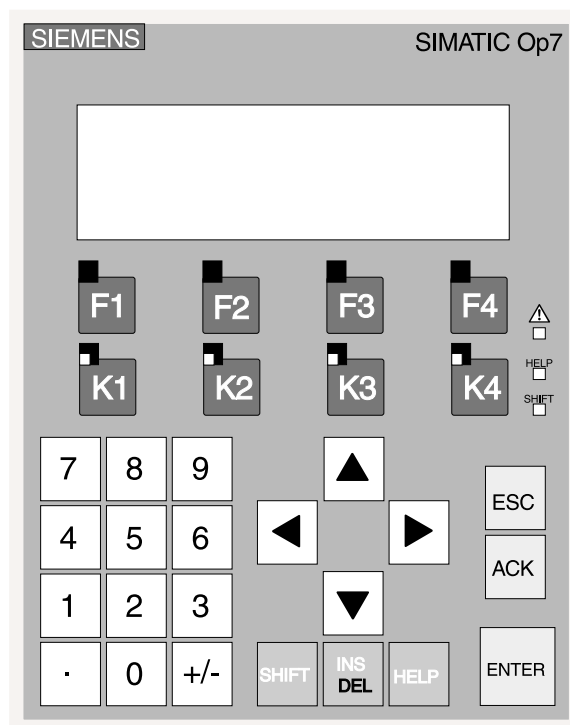


## Operating Instructions

### COROS OP7

GB



## Table of Contents

	Page
<b>1 Display OP7 - Main Functions</b> .....	3
1.1 Description of Softkey, Function and System Buttons .....	3
1.2 Displaying Text Variables .....	5
<b>2 Switching on</b> .....	6
2.2 Switching Unit on Using a Machine Interface (Remote Control) .....	6
2.3 Switching Unit on Using OP7 Display (Automatic / Manual Operation) .....	7
<b>3 Testing and Configuring Operating Parameters</b> .....	8
3.1 Operating Parameter = Display Drive Status .....	8
3.2 Operating Parameter = Time Values .....	8
3.4 Operating Parameter = Analog Values .....	9
<b>4 OP Functions</b> .....	11
4.1 Operating and Error Messages .....	11
4.2 Screens and Datasets .....	12
4.3 Testing with Status 'variable' and Control 'Variable' .....	12
4.4 System and Password (Language Selection) .....	13
<b>5 General Information</b> .....	14
<b>6 Error Messages</b> .....	15

## 1 Display OP7 - Main Functions

### 1.1 Description of Softkey, Function and System Buttons

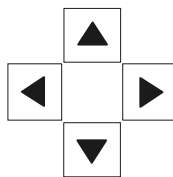
**F1 to F4** Softkeys  
(Screen-dependent functions)

**K1 to K4** Function Keys  
(Fixed functions)

**0 to 9** Numeric Keys (0 - 9)

**.** Decimal Point

**+/-** Plus/Minus Key  
Toggle Between +/-

 Cursor Keys

**ESC** Escape Key

**ACK** Acknowledge Error Messages / Delete Error Message Text




**SHIFT** Shift Key - Used to Access Secondary Functions on Function Keys

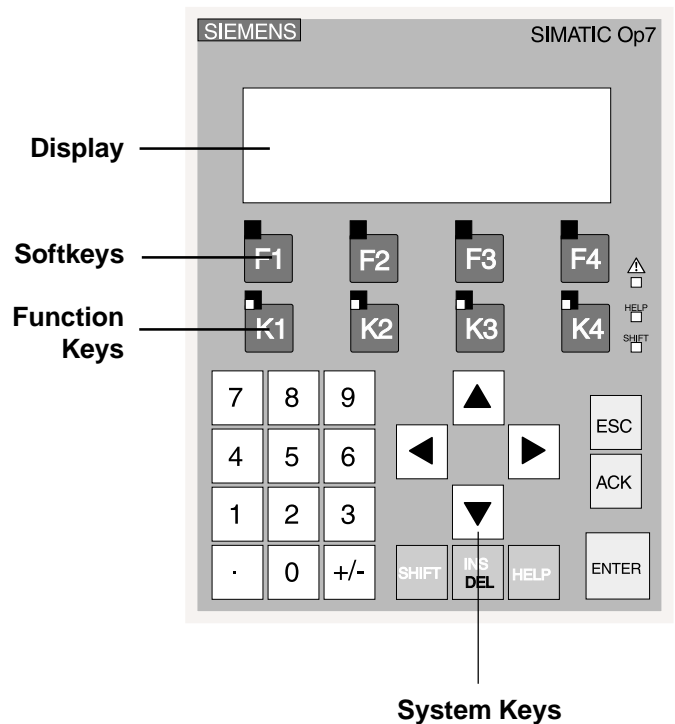
**INS DEL** No Function

**HELP** Display Information Text

**ENTER** Confirm Input and Exit

**SHIFT** **+/-** Adjust the Display Contrast

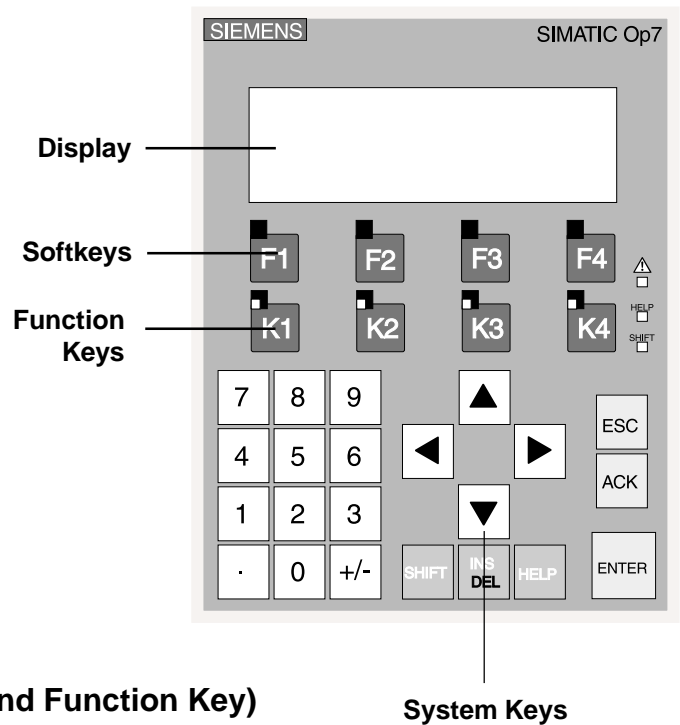
 Fault Red LED = Error message display (there are faults still remaining)  
 HELP Green LED = Information available in relevant screen  
 SHIFT Green LED = The SHIFT function is active



