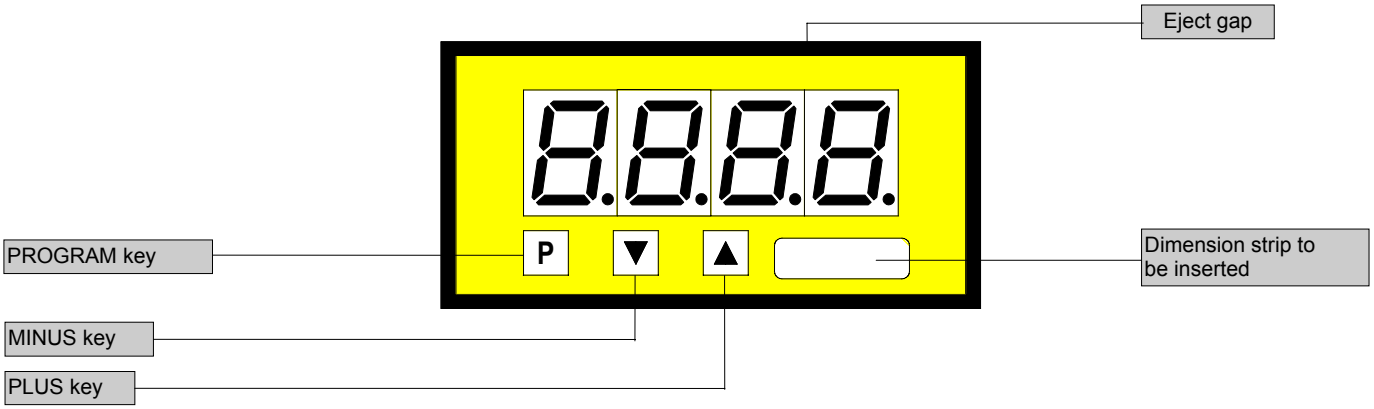
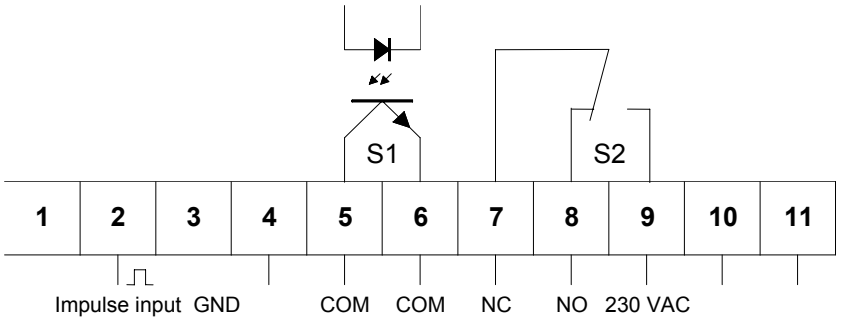
Frequency metering (0.01 Hz – 9999 Hz) with 2 setpoints

- Free scalable indication and setpoints from 0 up to +9999
- Standard: min/max memory - optional analogue output
- Mounting into panels with thickness up to 50 mm

72x36

8888

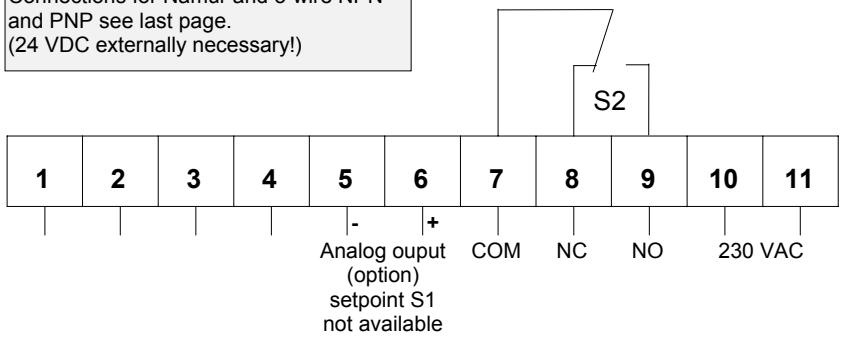




ORDER NUMBER OF TYPE

PFL 4.007.6522B

Connections for Namur and 3-wire NPN and PNP see last page.
(24 VDC externally necessary!)



