

Hand-held measuring unit ideal for maintenance, service and putting hydraulic fluid systems into operation

Today's hydraulic systems require a precise, quick and uncomplicated way of measuring important hydraulic parameters. For this purpose STAUFF offers the ideal solution: The PPC 04.

The mobile measuring device PPC 04 is controlled by its 8 buttons enabling the user of the device to access data on working pressure, peak pressure, differential pressure, temperature, flow and rotational speed very easily. This allows for a wide range of applications in the areas of:

- **Industrial hydraulics**
- **Mobile and Agricultural hydraulics**
- **Marine and Offshore hydraulics**
- **Chemical and Petrochemical industry**
- **Energy and Airconditioning industry**
- **Sanitary industry**

The PPC 04 provides two separate sensor inputs which automatically recognise the sensors connected to it and displays the unit and scale for the corresponding sensor. The unit and scale can be changed as the device is being put into operation.

For data output to a thermoprinter, or to a PC by an auxiliary adaptor, the PPC 04 - AP provides an optical data transmission to allow transfer of values measured.

The PPC 04 is unaffected by dirt and can be used under extreme conditions due to its heavy duty rubber cover to protect the device. The PPC is powered either by a 9 V block battery (**PPC 04 - B**) or an integrated rechargeable battery (**PPC 04 - AP**). Measuring for an extended period of time is possible by using an external power supply which also charges the rechargeable battery simultaneously.

PPC 04 - kits are supplied with a set of adaptors which allows the connection of the pressure transducers to STAUFF Test 20/15/12 and STAUFF Test 10 test points – even under pressure. Temperature- and flow sensors are supposed to be mounted in-line. Rotational speed measuring is accomplished without contact by a visual marking on rotating components.

In order to measure differential pressure two transducers of the same pressure range have to be used.

Hand-held unit PPC 04 - B and PPC 04 - AP

Measuring of:

- Pressure in bar and psi
- Temperature in °C and °F
- Flow in l/min and GPM (US)
- Rotational speed in U/min and RPM

PPC 04 - B hand-held unit with block-battery

PPC 04 - AP hand-held unit with rechargeable battery and data output

- 4-digit LCD-display, character height: 13 mm
- automatic recognition of sensors connected
- optical data transmission to transfer values measured to thermoprinter or PC (PPC 04 - AP only)
- Plastic housing made of ABS
- Protective rubber cover with integrated stand and carrying straps
- Auto power off after 15 minutes (except autoprint function)

Power supply:

9 V block battery IEC 6F 22 (PPC 04 - B)

Rechargeable battery - or by external power supply

Supply voltage 9 V (PPC 04 - AP)

12-bit-A/D-converter

Scanning rate ≤ 2 ms

Accuracy < 0,3 % ± 2 Digit

Two 4-pin round plug inputs 0,1...3,3 V, R_e = 470 kΩ

Temperature range 0...+50°C

Storage temperature -20...+60°C

Rel. Humidity < 85%

Dimensions l/w/h 145x70x40 mm

Weight approx. 340 g

Protection level DIN 40050/IP 54



EMC compatibility acc. to:

Interference emission DIN/EN 50081-1 (VDE 0839 part 81-1)

Resistance to jamming DIN/EN 50082-2 (VDE 0839 part 82-6)

