 1     , 0000.00, 0004.00, 17, 04
06=Sensor 2   , Maximal Value      ,mb , 1     , -0200.00, 2000.00, 21, 04
07=Sensor 2   , Minimal Wert       ,mb , 1     , -0200.00, 2000.00, 25, 04
08=Setpoint 2 ,Overflow            ,mb , 1     , 0000.00, 0099.00, 29, 04

```

Serial Interface of TECON devices

```

09=Setpoint 2,Underflow           ,mb , 1 , 0000.00, 0099.00, 33, 04
10=-                               , , 1 , 0000.00, 0004.00, 37, 04
11=-                               , , 1 , 0000.00, 0003.00, 41, 04

```

[AlarmParameter-330]

Def=A,c,0,01,48,48,12,12

```

01=Sensor 1 ,Upper Limit         ,°C , 0.1 ,-0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 ,-0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-                               , , 1 , 0000.00, 0004.00, 17, 04
06=Sensor 2 ,Upper Limit         ,°C , 0.1 ,-0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower Limit         ,°C , 0.1 ,-0200.00, 2000.00, 25, 04
08=Setpoint 2,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=Setpoint 2,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=-                               , , 1 , 0000.00, 0004.00, 37, 04
11=-                               , , 1 , 0000.00, 0003.00, 41, 04
12=-                               , , 1 , 0000.00, 0002.00, 45, 04

```

[AlarmParameter-331]

Def=A,c,0,01,36,36,09,09

```

01=Sensor 1 ,Upper Limit         ,°C , 0.1 ,-0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 ,-0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=Sensor 2 ,Upper Limit         ,°C , 0.1 ,-0200.00, 2000.00, 17, 04
06=Sensor 2 ,Lower Limit         ,°C , 0.1 ,-0200.00, 2000.00, 21, 04
07=Setpoint 2,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 25, 04
08=Setpoint 2,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=-                               , , 1 , 0000.00, 0007.00, 33, 04

```

[AlarmParameter-332]

Def=A,c,0,01,40,40,10,10

```

01=Sensor 1 ,Upper Limit         ,°C , 0.1 ,-0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 ,-0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=Sensor 2 ,Upper Limit         ,°C , 0.1 ,-0200.00, 2000.00, 17, 04
06=Sensor 2 ,Lower Limit         ,°C , 0.1 ,-0200.00, 2000.00, 21, 04
07=Setpoint 2,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 25, 04
08=Setpoint 2,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=-                               , , 1 , 0000.00, 0007.00, 33, 04
10=-                               , , 1 , 0000.00, 0007.00, 33, 04

```

[AlarmParameter-333]

Def=B,b,0,01,20,20,05,05

```

01=Sensor 1 ,Upper Limit         ,°C , 0.1 ,-0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 ,-0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-                               , , 1 , 0000.00, 0001.00, 17, 04

```

[AlarmParameter-334]

Def=A,c,0,01,16,16,04,04

```

01=Sensor 1 ,Upper Limit         ,°C , 0.1 ,-0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower Limit         ,°C , 0.1 ,-0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04

```

Serial Interface of TECON devices

```

04=Setpoint 1,Underflow          ,°C , 0.1 , 0000.00, 0099.00, 13, 04

[AlarmParameter-335];           basis 302
Def=A,c,0,01,44,44,11,11
01=Sensor 1 ,Alarm Code 1       , , 1 , 0000.00, 0004.00, 01, 04
02=Sensor 1 ,Upper Limit 1      ,°C , 0.1 ,-0200.00, 2000.00, 05, 04
03=Sensor 1 ,Lower Limit 1      ,°C , 0.1 ,-0200.00, 2000.00, 09, 04
04=Setpoint 1,Overflow 1        ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=Setpoint 1,Underflow 1       ,°C , 0.1 , 0000.00, 0099.00, 17, 04
06=Sensor 2 ,Alarm Code 2       , , 1 , 0000.00, 0004.00, 21, 04
07=Sensor 2 ,Upper Limit 2      ,°C , 0.1 ,-0200.00, 2000.00, 25, 04
08=Sensor 2 ,Under Limit 2      ,°C , 0.1 ,-0200.00, 2000.00, 29, 04
09=Setpoint 2,Overflow 2        ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=Setpoint 2,Underflow 2       ,°C , 0.1 , 0000.00, 0099.00, 37, 04
11=- ,Alarm Code 3             , , 1 , 0000.00, 0003.00, 41, 04

[AlarmParameter-336]
Def=A,c,0,01,16,16,04,04
01=Sensor ,Upper Limit         , , 1 , -2000.00, 2000.00, 01, 04
02=Sensor ,Lower Limit         , , 1 , -2000.00, 2000.00, 05, 04
03=Setpoint ,Overflow          , , 1 , 0000.00, 0014.00, 09, 04
04=Setpoint ,Underflow         , , 1 , 0000.00, 0014.00, 13, 04

[AlarmParameter-337]
Def=A,c,0,01,36,36,09,09
01=Nullpunkt ,PT100            ,BIT, 1 , 0000.00, 4095.00, 01, 04
02=Nullpunkt ,CA               ,BIT, 1 , 0000.00, 4095.00, 05, 04
03=Null ,Analog. inputg       ,BIT, 1 , 0000.00, 4095.00, 09, 04
04=Value ,PT100 at 200 °C     ,BIT, 1 , 0000.00, 4095.00, 13, 04
05=Value ,CA at 200 °C       ,BIT, 1 , 0000.00, 4095.00, 17, 04
06=Value ,Analog. input 10V   ,BIT, 1 , 0000.00, 4095.00, 21, 04
07=Null ,DAC                  ,BIT, 1 , 0000.00, 9999.00, 25, 04
08=Amplific. ,DAC             ,BIT, 1 , 0000.00, 9999.00, 29, 04
09= ,Status                   , , 1 , 0000.00, 0040.00, 33, 04

[AlarmParameter-338];           Dosieren
Def=B,b,0,01,08,08,02,02
01=Scale ,Upper limit         , , 1 , 0000.00, 9999.00, 01, 04
02=Scale ,Lower limit         , , 1 , 0000.00, 9999.00, 05, 04

[AlarmParameter-339];
Def=A,c,0,01,44,44,11,11
01=Sensor 1 ,Upper limit       ,°C , 0.1 ,-0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower limit       ,°C , 0.1 ,-0200.00, 2000.00, 05, 04
03=Setpoint 1,Overflow         ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow       ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=- ,Alarm Code 1           , , 1 , 0000.00, 0009.00, 17, 04
06=Sensor 2 ,Upper limit       ,°C , 0.1 ,-0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower limit       ,°C , 0.1 ,-0200.00, 2000.00, 25, 04
08=Setpoint 2,Overflow         ,°C , 0.1 , 0000.00, 0099.00, 29, 04
09=Setpoint 2,Underflow       ,°C , 0.1 , 0000.00, 0099.00, 33, 04
10=- ,Alarm Code 2           , , 1 , 0000.00, 0009.00, 37, 04
11=- ,Alarm Code 3           , , 1 , 0000.00, 0003.00, 41, 04

[AlarmParameter-340]           236
Def=A,c,0,01,40,40,10,10
01=Sensor 1 ,Upper limit       ,°C , 0.1 ,-0200.00, 2000.00, 01, 04
02=Sensor 1 ,Lower limit       ,°C , 0.1 ,-0200.00, 2000.00, 05, 04

```

Serial Interface of TECON devices

```

03=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 09, 04
04=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 13, 04
05=-           ,Alarm Code 1    ,   ,   , 1 , 0000.00, 0009.00, 17, 04
06=Sensor 2 ,Upper limit        ,°C , 0.1 , -0200.00, 2000.00, 21, 04
07=Sensor 2 ,Lower limit        ,°C , 0.1 , -0200.00, 2000.00, 25, 04
08=-           ,Alarm Code 2    ,   ,   , 1 , 0000.00, 0009.00, 29, 04
09=-           ,Alarm Code 3    ,   ,   , 1 , 0000.00, 0003.00, 33, 04
10=-           ,Alarm Code 4    ,   ,   , 1 , 0000.00, 0002.00, 37, 04

```

[AlarmParameter-341]

Def=A,c,0,01,32,32,08,08

