

# ExReg-D Temperature/Humidity Controller

ExReg - D - A  
ExReg - D - A - CT  
ExReg - D - A - VA

Subject to change!

Electrical, explosion-proof temperature/humidity controller  
for use exclusively in connection with ExMax-...-CY... or ExRun-Y actuators  
24 VAC/DC power supply, adaptive PID controller, alarm contact  
EC type-approved in acc. with ATEX directive 2014/34/EU for zone 1, 2, 21, 22

**Compact. Easy installation. Universal. Cost effective. Safe.**

Type	Sensor	Power supply	Sensor range	Interfaces (analogue)	Alarm contact	Wiring diagram
ExReg-D-A	Temp. / moisture	24 VAC/DC	as ExPro-C	1 × drive, 1 × setpoint value, 1 × actual value, 1 × drive position	Relay contact 30 V / 0.1 A	SB 1.0
ExReg-D-A-CT	Models as before with aluminium housing with seawater resistant coating (M16 cable gland, nickel-plated brass, screws in stainless steel)					
ExReg-D-A-VA	Models as before with stainless steel housing for aggressive environments (M20 cable gland, nickel-plated brass, screws in stainless steel)					

Type	Function	Measurement range	Sensor lengths	Connection	Place of sensor installation
ExPro-CT...	Temperature sensor	-40...+125 °C*	50 / 100 / 150 / 200 mm	Plug connector to ExReg-D...	Zones 1, 2, 21, 22
ExPro-CF...	Humidity sensor	0...100 % rH	50 / 100 / 150 / 200 mm	Plug connector to ExReg-D...	Zones 1, 2, 21, 22

↑ Sensor length \* for 50 mm length -40...+80 °C

## Product images and applications



## Description

The ExReg-D... temperature/humidity controller is an essential component of technical building services, chemistry, pharmacy, industry and in onshore and offshore plants, for use in explosion-risk areas in Zones 1 and 2 (gas) and 21 and 22 (dusts).  
The highest explosion protection classifications (ATEX) and degree of protection IP66, small dimensions and universal functions and technical specifications ensure safe operation, even in difficult ambient conditions.  
The ExReg-D... is for direct use in potentially explosive areas for temperature and air humidity control. For the technical implementation, an ExMax-...-CY or ExMax-...-CYF damper actuator (with emergency control function/spring return) or ExRun-Y and a control valve are required.  
All controllers can be configured on site using menu navigation, without any additional electronic aids. The internal PID control structure is easy to use and can be configured fully automatically for standard applications. The display indicates the current status for actual value, setpoint value and control variable during operation (can be switched off as required).

## Highlights

- ▶ Use for all types of gases, mists, vapours and dusts in Zones 1, 2, 21 and 22
- ▶ 24 VAC/DC power supply
- ▶ Direct drive connection via the Ex-e terminal box integrated into the controller
- ▶ No additional Ex-i module required in switch cabinet
- ▶ Ex-i cable routing from sensor to switch cabinet not required
- ▶ No Ex-i wiring or additional space required in switch cabinet
- ▶ Relay output with adjustable alarm monitoring
- ▶ Adjustable analogue inputs and outputs (for setpoint values, actual values, etc.)
- ▶ Optional analogue output for reporting control variable
- ▶ Backlit display (can be switched off)
- ▶ Password protected
- ▶ Can be used in ambient temperatures down to -20 °C
- ▶ Compact design and small size
- ▶ Robust aluminium housing (with optional seawater resistant coating) or in stainless steel
- ▶ Degree of protection IP66
- ▶ Offshore versions with pressure connection for threading clamping ring connection Ø 6 mm

**ExMax-...-CY... / ExRun-Y and ExPro sensors – refer to the separate data sheet**


**Technical data**

Supply voltage, frequency	24 VAC/DC +15 % (24,0...27,6 VAC/DC), 50/60 Hz
Nominal current, power input	150 mA, ~ 3 W, internal fuse 350 mA/T, not replaceable
Galvanic isolation	Supply to analogue inputs and outputs min. 1.5 kV, supply to relay output min. 1.5 kV
Electrical connection	Terminals 0.14...2.5 mm <sup>2</sup> in integrated Ex-e terminal box, wire stripping 9 mm, tightening torque 0.4...0.5 Nm, protective bonding conductor 4 mm <sup>2</sup>
Cable glands	2 × M16 × 1.5 mm, Ex-e certified, for cable diameter ~ Ø 5...9 mm
Cable glands ...-CT	2 × M16 × 1.5 mm, Ex-e certified, nickel-plated brass, for cable diameter ~ Ø 6...10 mm
...-VA	2 × M20 × 1.5 mm, Ex-e certified, nickel-plated brass, for cable diameter ~ Ø 6...13 mm
Protection class	Protection class III (grounded)
Display	LC display, backlit, for configuration, user guidance, parameter setting and actual value display. Status display via LEDs
Controls	3 keys for configuration
Housing material	Aluminium casting housing, coated. With optional seawater resistant coating (...-CT) or stainless steel housing, 1.4581 / UNS-J92900 / similar to AISI 316Nb (...-VA)
Dimensions (L × W × H)	Aluminium housing ~ 180 × 107 × 66 mm, stainless steel housing ~ 195 × 127 × 70 mm (each without connectors)
Weight	~ 950 g aluminium housing, stainless steel version ~ 2.5 kg
Ambient temperature	-20...+50 °C, storage temperature -35...+70 °C
Ambient humidity	0...95 % rH, non condensing
Sensor circuit	Internal, intrinsically safe circuit
Sensor	Sensor connector for ExPro sensors
Measurement range	-40...+125 °C / 0...100 % relative humidity (refer to the ExPro sensors data sheet)
Sensor damping (filter)	1...50 seconds, adjustable
Control	Adaptive PID controller (automatic or manual operation mode can be selected)
Control tolerance	1...5 %, adjustable
Switch-on delay	3 s
Alarm monitor (terminal 3)	Monitoring of temperature or humidity; adjustable functions: Tolerance limit (fixed value and variable value), alarm delay
Alarm contact (terminal 3)	Relay; max. values: 0.1 A (30 VAC/DC), min. values: 10 mW / 0,1 V / 1 mA
Lifetime, mechanical	10 × 10,000,000
electrical (nominal load)	100 × 10,000
Positive control (terminal 3)	Alternatively, the actuator can be moved to position "Open" or "Closed" using an external auxiliary switch. The alarm function is not available in this setting.
Current output (terminal 6)	Range 4...20 mA, invertible, basic accuracy ± 1.0 % of ultimate value, load impedance < 500 Ω, influence < 0.1 %, open circuit voltage < 24 V
Voltage input (terminal 8)	Range 0...10 V, invertible, basic accuracy ± 1.0 % of ultimate value, surge-protected up to 30 V
Voltage input (terminal 9)	Range 0...10 V, adjustable, basic accuracy ± 1.0 % of ultimate value, surge-protected up to 30 V
Voltage output (terminal 11)	Range 0...10 V, adjustable, basic accuracy ± 1.0 % of ultimate value, load > 10 kΩ, influence < 0.1 %, short circuit-proof
Voltage input (terminal 13)	Range 0...10 V, adjustable, basic accuracy ± 1.0 % of ultimate value, surge-protected up to 30 V
Wiring diagram	SB 1.0
Scope of delivery	Controller, 3 sheet-metal screws 4.2 × 13 mm or in stainless steel for ...-CT and ...-VA versions

