

Filter Control



Operating instructions

(Translation of Original German version)



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1 Legal Provisions

Manufacturer

HESCH Industrie-Elektronik GmbH, Boschstraße 8, 31535 NEUSTADT | GERMANY

Intended use

- The HE 5760 is a master-slave control for the cleaning process of industrial dust extraction systems.
- The expansion to a complete cleaning control system is carried out with the HE 5725 valve controllers, each of which controls 12 valves. Up to 48 valve controllers can be centrally controlled as CAN slaves by the HE 5760. The valves are assigned to so-called filter chambers. The control is set to the existing number of chambers and valves using the parameter menu. Parameterisation can also be carried out with the PC software 'SmartTool' via the USB interface.
- The HE 5760 control unit is located in a front-mounted housing with membrane keypad and graphic display and is designed for installation in control cabinets. Local operation at the control cabinet with switchgear and signal lamps that are connected directly is possible.
- The device can be operated within the operating and environmental conditions approved in these operating instructions without impairing its safety.
- The manufacturer is not liable for improper use and any resulting personal injury or material damage; the risk is borne solely by the user. Failure to comply with the above criteria for intended use will result in the expiry of the warranty and liability for the device.

Personnel qualification

All work on the differential pressure transducer may only be carried out by qualified electricians with sufficient knowledge in the field of electrical engineering.

Device Safety

The device has been constructed and tested in accordance with VDE 0411 / EN 61010-1 and has left the factory in perfect safety condition. To maintain this condition and ensure safe operation, the user must follow all instructions and warnings in this quick guide.

2 Safety Information

2.1 Symbols and Basic Safety Instructions

This chapter contains important safety regulations and notes. To protect against personal injury and material damage, it is necessary to read this chapter carefully before working with the device.

Symbols used

The following symbols are used in this manual. All safety instructions have a uniform structure.



2.2 Signal words

DANGER!

Indicates an imminently hazardous *high* risk situation, which, if not avoided, will result in death or serious injury.

WARNING!

Indicates a potentially hazardous medium risk situation, which, if not avoided, could result in death or serious injury.

CAUTION!

Indicates a hazardous low risk situation, which, if not avoided, could result in minor or moderate injury.

2.3 Safety in the individual operating phases

When installing the device and during operation, the following safety instructions must be observed.



Danger of Electrocution!

Before working on the device, switch off all power supplies used. The electrical cables must be laid according to the respective national regulations (in Germany VDE 0100). The measuring cables must be laid separately from the power lines. The connection between the connector for the functional earth (in the respective equipment carrier) and a protective earth must be established.



Danger of Electrocution!

Any interruption of the protective earth in the equipment carrier can result in the device becoming a hazard. Intentional interruptions are not permitted. If there is a suspicion that it is no longer possible to operate the device safely, it must be shut off and secured against being unintentionally switched on.



Danger of Electrocution!

Do not open the device when it is connected to the voltage! When opening the devices or removing covers and parts, live parts may be exposed. Connection points can also be live!



Attention!

The device must never be put into operation even if damage is recognisable.



Attention!

During installation, commissioning, maintenance and troubleshooting, observe the accident prevention regulations applicable to your system, e.g. DGUV Regulation 3 "Electrical installations and equipment".



Attention!

Clean dirty contacts with oil-free compressed air or ethyl alcohol and a lint-free cloth.



Warning of material damage caused by electrostatic charge! Observe the safety measures according to BS EN 61340-51/-3 to avoid electrostatic discharge!



Power Connection!

The electrical cables must be laid according to the respective national regulations (in Germany VDE 0100). The measuring cables must be laid separately from the power lines.



Troubleshooting!

At the beginning of troubleshooting, all possible sources of faults on additional devices or supply lines (measuring lines, wiring, downstream devices) should be taken into consideration. If the fault is not found after checking these points, we recommend sending the device to the supplier.



Decommissioning!

Switch off the power supply on all poles if the device is to be decommissioned. Secure the device against being unintentionally switched on!

If the device is linked to other devices and/or equipment, consider the impacts and take appropriate precautions before switching it off.

3 Technical data

Supply: -24 V(2226 V AC) -galvanically separated -0.3 A typical -5 A maximum Display: -graphic LC display -Resolution: 128 × 64 7938 -display area: 66 × 33 mm -Colour: yellow green LEDs -operation: green -Cleaning active: yellow -Alarms: red Keys: -menu operation: ESC, F1, F2, ENTER -navigation and value entry: LEFT, RIGHT, UP, DOWN	Technical Data	
-galvanically separated -0.3 A typical -5 A maximum Display: -graphic LC display -Resolution: 128 × 64 7938 -display area: 66 × 33 mm -Colour: yellow green LEDs -operation: green -Cleaning active: yellow -Alarms: red Keys: -menu operation: ESC, F1, F2, ENTER -navigation and value entry: LEFT, RIGHT, UP, DOWN	Supply:	-24 V(2226 V AC)
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-5 A maximum Display: -graphic LC display -Resolution: 128 × 64 7938 -display area: 66 × 33 mm -Colour: yellow green LEDs -operation: green -Cleaning active: yellow -Alarms: red Keys: -menu operation: ESC, F1, F2, ENTER -navigation and value entry: LEFT, RIGHT, UP, DOWN		-0.3 A typical
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-Colour: yellow green LEDs -operation: green -Cleaning active: yellow -Alarms: red Keys: -menu operation: ESC, F1, F2, ENTER -navigation and value entry: LEFT, RIGHT, UP, DOWN		-display area: 66 × 33 mm
LEDs -operation: green -Cleaning active: yellow -Alarms: red Keys: -menu operation: ESC, F1, F2, ENTER -navigation and value entry: LEFT, RIGHT, UP, DOWN		-Colour: yellow green
-Cleaning active: yellow -Alarms: red Keys: -menu operation: ESC, F1, F2, ENTER -navigation and value entry: LEFT, RIGHT, UP, DOWN	LEDs	-operation: green
-Alarms: red Keys: -menu operation: ESC, F1, F2, ENTER -navigation and value entry: LEFT, RIGHT, UP, DOWN Description		-Cleaning active: yellow
Keys: -menu operation: ESC, F1, F2, ENTER -navigation and value entry: LEFT, RIGHT, UP, DOWN		-Alarms: red
-navigation and value entry: LEFT, RIGHT, UP, DOWN	Keys:	-menu operation: ESC, F1, F2, ENTER
	_	-navigation and value entry: LEFT, RIGHT, UP, DOWN
Processor: -Fujitsu MB96F348	Processor:	-Fujitsu MB96F348
-544 kB Flash / 280 kB RAM		-544 kB Flash / 280 kB RAM
-1 MB flash for parameters and data		-1 MB flash for parameters and data
-Real-time clock optional		-Real-time clock optional
Ports -CAN Interface, galvanically isolated, 50 kBit/s	Ports	-CAN Interface, galvanically isolated, 50 kBit/s
control interface: Modbus RTU, Profibus		control interface: Modbus RTU, Profibus
Inputs: -5 Digital inputs 24 V DC, galvanically isolated, for local	Inputs:	-5 Digital inputs 24 V DC, galvanically isolated, for local
operation: Operation on the control cabinet with keys and		operation: Operation on the control cabinet with keys and
Indicator lights		Indicator lights
-2 analogue inputs 420 mA for system pressure and		-2 analogue inputs 420 mA for system pressure and
Uniterential pressure, accuracy. 0.1%	Outputo	directed autoute 24 V/DC 14, short aircuit proof, for local
ouputs. 4 digital ouputs 24 V DC, TA, short-circuit proof, for local	Oulpuis.	appretion
Housing Switch papel housing	Housing	Switch papel bousing
Dimensions: $196 \times 126 \times 40 \text{ mm} (W \times H \times D)$	Dimensions:	$196 \times 126 \times 40 \text{ mm} (W \times H \times D)$
Excernt: $166 \times 06 \text{ mm} (W \times H \times D)$	Excernt:	$166 \times 96 \text{ mm} (W \times H)$
IP protection class:	IP protection class:	-IP 65 Front
-IP 20 Rear		-IP 20 Rear
Electrical connections USB interface connector type B	Electrical connections	USB interface connector type B
Screw terminals for supply CAN local operation		Screw terminals for supply CAN local operation
measurement		measurement
Interference immunity: DIN EN 61000-6-2 and DIN EN 61326-1	Interference immunity:	DIN EN 61000-6-2 and DIN EN 61326-1
Emitted interference DIN EN 61000-6-3 and DIN EN 61326-1	Emitted interference	DIN EN 61000-6-3 and DIN EN 61326-1

Environmental Weather Conditions		
Operation:	-10…+55 °C	
Storage:	-25+60 °C	
Transport	-25+85 °C	
Ambient humidity:	75% rel. humidity, no condensation	

Subject to technical changes without notice!

