

INTERFACE DESCRIPTION

kins26en1-11-(1607)



Catalog No.

520-001
520-002
520-003
520-004
520-103
520-104

from software version V 3.2

Protec P3000

Helium Leak Detector

Content

1	Technical Description	1-5
2	Interface Connecting Cable	1-5
3	Interface Parameters	1-6
4	Interface Commands	1-7
4.1	Command Format	1-7
4.2	List of Commands	1-8
4.3	Error Messages	1-14
4.4	Examples of programming	1-14
4.4.1	Operating in measurement mode	1-14
4.4.2	Performing an external calibration	1-15
4.4.3	Performing a calibration with the built-in PRO-Check	1-18
5	Trouble Shooting	1-20

1 *Technical Description*

The Protec P3000 is equipped with a RS232 interface which is located on the rear right side of the instrument. This interface is of the DCE type (Data Communications Equipment) and allows the connection of a PC for monitoring and data logging. The connection is provided through a commercially available Sub-D plug.

The RS232 protocol can be set to "ASCII", "Diagnostics", "Printer auto" or "Printer manual". The ASCII protocol is a protocol similar to the SCPI, a standard protocol widely used for measuring equipment. The Diagnostics protocol is a binary protocol used for analysis in INFICON's quality control and trouble shooting during manufacturing and service.

For how to use the "Printer auto" and the "Printer manual" mode please refer to the Technical Handbook (kina26e1), Section 3.6.5 (Interfaces).

Interface Description

2 *Interface Connecting Cable*

The interface (HOST) is wired as data communication equipment (DCE). The connection is made via a 9-way sub-D socket on the rear of the instrument. The signals are assigned as follows:

Pin	Name	Signal
2	RXD	Receive data (Protec P3000 → PC)
3	TXD	Transmit data (PC → Protec P3000)
5	GND	Reference ground

The other pins are not used.

The levels on the RS 232 interface are defined as follows:

Level	Low (L)	High (H)
Voltage range	-3V ... - 25V	3V ... 25V
Logic state	logical 1	logical 0
Level designation	Mark	Space

RS232 Connecting Cable

A standard RS232 cable can be used (straight-through connecting cable, RxD and TxD not crossed). The RS232 hardware handshake must be switched off (in RS232 control program written by the user). If switching off of the hardware handshake is not possible, an RS232 connecting cable wired as follows may also be used:

(1607)

kins26en1-chapter.fm

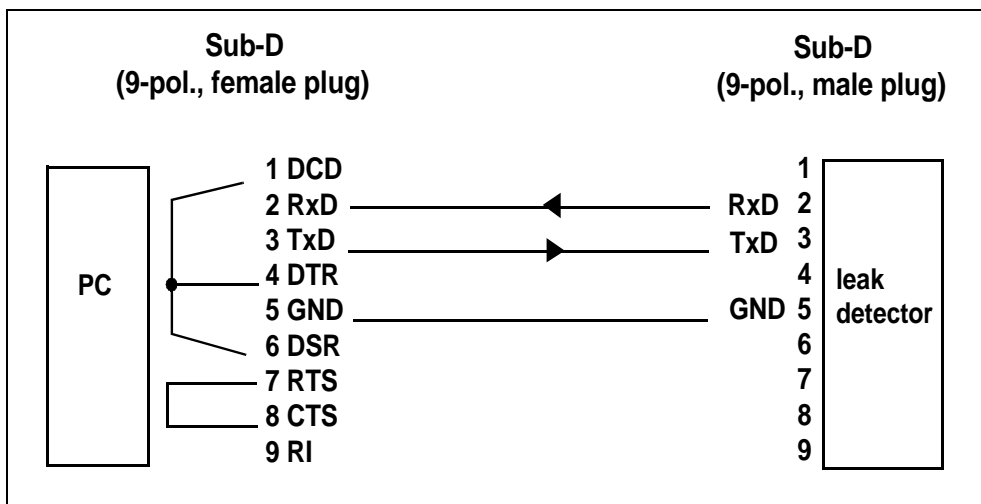


Fig. 1-1

Interface Description

3 Interface Parameters

In the ASCII mode the baud rate and the end sign can be selected. For details on how to set these parameters see the Technical Handbook for the Protec P3000 (kina26e1), Section 4.6 (Interfaces)

(1607)

kina26en1-chapter.fm

4 Interface Commands

4.1 Command Format

In ASCII mode any command starts with « * » (ASCII code 42 dec) and is finished with the end sign selected (e.g. CR). There is no differentiation between upper and lower case (except gas names and names of I•Guide programs). A blank is required between the command and the parameter, no other blanks are allowed (except names of I•Guide programs).

