

CLAMPS

TEST

DIAGTRONICS

FILTRATION

ACCESSORIES

BALL VALVES



Local Solutions for Individual Customers Worldwide

## Stauff Diagtronics

Stauff provides you with a broad range of electrical and mechanical diagnostic products, which can be used to measure the key parameters of your hydraulic system - contamination, pressure, temperature and flow.

### [SPG & WPG PRESSURE GAUGES](#)

#### [SPG063-DIGI MINITESTER](#)

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## Specifications

- Glycerine Filled for Accuracy
- Copper Alloy Bourden Tube
- Dual Scales
- Built in Relief Valve
- Operating Temperatures  
Ambient -4°F to 140°F (-20°C to 60°C)  
Media 140°F (+60°C)
- Acrylic Lens
- Accuracy + 1.5% of Full Scale
- Built in Snubber

## Options

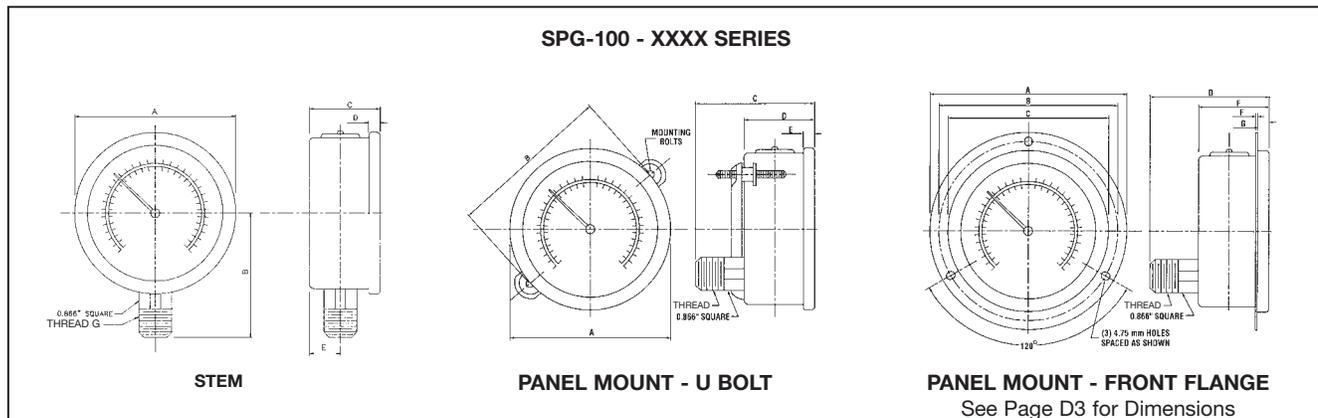
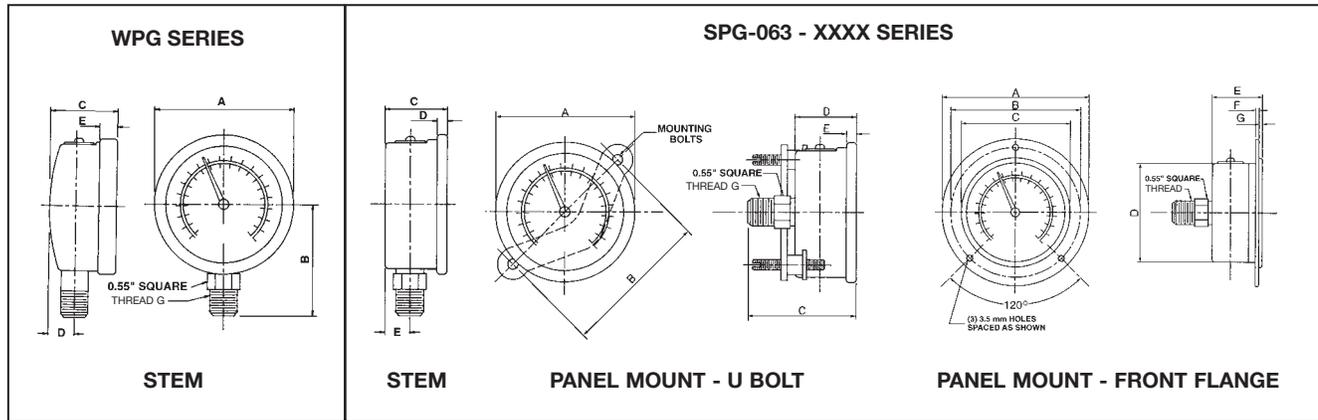
- 2 1/2" or 4" Diameter Available
- Forged Brass Case Available in 2 1/2" Version.
- Stainless Steel Case Available in 2 1/2" and 4" Version.
- Front Flange
- Rubber Protective Cover Available for SPG-063 Series Only
- Custom Dials & Pressure Gauges Available on Special Request.
- 7/16"-20 SAE Thread Available on Popular Ranges of SPG-063 Series



Protective Gauge Cover - SPG63 Series



## Dimensions

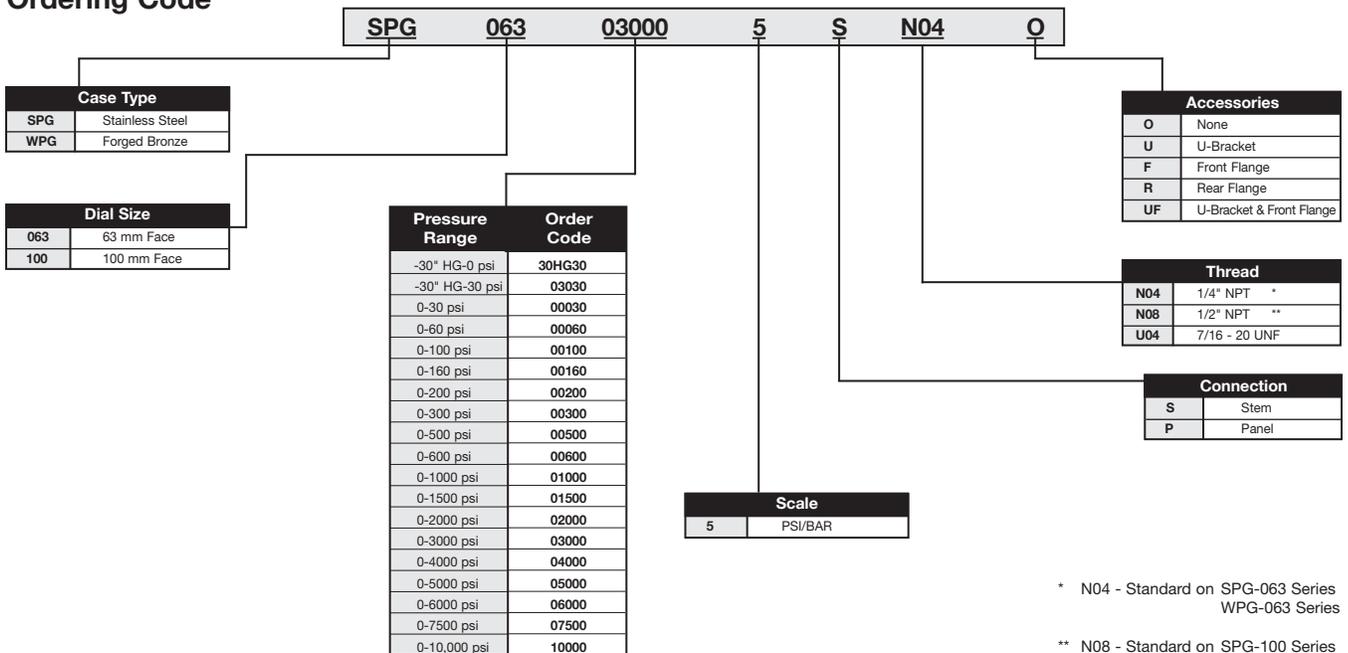


## Standard Stock Pressure Ranges

	SPG 063 Series STEM		SPG 063 Series PANEL		SPG 100 Series STEM	SPG 100 Series PANEL	WPG 063 Series STEM
	NPT	SAE	NPT	SAE			
-30" Hg - 0 PSI	•						
-30" Hg - 30 PSI	•		•				•
0 - 30 PSI	•	•					•
0 - 60 PSI	•		•				•
0 - 100 PSI	•						
0 - 160 PSI	•	•	•				•
0 - 200 PSI	•						
0 - 300 PSI	•		•	•	•	•	•
0 - 500 PSI	•						
0 - 600 PSI	•	•	•		•	•	•
0 - 1000 PSI	•	•	•		•	•	•
0 - 1500 PSI	•	•	•		•	•	•
0 - 2000 PSI	•	•	•		•	•	•
0 - 3000 PSI	•	•	•	•	•	•	•
0 - 4000 PSI	•		•				
0 - 5000 PSI	•	•	•	•	•	•	•
0 - 6000 PSI	•		•				•
0 - 7500 PSI							•
0 - 10000 PSI	•	•	•		•	•	

Series	Style	Size	A	B	C	D	E	F	G	
SPG	STEM MOUNT	2 1/2"	in 2.5 mm 63	2.1 53	1.2 31	0.51 13	0.26 6,5	-	1/4 NPT 7/16 - 20 UNF	
	PANEL MOUNT U-BOLT	2 1/2"	in 2.5 mm 63	2.8 72	2.4 62	1.2 31	0.26 6,5	-	1/4 NPT 7/16 - 20 UNF	
	PANEL MOUNT FRONT FLANGE	2 1/2"	in 3.3 mm 85	2.9 75	2.5 63	2.44 62	1.2 31	0.08 2	1/4 NPT 7/16 - 20 UNF	
	STEM MOUNT	4"	in 4.2 mm 107	3.4 86	1.85 47	0.3 7.5	0.64 16,3	-	1/2 NPT	
	PANEL MOUNT U-BOLT	4"	in 4.2 mm 107	4.25 108	3.15 80	1.85 47	0.3 7,5	-	1/2 NPT	
	PANEL MOUNT FRONT FLANGE	4"	in 5.2 mm 132	4.7 118	4.2 107	3.15 80	1.85 47	0.05 1,25	1/2 NPT	
	WPG	STEM MOUNT	2 1/2"	in 2.5 mm 63,5	2.13 54	1.5 38	0.44 11	0.50 12,2	-	1/4 NPT

## Ordering Code



## Adjustable Gauge Fitting EMV

G <sub>1</sub>	G <sub>2</sub>	H	SW	Order No.	
				BURA-N	VITON
G <sub>1</sub> /4	G <sub>1</sub> /4	42	19	EMV-G <sub>1</sub> /4-P-OR-PC	EMV-G <sub>1</sub> /4-V-OR-VC
G <sub>1</sub> /4	G <sub>1</sub> /2	47	19	EMV-G <sub>1</sub> /4/G <sub>1</sub> /2-P-OR-PC	EMV-G <sub>1</sub> /4/G <sub>1</sub> /2-V-OR-VC
G <sub>1</sub> /2	G <sub>1</sub> /4	51	27	EMV-G <sub>1</sub> /2/G <sub>1</sub> /4-P-OR-PC	EMV-G <sub>1</sub> /2/G <sub>1</sub> /4-V-OR-VC
G <sub>1</sub> /2	G <sub>1</sub> /2	55,5	27	EMV-G <sub>1</sub> /2-P-OR-PC	EMV-G <sub>1</sub> /2-V-OR-VC

## Complete Kits

Stauff-Test pressure monitoring kits are available pre-assembled with an assortment of our most popular components. Everything required for instant pressure checking is included in one rugged box. Gauges are safely nestled in the Ethafoam® cushion and hoses fit neatly in the lid.

DIAGNOSTICS

### SINGLE GAUGE KIT SMB-A1

1 60 inch Hose Assembly	SMS20-060-B
1 Direct Gauge Adaptor	SMD20-1/4 NPT-V
1 Union	SSV20/20
1 7500 PSI Gauge	WPG 63-7500 S
2 1/8 NPT Pressure Test Coupling	SMK20-1/8 NPT-VD
3 1/4 NPT Pressure Test Coupling	SMK20-1/4 NPT-VD
2 7/16 UNF Pressure Test Coupling	SMK20-7/16 UNF-VE
2 9/16 UNF Pressure Test Coupling	SMK20-9/16 UNF-VE
1 1/4 NPT Female QD Fitting	SQD-04NF-C



### DOUBLE GAUGE KIT SMB-B1

1 60 inch Hose Assembly	SMS20-060-B
2 Direct Gauge Adaptor	SMD20-1/4 NPT-V
1 Union	SSV20/20
1 7500 PSI Gauge	WPG 63-7500 S
1 1000 PSI Gauge	WPG 63-1000 S
2 1/8 NPT Pressure Test Coupling	SMK20-1/8 NPT-VD
2 1/4 NPT Pressure Test Coupling	SMK20-1/4 NPT-VD
1 7/16 UNF Pressure Test Coupling	SMK20-7/16 UNF-VE
1 9/16 UNF Pressure Test Coupling	SMK20-9/16 UNF-VE
1 1/4 NPT Female QD Fitting	SQD-04NF-C



### TRIPLE GAUGE KIT SMB-C1

2 60 inch Hose Assembly	SMS20-060-B
3 Direct Gauge Adaptor	SMD20-1/4 NPT-V
2 Union	SSV20/20
1 -30" Hg-0-30 PSI Gauge	WPG 63-3030 S
1 7500 PSI Gauge	WPG 63-7500 S
1 1000 PSI Gauge	WPG 63-1000 S
2 1/8 NPT Pressure Test Coupling	SMK20-1/8 NPT-VD
2 1/4 NPT Pressure Test Coupling	SMK20-1/4 NPT-VD
1 7/16 UNF Pressure Test Coupling	SMK20-7/16 UNF-VE
1 9/16 UNF Pressure Test Coupling	SMK20-9/16 UNF-VE
1 1/4 NPT Female QD Fitting	SQD-04NF-C



Custom Kits are easily supplied to your specific needs. OEMs in particular find this convenient for technicians and as an aftermarket service tool. Custom labels, foam inserts and boxes are available in quantity.

The new STAUFF SPG-DIGI digital pressure gauge continuously measures and displays in-line pressure as well as capturing and displaying minimum and maximum pressure readings. Typical accuracy is 0.5 % of full scale. The unit can be supplied individually or as part of a Pressure Test Kit.