4 Mounting

The ambient temperature at the installation point must not exceed the permissible temperature for nominal use specified in the technical data.

4.1 Dimensions

The HE 5760 is a panel-mounted unit with the following dimensions:



Figure 1 HE 5760 Dimensions

Scope of Delivery

- HE 5760 Premium
- Operating instructions



Note!

Check the delivery upon receipt for completeness and for visible defects. In the event of a complaint, contact our HESCH Service immediately (see chapter 13 Maintenance and Service).

5 System overview



Figure 2 System overview HE 5760 / HE 5725

5.1 System components

- Master control HE 5760 5.1.1
 - ≻ Central control of the filter system ≻
 - To be connected:
 - CAN line, ≻
 - ≻ Pressure sensor for system pressure and differential pressure
 - ≻ Keys and indicator lights for local operation, if desired.



Figure 3 HE 5760

5.1.2 HE 5725

- > Valve control as CAN slave
- 12 valves are connected directly as well as the pressure sensors of the local pressure tanks



Figure 4 HE 5725

5.1.3 HE 1149

- Used to measure the compressed air at the central supply 'system pressure' and at the local pressure tanks
- Measurement range 1.5...10 bar.



Figure 5 HE 1149

5.1.4 Differential pressure transmitter HE 5410

- > Differential pressure is measured between clean gas and raw gas side
- > Measured value is used as a measure of the contamination of the filter system
- Measuring range 0...100 mbar



Figure 6 HE 5410

5.2 Filter system



Figure 7 Filter sketch

- 1 Raw gas
- 2 Clean gas
- 3 Differential pressure measurement raw gas clean gas
- 4 Chamber as spatial unit of the filter elements
- 5 Local pressure tanks
- 6 Pressure measurement at the local pressure tank
- 7 Valves for compressed air cleaning of the filter elements
- 8 Filter elements

6 Display and operating elements



Figure 8 Display and Operating Elements HE 5760

Symbols:	Display Elements Meaning
LED indicators	
•	Operation The operating voltage is present and the control unit is ready for operation.
<i>i</i> ⊈; ●	Cleaning active The status of the control is thus visible, even if no valve is activated at the moment.
	Alarms present The alarm key can be used to view current alarms and the alarm list.
Command and control keys	
ESC	Exit the current menu without changing the value
F1 F2	Context menu keys, meaning is shown in the lowest text line of the display.
\diamond	Selection of the current value. Acceptance of the changed value.
Hot Keys	
	Function keys for system operation
	The function keys call up the operating and display options of normal operation. By pressing several times, more screens become visible. See also section 8 Operation.
Navigation keys	
	Line selection, value change for selected values
	-Backlight brightness -Page switching for longer lists Decimal position for value representation

7 Electrical commissioning

Before switching on the device, observe the following points:

- Connect the cable firmly to the glands. The power supply must correspond to the voltage indicated on the nameplate.
- The unit may only be operated when installed.
- The temperature limitations specified for the use of the device must be complied with before and during operation.
- The protective conductor connection in the corresponding equipment rack must be conductively connected to the protective conductor.



Danger of Electrocution!

Electrical installation must only be carried out when the power is disconnected.



Warning of material damage caused by electrostatic charge! Observe the safety measures according to DIN EN 61340-51/-3 to avoid electrostatic discharge!



Note!

Work on the electronic parts may only be carried out by qualified personnel.



Figure 9 HE 5760 Rear with electrical connections

7.1 Electrical connection HE 5760

Supply 24 V DC Supply	
1	24 V DC
2	GND
3	FE Functional Earth

CAN communication	
4	CAN-H
5	CAN-L
6	CAN -GND

Termination / Bus termination switchable

Digita	Digital Out 24 V DC status signals	
7	Operation = green LED	
8	Cleaning = yellow LED	
9	Malfunction = red LED	
10	Pulse	
11	Out-GND	

Digita	Digital In 24 V DC control signals	
12	Local/Remote	
13	Acknowledge	
14	Start	
15	Stop	
16	Post-Cleaning	
17	IN-GND	

Analogue In 420 mA Pressure measurement		
18	Filter dp +	Analogue input 1
19	420 mA -	
20	System p +	
21	420 mA -	Analogue input 2

7.1.1 Local operation through control signals



Figure 10 Example of the possible use of the control signals

7.2 Electrical connection HE 5725



Figure 11 Electrical connection HE 5725

Supply 24 V DC Supply	
1	+ 24 V DC 1A
2	GND
3	PE

Valve	es 1 to 6, 24 V DC
4	Valve 1 +
18	Valve 1 GND
32	Valve 1 PE
5	Valve 2 +
19	Valve 2 GND
33	Valve 2 PE
6	Valve 3 +
20	Valve 3 GND
34	Valve 3 PE
7	Valve 4 +
21	Valve 4 GND
35	Valve 4 PE
8	Valve 5 +
22	Valve 5 GND
36	Valve 5 PE
9	Valve 6 +
23	Valve 6 GND
37	Valve 6 PE

Pressure 1					
16	+ 24 V DC Out				
30	Sensor 1 GND				
44	PE				

IN	Out	CAN Connection
46	50	CAN-H
47	51	CAN-L
48	52	CAN-GND
49	53	Umbrella

Valv	es 7 to 12, 24 V DC
10	Valve 7 +
24	Valve 7 GND
38	Valve 7 PE
11	Valve 8 +
25	Valve 8 GND
39	Valve 8 PE
12	Valve 9 +
26	Valve 9 GND
40	Valve 9 PE
13	Valve 10 +
27	Valve 10 GND
41	Valve 10 PE
14	Valve 11 +
28	Valve 11 GND
42	Valve 11 PE
15	Valve 12 +
29	Valve 12 GND
43	Valve 12 PE

Pressure 2					
17	+ 24 V DC Out				
31	Sensor 2 GND				
45	PE				

7.3 CAN network configuration

7.3.1 CAN address assignment

Each device in the CAN network is addressed with its CAN node number. The assignment of the CAN addresses must comply with certain rules. The HE 5760 control unit does not require a CAN address.

With the HE 5725 valve controls, a distinction is made between:

- > one HE 5725 per chamber, consecutive numbering, 1, 2, 3, ... 48
- two HE 5725 per chamber, split numbering, 1, 25, 2, 26, ... 24, 48



Figure 12 CAN numbering 1 slave per chamber



Figure 13 CAN numbering 2 slaves per chamber

7.3.2 CAN address setting on HE 5725



Figure 14 Address setting on HE 5725

7.3.3 CAN termination

A CAN network must be terminated at both ends.

The termination is switchable at the units. If the termination is faulty, the technical bus communication will not work.



Figure 15 Bus termination Example 1



Figure 16 Bus termination Example 2

The baud rate of the CAN bus communication is fixed at 50 kBaud. The maximum bus extension can be up to 1200 m.

7.3.4 Termination on HE 5760 and HE 5725

For termination, the jumper is plugged into the positions shown in the following illustration.



Figure 18 Termination with jumper on HE 5760 and HE 5725

7.4 System start-up

Prerequisites:

- > Wiring of all components according to circuit diagrams
- Power supply to all components switched on
- System parameters entered completely
- Compressed air for valves available

Starting possibilities:

- Iocal control on the master enclosure is activated when the input "Local/Remote" (terminal 12) and the start input (terminal 14) is supplied with 24 VDC. The reference ground is terminal 17: GND
- Start with PC and 'SmartTool

The following is checked by the control unit after switching on:

- CAN network
- Conformity of parameter set and system
- Verification of necessary variables (pressures, etc.)

