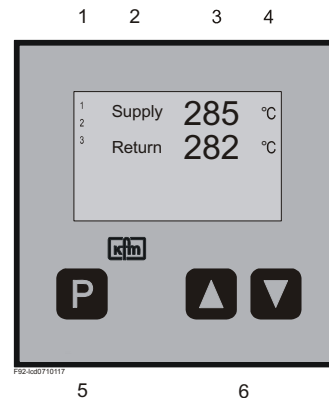1 LCD display for relay function
2 Descriptive text for displayed values
3 Digital value displays
4 Unit of display
5 Key for setpoint and parameter mode
6 Setpoint adjustment

certifications: DIN, GL, BV

General:

KFM 902 is an industrial microcomputer-based controller series in control panel format 96 x 96 mm with a performance range of up to 8 relay outputs, various signal inputs and outputs as well as numerous possible optional extras. Communication with control systems is also possible.

All relay contacts are implemented as potential-free changeover contacts. Normally, the N.O. contacts of all relays are internally permanently wired with RC elements. Optionally, the RC elements for relays K1…K3 are led on terminals for the selective connection (N.O. contact factory-connected). The scope of delivery includes plugable terminal blocks.

The transflective LCD indication with white background lighting is easy to read in both light and dark environments. In operating mode up to 4 values (actual values, setpoint values, control settings, ..) can be displayed including freely adjustable description text and unit of display. Additional displays for operating and malfunction messages, including the corresponding hardware or custom display masks are optionally available.

Stage controllers and three-point step controllers with auxiliary contact (e.g. burner controller) are fitted as standard with a 2nd measuring input, continuous controllers have an extended measuring input range.

Types (depending on configuration):	*Type*
Indicator	9020..
Single-stage controller	9021..
Two-stage controller	9022..
Three-point controller	9023..
Positioner / follow-up controller	9024..
Two-point PID controller	9025..
Three-point PID controller	9026..
Three-point step controller	9027..
Continuous controller	9028..
Continuous controller with 2 outputs	9029..

Sub-types:	*suffix*
Basic function	00
Basic function + 1..8 additional contacts	01..08
Basic function double, triple, quadruple	20,30,40
Logic output 0/24V max 40mA	..L

Function extensions:(*)	
Difference controller	991d
Limitation controller	991g
Cascade controller	991k
Program controller	991p
Ramp setpoint	991r
Malfunction modul	991s
Stage controller	991t

Additional devices:(*)	
Additional analog inputs	(99) a.
External setpoint incl. switching	(99) bwa.
Second setpoint incl. switching	(99) bwz.
Binary inputs for special functions	(99) b..
Further additional contacts	(99) f
Analog signal outputs	(99) o.
Interface by external module for Profibus, Modbus, Ethernet, ..	(99) s..

*See also data sheets 99.. !
subject to alterations

Measuring inputs: Type suffix
(max. 4, depending on version)

Pt100/standard signal, 0...400°C/adj.	without (or 0)
Pt100/standard signal, -200...+800°C/adj.	99mb14b
Thermal element NiCr-Ni (K)0...1200°C	
Fe-CuNi (J)0... 900°C, PtRh-Pt (S)0...1700°C	qt
Remote resistance transmitter 0…100/1000Ω	qw

Feature for meas. input 2 with equipment external setpoint: Standard signal configurable to ext. setpoint value, the Pt100 input is extra usable

Ranges:
Pt 100: 0..400°C (switching controllers), -200..+800°C (continuous controllers), switchable to °F, standard signal: Display adjustable -999 to 9999, setpoint range can be limited via menu

Binary inputs:
Max. 20 inputs, alt. for potential-free contacts or for ext. voltage 0 / 24V, for status messages (can optionally be saved) or control functions.

Displays:
Max. 4-four-digit value displays with selectable decimal point, each including adjustable descriptive text and unit of display, optional add. message texts, custom display masks, up to 8 displays for relay functions.