**Compliance and certifications**

ATEX directive	2014/34/EU
EU type examination	EPS 11 ATEX 1 380
IECEX certified	IECEX EPS 12.0028
Approval for gas	II 2 (1) G Ex eb mb ib [ia Ga] IIC T6 Gb
Types ...-CT, ...-OCT	II 2 (1) G Ex eb mb ib [ia Ga] IIB T6 Gb
Approval for dust	II 2 (1) D Ex tb ib [ia Da] IIIC T80°C Db IP66
CE identification	CE 0158
EMC directive	2014/30/EU
Enclosure protection	IP66 per EN 60529

**Custom variants and accessories**

...-CT	Types with aluminium housing with seawater resistant coating, parts nickel-plated
...-VA	Types in stainless steel housing, parts nickel-plated
ExMax...-CY	Actuating drive, 4...20 mA input, 0...10 V output
ExMax...-CYF	Actuating drive with spring return, 4...20 mA input, 0...10 V output
ExBox-Y/S	Ex-e terminal box
MKR	Mounting bracket for fitting to circular air ducts up to Ø 600 mm
Kit-S8-CBR	2 cable glands M16 × 1.5 mm, Ex-e, nickel-plated brass, for cables Ø 5...10 mm



Important information on installation and operation

A. Installation, commissioning, maintenance

All pertinent national and international standards and regulations must be observed. EN/IEC 60079-14 may be referred to for information on project planning, selection and assembly of electrical systems.



Caution: All explosion protection regulations must be observed before the internal terminal box is opened. Do not open the cover of the terminal box while live!

Extract the power supply cords using the cable glands. Use the internal, explosion protection-approved terminal box for connection and connect the equipotential bonding. The lines must be laid fixed and so that they are sufficiently protected from mechanical and thermal damage. The IP degree of protection (at least IP66) must be ensured.

Avoid temperature transfers. The maximum ambient temperature must not be exceeded. Weatherproof to protect against sun, rain and snow if installed outdoors. Perform a zero point offset after assembly and installation to ensure accurate measurement results (see description).

Sensors do not require maintenance. Annual inspection is recommended. EN/IEC 60079-17 may be referred to for information on the inspection and maintenance of electrical systems.

Explosion-proof devices may only be repaired by the manufacturer. Clean only with a damp cloth.

B. Long lines

Use of shielded signal lines, with connection of the shield at one side of the ...Reg... terminal box, is recommended.

C. Separate ground cables

Use separated ground cables for supply and signal lines.

D. Impedance of MCR system

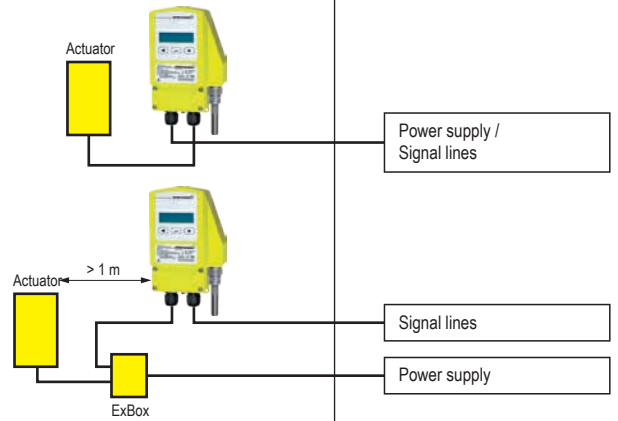
To ensure the proper function of the built-in wire break detection (constant mode), the impedance of the voltage source from which the setpoint signal for terminal 13 is generated must be less than or equal to 10k ohms. With higher impedances, a malfunction of the wire break detection is possible.