Existing alarm messages are signalled by the red LED / . .

The messages can be called up with the alarm key

Chapter 10 Error messages provides additional information on troubleshooting.



8 Operation

 Δp

The HE 5760 is operated via the individual keys on the front of the unit (see chapter 6 Display and operating elements).

8.1 Actual value image

The screen sequence shown below assumes operation with dp measurement AND dust measurement. If there is no dp or dust signal, the actual value images are omitted accordingly.



Standard screen for an overview of the most important values:

- Current chamber
- Current valve
- Differential pressure value and symbol
- System Pressure



Differential pressure symbol:

Depending on the selected cleaning thresholds, the current differential pressure is symbolised graphically.

Press the key

to go to the following screen.

t

1	7		0	3		1	4		Μ	Ó	n		3	8	:	3	5	:	3	
D	i	f	f	e	h	e	n	t	i	a	1		p	r	e	2	ŝ	а,	ł٢	ne
					1	1		0		m	b	a	h							
L	Ó	ω	e	m		t	h	h	e	s	h	Ó	1	Ċ						
					1	0		0		m	b	a	r							
U	р	р	e	m		t	h	h	e	s	h	Ó	1	Ċ						
					1	5		0		m	b	a	r							
F	'a	in.		m	e	e t	e	in.												

Differential pressure values:

- Current differential pressure
- Lower Threshold (Cleaning Start)
- Upper Threshold (Cleaning Stop)



8.3 Chamber control





If an alarm cause is eliminated, the message disappears. The hold function for alarms must not be switched on.



With the test function, an entire chamber or a single valve can be addressed directly.

8.4 Info screen





Important information

The fields can be freely described: Operator, manufacturer, service or emergency call information.

Further information can be called up with the F1 and F2 keys.

Set time

The alarms are stored together with the time stamp.

For the analysis of events, the exact time is important.

Operation Controllo	n time er	
156 Cleaning 54	h time h	
Cleaning 557	cycles cycles	

The display of the **operating hours** of

- Control
- Cleaning
- Number of cleaning cycles

The remaining time until the next maintenance can be viewed under parameters 6.4 to 6.6.

The inputs and outputs of the control unit can be called up with

and Test. The keys

and \diamond switch the different scre	ens like:
Analog inputs Input 1 9848 μΑ Input 2 9905 μΑ Temperature 39.5 °C Voltage 22.6 V	

Digital	outp	outs	5
Output	- 1 ()N	
Output	- 2 (JFF -	Break
Output	- 3 ()N -	
Output	- 4 ()FF	Break

Digi	tal i	nputs	
Inpu	t.	1	OFF
Inbu	t	2 1	OFF
Inbu	t	3 1	OFF
Inbu	t.	4 1	OFF
Inbu	t	5	ÖFF

ESC = Back	Password Level HE5760	input :
ESC = Back	Input	 Academic
	FSC = Bar	Jz -
	Last tast tast	11 N

• Analogue inputs

- Digital inputs
- Digital outputs
- Password entry

8.5 Communication structure

The HE 5760 central control unit is the master in the system CAN bus of the filter control system. A Profibus or a Modbus RTU interface is optionally available for the control technology. dp or the system pressure can be sent from the control technology.

9 Parameterisation

The setting of the control to the real filter system is made with the information under the parameters. With this information, the controller expects a very specific number of valve controls to which a specific number of valves and sensors must be connected. Any deviation is reported as an error.

The parameters are called up from the actual value screen with the context key



Parameter menue Systemparameter Local Control Valve control Cleaning cycles Chamber Control Operation time Service Passwords Measuring ranges Malfunction monitor	
Systemparameter Local Control Valve control Cleaning cycles Chamber Control Operation time Service Passwords Measuring ranges Malfunction monitor	Parameter menue
Local Control Valve control Cleaning cycles Chamber Control Operation time Service Passwords Measuring ranges Malfunction monitor	Sustemparameter
Valve control Cleaning cycles Chamber Control Operation time Service Passwords Measuring ranges Malfunction monitor	Local Control
Cleaning cycles Chamber Control Operation time Service Passwords Measuring ranges Malfunction monitor	Value control
Chamber Control Operation time Service Passwords Measuring ranges Malfunction monitor	Clasning cuclas
Operation time Service Passwords Measuring ranges Malfunction monitor	Chambar Control
Uperation time Service Passwords Measuring ranges Malfunction monitor	
Service Passwords Measuring ranges Malfunction monitor	Uperation time
Service Passwords Measuring ranges Malfunction monitor	
Service Passwords Measuring ranges Malfunction monitor	Casuiza
Passwords Measuring ranges Malfunction monitor	Service
Measuring ranges Malfunction monitor	Passwords
Malfunction monitor	Maneunina nonace
Maltunction monitor	ileása rúð Lauðes -
	Maltunction monitor
NaltaD rastanl	

The individual parameters are sensibly combined in parameter groups.

Navigation within the groups is done page by page with the left and right keys. The selection of a group is indicated by the inverted display, the selection, i.e. the call of the individual parameters, is made with the Enter key. Use the up and down keys to enter the required values or select settings. The Enter key accepts the change, the ESC key allows you to cancel the entry at any time without making a permanent change.

After parameterisation, the control unit searches for the defined units and transmits their parameters.

9.1 Smarttool

The parameters can also be changed via PC and the programme 'SmartTool'. The programme can be used to save a changed configuration or to restore a saved configuration. Connect the PC to the control unit via USB cable, start SmartTool.exe and transfer the files or data.

A manual for the most important programme functions is available. The programme in its basic version is free of charge. The USB port of the HE 5760 for exchanging parameter data. The plug must not be set to flash.



9.2 Parameter table

	Name	Factory	Min	Max	Unit	Password
1	System parameters					
1.1	Number of chambers	8	1	48		Service
1.2	Valves / Chamber	12	1	24		Service
1.3	Slaves / Chamber	1	1	2		Service
1.4	Manifold / Slave	0	0	2		Service
1.5	Valves 1. manifold	12	1	12		Service
2	On site service					
2.1	Language	0	0	1		Customer
2.2	Synchronous time	-1	-1	1439		Technician
3	Interfaces					
3.1	Interface PLC	0	0	1		Service
3.2	Device address	12	1	255		Technician
3.3	dp Source	A-In 1				?
3.4	Sys-P Source	A-In 2				?
3.5	Modbus baud rate	3	0	5	kBaud	Technician
3.6	Modbus parity	2	0	3		Technician
4	Valve control					
4.1	Operation mode	1	0	2		Technician
4.2	Cleaning mode	0	0	1		Technician
4.3	Manual cleaning	0	0	2		Technician
4.4	Valve sequence	1	1	23		Technician
4.5	Chamber sequence	1	0	47		Technician
4.6	1. Control time pulse	100.0	10.0	60000.0	ms	Technician
4.7	1. Control time pause	50.0	1.0	3600.0	s	Technician
4.8	2. Control time pulse	0,0,	0.0	60000.0	ms	Technician
4.9	2. Control time pause	0.0	0.0	3600.0	s	Technician
4.10	Pressure switch function	0	0	7		Technician
4.11	System pressure On	0.0	0.0	3600.0	s	Technician
4.12	System pressure Off	10.0	10.0	3600.0	s	Technician
4.13	Drain valves	0	0	2		Technician
4.14	Drainage pulse	100.0	10.0	60000.0	ms	Technician
4.15	Drainage pause	60.0	1.0	10000.0	Minutes	Technician
4.16	Start / stop function	0	0	1		Technician
4.17	1. Parallel valve	0	0	48		Technician
4.18	2. Parallel valve	0	0	48		Technician
4.19	3. Parallel valve	0	0	48		Technician
5	Overall cleaning					
5.1	Post-cleaning	1	0	10		Technician
5.2	Chamber cleaning	1	0	10		Technician
5.3	Background cleaning	0	0	100		Technician
5.4	HG cleaning unit	0	0	2		Technician
5.5	HG cleaning time	0.0	0.0	1440.0	Minutes	Technician
5.6	HG cleaning threshold	20.0	0.0	799.0	mbar	Technician
6	Chamber control					
6.1	Chamber shut-off	2	0	2		Service
6.2	Chamber post cleaning	0	0	10		Service