Power supply 115 VAC **PFL 4.007.6422B**
(connection via terminal 10 and 11)

Power supply 24 VDC **PFL 4.007.6722B**
- galvanic insulated - (11=plus, 10=minus)

Options

- green LED
- Protection IP54
- Protection IP65
- Plug in terminal with protection IP40
- Plug in terminal with protection IP54
- Plug in terminal with protection IP65
- Analog output 0-10 VDC
- Analog output 0-20 mA/load 500 Ω
- Analog output 4-20 mA/load 500 Ω
- Analog output 0-10 VDC (Power supply 24 VDC galvanically insulated)
- Analog output 0-20 mA/load 500 Ω (Power supply 24 VDC galvanically insulated)
- Analog output 4-20 mA/load 500 Ω (Power supply 24 VDC galvanically insulated)

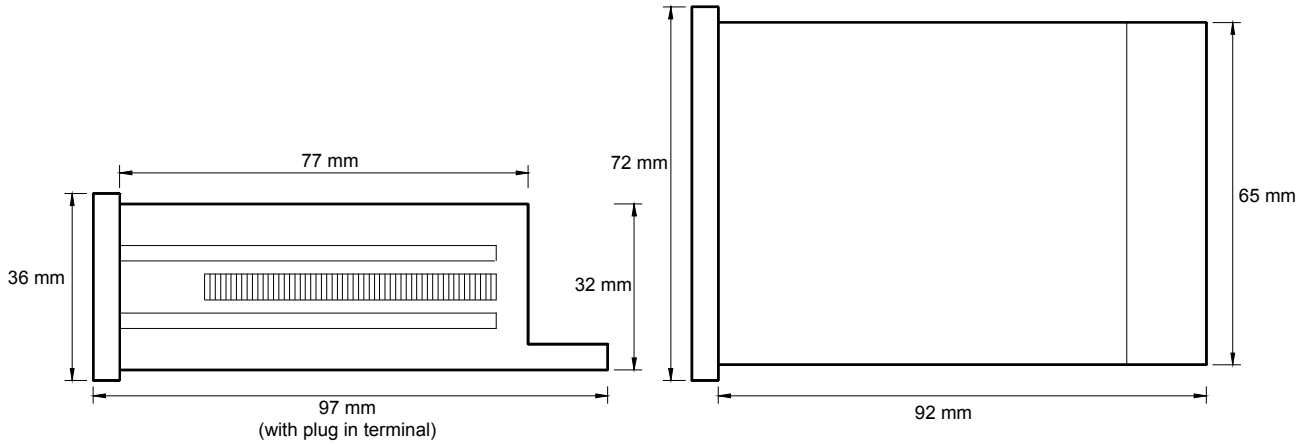
With analog output there is no setpoint S1!

- Dimension strip selectable (7 characters max.)
- Other power supplies on demand
- Other impuls inputs on demand (TTL, CMOS, etc)