Installation

Hazardous area - Zone 1, 2, 21, 22

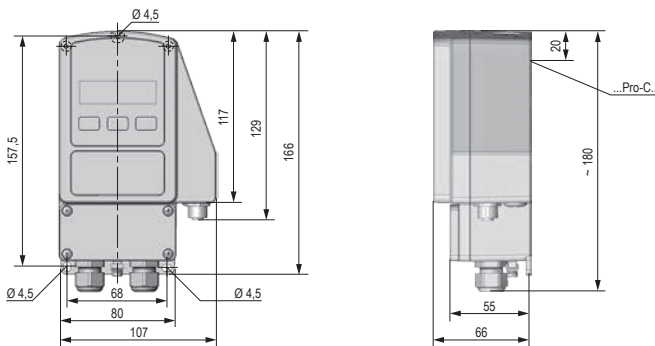


Safe area

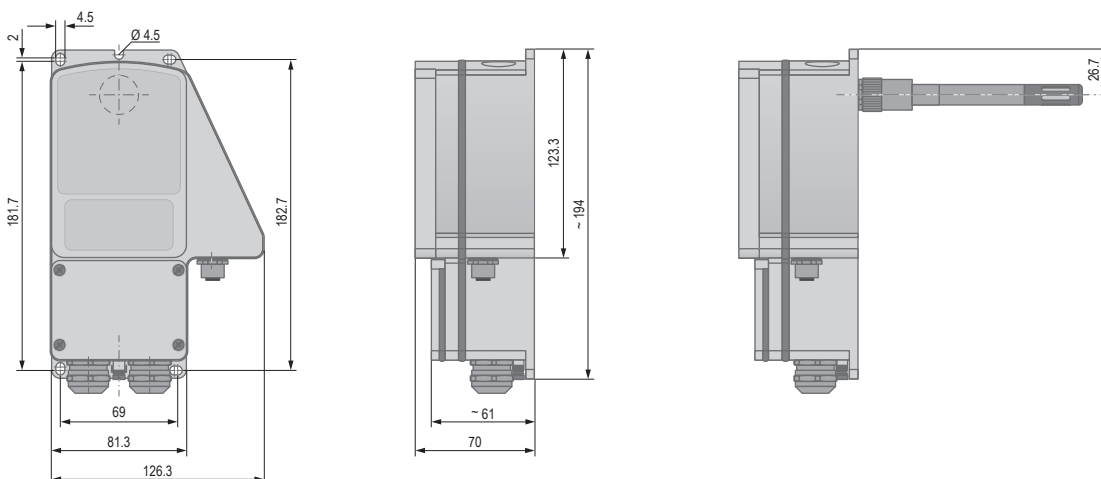


Dimensions (mm)

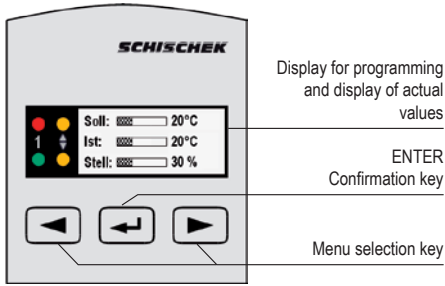
Aluminium housing



Stainless steel housing



**Display, controls and parameter setting**



**Display in operating mode**

The current setpoint value, the actual value and the actuating value are displayed in operating mode. The red and green LEDs indicate the current operating status. If the system is in the adjusted state, the green LED lights continuously and signals fault-free operation. The red LED lights if the control variable limits are reached or if an internal error is detected.

A flashing red LED indicates that the setpoint value cannot be achieved. In this case, the alarm function is active.

The yellow LEDs show the actuating drive's direction of motion during the adjustment phase. If the upper yellow LED is flashing, the drive is opening. If the lower yellow LED is flashing, the drive is closing. The yellow LEDs are switched off when the system is within the defined control tolerance (see Menu 8.6).

**Switchover from operating mode to parameters mode**

The switchover from operating mode to parameters mode switches the operating function to the parameters function. The switchover is performed by pressing once on the ENTER key for at least 6 seconds. Return to operating mode with "Exit menu".

**Selection of access level**

The access level, which allows access to a selection of menu items only, depending on the user group, must be selected immediately after switching to parameters mode. Password protection can also be applied to the individual access levels. The password must then be entered.

**User groups**

There are three access levels available for user groups, which can be protected with different passwords:

Group/Level 1:	User
Group/Level 2:	Service
Group/Level 3:	Manufacturer

Only a few menu items intended for users without specialist knowledge can be configured on user level. Almost all menus are available on service level, meaning initial start-up is possible on site. The calibration values can also be defined on manufacturer level. This level is therefore intended for damper manufacturers.

**Password protection**

Configuration can be protected with various passwords, depending on the user group. The appropriate, password-protected access level must be selected before the main menu is displayed. The password can be set and changed in Menu 12. Access is unrestricted if no password is set ("0" value).

**Note:** If a password is no longer known, menu access can be unblocked using a master password. The master password varies from one device to the next. It can be obtained from our sales service. If you have obtained a complete unit from a damper manufacturer, please contact their service department.

**Applications**

**Menu 2**

The ...Reg-D can be used for different applications.

In the first step of configuring the temperature/humidity controller, the relevant application must be selected in Menu 2.

Menu	Wiring diagram	Menu structure
2.1 Temperature control	SB 1.0	Table 1.0
2.3 Humidity control	SB 1.0	Table 1.2

The settings specified are the same as the factory settings for the corresponding application. Starting configuration of the ...Reg-D with this menu is therefore recommended.

**Application Temperature control**

Menu 2.1

The main application for the ...Reg-D is temperature control, such as in a ventilation duct or a room. The setpoint value is specified in variable control mode by the control system, or in constant mode by the device from the menu settings (see Menu 7.2). In normal mode, the internal control structure constantly compares the current temperature/humidity (actual value) with the temperature/humidity (setpoint value) and reconciles them by correcting the control variable (e.g. damper drive).

	Function	User	Service	Manufacturer
Menu 1	Language	✓	✓	✓
Menu 2	Application		✓	✓
Menu 3	Sensor		✓	✓
Menu 4	Drive		✓	✓
Menu 5	Temperature	✓	✓	✓
Menu 5.4	Maximum value	✓	✓	✓
Menu 5.5	Minimum value	✓	✓	✓
Menu 6	Actual value		✓	✓
Menu 7	Setpoint value		✓	✓
Menu 8	Controller		✓	✓
Menu 9	Switching contact	✓	✓	✓
Menu 11	Diagnostics		✓	✓
Menu 12	Password	✓	✓	✓
Menu 12.1	Level 1	✓	✓	✓
Menu 12.2	Level 2		✓	✓
Menu 12.3	Level 3		✓	✓
Menu 13	Display	✓	✓	✓
Menu 14	Parameters		✓	✓
Menu 15	Exit menu	✓	✓	✓

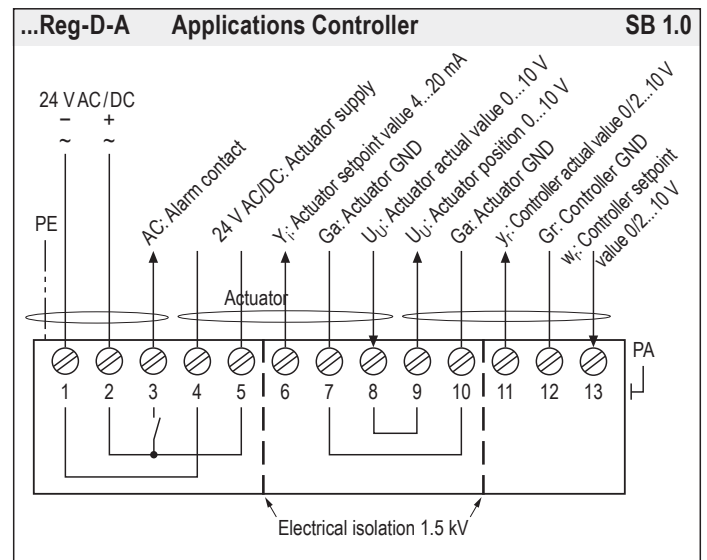
Table 1.0

**Electrical connection**

The controller is operated using a 24V AC/DC power supply terminal 1 (-/-) and 2 (+/+). Terminals 1 and 2 are connected internally to terminals 4 and 5 and function as power supply for the drive. The drive's electrical connectors are directly connected to the controller via terminals 4 - 8. An additional terminal box for connecting the drive can be omitted, as long as the drive is assembled less than 1 metre from the controller. Otherwise an additional terminal box should be used.