Pressure Transducer PTD

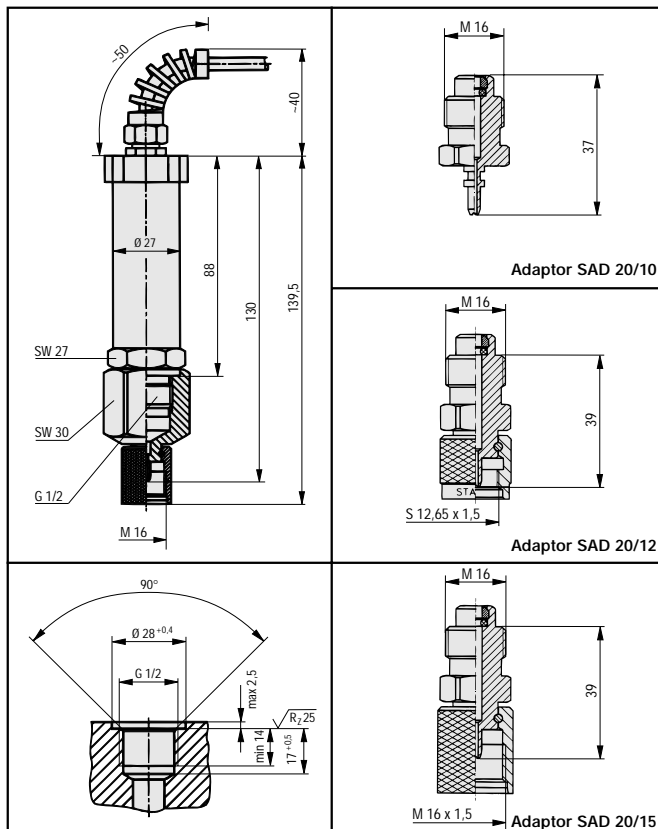
Type	PTD 015	PTD 063	PTD 630
Pressure range	-1...15 bar	0...63 bar	0...630 bar
Overload capacity	20 bar	150 bar	1000 bar
Burst pressure	45 bar	500 bar	1800 bar
Output signal	+0,1...+3,3 V	+0,3...+3,3 V	+0,3...+3,3 V
Reproducibility	<±0,15% FS*	<±0,18% FS*	<±0,15% FS*

Test system piezoresistive
 Temperature deviation <± 0,03 % FS*
 Characteristic curve deviation <± 0,5 % FS*
 Long-term stability < 0,5 % FS/year
 Response time < 1 ms
 Vibration resistance IEC 68-2-6 at 10...500 Hz
 Max. shock-load to IEC 68-2-29
 Peak pressure increase 15.000 bar/s
 Supply voltage +7V...+15V DC
 Current consumption ≤ 5 mA
 Media-temperature range -25...+105°C
 Ambient temperature range -20...+85°C
 Compensated temperature range 0...+85°C
 Storage temperature range -40...+125°C
 Endurance 10 million cycles
 Media application gas, fluids (for use with aggressive media please consult STAUFF)

Transducer connection with adaptor STAUFF Test 20 (M16 x 2) (without adaptor G 1/2 A)
 Material of housing stainless steel 1.4301
 Sealing material FPM
 Weight approx. 200 g
 Protection level DIN 40050 – IP 65

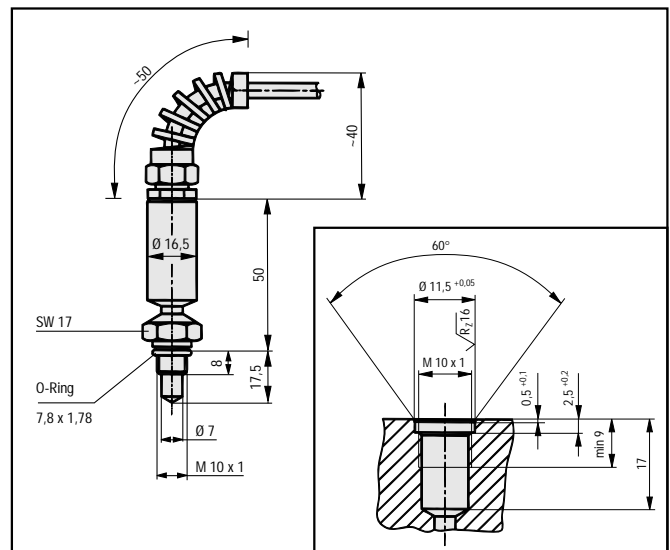
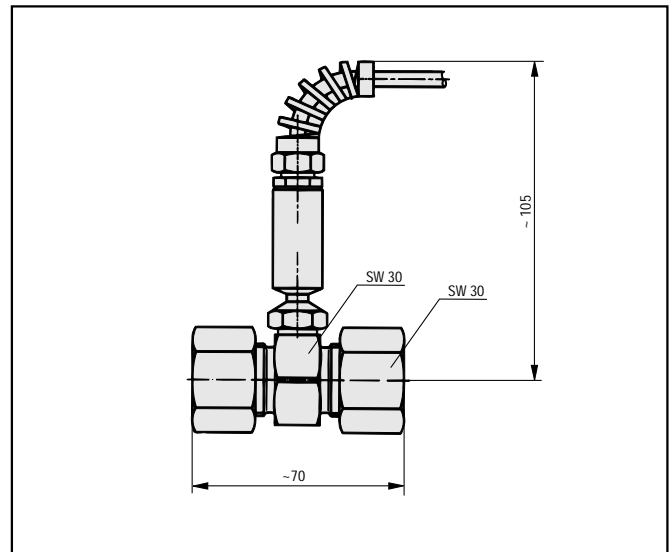
2 mtr.-cable connected with transducer; round plug series 712