There is a short and an extended form of the command. Either the short or the extended command must be used, no other abbreviations are allowed. Command Words have to be separated by a colon. A command can be composed of up to three words. Parameters have to be separated by a comma.

Each command is answered with „ok“ or „EXX“ (in case of an error). For a list of all error message see section 4.1.3. The transmission can be cancelled with ESC, ^C or ^X.

Some commands can be used as queries, some can be used to set menu parameter and some can be used for both. A query is marked by a „?“ after the command, for setting data the command has to be followed by the new value to be set.

Parameter can be Boolean or numerical:

 Boolean 0 / 1 or OFF / ON or ENable / DISable
 <NR> Numeric representation format: integer, real (15.6) or exponential (4.5E-7)
 Format: [space] [sign] [ddd] [.] [ddd] [e[sign]ddd] (d: digit)

Notice Always use a point as the decimal marker. If a comma is used during numerical data entry, the conversion of the number is cancelled at this point and only the integer part of the number will be used.

Commands in brackets - as in *status[:CAL] - are optional commands and do not necessarily need to be transmitted.

Examples

Command	Reply	Content
*stat? (CR)	MEAS (CR)	status of the unit
*status? (CR)	MEAS (CR)	status of the unit
*read 1? (CR)	14.3 g/a (CR)	leak rate gas 1 in chosen unit of measurement
*read 1:oz/yr? (CR)	2.876E-5 oz/yr (CR)	leak rate gas 1 in different unit of measurement
*start (CR)	OK (CR)	start run-up
*conf:search? (CR)	90 (CR)	query search level
*conf:search 75 (CR)	OK (CR)	set search level

4.2 List of Commands

The following table lists all command available in the ASCII mode.

Command word1	Command word2	Command word3	Statement	Read / Set
*CAL			external calibration	-
*CAL	:ESC		abort calibration	S
*CAL	:FACTOR		calibration factor	R
*CAL	:FACTOR	:NEW	calibration factor for actual calibration	R
*CAL	:FACTOR	:OLD	calibration factor for last calibration	R
*CAL	:FLOW		calibration factor for flow at calibration	R
*CAL	:FLOW	:NEW	calibration factor for actual calibration	R
*CAL	:FLOW	:OLD	calibration factor for last calibration	R
*CAL	:FlowXL		Flow at calibration in HIGH FLOW	-
*CAL	:FlowXL	:NEW	flow at actual calibration	R
*CAL	:FlowXL	:OLD	flow at last calibration	R
*CAL	:PressLow		pressure in low FLOW mode at calibration	R
*CAL	:PressLow	:NEW	pressure at actual calibration	R
*CAL	:PressLow	:OLD	pressure at last calibration	R
*CAL	:PressXL		pressure in HIGH FLOW mode at calibration	-
*CAL	:PressXL	:NEW	pressure at actual calibration	R
*CAL	:PressXL	:OLD	pressure at last calibration	R
*CAL	:LEAKrate		leak rate (test leak)	R / S
*CAL	:QUIT		acknowledge (proceed)	S
*CAL	:READ		signal (for stability observation)	R
*CAL	:START		start	S
*CAL	:STATUS		Status (plain text) „T<20MIN, CONFIRM“ „PROOF, REMOVE SNIFFER“ „WAIT“ „START CAL INT, CONFIRM“ „REMOVE SNIFFER OUT OF TL“ CAL FINISHED, CONFIRM“ „START CAL, CONFIRM“ „EDIT LEAKRATE“ „LEAK STABLE, CONFIRM“ „AIR STABLE, CONFIRM“ „CAL FINISHED“ „CONFIRM“ „PROOF FINISHED, CONFIRM“ „ERRxx, CONFIRM“	R
*CAL	:UNIT		unit (test leak)	R / S
*CLS	:UNIT		Clear Error	R
*CONFig	:UNIT			