The drive needs approx. 2 A starting current for max. 1 s to initialise.

**Note:** The sensor must be disconnected from voltage before opening the cover of the terminal box.



Electrical connection for the "temperature control" and "humidity control" applications.

**Application Humidity controller**

Menu 2.3

	Function	User	Service	Manufacturer
Menu 1	Language	✓	✓	✓
Menu 2	Application		✓	✓
Menu 3	Sensor		✓	✓
Menu 4	Drive		✓	✓
Menu 5	Humidity	✓	✓	✓
Menu 5.4	Maximum value	✓	✓	✓
Menu 5.5	Minimum value	✓	✓	✓
Menu 6	Actual value		✓	✓
Menu 7	Setpoint value		✓	✓
Menu 8	Controller		✓	✓
Menu 9	Switching contact	✓	✓	✓
Menu 10	[ no function ]			
Menu 11	Diagnostics		✓	✓
Menu 12	Password	✓	✓	✓
Menu 12.1	Level 1	✓	✓	✓
Menu 12.2	Level 2		✓	✓
Menu 12.3	Level 3		✓	✓
Menu 13	Display	✓	✓	✓
Menu 14	Parameters		✓	✓
Menu 15	Exit menu	✓	✓	✓

Table 1.2

The alarm contact (terminal 3) is used as a feedback signal for normal operation. The device also has an analogue output (terminal 11) which outputs the current setpoint value as a constant signal, and an analogue feedback signal for the damper position (terminal 9). This function is predominantly used to save energy.

The setpoint value is set via terminal 13. The voltage range for minimum and maximum temperature or humidity is defined from 0...10 V or 2...10 V. Depending on the "setpoint value" (Menu 6) setting used, the positive control function can also be used. If the voltage level of approx. 12 V is exceeded, the damper opens; if the level falls below 0.2 V, the damper is completely closed. The controller is not in use during these positive control functions (Damper Open/Closed). A switch to Constant mode occurs if the input is unwired. The setpoint value is set by the device in this operating mode, and can be adjusted in Menu 7.2 (setpoint value setting).

**ExPro sensor**

Menu 3

An ExPro sensor must be connected to use the ExReg-D. Either temperature or humidity can be controlled depending on sensor type. Please refer to the sensor data sheet for further information.

**Sensor filter**

Menu 3.1

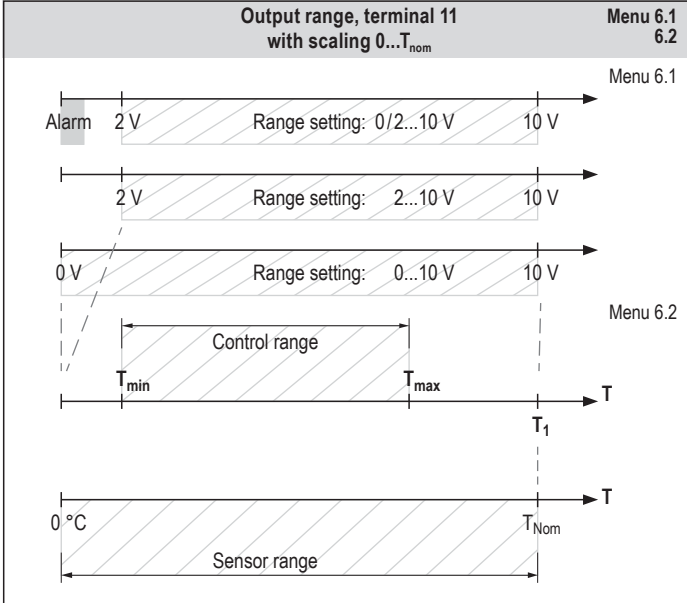
The ...Reg-D... has an electronic filter that can be used to moderate the sensor signal in the event of temperature and humidity fluctuations.

The filter value entered sets the interval between 1 and 50 seconds, in which the sliding average value is calculated. If 20 s is set, for example, the measured values of the previous 20 seconds are used consecutively to determine the average value.



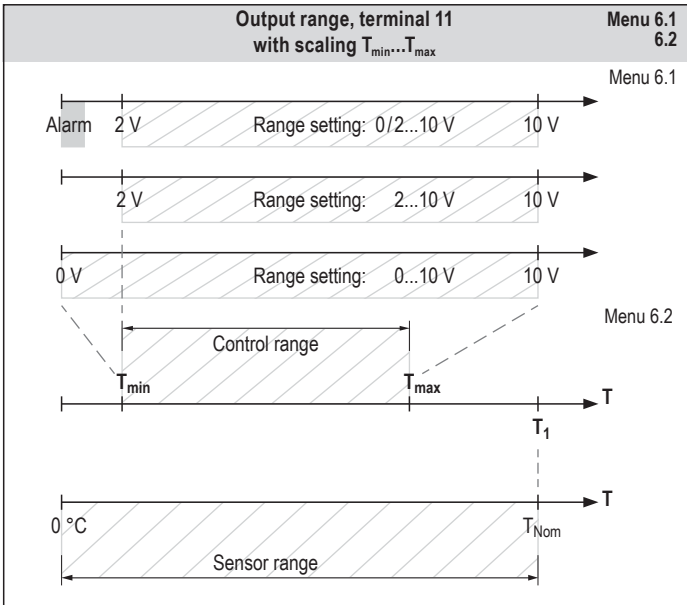
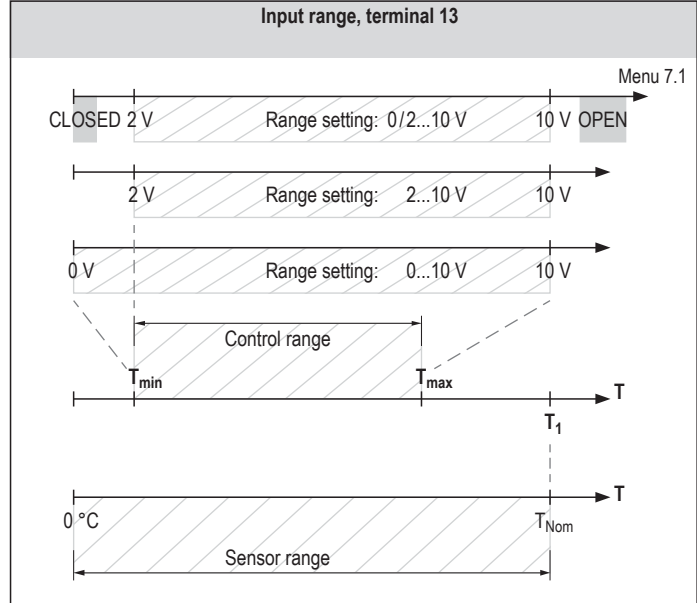
Actual value Temperature control Menu 6