## Dimensions

- Diameter  $\varnothing 80$  mm (3.15 inch)
- Thickness 33 mm (1.3 inch)

## Display

- Text-Display 4 1/2-digit  
Dimension : 50 x 34 mm  
(1.97 x 1.34 in)
- Text Height: 15 mm (0.59 in)
- Available Units: Bar, PSI, Mpa, kPa, mbar
- "Bar-Graph-Scale" c/w drag indicator
- Back lighted
- Battery Life-Display



## Specifications

- Measures inline pressure
- $\pm 0.5$  % FS\* accuracy
- Measurement of pressure peaks at 10ms intervals
- Operating temperature :  $-10^{\circ}\text{C} \dots 50^{\circ}\text{C}$  (14...122 $^{\circ}\text{F}$ )
- Ambient temperature :  $-20^{\circ}\text{C} \dots 80^{\circ}\text{C}$  (-4...176 $^{\circ}\text{F}$ )
- Back lighted display
- Battery-life indicator 1500 hours (2 x 1.5 V battery)
- Pressure Connection G 1/4 BSPP or 7/16-20 UNF (stainless steel)
- Zinc die cast housing with TPE protective cover
- Adapter is steel with zinc-plating
- Protection class : EN60529 - IP67

\* FS = Full Scale

## Display and Functional Description

- 1 - "Bar-Graph"-Display, actual and maximum pressure (Peak-Hold-function)
- 2 - Actual value display (height 15mm, 0.59 inch)
- 3 - Battery-Life indicator
- 4 - MIN/MAX- or Full Scale-display

- Turns back light on/off

- Changes between Min/Max- and Full Scale-Display

- MENU : Auto-POWER-OFF, choice of units ZERO-Function

- RESET : deletes measured values (MIN/MAX) OK : confirm selected inputs

## Ordering Code and Technical Data

### SPG-DIGI-B0100-U-CAL

Type	
SPG	STAUFF Pressure Gauge

Display	
DIGI	Digital Display

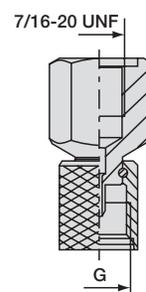
Pressure Range			
Code	Measuring Range	Overload	Burst Pressure
B0016	-1...16 bar (-14.5...230 PSI)	40 bar (580 PSI)	50 bar (725 PSI)
B0100	0...100 bar (0...1450 PSI)	200 bar (2900 PSI)	800 bar (11600 PSI)
B0400	0...400 bar (0...5800 PSI)	800 bar (11600 PSI)	1700 bar (24650 PSI)
B0600	0...600 bar (0...8700 PSI)	1200 bar (17400 PSI)	2200 bar (31900 PSI)

Connection	
B	G 1/4 BSP
U	7/16-20 UNF*

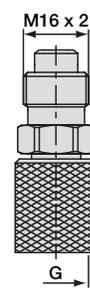
Calibration	
	Without calibration
CAL	With calibration

\* Standard

## Additional Adapter

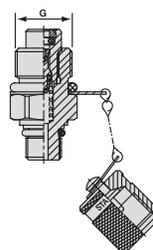


**Adapter SDA**  
Connection pressure gauge with a test point



**Adapter SAD**  
Only in conjunction with adapter SDA20-G1/4, connection with other test point series / threads

For more information about adapters and test points see TEST SECTION of this catalog.



Test Point

Adapter	Adaption from	To Dim. G
SDA20-7/16" UNF	7/16 UNF	M16x2
SDA15-7/16" UNF	7/16 UNF	M16x1,5
SDA12-7/16" UNF	7/16 UNF	S12,65x1,5
SAD20/15-V	M16x2	M16x1,5
SAD20/12-V	M16x2	S12,65x1,5
SAD20/10-V	M16x2	Plug

## MODELS FROM 300 PSI TO 15,000 PSI

The SPT pressure transmitters use a thin film sensor for pressure ranges 300 PSI to 15,000 PSI.

The model features a highly stable, temperature compensated, conditioned output signal. As an option for additional reliability, 3-wire voltage current output circuits are protected from electromagnetic interference as specified by international standard IEC 801.

With a stainless steel case and compact design, STAUFF SPT pressure transmitters provide a high performance sensor package featuring excellent vibration resistance and long service life. OEM applications include hydraulics, pneumatics HVAC compressor control, machine tools, robotics and off road equipment.

Input 10-30 VDC  
Output 4-20 mA

Note: \* Maximum pressure, causing no permanent changes in specifications but may lead to zero and span shifts.  
\*\* Burst pressure, leading to permanent changes in specifications (i.e. zero offsets) or destruction of the transmitter.

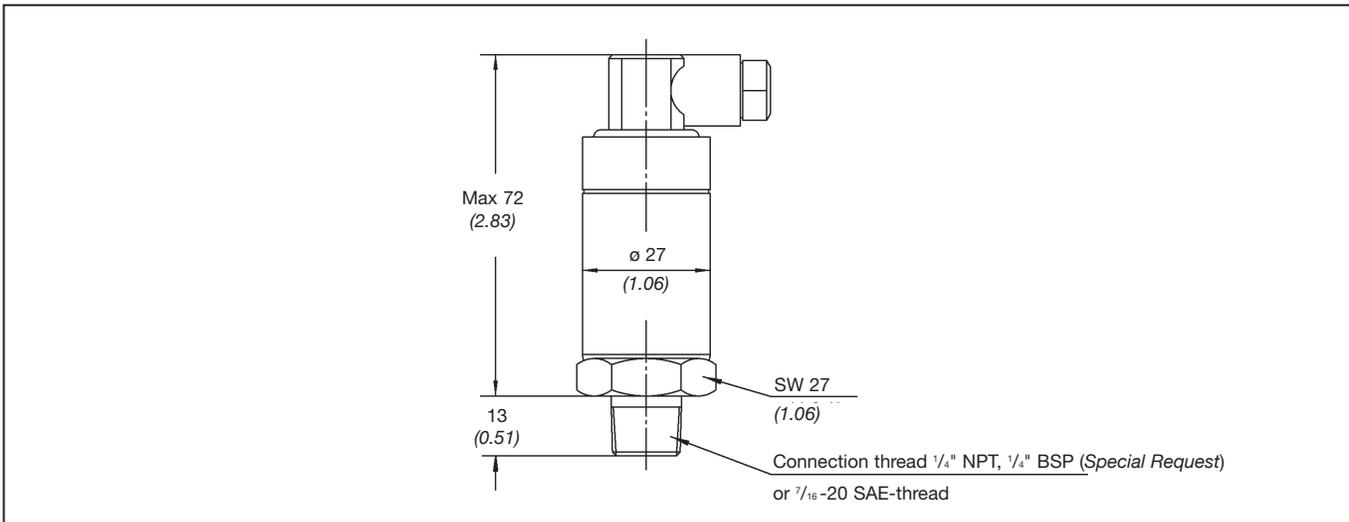


### Features:

- Thin film sensor
- Rugged stainless steel body
- Compact size
- Work pressure up to 1000 bar (15000 PSI)
- Highly stable
- Temperature compensated
- Protected against reverse polarity, short circuit output and suppressor diode for high voltage protection
- Connections available BSP, NPT and SAE (male)
- Protection class (IP 65 / NEMA 5)
- Input 10-30 VDC
- Output 4...20mA

### DIN 43 650 miniature L-plug

All dimensions in mm (inch)



## DIMENSIONS & ORDERING CODE

### Ordering Code - Standard Ranges - SPT\* Series

Code	Pressure Range	Maximum Pressure**	Burst Pressure ***
B0010	0-10 bar (0-145 PSIG)	35 bar (507 PSI)	42 bar (609 PSI)
B0016	0-16 bar (0-232 PSIG)	80 bar (1160 PSI)	96 bar (1392 PSI)
B0025	0-25 bar (0-363 PSIG)	50 bar (725 PSI)	96 bar (1392 PSI)
B0040	0-40 bar (0-580 PSIG)	80 bar (1160 PSI)	400 bar (5800 PSI)
B0060	0-60 bar (0-870 PSIG)	120 bar (1740 PSI)	550 bar (7980 PSI)
B0100	0-100 bar (0-1450 PSIG)	200 bar (2900 PSI)	800 bar (11600 PSI)
B0160	0-160 bar (0-2320 PSIG)	320 bar (4640 PSI)	1000 bar (14500 PSI)
B0250	0-250 bar (0-3630 PSIG)	500 bar (7250 PSI)	1200 bar (17400 PSI)
B0400	0-400 bar (0-5800 PSIG)	800 bar (11600 PSI)	1700 bar (24650 PSI)
B0600	0-600 bar (0-8700 PSIG)	1200 bar (17400 PSI)	2400 bar (34800 PSI)
B1000	0-1000 bar (0-14500 PSIG)	1500 bar (21750 PSI)	3000 bar (43500 PSI)
<b>P00300</b>	<b>0-300 PSIG (0-20 bar)</b>	<b>725 PSI (49 bar)</b>	<b>3625 PSI (247 bar)</b>
P00400	0-400 PSIG (0-27 bar)	725 PSI (49 bar)	3625 PSI (247 bar)
P00500	0-500 PSIG (0-34 bar)	1160 PSI (79 bar)	5800 PSI (395 bar)
<b>P00600</b>	<b>0-600 PSIG (0-34 bar)</b>	<b>1160 PSI (79 bar)</b>	<b>5800 PSI (395 bar)</b>
P01000	0-1000 PSIG (0-68 bar)	1740 PSI (118 bar)	7975 PSI (543 bar)
<b>P01500</b>	<b>0-1500 PSIG (0-102 bar)</b>	<b>2900 PSI (197 bar)</b>	<b>11600 PSI (789 bar)</b>
P02000	0-2000 PSIG (0-136 bar)	2900 PSI (197 bar)	11600 PSI (789 bar)
<b>P03000</b>	<b>0-3000 PSIG (0-204 bar)</b>	<b>7250 PSI (493 bar)</b>	<b>17400 PSI (1184 bar)</b>
<b>P05000</b>	<b>0-5000 PSIG (0-340 bar)</b>	<b>11600 PSI (789 bar)</b>	<b>24650 PSI (1677 bar)</b>
<b>P07500</b>	<b>0-7500 PSIG (0-510 bar)</b>	<b>17400 PSI (1184 bar)</b>	<b>34800 PSI (2367 bar)</b>
P10000	0-10000 PSIG (0-680 bar)	17400 PSI (1184 bar)	34800 PSI (2367 bar)
P15000	0-15000 PSIG (0-1020 bar)	21750 PSI (1480 bar)	43500 PSI (2959 bar)

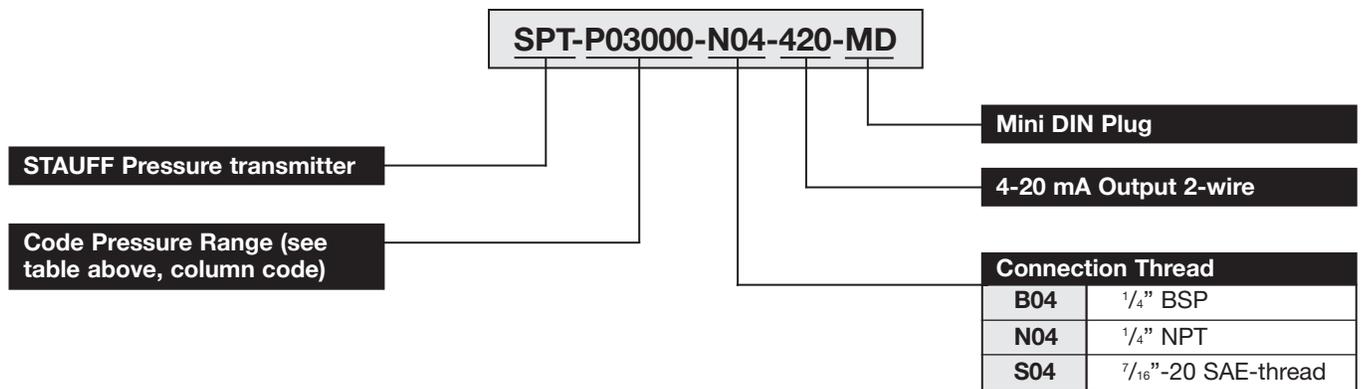
**Note:** \* Bold Print denotes Standard Stocking Program

\*\* Maximum pressure, causing no permanent changes in specifications but may lead to zero and span shifts.

\*\*\* Burst pressure, leading to permanent changes in specifications (i.e. zero offsets) or destruction of the transmitter.

Consult factory for availability on "B" options

### Ordering Code

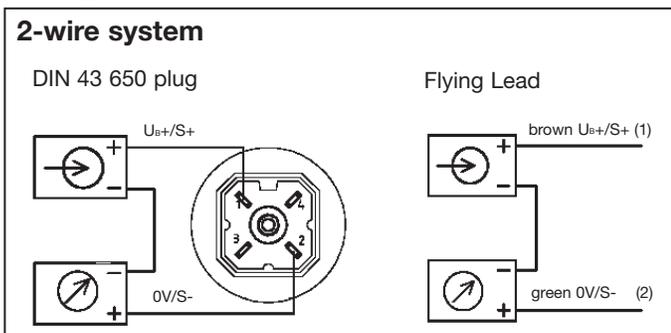


## SPECIFICATIONS

Specifications	
Sensing principle Pressure reference	thin film, relative pressure {absolute reference to 250 PSIA}
<b>Pressure connection</b>  <b>Material:</b> - wetted parts - case - internal transmitting liquid	1/4 NPT male 1/4 BSP male 7/16 - 20 SAE male  1.4571 and 1.4542 stainless steel (316 SS and PH17-4 SS) 1.4301 stainless steel (304 SS) silicone oil piezoresistive sensors to 20 bar (300 PSI), {halocarbon oil or oxygen service}, no liquid fill used for thin film sensors > 20 bar (300 PSI)
<b>Supply Voltage U<sub>s</sub></b>  Output and load limitations: Output signal and maximum load  Upper cutoff frequency Response time (10...90%)	10-30 DC Volts  4-20 mA 2-wire system    RA [Ohm] < (U [V] - 10V) / 0.02 A  150Hz < 1 milliseconds
<b>Accuracy</b> (linearity, including hysteresis and repeatability)  Repeatability Hysteresis  1 year stability	≤ 0.50% of span (B.F.S.L.)  ≤ 0.05% of span ≤ 0.1% of span  ≤ 0.2% of span (under reference conditions)
<b>Temperature</b> Media Ambient Storage Compensated range  Temperature error (reference 21°C (70°F)) on zero point on span	-30°C to +85°C (-22°F to +185°F) -30°C to +85°C (-22°F to +185°F) -40°C to +100°C (-40°F to +212°F) 0°C to +80°C (+32°F to +176°F)  < 0.3% of span per 10°C (18°F) change < 0.2% of span per 10°C (18°F) change
<b>CE conformity</b>	89/336/EWG Interference emission and immunity according to EN61326 97/23/EWG Pressure equipment directive
<b>Shock resistance</b> <b>Vibration resistance</b>	1000g according to IEC 60068-2-27 50g according to IEC 60068-2-6
<b>Electrical connection</b>  <b>Weight</b> <b>Dimensions</b>  <b>Electrical protection</b>  <b>Environmental protection</b>	4-pin miniature L-plug per DIN 43 650  approximately 0.1 kg (0.2lb) see drawing  protected against reverse polarity, short circuit, and overvoltage  IP 65 (NEMA 5) according to IEC 60529 with L-plug (4-pin)

## Electrical connections

### Wiring



### 2-wire system

Wire	Coding	DIN Plug	Wire Color
Supply +	UB+ / S+	pin1	Brown
Signal -	0V / S-	pin2	Green

## General

The Stauff Level / Temperature Switches (SLTS-series) are unique in their design and modularity. One of the greatest advantages is the ability of the end-user to adjust the switching level. The internal support wire carrying the level and temperature switches makes it a simple and quick job to change the level switch position. See the drawings on the next page for the max and min level switch points and the total available switching range. This design permits changing the level switch function from Normally Closed (NC) to Normally Open (NO). Mentioned stem lengths are standard. Custom lengths are available upon request.