**F1** to **F4** Softkeys  
(Screen-dependent functions)

## Primary Function Key Functions

- K1** Select Screen:  
Operating Messages
- K2** Select Screen:  
Error Messages
- K3** No Function
- K4** Test Lights (Touch Operation)



## Secondary Function Key Functions (SHIFT and Function Key)

- K1** Select Language: German
- K2** Select Language: English
- K3** Select Language: Local Language
- K4** Switch to Transfer Mode

## Key Combinations

**SHIFT** **+/-** Adjust Display Contrast

**ESC** **ACK** Suppress Error Messages

**ESC** **▶** **▼** Delete  
This combination of keys deletes the OP from the memory when you connect the power supply.

## 1.2 Displaying Text Variables

### Text Variable 1

The following messages are displayed:

Display		Explanation
- Off	=	Unit is OFF
- On	=	Unit is ON

### Text Variable 2

The following messages are displayed:

Display		Explanation
- Remote	=	Remote operation
- Local	=	Local operation

### Text Variable 3

The following messages are displayed:

Display		Explanation
- Pressure status -0 mbar	=	The current vacuum in the drum



*Text variable 3 is only available in models with a pressure sensor (see section 3.3)*

### Text Variable 4

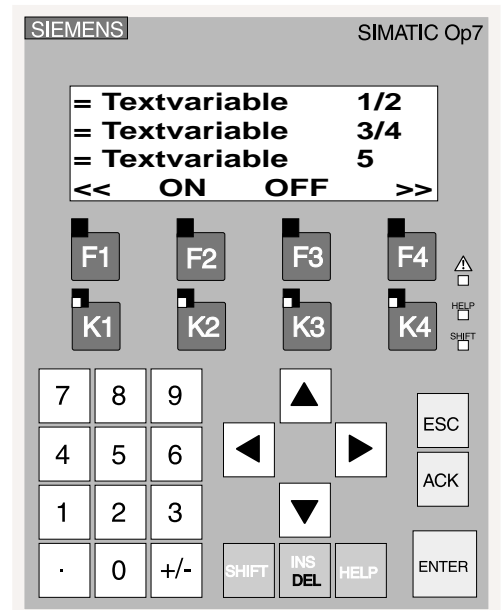
The following messages are displayed:

Display		Explanation
- Off	=	No operation mode
- Automatic	=	Unit is in automatic operation
- Circular	=	Unit is in circular operation
- Manual	=	Unit is in manual operation

### Text Variable 5

The following messages are displayed:

Display		Explanation
- No control voltage	=	No control voltage for entire unit
- Automatic deceleration	=	Automatic deceleration time



## 2.0 Switching on

### 2.1 Switching Unit on Using a Machine Interface (Remote Control)

- 1) **Switch on the Unit**
  - Using the F3 key, select ON
  - Unit is ON' appears on the display
- 2) **Select Remote Operation**
  - Using the F2 key, select REMOTE
  - Remote Operation' appears on the display
- 3) **Selecting Coolant Using a Machine Interface**

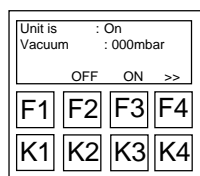


Fig.1.1

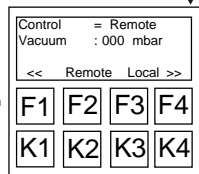


Fig.1.2

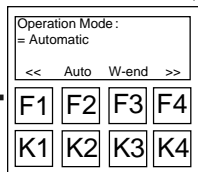


Fig.1.3

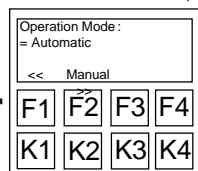


Fig.1.4

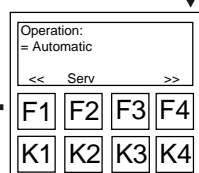


Fig.1.5

Return to Fig.1.1

**Start Screen (Basic Screen)**  
 Unit ON/OFF  
 Switch the machine on as follows:

- The unit switches on automatically as a result of a control signal.
- Use the F2 key to switch the machine off.

**Control Mode**  
 Operation : Remote Key F2  
 Operation : Local Key F3

- Remote = Via Machine Interface
- Local = On Display

**Operating Mode**  
 Operating Mode: Automatic Operation - Weekend Operation

- F2 = Automatic
- F3 = Weekend Operation (circular)

**Operating Mode**  
 Operating Mode: Manual

It is not possible to switch to manual operation. In order to switch to manual, the control mode must be set to 'Local'.

**Selecting the "Serv" (Service) Menu**  
 The Service menu can be accessed in all operating modes.  
 Select the "Service" menu  
 Select using the F2 key  
 The following sub-menus are available:

- Manual operation of all motors / solenoids
- Status display of all motors / solenoids
- Query and change all time values
- Query and change analog values (pressure sensor)
- Select OP functions

## 2.2 Switching Unit on Using OP7 Display (Automatic / Manual Operation)

### Selecting Automatic Operation

- 1) Switch unit on using F3 - "Unit is ON" appears on the display
- 2) Select "Local" control using F3 - Control Local appears on the display.
- 3) Press F2 to start automatic operation - "Operation Mode: Automatic" appears on the display => The system is now in automatic mode.