	Name	Factory	Min	Max	Unit	Password
7	Operating hours					
7.1	Control	0.0	0.0	10 000 00.0	h	Service
7.2	Cleaning	0.0	0.0	10 000 00.0	h	Service
7.3	Cleaning cycles	0	0	100 000	Cycles	Service
7.4	Service control	0.0	0.0	100 000.0	h	Service
7.5	Service cleaning	0.0	0.0	100 000.0	h	Service
7.6	Service Cleaning cycles	0	0	100 000	Cycles	Service
8	Service					
8.1	Interval control	0.0	0.0	100000.0	h	Service
8.2	Interval cleaning	0.0	0.0	100000.0	h	Service
8.3	Interval cycles	0	0	100000		Service
9	Autostart / Timeout					
9.1	Autostart delay	0	0	14400		Technician
9.2	Remote timeout	0	0	14400		Technician
9.3	Local timeout	0	0	14400		Technician
10	Passwords					
10.1	HE5760	10000	10000	39999		HE5760
10.2	Service	0	0	9999		Service
10.3	Customer (technician)	0	0	9999		Technician
10.4	Customer	0	0	9999		Customer
11	Measuring ranges					
11.1	Delta-p unit	0.0	0.0	1.0	mbar/WS	Technician
11.2	Delta-p	30.0	9.9	799.0	mbar	Technician
11.3	Pressure	6.0	1.0	799.0	bar	Technician
11.4	System pressure function	1	0	1	yes/no	Technician
11.5	Delta-p filter	0.0	0.0	999.0	s	Technician
11.6	Dust	49.9	49.9	200.0	%	Technician
11.7	Dust filter	0.0	0.0	99.9	S	Technician
12	Error evaluation					
12.1	Delta-p Low Alarm	-5.0	-10.0	799.0	mbar	Technician
12.2	Delta-p High Alarm 1	20.0	-10.0	799.0	mbar	Technician
12.3	Delta-p High Alarm 2	25.0	-10.0	799.0	mbar	Technician
12.4	Pressure High Alarm	10.0	1.0	799.0	bar	Technician
12.5	Minimum pressure	50.0	0.0	100.0	%	Technician
12.6	Pressure drop	-30.0	-100.0	100.0	%	Technician
12.7	Hold function	0	0	1	yes/no	Technician
12.8	Fail-safe	0	0	1	yes/no	Technician
13	Dust monitoring				-	
13.1	Central dust sensor	0	0	3		Technician
13.2	Dust alarm max.	50.0	0.0	200.0	%	Technician
13.3	Dust alarm relative	0	0	1		Technician
13.4	Dust pre-alarm	20.0	0.0	500.0	%	Technician
13.5	Dust main alarm	30.0	0.0	500.0	%	Technician
13.6	Dust alarm filter	0.1	0.1	10.0	s	Technician
13.7	Dust delay	1.0	0.0	3600.0	S	Technician
13.8	Lock dust valve	0	0	3		Technician
13.9	Stop dust chart	9.0	0.0	200.0	S	Technician

14	Delta-p control					
14.1	Lower threshold	10.0	0.0	799.0	mbar	Technician
14.2	Upper threshold	15.0	0.0	799.0	mbar	Technician
14.3	Delta-p offset	0.0	-799.0	799.0	mbar	Technician
14.4	Setpoint 0%	0.0	0.0	799.0	mbar	Technician
14.5	Setpoint 10%	0.0	0.0	799.0	mbar	Technician
14.6	Setpoint 20%	0.0	0.0	799.0	mbar	Technician
14.7	Setpoint 30%	0.0	0.0	799.0	mbar	Technician
14.8	Setpoint 40%	0.0	0.0	799.0	mbar	Technician
14.9	Setpoint 50%	0.0	0.0	799.0	mbar	Technician
14.10	Setpoint 60%	0.0	0.0	799.0	mbar	Technician
14.11	Setpoint 70%	0.0	0.0	799.0	mbar	Technician
14.12	Setpoint 80%	0.0	0.0	799.0	mbar	Technician
14.13	Setpoint 90%	0.0	0.0	799.0	mbar	Technician
14.14	Setpoint 100%	0.0	0.0	799.0	mbar	Technician
14.15	Maximum pause	600.0	10.0	3600.0	S	Technician

9.3 Description of the parameters

9.3.1 System description

0.1 Parameter name

Work, Min...Max Explanation of the parameter. The factory setting is highlighted. The numbering is independent and does not follow the manual numbering.

1.1 Number of chambers

8, 1...48 Number of chambers in the filter.

1.2 Valves / Chamber

12, 1...24 Number of valves per chamber.

1.3 Slaves / Chamber

1, 1...2

HE 5725 valve controls per chamber. The HE 5725 valve controls are used in the sense of The CAN terminology defines a slave control. Each HE 5725 controls max. 12 valves. If there are more than 12 valves per chamber, a second valve control is required. With two controls, the following valve assignment applies:

- even number of valves -> both HE 5725 with the same number of valves
- odd number of valves -> 1. Slave takes over (n/2 + 1) valves.

1.4 Manifolds / Slave

0, 0...2

For the 'valve monitoring' function, one HE 5725 can monitor the pressure in two tanks. For this purpose, the pressure curve is measured during valve actuation. The pressure drop during valve actuation and the pressure rise afterwards must reach certain values in order not to report a valve fault. The values can be set with parameter 10.6 Pressure drop. Valve function monitoring can also be carried out via the system pressure sensor. This is activated automatically if the parameter Pressure switch function = Function and no pressure tanks are connected to the slave.

1.5 Valves 1. manifold

12, 1...12

When using a pressure tank, this is the number of valves.

With two pressure tanks, half the valves.

If two pressure tanks are used per HE 5725 and the distribution is not even, this parameter indicates the number of valves on the 1st pressure tank. Pressure tank. This information is needed to select the correct pressure transmitter for valve monitoring. Without valve monitoring function (10.6) the parameter has no meaning.

9.3.2 On site service

2.1 Language

0, 0...1

All display texts can be shown in two languages. The language elements are stored in a nonvolatile part of the memory. The control itself works language-independently with internal text numbers. Each text number stands for a word or phrase. This parameter selects the current language set. The complete text list for the 2. Language must be loaded in the control unit to be selectable.

2.2 Synchronous time

-1, -1...1439

Always visible (Profibus or Modbus)

9.3.3 Interfaces

3.1 Interface PLC (control technology)

none, Profibus, Modbus RTU
The interface used between control technology (PLC) and this control.
Two interfaces between control technology and master control are optionally available.
'PROFIBUS-DP' or 'Modbus-RTU' as fieldbus slave. This gives access to the complete

process image of the plant. Modbus RTU communication takes place via RS-485.

3.2 Device address Profibus or Modbus

12, 1...255

3.3 dp source A-In 1, No, A-In 2, PLC

3.4 Sys-P source A-In 2, No, A-In 1, PLC

3.3 Modbus baud rate 3, 0...5 kBaud

3.4 Modbus Parity 2, 0...3

9.3.4 Valve control

4.1 Operation mode

Permanent, **Threshold**, Control, sets the start/stop condition of the cleaning process. <u>Requirement:</u>

The wiring of the inputs 'Filter Start', 'Filter Stop' etc. have been done correctly.

'Permanent'

Start/stop are only dependent on the wiring of the inputs.

'Threshold'

Start/stop depending on input wiring and dp signal (threshold is defined with special parameters)

'Regulation'

It is regulated to a dp value. Output size is the pause time. Additionally a pause time extension can be made according to a characteristic curve with 10 coordinate pairs (parameters 11.4 - 11.14)

4.2 Cleaning mode

PartCycle 0, TotalCyc. 1 Setting whether to clean with complete cycles or with partial cycles.

4.3 Manual cleaning mode

Permanent, Threshold, Regulation Defines the start/stop condition of manual cleaning.