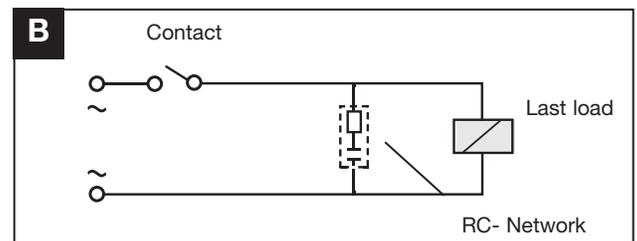
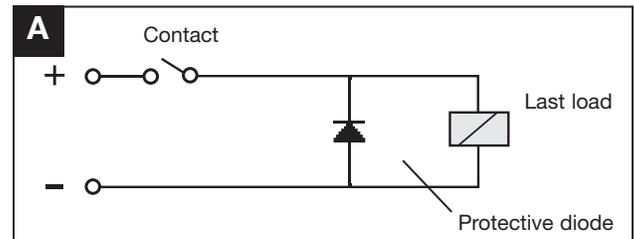
## Contact Life Time

Due to their design Reed contacts have a very high life expectancy. However, it is worthwhile to note the following information.

## Contact protection

To reduce the high reverse voltage produced when a reed switch opens, the following contact protection can be applied.

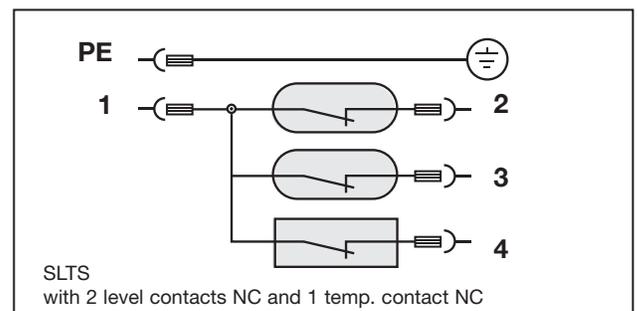
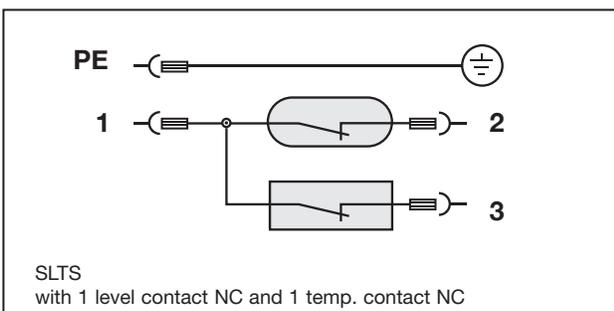
- DC voltage: a diode parallel to the load, see figure A
- AC voltage: an RC-network parallel to the load, see figure B and table below.



VA	10	25	50	75	100
<b>Open contact voltage V</b>	R/Ohm - C/μF				
24	22 - 0,022	1 - 0,1	1 - 0,47	1 - 1	1 - 1
48	120 - 0,0047	22 - 0,022	1 - 0,1	1 - 0,47	1 - 0,47
110	470 - 0,001	120 - 0,0047	22 - 22	22 - 0,047	22 - 0,1

## Wiring Diagram

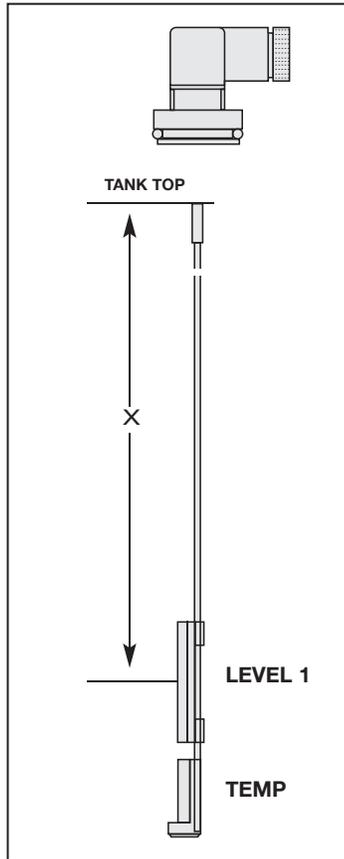
Please refer to the following connection diagrams and the relevant data in the specification sheets.



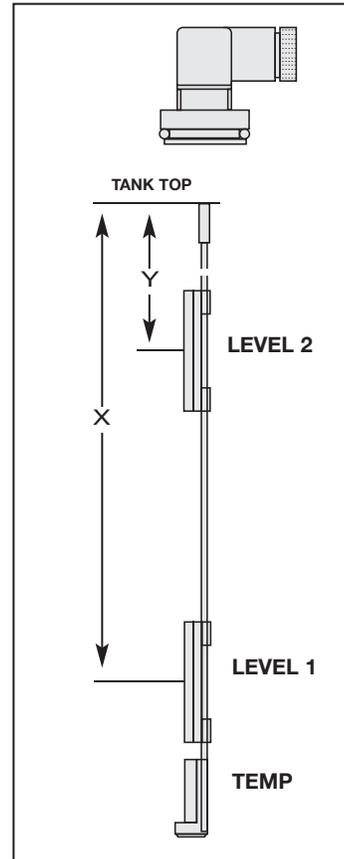
## DIMENSIONS & ORDERING CODE

Standard Factory Settings For Level Switch Position			
	Option 1: Low Level Only (from tank top to switch position)	Option 2: High and Low Level (from tank top to switch position)	
SLTS Type	X (in / mm)	X (in / mm)	Y (in / mm)
SLTS 12	10.5 / 266	10.5 / 266	2.6 / 66
SLTS 18	16.5 / 418	16.5 / 418	2.6 / 66

Option 1



Option 2



DIAGNOSTICS

### Ordering Code

**SLTS 12 - 140 - 2 - B12 - G115**

#### Type

**SLTS** Level-temperature switch

#### Stem Length

**12** 305 mm (12")

**18** 457 mm (18")

#### Switching temperature

**140** 60°C / 140°F

**158** 70°C / 158°F

**O** without temperature switch

#### Voltage (Volt AC/DC)

**G115** 115 Volt max  
(for thread N16 only)

#### Thread

**B12** G<sup>3</sup>/<sub>4</sub> (on request)

**N16** 1 NPT (standard)

#### Number of Level Switches

**1** 1 level switch (L, H)\*

**2** 2 level switch (L, H)\*

\* please indicate level position(s): L = low, H = high



# Level-Temperature Switches SLTS Series

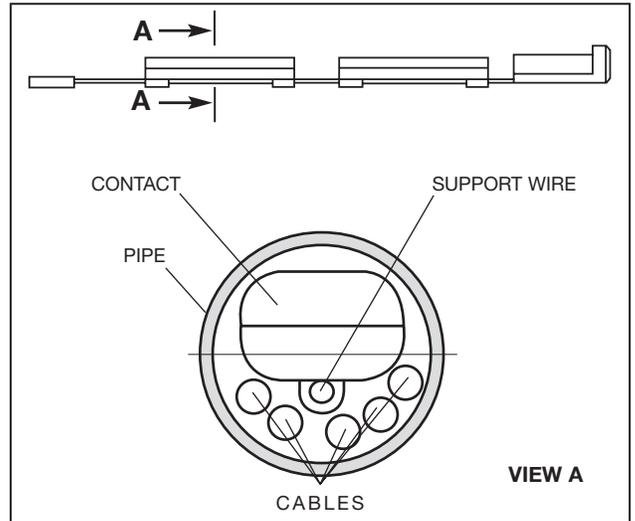
## SPECIFICATIONS

### Specifications

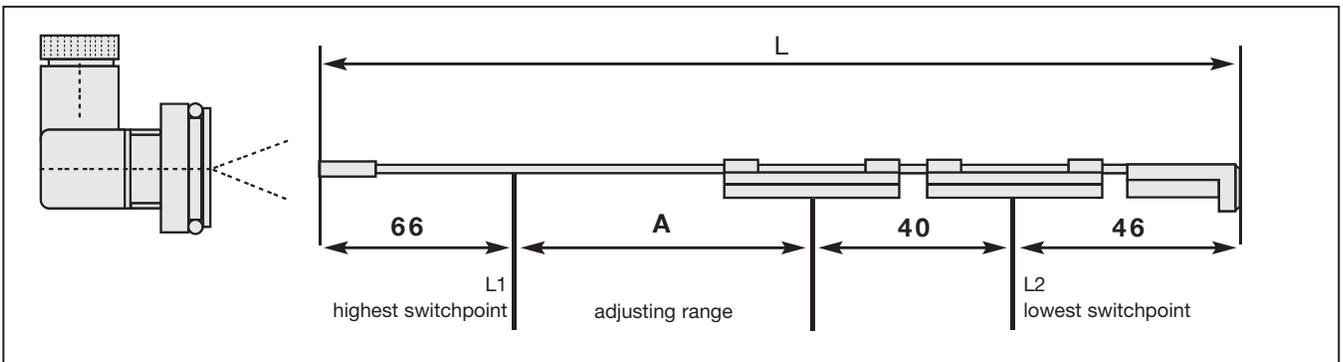
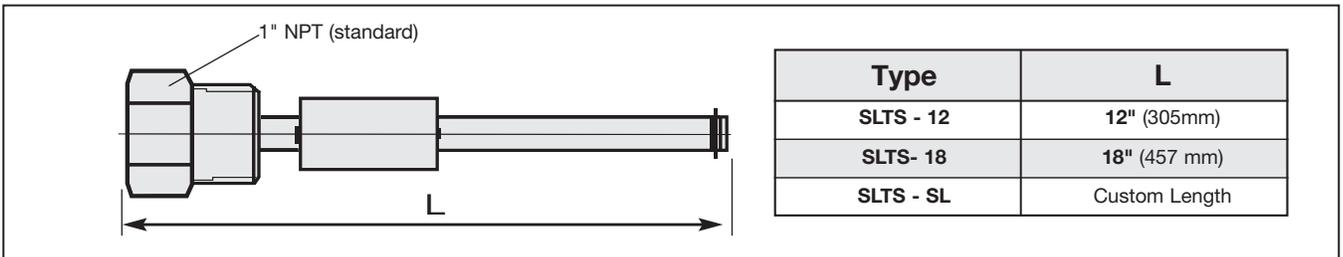
- Brass Stem, Plastic float
- Compatible with mineral oils and petroleum based fluids
- Switches normally closed (NC)
- Max. operating temp 176°F
- Max. operating voltage 115V
- Max. current level contact 0.5A
- Max. current temp contact 2.0A
- Contact load level contact 10VA
- Hysteresis 18°F

### Options

- Any combination of three level temperature contacts
- Easy adjustable switch level
- Wide range of temperature switches
- Custom sizes, configuration and materials available upon request



DIAGTRONICS



Type	L	A
SLTS - 12	12.3" (312mm)	6.3" (160mm)
SLTS - 18	18.3" (464 mm)	12.3" (312 mm)
SLTS - SL	Custom Length	Custom Range

The STAUFF PPC series of Hydraulic Testers are state-of-the-art instruments designed to diagnose certain variables in today's hydraulic and pneumatic systems like pressure, differential pressure, temperature, flow and hydraulic power. Depending on the type chosen, the STAUFF PPCs can analyze, store and process all data in a PC or notebook. The Hydraulic Testers are specially designed for today's increasing demands of system monitoring, trouble-shooting and determination of important values. The PPC units can be applied in the following wide range of applications :

- Industrial Hydraulics
- Mobile and Agriculture Hydraulics
- Marine and Offshore Hydraulics
- Chemical and Petrochemical Industry
- Energy and Air-condition Industry
- Sanitary Industry



The PPC-04 /2 is a very easy to handle mobile measuring device controlled by only 8 buttons and allows the connection of up to two sensors. The measured data is displayed on the double spaced screen as numeric values.

The larger PPC-06 / 08 / 12 Hydraulic Testers are available as three, four or six channel models having an internal data storage capability of up to 250,000 data points. The unit displays measurements not only as numeric values but also in graphic form.

The PPC-04 /2 series has been completely revised. The display is now a two-line display to monitor both connected sensors at one time. This new revision (marked with the "/2" in the designation) also now operates with the same sensors as the series PPC-06 / 08 / 12, this makes handling, connecting, and measuring easier, saving time and cost.

The table shown below gives you a short overview of the STAUFF Hydraulic Testers; you will find more detailed information on the pages dedicated to each unit.

## Hydraulic Tester

PPC-04 / 2	PPC-06 / 08 / 12
2 sensor inputs  Memory – function for minimum and maximum (MIN-/MAX) values	PPC-06: 3 sensor inputs Memory capacity for 60.000 data points  PPC-08: 4 sensor inputs Memory capacity for 125.000 data points  PPC-12: 6 sensor inputs Memory capacity for 250.000 data points
Display for numeric values	Display for numeric values and graphs
Download of numeric values to a PC	Download of numeric values and graphics (diagrams) to a PC
Battery or rechargeable battery and external power supply	Rechargeable battery and external power supply
External / Auxiliary sensors not possible	External / Auxiliary sensors possible
Description see pages D14 and D15	Description see pages D16 and D17

## Sensors

The sensors are compatible with the Hydraulic Testers PPC-04 / 2 and PPC-06 / 08 / 12	
Pressure & Temperature Transducer	Description see pages D19 and D20
Rotational Speed Sensor	Description see page D21
Flow Turbines and Meters	Description see pages D22 to D25
Only PPC-06 / 08 / 12-series : External / Auxiliary sensors for special measurements, see page D26	

## Hand-held measuring unit ideal for maintenance, service and commissioning of hydraulic systems.

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 /2.

### New revised model:

- Two-line display
- 5-pin-sensor input  
(now compatible with sensors of the PPC-06/08/12 series)
- "ZERO"-function



The portable measuring device PPC-04 /2 is controlled by 8 buttons enabling the user to easily obtain data on working pressure, peak pressure, differential pressure, temperature, flow and rotational speed.

The PPC-04 /2 provides two separate sensor inputs which automatically identify the sensor connected to it. The new two-line display now shows the values of both sensor inputs at one time. The unit and scale can be changed during use.

The PPC-04 /2 is insensitive to dirt and is designed to be used wherever hydraulic control and components are in use. The heavy duty rubber cover protects the unit from damage during use in extreme conditions. The PPC-04 /2 is powered either by a standard 9V battery (PPC-04-B /2), or by an integrated rechargeable battery (PPC-04-A/-AP /2).

Operation for an extended period of time is supported with the use of an AC power adaptor, which also charges the rechargeable-battery. With the RS-232 port (not for PPC-04-A /2 and PPC-04-B

/2) the PPC-04 /2 can be directly connected to the serial port of a PC or notebook. The PPC-04 /2-software is compatible with all Windows 3.1®, Windows 95®, Windows 98®, Windows NT® and Windows XP® operating systems.