```

01=Sensor 1 ,Upper limit        ,°C , 0.1 , -0050.00, 0099.00, 01, 04
02=Sensor 1 ,Lower limit        ,°C , 0.1 , -0050.00, 0099.00, 05, 04
03=Sensor 2 ,Upper limit        ,% , 1 , 0000.00, 0099.00, 09, 04
04=Sensor 2 ,Lower limit        ,% , 1 , 0000.00, 0099.00, 13, 04
05=Setpoint 1,Overflow           ,°C , 0.1 , 0000.00, 0099.00, 17, 04
06=Setpoint 1,Underflow         ,°C , 0.1 , 0000.00, 0099.00, 21, 04
07=Setpoint 2,Overflow           ,% , 1 , 0000.00, 0099.00, 25, 04
08=Setpoint 2,Underflow         ,% , 1 , 0000.00, 0099.00, 29, 04

```

3.4 Controlling Parameters (400)

[ReglerParameter-401]

Def=R,r,0,01,40,40,10,10

01=Contr. 1	,Controller Mode	,	,	1	,	0000.00,	0008.00,	01,	04	
02=Contr. 1	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	05,	04
03=Contr. 1	,Lag Time	,	s	,	1	,	0000.00,	9999.00,	09,	04
04=Contr. 1	,Lead Time	,	s	,	1	,	0000.00,	0999.00,	13,	04
05=Contr. 1	,Relay Interval	,	s	,	1	,	0001.00,	0999.00,	17,	04
06=Contr. 2	,Controller Mode	,	,	1	,	0000.00,	0008.00,	21,	04	
07=Contr. 2	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	25,	04
08=Contr. 2	,Lag Time	,	s	,	1	,	0000.00,	9999.00,	29,	04
09=Contr. 2	,Lead Time	,	s	,	1	,	0000.00,	0999.00,	33,	04
10=Contr. 2	,Relay Interval	,	s	,	1	,	0001.00,	0999.00,	37,	04

[ReglerParameter-402]

Def=R,r,0,01,52,52,13,13

01=Contr. 1	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	01,	04
02=Contr. 1	,Lag Time	,	s	,	1	,	0000.00,	9999.00,	05,	04
03=Contr. 1	,Lead Time	,	s	,	1	,	0000.00,	0999.00,	09,	04
04=Contr. 1	,Relay Interval	,	s	,	1	,	0001.00,	0999.00,	13,	04
05=Contr. 1	,Max. Permitted Power	,	%	,	0.1	,	0010.00,	0100.00,	17,	04
06=Contr. 2	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	21,	04
07=Contr. 2	,Lag Time	,	s	,	1	,	0000.00,	9999.00,	25,	04
08=Contr. 2	,Lead Time	,	s	,	1	,	0000.00,	0999.00,	29,	04
09=Contr. 2	,Relay Interval	,	s	,	1	,	0001.00,	0999.00,	33,	04
10=Contr. 2	,Max. Permitted Power	,	%	,	0.1	,	0010.00,	0100.00,	37,	04
11=Contr. 1&2	,Dead Band	,	°C	,	0.01	,	0000.00,	0099.90,	41,	04
12=Contr. 2	,Setpoint Offset Of 2nd Contr.	,	°C	,	0.01	,	-0099.00,	0099.90,	45,	04
13=Contr. 1&2	,Positioning Time	,	s	,	1	,	0001.00,	0999.00,	49,	04

[ReglerParameter-403]

Def=R,r,0,01,44,44,11,11

01=Contr. 1	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	01,	04
02=Contr. 1	,Lag Time	,	s	,	1	,	0000.00,	9999.00,	05,	04
03=Contr. 1	,Lead Time	,	s	,	1	,	0000.00,	0999.00,	09,	04
04=Contr. 1	,Relay Interval	,	s	,	1	,	0001.00,	0999.00,	13,	04
05=Contr. 1	,Max. Permitted Power	,	%	,	0.1	,	0010.00,	0100.00,	17,	04
06=Contr. 2	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	21,	04
07=Contr. 2	,Lag Time	,	s	,	1	,	0000.00,	9999.00,	25,	04
08=Contr. 2	,Lead Time	,	s	,	1	,	0000.00,	0999.00,	29,	04
09=Contr. 2	,Relay Interval	,	s	,	1	,	0001.00,	0999.00,	33,	04
10=Contr. 2	,Max. Permitted Power	,	%	,	0.1	,	0010.00,	0100.00,	37,	04
11=Contr. 1&2	,Dead Band	,	°C	,	0.01	,	0000.00,	0099.90,	41,	04

[ReglerParameter-404]

Def=R,r,0,01,48,48,12,12

01=Contr. 1	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	01,	04
02=Contr. 1	,Lag Time	,	s	,	1	,	0000.00,	9999.00,	05,	04
03=Contr. 1	,Lead Time	,	s	,	1	,	0000.00,	0999.00,	09,	04
04=Contr. 1	,Relay Interval	,	s	,	1	,	0001.00,	0999.00,	13,	04
05=Contr. 1	,Max. Permitted Power	,	%	,	0.1	,	0010.00,	0100.00,	17,	04
06=Contr. 2	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	21,	04
07=Contr. 2	,Lag Time	,	s	,	1	,	0000.00,	9999.00,	25,	04
08=Contr. 2	,Lead Time	,	s	,	1	,	0000.00,	0999.00,	29,	04
09=Contr. 2	,Relay Interval	,	s	,	1	,	0001.00,	0999.00,	33,	04
10=Contr. 2	,Max. Permitted Power	,	%	,	0.1	,	0010.00,	0100.00,	37,	04

Serial Interface of TECON devices

```
11=Contr. 1&2,Dead Band           ,°C , 0.01 , 0000.00, 0099.90, 41, 04
12=Contr. 1&2,Positioning Time     ,s , 1 , 0001.00, 0999.00, 45, 04
```

[ReglerParameter-405]

```
Def=R,r,0,01,56,56,14,14
```

```
01=- ,Controller Mode           , , 1 , 0000.00, 0011.00, 01, 04
02=Contr. 1 ,Proportional Band   ,°C , 0.1 , 0000.00, 0999.00, 05, 04
03=Contr. 1 ,Lag Time            ,s , 1 , 0000.00, 9999.00, 09, 04
04=Contr. 1 ,Lead Time           ,s , 1 , 0000.00, 0999.00, 13, 04
05=Contr. 1 ,Relay Interval       ,s , 1 , 0001.00, 0999.00, 17, 04
06=Contr. 1 ,Max. Permitted Power ,% , 0.1 , 0010.00, 0100.00, 21, 04
07=Contr. 2 ,Proportional Band   ,°C , 0.1 , 0000.00, 0999.00, 25, 04
08=Contr. 2 ,Lag Time            ,s , 1 , 0000.00, 9999.00, 29, 04
09=Contr. 2 ,Lead Time           ,s , 1 , 0000.00, 0999.00, 33, 04
10=Contr. 2 ,Relay Interval       ,s , 1 , 0001.00, 0999.00, 37, 04
11=Contr. 2 ,Max. Permitted Power ,% , 0.1 , 0010.00, 0100.00, 41, 04
12=Contr. 1&2,Dead Band           ,°C , 0.01 , 0000.00, 0099.90, 45, 04
13=Contr. 2 ,Setpoint Offset Of 2nd Contr. ,°C , 0.01 , -0099.00, 0099.90, 49, 04
14=Contr. 1&2,Positioning Time     ,s , 1 , 0001.00, 0999.00, 53, 04
```

[ReglerParameter-406]

```
Def=R,r,0,01,20,20,05,05
```

```
01=- ,Inteliface-Mode           , , 1 , 0000.00, 0001.00, 01, 04
02=Modem ,Switched Off          , , 1 , 0000.00, 0001.00, 05, 04
03=Relay 1 ,Interval Time        ,s , 1 , 0000.00, 0999.00, 09, 04
04=Relay 2 ,Interval Time        ,s , 1 , 0000.00, 0999.00, 13, 04
05=- ,Alarm Code                 , , 1 , 0000.00, 0003.00, 17, 04
```

[ReglerParameter-407]

```
Def=R,r,0,01,20,20,05,05
```

```
01=- ,Inteliface-Modus          , , 1 , 0001.00, 0001.00, 01, 04
02=Modem ,Switched Off          , , 1 , 0000.00, 0001.00, 05, 04
03=Relay 1 ,Interval Time        ,s , 1 , 0000.00, 0999.00, 09, 04
04=Relay 2 ,Interval Time        ,s , 1 , 0000.00, 0999.00, 13, 04
05=- ,Alarm Code                 , , 1 , 0000.00, 0003.00, 17, 04
```

[ReglerParameter-408]

```
Def=R,r,0,01,48,48,12,12
```

```
01=Contr. 1 ,Proportional Band   ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time            ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time           ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Relay Interval       ,s , 1 , 0001.00, 0999.00, 13, 04
05=Contr. 1 ,Max. Permitted Power ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=Contr. 2 ,Proportional Band   ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Contr. 2 ,Lag Time            ,s , 1 , 0000.00, 9999.00, 25, 04
08=Contr. 2 ,Lead Time           ,s , 1 , 0000.00, 0999.00, 29, 04
09=Contr. 2 ,Relay Interval       ,s , 1 , 0001.00, 0999.00, 33, 04
10=Contr. 2 ,Max. Permitted Power ,% , 0.1 , 0010.00, 0100.00, 37, 04
11=Contr. 1&2,Dead Band           ,°C , 0.01 , 0000.00, 0099.90, 41, 04
12=Contr. 2 ,Setpoint Offset Of 2nd Contr. ,°C , 0.01 , -0099.90, 0099.90, 45, 04
```

[ReglerParameter-409]; Basis 402

```
Def=R,r,0,01,52,52,13,13
```

```
01=Contr. 1 ,Proportional Band   ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time            ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time           ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Relay Interval       ,s , 1 , 0000.00, 0999.00, 13, 04
05=Contr. 1 ,Max. Permitted Power ,% , 0.1 , 0010.00, 0100.00, 17, 04
```

Serial Interface of TECON devices

```

06=Contr. 2 ,Proportional Band      ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Contr. 2 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 25, 04
08=Contr. 2 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 29, 04
09=Contr. 2 ,Relay Interval           ,s , 1 , 0000.00, 0999.00, 33, 04
10=Contr. 2 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 37, 04
11=Contr. 1&2,Dead Band               ,°C , 0.01 , 0000.00, 0099.90, 41, 04
12=Contr. 2 ,Setpoint Offset Of 2nd Contr. ,°C , 0.01 , -0099.00, 0099.90, 45, 04
13=Contr. 1&2,Positioning Time        ,s , 1 , 0001.00, 0999.00, 49, 04

```

[ReglerParameter-410]

Def=R,r,0,01,44,44,11,11

```

01=Contr. 1 ,Proportional Band      ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 13, 04
05=Contr. 1 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=Contr. 1&2,Dead Band               ,°C , 0.01 , 0000.00, 0099.90, 21, 04
07=Contr. 2 ,Proportional Band      ,°C , 0.1 , 0000.00, 0999.00, 25, 04
08=Contr. 2 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 29, 04
09=Contr. 2 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 33, 04
10=Contr. 2 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 37, 04
11=Contr. 2 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 41, 04

```

[ReglerParameter-411]

Def=R,r,0,01,52,52,13,13

```

01=Contr. 1 ,Proportional Band      ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 13, 04
05=Contr. 1 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=Contr. 2 ,Proportional Band      ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Contr. 2 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 25, 04
08=Contr. 2 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 29, 04
09=Contr. 2 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 33, 04
10=Contr. 2 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 37, 04
11=Contr. 1&2,Dead Band               ,°C , 0.01 , 0000.00, 0099.90, 41, 04
12=Contr. 1&2,Max. Power Ramp         ,%/s, 0.01 , 0000.00, 0100.00, 45, 04
13=Contr. 1&2,Positioning Time        ,s , 1 , 0001.00, 0999.00, 49, 04

```

[ReglerParameter-412]; basis 403

Def=R,r,0,01,44,44,11,11

```

01=Contr. 1 ,Proportional Band      ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Relay Interval           ,s , 1 , 0005.00, 0005.00, 13, 04
05=Contr. 1 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=Contr. 2 ,Proportional Band      ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Contr. 2 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 25, 04
08=Contr. 2 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 29, 04
09=Contr. 2 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 33, 04
10=Contr. 2 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 37, 04
11=Contr. 1&2,Dead Band               ,°C , 0.01 , 0000.00, 0099.90, 41, 04

```

[ReglerParameter-413]; basis 402

Def=R,r,0,01,52,52,13,13

```

01=Contr. 1 ,Proportional Band      ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04

```

Serial Interface of TECON devices

```

04=Contr. 1 ,Relay Interval           ,s , 1 , 0001.00, 0099.00, 13, 04
05=Contr. 1 ,Max. Permitted Power    ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=Contr. 2 ,Proportional Band       ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Contr. 2 ,Lag Time                 ,s , 1 , 0000.00, 9999.00, 25, 04
08=Contr. 2 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 29, 04
09=Contr. 2 ,Relay Interval           ,s , 1 , 0001.00, 0099.00, 33, 04
10=Contr. 2 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 37, 04
11=Contr. 1&2,Dead Band               ,°C , 0.01 , 0000.00, 0099.90, 41, 04
12=Contr. 2 ,Setpoint Offset Of 2nd Contr. ,°C , 0.01 , -0099.00, 0099.90, 45, 04
13=Contr. 1&2,Positioning Time        ,s , 1 , 0001.00, 0999.00, 49, 04

```

[ReglerParameter-414]

Def=R,r,0,01,24,24,06,06