The following settings must be used in the Temperature control application. The basic value ranges for the control variables defined here have a direct influence on scaling of the analogue output signal (actual value). The measurement range is usually output for the actual value. Alternatively, the control range can also be used as scaling (see Menu 6.2).



Setpoint value Menu 7

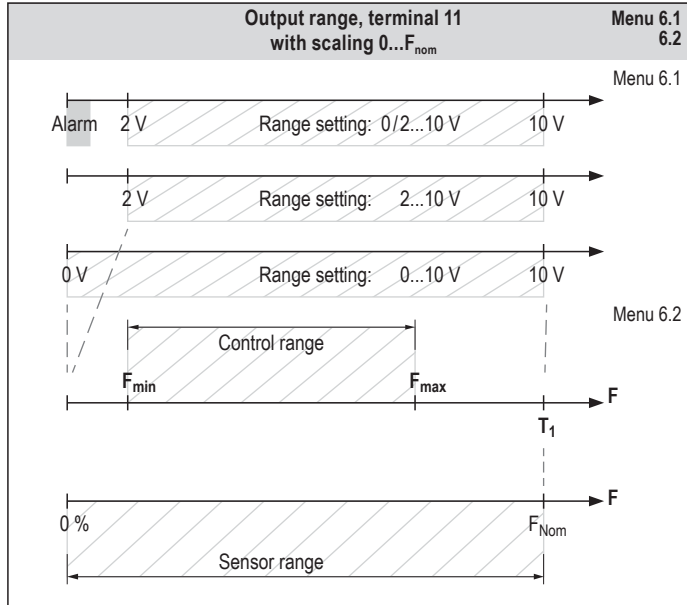
The control range between minimum and maximum values ( $T_{min}$  and  $T_{max}$ ) is always used for the setpoint value.





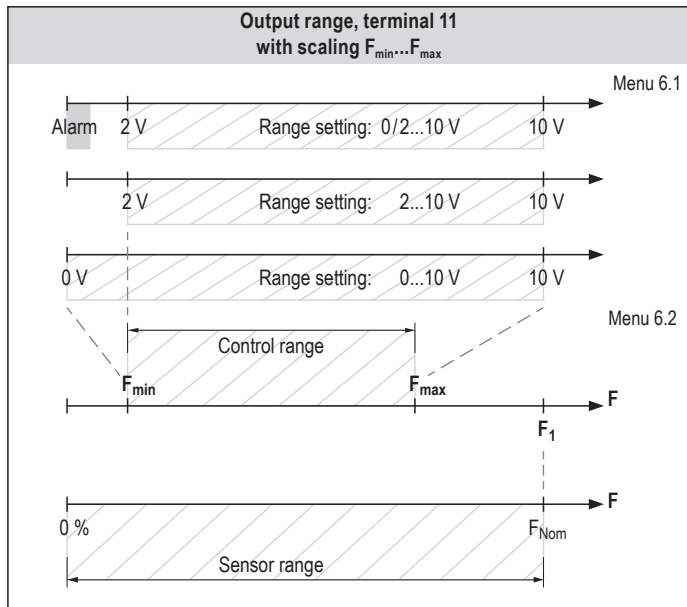
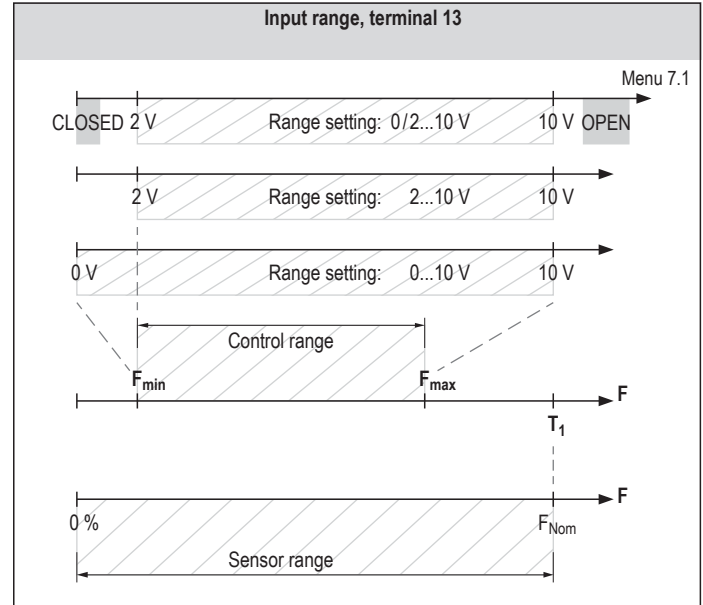
Actual value Humidity control Menu 6

The following settings must be used in the Humidity control application. The basic value ranges for the control variables defined here have a direct influence on scaling of the analogue output signal (actual value). The measurement range is usually output for the actual value. Alternatively, the control range can also be used as scaling (see Menu 6.2).



Setpoint value Menu 7

The control range between minimum and maximum values (F<sub>min</sub> and F<sub>max</sub>) is always used for the setpoint value.