Outputs:
Up to 8 relays as setting outputs or additional contacts, with potential-free changeover contacts, switching power 250V 2A incl. spark extinction (on the N.O. contact)
up to 6 continuous outputs 0/4...20mA, 0/2...10V (load <= 500 Ω), as setting or signal output
up to 3 logic outputs 0/24V max. 40 mA, alternatively 16 outputs open collector, max 24 V / 100 mA

Installation:

Before installation inspect the controller for any visible signs of damage caused during transport. Check power supply acc. to name plate.
Push the housing from the front into the DIN- panel cut-out and secure from behind with the fastening devices supplied.

Electrical wiring:

Plug bar on the back face of the controller; connect up the controller at the rear following the wiring diagram; wire cross section max. 1,5 mm^2

- To avoid cross interference *all low voltage measuring lines and pilot wires* must be encased in a *shielded cable* (the shielding must be earthed one-sided).
- The control leads must be *fused externally* to protect the output relays.
- Phase wire and neutral wire must not be transposed.

Putting into operation:

Switch on power supply. Digital display and control lamps (if available) will light up according to the setpoint after some seconds. If nothing happens check the fine-wire fuse (if available) on the back panel of the controller and the electrical wiring. Adjust set value and check other adjustments.

Maintenance:

All electronic controllers in the product range of the manufacturer are virtually maintenance-free. Provided that the controller is correctly installed and put into operation and is protected against mechanical damage and inadmissible operating conditions, it should give years of trouble-free service. *In case of faults* repair work by the customer should be restricted to the externally accessible leads and connections and components the customer is expressly permitted to deal with himself (bridge circuits, fuses).

All further work, especially on internal components will terminate warranty, makes subsequent inspection and fault repair more difficult and can cause considerable damage to the circuitry.

For repair remittance remove plug board with connected leads on the rear side, loosen fastening devices and remove controller from the panel.

In case of remittance please give precise details of the fault to reduce time and cost of repair.

Error messages:

Err 1...6	Fault on measuring input nr. ... check measuring lines for short circuit or breakage check measuring input by connecting a RTD
Err 55	Fault on loading the parameter; press any key, the controller starts in emergency operation mode, configuration of the parameters has to be checked
Err 50	Hardware error in program section
Err 52	Hardware error in data section no further operation possible, remit controller for repair
Err 58	Binary inputs out of function (status = 0), remit controller for repair
Err 59	Digital outputs out of function (switched off), remit controller for repair
Err 60	Relay outputs out of function (switched off), remit controller for repair
Err 61	Analogue outputs out of function (0 %), remit controller for repair
	Error messages during self adaptation:
Err 202	Ambient conditions are not suitable for self adaptation; adjust parameter manually
Err 205	routine exceeded the setpoint raise setpoint or lower actual value and start adaptation again
Err 206	Fault on measuring input during adaptation; check the wiring and start adaptation again

Operating status:

```
1  ACT.VAL.1  2 3 5. 8  ℃
2
3  ACT.VAL.2  2 3 1. 2  ℃

   SETPOINT   2 3 6. 0  ℃
```

<u>Analog values:</u> Depending on the configuration, up to three values in 10 mm size or two values in 10 mm and two values in 3 mm size can be displayed. A dedicated unit for each value can be configured if desired. The corresponding descriptive texts are changeable by means of the PKS PC software.
Depending on equipment, the status of the relays is shown at the left side of the display via the respective number (K) 1, 2, ..

```
   ACT.VAL.1  2 3 5. 8  ℃

   ACT.VAL.2  2 3 1. 2  ℃

   12:09   TEMPERTURE HIGH
   12:26   LEVEL LOW
```

In conjunction with the option of binary input messages, the corresponding texts are shown in the two lower 3 mm display lines if the binary inputs are activated. The corresponding value displays are hidden during this time.

```
   BIN. MESSAGES P1/2
   ○ WATER LEVEL LOW
   ○ SMOKE GAS TEMP HIGH
   ○ STEAM TEMP HIGH
   ○ PRESSURE LIMITTER
   BURNER OPERATION
   BURNER MAX LOAD
   CIRC. PUMP STEP 1
   CIRC. PUMP STEP 2
```

<u>Message list:</u> *Briefly* press the ▲ - button (*do not* hold)
The display now shows a list of message texts for all activated binary inputs in the order of their occurrence. Additionally, messages which are configured to the collective relay are marked with a circle symbol. This flashes until the message has been confirmed by means of binary input 1.