```

01=Contr. 1 ,Proportional Band       ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time                 ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 13, 04
05=Contr. 1 ,Dead Band               ,°C , 0.01 , 0000.00, 0099.90, 17, 04
06=Contr. 1 ,Max. Power Ramp          ,% , 1 , 0000.00, 0100.00, 21, 04

```

[ReglerParameter-415]

Def=R,r,0,01,16,16,04,04

```

01=Contr. 1 ,Proportional Band       ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time                 ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 13, 04

```

[ReglerParameter-416]

Def=R,r,0,01,36,36,09,09

```

01=Contr. 1 ,Controller Mode          , , 1 , 0000.00, 0010.00, 01, 04
02=Contr. 1 ,Proportional Band       ,°C , 0.1 , 0000.00, 0999.00, 05, 04
03=Contr. 1 ,Lag Time                 ,s , 1 , 0000.00, 9999.00, 09, 04
04=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 13, 04
05=Contr. 1 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 17, 04
06=Contr. 2 ,Proportional Band       ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Contr. 2 ,Lag Time                 ,s , 1 , 0000.00, 9999.00, 25, 04
08=Contr. 2 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 29, 04
09=Contr. 2 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 33, 04

```

[ReglerParameter-417]

Def=R,r,0,01,68,68,17,17

```

01=- ,Amplification                   , , 0.1 , 0000.00, 0099.90, 01, 04
02=Cascade ,Lag Time 1                 ,s , 1 , 0000.00, 9999.00, 05, 04
03=Cascade ,Lead Time 1                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Cascade ,P-Band Heating             ,°C , 0.1 , 0000.00, 0999.00, 13, 04
05=Cascade ,P-Band Cooling            ,°C , 0.1 , 0000.00, 0999.00, 17, 04
06=Cascade ,Lead Time 2                ,s , 1 , 0000.00, 0999.00, 21, 04
07=Heating ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 25, 04
08=Cooling ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 9999.00, 29, 04
09=Heating ,Relay Interval            ,s , 1 , 0001.00, 0099.00, 33, 04
10=Heating ,Max. Permitted Power      ,s , 0.1 , 0010.00, 0100.00, 37, 04
11=Cooling ,Relay Interval            ,s , 1 , 0001.00, 0099.00, 41, 04
12=Cooling ,Max. Permitted Power      ,s , 0.1 , 0010.00, 0100.00, 45, 04
13=- ,Dead Band                       ,°C , 0.1 , 0000.00, 0099.90, 49, 04
14=Shell ,P-Band Heating              ,°C , 0.1 , 0000.00, 0999.00, 53, 04
15=Shell ,P-Band Cooling              ,°C , 0.1 , 0000.00, 0999.00, 57, 04
16=Shell ,Lag Time 1                  ,s , 1 , 0000.00, 9999.00, 61, 04
17=Shell ,Lead Time 1                 ,s , 1 , 0000.00, 0999.00, 65, 04

```

Serial Interface of TECON devices

[ReglerParameter-418]

Def=R,r,0,01,36,36,09,09

01=Relay	1	,Relay Mode	,	,	1	,	0000.00,	0007.00,	01,	04
02=Relay	1	,Relay Code	,	,	1	,	0000.00,	0002.00,	05,	04
03=Relay	1	,Hysteresis	,	,	1	,	0000.00,	0099.00,	09,	04
04=Relay	2	,Relay Mode	,	,	1	,	0000.00,	0007.00,	13,	04
05=Relay	2	,Relay Code	,	,	1	,	0000.00,	0002.00,	17,	04
06=Relay	2	,Hysteresis	,	,	1	,	0000.00,	0099.00,	21,	04
07=Relay	3	,Relay Mode	,	,	1	,	0000.00,	0007.00,	25,	04
08=Relay	3	,Relay Code	,	,	1	,	0000.00,	0002.00,	29,	04
09=Relay	3	,Hysteresis	,	,	1	,	0000.00,	0099.00,	33,	04

[ReglerParameter-419]

Def=R,r,0,01,52,52,13,13

01=Contr.	1	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	01,	04
02=Contr.	1	,Lag Time	,	,s	,	1	,	0000.00,	9999.00,	05,	04
03=Contr.	1	,Lead Time	,	,s	,	1	,	0000.00,	0999.00,	09,	04
04=Contr.	1	,Relay Interval	,	,s	,	1	,	0001.00,	0999.00,	13,	04
05=Contr.	1	,Max. Permitted Power	,	,%	,	0.1	,	0010.00,	0100.00,	17,	04
06=Contr.	2	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	21,	04
07=Contr.	2	,Lag Time	,	,s	,	1	,	0000.00,	9999.00,	25,	04
08=Contr.	2	,Lead Time	,	,s	,	1	,	0000.00,	0999.00,	29,	04
09=Contr.	2	,Relay Interval	,	,s	,	1	,	0001.00,	0999.00,	33,	04
10=Contr.	2	,Max. Permitted Power	,	,%	,	0.1	,	0010.00,	0100.00,	37,	04
11=Contr.	1&2,	Dead Band	,	°C	,	0.01	,	0000.00,	0099.90,	41,	04
12=-		,Anzahl Stufen	,	,	,	1	,	0002.00,	0006.00,	45,	04
13=-		,Step-On Time	,	,s	,	1	,	0001.00,	0999.00,	49,	04

[ReglerParameter-420];

basis 402

Def=R,r,0,01,52,52,13,13

01=Contr.	1	,Proportional Band	,	,%rF,	,	0.1	,	0000.00,	0999.00,	01,	04
02=Contr.	1	,Lag Time	,	,s	,	1	,	0000.00,	9999.00,	05,	04
03=Contr.	1	,Lead Time	,	,s	,	1	,	0000.00,	0999.00,	09,	04
04=Contr.	1	,Relay Interval	,	,s	,	1	,	0001.00,	0999.00,	13,	04
05=Contr.	1	,Max. Permitted Power	,	,%	,	0.1	,	0010.00,	0100.00,	17,	04
06=Contr.	2	,Proportional Band	,	,%rF,	,	0.1	,	0000.00,	0999.00,	21,	04
07=Contr.	2	,Lag Time	,	,s	,	1	,	0000.00,	9999.00,	25,	04
08=Contr.	2	,Lead Time	,	,s	,	1	,	0000.00,	0999.00,	29,	04
09=Contr.	2	,Relay Interval	,	,s	,	1	,	0001.00,	0999.00,	33,	04
10=Contr.	2	,Max. Permitted Power	,	,%	,	0.1	,	0010.00,	0100.00,	37,	04
11=Contr.	1&2,	Dead Band	,	,%rF,	,	0.01	,	0000.00,	0099.90,	41,	04
12=Contr.	2	,Setpoint Offset Of 2nd Contr.	,	,%rF,	,	0.01	,	-0099.00,	0099.90,	45,	04
13=Contr.	1&2,	Positioning Time	,	,s	,	1	,	0001.00,	0999.00,	49,	04

[ReglerParameter-421];

basis 402

Def=R,r,0,01,52,52,13,13

01=Contr.	1	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	01,	04
02=Contr.	1	,Lag Time	,	,s	,	1	,	0000.00,	9999.00,	05,	04
03=Contr.	1	,Lead Time	,	,s	,	1	,	0000.00,	0999.00,	09,	04
04=Contr.	1	,Relay Interval	,	,s	,	1	,	0001.00,	0999.00,	13,	04
05=Contr.	1	,Max. Permitted Power	,	,%	,	0.1	,	0000.00,	0100.00,	17,	04
06=Contr.	2	,Proportional Band	,	°C	,	0.1	,	0000.00,	0999.00,	21,	04
07=Contr.	2	,Lag Time	,	,s	,	1	,	0000.00,	9999.00,	25,	04
08=Contr.	2	,Lead Time	,	,s	,	1	,	0000.00,	0999.00,	29,	04
09=Contr.	2	,Relay Interval	,	,s	,	1	,	0001.00,	0999.00,	33,	04
10=Contr.	2	,Max. Permitted Power	,	,%	,	0.1	,	0000.00,	0100.00,	37,	04
11=Contr.	1&2,	Dead Band	,	°C	,	0.01	,	0000.00,	0099.90,	41,	04

Serial Interface of TECON devices

```
12=Contr. 2 ,Setpoint Offset Of 2nd Contr. ,°C , 0.01 , -0099.00, 0099.90, 45, 04
13=Contr. 1&2,Positioning Time ,s , 1 , 0001.00, 0999.00, 49, 04
```

[ReglerParameter-422]

```
Def=S,s,0,01,68,68,17,17
```

```
01=- ,Amplification , , 0.1 , 0000.00, 0099.90, 01, 04
02=Cascade ,Lag Time 1 ,s , 1 , 0000.00, 9999.00, 05, 04
03=Cascade ,Lead Time 1 ,s , 1 , 0000.00, 0999.00, 09, 04
04=Heating ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 13, 04
05=Cooling ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 9999.00, 17, 04
06=Cascade ,P-Band Heating ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Cascade ,P-Band Cooling ,°C , 0.1 , 0000.00, 0999.00, 25, 04
08=Cascade ,Lead Time 2 ,s , 1 , 0000.00, 0999.00, 29, 04
09=Heating ,Relay Interval ,s , 1 , 0001.00, 0099.00, 33, 04
10=Heating ,Max. Permitted Power ,s , 0.1 , 0010.00, 0100.00, 37, 04
11=Cooling ,Relay Interval ,s , 1 , 0001.00, 0099.00, 41, 04
12=Cooling ,Max. Permitted Power ,s , 0.1 , 0010.00, 0100.00, 45, 04
13=- ,Dead Band ,°C , 0.1 , 0000.00, 0099.90, 49, 04
14=Shell ,P-Band Heating ,°C , 0.1 , 0000.00, 0999.00, 53, 04
15=Shell ,P-Band Cooling ,°C , 0.1 , 0000.00, 0999.00, 57, 04
16=Shell ,Lag Time 1 ,s , 1 , 0000.00, 9999.00, 61, 04
17=Shell ,Lead Time 1 ,s , 1 , 0000.00, 0999.00, 65, 04
```

[ReglerParameter-423]