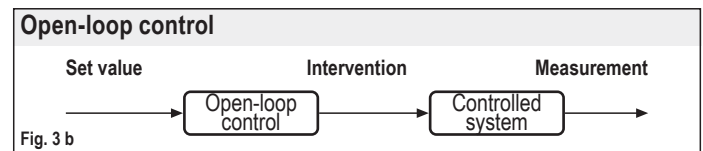
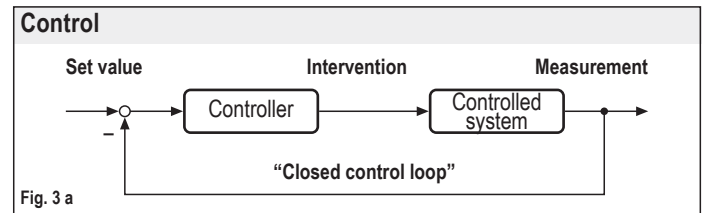
Control (general) Menu 8

There are a range of processes in nature, technology and economics that act as controls. Product pricing is controlled by supply and demand in economics, for example. Or, an individual controls his/her personal circumstances, i.e. in each of these cases, a system (in technology, the term "controlled system" is used) is brought out of equilibrium by certain or unknown circumstances (disturbance variables). The controller, which can be a person, a device or a system in general, attempts to restore the desired state (setpoint value, reference variables, etc.) by means of an intervention (control variable). In technology therefore, control is always used where disturbances can influence the actual value (measurement value) and are largely unknown. The objectives of control are to bring a physical variable to a defined value and keep it constant. For this, the preset value (reference variable/setpoint value) is continually compared with the measurement value (actual value). A controller corrects the control variable according to the deviation to bring the actual value to the setpoint value and to keep it there. A closed functional chain (closed-loop system) is characteristic for control (refer to Fig. 3 a).

In contrast to a control, an open-loop control has only an open-loop system (see Fig. 3 b) i.e. a certain actual value (measurement value) is set using the set value via the open-loop control; however, verification does not take place.

The terminology and definitions of control technology are defined in the DIN IEC 60050-351 series of standards. Control is described as follows:

"Control is a procedure in which a variable's set value is continuously produced and maintained by means of interventions on account of measurements".



**Configuration Control**

Continuation Menu 8

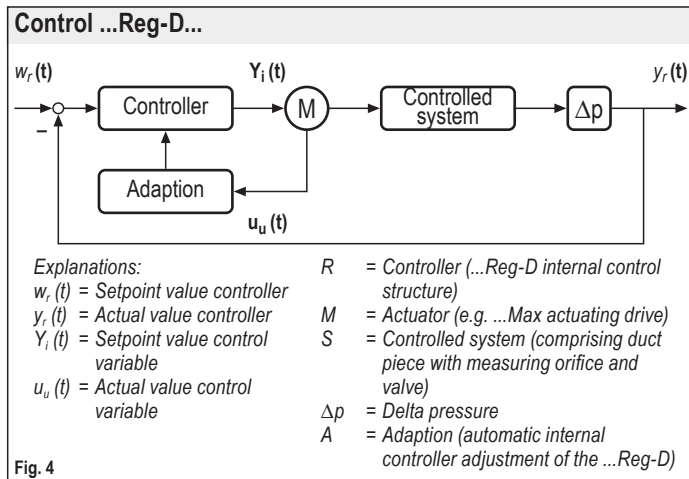
The ...Reg-D... is designed for the control of temperature and air humidity. Control behaviour can be set in Menu 8, "Controller". Fully automatic calculation of control parameters ("Auto" selection) is normally sufficient. In addition, an adaptive PID controller (P component is calculated automatically) and a standard PID controller can be selected. These settings should only be applied by trained specialists.

In certain circumstances – particularly in case of major fluctuations of readings in the air duct – the control circuit gain (Menu 8.2) and control tolerance (Menu 8.6) should be adjusted.

**Controller types**

The ...Reg-D... has three different PID control structures, which differ from each other in terms of automation level. The controller type can be selected in Menu 8.1. The following settings are available for selection:

Option	Type	Automatic setting
1.) "Auto"	Fully automatic controller	P, I and D components
2.) "Adaptive PID"	Semi-automatic controller	P component
3.) "Standard PID"	Manual controller	None



**Control speed**

The control speed can be specified directly via the drive's run time. The control parameters do not need to be modified in this case. The controller automatically factors in the change to runtime via the drive's feedback cable (terminal 7). This applies to all controller settings. The control speed therefore depends only on the drive runtime used.

Please refer to the actuator data sheet for further information.

**Actual value monitoring (alarm function)**

Menu 9

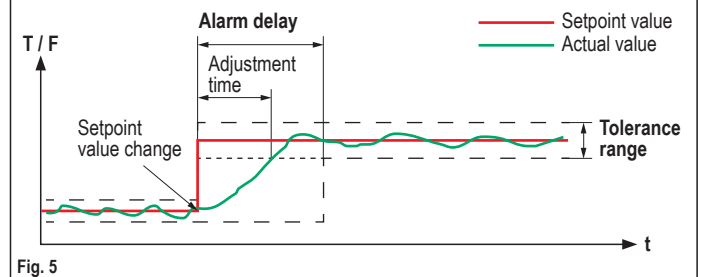
The adjustable alarm function can be used to monitor the actual value. An activated alarm is signalled both visually and electrically (see "Alarm function signalling").

Both a fixed limit and a percentage limit relating to the setpoint value can be set as alarm limits. If both values are set, they are added together.

**Example 1: Temperature application**  
 Limit (%) = 4 %; setpoint value = 20 °C; fixed limit = 2 °C  
 Tolerance limit:  $\pm (0.01 \times 165 \text{ °C} + 2 \text{ m}^3/\text{h}) = \pm 3.7 \text{ °C}$

**Example 2: Humidity application**  
 Limit (%) = 5 %; setpoint value = 50 %; fixed limit = 2 %  
 Tolerance limit:  $\pm (0.05 \times 100 \% + 2 \%) = \pm 7 \%$

**Alarm limits**



The alarm function can be set with a delay (Menu 9.4). An alarm is not triggered after a change to the setpoint value during an adjustment procedure. The adjustment time (see Fig. 5) is based primarily on the drive's set runtime. **Please refer to the drive data sheet for information on setting runtime.**

The drive's runtime can also be set (Menus 4.4 and 4.5). The alarm delay should always be set so that it corresponds to the drive runtime as a minimum.

Example: The ...Max-CY used is configured with switch setting 2 (30 s runtime). The alarm delay should thus be at least 30 s.