Setpoint value setting:

Briefly press the ▣ - button (*do not* hold)

```
1  ACT.VAL.1  2 3 5. 8  ℃
3
4  ACT.VAL.2  2 3 1. 2  ℃

   SP=236.0            SP
   SETPOINT CHANNEL 1
```

A flashing frame with the description SP shows the activated setpoint level.
The *upper text display* shows the parameter name "SP=" and the adjusted value, the *lower text display* optionally shows a description text.

The displayed value can now be changed using the ▼ (smaller) and ▲ (larger) *buttons*.
A setpoint change is effective *immediately*, without any further operational steps.

'Arrow' button *acceleration effect:*
longer pressing *causes faster* changing.

return to operating mode:
briefly press the ▣ *- button (or automatic after > 30 sec)*

optional:
*SPB
*SP
SP2 / 3 / ..
SPE

SP-F

Briefly press the ▣ - button again each time:
Bus setpoint, forced by an external bus adapter (e.g. 99spde..)
setpoints of additional control loops (*=no)
additional setpoints for the control loops
external setpoint (display only);
flashing description signifies for this version:
value is presently *not* active.
Switch over menu SP / SPE (only in case of adjustment SP-F=MENU (Conf-level))

Manual operation: *(optional)*

Press and hold the ▼ -button, then additionally press the ▲ - button, then release both. (Option: *Switch on and off using the extra button* ▣)
(*For multi-channel controllers, first select the channel number CH..*
using the ▼...▲*. buttons and continue with the* ▣ *-button, after which*:)

MAN.

The *upper* text display shows "MAN. *", plus the setting variable, if it exists.
The control function is switched off.
Manual control is now possible using the ▼...▲. buttons
return to operating mode: *only* with ▣ -button (or. ▣),
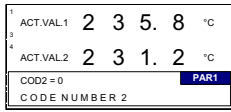*no* automatic switching back from manual operation!

Optional: Start self-optimisation (see chapter Optimisation):
press the ▣ -button >5 sec whilst in manual control function;
the lower display jumps to "-Ad-".
Abort: press the ▣ -button again >5 sec

Access from the operating level

¹ ACT.VAL.1 2 3 5. 8 °C	
³	
⁴ ACT.VAL.2 2 3 1. 2 °C	
COD2 = 0 PAR1	
C O D E N U M B E R 2	

After *polling* (see instructions for level PARA 1 / 2), a flashing frame with the description PAR1 / PAR2 shows the activated parameter level.
The *upper text display* shows the first parameter name and the adjusted value, the *lower text display* optionally shows a description text.

continue to the next parameter and/or *confirm* entry:
briefly press each time the 🅿 - button

To *change* the setting displayed: Press the 🔽...🔼 buttons

Settings in detail:
(existence depends on version and type):

PARA 1	Polling: press and hold the 🅿 - button >5 sec, release it after the display reacts.	*Factory setting*	*Notes*
COD2	Code number 2 (password) for parameter levels (1…9999)	1	___
CH..	(only) for multi-channel controllers: Selection of desired channel (no.)		
P	Proportional range Xp (%) (for more details, see "Optimisation")	25.0	___
I	Integral action time Tn (min) (for more details, see "Optimisation")	7.0	___
D	Rate time Tv (min) (for more details, see "Optimisation")	0.2	___
SH	Response sensitivity ("dead zone") Xsh (%)	0.1	___
SA.	Setpoint distance (absolute) for following switching contact no.	5.0*	___
SP.	Independent setpoint for switching contact no.	0.0	___
SD.	Hysteresis (switching difference on/off) for switching contact no.	3.0	___
		(..201,701/SA3 :10.0)*	

return to operating mode:
briefly press the 🅿 *- button (or automatic after > 30 sec)*