```
Def=S,s,0,01,72,72,18,18
```

```
01=- ,Amplification , , 0.1 , 0000.00, 0099.90, 01, 04
02=Cascade ,Lag Time 1 ,s , 1 , 0000.00, 9999.00, 05, 04
03=Cascade ,Lead Time 1 ,s , 1 , 0000.00, 0999.00, 09, 04
04=Cascade ,P-Band Heating ,°C , 0.1 , 0000.00, 0999.00, 13, 04
05=Cascade ,P-Band Cooling ,°C , 0.1 , 0000.00, 0999.00, 17, 04
06=Cascade ,Lead Time 2 ,s , 1 , 0000.00, 0999.00, 21, 04
07=Heating ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 25, 04
08=Cooling ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 29, 04
09=Heating ,Relay Interval ,s , 1 , 0001.00, 0099.00, 33, 04
10=Heating ,Max. Permitted Power ,s , 0.1 , 0010.00, 0100.00, 37, 04
11=Cooling ,Relay Interval ,s , 1 , 0001.00, 0099.00, 41, 04
12=Cooling ,Max. Permitted Power ,s , 0.1 , 0010.00, 0100.00, 45, 04
13=- ,Dead Band ,°C , 0.1 , 0000.00, 0099.90, 49, 04
14=- ,Step-On Time ,s , 1 , 0001.00, 0999.90, 53, 04
15=Shell ,P-Band Heating ,°C , 0.1 , 0000.00, 0999.00, 57, 04
16=Shell ,P-Band Cooling ,°C , 0.1 , 0000.00, 0999.00, 61, 04
17=Shell ,Lag Time 1 ,s , 1 , 0000.00, 9999.00, 65, 04
18=Shell ,Lead Time 1 ,s , 1 , 0000.00, 0999.00, 69, 04
```

[ReglerParameter-424]

```
Def=S,s,0,01,72,72,18,18
```

```
01=- ,Amplification , , 0.1 , 0000.00, 0099.90, 01, 04
02=Cascade ,Lag Time 1 ,s , 1 , 0000.00, 9999.00, 05, 04
03=Cascade ,Lead Time 1 ,s , 1 , 0000.00, 0999.00, 09, 04
04=Cascade ,P-Band Heating ,°C , 0.1 , 0000.00, 0999.00, 13, 04
05=Cascade ,P-Band Cooling ,°C , 0.1 , 0000.00, 0999.00, 17, 04
06=Cascade ,Lead Time 2 ,s , 1 , 0000.00, 0999.00, 21, 04
07=Heating ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 25, 04
08=Cooling ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 29, 04
09=Heating ,Relay Interval ,s , 1 , 0001.00, 0099.00, 33, 04
10=Heating ,Max. Permitted Power ,s , 0.1 , 0010.00, 0100.00, 37, 04
11=Cooling ,Relay Interval ,s , 1 , 0001.00, 0099.00, 41, 04
12=Cooling ,Max. Permitted Power ,s , 0.1 , 0010.00, 0100.00, 45, 04
```

Serial Interface of TECON devices

```

13=-      ,Dead Band           ,°C , 0.1 , 0000.00, 0099.90, 49, 04
14=-      ,Positioning Time    ,s , 1 , 0001.00, 0999.90, 53, 04
15=Shell  ,P-Band Heating       ,°C , 0.1 , 0000.00, 0999.00, 57, 04
16=Shell  ,P-Band Cooling       ,°C , 0.1 , 0000.00, 0999.00, 61, 04
17=Shell  ,Lag Time 1          ,s , 1 , 0000.00, 9999.00, 65, 04
18=Shell  ,Lead Time 1         ,s , 1 , 0000.00, 0999.00, 69, 04

```

[ReglerParameter-425]

Def=S,s,0,01,72,72,18,18

```

01=-      ,Amplification        , , 0.1 , 0000.00, 0099.90, 01, 04
02=Cascade ,Lag Time 1                ,s , 1 , 0000.00, 9999.00, 05, 04
03=Cascade ,Lead Time 1              ,s , 1 , 0000.00, 0999.00, 09, 04
04=Heating ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 13, 04
05=Cooling ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 9999.00, 17, 04
06=Cascade ,P-Band Heating           ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Cascade ,P-Band Cooling           ,°C , 0.1 , 0000.00, 0999.00, 25, 04
08=Cascade ,Lead Time 2              ,s , 1 , 0000.00, 0999.00, 29, 04
09=Heating ,Relay Interval           ,s , 1 , 0001.00, 0099.00, 33, 04
10=Heating ,Max. Permitted Power      ,s , 0.1 , 0010.00, 0100.00, 37, 04
11=Cooling ,Relay Interval           ,s , 1 , 0001.00, 0099.00, 41, 04
12=Cooling ,Max. Permitted Power      ,s , 0.1 , 0010.00, 0100.00, 45, 04
13=-      ,Dead Band           ,°C , 0.1 , 0000.00, 0099.90, 49, 04
14=-      ,Positioning Time    ,s , 1 , 0001.00, 0999.90, 53, 04
15=Shell  ,P-Band Heating       ,°C , 0.1 , 0000.00, 0999.00, 57, 04
16=Shell  ,P-Band Cooling       ,°C , 0.1 , 0000.00, 0999.00, 61, 04
17=Shell  ,Lag Time 1          ,s , 1 , 0000.00, 9999.00, 65, 04
18=Shell  ,Lead Time 1         ,s , 1 , 0000.00, 0999.00, 69, 04

```

[ReglerParameter-426]

Def=R,r,0,01,56,56,14,14

```

01=Contr. 1 ,Proportional Band ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time           ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time          ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 2 ,Proportional Band ,°C , 0.1 , 0000.00, 0999.00, 13, 04
05=Contr. 2 ,Lag Time           ,s , 1 , 0000.00, 9999.00, 17, 04
06=Contr. 2 ,Lead Time          ,s , 1 , 0000.00, 0999.00, 21, 04
07=Contr. 1&2,Dead Band         ,°C , 0.01 , 0000.00, 0099.90, 25, 04
08=Contr. 3 ,Proportional Band ,°C , 0.1 , 0000.00, 0999.00, 29, 04
09=Contr. 3 ,Lag Time           ,s , 1 , 0000.00, 9999.00, 33, 04
10=Contr. 3 ,Lead Time          ,s , 1 , 0000.00, 0999.00, 37, 04
11=Contr. 4 ,Proportional Band ,°C , 0.1 , 0000.00, 0999.00, 41, 04
12=Contr. 4 ,Lag Time           ,s , 1 , 0000.00, 9999.00, 45, 04
13=Contr. 4 ,Lead Time          ,s , 1 , 0000.00, 0999.00, 49, 04
14=Contr. 3&4,Dead Band         ,°C , 0.01 , 0000.00, 0099.90, 53, 04

```

[ReglerParameter-427]

Def=R,r,0,01,28,28,07,07

```

01=Contr. 1 ,Proportional Band ,mb , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1 ,Lag Time           ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time          ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 2 ,Proportional Band ,mb , 0.1 , 0000.00, 0999.00, 13, 04
05=Contr. 2 ,Lag Time           ,s , 1 , 0000.00, 9999.00, 17, 04
06=Contr. 2 ,Lead Time          ,s , 1 , 0000.00, 0999.00, 21, 04
07=Contr. 1&2,Dead Band         ,mb , 0.01 , 0000.00, 0099.90, 25, 04

```

[ReglerParameter-428]

Def=U,u,0,01,24,24,06,06

```

01=Contr. 1 ,Proportional Band ,m/M, 0.001, 0000.00, 0001.00, 01, 04

```

Serial Interface of TECON devices

```

02=Contr. 1 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 13, 04
05=Contr. 1 ,Dead Band                ,m/M, 0.0001, 0000.00, 0001.00, 17, 04
06=Contr. 1 ,Positioning Time         ,s , 1 , 0001.00, 0999.00, 21, 04

```

[ReglerParameter-429]

```
Def=R,r,0,01,24,24,06,06
```

```

01=Contr. 1 ,Proportional Band       ,rpm, 1 , 0000.00, 0001.00, 01, 04
02=Contr. 1 ,Lag Time                ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1 ,Relay Interval           ,s , 1 , 0001.00, 0099.00, 13, 04
05=Contr. 1 ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=Contr. 1 ,Dead Band                ,rpm, 0.1 , 0000.00, 0999.00, 21, 04

```

[ReglerParameter-430]

```
Def=U,u,0,01,40,40,10,10
```

```

01=Pump 1 ,Stroke Volume             , , 0.001, 0000.00, 009.999, 01, 04
02=Pump 2 ,Stroke Volume             , , 0.001, 0000.00, 009.999, 05, 04
03=Pump 3 ,Stroke Volume             , , 0.001, 0000.00, 009.999, 09, 04
04=Pump 4 ,Stroke Volume             , , 0.001, 0000.00, 009.999, 13, 04
05=- ,Max. Stroke Frequency          ,1/M, 1 , 0000.00, 0120.00, 17, 04
06=- ,Relay Interval Of Valve        ,s , 1 , 0001.00, 0099.00, 21, 04
07=- ,Lower Limit For Refill         , , 1 , 0000.00, 9999.00, 25, 04
08=- ,Upper Limit For Refill         , , 1 , 0001.00, 9999.00, 29, 04
09=- ,Stroke Frequency For Refill    ,1/M, 1 , 0000.00, 0120.00, 33, 04
10=- ,Delay Time for Restart         ,s , 1 , 0001.00, 0060.00, 37, 04

```

[ReglerParameter-431]

```
Def=R,r,0,01,36,36,09,09
```

```

01=- ,Proportional Band             ,pH , 0.01 , 0000.00, 0009.99, 01, 04
02=- ,Lag Time                      ,s , 1 , 0000.00, 9999.00, 05, 04
03=- ,Lead Time                      ,s , 1 , 0000.00, 0999.00, 09, 04
04=- ,Relay Interval                 ,s , 1 , 0001.00, 0999.00, 13, 04
05=- ,Positioning Time               ,s , 1 , 0001.00, 0999.00, 17, 04
06=- ,Hysteresis                    ,pH , 0.01 , 0001.00, 0000.99, 21, 04
07=- ,Max. Frequency                 ,1/M, 1 , 0010.00, 0240.00, 25, 04
08=- ,Dead Band                     ,pH , 0.01 , 0000.00, 0000.99, 29, 04
09=- ,Max. Permitted Power           ,% , 0.1 , 0010.00, 0100.00, 33, 04

```

[ReglerParameter-432]

```
Def=R,r,0,01,68,68,17,17
```

```

01=- ,Amplification                 , , 0.1 , 0000.00, 0099.90, 01, 04
02=Cascade ,Lag Time 1              ,s , 1 , 0000.00, 9999.00, 05, 04
03=Cascade ,Lead Time 1             ,s , 1 , 0000.00, 0999.00, 09, 04
04=Cascade ,P-Band Heating          ,°C , 0.1 , 0000.00, 0999.00, 13, 04
05=Cascade ,P-Band Cooling          ,°C , 0.1 , 0000.00, 0999.00, 17, 04
06=Cascade ,Lead Time 2            ,s , 1 , 0000.00, 0999.00, 21, 04
07=Heating ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 25, 04
08=Cooling ,Max. Temperature Difference ,°C , 0.1 , 0000.00, 0999.00, 29, 04
09=Heating ,Relay Interval          ,s , 1 , 0001.00, 0099.00, 33, 04
10=Heating ,Max. Permitted Power     ,s , 0.1 , 0010.00, 0100.00, 37, 04
11=Cooling ,Relay Interval          ,s , 1 , 0001.00, 0099.00, 41, 04
12=Cooling ,Max. Permitted Power     ,s , 0.1 , 0010.00, 0100.00, 45, 04
13=- ,Dead Band                     ,°C , 0.1 , 0000.00, 0099.90, 49, 04
14=Shell ,P-Band Heating            ,°C , 0.1 , 0000.00, 0999.00, 53, 04
15=Shell ,P-Band Cooling            ,°C , 0.1 , 0000.00, 0999.00, 57, 04
16=Shell ,Lag Time 1              ,s , 1 , 0000.00, 9999.00, 61, 04

```

Serial Interface of TECON devices