PPC-04 /2-Kits are supplied complete with adapters to connect the unit to STAUFF Test 20/15/12 and STAUFF Test 10 test points, even under pressure. Temperature and Flow measurements are possible using Temperature Sensor PPC-04/12-TS or SFM flow turbines mounted in the hydraulic line. Rotational speed can be measured using the STAUFF PPC-04/12-SDS rotational speed sensor.

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

**Note !** This unit does not have internal data collection and logging capability.

## Hydraulic Tester PPC-04-B /2, PPC-04-A /2 and PPC-04-AP /2

<b>PPC-04-B /2</b>	Unit with replaceable battery
<b>PPC-04-A /2</b>	Unit with rechargeable battery
<b>PPC-04-AP /2</b>	Unit with rechargeable battery and data output

### Measurements:

- Pressure in bar and *PSI*
  - Temperature in °C and °F
  - Flow in l/min and *GPM (US)*
  - Rotational speed U/min and *RPM*
- Two-line LCD-Display (4-digit)  
Text height 8 mm (0.32 inch)
  - Automatic recognition and identification of sensors connected
  - Data output to transfer data to PC (PPC-04-AP /2 only)
  - Plastic ABS housing with protective rubber cover integrated with stand and carrying straps
  - Auto power off after 15 minutes

\* FS = Full Scale

### Power supply:

- External power supply 110/230 VAC (PPC-04-A/-AP /2 only)
- 9V / 110mA/h block battery IEC 6F 22
- PPC-04-B /2 operating time with rechargeable batteries 5 hours
- CAR-adaptor 24VDC (PPC-04-A/-AP /2) (optional)

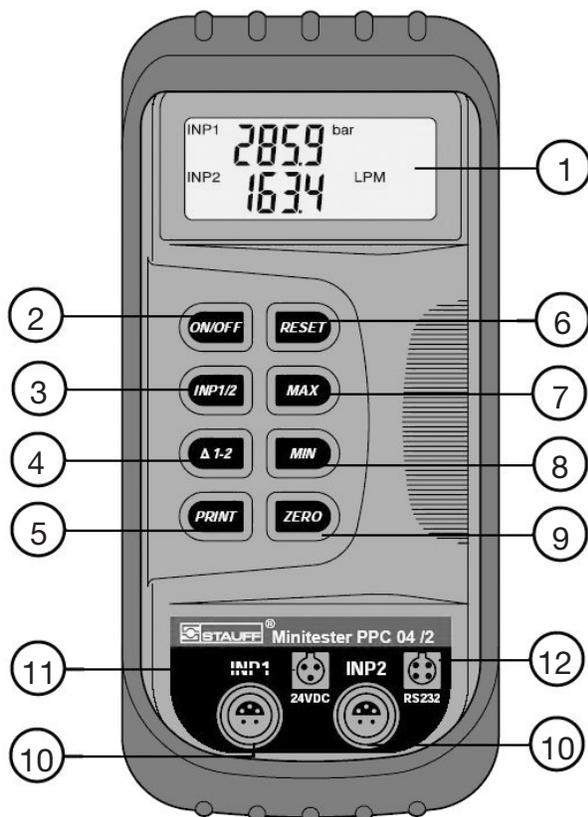
### Connections:

- Sensor input (5-pin)
- Automatic sensor identification
  - Input signal U = 0...3 VDC (R=470kΩ)
  - Scanning rate ≤ 2 ms
  - Accuracy < 0,3% FS ± 2 Digit
- Data output (4-pin, RS232-port)

### General:

- Temperature range 0...50°C (32...122°F)
- Storage Temperature -20...60°C (-4...140°F)
- Relative Humidity < 85%
- Protection Level EN60529 - IP54
- Dimensions L/W/H 145 x 70 x 40 mm (5.71 x 2.76 x 1.57 inch)
- Weight approx. 330 g (0.73 lbs.)

## Functional description PPC 04/2



1. **DISPLAY** Two-line LCD-display, display INP1 and INP2 or Δ P-value; battery status
2. **ON/OFF** Power on/off Switch
3. **INP 1/2** Selects whether meter will display measurement from Input 1 or Input 2
4. **Δ1-2** Displays the differential value of INPUT 1 minus INPUT 2
5. **PRINT\*** Sends displayed measurements to PC or notebook
6. **RESET** Resets minimum and maximum values to zero, calibration for Δp-measurement
7. **MAX** Displays the maximum value since meter was last reset or turned on. (f.e. pressure peak display)
8. **MIN** Displays the minimum value since meter was last reset or turned on
9. **ZERO** Zero-point adjustment
10. **INP1 / INP2** 5 pin sensor input
11. **24 VDC** External power supply or CAR-adaptor socket
12. **RS 232\*** Data output to transmit measured values to PC or notebook

\* only PPC-04-AP /2

- Measure Pressure, Temperature, Flow Rate, Frequency or Rotational Speed
- Integrated Data Storage
- Permanent Recording of Min/Max Values
- Menu-Driven Interface
- Automatic Recognition and Identification of connected Sensors
- Rugged Design
- Windows Compatible Software on CD-ROM
- RS-232-port for PC-connection
- Large, automatic scaling LCD-Display
- Online-data transfer



Type	Number of Sensor inputs	Data storage capacity up to ... data points
PPC-06	3	60,000
PPC-08	4	125,000
PPC-12	6	250,000

The PPC-06/08/12 Hydraulic Testers are state-of-the-art instruments designed to provide the latest in diagnostic evaluation of hydraulic and pneumatic systems. These units are available in either three, four or six channel models. Additional to the features of the PPC-04 /2-series the PPC-06/08/12 units have an integrated data storage for data recording and further processing.

The ergonomically designed case and large automatic scaling LCD display make it easy to use in even the most demanding environments.

The three different Hydraulic Testers PPC-06/08/12 differ in their data storage capacity, and in the number of sensor input ports (three, four or six channel model).

These hand held meters provide measurement and display of pressure, temperature, flow, differential pressure, as well as rotational speed. They are the perfect tools to capture diagnostic measurements at remote locations. Also new to these meters are the functions for calculating power and flow run-out. Permanent recording, a special trigger-function and the connection of auxiliary sensors are also additional features.

The PPC-06 Hydraulic Tester can store up to 60,000, the PPC-08 up to 125,000 and the top-of-the-line unit PPC-12 up to 250,00 data points. These measurements can be transferred directly to a PC via an RS-232 interface. The new PPC Software is compatible with all Windows 95®, Windows 98®, Windows NT® and Windows XP® operating systems and allows various data analysis and reports.

The PPC-06/08/12 units offer the latest in automatic sensor identification technology, eliminating the time consuming task of programming each individual sensor. This technology allows you to just plug in the sensor and you are ready to take measurements. The PPC-06/08/12 Hydraulic Tester will also allow you to program the individual inputs to accept other data collection formats, such as 4-20mA, 1-10 Volt or frequency.

Consult STAUFF for further details about the new PPC-06/08/12 Hydraulic Tester and kits.

## TECHNICAL DATA

### Hydraulic Tester PPC-06, PPC-08 and PPC-12

	Sensor input (5-pin)	Data storage capacity (number of data points)
PPC-06	3	60,000
PPC-08	4	125,000
PPC-12	6	250,000

#### Measurements:

- Pressure in bar and *PSI*
- Temperature in °C and °F
- Flow in l/min and *US GPM*
- Rotational speed in U/min and *RPM*
- Digital LCD-display 128x64 pixels
- Automatic character height scaling
- Automatic sensor identification
- Data output for data transfer to PC or notebook
- Reinforced polyamide glass material
- 11-key tactile touch membrane
- EMC Protection (EMV):
  - Electromagnetic interference  
DIN/EN 50081, Part 1
  - Immunity to emitted interference  
DIN/EN 50082, Part 2
- Auto power Off

#### Memory Functions:

- Variable storage rate
- Variable measuring period (2s ... 100h)
- Manual and automatic triggering

#### Power supply:

- Recharge circuit for use with external power supply
- Internal NiCd-rechargeable battery 7.2V / 700mAh
- Operating time with rechargeable batteries 5 hours

#### Connections:

##### Sensor input (5-pin)

- Automatic sensor identification
- Input signal U = 0...3 VDC (R = 470kΩ)
- Frequency input via input socket 13
- Frequency range 0.5 Hz ... 30 kHz
- Scanning rate < 1 ms
- Accuracy < 0.3 % FS\* ± 2 digit

##### Data output 4-pin, RS-232 interface (push/pull)

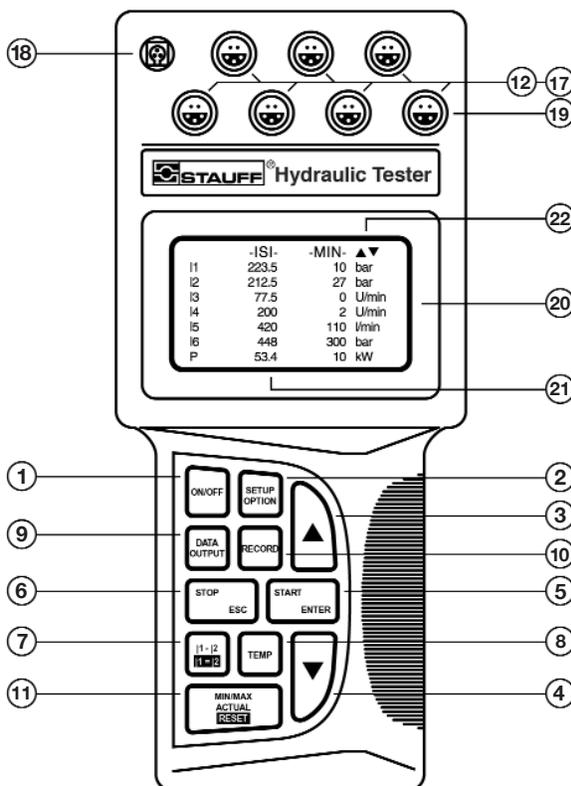
- Adjustable baud rate : 1200 ... 38400 PBS
- 8 data bits, 1 stop bit

#### General

- Temperature range 0 ... 50°C (32 ... 122°F)
- Storage temperature -20 ... 60°C (-4 ... 140°F)
- Relative humidity < 80%
- Protection class EN 60529 - IP54
- Dimensions L/W/H 235 x 106 x 52,5 mm  
(9.25 x 4.17 x 2.07 inch)
- Weight 700 g (1.54 lbs)

\* FS = Full Scale

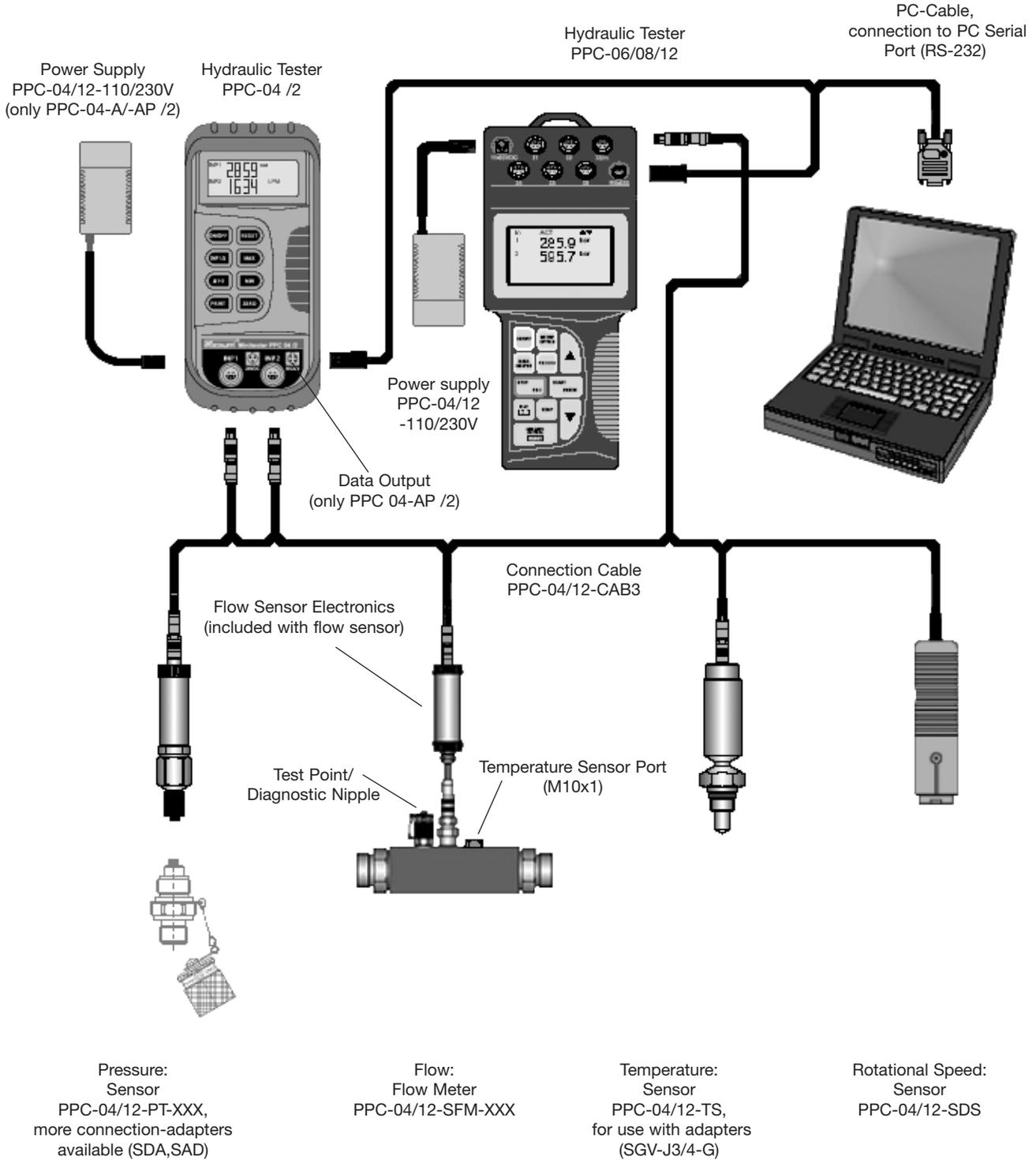
### Functional description PPC-06 / 08 / 12



- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 <b>ON/OFF</b></p> <p>2 <b>SETUP/OPTION</b></p> <p>3/4 <b>ARROWS</b></p> <p>5 <b>START/ENTER</b></p> <p>6 <b>STOP/ESC</b></p> <p>7 <b>I1-I2</b></p> <p>8 <b>TEMP</b></p> <p>9 <b>DATA-OUTPUT</b></p> <p>10 <b>RECORD</b></p> <p>11 <b>MIN/MAX/ACTUAL</b></p> <p><b>RESET</b></p> <p>12-17 <b>INPUT</b></p> <p>18 <b>EXTERNAL POWER SUPPLY 11-30 VDC</b></p> <p>19 <b>DATA OUTPUT</b></p> <p>20 <b>GRAPHIC LCD-DISPLAY</b></p> <p>21 <b>ADDITIONAL LINE</b></p> <p>22 <b>STATUS LINE</b></p> | <p>Turns unit on / off.</p> <p>Change system settings (date/clock, storage operation)</p> <p>Select line and function values.</p> <p>Change function values and start measurements.</p> <p>Stop or terminate functions.</p> <p>Differential value between input 1 and input 2.</p> <p>Zero adjustment (Tare-function)</p> <p>Displays the measured temperature values for all channels.</p> <p>Displays output to PC, or graphic display.</p> <p>To record and store measurements.</p> <p>Displays the minimum and maximum and actual values.</p> <p>Reset deletes values.</p> <p>Inputs for up to six sensors. (automatic sensor recognition)</p> <p>Input for external power supply and charging of internal battery.</p> <p>RS-232 port for connecting to the PC, or external trigger module.</p> <p>Displays measured values, adjustment menus and graphics.</p> <p>Displays the power or flow run out values.</p> <p>Shows the designation of the measured value or the menu name.</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Accessories Diagram PPC-04/06/08/12