PARA 2	Polling: *press and hold the* 🅿 *- button, additionally press the* 🔽 *- button, hold* both buttons *for >5 sec, release them after the display reacts:*		
COD2	Code number 2 (password) for parameter levels (1…9999)	1	___
Unit	Switches the unit of display (°C / °F)	C	___
***BLO/*BHI**	(only) for voltage / current input: start / end of display range	#	___
***ELO/*EHI**	(only) for external setpoint: start / end of setpoint range	#	___
***SLO/*SHI**	(only) for information signal output: start / end of range	#	___
NST	Number of decimal places of the display (0 / 1 / 2, depending on range)	0	___
***Lo / *HI**	Setpoint setting range, lower / upper limit	#	___
CRST	Contrast setting for display (0…20)	32	___
DSP1	Variable shown in first display line (10mm) (OFF / SP / Y / IST..)	IST1	___
DSP2	Variable shown in second display line (10mm) (OFF / SP / Y / IST..)	IST2	___
DSP3	Variable shown in third display line (10mm if DSP4=OFF, otherwise 3mm) (OFF / SP / Y / IST..)	SP	___
DSP4	Variable shown in fourth display line (3mm) (OFF / SP / Y / IST..) (SP = setpoint, Y=setting variable, Ist * = Actual value channel / measuring input*)	OFF	___
EIN1..4	Unit of measurement for corresponding display line(°C / °F / % / bar / mbar / mPas / cSt / Kgm3 / mm / KPa / L / m3/h) Note: no conversion!	C	___
Text1/2/3/4	Desription text for corresponding display line1..4: choose from a predefined list (ACT.VAL...,SETPOINT, SUPPLY,RETURN), resp. 1 additionally editable text..✻,changeable by PKS-software	1= ACT.VAL1 2= ACT.VAL1 3= SETPOINT	___ ___ ___

return to operating mode:
briefly press the 🅿 *- button (or automatic after > 30 sec)*

1. manual optimization

An optimum adaptation of the control parameters (P,I,D) is necessary in order to balance
an appearing deviation as quickly, non-oscillating and exactly as possible,
according to the given operating conditions.

Generally these adjustments require a lot of professional knowledge that cannot be replaced
by this brief information.
The following informations are for help purpose only:

P = proportional band Xp (%):
lower value *= longer* impulses, more sensitive reaction
higher value = *shorter* impulses, less sensitive reaction
    Examples: - Oscillating temperature without distinct initial overshot: Xp too low;
            - The setpoint is reached very slowly after initial exceeding: Xp too high.

I = integral action time Tn (min):
lower value= *shorter* impulse gaps, faster balancing
higher value= *longer* impulse gaps, slower balancing
    Examples: - the set value is reached very slowly without overshooting: Tn too high;
            - high initial overshot followed by fading oscillation: Tn too low.

D = rate time Tv (min):
increases the controller reaction in case of fast actual value or setpoint alterations
(adjust only if necessary). Higher values cause higher increase.

2. Self-adaptation

The self-adaptation is an automatic procedure that determines and self-adjusts
the optimum control parameters Xp, Tn and Tv.

Operation, if contained in supply schedule:
(Parameter-safety-switch on the rear panel of the controller (if available) has to be unlocked:
position "u")

Check starting assumptions:
Actual value at least 20% below the adjusted set value,(e.g.:heating phase), otherwise first:
Lower actual value adequately by manual operation (position of final control element) (quick circuits)
or increase setpoint adequately, if admissible. (faster procedure for slower circuits)

Call manual operation level: Press ▼ - key plus ▲ - key (optional: seperate key).
Check controller output: must not be higher than 85% , reduce if necessary.
Start self-adaptation: Hold down ■ - key for more than 5 sec. on manual operation level.
During operation the lower display shows: "-Ad-",
the upper display still shows permanently the actual value.

Information about computer operation: First the self-adaptation program waits for stabilization
of the actual value according to the given controller output (actual value alteration < 0,1% / min),
then it increases the output signal about 10% or, in case of three- point- step controller operation,
it triggers an output impulse with about 10% of the adjusted regulating time.
The optimum parameters are computed according to the unit- step response.

Cancel: Press ■ - key for more than 5 sec. = return to manual operation level

After successfully finishing the procedure the controller will return **automatically**
to operating level.