```

17=Shell      ,Lead Time    1          ,s , 1 , 0000.00, 0999.00, 65, 04

[ReglerParameter-433]
Def=R,r,0,01,56,56,14,14
01=Contr. 1  ,Proportional-Band      ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1  ,Lag Time                ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1  ,Lead Time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=Contr. 1  ,Relay Interval            ,s , 1 , 0001.00, 0999.00, 13, 04
05=Contr. 1  ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=Contr. 2  ,Proportional-Band      ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Contr. 2  ,Lag Time                ,s , 1 , 0000.00, 9999.00, 25, 04
08=Contr. 2  ,Lead Time                ,s , 1 , 0000.00, 0999.00, 29, 04
09=Contr. 2  ,Relay Interval            ,s , 1 , 0001.00, 0999.00, 33, 04
10=Contr. 2  ,Max. Permitted Power     ,% , 0.1 , 0010.00, 0100.00, 37, 04
11=Contr. 1&2,Dead Band                ,°C , 0.01 , 0000.00, 0099.90, 41, 04
12=-         ,Number of Steps           , , 1 , 0002.00, 0006.00, 45, 04
13=-         ,Delay Time Step On       ,s , 1 , 0001.00, 0999.00, 49, 04
14=-         ,Delay Time Step Off      ,s , 1 , 0001.00, 0999.00, 53, 04

[ReglerParameter-434]
Def=R,r,0,01,20,20,05,05
01=Heating   ,P-Band                  ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Cooling   ,P-Band                  ,°C , 0.1 , 0000.00, 0999.00, 05, 04
03=          ,Lag Time                  ,s , 1 , 0000.00, 0999.00, 09, 04
04=          ,Lead Time                    ,s , 1 , 0001.00, 0999.00, 13, 04
05=-         ,Dead Band                        ,°C , 0.01 , 0000.00, 0099.90, 17, 04

[ReglerParameter-435]
Def=S,s,0,01,56,56,14,14
01=-         ,Controller code                   , , 1 , 0000.00, 0002.00, 01, 04
02=-         ,Amplification                       , , 0.1 , 0000.00, 0099.90, 05, 04
03=Cascade   ,Lag Time 1                          ,s , 1 , 0000.00, 9999.00, 09, 04
04=Cascade   ,Lead Time 1                          ,s , 1 , 0000.00, 0999.00, 13, 04
05=Cascade   ,P-Band Heating                       ,°C , 0.1 , 0000.00, 0999.00, 17, 04
06=Cascade   ,P-Band Cooling                       ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Cascade   ,Lead Time 2                          ,s , 1 , 0000.00, 0999.00, 25, 04
08=Heating   ,Max. Temperature Difference          ,°C , 0.1 , 0000.00, 0999.00, 29, 04
09=Cooling   ,Max. Temperature Difference          ,°C , 0.1 , 0000.00, 0999.00, 33, 04
10=-         ,Dead Band                            ,°C , 0.1 , 0000.00, 0099.90, 37, 04
11=Shell     ,P-Band Heating                       ,°C , 0.1 , 0000.00, 0999.00, 41, 04
12=Shell     ,P-Band Cooling                       ,°C , 0.1 , 0000.00, 0999.00, 45, 04
13=Shell     ,Lag Time 1                          ,s , 1 , 0000.00, 9999.00, 49, 04
14=Shell     ,Lead Time 1                          ,s , 1 , 0000.00, 0999.00, 53, 04

[ReglerParameter-436]
Def=R,r,0,01,24,24,06,06
01=          ,Controller Code                   , , 1 , 0000.00, 0002.00, 01, 04
02=Heating   ,P-Band                              ,°C , 0.1 , 0000.00, 0999.00, 05, 04
03=Cooling   ,P-Band                              ,°C , 0.1 , 0000.00, 0999.00, 09, 04
04=          ,Lag Time                            ,s , 1 , 0000.00, 0999.00, 13, 04
05=          ,Lead Time                            ,s , 1 , 0001.00, 0999.00, 17, 04
06=-         ,Dead Band                            ,°C , 0.01 , 0000.00, 0099.90, 21, 04

[ReglerParameter-437]
Def=R,r,0,01,56,56,14,14
01=Contr. 1  ,Proportional Band                  ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Contr. 1  ,Lag Time                            ,s , 1 , 0000.00, 9999.00, 05, 04
03=Contr. 1  ,Lead Time                            ,s , 1 , 0000.00, 0999.00, 09, 04

```

Serial Interface of TECON devices

```

04=Contr. 1 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 13, 04
05=Contr. 1 ,Max. Permitted Power    ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=Contr. 2 ,Proportional Band       ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=Contr. 2 ,Lag Time                 ,s , 1 , 0000.00, 9999.00, 25, 04
08=Contr. 2 ,Lead Time                ,s , 1 , 0000.00, 0999.00, 29, 04
09=Contr. 2 ,Relay Interval           ,s , 1 , 0001.00, 0999.00, 33, 04
10=Contr. 2 ,Max. Permitted Power    ,% , 0.1 , 0010.00, 0100.00, 37, 04
11=Contr. 1&2,Dead Band               ,°C , 0.01 , 0000.00, 0099.90, 41, 04
12=- ,Nr. of Steps                   , , 1 , 0002.00, 0006.00, 45, 04
13=- ,Min. Step-On Delay              ,s , 0.1 , 0000.10, 0999.00, 49, 04
14=- ,Min. Step-off Delay             ,s , 0.1 , 0000.10, 0999.00, 53, 04

```

[ReglerParameter-438]

Def=R,r,0,01,28,28,07,07

```

01=- ,Proportional Band              , , 1 , 0000.00, 0999.00, 01, 04
02=- ,Lag Time                       ,s , 1 , 0000.00, 9999.00, 05, 04
03=- ,Lead Time                      ,s , 1 , 0000.00, 0999.00, 09, 04
04=- ,Dead Band                      , , 0.1 , 0000.00, 0099.00, 13, 04
05=- ,Interval Time                  ,s , 1 , 0001.00, 0999.00, 17, 04
06=- ,Stroke Frequency                ,/m , 1 , 0010.00, 0240.00, 21, 04
07=- ,Min. Impulse                   ,s , 0.1 , 0000.00, 0010.00, 25, 04

```

[ReglerParameter-439]

Def=R,r,0,01,44,44,11,11

```

01=Heating ,P-Band 1                 ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Heating ,Lag Time 1               ,s , 1 , 0000.00, 0999.00, 05, 04
03=Heating ,Lead Time 1              ,s , 1 , 0000.00, 0999.00, 09, 04
04=Heating ,Max. Permitted Power 1   ,% , 0.1 , 0010.00, 0100.00, 13, 04
05=Cooling ,P-Band 2                 ,°C , 0.1 , 0000.00, 0999.00, 17, 04
06=Cooling ,Lag Time 2               ,s , 1 , 0000.00, 0999.00, 21, 04
07=Cooling ,Lead Time 2              ,s , 1 , 0000.00, 0999.00, 25, 04
08=Heating ,Max. Permitted Power 2   ,% , 0.1 , -0010.00, -0100.00, 29, 04
09=Heat/Cool ,Dead Band              ,°C , 0.01 , 0000.00, 0099.90, 33, 04
10= ,Relay Interval 1                ,s , 1 , 0000.00, 0999.00, 37, 04
11= ,Relay Interval 2                ,s , 1 , 0000.00, 0999.00, 41, 04

```

[ReglerParameter-440]

Def=R,r,0,01,52,52,13,13

```

01=contr. 1 ,prop. band               ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=contr. 1 ,lag time                 ,s , 1 , 0000.00, 9999.00, 05, 04
03=contr. 1 ,lead time                ,s , 1 , 0000.00, 0999.00, 09, 04
04=contr. 1 ,relay interval           ,s , 1 , 0001.00, 0999.00, 13, 04
05=contr. 1 ,max. power                ,% , 0.1 , 0010.00, 0100.00, 17, 04
06=contr. 2 ,prop. band               ,°C , 0.1 , 0000.00, 0999.00, 21, 04
07=contr. 2 ,lag time                 ,s , 1 , 0000.00, 9999.00, 25, 04
08=contr. 2 ,lead time                ,s , 1 , 0000.00, 0999.00, 29, 04
09=contr. 2 ,relay interval           ,s , 1 , 0001.00, 0999.00, 33, 04
10=contr. 2 ,max. power                ,% , 0.1 , 0010.00, 0100.00, 37, 04
11=contr. 1&2,deadband               ,°C , 0.01 , 0000.00, 0099.90, 41, 04
12=range ,low                        ,°C , 0.1 , 0000.00, 2099.90, 45, 04
13=range ,high                       ,°C , 0.1 , 0000.00, 2099.90, 49, 04

```

[ReglerParameter-441]; Dosieren

Def=S,s,0,01,48,48,12,12

```

01=channel 1 ,proportional band       ,u , 0.1 , 0000.00, 0999.00, 01, 04
02=channel 1 ,lead time               ,s , 1 , 0000.00, 0999.00, 05, 04
03=channel 1 ,max. strokes per minute , , 1 , 0001.00, 0120.00, 09, 04
04=channel 1 ,pulse time              ,s , 0.1 , 0000.20, 0010.00, 13, 04

```

Serial Interface of TECON devices

```

05=channel 2 ,proportional band      ,E , 0.1 , 0000.00, 0999.00, 17, 04
06=channel 2 ,lead time              ,s , 1   , 0000.00, 0999.00, 21, 04
07=channel 2 ,max. strokes per minute, , 1   , 0001.00, 0120.00, 25, 04
08=channel 2 ,pulse time              ,s , 0.1 , 0000.20, 0010.00, 29, 04
09=scale    ,refill/tap lower limit  ,u , 1   , 0000.00, 9999.00, 33, 04
10=scale    ,refill/tap upper limit  ,u , 1   , 0000.00, 9999.00, 37, 04
11=channel 1 ,stroke capacity         ,u , 0.01, 0000.01, 0099.99, 41, 04
12=channel 2 ,stroke capacity         ,u , 0.01, 0000.01, 9999.90, 45, 04

```

[ReglerParameter-442]

Def=R,r,0,01,72,72,18,18