Command word1	Command word2	Command word3	Statement	Read / Set
*CONFig	:AUDio		Audio alarm type (TRIGger, SETpoint, PINpoint)	R / S
*CONFig	:BEEP		Beep-Sound (on, off)	R / S
*CONFig	:ButtonDelay		HIGH-FLOW delayed switching (s) (0.0..3.0)	R / S
*CONFig	:BRIGHTness		Sniffer light brightness (1 ... 6)	R / S
*CONFig	:CALAccess		CAL enable (on, off)	R / S
*CONFig	:ContaminLim		low, normal, high	R / S
*CONFig	:CONTRast		Contrast (0 ... 99)	R / S
*CONFig	:CONTROL		Control Location (LOCAL, RS232, LOCAL/RS232)	R / S
*CONFig	:DELay		Alarm Delay (0.0 ... 9.9) [s]	R / S
*CONFig	:DISPlay		CAL enable (on, off)	R / S
*CONFig	:DISPlay		ZERO enable (on, off)	R / S
*CONFig	:DISPlay		GAS enable (on, off)	R / S
*CONFig	:ERRor		Suppression of Error 14 (on, off) for applications in Helium-free atmosphere Caution: no self-monitoring of sensor functionality when disabled	R / S
*CONFig	:FILTer		Filter type (FIXed, I•filter)	R / S
*CONFig	:FlowDisplay		display of actual flow in main screen (ON, OFF)	R / S
*CONFig	:FlowErrorLow		limit for low flow error in LOW FLOW mode (150 - 240 sccm)	R
*CONFig	:FlowErrOn		enabling / disabling low flow error (ON, OFF)	R / S
*CONFig	:FLOWHigh		Flow limit high (300 ... 650) [sccm]	R / S
*CONFig	:FLOWLow		Flow limit low (100 ... 240) [sccm]	R / S
*CONFig	:HFButton		High Flow Button active (on, off)	R / S
*CONFig	:Highflow		High flow (on, off)	R / S
*CONFig	:LANGuage		language (ENGLISH, DEUtsch, FRANcaise, ITALiano, PORTugese, ESPanol, CHInese, KATakana)	R / S
*CONFig	:LIGHT		Sniffer light (on, off)	R / S
*CONFig	:MODE		select active gas no. (1 ... 4)	R / S
*CONFig	:PROcheck		PRO-Check (on, off)	R / S
*CONFig	:PROGram		I•Guide program number (0 - off, 1 ... 10 Program no.)	R / S
*CONFig	:PEAKhold		Show maximum peak (on, off)	R / S
*CONFig	:RECRange		Range of the linear analog output 0 = 10 x Trigger level 1 = 1E-5 mbar•l/s, 1E-6 Pa•m³/s 2 = 1E-5 Torr•l/s 3 = 1E-4 mbar•l/s, 1E-5 Pa•m³/s 4 = 1E-4 Torr•l/s 5 = 1E-3 mbar•l/s, 1E-4 Pa•m³/s 6 = 1E-3 Torr•l/s 7 = 1E-2 mbar•l/s, 1E-3 Pa•m³/s 8 = 1E-2 Torr•l/s	R / S

