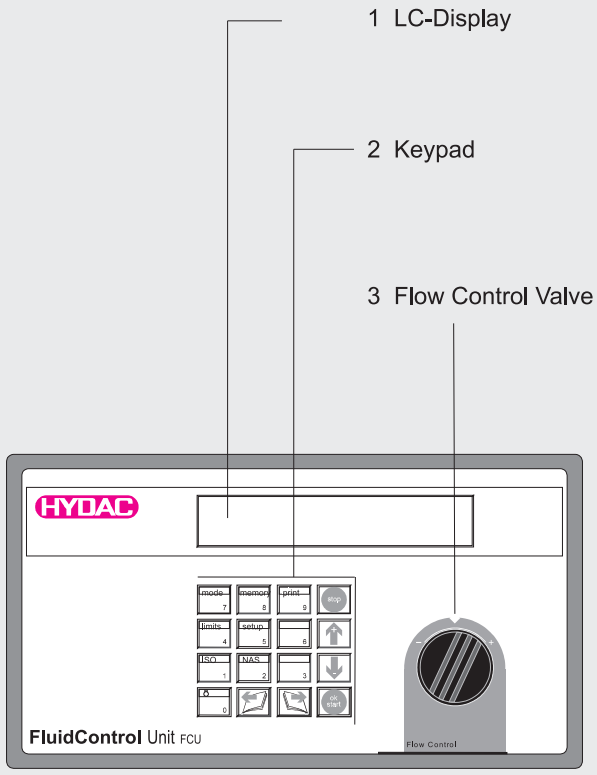
HYDAC INTERNATIONAL

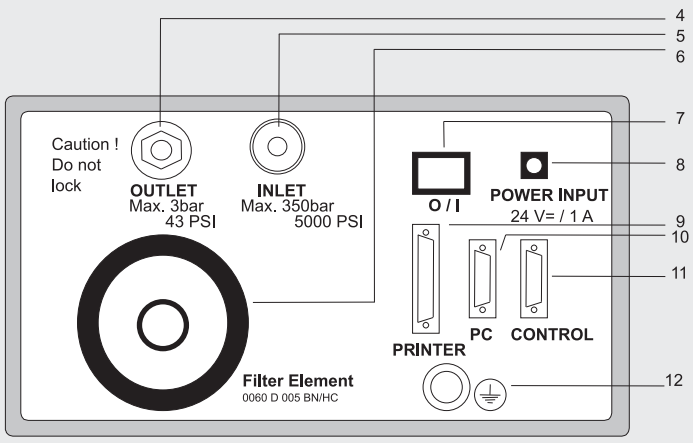
Quick Start Manual

FCU Type Code	
Serial Number	
Sensor Number	
FCU 2010 / 2011 / 2110 / 2111 FCU 2030 / 2031 / 2130 / 2131	

Front View



Rear View



Hydraulic Ports

4 - OUTLET Return line hose port DN7, low pressure

5 - INLET - measuring hose port DN4, high pressure

6 - Filter Element - cover for filter element, (Socket size AF19)

Electrical ports

7 - O / I - Power switch

8 - POWER INPUT - 24V DC connector for power supply

9 - PRINTER - external printer port (not all models)

10 - PC - RS232 connector

11 - CONTROL - Relay outputs for control of filtration unit

12 - ⏚ - case ground connector

Electrical Connections

Electrical Connections

1. Connect the jack plug of the power supply to the socket **POWER INPUT** on the back panel of the FCU.
2. Connect the power supply to the mains.

The rechargeable NiCd batteries need a charging time of approximately 11 hours, once they are discharged. To avoid the well known "memory effect" (multiple charging of batteries without discharging), we recommend that the batteries are discharged once a month by leaving the FCU turned on until the display dissappears.

Fully charged batteries allow operation of up to 4 hours (without printing).

Hydraulical Connections And Initial Operation

Warning:

As soon as the measuring hose is connected to the system, oil flows through the FCU. Thus it is absolutely necessary that all connections are carried out in the following order.

The FCU OUTLET must never be shut off, otherwise high pressure damages the unit and could cause injury.

Hydraulic Connections

1. Connect the female end of the return line hose (DN7, transparent) to the **OUTLET** connector on the back panel and the male end of the hose into the reservoir or a bucket.

2. Set the front panel flow control valve to position **5.** In most cases this provides the necessary sensor flow rate in the range of 50 -150 ml/min.

3. Check system pressure of the hydraulic system to be measured, It must be in the permissible range for the **INLET** Port (1-350 bar / 20-5000 psi).

