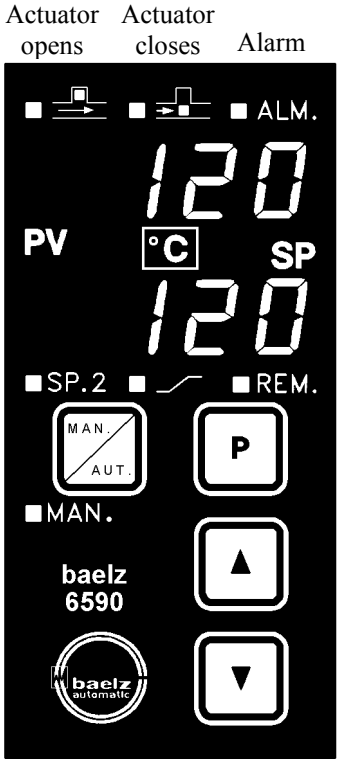
Microprocessor - based controller µCelsitron baelz 36590 / 2
Universal three - position step controller
as 19 - inch rackmount unit

Industrial controller with special PID - step controller algorithm

Contens

1. Operating and setting

Operating level:



Process variable display

Other phys. units available as stickers

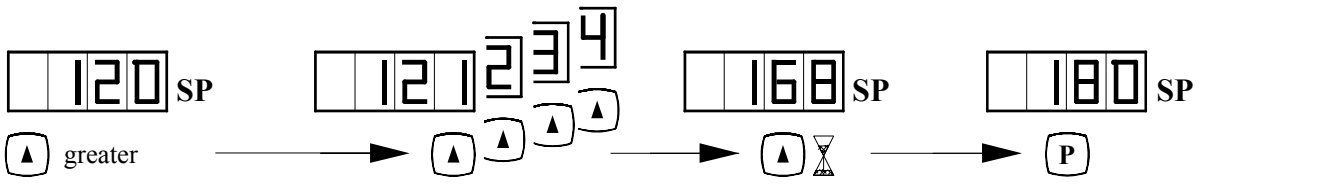
Setpoint display

SP.2: Second setpoint effective, setpoint 2
⎍⎍ : Setpoint ramp active

Remote setpoint effective, or serial communication remote setpoint

Manual mode

1.1 **Setting setpoint** in automatic mode



greater

smaller

in individual steps

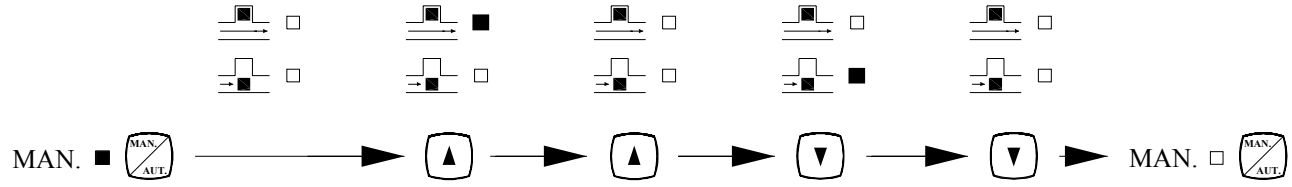
Continuous, adjustment at increasing speed

= press continously

within 5 s accept new setpoint, otherwise back to the old, still effective setpoint

Setting range: SP.L to SP.H
Locked setpoint input at SP.2 or REM.

1.2 **Opening / closing actuator** in manual mode



Change over to manual mode (lockable)