Technical data

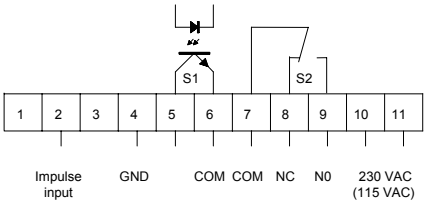
Dimensions	Housing	72 x 36 x 97 mm, including screw terminal
	Assembly cut out	$68.0^{+0.7}$ x $33.0^{+0.6}$ mm
	Fastening	special quick plastic clamp proper to fix in wall thickness up to 50 mm
	Housing material	PC/ABS-plastics blend, colour black, UL94V-0
	Protective system	at the front IP40 connection IP00
	Weight	approx. 0.190 kg
	Connection	at the rear side via terminals up to 2.5 mm^2
Input	Sensors	Namur, 3-wire pick up, impulse input High/low level ---> 10 V/<6 V
	Input resistance	Ri at 10 V = 10 KΩ
	Input frequency	0.01 Hz – 9999 Hz
Output	Relay output	charge 240 VAC/0.25 A – 24 VDC/1 A, with ohm resistive burden
	Switching cycles	$2 * 10^5$ at max. contact rating $10 * 10^6$ mechanically
	Open collector	supply by customers (U_B=5-40 V/I_{max}=100 mA)
	Analogue output	0-10 VDC (12 bit) 0-20 mA (12 bit) - load 500 Ohm 4-20 mA (12 bit) - load 500 Ohm } The analogue output is galvanic insulated from the measuring input!
Accuracy	Resolution	0 up to +9999
	Measuring fault	+/-0.04% of the input frequency
	Measuring principle	frequency/pulse width measuring
	Temp. Drift	40 ppm/K
Power unit	Supply voltage	230/115 VAC +/- 10 % (50-60 Hz), 24 VDC +/-10 % galvanic insulated
	Power consumption	approx. 3 VA
Indication	Display	LED with 7 segments, 14 mm high, red 4-digit = indication 9999
	Overflow	indication of four transversal bars
	Indication time	from 0.2 up to 10.0 seconds adjustable
Ambient conditions	Working temperature	0 up to + 60 °C
	Storing temperature	-20 up to + 80 °C

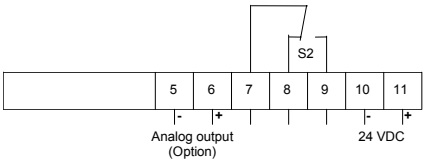
Housing:



CE-sign
For unlimited use of the instrument within the directives for electromagnetic compatibility 89/336/EC frequency input wires have to be used with shielded cable and cable's shield connected to earth ground at one end only.

Connection diagram, programming, remarks





Connections for Namur and 3-wire NPN and PNP see last page.
(externally 24 VDC necessary)

Setting

1. Connect the instrument according to the wiring diagramm.
2. After power on, the instruments runs into a lamp test and returns back to the standard mode.
3. Connect the desired input frequency to the measuring input.
4. Pressing the **P**-key enters the program mode with indication of „**P1**“ on the display.
5. Pressing the **P** and ▲ key simultaneously steps through the different program numbers.
6. Pressing ▲ or ▼ key shows the current values.
7. To change values use ▲ or ▼ key.
8. Otherwise the remaining values will be memorized automatically 7 seconds after the last touch of key with leaving program mode.

Additional key-functions in standard mode for indication of min/max values.

Simultaneously pressing of ▼ and ▲ key deletes and actualizes min/max-memory.
▲ key enters max-memory.
▼ key enters min-memory.

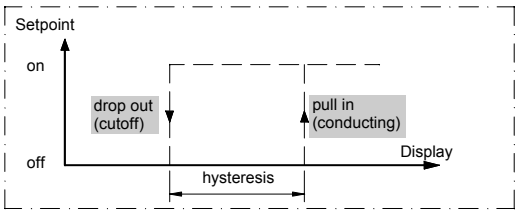
Instructions

After power on the instrument with the inbuilt microcontroller starts with an initial program activating lamp test and readout of memorized parameters in an EEPROM. In case of loosing parameters or any defects in hardware the system generates an error message „HELP“. This function prevents damage from the peripherals and human life, totally reset is required. After a new power on, the system remains in lamp test while pressing **P**-key. Then the unit storages the default parameters and is ready for a new programming.

Setpoints

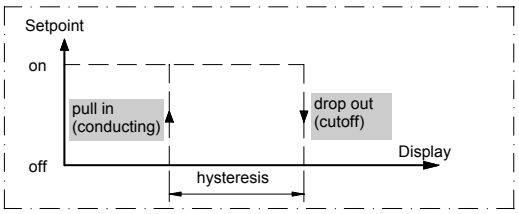
The following diagrams are showing the switching operation of PFL4 relay contacts and open collector outputs, the hysteresis is free programmable. There are two kinds of operation:

Example: operation current



Operation current means that the open collector will be pulled in (conducting) if reaching the adjusted setpoint.