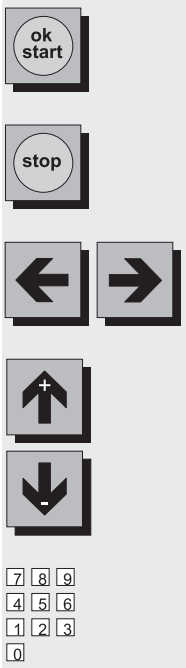
4. Connect the DN4 connector end of the measuring hose (DN4, black) to the FCU **INLET** first, then secondly connect the DN2 connector to the end to the hydraulic system.

5. Turn the FCU on with the **O / I** switch .

6. Press the **"START" key on the front panel.**

7. The actual sensor flow rate **Q** is now indicated in the lower left side of the LC-Display and should be adjusted to approx. **100 ml/min** by turning the front panel flow control valve.
If a flow error message appears, turn the flow control valve until the flow rate is set to the required range of **50 - 150 ml/min**. Then the error message disappears and the measurement automatically starts.

Control keys (grey)



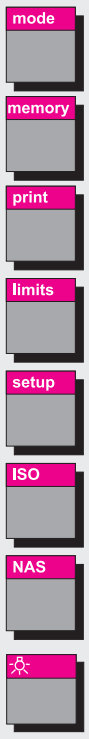
confirm entries,
start measurement

abort entries,
stop measurement

scroll through menus
(If the menue symbol "□"
is displayed)

increase/decrease
alphanumeric data
(in entry mode)

direct entry of
multiple digit numbers
(only in entry mode)



Menu and Number Keys (red)

select measuring mode
(with/without relay control).

edit log memory (name of measuring point averaging interval, deletion etc.).

print-out
(online, stored logs etc.).

edit limit switches for control of filtration units or for use with PLCs and external warnings.

edit setup
(autostart, date / time etc.).

display results in ISO-Code
(this key only functions during an active measurement).

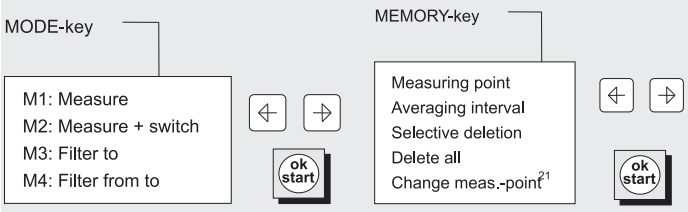
display results in NAS-Code
(this key only functions during an active measurement).

display illumination
1 x- auto off after 30 s.
2 x- permanently on.

1 x to switch off.