Command word1	Command word2	Command word3	Statement	Read / Set
*CONFig	:RS232		Mode of RS232 interface (Diagnostics, Ascii, PRTAuto, PRTManu)	R / S
*CONFig	:SNIFFer		Audio Sniffer (on / off)	R / S
*CONFig	:SPEAker		Audio Speaker internal (on / off)	R / S
*CONFig	:STANDBYDel		Time after which leak detector is set to Standby if no movement of sniffer in minutes : seconds (00:10, 00:30, 01:00, 02:00, 05:00, 10:00, 30:00, 60:00, disabled)	R / S
*CONFig	:TLRate		Leak rate external leak (4.1 [TLUnit])	R / S
*CONFig	:UNIT	:LR1	leak rate unit gas 1 (g/a, oz/yr, ppm, mbar*l/s, Pa*m ³ /s, atm*cc/s, Torr*l/s)	R / S
*CONFig	:UNIT	:LR2	leak rate unit gas 2 (as above)	R / S
*CONFig	:UNIT	:LR3	leak rate unit gas 3 (as above)	R / S
*CONFig	:UNIT	:LR4	leak rate unit gas 4 (as above)	R / S
*CONFig	:UNIT	:Pressure	pressure unit (mbar, Pa, atm, Torr)	R / S
*CONFig	:UNIT	:TLUnit	leak rate unit of external test leak (g/a, oz/yr, ppm, mbar l/s, Pa m ³ /s, atm cc/s, Torr l/s)	R / S
*CONFig	:USERmode		User mode (NORMAl, ADVanced)	R / S
*CONFig	:VOLMin		minimum volume (0 ... 15)	R / S
*CONFig	:VOLume		volume of internal speaker (0 ... 15)	R / S
*CONFig	:VOLume		lower flow limit at HIGH FLOW (500 ... 2400 sccm)	
*CONFig	:XIFlowError		limit low flow error in HIGH FLOW mode (1500 - 2400 sccm)	R / S
*CONFig	:XIFlowHigh		upper flow limit at HIGH FLOW (2700 - 3990 sccm)	R / S
*CONFig	:XIFlowLow		flow limit low [sccm] (1500 - 2400)	R / S
*CONFig	:ZEROTime		Zero Time (1.0 ... 9.9)	R / S
*GAS:<no>	:ADDhe		Additional display of Helium leak rate (ENABLED = on, DISABLED = off)	R / S
*GAS:<no>	:CALFAC		Calibration factor	R
*GAS:<no>	:CORFAC		Correction factor (depending on kind of gas) (only for user gases) Answer for gases of library: "No user gas"	R / S
*GAS:<no>	:GASpress		Refrigerant pressure (only in combination with PERcent and HEpress (no effect with User Gas)	R / S
*GAS:<no>	:HEpress		Helium pressure of helium (only in combination with PERcent and HEpress (no effect with User Gas)	R / S
*GAS:<no>	:LASTcal		Last calibration (Date, time, internal / external)	R
*GAS:<no>	:LIMIT		Lower display limit (1, 2, 4, 6, 8, 10, 20, 50, 100)	R / S
*GAS:<no>	:MODE		Choose / show active channel (1 ... 4)	R / S
*GAS:<no>	:MOLmass		Molecular weight for refrigerant equivalent leak rates	R / S

Command word1	Command word2	Command word3	Statement	Read / Set
*GAS:<no>	:NAME		Gas name (e. g. R134a, He) When writing the name all gas parameters are set to default values. When using gases of the library the correction factor will be calculated from the pressures. For other gases please enter the correction factor.	R / S
*GAS:<no>	:PEAKTime		Peak hold time (2, 3, 4, ... 20)	R / S
*GAS:<no>	:PERcent		Helium percentage (only in combination with HEpress and GASpress) (no effect on user gases)	R / S
*GAS:<no>	:SEARch		Search level (10 ... 100%)	R / S
*GAS:<no>	:TRIGGER		Trigger level (e.g. 2.5 [Unit])	R / S
*GAS:<no>	:UNIT		Trigger leak rate unit	R / S
*HOUR	:DATE		Date [dd.mm.yyyy] (set dd, mm, yyyy)	R / S
*HOUR	:DEVICE		Operating hours main unit [h]	R
*HOUR	:SENSor		Operating hours sensor	R
*HOUR	:SERVice			R
*HOUR	:SERVice	:FORE	Service diaphragm pump in [hh:mm]	R
*HOUR	:SERVice	:FILTER	Service Filter	R
*HOUR	:SINCE		Operating hours since power on (hours : minutes)	R
*HOUR	:TIME		Time [hh:mm:ss] [hh:mm] (set hh, mm)	R / S
*HOUR	:TL	:DATE	Manufacturing date PRO-Check	R
*HOUR	:TL	:EXPIry	expiration date PRO-Check	R
*HOUR	:TL	:WarnTime	Pro-Check Warn time expire date (14, 30 ,60, 90)	R / S
*IDN	:TL		Identification	R
*IDN	:BLOCK		number identifying valve block 1 = Protec P3000 2 = Protec P3000 with extended measurement range, 3 = Protec P3000XL	R
*IDN	:DEVice		device name (P3000, ...)	R
*IDN	:SERial		Serial number of Protec P3000	R
*IDN	:SNVersion		Software version sniffer	R
*IDN	:SNSerial		Sniffer serial number	R
*IDN	:SNTYPE		Sniffer type (length and version)	R
*IDN	:TLVersion		Software version PRO-Check test leak	R
*IDN	:TLSerial		Serial number PRO-Check test leak	R
*IDN	:TLSerial2		Serial number PRO-Check gas reservoir	R
*IDN	:VERsion		Software version of Protec P3000	R
*IDN	:WiseSerial		Serial number Wise Technology Sensor	R
*MEASure	:WiseSerial			
*MEASure	:FILTER		Current from I•Filter [A]	R
*MEASure	:FLOW		actual flow [sccm]	R