```

01=-        ,Amplification            , , 0.1 , 0000.00, 0099.90, 01, 04
02=Cascade  ,Lag Time 1              ,s , 1   , 0000.00, 9999.00, 05, 04
03=Cascade  ,Lead Time 1             ,s , 1   , 0000.00, 0999.00, 09, 04
04=Cascade  ,P-Band Heating           ,°C, 0.1 , 0000.00, 0999.00, 13, 04
05=Cascade  ,P-Band Cooling          ,°C, 0.1 , 0000.00, 0999.00, 17, 04
06=Cascade  ,Lead Time 2             ,s , 1   , 0000.00, 0999.00, 21, 04
07=Heating  ,Max. Temperature Difference,°C, 0.1 , 0000.00, 0999.00, 25, 04
08=Cooling  ,Max. Temperature Difference,°C, 0.1 , 0000.00, 0999.00, 29, 04
09=Heating  ,Relay Interval          ,s , 1   , 0001.00, 0099.00, 33, 04
10=Heating  ,Max. Permitted Power     ,s , 0.1 , 0010.00, 0100.00, 37, 04
11=Cooling  ,Relay Interval          ,s , 1   , 0001.00, 0099.00, 41, 04
12=Cooling  ,Max. Permitted Power     ,s , 0.1 , 0010.00, 0100.00, 45, 04
13=-        ,Dead Band               ,°C, 0.1 , 0000.00, 0099.90, 49, 04
14=-        ,Positioning Time        ,s , 1   , 0001.00, 0999.90, 53, 04
15=Shell    ,P-Band Heating           ,°C, 0.1 , 0000.00, 0999.00, 57, 04
16=Shell    ,P-Band Cooling          ,°C, 0.1 , 0000.00, 0999.00, 61, 04
17=Shell    ,Lag Time 1              ,s , 1   , 0000.00, 9999.00, 65, 04
18=Shell    ,Lead Time 1             ,s , 1   , 0000.00, 0999.00, 69, 04

```

[ReglerParameter-443]

Def=R,r,0,01,44,44,11,11

```

01=Heating  ,proportional band heating,°C, 0.1 , 0000.00, 0999.00, 01, 04
02=Heating  ,lag time                ,s , 1   , 0000.00, 0999.00, 05, 04
03=Heating  ,lead time                ,s , 1   , 0000.00, 0999.00, 09, 04
04=Heating  ,relay interval           ,s , 1   , 0000.00, 0999.00, 13, 04
05=Cooling  ,proportional band cooling ,°C, 0.1 , 0000.00, 0999.00, 17, 04
06=Cooling  ,lag time                ,s , 1   , 0000.00, 0999.00, 21, 04
07=Cooling  ,lead time                ,s , 1   , 0000.00, 0999.00, 25, 04
08=Cooling  ,relay interval           ,s , 1   , 0000.00, 0999.00, 29, 04
09=Heat/Cool,Dead Band               ,°C, 0.1 , 0000.00, 0009.90, 33, 04
10=Cooling  ,compressor function      , , 1   , 0000.00, 0002.00, 37, 04
11=Cooling  ,copmressor off delay     ,min, 1   , 0000.00, 0020.00, 41, 04

```

[ReglerParameter-444]

Def=R,r,0,01,46,46,14,14

```

01=Heating  ,proportional band heating,°C, 0.1 , 0000.00, 0999.00, 01, 04
02=Heating  ,lag time                ,s , 1   , 0000.00, 0999.00, 05, 04
03=Heating  ,lead time                ,s , 1   , 0000.00, 0999.00, 09, 04
04=Heating  ,relay interval           ,s , 1   , 0000.00, 0999.00, 13, 04
05=Cooling  ,proportional band cooling ,°C, 0.1 , 0000.00, 0999.00, 17, 04
06=Cooling  ,lag time                ,s , 1   , 0000.00, 0999.00, 21, 04
07=Cooling  ,lead time                ,s , 1   , 0000.00, 0999.00, 25, 04
08=Cooling  ,relay interval           ,s , 1   , 0000.00, 0999.00, 29, 04
09=Heat/Cool,Dead Band               ,°C, 0.1 , 0000.00, 0009.90, 33, 04
10=Cooling  ,compressor function      , , 1   , 0000.00, 0002.00, 37, 04

```

Serial Interface of TECON devices

```

11=Cooling ,compressor 2 threshold ,% , 0.1 , 0000.00, 0100.00, 41, 04
12=drying ,compressor 2 threshold ,% , 0.1 , 0000.00, 0100.00, 45, 04
13=Cooling ,compressor 1 off delay ,min, 1 , 0000.00, 0020.00, 49, 04
14=Cooling ,compressor 2 off delay ,min, 1 , 0000.00, 0020.00, 53, 04

```

[ReglerParameter-445]

```
Def=R,r,0,01,72,72,18,18
```

```

01=Heating ,proportional band heating ,°C , 0.1 , 0000.00, 0999.00, 01, 04
02=Heating ,lag time ,s , 1 , 0000.00, 0999.00, 05, 04
03=Heating ,lead time ,s , 1 , 0000.00, 0999.00, 09, 04
04=Heating ,relay interval ,s , 1 , 0000.00, 0999.00, 13, 04
05=Cooling ,proportional band cooling ,°C , 0.1 , 0000.00, 0999.00, 17, 04
06=Cooling ,lag time ,s , 1 , 0000.00, 0999.00, 21, 04
07=Cooling ,lead time ,s , 1 , 0000.00, 0999.00, 25, 04
08=Cooling ,relay interval ,s , 1 , 0000.00, 0999.00, 29, 04
09=Heat/Cool ,Dead Band ,°C , 0.1 , 0000.00, 0009.90, 33, 04
10=Cooling ,compressor function , , 1 , 0000.00, 0002.00, 37, 04
11=Cooling ,compressor 2 threshold ,% , 0.1 , 0000.00, 0100.00, 41, 04
12=drying ,compressor 2 threshold ,% , 0.1 , 0000.00, 0100.00, 45, 04
13=Cooling ,compressor 1 off delay ,min, 1 , 0000.00, 0020.00, 49, 04
14=Cooling ,compressor 2 off delay ,min, 1 , 0000.00, 0020.00, 53, 04
15=Heating ,Dead Band ,K , 0.1 , 0000.00, 0010.00, 57, 04
16=Heating ,Hysteresis ,K , 0.1 , 0000.00, 0010.00, 61, 04
17=Cooling ,Dead Band ,K , 0.1 , 0000.00, 0010.00, 65, 04
18=Cooling ,Hysteresis ,K , 0.1 , 0000.00, 0010.00, 69, 04

```

3.5 Process Programs (500)

[ProzessProgramm-501]

Def=P,p,1,99,16,16,06,06

01=-	,	,	1	,	0000.00,	0000.00,	01,	02		
02=-	,Nr. Of Following Section	,	1	,	-0000.00,	0099.00,	03,	02		
03=-	,Ramp	,	1/h,	0.1	,	0000.00,	0999.90,	05,	04	
04=-	,Dwell Time Hours	,	h	,	0000.00,	0099.00,	09,	02		
05=-	,Dwell Time Minutes	,	min,	1	,	0000.00,	0059.00,	11,	02	
06=-	,Setpoint	,	°C	,	0.1	,	-0200.00,	2000.00,	13,	04

[ProzessProgramm-502]

Def=P,p,1,16,14,14,05,05

01=-	,Setpoint	,	°C	,	0.1	,	-0200.00,	2000.00,	01,	04
02=-	,Dwell Time Hours	,	h	,	1	,	0000.00,	0099.00,	05,	02
03=-	,Dwell Time Minutes	,	min,	1	,	0000.00,	0059.00,	07,	02	
04=-	,Ramp	,	1/h,	0.1	,	0000.00,	0999.90,	09,	04	
05=-	,Nr. Of Following Section	,	1	,	-0000.00,	0016.00,	13,	02		

[ProzessProgramm-503]

Def=P,p,1,16,16,16,05,05

01=-	,Ramp 1	,	1/h,	0.1	,	0000.00,	0999.90,	01,	04	
02=-	,Setpoint	,	°C	,	0.1	,	-0200.00,	2000.00,	05,	04
03=-	,Dwell Time Hours	,	h	,	1	,	0000.00,	0099.00,	09,	02
04=-	,Dwell Time Minutes	,	min,	1	,	0000.00,	0059.00,	11,	02	
05=-	,Ramp 2	,	1/h,	0.1	,	0000.00,	0999.90,	13,	04	

[ProzessProgramm-504]

Def=P,p,1,16,18,18,06,06

01=-	,Setpoint	,	°C	,	0.1	,	-0200.00,	2000.00,	01,	04
02=-	,Dwell Time Hours	,	h	,	1	,	0000.00,	0099.00,	05,	02
03=-	,Dwell Time Minutes	,	min,	1	,	0000.00,	0059.00,	07,	02	
04=-	,Ramp	,	1/h,	0.1	,	0000.00,	0999.90,	09,	04	
05=-	,Setpoint ext. Controller	,	1	,	-0200.00,	2000.00,	13,	04		
06=-	,Nr. Of Following Section	,	1	,	-0000.00,	0016.00,	17,	02		

[ProzessProgramm-505]

Def=P,p,1,16,14,14,05,05

01=-	,Setpoint	,	°C	,	0.1	,	-0200.00,	2000.00,	01,	04
02=-	,Dwell Time Hours	,	h	,	1	,	0000.00,	0099.00,	05,	02
03=-	,Dwell Time Minutes	,	min,	1	,	0000.00,	0059.00,	07,	02	
04=-	,Power Setpoint	,	% P,	0.1	,	0000.00,	0100.00,	09,	04	
05=-	,Nr. Of Following Section	,	1	,	-0000.00,	0016.00,	13,	02		

[ProzessProgramm-506]

Def=P,p,1,99,16,16,06,06

01=Mode	,(0: Cascade 1: Shell)	,	1	,	0000.00,	0000.00,	01,	02		
02=-	,Nr. Of Following Section	,	1	,	-0000.00,	0099.00,	03,	02		
03=-	,Ramp	,	1/h,	0.1	,	0000.00,	0999.90,	05,	04	
04=-	,Dwell Time Hours	,	h	,	1	,	0000.00,	0099.00,	09,	02
05=-	,Dwell Time Minutes	,	min,	1	,	0000.00,	0059.00,	11,	02	
06=-	,Setpoint	,	°C	,	0.1	,	-0200.00,	2000.00,	13,	04

[ProzessProgramm-507]

Def=P,p,1,99,16,16,06,06

01=-	,Mode Of Integration	,	1	,	0000.00,	0002.00,	01,	02		
02=-	,Nr. Of Following Section	,	1	,	-0000.00,	0199.00,	03,	02		
03=-	,Setpoint 2	,	°C	,	0.1	,	-0200.00,	2000.00,	05,	04

Serial Interface of TECON devices

```

04--      ,Dwell Time Hours      ,h , 1 , 0000.00, 0099.00, 09, 02
05--      ,Dwell Time Minutes    ,min, 1 , 0000.00, 0059.00, 11, 02
06--      ,Setpoint              ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

[ProzessProgramm-508]