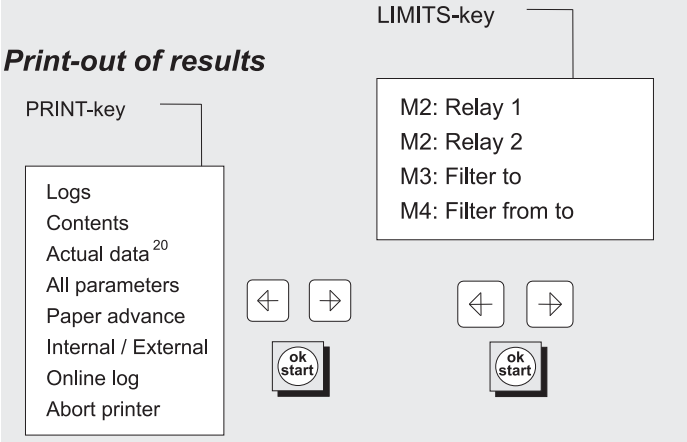
Menu-Overview

Measuring Parameters



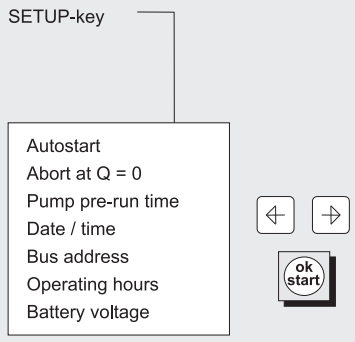
Programming of limit switches

Print-out of results

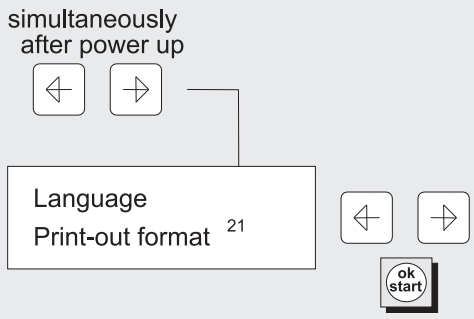


20 - only FCU 2010/2011/2030/2031
21 - only FCU 2110/2111/2130/2131

Basic configuration



Unit configuration

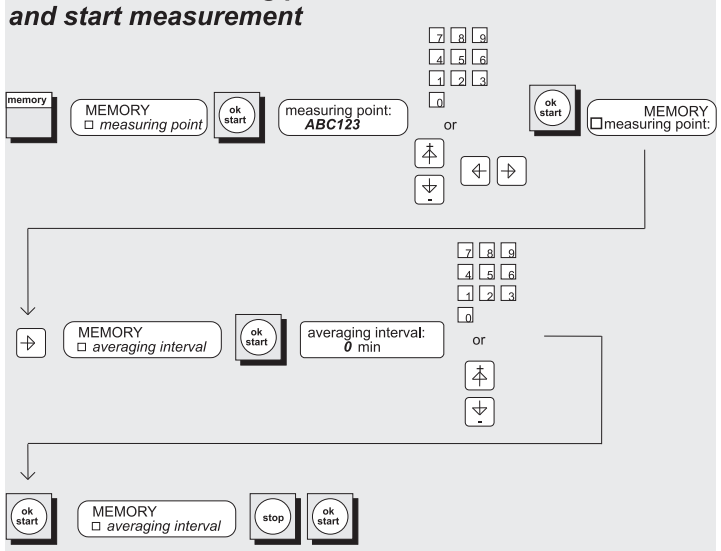


20 - only FCU 2010/2011/2030/2031
21 - only FCU 2110/2111/2130/2131

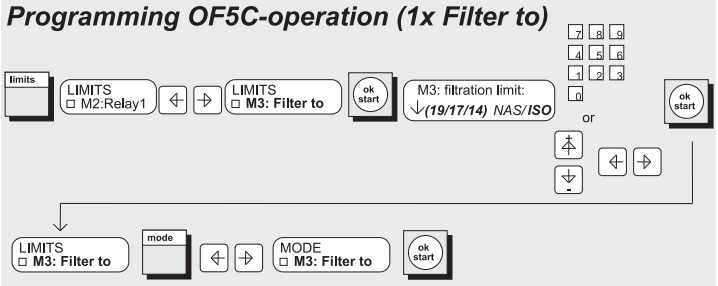
Start measurement:

Stop measurement

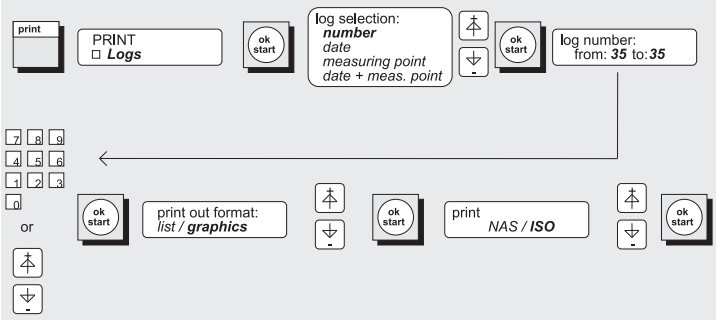
Enter new measuring parameters and start measurement



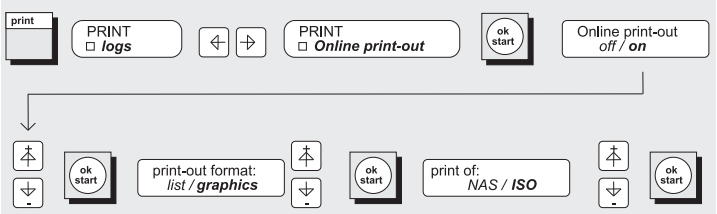
Programming OF5C-operation (1x Filter to)