actuator stops

actuator opens

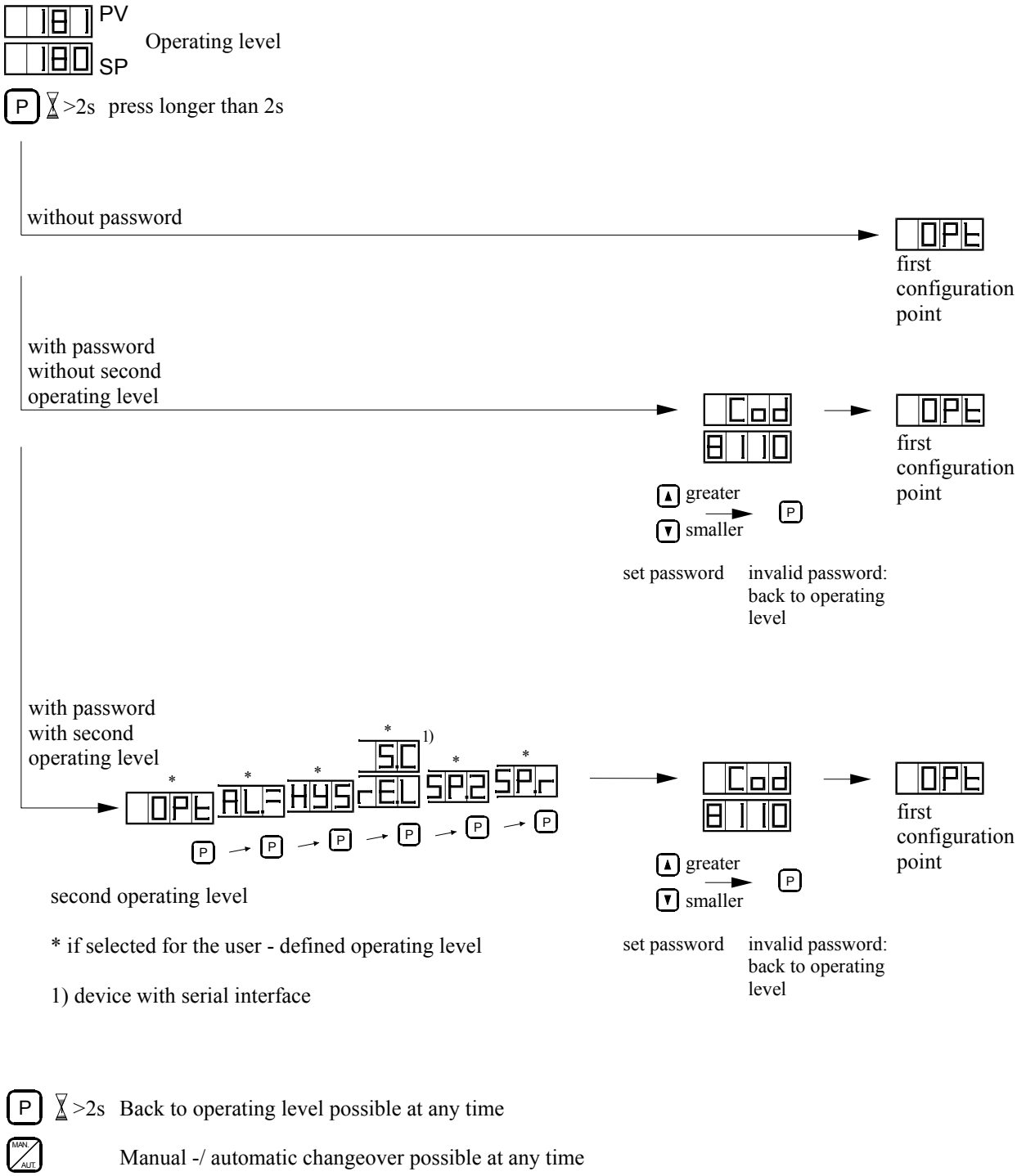
actuator stops

actuator closes

actuator stops

Change over to automatic mode

1.3 Branch to parameterization -/ configuration level

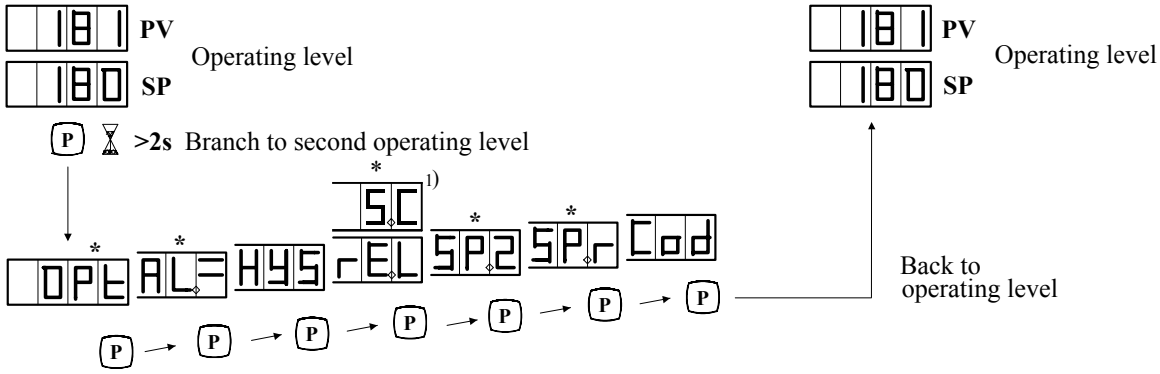


P >2s Back to operating level possible at any time

MAN. AUT. Manual -/ automatic changeover possible at any time

1.4 Branch to second operating level (user - defined operating level)

Parameters and configuration points that have been selected for the second operating level can be called up and set without entering the password, in case of access to the parameterization -/ configuration level is protected by a password.