*) FS = Full Scale



Temperature Sensor TS 04

Probe system Silicon chip
 Measuring range -25...+125°C
 Accuracy ± 1,5 % FS*
 Response time T_{0,9} approx. 7 s
 Supply voltage +7...+15 V DC
 Current consumption ≤ 3 mA
 Output voltage +0,25...+1,75 V
 Max. working pressure 630 bar
 Ambient temperature range 0...+70°C
 Media-temperature range -25...+125°C
 Storage temperature range -25...+80°C
 Cable length 2 m, round plug
 Sensor connection a) STAUFF-Test-straight fitting SGV-16-S-G for in-line installation
 b) Port connection M10 x 1
 Material Steel 9SMnPb28k
 Surface treatment zinc plated, yellow chromated
 Sealing FPM
 Protection level DIN 40050 – IP 65



Flow-Turbines SFM

Type	SFM-015	SFM-060	SFM-300	SFM-600
Measuring range (l/min)	1...15	7,5...60	15...300	25...600
Pressure range (bar)	400	400	400	350
Characteristic curve deviation ($\pm\%$ FS)	1	1	1	1
Pressure drop (bar)	0,14	0,28	2,0	1,7
Port connection (BSP)	G 1/4	G 3/4	G 1	G 1 1/4
Length tolerance (mm)	± 2	± 2	± 2	± 2
Weight (g) approx.	650	750	1200	1800

Media-temperature range	-20...+150°C
Response time	approx. 200 ms
Reproducibility	$\pm 0,2\%$ FS
Calibration viscosity	30 mm ² /s (= 30 cSt)
Material of housing	Aluminium
Surface treatment	black anodized
Test point	SMK 20 (M16 x 2)
Additional connection	M10x1 (standard: screw-plug)
Protective system	DIN 40050/IP40