Command word1	Command word2	Command word3	Statement	Read / Set
*MEASure	:GLOBal		!•Guide global leak rate (in selected unit)	R
*MEASure	:HEATer		Sensor heater voltage	R
*MEASure	:HIGHVoltage		Sensor high voltage	R
*MEASure	:Pressure			R
*MEASure	:Pressure	:FOREline	foreline pressure [in selected unit of measurement]	R
*MEASure	:POInt no		!•Guide measuring point no.	R
*MEASure	:POInt	:TIME no.	!•Guide leak rate for measuring point with time stamp	R
*MEASure	:TEMPeratur			R
*MEASure	:TEMPeratur	:Electronic	Electronics temperature [°C]	R
*MEASure	:TEMPeratur	:Leak	PRO-Check temperature [°C]	R
*MEASure	:U5Leak		Voltage 5V Test leak [V]	R
*MEASure	:U5Sniffer		Voltage 5V Sniffer [V]	R
*MEASure	:U24Ext		Voltage 24V external [V]	R
*MEASure	:U24MC50		Voltage 24V MC50 [V]	R
*MEASure	:U24WISE		Voltage 24V Wise Technology sensor	R
*MEASure	:U15MC50		Voltage +15V MC50 [V]	R
*MEASure	:U-15MC50		Voltage -15V MC50 [V]	R
*MEASure	:WISE		Wise Technology sensor current [A]	R
*PROGrama<:nr:>	:WISE		!•Guide with program number	R / S
*PROGrama<:nr:>	:ENABLE		Enable (on, off) (program choosable) Total enabling see CONF:PROG (ON, OFF)	R / S
*PROGrama<:nr:>	:GAS		Gas name in program <nr>	R
*PROGrama<:nr:>	:MEAStime		Measuring time (1.0 ... 25.0)	R / S
*PROGrama<:nr:>	:NAME		Name (maximum 6 characters)	R / S
*PROGrama<:nr:>	:NR		Gas no. (1 ... 4)	R / S
*PROGrama<:nr:>	:POInts		Number of points (0 ... 20)	R / S
*PROGrama<:nr:>	:TRIGger		Global trigger	R / S
*PROGrama<:nr:>	:WAITtime		Wait time (0.1 ... 25.0)	R / S
*READ	[<nr>]	[<unit>]	Leak rate (Gas number 1 ... 4) Gas 0 = Helium independant of gas selected unit (g/a, oz/yr, ppm, mbar*l/s, Pa*m3/s, atm*cc/s, Torr*l/s) Example: "read 0 mbarl*s?" Helium in mbar*l/s "read Torr*l/s?" Selected gas in Torr*l/s "READ 2?" Gas 2 in selected unit	R
*SLEEP			activating sleep mode	S
*STANDBY			activating standby	S
*START			start (after standby or sleep)	S

Command word1	Command word2	Command word3	Statement	Read / Set
*STaTus			status of the Protec P3000 (INIT, START, MEAS, CAL, ERROR, ADJUST, STANDBY, OVERRANGE)	R
*STaTus	[:CAL]		status calibration (status number) 2 - LEAKRATE STABLE, CONFIRM 7 - AIR STABLE, CONFIRM 10 - CAL FINISHED, CONFIRM	R
*STaTus	[:CALHist 1] ... [:CALHist 12]		Calibration history starting from 1 to 12 Date, time, cal.-type (internal/external), calibration factor	R
*STaTus	[:CALMode]		Type of calibration (NO, PROOF, INTERNAL, EXTERNAL)	R
*STaTus	[:ERRor]		Error (NO ERROR / WARNING, ERROR<nr>, WARNING <nr>)	R
*STaTus	[:ERRorHist 1] ... [:ERRorHist 12]		Error history starting from 1 to 12 Date, time, error no.	R
*STaTus	[:LEAK]		PRO-Check test leak	R
*STaTus	[:LEAK]	[:Gas]	Gas type (Helium)	R
*STaTus	[:LEAK]	[:LRNom]	nominal leak rate [in selected unit]	R
*STaTus	[:LEAK]	[:LREff]	effective leak rate [in selected unit]	R
*STaTus	[:LEAK]	[:GAIN]	Compensation Gain	R
*STaTus	[:LEAK]	[:Offset]	Compensation Offset	R
*STaTus	[:PROGram]		Current I•Guide point no.	R
*STaTus	[:PROof]		status of proof function (status number) 2 - WAIT UNTIL STABLE 7 - WAIT UNTIL AIR STABLE 10 - SHOW RESULTS 16 - MEASURE LEAK 17 - REMOVE UNTIL AIR STABLE	R
*STaTus	[:SEARch]	<nr>	Search level exceeded (by gas number)	R
*STaTus	[:SERviceHist 1] ... [:SERviceHist 12]		Service history starting from 1 to 12 Date, time, mode	R
*STaTus	:SNkey		reads status of probe button (e.g. 01=right button pressed)	R
*STaTus	[:TRIGger]	<nr>	Trigger level exceeded (by gas number)	R
*STaTus	[:VALve]		State of valves, i. e. 10010 valve 5 left, valve 1 right, 1 = open, 0 = closed; valve 2 and 5 open, others closed	R
*ZERO	[:VALve]		setting new ZERO level	S