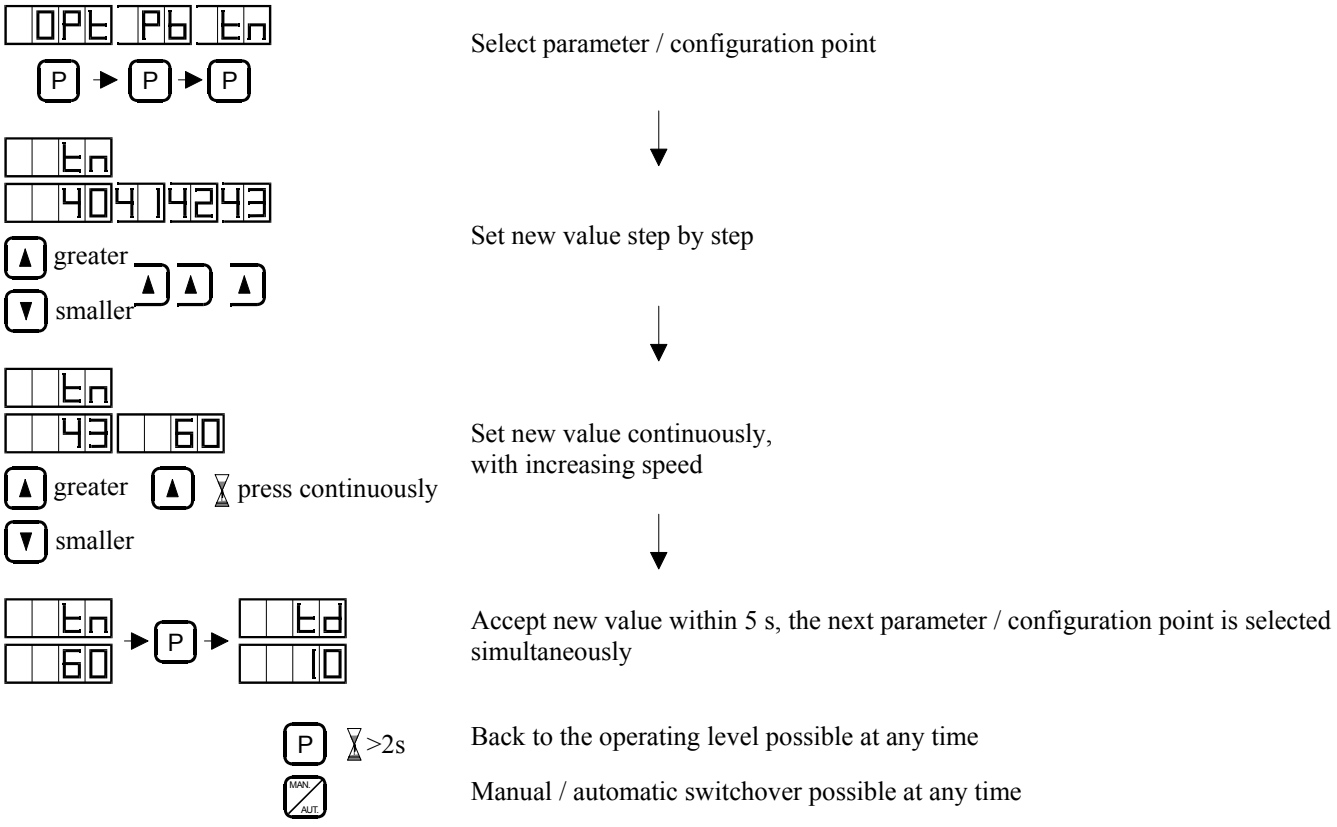


*if this function has been selected for the user-defined operating level and the access to the parameterization -/ configuration level has been interlocked by means of the password.
1) device with serial interface

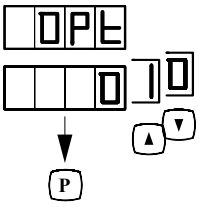
The following can be set as an option on the second operating level:

- self-optimization OPt
- alarm AL.,HYS