### Selecting Manual Operation

- 1) Switch unit on using F2 - "Unit is ON" appears on the display
- 2) Select "Local" control using F3 - Control Local appears on the display.
- 3) Press F2 to start manual operation - "Operation Mode: Manual" appears on the display => The system is now in manual mode. (see Chapter 3)

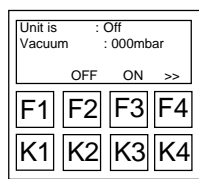


Fig. 1.1

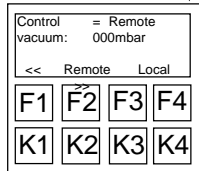


Fig. 1.2

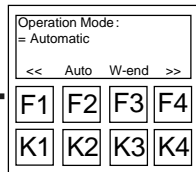


Fig. 1.3

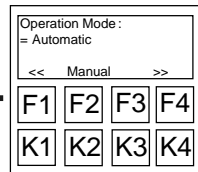


Fig. 1.4

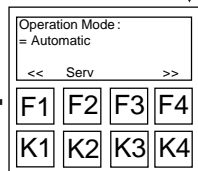


Fig. 1.5

Return to Fig1.1

**Start Screen (Basic Screen)**  
Unit ON / OFF  
Switch the unit on as follows:  
  
Manual Operation  
Press F2 to switch the unit off  
Press F3 to switch the unit on

**Operation**  
Operation: Remote - Local  
  
Remote: Remote control of unit using a machine interface  
Local: Control of unit using the OP7 control module  
Select the operation mode as follows:  
Remote = Control via OP7  
Select using F2  
  
Local = Control via the machine

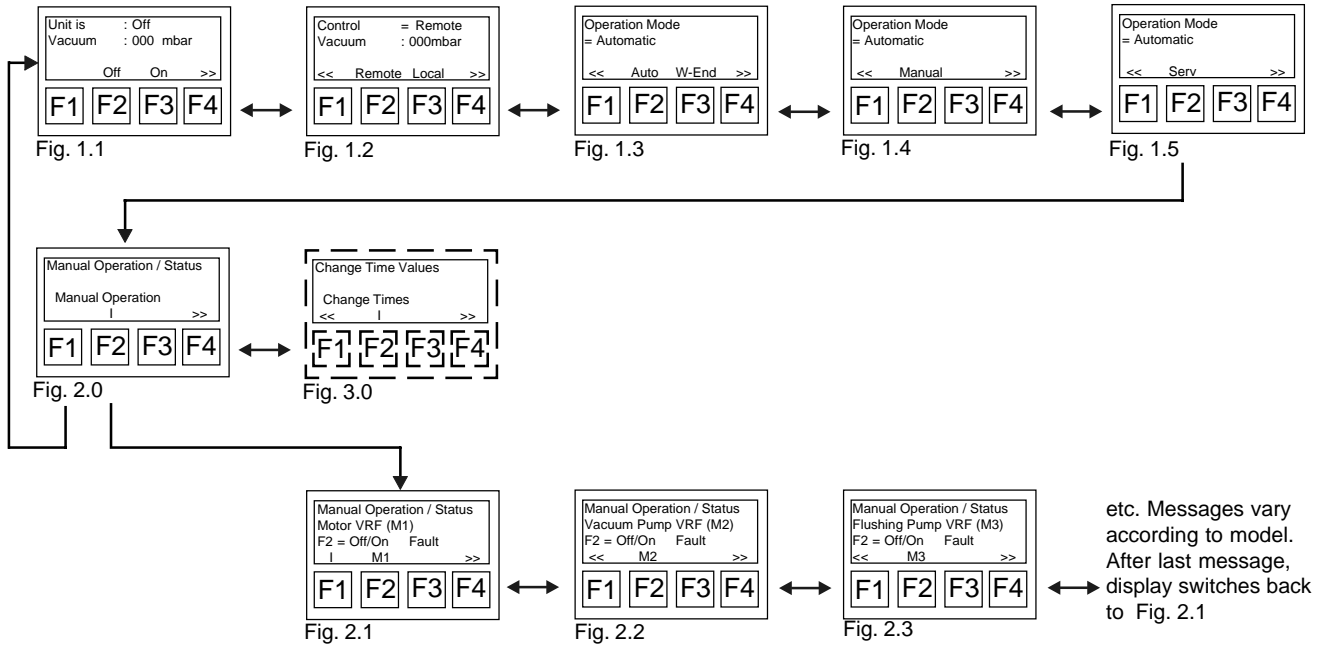
**Operation Mode**  
Operation Mode: Automatic - Weekend  
Select the operation mode as follows:  
(This is only possible if 'Local' is selected)  
  
Operation Mode = Automatic  
Press F2 to start  
  
Operation Mode = Weekend  
Press F3 to start

**Operation Mode**  
Operation Mode: Manual  
Select the operation mode as follows:  
(This is only possible if 'Local' is selected)  
  
Operation Mode = Manual  
Press F2 to start

**Selecting the "Serv" (Service) Menu**  
The Service menu can be accessed in all operating modes.  
Select the "Service" menu  
Select using the F2 key  
The following sub-menus are available:  
- Manual operation of all motors / solenoids  
- Status display of all motors / solenoids  
- Query and change all time values  
- Query and change analog values (pressure sensor)  
- Select OP functions