4.3 Error Messages

The following error messages may be received from the Protec P3000:

Error number	Error message	Statement
0	ERR_OK	Command ausgeführt
1	ERR_CMD_START	wrong command start (no "**")
2	ERR_ERR_BLANK	illegal blank3
3	ERR_CMD_WORD_1	Command Word 1 illegal
4	ERR_CMD_WORD_2	Command Word 2 illegal
5	ERR_CMD_WORD_3	Command Word 3 illegal
6	ERR_DISABLED	control via RS232 not enabled
7	ERR_ARGUMENT	argument wrong
8	ERR_NO_DATA	no data available
9		
10	ERR_INVALID	Command currently invalid
11	ERR_NO_QUERY	no query allowed
12	ERR_QUERY	only query allowed
13	ERR_NOT_IMPLEMENTED	not yet implemented

4.4 Examples of programming

4.4.1 Operating in measurement mode

Gas settings:

- Gas 1: He, unit mbar*l/s
- Gas 2: disabled
- Gas 3: disabled
- Gas 4: R134a, unit g/a

RS232 Interface settings:

- RS232 protocol: ASCII
- Baud rate & End sign: 19200 / CR (must be identical with settings of PC))
- Control location: Local and RS232 (if RS23 is not enabled, control through the interface is impossible)

With these commands the status of the Protec P3000, the status of the trigger and the leak rates can be monitored in measurement mode.

Command sent to Protec P3000	Response received from Protec P3000	Meaning
.....		
*status? (CR)		Requests the status of the Protec P3000
	MEAS (CR)	Protec P3000 is in measurement mode

Command sent to Protec P3000	Response received from Protec P3000	Meaning
*status:trigger? (CR)		Requests the status of the trigger for the enabled gas
	OFF (CR) ON (CR)	The leak rate is are below trigger value The leak rate exceeds the trigger value
*read 1? (CR)		Requests the leak rate for gas number 1 (R134a)
	2.5E-5 mbar*l/s (CR)	Leak rate Gas 1 (He)
*read 4? (CR)		Requests the leak rate for gas number 4 (He)
	3.9 g/a (CR)	Leak rate Gas 4 (R134a)
.....		
If an error occurs, the status changes from MEAS to ERROR, the error number can be queried and no leak rates will be available anymore. If the problem has been fixed the error can be acknowledged and the unit will start up again and go back into measurement mode.		
*status? (CR)		Requests the status of the Protec P3000
	ERROR (CR)	Protec P3000 currently shows an error
*status:error? (CR)		Requests the error number the Protec P3000 currently shows
	ERROR 25 (CR)	Error number 25 (Remove sniffer from CAL port!)
*read 1? (CR)		Requests the leak rate for gas number 1 (Helium)
	E08 (CR)	ERR_NO_DATA, no data available as unit currently shows an error
....		
*cls (CR)		Acknowledges (clears) the error message
	OK (CR)	Protec P3000 has received request okay, unit will start up again
*status? (CR)		Requests the status of the Protec P3000
	START (CR)	Protec P3000 is starting up
*status? (CR)		Requests the status of the Protec P3000
	MEAS (CR)	Protec P3000 is in measurement mode

4.4.2 Performing an external calibration

Gas settings and interface settings as above.

With the following chain of command an external calibration of gas 1 (He) may be controlled via RS232. The progress of the calibration is shown on the main unit display, any confirmations through the buttons of the main unit display nor the probe button is impossible however.