- remote -/ local changeover rE.L or serial communication S.C
- second setpoint SP.2
- setpoint ramp SP.r

1.5 Set parameters / configuration points



2. Parameterization -/ configuration level

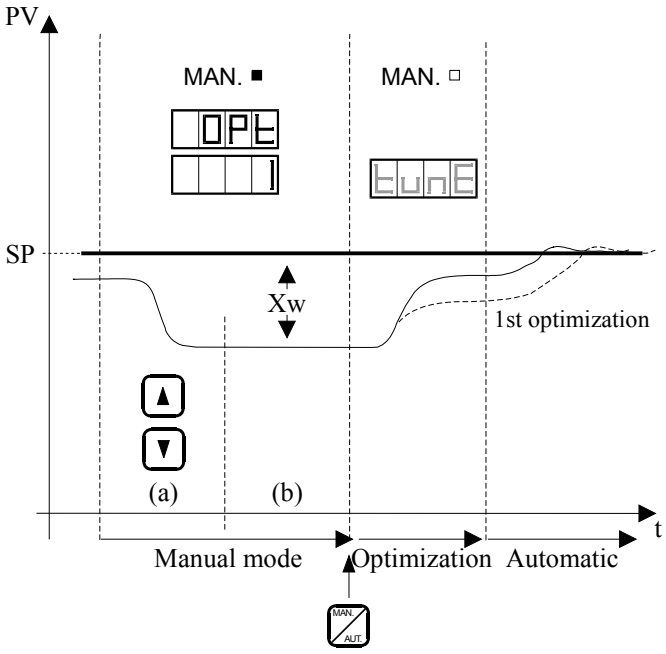


2.1 Optimization for automatic determination of favourable control parameters.

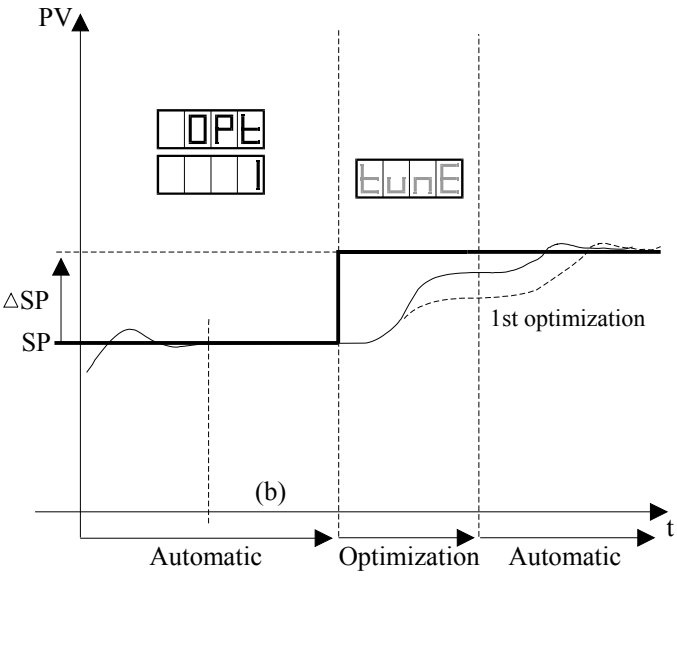
Selections: 0 No self - optimization
1 Self - optimization activated