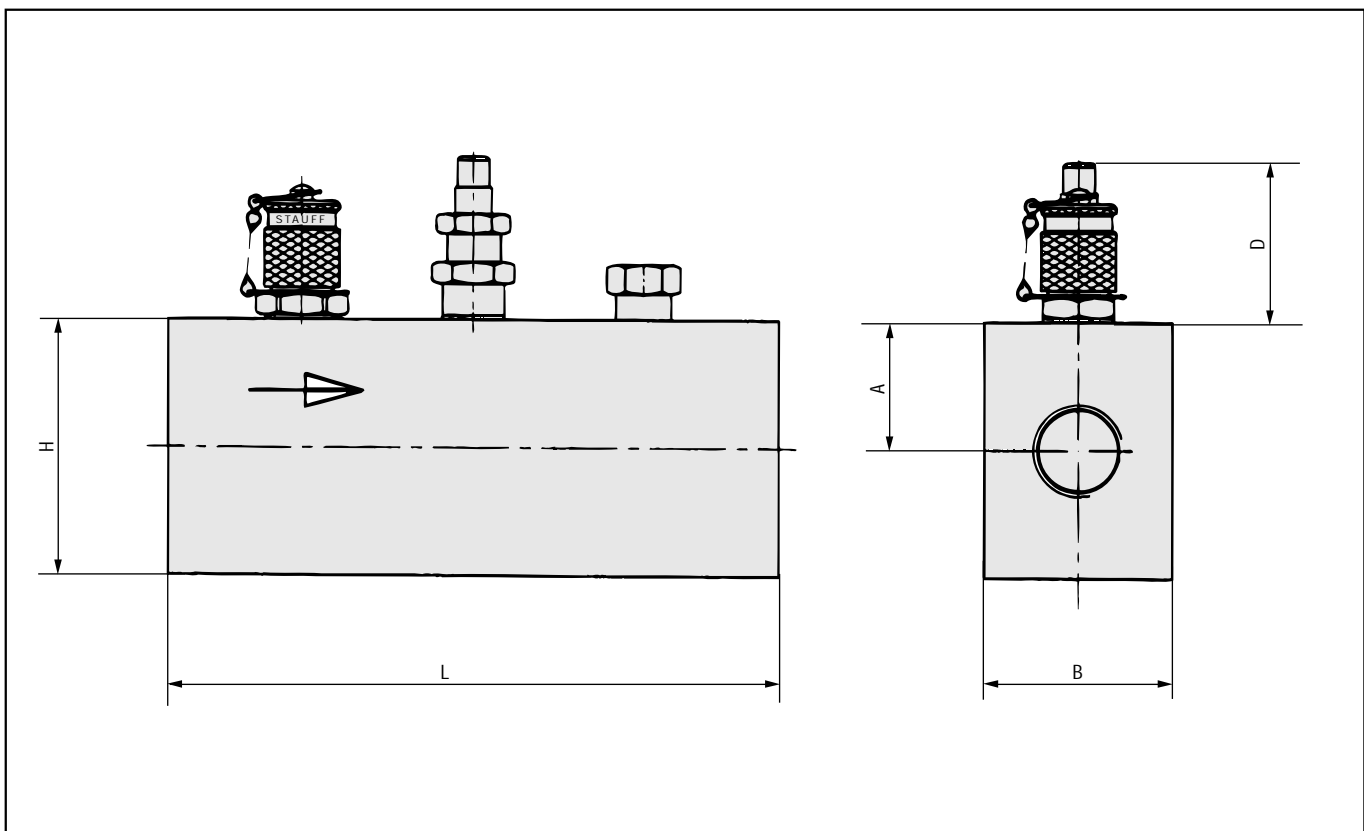
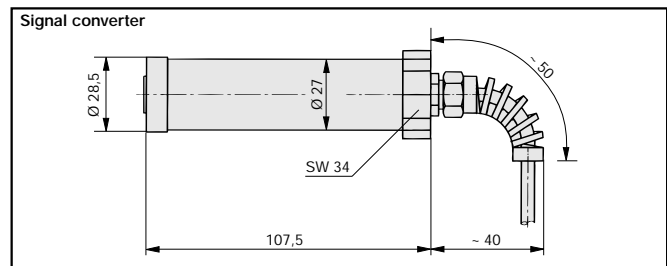
Type	SFM-015	SFM-060	SFM-300	SFM-600
A	22,5	26,5	30,5	33
B	31,5	38	50	62,5
D	58,5	57,5	57,5	57,5
L	120	129	149	173
H	37,5	46	56	63,5