Unsuccessful adaptation (Display shows error code, ref.to chapter error messages):
Press ■ - key again: Return to manual operation level
eliminate the indicated error
start adaptation again: ■ - key > 5 sec.
or return to operating level: ■ - key shortly

Access from the operating level

Polling: press and hold the P *- button, additionally press the* ▲ *- button,*
hold both buttons *for >5 sec, release them after the display reacts:*
A flashing frame with the description CONF shows the activated parameter
level. The *upper text display* shows the first parameter name and the
adjusted value, the *lower text display* optionally shows a description text.

ACT.VAL.1 2 3 5. 8 °C
ACT.VAL.2 2 3 1. 2 °C
CODE = 1   CONF
C O D E N U M B E R

continue to the next parameter and/or *confirm* entry:
briefly press each time the P - button

To *change* the setting displayed:
Number values: Press the ▼...▲ buttons, text values: press the ▲ - button

Settings in detail:
(existence depends on version and type):   *Factory setting*   *Notes*

CODE	Code number for configuration level (1…9999),	1	___
	Alternatively: Hold the P button for more than 10 sec after code entry:		
COD1	Possibility of setting the code number for the configuration level(option).1		___
COD2	Possibility of setting the code number for the parameter levels(option). 1		___
LNG	Language selection of the menu text(Deutsch,English,User def, Off)Deutsch		___
CONF	Selection of the configured controller function (*if existent*)		

return to operating mode: *Briefly* press the P - button

or: **continue** to the following settings: press the P -button and *hold it* > 5 sec:

Note: when continuing after changing a function, the display first flashes for a
few seconds, only then does the desired switching over or back take place

SPEF	Configuration external/second setpoint "BIN" (activation by binary input)		
	/ "MENU" (activation from the setpoint level) / "SP2" / "AUS"=OFF	MENU	___
AIN*	Input type for input no.*: "RTD / 0-20 / 4-20(mA) / 0-10 / 2-10(V) /	*RTD*	___
	AUS=OFF" (note different terminals for I/U!)**		
IST*	Correction value for changing the controller display (+/-)	*0.0*	___
SP 2/E	Type of effect of second / external setpoint: "Add/ Sub/ AbS"	AbS	___
	(adding / subtracting / absolute value)		
***YM**	Setting time of the controlled drive "6…600" (sec)	*60 sec*	___
***CY' '**	Switching frequency in two-point controllers: "2...120" (sec.)	*20 sec*	___
***OUT**	Setting output signal "0...20 / 4...20" (mA) /0...10 / 2...10 (V)"	*4...20 mA*	___
***OUT**	Setting output characteristic: direct / inverse "di / in"	*in*	___
	(with 2 outputs: "in in / in di / di in / di di")	*inin*	___
***td**	For 2 outputs: dead zone between outputs 1 and 2 "0…10%"	*0*	___
***AP**	Output signal working point (-100…+100)	*50*	___
FG A/E	Automatic adjustment of remote transmitter input (see extra sheet 99ar)		
Sou*	Assignment of inform. output signal(s)* (act. value/setp., setting var..)	*Ist1*	___
Sou*	Type of information output signal(s)* "0..20/4..20(mA)/0..10/2..10(V)"	*4...20 mA*	___
	(* Sout= Signal 1; Sou2 = Signal 2)		
***Y_S**	Behaviour of the setting output in the event of measurement line error:		
	Relay position: "rel1 / rel2 / OFF"	*rel2(70.),rel1(20.)*	___
	Continuous output: "0...100" (%)	*0*	___
bin. Eing	Sub-menu for binary input configurations		
	Polling: press the P -button and *hold it* > 5 sec:		
BIN*	Direction of control action binary input* direct / inverse (di/in)	di	___
BIN*	Assignment of collective relay: Stat=none, SREL= collective relay	stat	___
BIN*	Switch-on delay (0…300 sec)	0	___
REL*	Function mode of additional contact (relay no.)	So*A(701),St*A(201)	___
REL*	Measuring input / control loop assigned to additional contact	*Ist 1*	___
REL*	Add. contact – relay pos. in event of meas. line error "SiE/SiA"(on/off)	*Si A*	___
Adr	if equipped with interface: bus address (number)	*5*	___
BAUD	if equipped with interface: baudrate (9600/19200/38400)	38400	___

**return** to operating mode: briefly press the P - button *again*

* = ID number in case of several inputs / outputs or control loops.
**= Rtd input of ain2 is additionally usable if equipped with ext. setpoint and activation using SP-F.