Command sent to Protec P3000	Response received from Protec P3000	Meaning
.....		
*status? (CR)		Requests the status of the Protec P3000
	MEAS (CR)	Protec P3000 is in measurement mode
*cal:start (CR)		Starts calibration process
	OK (CR)	Protec P3000 has received start signal
*cal:status? (CR)		Requests the status of the calibration
	T<20 MIN, CONFIRM (CR)	If the Protec P3000 has been running for less than 20 min a warning is sent by the Protec P3000
*cal:quit (CR)		Acknowledges warning
	OK (CR)	Protec P3000 has received acknowledgement
*cal:status? (CR)		Requests the status of the calibration
	START CAL, CONFIRM (CR)	Status is: ready for calibration
If test leak rate setting and unit of test leak is known from last calibration process and identical, the calibration may be started immediately (see next table), otherwise the test leak information has to be sent to the Protec P3000 first:		
*cal:unit? (CR)		Requests the set unit of the test leak rate
	mbar l/s (CR)	Unit of test leak rate is mbar l/s
*cal:leakrate? (CR)		Requests the currently set leak rate for the external test leak
	2e-5 (CR)	Leak rate is 2×10^{-5} mbar l/s
*cal:leakrate 4e-5 (CR)		Sets the leak rate of the external test leak used to 4×10^{-5} mbar l/s
	OK (CR)	Protec P3000 has received new setting
*cal:status? (CR)		Requests the status of the calibration
	START CAL, CONFIRM (CR)	Status is: ready for calibration
Calibration may now be started:		
*cal:quit (CR)		Starts the calibration process

	OK (CR)	Protec P3000 has received start signal
*cal:status? (CR)		Requests the status of the calibration
	LEAK STABLE, CONFIRM (CR)	Status: waiting for acknowledgement that signal from test leak is stable
*cal:read? (CR)		Requests leak rate signal reading
	8.2638e-14 (CR)	Signal from test leak is 8.2638e-14
.....	<i>This request should be repeated several times to determine whether the reading has stabilized.</i>	
*cal:quit (CR)		Starts the test leak measurement
	OK (CR)	Protec P3000 has received start signal
*cal:status? (CR)		Requests the status of the calibration
	WAIT (CR)	Status: measuring test leak
.....		
*cal:status? (CR)		Requests the status of the calibration
	AIR STABLE, CONFIRM (CR)	Status: waiting for background measurement, waiting for signal to be confirmed to be stable
*cal:read? (CR)		Requests leak rate signal reading
	3.0513e-15 (CR)	Signal from background is 3.0513e-15
.....	<i>This request should be repeated several times to determine whether the reading has stabilized.</i>	
*cal:quit (CR)		Starts the background measurement
	OK (CR)	Protec P3000s has received start signal
*cal:status? (CR)		Requests the status of the calibration
	WAIT (CR)	Status: measuring background
.....		
*cal:status? (CR)		Requests the status of the calibration
	CAL FINISHED, CONFIRM (CR)	Status: calibration finished without errors, results are available
*cal:factor:old? (CR)		Requests data for old calibration factor
	1.95 (CR)	Old calibration factor was 1.95
*cal:factor:new? (CR)		Requests data for new calibration factor
	2.05 (CR)	new calibration factor is 2.05

*cal:flow:old? (CR)		Requests data for old flow at calibration
	276 (CR)	Old flow was 276 (sccm)
*cal:flow:new? (CR)		Requests data for new flow at calibration
	287 (CR)	New flow is 287 (sccm)
*cal:quit (CR)		Save results of new calibration
	OK (CR)	Protec P3000s has received request to save new values
*cal:status? (CR)		Requests the status of the calibration
	WAIT (CR)	Status: wait, data is being saved, new offset is determined
*status? (CR)		Requests the status of the Protec P3000
	CAL (CR)	Status: still in calibration mode (calibration process not finished yet)
.....		
*status? (CR)		Requests the status of the Protec P3000
	MEAS (CR)	Protec P3000 is in measurement mode

The calibration process may be cancelled at any time with „*cal:esc (CR)“. If an error occurs during the calibration process (e.g. „ERR78, CONFIRM“), the error message may be acknowledged with *cal:quit (CR)“.