Dimensions in mm

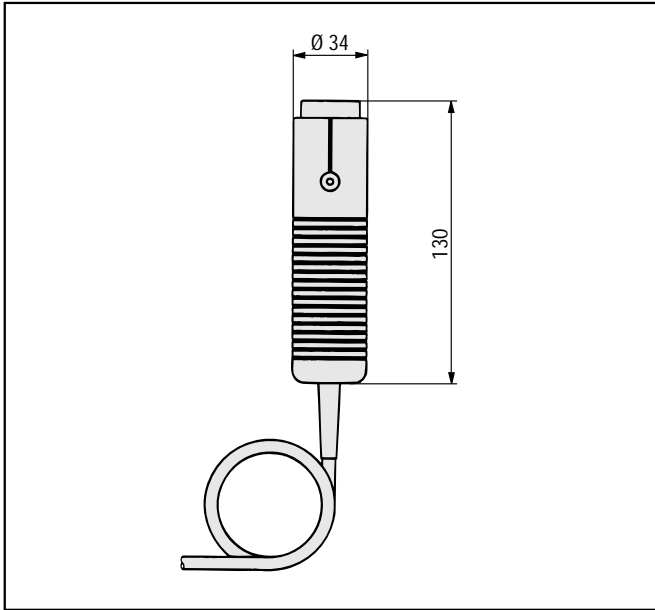
Signal Converter

The signal converter must be used for the connection of the flow turbine, and is supplied with each turbine. Flow turbine and signal converter are a coordinated unit. This unit must not be changed at all later on. In order to connect the signal converter with the PPC 04, the SFM-04 cable must be used. This cable does not belong to the supply schedule of the flow turbine.

Input	10...2000 Hz, 10...100 mVss
Output	0...3 V and sensor recognition
Accuracy	$\leq 0,3\%$ FS
Response time	approx. 200 ms
Working temperature	0...+60°C
Storage temperature	-20...+80°C
Supply voltage	+7...+15 V DC
Current consumption	approx. 8 mA
Electrical connection	Turbine end: cable (0,4 m) connected to signal converter with 5 pin plug connection to hand-held unit: cable SFM-04 (2 m)
Material of housing	stainless steel 1.4301
Weight	approx. 200 g



Rotational Speed Sensor SDS-04



Rotational speed measurement (RPM) is made possible with the use of the SDS 04 non-contact sensor. Speed measurement is achieved by using a photoelectric cell, which counts revolutions using a reflecting strip or marking on the rotating surface, thus resulting in a high level of accuracy.

Additionally a contact sensor is available. A mechanical contact adaptor is connected to the speed sensor, which is then held onto the rotating surface during measurement, also resulting in a high level of accuracy.

When used with particularly small surfaces, accurate speed measurements may be more readily obtained by using a special focussing adaptor.

Lengthening of the SVK 04 cable could result in inaccurate speed measurement and should be avoided. The standard cable length of 3 m, fixed to the sensor should not be altered for best results.

Technical Data

Input

Measuring range 20...10.000 RPM
 Measuring distance 25...600 mm
 Measuring angle $\pm 45^\circ$
 Measurement optical, red LED

Output

Output signal 0...3 V DC \triangleq 0...10.000 RPM
 Accuracy <0.5 %
 Resulotion ± 5 RPM
 Supply voltage 7...9 V DC (of the PPC 04)

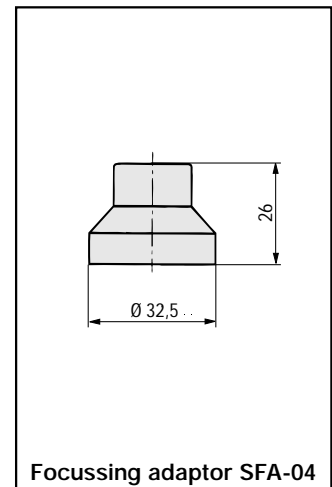
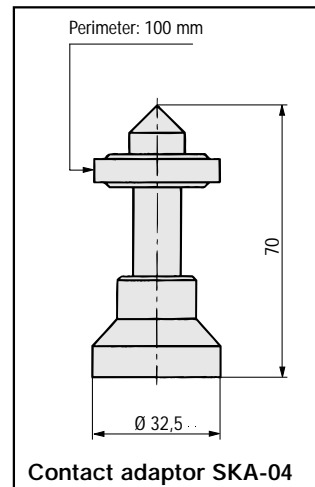
Electrical connection

Cable connected to the sensor lenght 3 m, round plug (extension cable not recommended)

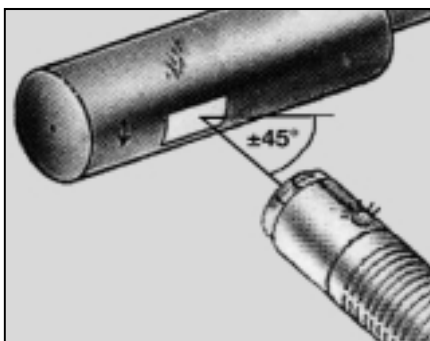
General

Material ABS
 Dimensions D= \varnothing 34, L=130 mm (without adaptor)
 Weight approx. 230 g