Def=P,p,1,99,16,16,06,06

```

01--      ,Digital Outputs        , , 1 , 0000.00, 0015.00, 01, 02
02--      ,Nr. Of Following Section , , 1 , -0000.00, 0099.00, 03, 02
03--      ,Ramp                  ,1/h, 0.1 , 0000.00, 0999.90, 05, 04
04--      ,Dwell Time Hours      ,h , 1 , 0000.00, 0099.00, 09, 02
05--      ,Dwell Time Minutes    ,min, 1 , 0000.00, 0059.00, 11, 02
06--      ,Setpoint              ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

[ProzessProgramm-509] basis 501

Def=P,p,1,99,16,16,06,06

```

01--      ,                      , , 1 , 0000.00, 0000.00, 01, 02
02--      ,Nr. Of Following Section , , 1 , -0000.00, 0199.00, 03, 02
03--      ,Ramp                  ,1/h, 0.1 , 0000.00, 0999.90, 05, 04
04--      ,Dwell Time Hours      ,h , 1 , 0000.00, 0099.00, 09, 02
05--      ,Dwell Time Minutes    ,min, 1 , 0000.00, 0059.00, 11, 02
06--      ,Setpoint              ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

[ProzessProgramm-510]

Def=P,p,1,99,16,16,06,06

```

01--      ,                      , , 1 , 0000.00, 0000.00, 01, 02
02--      ,Nr. Of Following Section , , 1 , 0000.00, 0199.00, 03, 02
03--      ,Anzahl Wiederholungen , , 1 , 0000.00, 9999.00, 05, 04
04--      ,Section Time Hours    ,h , 1 , 0000.00, 0099.00, 09, 02
05--      ,Section Time Minutes  ,min, 1 , 0000.00, 0059.00, 11, 02
06--      ,Setpoint At End Of Section ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

[ProzessProgramm-511]

Def=P,p,1,99,16,16,06,06

```

01--      ,Digital Outputs        , , 1 , 0000.00, 0015.00, 01, 02
02--      ,Nr. Of Following Section , , 1 , 0000.00, 0199.00, 03, 02
03--      ,Number Of Repetitions , , 1 , 0000.00, 9999.00, 05, 04
04--      ,Section Time Hours    ,h , 1 , 0000.00, 0099.00, 09, 02
05--      ,Section Time Minutes  ,min, 1 , 0000.00, 0059.00, 11, 02
06--      ,Setpoint At End Of Section ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

[ProzessProgramm-512]; basis 508

Def=P,p,1,99,16,16,06,06

```

01--      ,Digital Outputs        , , 1 , 0000.00, 0015.00, 01, 02
02--      ,Nr. Of Following Section , , 1 , -0000.00, 0099.00, 03, 02
03--      ,Ramp                  ,1/h, 0.1 , 0000.00, 0999.90, 05, 04
04--      ,Dwell Time Hours      ,h , 1 , 0000.00, 0099.00, 09, 02
05--      ,Dwell Time Minutes    ,min, 1 , 0000.00, 0059.00, 11, 02
06--      ,Setpoint              ,%rH, 0.1 , 0000.00, 0100.00, 13, 04

```

[ProzessProgramm-513]; basis 506

Def=P,p,1,99,16,16,06,06

```

01=Mode    ,(0=Cascade, 1=Shell) , , 1 , 0000.00, 0001.00, 01, 02
02--      ,Nr. Of Following Section , , 1 , -0000.00, 0199.00, 03, 02
03--      ,Ramp                  ,1/h, 0.1 , 0000.00, 0999.90, 05, 04
04--      ,Dwell Time Hours      ,h , 1 , 0000.00, 0099.00, 09, 02
05--      ,Dwell Time Minutes    ,min, 1 , 0000.00, 0059.00, 11, 02
06--      ,Setpoint              ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

Serial Interface of TECON devices

[ProzessProgramm-514]

Def=P,p,1,99,16,16,06,06

01=Mode	,(0: Cascade 1: Shell)	, , 1	, 0000.00, 0001.00, 01, 02
02=-	,Nr. Of Following Section	, , 1	, -0000.00, 0199.00, 03, 02
03=-	,Number Of Repetitions	, , 1	, 0000.00, 9999.90, 05, 04
04=-	,Dwell Time Hours	,h , 1	, 0000.00, 0099.00, 09, 02
05=-	,Dwell Time Minutes	,min, 1	, 0000.00, 0059.00, 11, 02
06=-	,Setpoint	,°C , 0.1	, -0200.00, 2000.00, 13, 04

[ProzessProgramm-515]

Def=P,p,1,99,16,16,06,06

01=Mode	,(0: Cascade 1: Shell)	, , 1	, 0000.00, 0001.00, 01, 02
02=-	,Folgeart	, , 1	, 0000.00, 0002.00, 03, 02
03=-	,Ramp	,1/h, 0.1	, 0000.00, 0999.90, 05, 04
04=-	,Dwell Time Hours	,h , 1	, 0000.00, 0099.00, 09, 02
05=-	,Dwell Time Minutes	,min, 1	, 0000.00, 0059.00, 11, 02
06=-	,Setpoint	,°C , 0.1	, -0200.00, 2000.00, 13, 04

[ProzessProgramm-516]

Def=P,p,1,16,22,22,09,09

01=-	,	, , 1	, 0000.00, 0000.00, 01, 02
02=-	,Nr. Of Following Section	, , 1	, 0000.00, 0199.00, 03, 02
03=-	,Logic Code	, , 1	, 0000.00, 0007.00, 05, 02
04=-	,Ramp Time Hours	,h , 1	, 0000.00, 0099.00, 07, 02
05=-	,Ramp Time Minutes	,min, 1	, 0000.00, 0059.00, 09, 02
06=-	,Dwell Time Hours	,h , 1	, 0000.00, 0099.00, 11, 02
07=-	,Dwell Time Minutes	,min, 1	, 0000.00, 0059.00, 13, 02
08=-	,Setpoint Rel. Humidity	,%rH, 0.1	, 0000.00, 0100.00, 15, 04
09=-	,Setpoint Temperature	,°C , 0.1	, -0050.00, 0150.00, 19, 04

[ProzessProgramm-517]

Def=P,p,1,99,16,16,06,06

01=-	,	, , 1	, 0000.00, 0000.00, 01, 02
02=-	,Nr. Of Following Section	, , 1	, -0000.00, 0199.00, 03, 02
03=-	,Ramp	,1/h, 0.001	, 0000.00, 009.999, 05, 04
04=-	,Dwell Time Hours	,h , 1	, 0000.00, 0099.00, 09, 02
05=-	,Dwell Time Minutes	,min, 1	, 0000.00, 0059.00, 11, 02
06=-	,Setpoint	,m/M, 0.001	, 0000.00, 0009.99, 13, 04

[ProzessProgramm-518]

Def=P,p,1,99,16,16,06,06

01=-	,	, , 1	, 0000.00, 0000.00, 01, 02
02=-	,Nr. Of Following Section	, , 1	, -0000.00, 0199.00, 03, 02
03=-	,Ramp	,1/h, 1	, 0000.00, 9999.00, 05, 04
04=-	,Dwell Time Hours	,h , 1	, -0001.00, 0099.00, 09, 02
05=-	,Dwell Time Minutes	,min, 1	, -0001.00, 0059.00, 11, 02
06=-	,Setpoint	,m/M, 0.1	, 0150.00, 2400.00, 13, 04

[ProzessProgramm-519]

Def=P,p,1,99,16,16,05,05

01=-	,Nr. Of Following Section	, , 1	, -0000.00, 0199.00, 01, 02
02=-	,Pump Number	, , 1	, 0001.00, 0004.00, 03, 02
03=-	,Section Time Hours	,h , 1	, -0001.00, 0099.00, 05, 02
04=-	,Section Time Minutes	,min, 1	, -0001.00, 0059.00, 07, 02
05=-	,Volume Per Section	, , 0.01	, 0000.00, 9999.99, 09, 08

[ProzessProgramm-520]

Def=P,p,1,99,16,16,06,06

Serial Interface of TECON devices

```

01=-      ,Output Nr. 4      , , 1 , 0000.00, 0001.00, 01, 02
02=-      ,Nr. Of Following Section , , 1 , -0000.00, 0199.00, 03, 02
03=-      ,Ramp              ,1/h, 1 , 0000.00, 0099.99, 05, 04
04=-      ,Dwell Time Hours   ,h , 1 , -0001.00, 0099.00, 09, 02
05=-      ,Dwell Time Minutes ,min, 1 , -0001.00, 0059.00, 11, 02
06=-      ,Setpoint          ,pH , 0.01 , 0000.00, 0014.00, 13, 04

```

[ProzessProgramm-521]

Def=P,p,1,09,16,16,06,06

```

01=Mode    ,(0: Cascade 1: Shell) , , 1 , 0000.00, 0001.00, 01, 02
02=-      ,Nr. Of Following Section , , 1 , 0000.00, 0019.00, 03, 02
03=-      ,Ramp              ,1/h, 0.1 , 0000.00, 0999.90, 05, 04
04=-      ,Dwell Time Hours   ,h , 1 , -0001.00, 0099.00, 09, 02
05=-      ,Dwell Time Minutes ,min, 1 , -0001.00, 0059.00, 11, 02
06=-      ,Setpoint          ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

[ProzessProgramm-522]

Def=P,p,1,09,16,16,06,06

```

01=Mode    ,(0: Cascade 1: Shell) , , 1 , 0000.00, 0001.00, 01, 02
02=-      ,Nr. Of Following Section , , 1 , 0000.00, 0009.00, 03, 02
03=-      ,Ramp              ,1/h, 0.1 , 0000.00, 0999.90, 05, 04
04=-      ,Dwell Time Hours   ,h , 1 , -0001.00, 0099.00, 09, 02
05=-      ,Dwell Time Minutes ,min, 1 , -0001.00, 0059.00, 11, 02
06=-      ,Setpoint          ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

[ProzessProgramm-523]

Def=P,p,1,09,14,14,05,05

```

01=-      ,Setpoint          , , 1 , -2000.00, 2000.00, 01, 04
02=-      ,Dwell Time Hours   ,h , 1 , -0001.00, 0099.00, 05, 02
03=-      ,Dwell Time Minutes ,min, 1 , -0001.00, 0059.00, 07, 02
04=-      ,Ramp              ,1/h, 1 , 0000.00, 9999.99, 09, 04
05=-      ,Nr. Of Following Section , , 1 , 0000.00, 0009.00, 13, 02

```

[ProzessProgramm-524]; Dosieren

Def=P,p,1,09,14,14,05,05

```

01=-channel 1,quantity or flow ,u , 1 , 0001.00, 9999.00, 01, 04
02=-channel 2,quantity or flow ,u , 1 , 0001.00, 9999.00, 05, 04
02=-      ,duration hours     ,h , 1 , -0001.00, 0099.00, 09, 02
03=-      ,duration minutes   ,min, 1 , -0001.00, 0059.00, 11, 02
05=-      ,Nr. of following section , , 1 , 0000.00, 0009.00, 13, 02

```

[ProzessProgramm-525]

Def=P,p,1,09,16,16,06,06