Selectable switching functions (depending on version)**:**
*For setting please refer to configuration level under „reL...".*

Switching functions for trailing contacts:

LC A   Break contact on either side of setpoint
(**L**imit **c**omparator). Relay drops out as
deviation increases (**A**us = off)

LC E   Make contact on either side of setpoint
(**L**imit **c**omparator). Relay picks up as
deviation increases (**E**in = on)

Su A   Break contact below setpoint. Relay drops
out as actual value decreases (**A**us = off)

Su E   Make contact below setpoint. Relay picks
up as actual value decreases (**E**in = on)

So A   Break contact above setpoint. Relay drops
out as actual value increases (**A**us = off)

So E   Make contact above setpoint. Relay picks
up as actual value increases (**E**in = on)

St A   Heating stage below setpoint. Relay
drops out actual value increases (**A**us =
off)
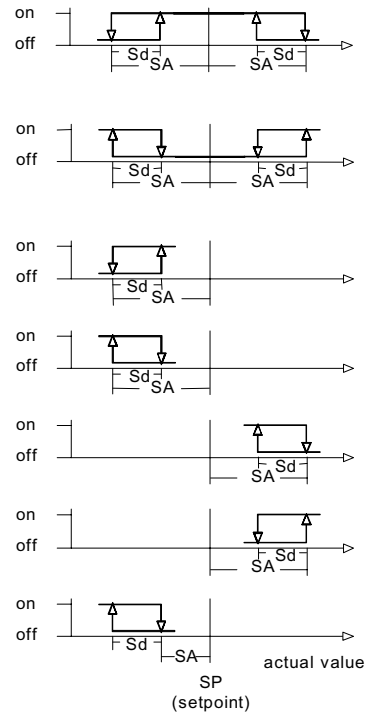
Switching functions for independent contacts:

US A   Relay drops out with increasing actual
value (**A**us = off)

US E   Relay picks up with increasing actual
value (**E**in = on)
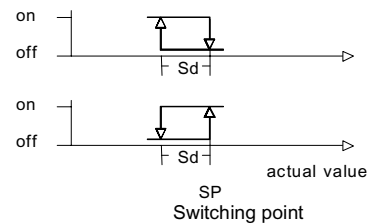
Service function:

Ein/Aus contact is constantly switched on (**Ein**) or
off (**Aus**) respectively

Special function:

SF6   as SoA but switching point at setpoint, control output around SA below

In each case additional settings follow under "rEL." after the selection is acknowledged (P key)
(depending on version)**:**

Ist./ Y   assigned value: actual value no. ... or Y (actuating signal)

**CH../.SP.**(only) for trailing contacts: assigned control circuit / channel (no.) or
assigned setpoint (1SP., rSP, SP.1, ..)
for independent contacts: assignment of parameter input (channel no..)

"Safety" shut down (in case of measuring line fault):
SI E   Relay for "Safety" behaviour in event of measuring circuit error: relay **on**
SI A   Relay for "Safety" behaviour in event of measuring circuit error: relay **off**

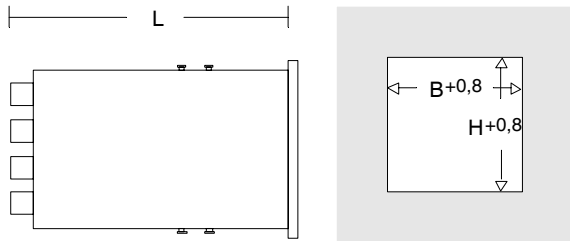## Characteristics: *(parameters dep. on sub type:)*