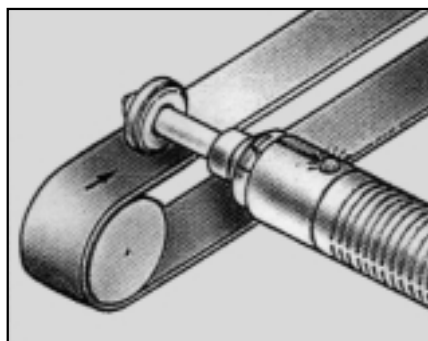
Accessories



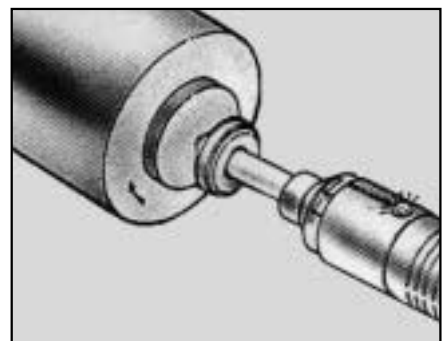
Applications



App. 1 – rotating shaft non-contact RPM



App. 2 – tangent RPM with contact adaptor



App. 3 – front-side RPM with contact adaptor

Thermoprinter PR PPC (for PPC 04 - AP only)

The thermoprinter PR PPC allows the recording of important hydraulic parameters such as maximum, minimum and current values, following a pre-set transmission interval from 1 to 100 s.

The power-off mode of the PPC 04 is switched off during long-period measuring. The thermoprinter PR PPC is powered by an external power supply KNG PR PPC to which the PPC 04 - AP can be connected as well.

All data measured by the PPC 04 - AP is transferred by a dirt-insensitive optical data transmission in conjunction with the glass fibre cable SDK-04.

PC-connection (PPC 04 - AP)

The PPC 04 - AP can also be connected to any PC by using the glass fibre cable (SDK - 04) and an auxiliary adaptor (SPA - 04). Together with the PC-adaptor, we supply a data record program for the measuring values, which is compatible to Microsoft Windows 3.1X, Windows 95 and Windows NT. All data can be displayed on a PC-screen, and it can be stored in Microsoft Excel.