```

01=-      ,Setpoint          , øC, 0.1 , -2000.00, 2000.00, 01, 04
02=-      ,Setpoint 2        , øC, 0.1 , -2000.00, 2000.00, 05, 04
03=-      ,duration hours     ,h , 1 , -0001.00, 0099.00, 09, 02
04=-      ,duration minutes   ,min, 1 , -0001.00, 0059.00, 11, 02
05=-      ,lumination power   , , 25 , 0000.00, 0100.00, 13, 02
06=-      ,Nr. of following section , , 1 , 0000.00, 0099.00, 15, 02

```

[ProzessProgramm-526]

Def=P,p,1,99,16,16,05,05

```

01=Mode    ,(0: Cascade 1: Shell) , , 1 , 0000.00, 0001.00, 01, 04
02=-      ,Following section  , , 1 , 0000.00, 0099.00, 05, 04
03=-      ,Dwell time (Hours) ,h , 1 , -0001.00, 0099.00, 09, 02
04=-      ,Dwell time (Min.) ,min, 1 , -0001.00, 0059.00, 11, 02
05=-      ,Setpoint          ,°C , 0.1 , -0200.00, 2000.00, 13, 04

```

Serial Interface of TECON devices

[ProzessProgramm-527]

Def=P,p,1,99,18,18,07,07

01=Mode	,(0: Cascade 1: Shell)	, , 1	, 0000.00, 0001.00, 01, 02
02=-	,Following section.	, , 1	, 0000.00, 0099.00, 03, 02
03=-	,Ramp	,1/h, 0.1	, 0000.00, 0999.99, 05, 04
04=-	,Dwell time (Hours)	,h , 1	, -0001.00, 0099.00, 09, 02
05=-	,Dwell time (Min)	,min, 1	, -0001.00, 0059.00, 11, 02
06=-	,Setpoint	,°C , 0.1	, -0200.00, 2000.00, 13, 04
07=-	,Outputs	, , 1	, 0000.00, 0015.00, 17, 02

[ProzessProgramm-528]

Def=P,p,0,99,14,14,06,06

01=-	,setpoint temperature	,°C , 0.1	, -0050.00, 0099.00, 01, 04
02=-	,setpoint humid	,% , 1	, 0000.00, 0099.00, 05, 02
03=-	,lighting power	,% , 1	, 0000.00, 0100.00, 07, 02
04=-	,endtime hour	,h , 1	, 0000.00, 0099.00, 09, 02
05=-	,endtime minutes	,min, 1	, 0000.00, 0059.00, 11, 02
06=-	,following section	, , 1	, 0000.00, 0099.00, 13, 02

[ProzessProgramm-529] basis 501

Def=P,p,1,99,16,16,06,06

01=-	,	, , 1	, 0000.00, 0000.00, 01, 02
02=-	,following section	, , 1	, -0000.00, 0199.00, 03, 02
03=-	,Ramp	,1/h, 0.1	, 0000.00, 0999.90, 05, 04
04=-	,Dwell time (Hours)	,h , 1	, 0000.00, 0099.00, 09, 02
05=-	,Dwell time (Min)	,min, 1	, 0000.00, 0059.00, 11, 02
06=-	,Setpoint	,mb , 1	, -0200.00, 2000.00, 13, 04

25=No Answer

26=

27=

28=

29=

30=

3.6 Alarm Status (700)

[AlarmTabelle-701]

Def=31

00=
 01=Sensorbrk.1
 02=Upper Lim.1
 03=Lower Lim.1
 04=4
 05=Overflow 1
 06=Underflow 1
 07=
 08=Sensorbrk.2
 09=Upper Lim.2
 10=Lower Lim.2
 11=11
 12=Overflow 2
 13=Underflow 2
 14=Prog. End
 15=Timeout
 16=Power On
 17=
 18=
 19=
 20=
 21=
 22=
 23=
 24=

[AlarmTabelle-702]

Def=31

00=
 01=Sensorbrk.
 02=Upper Lim.
 03=Lower Lim.
 04=Band Err.
 05=Overflow
 06=Underflow
 07=
 08=
 09=
 10=
 11=
 12=
 13=Prog. End
 14=Timeout
 15=
 16=
 17=
 18=
 19=
 20=
 21=

Serial Interface of TECON devices

22=
23=
24=
25=No Answer
26=
27=
28=
29=
30=

[AlarmTabelle-703]

Def=31
00=
01=Sensorbr.
02=Upper Lim.
03=Lower Lim.
04=
05=Overflow
06=Underflow
07=
08=
09=

10=
11=
12=
13=Prog. End
14=Timeout
15=
16=
17=
18=
19=
20=
21=
22=
23=
24=
25=No Answer
26=
27=
28=
29=
30=

[AlarmTabelle-704]

Def=31
00=
01=
02=
03=
04=
05=
06=
07=
08=
09=
10=

11=
12=
13=Timeout
14=
15=
16=
17=
18=
19=
20=
21=
22=
23=
24=
25=No Answer
26=
27=
28=
29=
30=

[AlarmTabelle-705]

Def=31
00=
01=Alarm 1
02=Alarm 2
03=Alarm 3
04=Alarm 4
05=Alarm 5
06=Timeout 1
07=Timeout 2
08=Power On
09=Dig. Inp.
10=Alarm 10
11=Alarm 11
12=Alarm 12
13=Alarm 13
14=Alarm 14
15=Alarm 15

16=
17=
18=
19=
20=
21=
22=
23=
24=
25=No Answer
26=
27=
28=
29=
30=

[AlarmTabelle-706]

Def=31

Serial Interface of TECON devices

00=	24=
01=Alarm 1	25=No Answer
02=Alarm 2	26=
03=Alarm 3	27=
04=Alarm 4	28=
05=Alarm 5	29=
06=Timeout 1	30=
07=Timeout 2	
08=Power On	[AlarmTabelle-708]
09=Dig. Inp.	Def=31
10=Al.Master	00=
11=Al.Slave	01=Sensorbrk.1
12=Alarm 12	02=Upper Lim.1
13=Alarm 13	03=Lower Lim.1
14=Alarm 14	04=Band Error
15=Alarm 15	05=Overflow 2
16=	06=Underflow 2
17=	07=Sensorbrk.2
18=	08=Upper Lim.2
19=	09=Lower Lim.2
20=	10=Band Error
21=	11=Overflow 2
22=	12=Underflow 2
23=	13=Prog. End
24=	14=Timeout
25=No Answer	15=Power On
26=	16=
27=	17=
28=	18=
29=	19=
30=	20=
	21=
[AlarmTabelle-707]	22=
Def=31	23=
00=	24=
01=Sensorbrk.1	25=No Answer
02=Upper Lim.1	26=
03=Lower Lim.1	27=
04=	28=
05=Overflow 1	29=
06=Underflow 1	30=
07=Sensorbrk.2	
08=Upper Lim.2	[AlarmTabelle-709]
09=Lower Lim.2	Def=31
10=	00=
11=Overflow 2	01=Sensorbrk.1
12=Underflow 2	02=Upper Lim.1
13=Prog. End	03=Lower Lim.1
14=Timeout	04=
15=Power On	05=Overflow 1
16=	06=Underflow 1
17=	07=Sensorbrk.2
18=	08=Upper Lim.2
19=	09=Lower Lim.2
20=	10=
21=	11=Overflow 2
22=	12=Underflow 2
23=	13=Prog. End

Serial Interface of TECON devices

14=Timeout
15=Power On
16=Sensorbrk.3
17=
18=
19=
20=
21=
22=
23=
24=
25=No Answer
26=
27=
28=
29=
30=

[AlarmTabelle-710]

Def=31
00=
01=Sensorbrk.
02=Upper Lim.
03=Lower Lim.
04=
05=Overflow
06=Underflow
07=
08=
09=
10=
11=
12=
13=Prog. End
14=Timeout
15=Power On

16=
17=
18=
19=
20=
21=
22=
23=
24=
25=No Answer
26=
27=
28=
29=
30=

[AlarmTabelle-711]

Def=31
00=
01=Sensorbrk.1
02=Upper Lim.1
03=Lower Lim.1

04=Band Err. 1
05=Overflow 1
06=Underflow 1
07=Sensorbrk.2
08=Upper Lim.2
09=Lower Lim.2
10=Band Err. 2
11=Max. Volume
12=Min. Volume
13=Prog. End
14=Timeout
15=Power On
16=
17=
18=
19=
20=
21=
22=
23=
24=
25=No Answer
26=
27=
28=
29=
30=

[AlarmTabelle-712]

Def=2
00=
01= HAVARIE

[AlarmTabelle-713]

Def=31
00=
01=Sensorbrk.1
02=Upper Lim.1
03=Lower Lim.1
04=Overflow 1
05=Underflow 1
06=Sensorbrk.2
07=Upper Lim.2
08=Under Lim.2
09=Overflow 1
10=Underflow 1
11=Prog.End
12=Timeout
13=Power On
14=
15=
16=
17=
18=
19=
20=
21=
22=

Serial Interface of TECON devices

23=	12=
24=	13=
25=No Answer	14=
26=	15=
27=	16=
28=	17=
29=	18=
30=	19=
	20=
	21=
[AlarmTabelle-714]	22=
Def=31	23=
00=	24=
01=sensorbrk.1	25=no answer
02=sensorbrk.1	26=
03=sensorbrk.1	27=
04=Overflow temp.	28=
05=Underflow temp.	29=
06=Overflow humid	30=
07=Underflow humidity	
08=band err. temp.	
09=band err. humidity	
10=power on	
11=prog.end	

3.7 Special protocols

3.7.1 Tecon 234, 237 ,238

The communication with these devices differs on behalf of the multiple loop feature. They use 4 sequential addresses. The first and lowest address is specified in the device (see manual: serial interface). One address serves 2 loops.

1. Address	Setpoint 1 = Setpoint 1 Setpoint 2 = Setpoint 2 Act. value 1 = Act. value 1 Act. value 2 = Act. value 2 Output 1 = Output 1 Output2 = Output 2 etc.	2. Address	Setpoint 1 = Setpoint 3 Setpoint 2 = Setpoint 4 Act. value 1 = Act. value 3 Act. value 2 = Act. value 4 Output 1 = Output 3 Output 2 = Output 4 etc.
3. Address	Setpoint 1 = Setpoint 5 Setpoint 2 = Setpoint 6 Act. value 1 = Act. value 5 Act. value 2 = Act. value 6 Output 1 = Output 5 Output 2 = Output 6 etc.	4. Address	Setpoint 1 = Setpoint 7 Setpoint 2 = Setpoint 8 Act. value 1 = Act. value 7 Act. value 2 = Act. value 8 Output 1 = Output 7 Output 2 = Output 8 etc.