Adjustment on parameter level, code locked,
pre adjusted on customer´s demand.
Proportional band Xp: 0,1...999,9 %
Integral action time Tn: 0,0...999,9 min
Rate time Tv: 0,0...99,9 min
Sensitivity of response Xsh: 0,1...1,0 %
Travel time of the actuator Tm: 6...600 sec
Switching frequency cy: 2...120 sec
Function characteristics: direct / inverted
Switching interval SA (add. contacts): 0..100,0 K
Switching difference Sd: 0,1...100,0 K
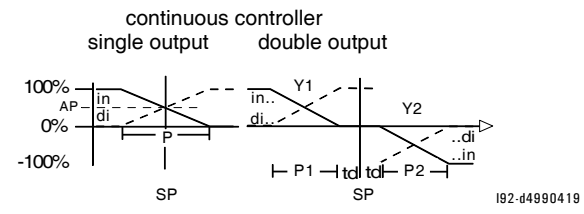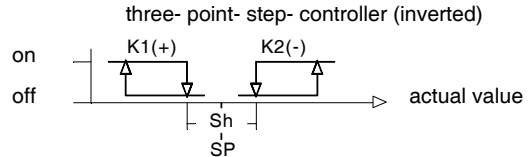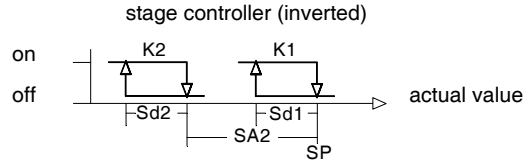
Additional contact functions:

As switching interval above and below setpoint or
independent adjustable with own setpoint and
measuring input, switching function adjustable
(ref. to chapter additional switching contacts)
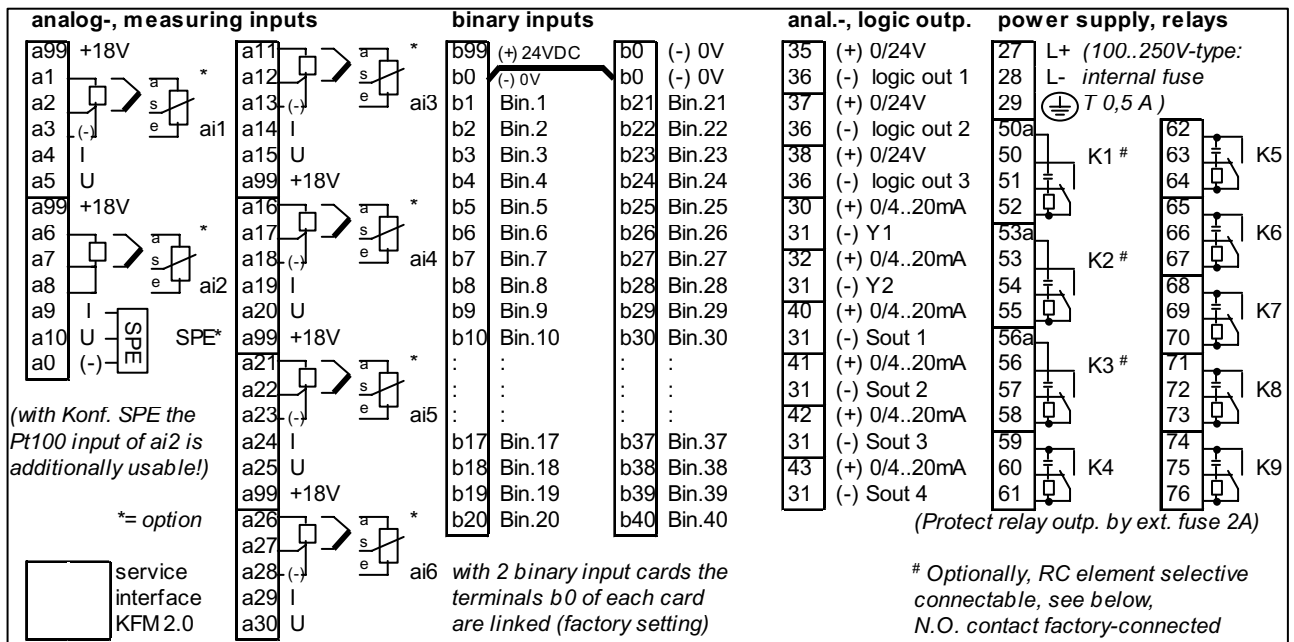
Installation dimensions:

Form 96x96: L=150mm, B=92mm, H=92mm

stage controller (inverted)

three- point- step- controller (inverted)

continuous controller
single output   double output

I92-d4990419

Other data:

Housing for panel mounting, 96 x 96 mm
Power supply: 100..250 VAC, about 14 VA
alternative 24 V AC / DC
Protective system EN 60529: IP54 (terminals IP20)
Permissible ambient temperature: 0...60°C
Nominal temperature: 20°C
Climatic category: KWF to EN 60529
Relative humidity <= 75 % yearly average,
no condensation
EMC: referring to EN 61326

Wiring diagram: (Example, valid for each delivered controller is the wiring diagram on its casing only)

analog-, measuring inputs		binary inputs		anal.-, logic outp.		power supply, relays	
a99 +18V	a11	b99 (+) 24VDC	b0 (-) 0V	35 (+) 0/24V		27 L+ (100..250V-type:	
a1	a12	b0 (-) 0V	b0 (-) 0V	36 (-) logic out 1		28 L- internal fuse	
a2	a13 (-) ai3	b1 Bin.1	b21 Bin.21	37 (+) 0/24V		29 T 0,5 A)	
a3 (-) ai1	a14 I	b2 Bin.2	b22 Bin.22	36 (-) logic out 2		50a	62 K5
a4 I	a15 U	b3 Bin.3	b23 Bin.23	38 (+) 0/24V		50 K1 #	63
a5 U	a99 +18V	b4 Bin.4	b24 Bin.24	36 (-) logic out 3		51	64
a99 +18V	a16	b5 Bin.5	b25 Bin.25	30 (+) 0/4..20mA		52	65
a6	a17	b6 Bin.6	b26 Bin.26	31 (-) Y1		53a	66 K6
a7 ai2	a18 (-) ai4	b7 Bin.7	b27 Bin.27	32 (+) 0/4..20mA		53 K2 #	67
a8	a19 I	b8 Bin.8	b28 Bin.28	31 (-) Y2		54	68
a9 I	a20 U	b9 Bin.9	b29 Bin.29	40 (+) 0/4..20mA		55	69 K7
a10 U	a99 +18V	b10 Bin.10	b30 Bin.30	31 (-) Sout 1		56a	70
a0 (-) SPE*	a21	: :	: :	41 (+) 0/4..20mA		56 K3 #	71
	a22	: :	: :	31 (-) Sout 2		57	72 K8
	a23 (-) ai5	: :	: :	42 (+) 0/4..20mA		58	73
	a24 I	b17 Bin.17	b37 Bin.37	31 (-) Sout 3		59	74
	a25 U	b18 Bin.18	b38 Bin.38	43 (+) 0/4..20mA		60 K4	75 K9
	a99 +18V	b19 Bin.19	b39 Bin.39	31 (-) Sout 4		61	76
	a26	b20 Bin.20	b40 Bin.40				
	a27						
	a28 (-) ai6						
	a29 I						
	a30 U						

(with Konf. SPE the Pt100 input of ai2 is additionally usable!)

*= option

service
interface
KFM 2.0

with 2 binary input cards the terminals b0 of each card are linked (factory setting)

(Protect relay outp. by ext. fuse 2A)

 # Optionally, RC element selective connectable, see below, N.O. contact factory-connected

Wiring, examples for input 1 and output 1 respectively:

Pt100
a1
a2 3-wire
a3

a1
a2 2-wire
a3

standard signal
(-) a3
(+) a4 0/4..20mA
(-) a4 4..20mA
(+) a99 2-wire-Tr.
(-) a3
(+) a5 0/2..10V

others
a1 thermo-
a2 couple

a1
a2 feedback
a3 device

binary inputs
b99 pot.free
b1 contact

+ b1 external
- b0 voltage. 24V

relay contact
50a without RC-
50 element
50a N.O. contact
50 with RC
50a N.C. contact
51 with RC

actuator
up
M
dn
N   L
50a
50
51
52
53a
53
54
55