'Permanent'	Start/stop are only dependent on the wiring of the inputs.
'dp Threshold'	Start/stop depending on the input wiring and the dp signal
	(Threshold is defined with special parameters)
'Regulation'	It is regulated to a dp value. Output size is the pause time. In addition, a pause time extension can be set according to a characteristic coordinate pairs can be made (parameters 14.4 - 14.14)

4.4 Valve sequence

1, 1...23 Increment amount for calculating the next active valve within a chamber.

4.5 Chamber sequence

1, 0...47 Increment amount for the calculation of the next active chamber.

4.6 1. Control time pulse

100,0, 10,0...60000,0 ms

Pulse time for the first set of control times. This pulse time is used for normal cleaning operation.

4.7 1. Control time pause

50,0, 1,0...3600,0 s Pause time for the first set of control times. This break time is used for normal cleaning operations.

4.8 2. Control time pulse

0,0, 0,0....60000,0 ms

Pulse time for the second set of control times. This pulse time is used for 'Forced cleaning', 'Manual cleaning' and 'Post-cleaning'. If '0' is entered here, the pulse time of the first set is used.

4.9 2. Control time pause

0,0, 0,0...3600,0 s

Pause time for the second set of control times. This pause time is used for 'Forced cleaning', 'Manual cleaning' and 'Post-cleaning'. If '0' is entered here, the pause time of the first set is used.

4.10 Pressure switch function

None, Function, Blow pressure, F+B, Time, F+Z, B+Z, F+B+Z <u>When using a pressure transmitter in a pressure tank, three functions (and their combinations)</u> <u>can be selected:</u>

'Function

After a valve has been activated, the pressure in the local pressure tank must fall below a certain value. If not, an error message is generated.

After closing the valve, the pressure must exceed a certain value. If not, an error message is generated. The thresholds are set in separate parameters. 14.1 ff

'Blowing pressure'

Before a valve is activated, the pressure in the corresponding pressure vessel must be above a certain value. If not, the valve is not activated and an error message is generated. The value is set with parameter 12.5 'Minimum pressure'.

'Pause Time Optimisation'

The possibility of shortening the pause time between two valve actuations when the pressure at the local pressure tank has recovered. The pause time in the above parameters is understood as the maximum time that can be shortened by recovering the tank pressure earlier. The threshold for this is set with parameter 12.5 'Minimum pressure'.

4.11 System pressure On

No, 0.0...3600.0 s The lead time that is waited after opening the central shut-off valve for further actions.

4.12 System pressure Off

10,0, 0,0...3600,0 s Follow-up time for closing the central shut-off valve.

4.13 Drain valves

0, 0...2
Number of drain valves per valve slave box.
0 = Drainage function switched off.
Valves from 2 pressure tanks can be connected to one valve box.
<u>Connection sequence at the valve terminals for 2 tanks:</u>
Blow valves Tank1, Blow valves Tank2, Drain valve Tank1, Drain valve Tank2

4.14 Drainage pulse

100.0, 10.0...60000.0 msec Opening duration of a drain valve.

4.15 Drainage pause 60.0, 1.0...10000.0 min

Pause until the next actuation of the same drain valve.

4.16 Start/stop function

static, dynamic

The type of command (continuous signal, tactile signal).

4.17 1. Parallel valve

no, 1...48

The system is capable of controlling up to 4 valves simultaneously. Each valve that is to be operated simultaneously has its own parameter. Precondition: Valves to be controlled simultaneously are not connected to the same valve control unit. The parameter is understood as an offset value on the valve control unit: e.g. '2' means valve no. 'N' on valve control unit '1' and valve no. 'N' on valve control unit '3' are controlled together.

4.18 2. Parallel valve

without, 1...48 as above

4.19 3. Parallel valve without, 1...48 as above

9.3.5 Overall cleaning (cleaning process)

5.1 Post cleaning

1, 0...10 cycles

Post-cleaning is a cleaning procedure with all valves of the filter system. Up to 10 Repetitions of complete cleaning cycles can be selected. The post-cleaning is activated with the post-cleaning input and uses pulse and pause time of the second control time set.

5.2 Chamber cleaning

1, 0...10 cycles

Chamber cleaning addresses all valves in a chamber. Up to 10 repetitions of the Chamber cleaning can be selected.

5.3 Background cleaning

0, 0...100

Background cleaning monitors the time that has elapsed since the last valve actuation when the differential pressure is very low. If no valve has been activated within the background cleaning time, the background cleaning starts with the times of the second control time set.

5.4 BG cleaning unit

Ventiles, chambers, cycles The parameter specifies what is to be cleaned during background cleaning.

5.5 BG cleaning time

off, 1.0...1440.0 minutes

Maximum time between 2 valve actuations. If the time is exceeded, the control unit starts background cleaning.

5.6 BG cleaning threshold

20.0, 0.0...799.0 mbar A value close to zero. If the dp value is still smaller, it is assumed that the system is switched off and background cleaning is not performed.

9.3.6 Chamber control

6.1 Chamber shut-off

Yes, No

A chamber can be removed from the cleaning procedure with the function key 'Chamber control'. This chamber switch-off can be enabled with this parameter

6.2 Chamber post cleaning

Off, 1...10 cycles The number of re-cleanings per chamber is selectable.

9.3.7 Operating hours

7.1 Control

0. 0, 0.0...1000000.0 hours A counter for the real operating time of the controller. The times are stored internally with the real time.

7.2 Cleaning

0. 0, 0.0...1000000.0 hours A counter for the actual cleaning time.

7.3 Cleaning cycles

0, 0...100000 cycles

A payer for the actual cleaning cycles.

7.4 Service control 0.0, 0.0...100000.0 hours A down counter for the next maintenance.

7.5 Cleaning service

0. 0, 0.0...100000.0 hours

A down counter for the next maintenance.

7.6 Service cleaning cycles

0, 0...100000 cycles

A down counter for the next maintenance. Service on fans, filter bags, sensors, pressure tubes, pressure tanks, etc.

9.3.8 Service

8.1 Interval control

0.0, 0.0...100000.0 hours

The default value for the service interval. The current counter reading can be called up under the operating hours. If the execution of the service measures is acknowledged, the down counter is filled again with this default value.

8.2 Interval cleaning

0.0, 0.0...100000.0 hours Interval for the service related to the cleaning time.

8.3 Interval cycles

0, 0... 100000 cycles Interval for the service related to the cleaning cycles.

9.3.9 Autostart / Timeout

9.1 Autostart delay 0, 0...14400

9.2 Remote timeout

0, 0...14400

9.3 Local timeout 0, 0...14400

9.3.10 Passwords

Anyone can view any parameter value, but attempts to change protected parameters will be met with a password prompt. After successfully entering the password, the parameters of this service level can be changed. The password level of the parameters is indicated in the overview table. When the normal operating display is shown, access to the parameters is blocked again.

10.1 HE 5760

10000, 10000...39999 System engineering and setup, all parameters

10.2 Service

0, 0...9999 Service personnel of the manufacturer

10.3 Customer (technician) 0, 0...9999

Service personnel of the customer

10.4 Customer

0, 0...9999 Operating personnel of the customer

9.3.11 Measuring ranges

The control unit receives analogue values in standardised form (4...20 mA). The measuring ranges and physical units must be defined in order to be displayed correctly.

11.1 Delta-p unit

mbar, mmWS 1 milli bar = 10.197 mm water column 1 mm WS = 0.098 milli bar

11.2 Delta-p

30.0, 9.9...799.0 mbar The measuring range of the differential pressure gauge.

11.3 Pressure

6.0, 1.0...799.0 bar The measuring range of all pressure transmitters for tank pressure and system pressure.

11.4 System pressure function

Yes, no Functions that evaluate the system pressure can be switched off.

11.5 Delta-p filter

0,0, 1,0...999,0 s The process signal is provided with a 1st order low pass filter. This value is displayed and processed internally.

11.6 Dust

49,9, 49,9...200,0 %

11.7 Dust filter

0,0, 0,0...99,9 s

The process signal is provided with a 1st order low pass filter. This value is displayed and processed internally.

9.3.12 Error evaluation

12.1 Delta-p Low Alarm

-5.0, **-10.0**...799.0 mbar Negative values mean a reversed airflow. The sensor must be able to supply negative values for this function.