## 3 Testing and Configuring Operating Parameters

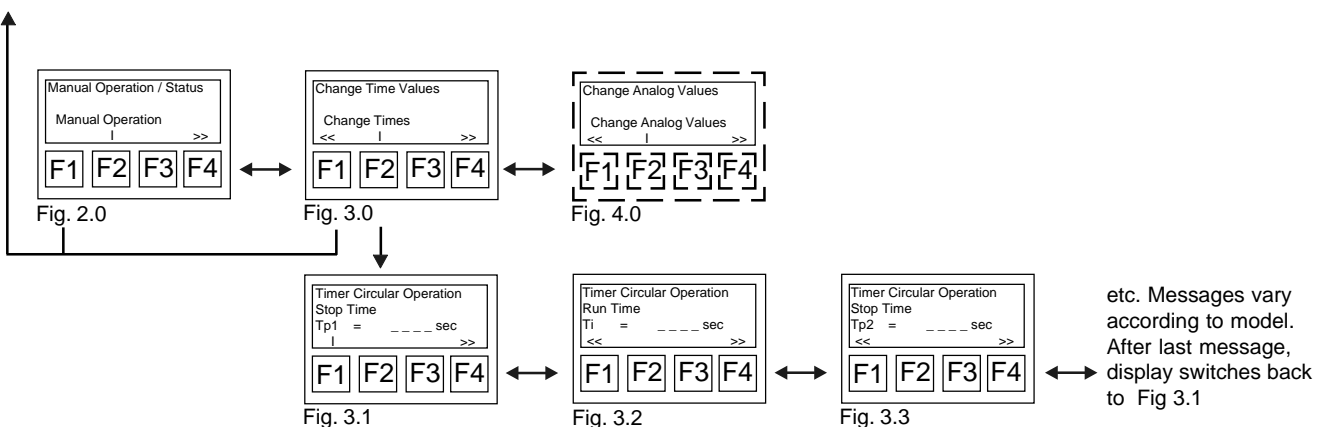
### 3.1 Operating Parameter = Display Drive Status



*A drive or solenoid valve can be switched on or off by means of the corresponding function key.*

*The error display only flashes when a fault occurs in the drives.  
(e.g. pump motor or drive motor)*

### 3.2 Operating Parameter = Time Values



*Changes to the time settings for customisation purposes may only be performed by trained personnel.*

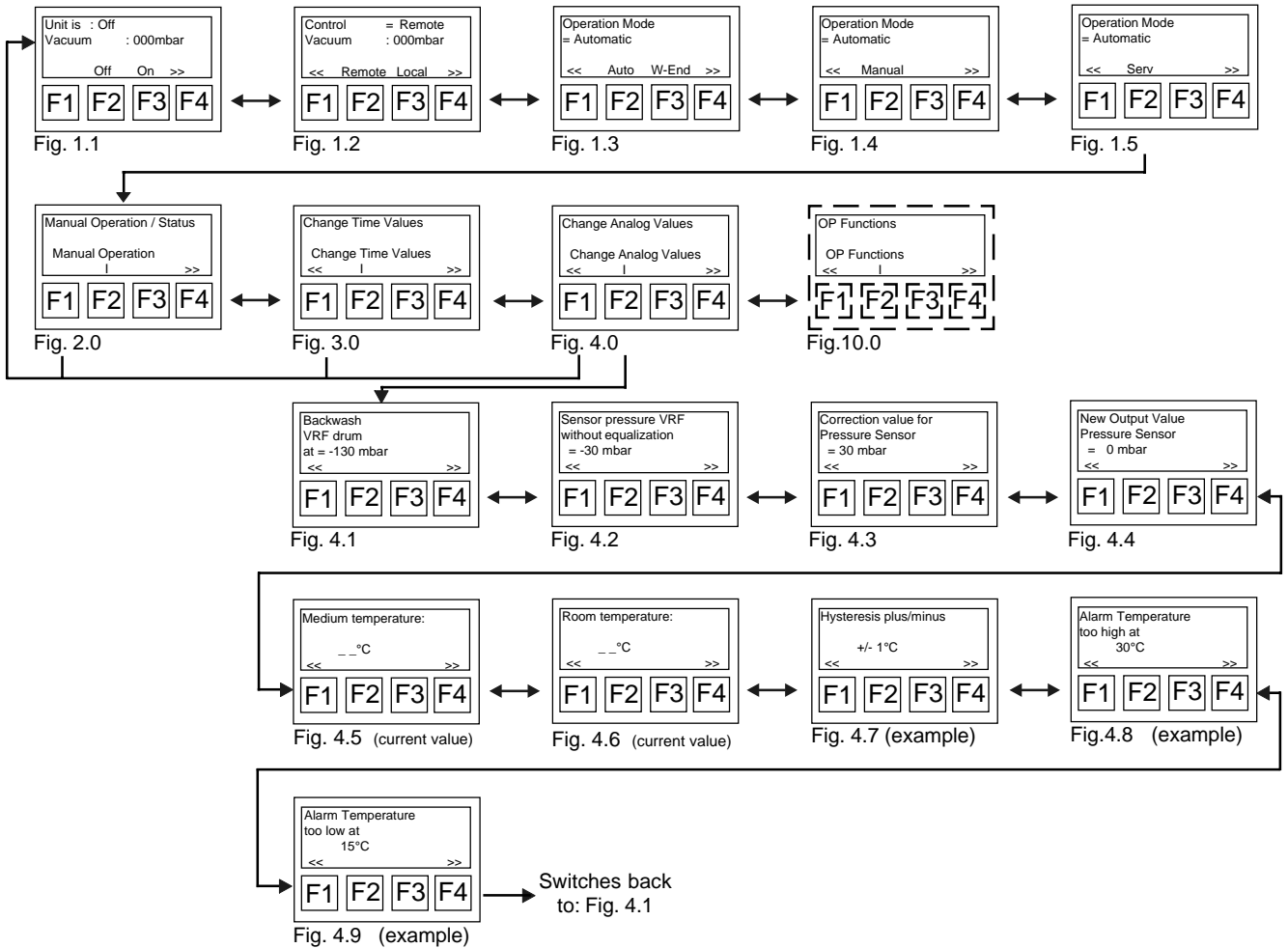
*Please make a note of the original value before making any changes.*

*To make a change, select the relevant time setting, enter the new value via the numeric keypad and confirm with the Enter key.*

## 3.3 Operating Parameter = Analog Values



Analog values are only possible in units with pressure sensors. Other settings (e.g. temperature range) may also be possible depending on the equipment of your unit.