DIAGNOSTICS



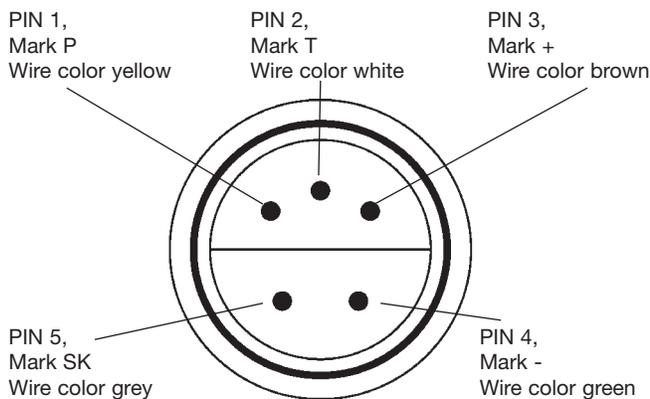
Sensor PPC-04/12-PT-XXX-CAB with adapter SDA20-G1/2



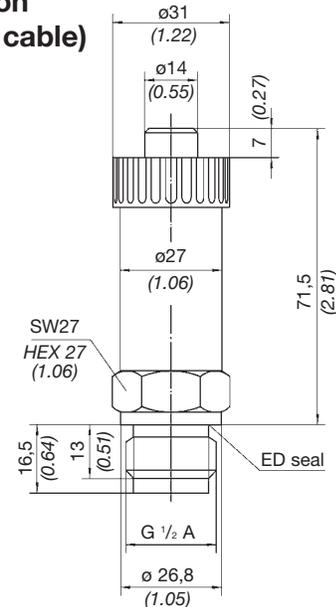
Sensor PPC-04/12-PT-XXX with adapter SDA20-G1/2



### Cable End (PIN Out)



### Dimension (without cable)



All dimensions in mm (inch)

DIAGTRONICS

### Technical Data

Type (Piezoresistive)	Sensor PPC-04/12-PT-015	Sensor PPC-04/12-PT-100	Sensor PPC-04/12-PT-400	Sensor PPC-04/12-PT-600
<b>Pressure range</b>	-1...15 bar (-15...210 PSI) (Relative)	0...100 bar (0...1450 PSI) (Absolute)	0...400 bar (0...5800 PSI) (Absolute)	0...600 bar (0...8700 PSI) (Absolute)
<b>Overload pressure</b>	20 bar (290 PSI)	150 bar (2175 PSI)	800 bar (11600 PSI)	1000 bar (14700 PSI)
<b>Burst pressure</b>	45 bar (650 PSI)	500 bar (7250 PSI)	1200 bar (17400 PSI)	1800 bar (26100 PSI)
<b>Hysteresis</b> ( $\pm\%$ FS* typ./max)	0,10/0,25	0,10/0,20	0,08/0,15	0,05/0,10
<b>Repeatability</b> ( $\pm\%$ FS* typ./max)	0,08/0,15	0,08/0,15	0,08/0,15	0,08/0,15
<b>Non-conformity</b> ( $\pm\%$ FS* typ./max)	0,25/0,50	0,25/0,50	0,25/0,50	0,25/0,50

#### Ambient Conditions

- Media temperature: -25...105°C (-13...221°F)
- Ambient temperature: -20...85°C (-4...185°F)
- Storage temperature: -40...125°C (-40...257°F)
- Compensated range: 0...85°C (32...285°F)

#### Voltage Requirement

- Excitation voltage: 7...12 VDC
- Current consumption:  $\leq 5$  mA

#### Output

- Output signal: U=0...3 VDC
- Temperature deviation:  $< \pm 0,03\%$  FS\*/°C
- Response time:  $< 1$  ms
- Long-term stability:  $< 0,2\%$  FS\*/a
- Service Life: 10 Million Cycles
- Max Shock load: IEC 68 2-29
- Characteristic curve deviation:  $< \pm 0,5\%$  FS\*

#### Connection

- Media application
- Transducer connection

#### Material

- Transducer/Diaphragm
- Coupler
- Seal

#### General

- Male Stud
  - Weight
- \* FS = Full Scale

gases, fluids (for use with aggressive media, please consult STAUFF) with adapter Stauff-Test 20 (M16x2), without adapter G 1/2A

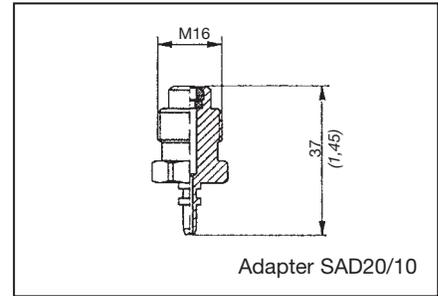
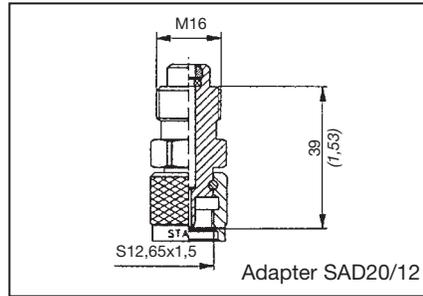
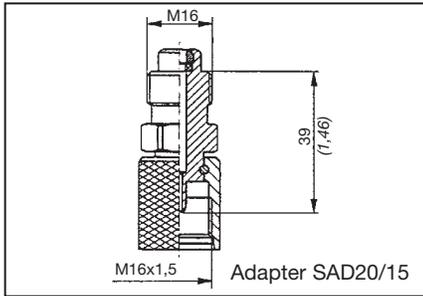
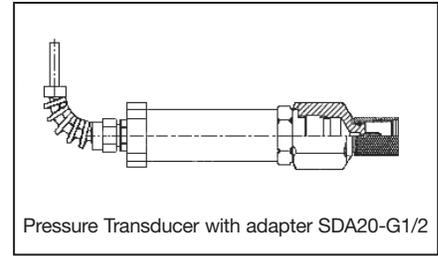
Stainless steel  
Carbon steel zinc plated  
yellow chromated  
FPM (Viton®)

G 1/2 (BSPP)  
Approx. 200g (0,44 lbs)

## Connecting adapters for PPC pressure sensors

There are several different adapters and adapter sets available to connect the PPC pressure transducers not only to the well known STAUFF Test 20 series (adapter SDA20-G1/2) but also to the test points series STAUFF Test 15/12/10 (adapter SAD20/15-V, SAD20/12-V, SAD20/10-V). All these adapters are supplied in the PPC-Kits as standard (for more information see page D27).

For more information about available adapters please see TEST SECTION of this catalog.



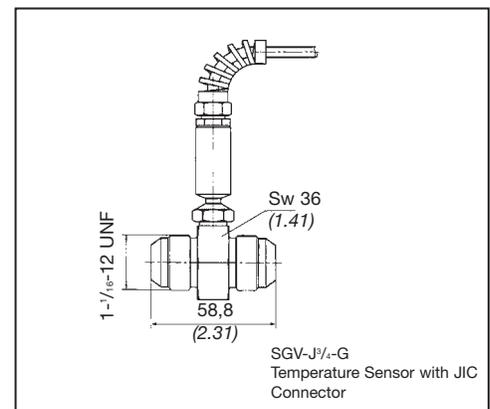
## Temperature Sensors

All dimensions in mm (inch)



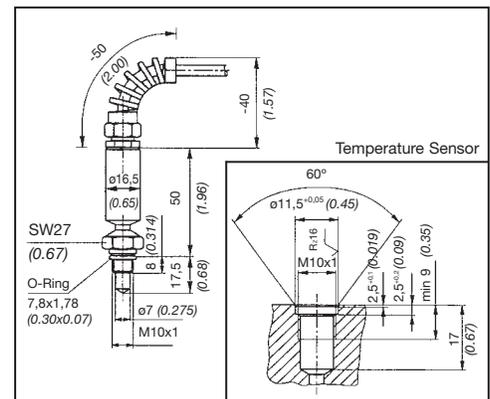
The sensor PPC-04/12-TS-CAB measures the actual temperature of the media directly in-line. With the integrated cable (2m /6,5 ft.) all data are transferred to the Hydraulic tester.

The temperature sensor is also compatible with the flow turbines PPC-04/12-SFM (see page D22) and is suitable with temperatures up to 125°C (257°F).



## Technical Data Sensor PPC-04/12-TS-CAB

- Probe system: Silicon Chip
- Measuring range: -25...125°C (-13...257°F)
- Ambient temperature: 0...70°C (32...158°F)
- Media temperature: -25...125°C (-13...257°F)
- Storage temperature: -25...80°C (-13...176°F)
- Output signal: U=0...3 VDC
- Accuracy: ± 1.5 % FS\*
- Response time: approx. 13,5 s
- Max. working pressure: 630 bar (9000 PSI)
- Media application: Fluids (for use with aggressive media please consult STAUFF)
- Cable length: 2 m (6.5 ft), round plug Series 712
- Connection:
  - a) STAUFF-Test JIC fitting SGV-J<sup>3/4</sup>-G for in-line installation
  - b) Port Connection M10 x 1
- Material (sensor): Steel
- Surface treatment: zinc-plated, yellow chromated
- Sealing: Viton
- Protection level: EN 60529 - IP 65



All dimensions in mm (inch)

\* FS = Full Scale

## Rotational Speed Sensor PPC-04/12-SDS-CAB

Rotational speed measurement (RPM) is made possible with the use of the PPC-04/12-SDS-CAB non-contact sensor. Speed is measured using a photoelectric cell which counts revolutions via a reflecting strip or marking on the rotating surface resulting in a high level of accuracy. Additionally a contact sensor is available. A mechanical contact adapter is connected to the speed sensor, which is held onto the rotating surface during measurement.

When used with particularly small surfaces, accuracy may be improved by using a special focusing adapter.

Standard cable length is 3m (10 ft) and fixed to the sensor. To achieve best results and correct values this length should not be altered by other extension cables.



### Technical Data Sensor PPC-04/12-SDS-CAB

#### Input

- Measuring range 20...10.000 RPM
- Measuring distance 25...500 mm (1...20 inch)
- Measuring angle  $\pm 45^\circ$
- Measurement optical, red LED

#### Output

- Output signal U=0...3 VDC
- Accuracy <0.5% FS\*
- Resolution  $\pm 5$  RPM

### Electrical Connection

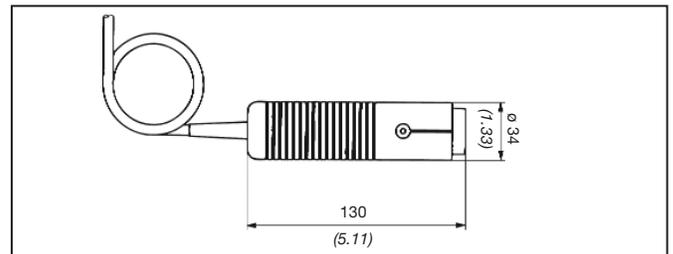
- Cable connected to the sensor length 3 m (10 ft), round plug (extension cable not recommended)

### General

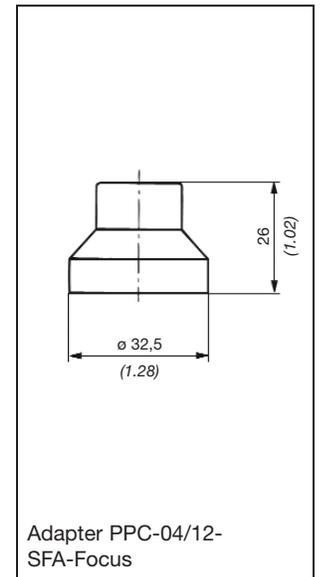
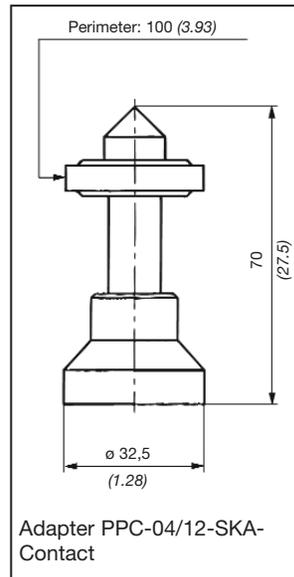
- Material ABS
- Dimension D= $\varnothing$  34 (1.34 inch)  
L=130 (5.1 inch) (without adapter)
- Weight ca. 230 g (0.5 lb.)
- Ambient temperature 0...70°C (32...158°F)

\* FS = Full Scale

### Rotational Speed Sensor PPC-04/12-SDS-CAB

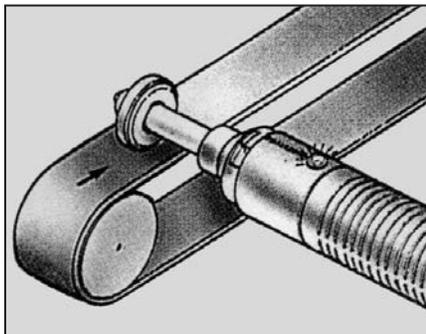


### Accessories

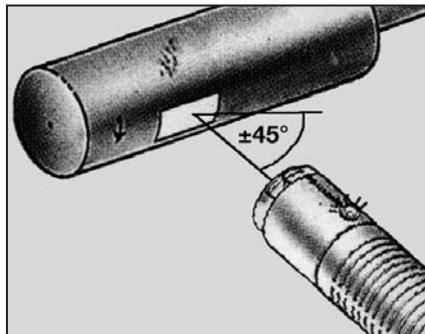


All dimensions in mm (inch)

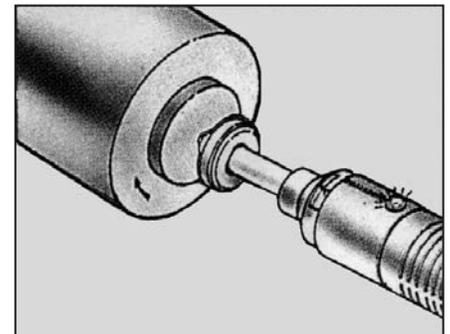
### Applications



App. 1 – RPM with contact adaptor using perimeter



App. 2 – rotating shaft non-contact RPM with reflecting strip



App. 3 – RPM with contact adaptor using point



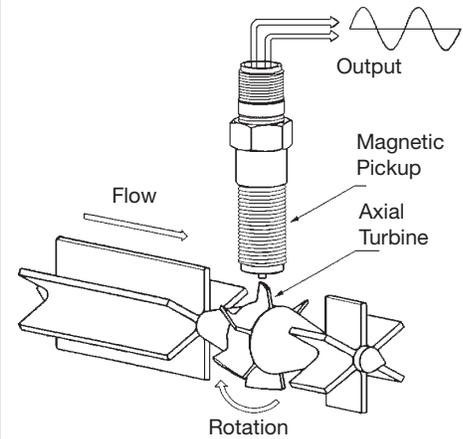
## Hydraulic Tester PPC-SFM Flow Turbines

### Flow-Turbines PPC-04/12-SFM

The PPC-04/12-SFM flow turbine is installed in-line, this allows fluid flow to directly set the turbine into rotation. The resulting frequency is transferred by a digital electronic device (the signal converter) thereby compensating for the influence of interfering flow effects. The flow turbine PPC-04/12-SFM is available in five different measuring ranges.