Self - optimization is triggered by:

– a change in the setpoint SP (not for remote setpoint)
– a change in the setpoint SP.2 on the parameterization -/ configuration level, if SP.2 is the effective setpoint
– a changeover from manual to automatic mode



Optimization from manual mode



Optimization in automatic mode

Procedure during optimization:

From the manual mode:

- Set the setpoint SP
- Switch over to manual mode
- Set the process variable PV greater / smaller than the setpoint SP by opening / closing the controlling element (a)
- Wait until PV is stable (b)
- Branch to parameterization -/ configuration level
- Set OPt = "1"
- If known, enter process gain P.G. (standard setting: P.G = 100%)
- Back to operating level
- Switch over to automatic mode

In the automatic mode:

- Wait until PV is stable (b)
- Branch to parameterization -/ configuration level
- Set OPt = "1"
- If known, enter process gain P.G. (standard setting: P.G = 100%)
- Back to operating level
- Set the setpoint

Self - optimization starts upon manual -/ automatic changeover (for optimization from the manual mode) or upon setpoint change DSP (for optimization in the automatic mode). During the optimization procedure, the **tunE** display is shown cyclically in the setpoint display SP. The determined parameters (Pb, tn, Td, P.G) are accepted automatically at the end of the self - optimization procedure.

The optimisation routine will not be started, if the control deviation Xw (manual mode) or the setpoint change DSP (automatic mode) is less than 3.125% of the measuring range PV at the beginning of the optimization procedure. The change in the process variable PV or the setpoint must, during optimization, run in the same range and in the same direction in which the process is controlled following optimization, which means that the optimization procedure must correspond to the later control procedure as far as possible. If, during a control process, sequences of the process show extreme differences in time behaviour (e.g. rapid heating, slow cooling), the more important part of the process should be optimized.
If the process sequences are equivalent, the slower procedure has to be optimized.

For systems with linear transfer behaviour (constant process gain $P.G = \frac{\Delta PV}{\Delta Y}$ over the entire control range), one optimization procedure will always provide the optimum control parameters.

If the transfer behaviour of the system is non-linear (e.g. process gain $P.G = \frac{\Delta PV}{\Delta Y}$ changes with the setpoint SP to be controlled), the variable process gain P.G will have a significant effect on the control parameters. In this case, the process variable PV should come close to achieving the target setpoint during the optimization procedure.
Otherwise, an additional optimization procedure must be carried out. The process gain P.G in the working point was determined automatically in the preceding optimization procedure.
If the process gain P.G in the working point is known, it can be entered manually prior to optimization.
The configuration point OPt is reset to 0 automatically following each optimization procedure.
An optimization procedure can be interrupted anytime by pressing the hand - key or the **P** - key briefly.