### Information : Fig. 4.1 to 4.4

- Different output values can be set for this pressure sensor according to production tolerances. This means that the output values have to be equalized via the controls. Equalization must be carried out when the system is full because the water pressure also has to be taken into consideration. It is vital that you equalize the system, otherwise the following situations may arise:
- Display - 140 mbar (no equalization)  
Drum backwash is initiated at pressures of -130 mbar. As a result, a pressure of -140 mbar causes backwashing to be continuously restarted.
- Display 140 mbar (no equalization)  
In this instance, a pressure of 260 mbar builds up in the drum until backwashing is initiated. As a result, the filter performance (liters/min) is reduced accordingly. Furthermore, this level of pressure subjects the drum to high mechanical stresses.

## Procedure for Equalizing the Pressure Sensor:



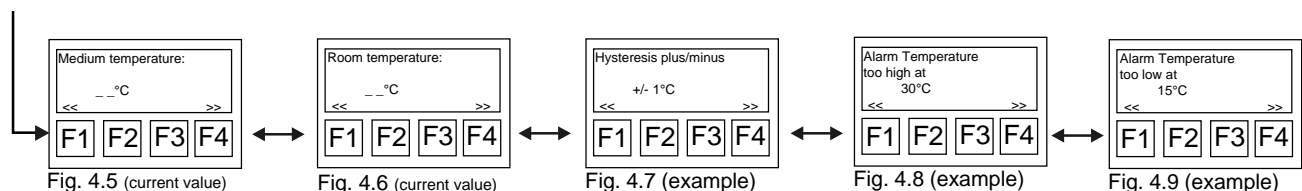
*The vacuum and rinse pumps must be switched off.  
Activate the main switch.*

- 1) Make a note of the output pressure as detected by the sensor.  
Sensor pressure without equalization (Fig. 4.2) = -30 mbar
- 2) Press F4 to go to the next screen. Enter the correction value using the numeric keys  
Correction value for pressure sensor (Fig. 4.3) = +30 mbar (the correction value is equal but opposite to the output value from the sensor without equalization)  
Press ENTER to confirm the new value.
- 3) Press F4 to go to the next screen  
If all values are correct, the following information appears on the display:  
New output pressure from sensor = 0 mbar



*Small deviations of -20 mbar to +20 mbar can be ignored.*

## Information: Setting temperature values (Fig. 4.5 to 4.9)



### Fig. 4.5: Medium temperature

- Displays the reading from the medium temperature sensor

### Fig. 4.6: Room temperature

- Displays the reading from the room temperature sensor

### Fig. 4.7: Hysteresis plus / minus

- A hysteresis of +/- 1°C means that the cooling system will switch “on” or “off” as soon as the difference between the room and medium temperature reaches approx. 2°C
- The medium temperature is adapted to the room temperature

### Fig. 4.8: Medium temperature too high at 30°C

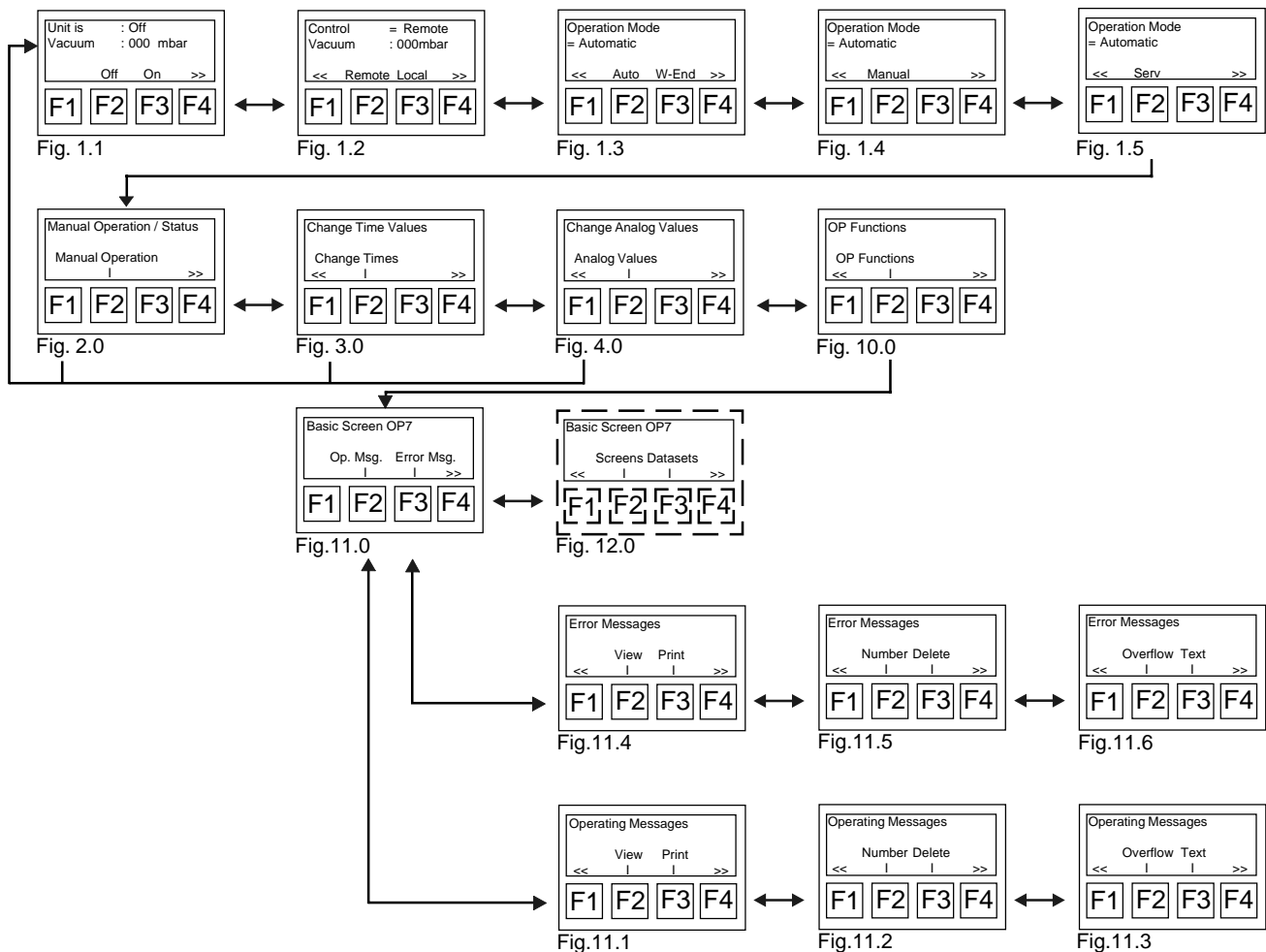
- If the temperature exceeds the limit value of 30°C, a fault message is generated
- The limit value can be changed in the display via the numeric keypad