The flow turbines PPC-04/12-SFM have an integrated test point for connection of a pressure transducer (see page D19).

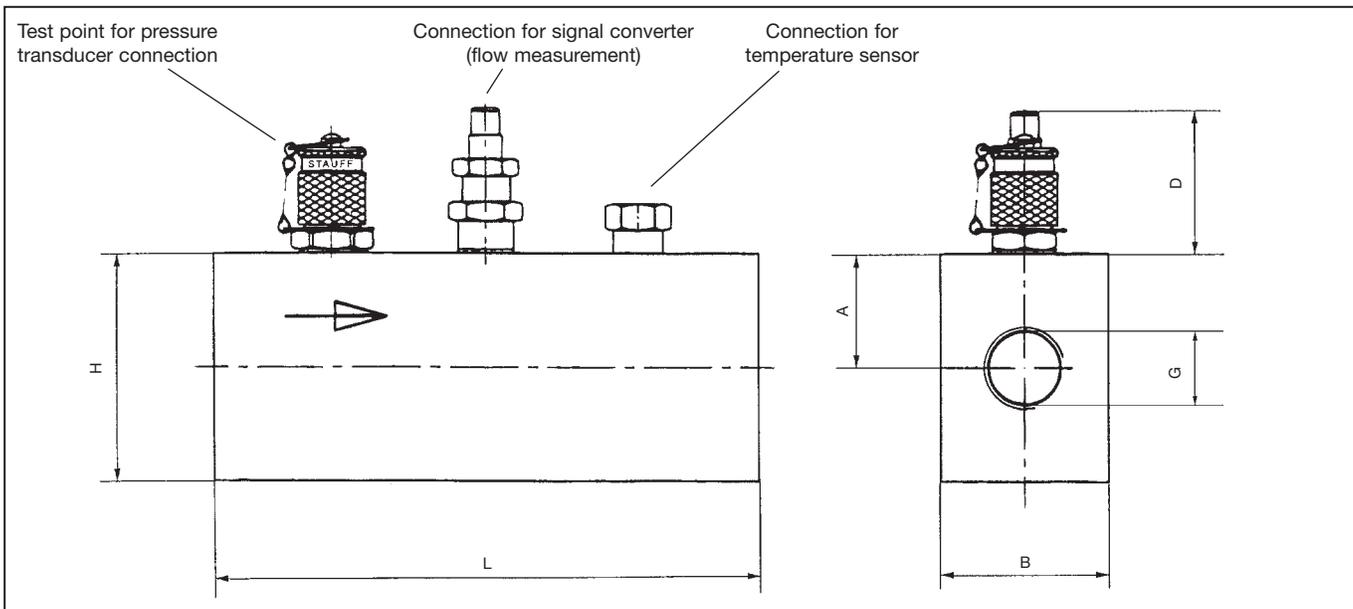
All flow turbines have a connection port to accommodate the temperature sensor PPC-04/12-TS (see page D20).



DIAGNOSTICS

Type sensor PPC-04/12-...		SFM-015	SFM-060	SFM-150	SFM-300	SFM-600
Technical Data	Measuring Range l/min (GPM)	1-15 (0.26-3.9)	7,5-60 (1.95-15.6)	7,5-150 (1.95-39.6)	15-300 (3.9-78)	25-600 (7.8-156)
	Pressure Range bar (PSI)	400 (5800)	400 (5800)	400 (5800)	400 (5800)	350 (5000)
	Characteristic Curve Deviation (% FS*)	1	1	1	1	1
	Max. Pressure Drop bar (PSI)	1.85 (26.8)	1.2 (17.4)	1.75 (24.7)	2.0 (29)	2.0 (29)
	Port Connection (BSP)	G 1/4"	G 3/4"	G 3/4"	G 1"	G 1 1/4"
	Port Connection (SAE)	3/4"-16	1 1/16"-12	1 1/16"-12	1 5/16"-12	1 5/8"-12
	Weight kg (lbs)	0,65 (1.4)	0,75 (1.6)	0,75 (1.6)	1,2 (2.6)	1,8 (4)
Dimensions	A mm inch	22,5 (0.88)	26,5 (1.04)	26,5 (1.04)	31 (1.20)	33 (1.30)
	B mm inch	32 (1.24)	38 (1.50)	38 (1.50)	51 (1.97)	64 (2.46)
	D mm inch	58,5 (2.3)	57,5 (2.26)	57,5 (2.26)	57,5 (2.26)	57,5 (2.26)
	L mm inch	120 (4.72)	129 (5.08)	129 (5.08)	149 (5.86)	173 (6.81)
	H mm inch	38 (1.47)	46 (1.81)	46 (1.81)	56 (2.20)	63 (2.5)

All dimensions in mm (inch)



## Signal Converter for Flow Turbine PPC-04/12-SFM

The signal converter is supplied with the flow turbine and is essential for flow measurement.

**NOTE : Flow turbine and signal converter are matched units and must not be replaced with identical parts.**

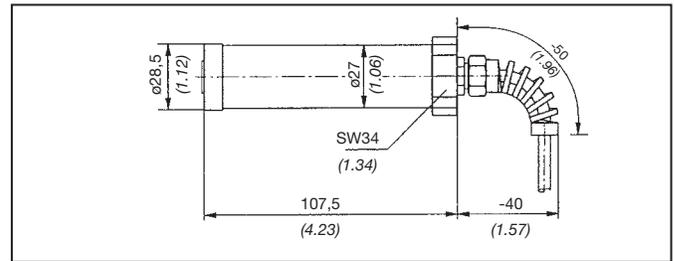
### Technical Data Flow-Turbine PPC-04/12-SFM

- Media temperature -20...150°C (-4...302°F)
- Viscosity 15...100 cSt
- Calibration viscosity 30 mm<sup>2</sup>/s (=30 cSt)
  
- Response time approx. 400 ms
- Accuracy ± 1.0 % FS\* at 30 cSt
- Reproducibility ± 0.2 % FS\*
  
- Material of housing Aluminum
- Surface treatment black anodized
- Seals NBR (Buna-N, standard)  
others on request
  
- Test point SMK 20 (M16 x 2)
- Additional connection M10x1 (standard screw-plug)

\* FS = Full Scale

To connect the signal converter to the Hydraulic Tester PPC-04 /2 and PPC-06/08/12 you must use a connection cable PPC-04/12-CAB3 which is not supplied with the flow turbine.

## Dimensions for signal converter for PPC-04/12-SFM



All dimensions in mm (inch)

### Technical Data Signal Converter

- Output signal U = 0...3 VDC
- Accuracy ≤ 0.3 % FS\*
  
- Working temperature 0...+60°C (32...140°F)
- Storage temperature -20...+80°C (-4...176°F)
  
- Electrical connection  
Turbine end: cable 0.4 m (1,31 ft) connected to signal converter with 5pin plug  
Connection to unit: cable PPC-04/12-CAB3 3m (10 ft.)
  
- Material of housing stainless steel 1.4301
  
- Weight ca. 200 g (0.44 lbs.)

## Flow meter PPC-04/12-SVC (positive displacement flow meter)

The STAUFF flow meter PPC-04/12-SVC measures flow in hydraulic systems. With its high precise gears the PPC-SVC achieves accurate results. With various seal material options the STAUFF volume counter is compatible with a wide range of fluids and various viscosity ranges such as aggressive products like brake fluids, skydrol, biological oils or isocyanates.

### Types PPC-04/12-SVC

Type PPC-04/12-SVC-		015	060	150	300
Measuring Range	l/min	0,2...15	0,4...60	0,6...150	1,0...300
	gal/min	<b>0.05...3.9</b>	<b>0.1...15.9</b>	<b>0.16...39.6</b>	<b>0,26...79.3</b>
Max. Working Pressure	bar	400	400	315	315
	PSI	<b>5800</b>	<b>5800</b>	<b>4570</b>	<b>4570</b>
Overload pressure	bar	480	480	350	350
	PSI	<b>6960</b>	<b>6960</b>	<b>5075</b>	<b>5075</b>
Connection (BSPP)		G 3/8	G 1/2	G 1	G 1
Weight	g	2000	5200	9000	13000
	lbs.	<b>4.41</b>	<b>11.46</b>	<b>19.84</b>	<b>28.66</b>
Sound level db	A	<60	<70	<70	<72
Resolution	impulse/liter	4082	965	333,33	191
Frequency	Hz [at FS]	1020	965	833,33	955

\*FS: Full-Scale



### Technical data PPC-04/12-SVC

- Flows up to 300 l/min (79 US gal/min)
- 4 measuring ranges
- Working pressure up to 400 bar (5800 PSI)
- Accuracy ± 0.5% FS\*
- Large viscosity range
- Low noise
- With connecting plate
- With signal converter (without cable)
- Compatible with all STAUFF Hydraulic Tester series PPC
- Automatic scaling / sensor identification
- Output signal U = 0...3 VDC

**Technical Data**

- Accuracy  $\pm 0.5\% \text{ FS}^*$   
 $\pm 0.3\%$  of measured value  
(frequency service)
- Repeatability 0,01 % FS\*
- Response time 400 ms (in conjunction with signal converter), for shorter response time see advice at the bottom of the page
- Ambient temperature  $-30... 80^\circ\text{C} (-22...176^\circ\text{F})$
- Media temperature  $-30...120^\circ\text{C} (-22...248^\circ\text{F})$
- Viscosity range see diagrams next page
- Material housing GGG40
- Seal material FPM (Viton)  
EPDM (on request)
- Style Gear motor / Bearing material 1.7139, free of non-ferrous heavy metal and silicone

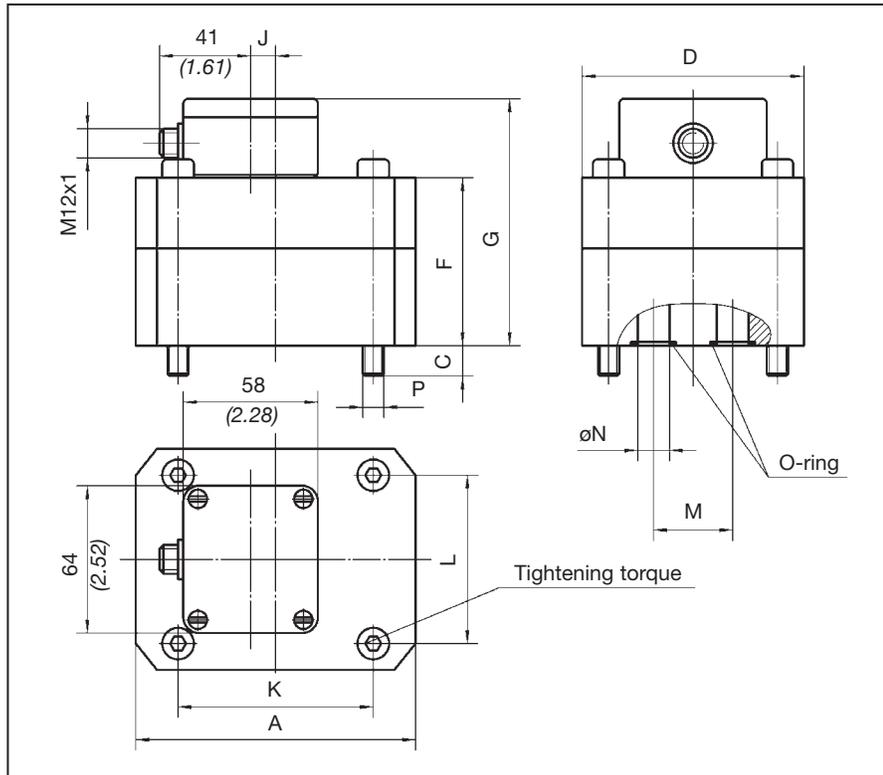
**Electrical Data**

- Working temperature  $10...60^\circ\text{C} (50...140^\circ\text{F})$
- Ambient temperature  $0...70^\circ\text{C} (32...158^\circ\text{F})$
- Storage temperature  $-20...80^\circ\text{C} (-4...176^\circ\text{F})$
- Output  $U = 0...3 \text{ VDC}$
- Resistance ( $\Omega$ )  $\leq 500$
- Supply voltage  $+18 \dots +30 \text{ VDC}$
- Current drain 28 mA
- Thermal drift  $\pm 0.05 (\% \text{ FS } / ^\circ\text{C})$
- Connection (IP 67) M12x1
- EMC Protection (EMV): EN 50081 Part 1  
EN 50082 Part 2
- Signal hissing  $< 5 \text{ mV}$

\* FS = Full Scale

**Dimensions (without connecting plate)**

All dimensions in mm (inch)