12.2 Delta-p High Alarm120.0, -10.0... 799.0 mbarPressure threshold for Delta-P alarm1.

12.3 Delta-p High Alarm2

25.0, -10.0...799.0 mbar Pressure threshold for Delta-P Alarm2.

12.4 Pressure High Alarm 10, **1.0**...799.0 bar System Pressure High Alarm

12.5 Minimum pressure

50, 0,0...100,0 %

Pressure in the local pressure tank compared to the system pressure, which must absolutely be present for valve actuation.

12.6 Pressure drop

-30.0, -100,0...+100,0 % The pressure drop in the local pressure tank after valve actuation is normal and is evaluated to monitor proper operation. Positive: an absolute pressure loss, related to the system pressure. Negative: a relative pressure loss, related to the pressure before the valve actuation.

12.7 Hold function

No, Yes

No: The alarm is cancelled when the cause is removed. Yes: The alarm is held and requires acknowledgement.

12.8 Fail-safe

No, Yes The logic value of alarm messages, No: High for active alarms. Yes: Low for active alarms.

9.3.13 Dust monitoring

13.1 Central dust sensor

No, **A-In 1**, A-In 2 Selection of which analogue input the central dust sensor was connected to.

No...1...2 No = deactivated

13.2 Dust alarm max.

50.0, 0,0...200,0% Global dust monitoring that runs in the background even without valve control. If the set value is exceeded, an alarm is triggered. If a dust delay is set, it is applied here.

13.3 Dust alarm relative

0, 0...1 Setting absolute or relative value No...Yes Yes= Absolute No = Relative

13.4 Dust pre-alarm

20,0, 0,0...500,0 %

If the set value is exceeded, an alarm is triggered.

13.5 Dust main alarm

30.0, 0,0...500,0 % If the set value is exceeded, an alarm is triggered. If parameter 13.8 'Disable dust valve' is activated, the valves are no longer controlled after the main alarm has been triggered.

13.6 Dust alarm filter

0.1, 0.1...10,0 s Time period that an alarm remains unexecuted before it is reported.

13.7 Dust delay

0,0...1,0...3600,0 s

The dust alarm message is delayed by the set time.

13.8 Lock dust valve

0...3 Setting valve blocking after triggering the main alarm

- No...Yes Yes= Valve is blocked after the main alarm has been triggered. No = Valve continues to be activated after the main alarm has been triggered. Disabling may be cancelled by resetting the alarm. However, this applies then to all valves simultaneously.
- Yes-Opt.1 Yes-Opt. 1 = Dust valves will be disabled. The release takes place independently of the alarm reset via the context key 'Reset dust valves' (F2) in the view 'Current alarms' (see also chapter *12.1 Reset of dust valves*). The context key is only visible there if valves are currently locked. The dustcontaminated valves are displayed in the alarms list until the function key 'Reset Dust Valves' is pressed.
- Yes option 2 Like Yes-Opt 1. In addition, the blocked dust valves are integrated into the normal cleaning sequence with the time parameter of the background cleaning "HG cleaning time" (see 5.5 HG cleaning time), i.e. one dust-laden valve is cleaned every x minutes). The parameter 'BG Cleaning Time' can be adjusted from 0 to 1440 minutes (24 h). The valves are able to "heal" themselves with this slow cleaning action. That means that if the alarm is not triggered again after renewed actuation, the

valve functions correctly.

13.9 Stop dust chart

9.0, 0,0...200 s

It is set how many seconds after the main alarm is triggered the recording on the display is stopped.

No...Yes

Yes = recording is stopped (1-200).

No = recording is not stopped and continues.

9.3.14 dp regulation

14.1 Lower threshold

10.0, 0.0...799.0 mbar

In operating mode (4.1) 'Threshold', the cleaning request is reset when the value of the differential pressure falls below the lower threshold.

14.2 Upper threshold

15.0, 0.0...799.0 mbar

In operating mode (4.1) 'Threshold', the cleaning request is set when the value of the differential pressure exceeds the upper threshold.

14.3 Delta-p offset

0.0, -799.0...799.0 mbar

A value that is added to the cleaning thresholds. This increases the filter effect. The interpolation points of the filter curve are also changed.

14.4 Setpoint 0%

0.0...799.0 mbar

14.5 Setpoint 10% 0.0...799.0 mbar

14.6 Setpoint 20% 0.0...799.0 mbar

14.7 Setpoint 30%

0.0...799.0 mbar

14.8 Setpoint 40% 0.0...799.0 mbar

14.9 Setpoint 50% 0.0...799.0 mbar

14.10 Setpoint 60% 0.0...799.0 mbar

14.11 Setpoint 70% 0.0...799.0 mbar

14.12 Setpoint 80% 0.0...799.0 mbar

14.13 Base 90%

0.0...799.0 mbar

14.14 Setpoint 100% 0.0...799.0 mbar

14.15 Maximum pause 600,0,10,0...3600,0 s

Filter characteristic

In the 'Control' operating mode, the pause time is shortened at higher differential pressure. The pause time reduction is derived from the filter characteristic entered. The pause time is calculated by a PID control algorithm. Very large pause times are calculated, especially with low differential pressure. The value 'Maximum pause' limits the output value.



10 Error messages

10.1 System start-up

According to the system description in the parameters, the control unit expects to find a certain number of HE5725 valve controls on the CAN bus and tries to establish a valid CAN communication. The previously selected valves and sensors must be connected to the valve controls.



Errors at the start of CAN communication are displayed inversely.

Display	Criterion	Cause / Remedy
Bus error (inverse node no.)	Communication with node failed	 CAN line interrupted or not connected HE 5725 Voltage missing HE 5723 defective. Fuses tripped CAN line not terminated. Wrong node number set. System description does not match actual hardware.

The errors are listed in the alarm log. Recall with the Alarm key

Display	Criterion	Cause / Remedy
Malfunction (inverse node number)	Communication with node works, configuration information of the node is evaluated	 Sensor has sensor break or is not connected Sensor system reports short circuit System description does not match actual hardware.

10.2 Alarm screens

The red alarm LED indicates pending alarms.

Pressing the alarm key shows the current alarms.

Pressing the alarm key again shows an alarm log list of the last 200 alarms with time. A small tick behind the alarm number indicates the acknowledgement status.



The alarms that are currently present. If an alarm cause is eliminated, the message disappears.

The *hold function* for alarms must not be switched on (12.7).

You can switch between the screens with the alarm key.



Alarm protocol 2017.03.14 10:17	:18
Ch. 1 Manifold press 1	low
<u>1 Bus-Error</u>	
3 17.03.13 10:17	1;19
Ch. 2 Valve contro	1
<u>1 Bus-Error</u>	
Acknowl.	200

A list of all alarms that have occurred, sorted by time of occurrence. The most recent alarms are mentioned first. A

maximum of 200 alarms are listed.

10.2.1 Sensor error

Display	Criterion	Cause / Remedy
Analogue-In sensor break Analogue-in sensor lock	Analogue input on master open or short-circuited	 Sensor error Sensor not connected System description does not match actual hardware.