### Fig. 4.9: Medium temperature too low at 15°C

- If the temperature fails to reach the limit value of 15°C, a fault message is generated
- The limit value can be changed in the display via the numeric keypad

## 4 OP Functions

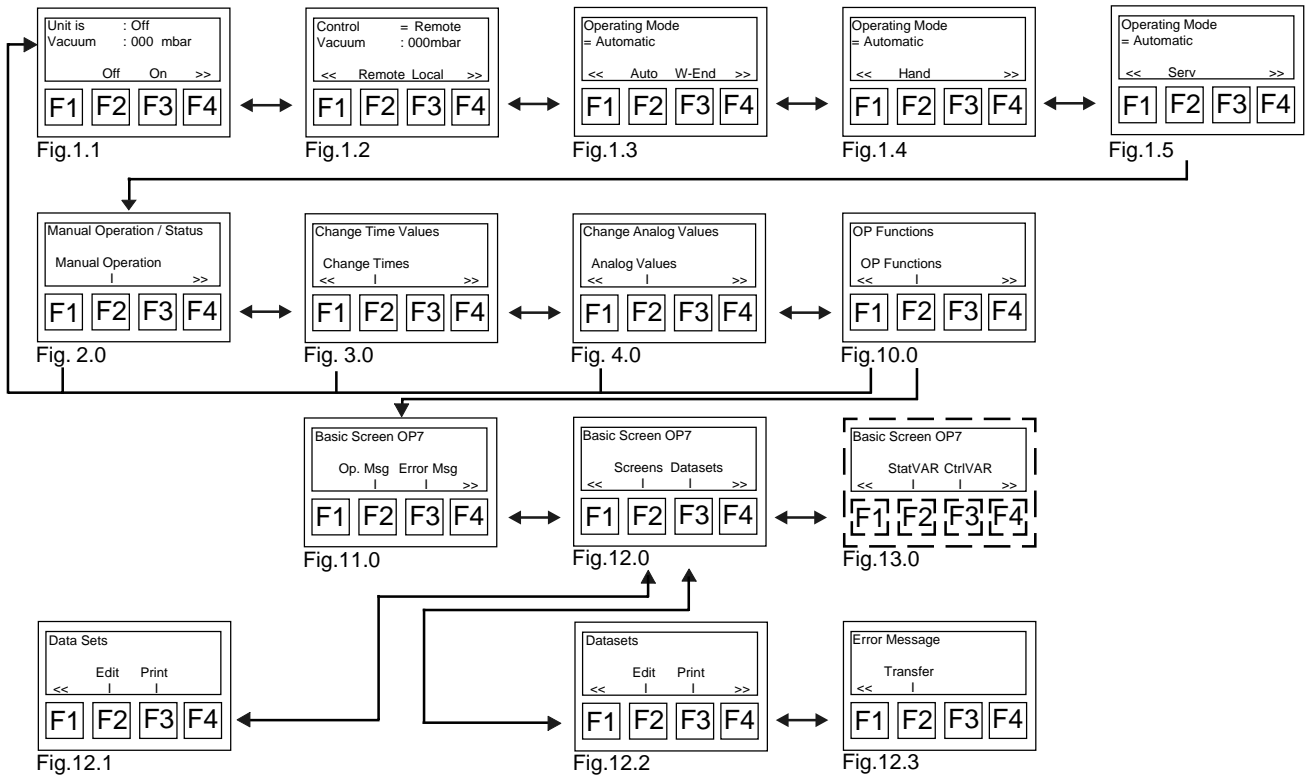
### 4.1 Operating and Error Messages



#### Operating and Error Message Buffer

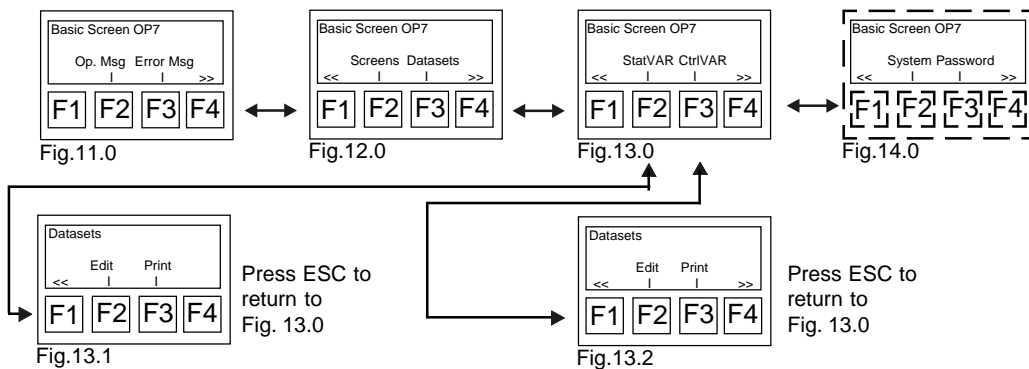
- Operating and error messages are immediately logged in the error message buffer or operating message buffer. The following information is included in the buffer:
  - Time of event
  - Entry and exit of events
  - In the case of error messages, the time of acknowledgement
  - Message number
- The message buffers can store 256 messages each. If the maximum number of events is stored in the buffer, approximately 10% of the oldest messages are deleted. The following abbreviations are used when displaying operating and error messages:
  - K = entry of a message
  - Q = acknowledgement of a message (error messages only)
  - G = exit of a message