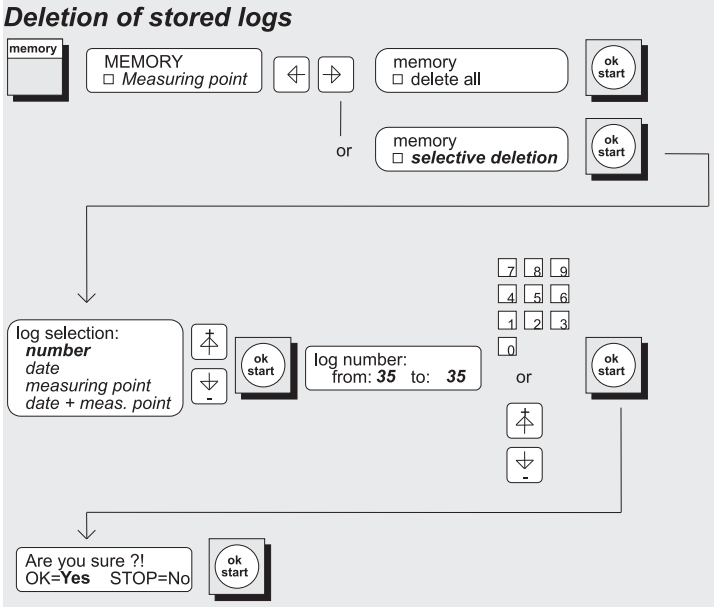
Printing stored logs



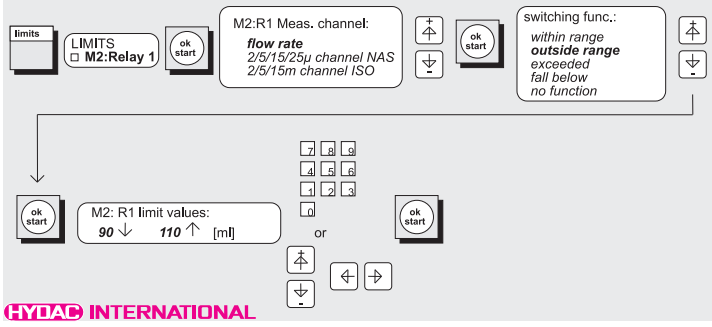
Printing online logs (only during active measurements)



Deletion of stored logs

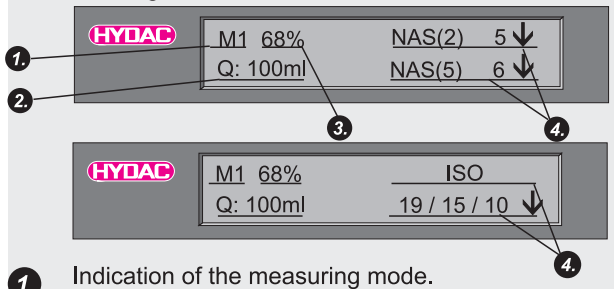


Programm limit switches (relais 1 and 2)



Displayed Information

During active measurements, the LC-Display shows the following information:



1. Indication of the measuring mode.
Shown: M1 (measure)

2. Display of actual flow rate through the particle sensor (**100 ml/min** recommended, permissible range: **50-150 ml/min**).

3. Indicates elapsed measuring time in %.
Measuring time is not constant, the display is updated only after 100 ml of oil has passed through the particle sensor. Thus the display starts with 0%, at 100% a new value for the measured contamination class is displayed.

4. Display of actual contamination class. For NAS display, each particle sizes is displayed separately.
(2) = 2 -5µm, (5) = 5-15 µm etc.
Shown: NAS class 6 in the size range of 5-15µm. The trend arrow indicates whether contamination classes are rising or falling.

Changing the paper/ ribbon cardridge on the FCU printer

1. To insert new ribbon cardridge in the FCU printer

a) Lift printer cover, and fold back fully.

b) On the right side of the ribbon cartridge, push where marked "**Push**" until the cartridge is released.

c) Remove old ribbon cartridge.

d) When fitting the new ribbon cartridge, the "**Push**" label must be on the top of the right. Feed paper strip through the ribbon cartridge (between ribbon and plastic cartridge).

e) Place the left side (ribbon drive) of the ribbon cartridge in first , then push where marked "**Push**" on the right hand side until the ribbon cartridge clicks in.

f) Re-align paper and close printer cover. Approximately 0,5 cm of paper should emerge from the cover.

Changing the paper/ ribbon cardridge on the FCU printer

2. To insert new paper roll in the printer:

a) Switch off FCU

b) Carry out instructions a) to c) from point 1 ("To insert new Ribbon cartridge in the printer").

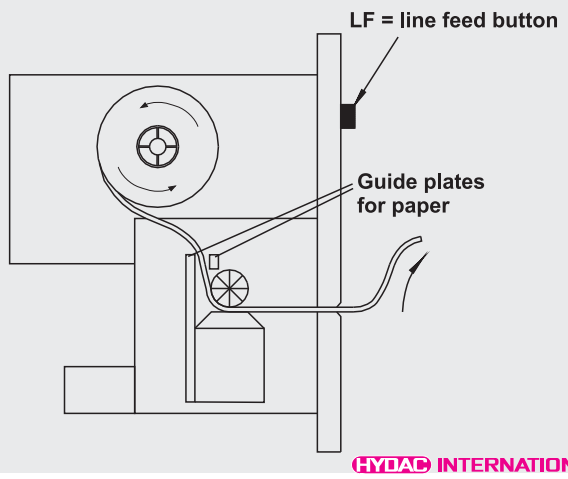
c) Lift out old paper roll, remove plastic spindle and place it inside new paper roll.

d) Place new paper roll in the printer so that the paper unrolls from the bottom.

e) Feed paper edge until it stops between the two metal guide plates beneath the feed roller.

f) Press and hold down green button (LF) while switching on the FCU and wait until approximately 3 cm of printer paper feeds through.

g) Carry out instructions d) to f) from point 1.