10.2.2 Misprint

Display	Criterion	Cause / Remedy
Delta-p High Alarm 1	Pressure exceeds the defined limit for alarm 1	 Delta-p High Alarm 1 too low sudden influx of dust
Delta-p High Alarm 2	Pressure exceeds the defined limit for alarm 2	 Delta-p High Alarm too low sudden influx of dust
Delta-p Low Alarm	Pressure is below the defined limit	 Delta-p High Alarm too low No throttle cable
Delta-p sensor error	Value corresponds to the highest or lowest limit	 Open line to the sensor Short circuit on the sensor
System pressure High Alarm	System pressure exceeds the defined limit	 Compressed air supply defective Pressure High Alarm too low
System pressure sensor error	Value corresponds to the highest or lowest limit	 Open line to the sensor Short circuit on the sensor

10.2.3 Valve control Bus error

Display	Criterion	Cause / Remedy
Ch. 2 Slave 1 Bus error	No communication with this control	 Line interruption Voltage supply at the node is missing Fuse tripped

10.2.4 Valve error

Display	Criterion	Cause / Remedy
Ch. 3 Valve 1 Wire breakage	Output is monitored: Open valve outlet	Valve not connectedValve defective
Ch. 3 Valve 2 Overcurrent	Output is monitored: Short circuit at the valve outlet	Line squeezedValve defective
Ch. 3 Valve 3 does not open	No short-term pressure drop in the local pressure tank	Valve defectiveValue for pressure drop too high
Ch. 3 Valve 4 does not close	No short-term pressure increase in the local pressure tank	Valve defectiveValue for pressure rise too high
Ch. 3 Valve 5 no pressure	Tank pressure has not recovered within the tank refill time	 Valve defective Tank refill time too low System pressure too low

10.2.5 Valve control tank pressure sensor error

Display	Criterion	Cause / Remedy
Ch. 4 Tank Pressure 1	Input is monitored:	 Power interruption Sensor not connected Pressure sensor
Sensor Malfunction	Open sensor input	defective
Ch. 4 Tank pressure 4	Input is monitored: short-	 Line squeezed Pressure sensor
Sensor closure	circuited sensor input	defective

10.2.6 Valve control Tank pressure error (sensor is OK)

Display	Criterion	Cause / Remedy
Ch. 7 Tank pressure 1 low (Tank 1-4)	Pressure value lower than specified with tank pressure monitor	System pressure missingValue set too high

11 Communication

11.1 Master (HE 5760) - Slave (HE 5725) Communication

Node	Direction	PDO	Туре	Byte	Bit	Function		Object	SI
Slave 0x180+	Txd Inputs	1	Digital	1 Stat us	0 1 2 3	Pressure 1 ok Pressure 2 ok Valve current ok Pressure profile ok	Unsigned char	5300	1
		1	Digital	2 Stat us	0 1 2 3	Single valve test active Test cycle active Testing Test aborted	Unsigned char		2
		1	Digital	3		Current valve	Unsigned char		3
		1	Digital	4	0 1 2 3 4	Valve error status Interruption Overcurrent No pressure drop No pressure rise No pressure (before activation)	Unsigned char		4
		1	Digital	5		Valve error	Unsigned char		5
		1	Digital	6	0 1 2 3	Sensor error status Pressure 1 Sensor break Pressure 1 Sensor lock Pressure 2 Sensor break Pressure 2 Sensor lock	Unsigned char		6
0x280+		2	Analogue	1 2 3 4		Pressure 1 Pressure 2 Pressure 1 Delta Pressure 2 Delta	char +/-100% char +/-100% char +/-100% char +/-100%	5400	1 2 3 4
0x380+		2	Analogue	1+2 3+4		Voltage Temperature	Signed short (16 Bit) Signed short (16 Bit)	5600	1
0x200+	Rxd outputs	1	Digital	1 Actio n	0 1 2 3 4 5 6 7	Valve control Valve monitoring Shut-off valve open On-site test deactivated Power monitoring Scan Error acknowledgement 2. Control time	Unsigned char	5500	1
		1	Digital	2		Current valve	Unsigned char		2

Position	Bit	Function	Data type	Length (bytes)
0		Commands	Digital	1
	0	Filter start	unsigned char	
	1	Filter Stop		
	2	Quick stop (emergency stop)		
	3	Alarm reset		
	4	Request post cleaning		
	5	Request forced cleaning		
1		Commands	Digital	1
	0	On-site operation blocked	unsigned char	
	1	Remote control		
	2	Cancel 'Close chamber' on site		
	3	Delta-p offset activated		
	4	Time synchronised		
	5	Dust monitoring blocked		
2		Close chamber	Digital	1
	0	Chamber 1	unsigned char	
		to		
	7	Chamber 8		
3		Close chamber	Digital	1
	0	Chamber 9	unsigned char	
		to		
	7	Chamber 16		
4		Close chamber	Digital	1
	0	Chamber 17	unsigned char	
		to		
	7	Chamber 24		
5		Close chamber	Digital	1
	0	Chamber 25	unsigned char	
		to		
	7	Chamber 32		
6		Close chamber	Digital	1
	0	Chamber 33	unsigned char	
		to		
	7	Chamber 40		
7		Close chamber	Digital	1
	0	Chamber 41	unsigned char	
		to		
	7	Chamber 48		

11.2 Data direction process control to HE 5760

Position	Bit	Function	Data type	Length (bytes)
8		Clean chamber	Digital	1
	0	Chamber 1	unsigned char	
		to		
	7	Chamber 8		
9		Clean chamber	Digital	1
	0	Chamber 9	unsigned char	
		to		
	7	Chamber 16		
10		Clean chamber	Digital	1
	0	Chamber 17	unsigned char	
		to		
	7	Chamber 24		
11		Clean chamber	Digital	1
	0	Chamber 25	unsigned char	
		to		
	7	Chamber 32		
12		Clean chamber	Digital	1
	0	Chamber 33	unsigned char	
		to		
	7	Chamber 40		
13		Clean chamber	Digital	1
	0	Chamber 41	unsigned char	
	-	to		
	1	Chamber 48		
4.4		Dalta a offect llever three held		0
14		Delta-p offset lunner threshold	signed short	2
10		Delta-poinset upper threshold	signed short	2
18		Extra break 1. Control time	unsigned short	2
20		Extra break 2. Control time	unsigned short	2
22		System Procesure	signed short	2
24		System Pressure	signed short	2
25		Test command	Digital	1
23				1
		1= Valve lest		
		2= Chamber cleaning		
		4- Shut-off valve closed		
26		Chamber number		1
20				•
27		Valve number		1
£1				1
28		reserved		1
		10001100		•

Position	Bit	Function	Data type	Length (bytes)
0		Status Part 1	Digital	1
	0	Cleaning activated	unsigned char	
	1	Filter Stop (Not Stop)		
	2	Cleaning in progress		
	3	Post cleaning in progress		
	4	Forced cleaning in progress		
	5	Chamber cleaning in progress		
	6	Background cleaning in progress		
	7	On-site operation enabled		
1		Status Part 2	Digital	1
	0	Test function activated	unsigned char	
	1	Delta-p offset activated		
	2	Time synchronised		
	3	reserved		
	4	Dust monitoring blocked		
2		Current chamber	Unsigned char	1
3		Current valve	Unsigned char	1
4		Chamber closed	Digital	1
	0	Chamber 1 to	Unsigned char	
	7	Chamber 8		
5		Chamber closed	Digital	1
	0	Chamber 9 to	Unsigned char	
	7	Chamber 16		
6		Chamber closed	Digital	1
	0	Chamber 17 to	Unsigned char	
	7	Chamber 24		
7		Chamber closed	Digital	1
	0	Chamber 25 to	Unsigned char	
	7	Chamber 32		
8		Chamber closed	Digital	1
	0	Chamber 33 to	Unsigned char	
	7	Chamber 40		
9		Chamber closed	Digital	1
	0	Chamber 41 to	Unsigned char	
	7	Chamber 48		

11.3 Data direction HE 5760 to process control

Position	Bit	Function	Data type	Length (bytes)
10		Chamber cleaning in progress	Digital	1
	0	Chamber 1 to	Unsigned char	
	7	Chamber 8		
11		Chamber cleaning in progress	Digital	1
	0	Chamber 9 to	Unsigned char	
	7	Chamber 16		
12		Chamber cleaning in progress	Digital	1
	0	Chamber 17 to	Unsigned char	•
	7	Chamber 24		
13			Digital	1
15	0	Chamber cleaning in progress		
		Chamber 22 to	Unsigned chai	
	1	Chamber 32		
14		Chamber cleaning in progress	Digital	1
	0	Chamber 33 to	Unsigned char	
	7	Chamber 40		
15		Chamber cleaning in progress	Digital	1
	0	Chamber 41 to	Unsigned char	
	7	Chamber 48		
16		Alarms 1st part	Digital	1
	0	Collective alarm	Unsigned char	
	1	Differential pressure alarm		
	2	Frror compressed air system		
	3	Manifold pressure alarm		
	4	From abut off value		
	5			
	6			
	7	CAN bus error		
	1	Dust alarm		
47			Divital	4
17	0	Pressure alarms		
	0	Differential pressure exceeded Infeshold 1	Unsigned char	
	1	Differential pressure exceeded Threshold 2		
	2	Differential pressure undershot		
	3	Differential pressure sensor error		
	4	System pressure exceeded		
	5	System pressure undershot		
	6	System pressure sensor error		
18		reserved		
	1			
	1	Chamber-related information		
	1	Chamber 1		
	1			
24	1	Print information	Digital	1
	0	Pressure tank 1 Pressure alarm	Unsigned char	
	1 -			