## 4.2 Screens and Datasets




**Screens and Datasets:** Datasets are not created or edited.

## 4.3 Testing with Status 'variable' and Control 'Variable'

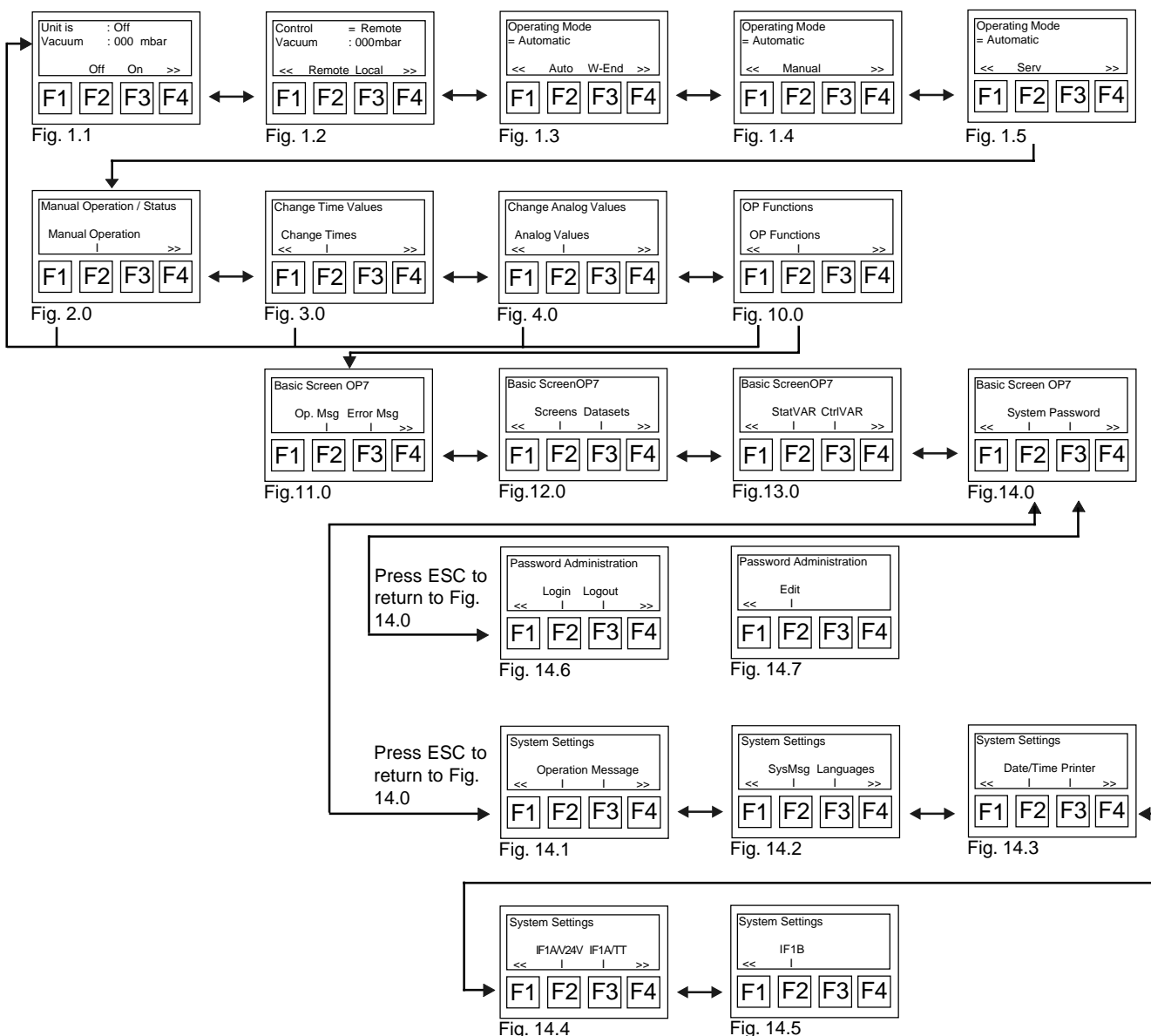


### Status VAR and Control VAR

- By means of the PU functions Status VAR and Control VAR, OP allows you to display and edit operand values from the connected controls using the standard screens. When the system is in online mode you can edit control operands directly through the OP without needing to connect a programming unit.
- Status VAR      Operands can be shown directly on the display.
- Control VAR      Operands can be shown directly on the display and their variable values can be changed and sent back to the control system.

 *These functions may only be used by Knoll service engineers.*

## 4.4 System and Password (Language Selection)



### Password

- To prevent unauthorized access to the OP, you can set access privileges using passwords and password levels. This can be applied to access to screens and input functions. All functions in the control system which are password-protected are given password level 9 (super-user).
- Default setting : 100

### System Settings

- Before implementing any changes to the system settings, please consult the appropriate notes and the OP7 manual. You can obtain help on language, date and time settings by pressing HELP.