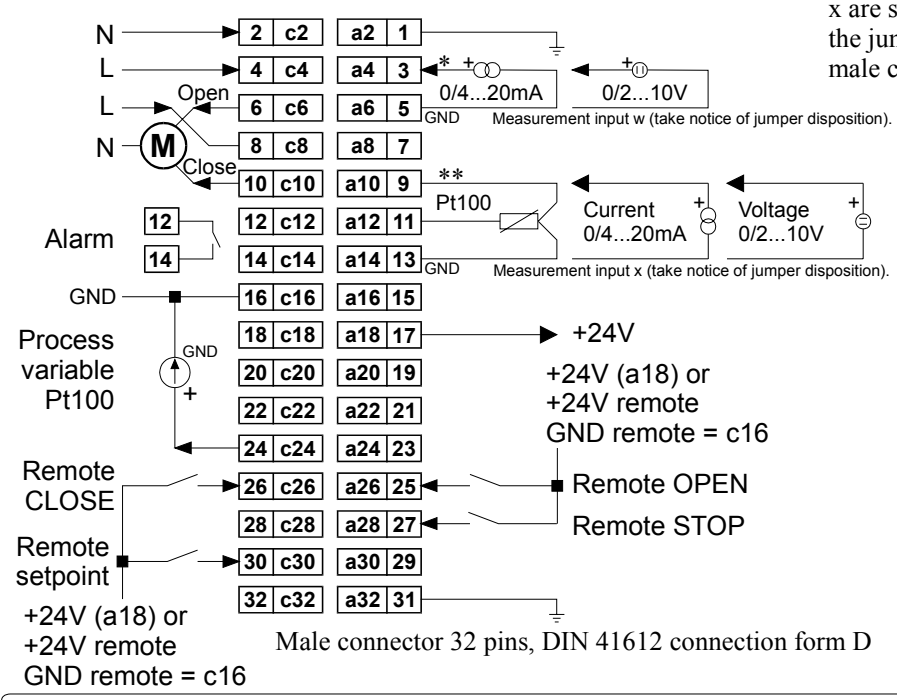
NO ENTRIES OR CHANGEOVER OPERATIONS MUST BE MADE DURING THE OPTIMIZATION PROCEDURE !

3. Technical data

Power supply	230 V AC 115 V AC 24 V AC } -15 % / +10 %, 50 / 60 Hz
Power consumption	approx. 7 VA
Weight	approx. 1,2 kg
Permissible ambient temperature	
- Operation	0 to 50ºC
- Transport and storage	-25º to + 65ºC
Degree of protection	Front IP 65 according to DIN 40050 (for the controller, only - not for the rackmount kit)
Design	for rack - unit mounting 3 HU (height), 10 DU (depth)
Installation position	arbitary
DI - feed voltage and measuring transducer feed voltage	24 V DC, Imax. = 60 mA
Analog inputs	Pt100, 2.4 = 0°C to 300°C or 2.2 = 0°C to 400°C Connection in three - wire system 0/4 to 20 mA, input resistance = 50 Ohm 0/2 to 10 V, input resistance = 100 KOhm
Accuracy	0.1% of measuring range
Digital inputs	high active, Ri = 1 k W; n.c. / 0V DC = low 15 V to 24 V DC = high
Analog output	0 to +10 V comply with 0° to 300°C (2.4) or 0° to 400°C (2.2), Imax. = 2 mA
Displays	Two 4 - digit 7- segment displays, LED ,red, digit height = 10 mm
Alarm	Alarm type A, B, C; normally closed contact principle
Relays	Contact equipment: Alarm: 1 breaker potential - free, motor: 1 change - over contact Switching capacity: 250 V AC / 3 A, spark quenching element.
Data storage	Semi - conductor memory

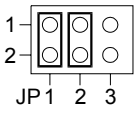
4. Wiring diagram

Wiring diagram rackmount unit baelz 36590 / 2



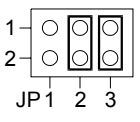
Male connector 32 pins, DIN 41612 connection form D

Remote setpoint w and measured variable input x are selectable by corresponding disposition of the jumpers on the circuit board (sight from male connector with 32 pins):



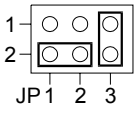
* Rem.w = 0/2 ... 10V: JP1

** x = Pt100 : JP2



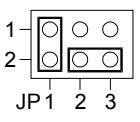
* Rem.w = 0/4 ... 20mA: JP3

** x = Pt100 : JP2



* Rem.w = 0/4 ... 20mA: JP3

** x = 0/2 ... 10V : JP1/2 connect. to JP2/2



* Rem.w = 0/2 ... 10V : JP1

** x = 0/4 ... 20mA: JP2/2 connect. to JP3/2

⚠ By exchange from 32390 to 36590 take notice of the following (see Page 9: Hardware changes): - Change the polarity of the process variable display
- On "STOP" - command the signal has to change from GND to +24 V