Position	Bit	Function	Data type	Length (bytes)
	1	Pressure tank 2 Pressure alarm		
	2	Pressure tank 3 Pressure alarm		
	3	Pressure tank 4 Pressure alarm		
	4	Pressure tank 1 Sensor error		
	5	Pressure tank 2 Sensor error		
	6	Pressure tank 3 Sensor error		
	7	Pressure tank 4 Sensor error		
25			Disital	
25	-	Valve error		1
	0	Line break	Unsigned char	
	1	Overcurrent		
	2	No blowing pressure		
	3	Valve does not open		
	4	Valve does not close		
	5	Dust pre-alarm		
	6	Dust main alarm		
26		Number of the faulty valve	Unsigned char	1
27		Chamber 2		Δ
21		Data structure like chamber 1		7
up to 165		Chamber 48 Data structure like chamber 1		4
Offset		Additional information Offset = 24+3 x number of chambers		
		Two-channel analogue input HE5760	Analogue	
Offset + 0		HE5760 1. Analogue input Delta-p	signed int	2
Offset + 2		HE5760 2. Analogue input system pressure	signed int	2

Position	Bit	Function	Data type	Length (bytes)
0		System status	Unsigned char	6
		Used by Profibus SPC3		
6		Header	Digital	1
•	7/6	00 - device-specific diagnosis	Digital	
	5-0	00 = device-specific diagnosis		
	<u> </u>	Lengin – o byte		
7	-	Status	Digital	1
-	0	Invalid parameter data	Unsigned char	•
	1	Invalid configuration	Children	
	2	Invalid command		
	3	Invalid test		
8		reserved		4
		chamber-related		
12		Header	Digital	1
	7/6	00 = device-specific diagnosis		
	5-0	Length = 33 byte		
	1	Chamber 1		
Second header + 1		Slave status	Digital	1
	0	Slave 1 not connected	Unsigned char	
	1	Slave 1 Error		
	2	Slave 2 not connected		
	3	Slave 2 Error		
Second header + 2		Pressure alarms	Digital	1
	0	Pressure tank sensor 1 Line break	Unsigned char	
	1	Pressure tank sensor 1 Short circuit		
	2	Pressure tank sensor 2 Line break		
	3	Pressure tank sensor 2 Short circuit		
	4	Pressure tank sensor 3 Line break		
	5	Pressure tank sensor 3 Short circuit		
	6	Pressure tank sensor 4 Line break		
	7	Pressure tank sensor 4 Short circuit		
Second		Chamber 2	Digital	2
neader + 3				
То				
Second		Chamber 16	Digital	2
header + 31		Data structure like chamber 1	9	
50		Third header	Digital	1
	7/6	00 = device-specific diagnosis		
	5-0	Length = 33 bytes		

11.4 Diagnosis HE 5760 on process control

Position	Bit	Function	Data type	Length (bytes)
Third header		Chamber 17	Digital	2
+ 1		Data structure like chamber 1		
10				
Third header		Chamber 32	Digital	2
+ 31				
83		Fourth header	Digital 1	
	7/6	00 = device-specific diagnosis	J	
	5-0	Length = 33 byte		
Fourth		Chamber 33	Digital	2
header + 1		Data structure like chamber 1		
То				
TO Faunth		Chamber 40	Distitul	0
Fourth beader + 31		Data structure like chamber 1	Digital	2
		Additional information Offset = 3 + 4 x number of chambers		
116		Fifth header	Digital	1
	7/6	00 = device-specific diagnosis		
	5-0	Length = 2 byte		
Fifth header + 1		I/O unit HE 5760	Digital	1
	0	1. Analogue input line break		
	1	1. Analogue input short circuit		
	2	2. Analogue input line break		
	3	2. Analogue input short circuit		

12 Central dust monitoring (applies from software version 2.10)

Central dust monitoring" is available as an option. Here, up to 3 central dust sensors are located in the clean gas duct, which monitor the dust level of all chambers.

The dust signal is monitored during the pause time in relation to the previously controlled valve. The break time is the monitoring window.



Note! The parameters for dust monitoring can be found in *chapter 9.2 Parameter table.*

The dust curve is shown over different time windows. The Y-axis of the monitoring graph is dynamically scaled.



Figure 19 Trend chart dust course

The Y-axis of the monitoring chart is dynamically scaled.

1 Display dust history

20 seconds is the smallest possible step. Pulses and monitoring windows are also visible.

- 2 Actual dust value
- 3 Chamber/ valve of the last pulse or the last monitoring window
- 4a Pulse
- 4b Monitoring window

The monitoring window begins with the valve pulse and ends with the end of the subsequent pause.

- 5 Toggle between current data or pause.
- 6 Threshold Pre-alarm
- Dust graph stopped due to main alarm
- 7 Threshold Main alarm



The displayed time span can be reduced / increased using the UP and DOWN arrow keys. Dust chart: 20 s, 60 s, 3 min, 15 min

The recording is stopped in the display but continues in the background.

7	

The graph is generated from volatile data, which is stored in memory at runtime. Power failure leads to loss of history.

12.1 Reset of dust valves

Note!

If the dust valves are locked *(see 9.3.13 Dust monitoring),* they can be released again by pressing the context key **for an end of the set of**



Figure 20 Reset Dust Valves

13 Maintenance and Service

Maintenance, Repair

The units are maintenance-free.

Disposal

Dispatch metals and plastics for recycling. Electrical and electronic components must be collected separately and disposed of properly. Dispose of equipped circuit boards properly.

Service

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14 Glossary

Term	Definition / Explanation
Operating mode,	Permanent processing of the parameterised valve sequence.
permanent	Control of the HE 5760 via start/stop signals.
Operating mode, dp	It can be regulated to a differential pressure value. The output
controller	variable of the controller is the pause time of the valve
	activation. A filter characteristic that is defined via interpolation
	points can be used to shorten the pause time.
Operating mode, dp	Control of cleaning via the dp signal. Cleaning starts when the
threshold	parameterised upper threshold is exceeded and stops when
	the value falls below the lower threshold.
Drain valve	The control supports drain valves on the local pressure
	tanks.
Background cleaning	If no regular cleaning takes place within a parameterisable
	time, background cleaning becomes active. This is often the
	case with small volume flows or lower dust inputs. At the same
	time, the differential pressure is monitored for a minimum
	value. If the value falls below this, it is assumed that there is no
	fan operation and cleaning is not continued.
Chamber sequence	A chamber offset of 1 causes chamber 1 valve 1, chamber 2
	valve 1, chamber 3 valve 1 etc. to be cleaned.
	A chamber offset has a higher priority than a valve offset. A
	chamber offset of 0 causes all valves to be controlled
	according to the valve sequence in chamber 1, then the valves
	of chamber 2 to be cleaned, etc.
Post-cleaning	If the complete filter is taken out of the process, re-cleaning
	may be necessary. The post-cleaning extends over the
	complete filter and carries out the parameterised number of
	cycles/valves etc. The post-cleaning uses 'Control time 2'.
Sub-cycle	Cleaning runs as long as the required start conditions are
	present. If the start condition is missing, cleaning is interrupted.
	The cleaning is then continued with the next following valve
Valve sequence	A valve offset of 2 causes control of valve 1, valve 3, valve 5,
	etc.
Full cycle	If the required start condition is given, a complete cleaning
	cycle is carried out over all active valves.
Forced cleaning	Setting this condition starts the cleaning process independently
	of other necessary conditions (e.g. dp thresholds). Cleaning
	runs as long as the condition is set or until all (full cycle) active
	valves have been cleaned. In connection with the partial cycle
	operating mode, the valves can be controlled individually.