4.4.3 Performing a calibration with the built-in PRO-Check

Command sent to Protec P3000	Response received from Protec P3000	Meaning
Insert the sniffer tip into the PRO-Check to start the calibration		
*cal:start (CR)		Within 8 s you have to send the Start command otherwise a PROOF function will be performed
	OK (CR)	Protec P3000 has received start signal
*cal:stat? (CR)		Requests status of calibration
	T<20 MIN, CONFIRM (CR)	If the Protec P3000 has been running for less than 20 min a warning is sent by the Protec P3000
*cal:quit (CR)		Acknowledges warning
	OK (CR)	Protec P3000 has received acknowledgement
*cal:stat? (CR)		Requests status of calibration
	WAIT (CR)	Please wait

Command sent to Protec P3000	Response received from Protec P3000	Meaning
*cal:stat? (CR)		Requests status of calibration
	REMOVE SNIFFER OUT OF TL (CR)	Status: waiting for sniffer to be taken out of the internal test leak
*cal:stat? (CR)		Requests status of calibration
	WAIT (CR)	Please wait
*cal:stat? (CR)		Requests status of calibration
	CAL FINISHED, CONFIRM	Calibration process finished, please confirm to save new values
*cal:factor:old?		Requests the value of the old calibration factor
	1.52 (CR)	Old calibration factor is 1.52
*cal:factor:new?		Requests the value of the new calibration factor
	1.61 (CR)	New calibration factor is 1.61
*cal:flow:new?		Requests the value of the old flow through the sniffer line
	295 (CR)	Old flow through sniffer line is 295 [sccm]
cal:flow:old?		Requests the value of the new flow through the sniffer line
*	290 (CR)	New flow through sniffer line is 290 [sccm]
*cal:quit (CR)		Save results of new calibration
	OK (CR)	Saving of calibration results acknowledged
*cal:stat? (CR)		Requests status of calibration
	NO CAL RUNNING	No active calibration process ongoing
*cal:esc (CR)		Stops the calibration process at any time of the calibration
	OK (CR)	Abortion of calibration process acknowledged

5 Trouble Shooting

Error	Possible Reason	Solution
No characters are received via the interface / the Protec P3000 does not answer	Wrong cable	Please use a 1:1 cable, (NO null-modem cable, also called cross-over cable!)
	Problems with flow control	Deactivate flow control in PC/PLC or use cable according to the wiring diagram in Section 2
	Wrong COM-Port used at PC	Select correct COM-Port
	Wrong interface parameters (Baud rate, Data bits, Parity, Stop bits)	Check if interface parameters (Baud rate, number of data bits, parity bit and number of stop bits in the Protec P3000 and PC / PLC match)
	Wrong protocol selected in the Protec P3000	Select correct protocol in the Protec P3000
	PC uses an USB-RS232 converter	In general the Protec P3000 will also work with an USB-RS232-converter. However, these often cause multiple difficult to track problems (driver, flow control.) Please test your PC program on a "real" RS232 interface first preferably. Especially with USB-RS232-converters it is often helpful to use a cable according to the wiring diagram in Section 2
	Serial interface of PC is (still) occupied with a different program	Check if other programs (e.g. a synchronisation software for your hand-held computer) uses the serial interface. It is also possible that an already closed program has not released the interface again yet. In this case a restart of the PC will help.
The Protec P3000 replies with „unreadable“ characters	Wrong interface parameters (Baud rate, Data bits, Parity, Stop bits)	Check if interface parameters (Baud rate, number of data bits, parity bit and number of stop bits in the Protec P3000 and PC / PLC match)
	Wrong protocol selected in the Protec P3000	Select correct protocol in the Protec P3000
Protec P3000 does not reply / Protec P3000 replies after several command with „E10“	„Carriage Return“ at the end of the command is missing	Finish all commands with „Carriage Return“ (ASCII 0dhex / 13dez)
Protec P3000 replies with „E06“	Control via RS232 not enabled in the Protec P3000	Enable control via RS232 (see submenu CONTROL LOCATION)
Protec P3000 replies with error message to the first command only, following commands are interpreted correctly	Receiving buffer of the Protec P3000 was not empty before sending the first command (e.g. by plugging in the RS232 cable during operation)	In the ASCII protocol the Protec P3000 has not time out function which will empty the receiving buffer automatically. Therefore, the buffer should be emptied before the first command by sending of ESC, ^C or ^X



INFICON GmbH, Bonner Strasse 498, D-50968 Cologne, Germany
Phone: +49 (0)221 347-40 Fax: +49 (0)221 347-41429 E-mail: leakdetection@inficon.com

UNITED STATES TAIWAN JAPAN KOREA SINGAPORE GERMANY FRANCE UNITED KINGDOM HONG KONG
Visit our website for contact information and other sales offices worldwide. www.inficon.com

Dokument: kins26e1-j (1607)