Extension cable SVK-04

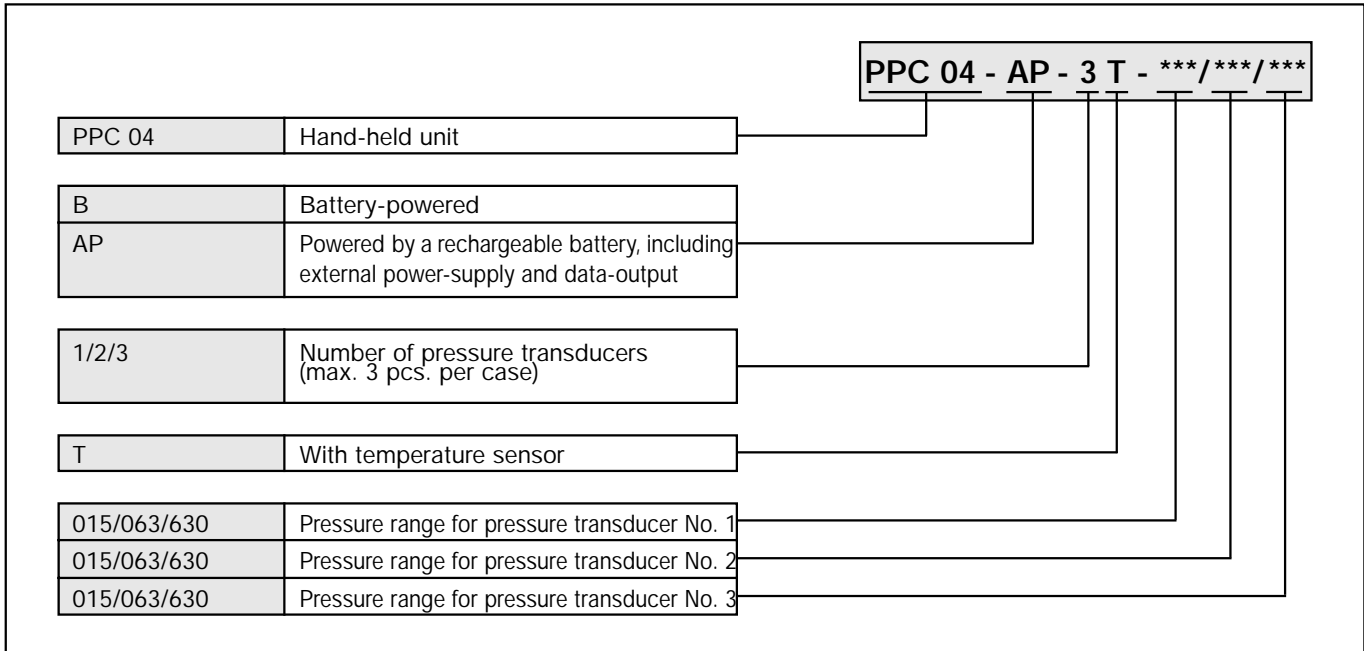
An extension cable can be supplied for all sensors, except the rotational speed sensor. Its length is 3 m. Accordingly, there is a maximum overall cable length of 5 m.



PPC 04 kits are supplied with a plastic case including foam inserts which provides room for the following components:

- 1 hand-held unit
- 1 external power supply
- 3 pressure transducers c/w STAUFF Test 20 adaptors
- 1 temperature sensor with straight fitting SGV-16 S-G
- 3 adaptors for STAUFF Test 15 / 12 / 10 (supplied with each PPC 04 kit)
- 1 operating instruction

Order Code for PPC 04 kits



In order to measure differential pressure two (2) transducers of the same pressure range have to be used.

Components

Description	Order Code
Hand-held unit with block battery Hand-held unit with rechargeable battery and data output External power supply ... input voltage 220 V or 110 V Rechargeable battery for PPC 04 - AP	HAG PPC 04 - B HAG PPC 04 - AP KNG-04 - *** V Akku - 9V
Pressure transducer; connection G ^{1/2} A *** = pressure range 015, 063 or 630 (bar) Pressure transducer c/w STAUFF Test 20 adaptor *** = pressure range 015, 063 or 630 (bar) STAUFF Test 20 adaptor for pressure transducer STAUFF Test 20 / STAUFF Test 15 adaptor STAUFF Test 20 / STAUFF Test 12 adaptor STAUFF Test 20 / STAUFF Test 10 adaptor	PTD *** PTD *** / SDA SDA 20 - G ^{1/2} SAD 20/15 - P SAD 20/12 - P SAD 20/10 - P
Temperature sensor (w/o straight fitting) Straight fitting 16 S with M 10 x 1 port connection for temp. sensor (Other dimensions on request)	TS-04 SGV - 16S - G
Plastic case c/w foam inserts	case PPC 04
Flow-turbine c/w signal converter *** = flow rate 015, 060, 300 or 600 (l/min) Connecting cable PPC 04 - signal converter	SFM - *** cable SFM - 04
Rotational speed sensor Contact adaptor Focussing adaptor	SDS - 04 SKA - 04 SFA - 04
Thermoprinter External power supply for thermoprinter PR PPC (110 V / 220 V change-over switch) Glass fibre cable PPC 04 - thermoprinter / PC-adaptor PC-adaptor to connect glass fibre cable to PC Paper for thermoprinter PR PPC	PR PPC KNG PR PPC SDK - 04 SPA - 04 SPR PR PPC
Plastic case with foam inserts (without printer) Plastic case with foam inserts (with printer)	case PPC-04 case PPC PR
Extension cable for sensors, lenght = 3 m	SVK-04