Example: quiescent current



Quiescent current means that the open collector will be dropped out (cutoff) if reaching the adjusted setpoint.

Program table, example of programming

Program table 1

Program Number (PN)	Function	Remark	Display	Basic parameter after reset
1	Input of desired indication value		0 up to +9999	1000
2	Setting of decimal point for indication value	Press ▲ for desired decimal point		no deci. point
3	Setting of input frequency Adjust the numerically maximum value.	Setting in Hz The decimal point remains unconsidered.		1000.
4	Setting of decimal point for input frequency (corresponds with selected measuring range) The position of the decimalpoint corresponds to the multiplier.	Press ▲ for desired decimal point x corresponds f*1 x,x corresponds f*0.1 x,xx corresponds f*0.01 x,xxx corresponds f*0.001	 0001 to 9999 000.1 to 999.9 00.01 to 99.99 0.001 to 9.999	no deci. point
5	Input of final value for analog output	Option	0 up to +9999	1000
6	Input of offset for analog output	Option	0 up to +9999	0
7	Setting delay (last input flank up to indication value „0“)	Adjustment range: 1 up to 250 seconds	1 up to 250 s	10
8	Input of display time		0.2 up to 10.0 s	1.0

During indication times> 7 seconds, the most supreme input frequency is limited as follows:

Indication time (s)	Maximum frequnecy
7	**9000**
8	**8000**
9	**7000**
10	**6500**

Exceeding the limit is indicated by transversal bars „- - - -“

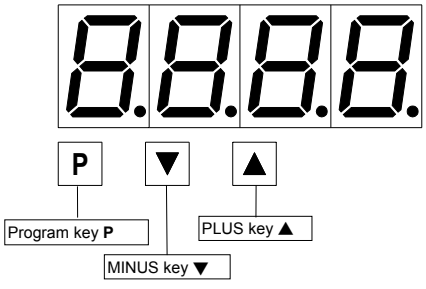
The max. permissible input frequency is controlled by 16 kHz, the device receives a reset above this frequency through the built-in watchdog.

Program table 2
(setpoints)

S1	S2	Function	Display	Basic parameter after reset
PN	PN			
61	66	Setpoint	0 up to +9999	500 / 600
62	67	Hysteresis	0 up to +9999	1
63	68	Quiescent current	0	-
		Operating current	1	1

Example for programming

Input: frequency
Measuring value: 0 - 8.5 Hz
Indication: 0 Hz = 0.0 8.5 Hz=300.0
Display refres. time: 2.0 seconds
Setpoints: S1 ==> 60.0 and quiescent current
Relay pull in = 58.0 ==> 2.0
S2 ==> 150.0 and operating currrent
Relay drop out = 80.0 ==>70.0
Analog output: 0 V output ==> display 0.0 ==> measuring value 0 Hz
(Setpoint S1 not available) 10 V output ==> display 300.0 ==> measuring value 8.5 Hz



The basic adjustments concerning to the following program example are the ground parameters after a total reset occuring through a power on with pressing **P**-key (see previous page).

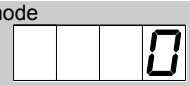
Program advices
Pressing the **P**-key enters **always** the program mode with program number **1**. The „**P1**“ begins to blink in change with the current value after 3 seconds. After further 4 seconds the system leaves the program mode and goes to the standard mode. In Program mode pressing ▼ or ▲ keyselects the current values which are free scalable with both the keys. All parameters will be memorized automatically after leaving program mode.

Example for programming

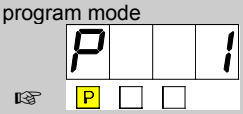
Programming
Switch power on!

Lamp test

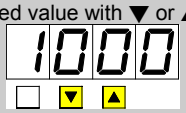
Standard mode



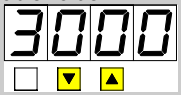
Enter program mode



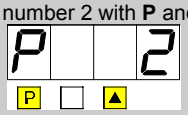
To memorized value with ▼ or ▲.