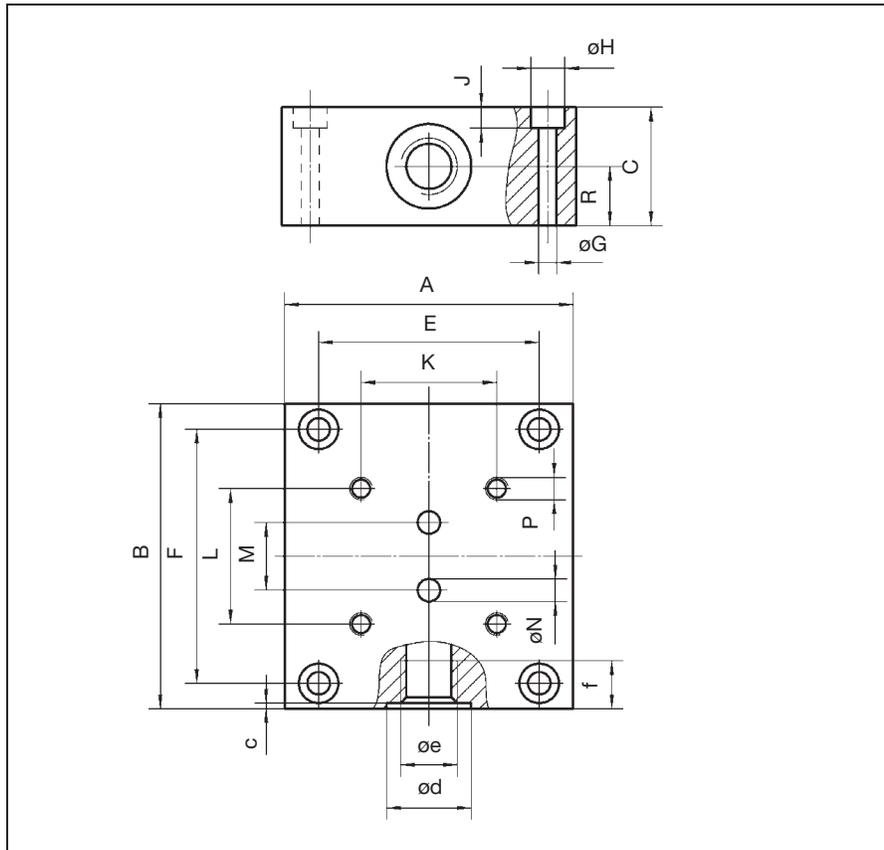
	Type PPC-04/12-SVC-			
	015	060	150	300
<b>A</b>	85 (3.35)	120 (4.72)	170 (6.69)	170 (6.69)
<b>C</b>	13 (0.51)	13 (0.51)	18 (0.71)	22 (0.87)
<b>D</b>	60 (2.36)	95 (3.74)	120 (4.72)	120 (4.72)
<b>F</b>	57 (2.24)	72 (2.83)	89 (3.50)	105 (4.13)
<b>G</b>	94 (3.70)	109 (4.29)	140 (5.51)	142 (5.59)
<b>J</b>	-	10,5 (0.41)	46,5 (1.83)	40 (1.57)
<b>K</b>	70 (2.76)	84 (3.31)	46 (1.81)	46 (1.81)
<b>L</b>	40 (1.57)	72 (2.83)	95 (3.74)	95 (3.74)
<b>M</b>	20 (0.79)	35 (1.38)	50 (1.97)	50 (1.97)
<b>N</b>	9 (0.35)	16 (0.63)	25 (0.98)	25 (0.98)
<b>P</b>	M6	M8	M12	M12
<b>Moment [Nm]</b>	14	35	120	120

All dimensions in mm (inch)

The flow meter PPC-04/12-SVC is always supplied with a connecting plate and a signal converter. To connect the signal converter to a Hydraulic Tester PPC the following cable is required (not supplied with the volume counter PPC-04/12-SVC): PPC-04/12-CAB3 for connection to PPC-04 /2, PPC-06, PPC-08 and PPC-12.

For the PPC-04/12-SVC a special cable with lower response time (6 ms) is available, **Cable PPC-04/12-SVC-FAST**. Connect this cable only to port 3 because the automatic sensor identification is not supported with this cable.

## Dimensions Connecting Plate

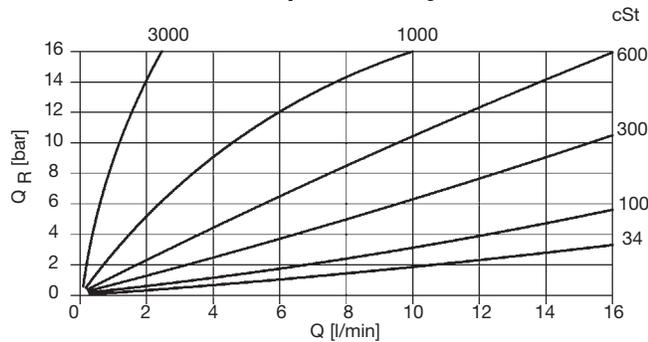


		Type PPC-04/12-SVC-			
		015	060	150	300
Dimensions	A	85 (3.35)	100 (3.94)	160 (6.30)	160 (6.30)
	B	90 (3.54)	120 (4.72)	165 (6.50)	165 (6.50)
	C	35 (1.38)	37 (1.46)	80 (3.15)	80 (3.15)
	E	65 (2.56)	80 (3.15)	140 (5.51)	140 (5.51)
	F	76 (2.99)	106 (4.17)	145 (5.71)	145 (5.71)
	G	7 (0.28)	7 (0.28)	9 (0.35)	9 (0.35)
	H	11 (0.43)	11 (0.43)	15 (0.59)	15 (0.59)
	J	7 (0.28)	7 (0.28)	9 (0.35)	9 (0.35)
	K	70 (2.76)	84 (3.31)	46 (1.81)	46 (1.81)
	L	40 (1.58)	72 (2.83)	95 (3.74)	95 (3.74)
	M	20 (0.79)	35 (1.38)	50 (1.97)	50 (1.97)
	N	6,5 (0.26)	12 (0.47)	25 (0.98)	25 (0.98)
	P	M6 x14	M8 x18	M12 x28	M12 x28
	R	17 (0.67)	17,5 (0.69)	28,5 (1.12)	28,5 (1.12)
	c	0,7 (0.03)	0,7 (0.03)	1 (0.04)	1 (0.04)
	d	25 (0.98)	29 (1.14)	42 (1.65)	42 (1.65)
e	G 3/8	G 1/2	G 1	G 1	
f	13 (0.51)	15 (0.59)	19 (0.75)	19 (0.75)	

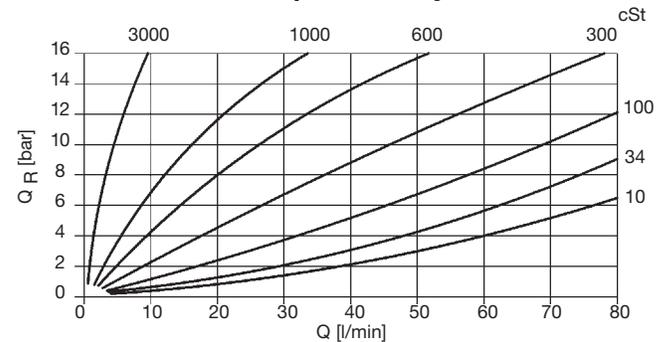
All dimensions in mm (inch)

## Pressure Drop Curves

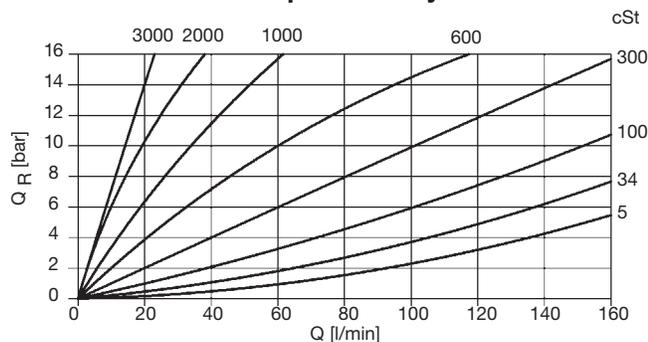
PPC-04/12-SVC-015  $\Delta p$  - viscosity



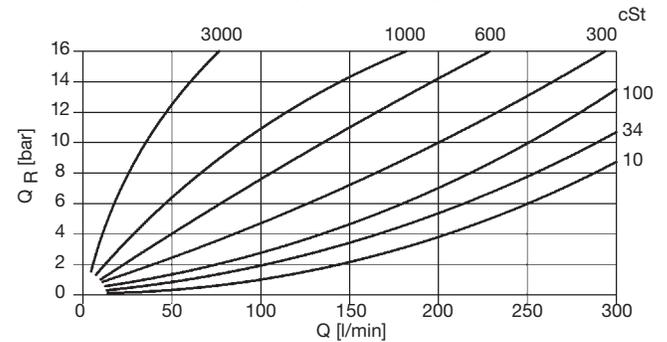
PPC-04/12-SVC-060  $\Delta p$  - viscosity



PPC-04/12-SVC-150  $\Delta p$  - viscosity



PPC-04/12-SVC-300  $\Delta p$  - viscosity



## Other Measurements

With the PPC-06/08/12 Hydraulic Tester you are able not only to measure pressure, temperature, rotational speed and flow; in addition the PPC can read various signals (e.g. analogue signals of a load-displacement sensor / electrical current- or voltage-signal of

a proportional valve) from external sensors. To measure and to process these signals the Hydraulic Tester PPC-06/08/12 uses the following adapters :

- Auxiliary adapter Adapter PPC-06/12-VADC-A
- Adapter for external sensors Adapter PPC-06/12-AUX-A
- External trigger-adapter Adapter PPC-06/12-TR-A

### Adapter PPC-06/12-VADC-A

The auxiliary adapter PPC-06/12-VADC-A measures electrical currents up to 1.5 ADC and voltages up to 48 VDC and transfers these signals to the PPC-unit.

For example these adapters are used to check the inverter state of a motor / pump unit or of a proportional valve.

### Adapter PPC-06/12-AUX-A

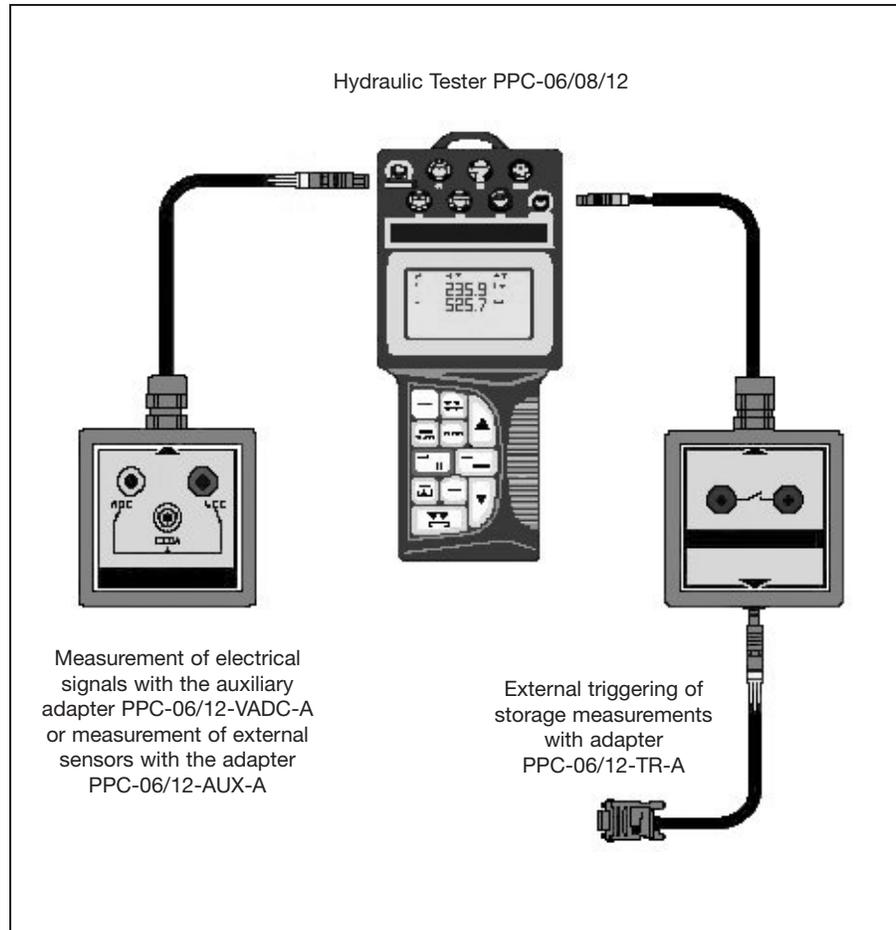
Signals of external sensors (like 0...20 mA or 0...10 VDC) are measured with the adapter PPC-06/12-AUX-A and are transferred to the PPC-06/08/12 units later on.

With this you can determine and display typical applications like load-displacement diagrams or torque / flow characteristics.

### Adapter PPC-06/12-TR-A

External signals from a relay contact can be used to start a measurement report with the Hydraulic Testers PPC-06/08/12. The report begins with the start-up of a pump or the release of a valve. To ensure the external relay triggers during online measurements you must connect the adapter PPC-06/12-TR-A directly to a PC or a notebook.

**NOTE !!! All three adapters are not for use with the PPC-04 /2 Hydraulic Tester !!!**



### Adapter PPC-04/12-U5P-S4P

The adapter PPC-04/12-U5P-S4P is a solution to adapt the old 4-pin-sensors and flow meters with the new units PPC-04 /2 and PPC-06/08/12 with the 5-pin ports.

### Adapter PPC-06/12-RS232-to-USB-CAB

To connect the PPC units to a PC or notebook there are special PC-cables available (PC-SET PPC-04-SW-CAB and PC-SET PPC-06/12-SW-CAB). These cables have an RS-232 connection as standard. To connect these cables to a USB-port of a PC or notebook the adapter PPC-06/12-RS232-to-USB-CAB is an easy solution.



A variety of standard and custom PPC-04/06/08/12-Kits can be supplied to meet customer requirements. All kits are supplied in a handy case including individual foam inserts, which provide room for the following components:



- 1 Hydraulic Tester PPC-04 /2
- 1 Power supply
- up to 3 Pressure transducers with adapter STAUFF-Test 20
- up to 3 Connection Cable
- 1 Temperature sensor with straight fitting SGV-J3/4-G (not shown here)
- 3 Adapters for STAUFF-Test series 15, 12 and 10 are supplied with each PPC-04 /2-Kit
- 1 Operators manual

- 1 Hydraulic Tester PPC-06, PPC-08 or PPC-12
- 1 Power supply
- up to 3 Pressure transducers with adapter STAUFF-Test 20
- up to 3 Connection Cable
- 1 Temperature sensor (optional)
- 3 Adapters for STAUFF-Test series 15, 12 and 10 are supplied with each PPC-06/08/12-Kit
- 1 Operators manual
- 1 PC-Software for PPC-06/08/12
- 1 PC-connection cable

**PPC - 04 - AP - 3 T - \*\*\* / \*\*\* / \*\*\***

<b>PPC</b>	Hydraulic Tester
<b>04-B-SET</b>	2 sensor inputs, without internal storage Battery-powered
<b>04-A-SET</b>	2 sensor inputs, without internal storage, with rechargeable battery and power supply, without data-output
<b>04-AP-SET</b>	2 sensor inputs, without internal storage, with rechargeable battery and power supply, with data-output
<b>06-SET</b>	3 sensor inputs, incl. PC-software and PC- connection cable, internal data storage, for up to 60.000 MIN-/MAX-data points
<b>08-SET</b>	4 sensor inputs, incl. PC-software and PC- connection cable, internal data storage, for up to 125.000 MIN-/MAX-data points
<b>12-SET</b>	6 sensor inputs, incl. PC-software and PC- connection cable, internal data storage, for up to 250.000 MIN-/MAX-data points

Pressure Range for Pressure Transducer	
<b>000/015/100/ 400/600</b>	Pressure range for pressure transducer No.3
For Kits with only two pressure transducers please fill in "000" for the third pressure transducer	
<b>015/100/ 400/600</b>	Pressure range for pressure transducer No.2
<b>015/100/ 400/600</b>	Pressure range for pressure transducer No.1
Please Note: in order to measure differential pressure two transducers of the same pressure range must be used.	

Number of Pressure Transducers	
<b>1</b>	with one pressure transducer
<b>2</b>	with two pressure transducers
<b>3</b>	with three pressure transducers

Temperature Sensor	
	without temperature sensor
<b>T</b>	with temperature sensor

Note: Maximum three sensors (pressure transducers and temperatures sensor) are allowed for one PPC-06/08/12-Kit at the same time.