## 5 General Information

### Dimensions - Front

- Width : 144 mm / Height : 180 mm

### Mounting Recess

- The OP7 requires a mounting recess measuring (width x height) 134 +1 mm x 170+1 mm

### Data Buffering in the Event of a Power Failure

- It is not possible to store data on the OP7 as it requires a suitable power supply to maintain data.
- In the event of a power failure, the following data is lost:
  - Internal Time
  - Internal Date
- This data is not necessary for the software.
- Both the software and control processes are year 2000 compliant and will not be affected by the changeover to the year 2000.  
Dates displayed as follows: 01.01.00 (01 January 2000)

### System Messages

- Error messages which are generated by the operating software are displayed as follows:

\$ 005 = Internal Error = Transfer Software Again

If such an error occurs, consult the manual (6AV3991-1AE05-0AA0) for an analysis of the problem and appropriate corrective measures.

- The following is a list of common error messages:

\$ 005 = Internal Error	= Transfer software again
\$ 040 = Control not responding	= Check OP PLC cable
\$ 114 = New Control Attempt	
\$ 225 = Error message buffer full	= Clear error message buffer
\$ 305 = Data block number x missing	= Check data blocks

### Cleaning:

Clean the key panel and display at regular intervals using a damp cloth. Use water only - do not use harsh detergents or chemicals as they may damage the surface and lamination of the panel.

### Password

All functions in the control system which are password-protected are given password level 9 (super-user).

Default setting : 100 (factory setting)

New password : \_\_\_\_ (customer setting)

## 6 Error Messages

<b>Error Text (Fault)</b>	<b>Possible Cause</b>	<b>Solution</b>
Emergency stop activated in control cabinet		Rectify fault and reset emergency stop switch
Machine emergency stop activated		Rectify fault and reset emergency stop switch
PLC buffer battery exhausted Please replace		Replace battery
Incorrect operating mode Switch to REMOTE mode		Switch to REMOTE mode
De-sludger M... motor safety switch Q...F activated	Motor faulty Motor blocked	Test / repair motor Remove blockage
Vacuum pump M... motor safety switch Q...F activated	Motor faulty Pump supply volume too high Observe connecting frequency	Test / repair motor Reduce pump supply volume
Flushing pump M... motor safety switch Q...F activated	Motor faulty Pump supply volume too high Observe connecting frequency	Test / repair motor Reduce pump supply volume
Sump pump M... motor safety switch Q...F activated	Motor faulty Pump supply volume too high Observe connecting frequency	Test / repair motor Reduce pump supply volume Check float switch
Pure water pump M... motor safety switch Q...F activated	Motor faulty Pump supply volume too high Observe connecting frequency	Test / repair motor Reduce pump supply volume
Coolant pump M... motor safety switch Q...F activated	Motor faulty Pump supply volume too high Observe connecting frequency	Test / repair motor Reduce pump supply volume

<b>Error Text (Fault)</b>	<b>Possible Cause</b>	<b>Solution</b>
Leakage Cooling system	Dirty-water or deep tank leaking	Repair leak Top up coolant
Safety cut-outs F... - F... activated	Check safety cut-outs Check control cables to system for damage (short-circuit)	Check circuit-breakers Check electrical lines
Cable damaged Check cable of VRF pressure sensor	Electrical cable damaged	Check cable and replace if necessary
Signal overflow Please replace VRF pressure sensor	Pressure sensor faulty Short-circuit in power supply Short-circuit in plug	Replace sensor Replace cable Replace plug
Vacuum duration in VRF drum too long	Pressure sensor faulty Sensor not equalized properly	Replace sensor Equalize sensor (See "Setting analog values")
VRF pressure sensor output value too high	Pressure sensor faulty Sensor not equalized properly	Replace sensor Equalize sensor (See "Setting analog values")
Cable break Check cable of medium temperature sensor	Cable faulty	Check/replace cable
Signal overflow Please replace medium temperature sensor	Temperature sensor faulty	Replace temperature sensor
Cable break Check cable of room temperature sensor	Cable faulty	Check/replace cable
Signal overflow Please replace room temperature sensor	Temperature sensor faulty	Replace temperature sensor
Medium temperature too high __ °C	Temperature regulation faulty (solenoid valve of cooler/temperature sensor)	Check solenoid valve of heat exchanger/temperature sensor
Medium temperature too low __ °C	Temperature regulation faulty (solenoid valve of cooler/temperature sensor)	Check solenoid valve of heat exchanger/temperature sensor

Error Text (Fault)	Possible Cause	Solution
Overflow VRF tank S-switch S...	Deep tank leaking Backwashing valve leaking Constant backwashing of system	Seal deep tank Seal backwashing valve Adjust backwashing times
Coolant deficiency Warning VRF tank S-switch S...	No voltage supply to float switch Float switch jammed Filling level in unit too low	Check supply voltage Check switching function via LED Clean float switch Top up unit
Coolant deficiency Alarm VRF tank S-switch S...	No voltage supply to float switch Float switch jammed Filling level in unit too low	Check supply voltage Check switching function via LED Clean float switch Top up unit
Pressure switch Compressed air E-switch S...	Compressed air supply inadequate	Check compressed air supply Check filter of maintenance unit
Coolant deficiency Warning deep tank S-switch S...	Vacuum pump faulty No voltage supply to float switch Float switch jammed Filling level in system too low	Check / repair motor Check supply voltage Check switching function via LED Clean float switch Top up unit
Overflow Sump pump S-switch S...	No voltage supply to float switch Float switch jammed Sump pump faulty	Check supply voltage Check switching function via LED Clean float switch Check sump pump



*Error messages with item designations (e.g. M1, SE0.1, F6 etc.) can be found in the relevant circuit diagram under "Machine assembly diagram".*

*The same applies to messages of a similar nature.*

**KNOLL** Coolant cleaning systems  
Swarf conveying systems  
Low lift and jetting pumps

KNOLL Maschinenbau GmbH  
Schwarzachstr. 20, Postf. 1362  
D-88342 Saulgau, GERMANY

Phone +49 (0) 7581/2008-0  
Telefax +49 (0) 7581/2008-140  
E-mail [info@knoll-mb.de](mailto:info@knoll-mb.de)  
web [www.knoll-mb.de](http://www.knoll-mb.de)