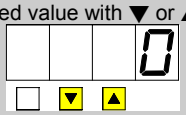
Set free scalable value



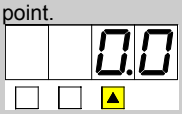
To program number 2 with **P** and ▲.



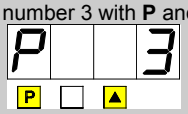
To memorized value with ▼ or ▲.



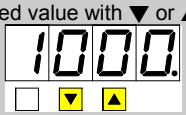
Set decimal point.



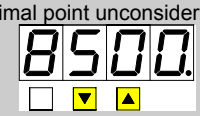
To program number 3 with **P** and ▲



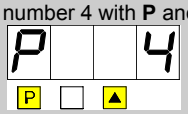
To memorized value with ▼ or ▲.



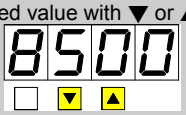
Set the free scalable input frequency
in Hz. Decimal point unconsidered.



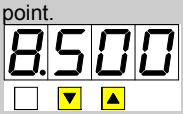
To program number 4 with **P** and ▲.



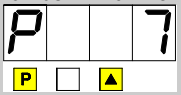
To memorized value with ▼ or ▲.



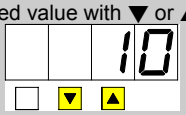
Set decimal point.



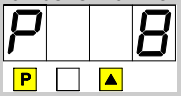
To program number 7 with **P** and ▲.



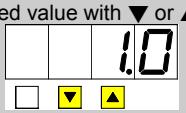
To memorized value with ▼ or ▲.



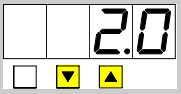
To program number 8 with **P** and ▲.



To memorized value with ▼ or ▲.

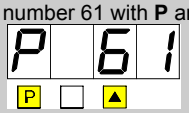


Set display time.

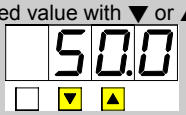


The following programming steps are necessary for setpoint-programming of S1 and S2 only.

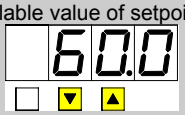
To program number 61 with **P** and ▲.



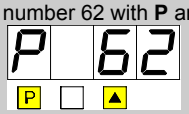
To memorized value with ▼ or ▲.



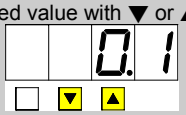
Set free scalable value of setpoints S1.



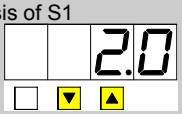
To program number 62 with **P** and ▲.



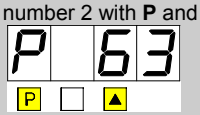
To memorized value with ▼ or ▲.



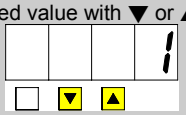
Set hysteresis of S1



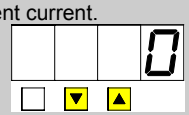
To program number 2 with **P** and ▲.



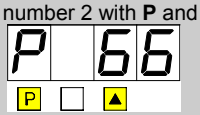
To memorized value with ▼ or ▲.



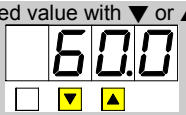
Set quiescent current.



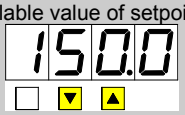
To program number 2 with **P** and ▲.



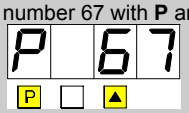
To memorized value with ▼ or ▲.



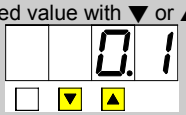
Set free scalable value of setpoint S2.



To program number 67 with **P** and ▲.



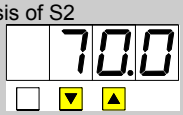
To memorized value with ▼ or ▲.