Error messages and trouble shooting

Displayed Error Message	Cause(s)	Remedy
invalid parameter	You have entered a value which is outside the permitted value range (e.g. NAS 40).	Check the permitted value range with the arrow keys +↑ and -↓ by scrolling above the maximum values. Then the minimum value is automatically displayed. This works forward and backwards.
Check parameters Defective parameter: no. xx	The self- monitoring function of the FCU has detected a checksum error for one or more parameters. Cause: a strong electromagnetic Interference has changed the parameters.	• Re-set all parameters again with the FCU keypad. • alternatively download all parameters again using the FCUDESK PC software package.
Number of defective logs:	The self- monitoring function of the FCU has detected a checksum error for one or more stored logs. Cause: • a strong electromagnetic interference has changed the parameters. • the internal back up battery is discharged.	• The defective logs are automatically deleted. This means after the next power up this message is not displayed again if this was just a short Interference. • If this message is displayed several times, the internal back up battery is discharged. -> Ship FCU to HYDAC for repair.
no logs stored !!	You have tried to print logs, but the memory is empty.	Perform new measurements.
not enough points	You have tried to print a graph, but the selected log has insufficient measurement values (min. 3) to show a graph.	print log as a list.
charge battery	The rechargeable batteries are low.	You still can perform measurements, but you should connect the power supply, especially for printing.
use power supply	The rechargeable batteries are discharged.	• You have to charge the batteries with the power supply for approx. 11 hours. • With the power supply connected, you still can perform measurements.
Flow rate error! correct: 0 ml	• There is no oil flowing through the particle sensor (i.e. only air). • The flow rate counter is damaged.	1. Turn flow control valve fully clockwise. 2. Check hydraulic connections. 3. Check pressure. With pressure > 30bar/420psi oil must always flow through the OUTLET hose, because the internal pressure relief valve must be open (see hydraulic circuit diagram in manual). 4. Ship FCU to HYDAC for repair, if necessary.

Error messages and trouble shooting

Displayed error message	Cause(s)	Remedy
Flow rate error! correct: 15 ml	The flow through the particle sensor is lower than the necessary minimum value of 50 ml/min to perform measurements.	Turn flow control valve clockwise (+ direction) until measurement starts.
Flow rate error! correct: 250 ml	The flow through the particle sensor is higher than the maximum value of 150 ml/min to perform measurements.	Turn flow control valve counterclockwise (- direction) until measurement starts.
filter contaminated	The internal protection filter for the flow control valve of the FCU is clogged.	Replace FCU filter element.
ext. input activated (this message only occurs with the OF5C filtration unit)	The clogging indicator fitted in the OF5C is activated, the OF5C filter is clogged.	Replace OF5C filter element.
internal printer not ready	• Paper roll empty. • Printer fault.	• Replace with new paper roll. • Ship FCU to HYDAC for repair.
external printer not ready	• No paper in printer. • External printer not on line. • No printer cable or incorrect printer cable connected. • External printer damaged.	• Replace with new paper roll. • Put printer online. • Use original FCU printer cable. • If necessary, use different printer
Fehler in gewählter Sprache	• The last language selected and stored in the FCU has been changed due to internal fault. • The internal back up battery is discharged. Because of the defective language the FCU selects German language as a default.	• Download the FCU languages again using the PC-software package FCUDESK. • If this error message repeats -> Ship FCU to HYDAC for repair.
reload languages	• The language memory has been changed due to internal fault. • The internal back up battery is discharged.	• Download the FCU languages again using the PC-software package FCUDESK. • If this error message repeats -> Ship FCU to HYDAC for repair.
Calibration fault	Internal calibration data in EEPROM are lost due to electrical interference.	Ship FCU to HYDAC for repair.
Device ID defect	Internal designations in EEPROM are lost due to electrical interference.	• This is not a critical error, because these designations do not affect the proper function of the FCU. • Ship FCU to HYDAC for repair if necessary.

For service/calibration/repair ship unit to:

HYDAC INTERNATIONAL

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Notes

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