**Alarm function signalling**

The red status LED flashes when the alarm function is active.

If the LED continuously lights RED, this indicates a critical state – however, the alarm signal is not active.

The alarm is also output via the relay on terminal 3. In addition, the "0/2...10 V" option can be activated from Menu 6.1 "Range".

In the event of an alarm, the actual value signal is switched to 0 V (error); a signal between 2...10 V would be output during normal operation, depending on the current actual value. The visual display and the electrical signals (terminal 3 alarm relay and actual value signal at terminal 11) are always activated simultaneously.

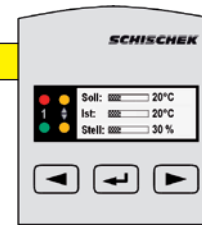




### Parameter setting and initial start-up

The switchover from operating mode to parameters mode is performed by pressing once on the ENTER (↵) key for at least 6 seconds. If the setting is password-protected, enter the password and press (↵). Return to operating mode with "Exit menu".

Operation → Parameter setting  
Press (↵) for at least 6 seconds



Menu	Function	ENTER	Indication	Select	ENTER	Description
<b>Menu 1</b>	<b>Language</b> Language selection	↵	1: Language english deutsch, english, français, italiano, español, Back	◀ ▶	↵	The following languages are available for selection: German, English, French, Italian, Spanish
<b>Menu 2</b>	<b>Application</b> Application selection	↵	2: T/rH controller application Temperature control, Humidity control, Back	◀ ▶	↵	Default and factory settings for the respective application.
2.1	<b>Temperature control</b> Select standard temperature control	↵	Device being recon- figured. Continue? No Yes	◀ ▶		
2.2	<b>No function</b> (menu item is skipped)	↵				
2.3	<b>Humidity control</b> Select standard humidity control	↵	Device being recon- figured. Continue? No Yes	◀ ▶		
2.4	<b>No function</b> (menu item is skipped)	↵				
<b>Menu 3</b>	<b>Sensor ...Pro-C...</b> Configuration menu for sensor setting	↵	3: Sensor Filter Filter, Status, Back	◀ ▶	↵	Setting selection for the external ExPro sensor.
3.1	<b>Filter</b> Select filter/damping sensor reading	↵	3.1: Filter 20 s 0...50 s	◀ ▶	↵	The input filter for the internal sensor can be adjusted in range 1...50 s to reduce fluctuations in the readings.
3.2	<b>No function</b> (menu item is skipped)	↵				
3.3	<b>Status</b> Display of the current reading	↵	3.3: Status 20 °C		↵	Test and status display of the reading for the external sensor. This function is usually used for diagnostics.
<b>Menu 4</b>	<b>Drive</b> Configuration menu for drive	↵	4: Drive Inverse Inverse, Test, Status, Runtime, Range mA, Back	◀ ▶	↵	Settings for selection for installation, trial run and initial start-up of the actuating drive.
4.1	<b>Invers</b> Set inverse operation	↵	4.1: Inverse Off Off, On, Back	◀ ▶	↵	For spring return drives in particular, it can be necessary, depending on the safety position, for the drive to be actuated inversely.
4.2	<b>Test</b> Perform test drive	↵	4.2: Test 20 % 0...100 %	◀ ▶	↵	The drive is put into operation towards a defined position as a test. It must be at position 0% when closed and at 100% when open.
4.3	<b>Status</b> Display of the drive's current position	↵	4.3: Status 20 % 0...100 %		↵	Test and status display of the drive position. This function is usually used for diagnostics.
4.4	<b>Runtime "Open"</b> Set runtime limit	↵	4.4: Runtime open 10 s 0...120 s	◀ ▶	↵	If the runtime is limited to 10 s, for example, it amounts to at least 10 s. This function can be deactivated with the setting "0 s".
4.5	<b>Runtime "Close"</b> Set runtime limit	↵	4.5: Runtime close 10 s 0...120 s	◀ ▶	↵	If the runtime is limited to 10 s, for example, it amounts to at least 10 s. This function can be deactivated with the setting "0 s".
4.6	<b>Range</b> Set drive control signal (mA)	↵	4.6: Range mA 4...20 mA 0...20 mA, 4...20 mA	◀ ▶	↵	The 4...20 mA setting should be used for standard Schischek drives.
<b>Menu 5</b>	<b>Temperature / humidity</b> Configuration menu for temperature or humidity (depending on application)	↵	5: Temperature Maximum value, minimum value	◀ ▶	↵	The relevant control variables can be adjusted according to configuration.
5.1	<b>No function</b> (menu item is skipped)	↵				
5.2	<b>No function</b> (menu item is skipped)	↵				
5.3	<b>No function</b> (menu item is skipped)	↵				