5. Table of parameters

BAELZ 36590 / 2

82255.3

Parameter-Tabelle
Cod = 8110

		GAS-HEIZUNG gas heating chauff. gaz calefacc. gas riscaldam. gas	OEL / DAMPF oil / steam huile / vapeur aceite / vapor olio / vapore						
			DN15... ...DN25	DN32... ...DN125		engl.	franz	span	ital
	Opt	0	0	0	Selbstoptimierung	optimization	optimisation	autooptimizacion	autoadattamento
*	Pb	* 30	* 15	* 15	Proportional Band (%)	proport. band	bande proportionelle	margen proporcional	banda proporzionale
*	tn	* 18	* 130	* 130	Nachstellzeit (s)	reset time	temps d` action integrale	tiempo de inercia	tempo di integrazione
*	td	* 0	* 0	* 0	Vorhaltzeit (s)	differ. time	temps d` action derivee	tiempo de retencion	tempo di anticipo
	db	0,3	0,3	0,3	Schaltlücke	dead band	bande morte	umbral de conexion	sensibilita
	t.P	30	36	60	Stellzeit. Ventil (s)	manipulated time	temps de positionnement	tiempo de aj. de la valvula	tempo di escurzione
	AL	1	1	1	Alarm-Verhalten	alarm	alarme	alarma	allarme
	AL.=	+5	+5	+5	Alarm-Verhalten A / Signalkontakt	alarm version A	alarme choix 1	alarma selecion 1	allarme defin. 1
oder	HYS	5	1	1	Hysterese to A / Signalkontakt	hysterese A	hysterresie de l' alarme 1	histeressis de alarma 1	isteresi allarme 1
	AL.-				Alarm-Verhalten B / Grenzkontakt	alarm version B	alarme choix 2	alarma seleccion 2	allarme defin. 2
oder	HYS				Hysterese to B / Grenzkontakt	hysterese B	hysterresie de l' alarme 2	histeresis de alarma 2	isteresi allarme 2
	AL.≡				Alarm-Verhalt. C / Signalband Min. Wert	signalband C	moitie da la b. inferieure	mitad interior de la banda	limite inferiore
	HYS				Hysterese to C / Signalband Min. Wert	hysterese C	hysterresie de l' alarme -	histeresis de alarma -	isteresi allarme -
	Al. ≡				Alarm Verhalt. C / Signalband Max. Wert	signalband C	moitie de la b. superieure	mitad superior de la banda	limite superiore
	HYS				Hysterese to C / Signalband Max. Wert	hysterese C	hysterresie de l' alarme +	histeresis de alarma +	isteresi allarme +
	dP	0	0	0	Dezimal pkt. XXX.X	decimal point	point decimal	punto decimal para visual.	decimali sui display
	dI.L	0	0	0	Messgrössen - Nullpunkt	display low	base de l' echelle	punto cero del margen	immet. l' inizio d' scala
	dI.H	300	300	300	Messgrössen-Endpunkt	diplay high	haut de l' echelle	punto final del margen	immet . il fondo d' scala
	SP.L	50	50	50	Minimaler Sollwert	setpoint low	point de consigne bas	volor nom. minimo ajust.	val. di set minimo
	SP.H	300	300	300	Maximaler Sollwert	setpoint high	point de consigne haut	valor nom. maximo ajust.	val. di set massimo
	rE.L	0	0	0	externer / interner sollwert	remote / local	commutation ext / local	conmutacion int / ext	commutazione int / est
	SP.2	0	0	0	Zweiter Sollwert	setpoint 2	sec point de consigne	segundo valor nominal	secondo valore
	SP.r	0	0	0	Sollwertrampe	setpoint ramp	rampe de point de cosigne	rampa de valores nominales	rampa setpoint
	rAd	0	0	0	Rampeneinrichtung	ramp direction	sens de la rampe	direccion de rampa	senso di az. d' rampa
	dSP	0	0	0	Delta Sollwert / Delta w	differ. set point	differ de consigne	differ valor nominal	differ de valore
*	P.G	*100	*100	*100	Prozessverstärkung (%)	process gain	gain de processus	amplificacion de proceso	amplificazione
	In.P	0	0	0	Istwert-Eingang-Festlegung	input process	entree mesure	ent. para magnitud de proc.	ingresso di misura
	In.S	1	1	1	ext. Sollwerteingang-Festlegung	input setpoint	entree point de cons. ext	entr. para val. nom. ext.	ingr. val. di set est.
	FIL	240	240	240	Messwertfilter	filter	filtre de la val. mes.	filtro de val. de medicion	filtro per ingr. di mis.
	SE.b	0	0	0	Stellgliedreaktion bei Fühlerstörung	sensor break	rupture de sonde	comp. en caso de f. del sensor	comp. in caso di sonda guasta
	MAn	0	0	0	Hand / Automatik-Festlegung	manual	verrouillage man/autom	encl. de la conm. man / aut	blocco manuale / auto
	dIr	0	0	0	Wirksinn	direction	sens d' action du regul	direcc. de acc. del reg.	senso di az. del reg.
	OL.2	4	4	4	zweite Bedienebene-Festlegung	operation level	sec niveau operateur	segundo nivel de mando	secondo livello di progr.
	PAS	1	1	1	Passwort Vorgabe	password	mot de passe	acc. al nivel de param.	accesso al livello