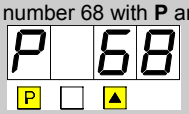
Subject to technical alteration
status 02/2006 - PFL476GB.DOC

Example for programming, connection diagrams

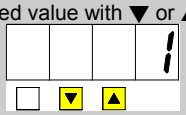
Set hysteresis of S2



To program number 68 with **P** and ▲.



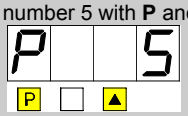
To memorized value with ▼ or ▲.



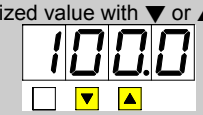
Programming finished.
All programmed values will be memorized after 7 seconds. Jumps back into standard mode automatically.

The program numbers 5 and 6 are available with option analogue output only.

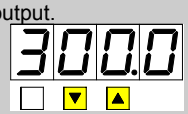
To program number 5 with **P** and ▲.



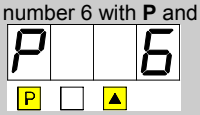
To memorized value with ▼ or ▲.



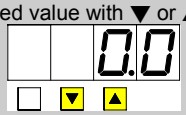
Set free scalable final indication value for analog output.



To program number 6 with **P** and ▲.

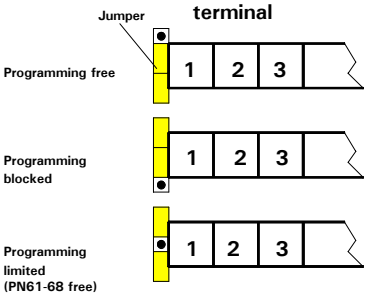


To memorized value with ▼ or ▲.



Programming finished.
All programmed values will be memorized after 7 seconds. Jumps back into standard mode automatically.

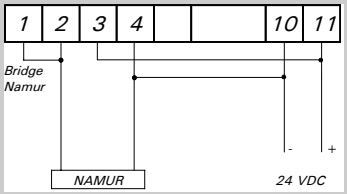
Setting possibilities of the jumper field on the rear side



Terminal holding for different sensors

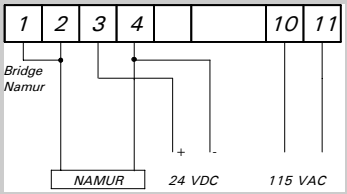
Namur

PFL 4



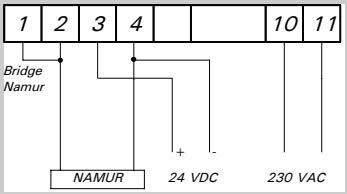
Namur

PFL 4



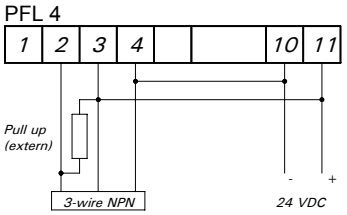
Namur

PFL 4



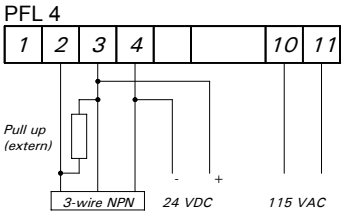
3-wire NPN

PFL 4



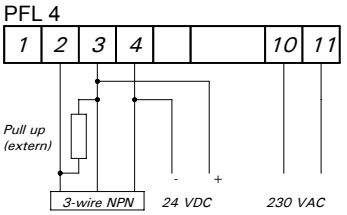
3-wire NPN

PFL 4



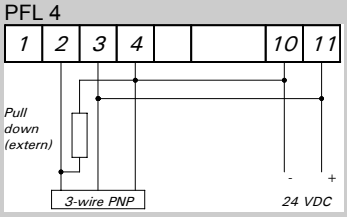
3-wire NPN

PFL 4



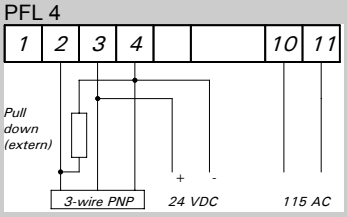
3-wire PNP

PFL 4



3-wire PNP

PFL 4



3-wire PNP

PFL 4