**Parameter setting and initial start-up (continued)**

Menu	Function	ENTER	Indication	Select	ENTER	Description
5.4	<b>Maximum value</b> Entry of maximum temperature/humidity value		5.4: Tmax 125 °C			For setting the upper limit of the control range.
5.5	<b>Minimum value</b> Entry of minimum temperature/humidity value		5.5: Tmin -40 °C			For setting the lower limit of the control range.
<b>Menu 6</b>	<b>Actual value</b> Configuration menu for actual value		6: Actual value Range Range, Scaling, Status, Back			Settings selection for the actual value. The actual value is shown either in °C or % rH depending on the application.
6.1	<b>Range</b> Output range settings		6.1: Range 0...10 V 0...10 V, 2...10 V, 0/2...10 V, Back			Electrical output range either between 0...10 V or 2...10 V. Additional option: outputting the state of the alarm monitor between 0/2...10 V.
6.2	<b>Scaling</b> Set output range (control or measurement range)		6.2: Scaling 0...Tnom 0...Tnom, Tmin...Tmax, Back			The actual value output can be set either to the control range (T <sub>min</sub> ...T <sub>max</sub> ) or to the measurement range (0...T <sub>Nom</sub> ).
6.3	<b>Status</b> Display of the current actual value		6.3: Status 20 °C			Test and status display of the actual value. This function is usually used for diagnostics.
<b>Menu 7</b>	<b>Setpoint value</b> Configuration menu for setpoint value		7: Setpoint value Range Range, Set value, Status, Back			Settings selection for the setpoint value. The setpoint value is read in °C or % rel. hum. depending on the application.
7.1	<b>Range</b> Output range settings		7.1: Range 0...10 V 0...10 V, 2...10 V, 0/2...10/12+ V, Back			Electrical output range either 0...10 V or 2...10 V. Additional option: enable positive control with 0/2...10/12+ V.
7.2	<b>Set value</b> Setpoint value setting in Constant mode		7.2: Set value 20 °C -40...125 °C			Constant mode is activated automatically if the electrical terminal for the setpoint value is unwired.
7.3	<b>Status</b> Display of the current setpoint value		7.3: Status 20 °C			Test and status display of the setpoint value. This function is usually used for diagnostics.
<b>Menu 8</b>	<b>Controller</b> Configuration menu for controller		8: Controller Controller type Controller type, Gain, P/I/D component, Tolerance			Settings selection for the internal PID controller. Adjustments should not be made for constant/variable standard applications.
8.1	<b>Controller type</b> Set controller type		8.1: Controller type Auto Auto, Adaptive PID, Standard PID, Back			
8.2	<b>Gain factor</b> Set control circuit gain		8.2: Gain factor 100 % 1...100			Control circuit gain can be adjusted in Automatic mode.
8.3	<b>P component</b> Set proportional component		8.3: P component 10 0...1000			The PID controller's proportional component is indicated with KP in control technology.
8.4	<b>I component</b> Set integral component (derivative action time)		8.4: I component 2.0 s 0...1000			The PID controller's integral component (derivative action time) is indicated with TI or TV in control technology.
8.5	<b>D component</b> Set damping component (reset time)		8.5: D component 1.0 s 0...1000			The PID controller's damping component (reset time) is indicated with TD or TN in control technology.
8.6	<b>Tolerance</b> Set controller tolerance		8.6: Tolerance 2.0 % 1.0...5.0			With automatic controllers, the gain is greatly reduced within the tolerance limits, so that the drive remains in an idle state as much as possible.
<b>Menu 9</b>	<b>Switching contact</b> Configuration menu for the alarm function		9: Switching contact Alarm function Alarm function, Limit %, Fixed Limit, Delay			Settings selection for actual value monitoring.
9.1	<b>Alarm function</b> Switch alarm function on/off		9.1: Alarm function auto/nc auto/nc, auto/no, manual/nc, manual/no, Off, Back			Activation of the alarm function. Additional switching characteristics for alarm contact (terminal 3) with "normally closed" (nc) or "normally open" (no).
9.2	<b>Limit (%)</b> Set alarm limit in %		9.2: Limit (%) 2.0 % 0...10.0			
9.3	<b>Limit (fixed)</b> Set fixed value in m <sup>3</sup> /h as alarm limit		9.3: Limit (fixed) 2 °C			
9.4	<b>Delay</b> Set delay for the alarm		9.4: Delay 20.0 s 10...200			
<b>Menu 10</b>	<b>No function</b> (Menu item is skipped)					


**Parameter setting and initial start-up (continued)**

Menu	Function	ENTER	Indication	Select	ENTER	Description
<b>Menu 11</b>	<b>Diagnostics</b> for testing all electrical inputs and outputs		11: Diagnostics Input 1 Input 1, ..., Output 1, ..., Contact, Back			Inspection and testing of electrical connections. The electrical level can be displayed or output according to type.
11.1	<b>Input 1</b> Status display terminal 8		11.1: Input 1 10.0 V			If the input is unwired, "Input open" appears in the display.
11.2	<b>Input 2</b> Status display terminal 9		11.2: Input 2 10.0 V			If the input is unwired, "Input open" appears in the display.
11.3	<b>Input 3</b> Status display terminal 13		11.3: Input 3 10.0 V			If the input is unwired, "Input open" appears in the display.
11.4	<b>Output 1</b> Test output terminal 6		11.4: Output 1 20.0 mA			Test of the electrical output level.
11.5	<b>Output 2</b> Test output terminal 11		11.5: Output 2 10.0 V			Test of the electrical output level.
11.6	<b>Contact</b> Test functions switching contact terminal 3		11.6: Contact Function: Open Status: Open			Test of the electrical properties of the alarm contact. The contact can be configured and tested as an input and output.
<b>Menu 12</b>	<b>Password</b> Configuration menu for passwords		12: Password Level 1 Level 1, Level 2, Level 3, Back			Up to three passwords can be assigned, according to access authorisation levels, in order to prevent unauthorised access and so that certain menus can no longer be selected.
12.1	<b>Level 1</b> Password for user level		12.1: Password L1 0000			
12.2	<b>Level 2</b> Password for installation level		12.2: Password L2 0000			
12.3	<b>Level 3</b> Password for manufacturer level		12.3: Password L3 0000			
<b>Menu 13</b>	<b>Indication</b> Configuration menu for display		13: Display Display Display, Contrast, Brightness, Quick Menu, Back			Settings selection for the display.
13.1	<b>Display</b> Set display functions		13.1: Display on, lit On lit, On, Off			The display mode can be set during standard operation mode. In this mode, the status LEDs remain switched on at all times.
13.2	<b>Contrast</b> Set display contrast		13.2: Contrast 60.0 %			
13.3	<b>Brightness</b> Set brightness of background lighting		13.3: Brightness 100 %			
13.4	<b>Quick menu</b> Use the Quick menu		13.4: Quick menu Off On, Off, Back			Frequently used functions can be accessed during control operation. To do this, press the  key between 2 and 10 seconds.
13.5	<b>Device info</b> Serial number, firmware		SN <serial number> Firmware <0.0>			
<b>Menu 14</b>	<b>Parameters</b> Menu for parameter management		14: Parameters Save Save, Edit, Activate, Delete, Back			The parameter menu can be used to manage up to three different configurations.
14.1	<b>Save</b> Save parameters		14.1: Save P1 (active) P1 (active), P2 (assigned), P3 (empty), Back			
14.2	<b>Use</b> Edit parameters		14.2: Edit P1 (active) P1 (active), P2 (assigned), P3 (empty), Back			
14.3	<b>Activate</b> Set active parameters		14.3: Activate P2 (assigned) P1 (active), P2 (assigned), P3 (empty), Back			
14.4	<b>Delete</b> Delete parameters		14.4: Delete P2 (assigned) P1 (active), P2 (assigned), P3 (empty), Back			
<b>Menu 15</b>	<b>Exit menu</b> Exit menu and confirm active parameters		15: Exit menu			