* **RICHTWERT**
guideline
valeur indicative
valor normativo
valore indicativo

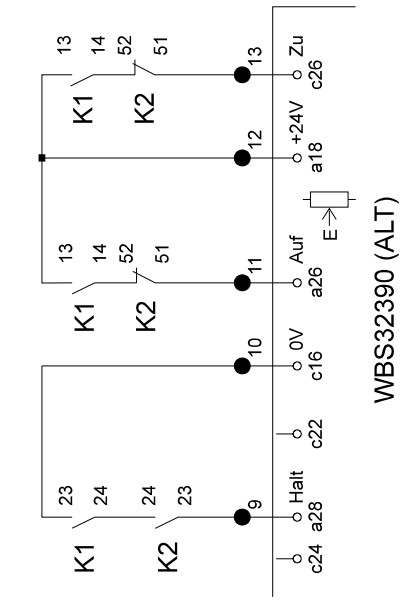
▲ **AUSLIEFERUNG**
delivery
livraison
distribucion
consegna

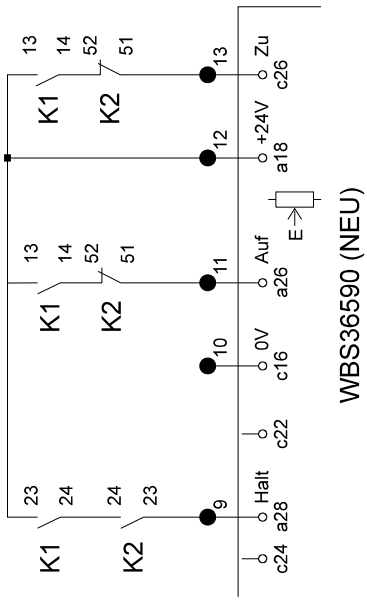
I: regolatore di temperatura **E: regulador de temperatura**
F: regulateur de temperature **GB: temperature controller**

Datum: 14.11.95 BABCOCK TEXTILMASCHINEN **TEMPERATURREGLER** = 812 (812.000)

W. Bälz & Sohn GmbH & Co. Koepffstrasse 5 74076 Heilbronn Germany
Telephone +49 (0)7131 15 00 0 Telefax +49 (0)7131 15 00 21 www.baelz.de mail@baelz.de

6. Hardware changes of temperature controller gas - heating





GB: temperature controller gas-heating

I: regulatore di temperature riscalm.gas

E: regulador de temperature calefacc.gas

F: regulateur de temperature chauffage gaz

HARDWAREÄNDERUNG
TEMPERATURREGLER
GASHEIZUNG

=812

BABCOCK
TEXTILMASCHINEN

Datum: 15.02.96

122'-3