## Hydraulic Tester PPC Order Codes

In the following table all available components for the Hydraulic Tester PPC-04 /2, PPC-06, PPC-08 and PPC-12 are listed with the exact ordering designations and can be individually compiled by the customer with this form. To make it easier to select, the components

are sorted according to their range of application. For more individual requirements or compilations please consult your nearest STAUFF distributor. You can use the following table as an order fax form.

Description	Ordering Code	Necessary	Optional	Catalog Page	Number of Parts
<b>1. Hydraulic Tester PPC 04 /2</b>					
Hydraulic Tester PPC-04-B /2 with 2 Sensor Inputs and Battery	Hydraulic Tester PPC-04-B /2				
Hydraulic Tester PPC-04-A /2 with 2 Sensor Inputs, Rechargeable Battery and Power Supply (110V / 230V)	Hydraulic Tester PPC-04-A /2	X		D14	
Hydraulic Tester PPC-04-AP /2 with 2 Sensor Inputs, Rechargeable Battery, Power Supply (110V / 230V) and Data Output	Hydraulic Tester PPC-04-AP /2				
<b>2. Hydraulic Tester PPC 06 / 08 / 12</b>					
Hydraulic Tester with 3 Sensor Inputs, Internal Data Storage for up to 60.000 MIN-MAX-data points, incl. PC Software and PC Connection Cable and Power Supply	Hydraulic Tester PPC-06				
Hydraulic Tester with 3 Sensor Inputs, Internal Data Storage for up to 125.000 MIN-MAX-data points, incl. PC Software and PC Connection Cable and Power Supply	Hydraulic Tester PPC-08	X		D16	
Hydraulic Tester with 3 Sensor Inputs, Internal Data Storage for up to 250.000 MIN-MAX-data points, incl. PC Software and PC Connection Cable and Power Supply	Hydraulic Tester PPC-12				
<b>3. Pressure Measuring (Connection and Extension Cable for Measuring Sensors without integrated cables see paragraph 8)</b>					
<b>Pressure Transducer G 1/2 A without Connection Cable</b>					
Pressure range -1...15 bar (-15...210 PSI) relative pressure	Sensor PPC-04/12-PT-015				
Pressure range 0...100 bar (0...1450 PSI) absolute pressure	Sensor PPC-04/12-PT-100	X		D19	
Pressure range 0...400 bar (0...5800 PSI) absolute pressure	Sensor PPC-04/12-PT-400				
Pressure range 0...600 bar (0...8700 PSI) absolute pressure	Sensor PPC-04/12-PT-600				
<b>Pressure Transducer G 1/2 A with integrated Connection Cable 2m (6,5 ft)</b>					
Pressure range -1...15 bar (-15...210 PSI) relative pressure	Sensor PPC-04/12-PT-015-CAB				
Pressure range 0...100 bar (0...1450 PSI) absolute pressure	Sensor PPC-04/12-PT-100-CAB		X	D19	
Pressure range 0...400 bar (0...5800 PSI) absolute pressure	Sensor PPC-04/12-PT-400-CAB				
Pressure range 0...600 bar (0...8700 PSI) absolute pressure	Sensor PPC-04/12-PT-600-CAB				
<b>Connection Adapters</b>					
Adapter STAUFF Test 20	SDA20-G1/2				
Adapter STAUFF Test 20 to STAUFF Test 15	SAD20/15-P		X	D20	
Adapter STAUFF Test 20 to STAUFF Test 12	SAD20/12-P				
Adapter STAUFF Test 20 to STAUFF Test 10	SAD20/10-P				
<b>4. Temperature Measuring (Connection and Extension Cable for Measuring Sensors without integrated cables see paragraph 8)</b>					
Temperature Sensor with integrated Connection Cable 2 m (6,5 ft.)	Sensor PPC-04/12-TS-CAB	X			
Temperature Sensor without Connection Cable	Sensor PPC-04/12-TS		X	D20	
Straight Fitting with M10x1 Port Connection for Temperature Sensor	SGV-16S-G				
<b>5. Flow Measuring (Connection and Extension Cable for Measuring Sensors without integrated cables see paragraph 8)</b>					
<b>Flow Meter SFM with Signal Converter (without Connection Cable)</b>					
Flow range 1...15 l/min (0,26...4,0 US GPM)	Flow Meter PPC-04/12-SFM-015				
Flow range 7,5...60 l/min (2...15,9 US GPM)	Flow Meter PPC-04/12-SFM-060	X		D22	
Flow range 7,5...150 l/min (2...40 US GPM)	Flow Meter PPC-04/12-SFM-150				
Flow range 15...300 l/min (4...79 US GPM)	Flow Meter PPC-04/12-SFM-300				
Flow range 25...600 l/min (6,6...158,5 US GPM)	Flow Meter PPC-04/12-SFM-600				
<b>Flow Meter SVC with Signal Converter (without Connection Cable)</b>					
Flow range 0,2...15 l/min (0,05...4,0 US GPM)	Flow Meter PPC-04/12-SVC-015				
Flow range 0,4...60 l/min (0,10...15,9 US GPM)	Flow Meter PPC-04/12-SVC-060				
Flow range 0,6...150 l/min (0,16...40 US GPM)	Flow Meter PPC-04/12-SVC-150	X		D23	
Flow range 15...300 l/min (0,26...79 US GPM)	Flow Meter PPC-04/12-SVC-300				
Connection Cable FAST 6ms (only Port 3, without sensor recognition)	Cable PPC-06/12-SVC-FAST		X		
<b>6. Rotational Speed Measuring (Connection and Extension Cable for Measuring Sensors without integrated cables see paragraph 8)</b>					
<b>Rotational Speed Sensor with integrated Connection Cable 3 m (10 ft.)</b>					
Rotational Speed Sensor	Sensor PPC-04/12-SDS-CAB	X			
Contact Adapter	Adapter PPC-04/12-SKA-Contact		X	D21	
Focussing Adapter	Adapter PPC-04/12-SFA-Focus				
<b>7. Other Measurements</b>					
External Trigger Adapter	Adapter PPC-06/12-TR-A		X		
Auxiliary Adapter (up to 1,5 ADC / 48 VDC)	Adapter PPC-06/12-VADC-A		X	D26	
Adapter for External Sensors (0...20 mA / 0...10 VDC)	Adapter PPC-06/12-AUX-A		X		
<b>8. Connection and Extension Cable for Measuring Sensors without integrated Cable</b>					
Connection Cable 3m (10 ft)	Cable PPC-04/12-CAB3		X		
Extension Cable 5m (16 ft)	Cable PPC-04/12-CAB5-EXT		X		
Adapter for Hydraulic Tester (5-Pin) with 4Pin-Plug Sensor Cables	Adapter PPC-04/12-U5P-S4P		X		
<b>10. Accessories and Spare Parts</b>					
External Power Supply (110/230 VAC) for PPC 04 / 06 / 08 / 12	Power Supply PPC-04/12-110-230V	X			
PC Software and PC Adapter PPC-04 /2 (RS-232 serial)	PC-SET PPC-04-SW-CAB		X		
PC Software and PC Adapter PPC-06 / 08 / 12 (RS-232 serial)	PC-SET PPC-06/12-SW-CAB		X		
Adapter Cable RS-232 (serial) to USB for PPC and LasPaC	Adapter PPC-04/12-RS232-to-USB CAB		X		
Mobile Car Cable 12V/24V for PPC-04 / 06 / 08 / 12	Cable PPC-04/12-CAB-MOB		X		
Manual PPC-06 / 08 / 12 incl. Quickstart, german	PPC-06/12-Manual-German		X		
Manual PPC-06 / 08 / 12 incl. Quickstart, english	PPC-06/12-Manual-English		X		
Case PPC-04	Case PPC-04		X		
Case PPC-04 large	Case PPC-04-SFM		X		
Case PPC-06 / 08 / 12	Case PPC-06/12		X		





**Description**

Kracht Volutronic range of positive displacement flow meters and display units offers a comprehensive solution for high accuracy, high pressure flow monitoring. Units are available for flow ranges from 0.002 GPM to 158 GPM. Media specific models are available for applications such as: hydraulic test stands, ink, lubrication systems, RIM, and brake fluid. Consult the factory for specific application information and for complete engineering catalog.



DIAGNOSTICS

**Technical Specifications VC Series**

Design	Gear motor, positive displacement	Fluid viscosity	1 to 100,000 Cst
Connection type	Mounting plate / in-line	Measuring accuracy	+/- 0.3 % of measured value, depending on series
Flow direction	Bi-directional	Linearity	< +/- 0.1% over entire measuring range
Operating pressure	to 414 bar (6000 PSI)	Reproducibility	< +/- 0.1% of measured value
Flow rating	to 598 LPM (158 GPM)	Voltage input	12 to 30 VDC
Max liquid temp	-30 °C to +120 °C	Output signal	Square wave
Standard version	(-22°F to 248°F)		
Max liquid temp	-30 °C to +150 °C		
High temp version	(-22°F to 302°F)		

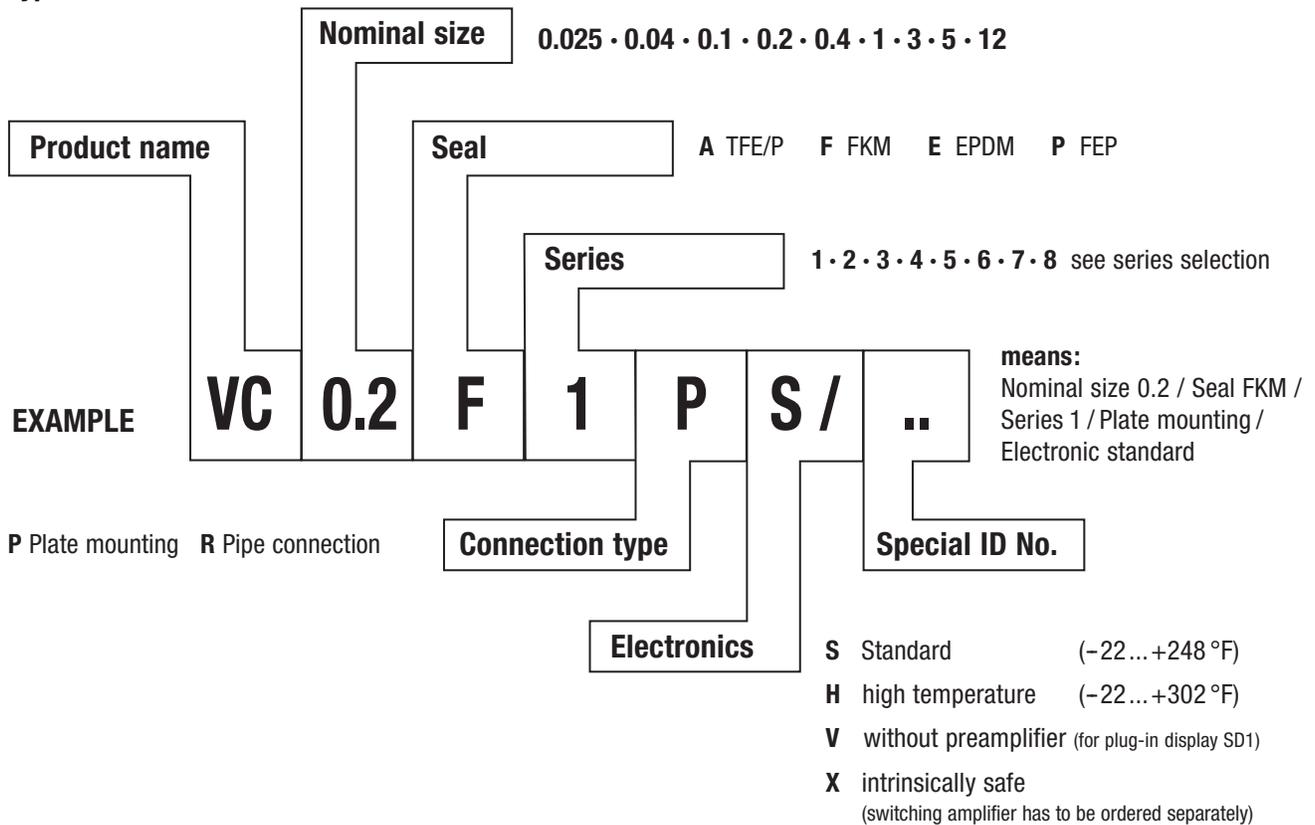
**Series selection / Summary of variants**

Series	1	2	3	4	5	6	7	8
<b>Material Housing</b>	cast iron GGG40 (79 GGG 60)	cast iron GGG 40	cast iron GGG 40	cast iron GGG 40	stainless steel 1.4404	stainless steel 1.4404	cast iron GGG 40	stainless steel 1.4404
<b>Material Gears</b>	steel 1.7139	steel 1.7139	steel 1.7139	steel 1.7139	stainless steel 1.4462	stainless steel 1.4462	steel 1.7139	stainless steel 1.4462
<b>Bearing</b>	ball bearings	ball bearings	bronze plain bearings	carbide plain bearings	carbide plain bearings	stainless steel ball bearings	hybrid ball bearings	hybrid ball bearings
<b>Connection</b>	P	P	P	P	P/R	P/R	P	P/R
<b>Max. perm. foreign particle size in the medium (µm)</b>	20	30	50	30	30	20	20	20
<b>Accuracy (of actual reading)</b>	± 0.3% at ≥ 20 mm <sup>2</sup> /s	± 0.5% at ≥ 50 mm <sup>2</sup> /s	± 1% at ≥ 100 mm <sup>2</sup> /s	± 0.5% at ≥ 100 mm <sup>2</sup> /s	± 0.5% at ≥ 100 mm <sup>2</sup> /s	± 0.3% at ≥ 20 mm <sup>2</sup> /s	± 1% at ≥ 20 mm <sup>2</sup> /s	± 1% at ≥ 20 mm <sup>2</sup> /s
<b>Nominal Size</b>	Starting point at [gpm]		Measuring range [gpm]					
0.025	0.0003 0.002-0.53	—	—	—	0.005-0.53*	0.002-0.53	0.002-0.53	0.002-0.53
0.04	0.001 0.005-1.06	—	—	—	—	0.005-1.06	0.005-1.06	0.005-1.06
0.1	0.002 0.01-2.1	—	—	—	—	—	—	—
0.2	0.002 0.04-4.3	0.04-4.3	—	0.04-4.3	0.04-4.3	0.04-4.3	0.04-4.3	0.04-4.3
0.4	0.002 0.05-10.6	—	—	0.05-8	—	—	—	—
1	0.005 0.1-21	0.1-21	0.15-10.6	0.08-16	0.08-16	0.1-21	0.1-21	0.1-21
3	0.008 0.16-42	—	—	0.16-26	0.16-26	0.16-42	—	—
5	0.01 0.26-66	0.26-66	0.31-21	0.26-42	0.26-42	0.26-66	—	—
12	0.03 0.53-158	—	—	—	—	—	—	—

\* Measuring accuracy ± 3%: Linearity ± 1.5%



## Type code



## Mounting Plates for VC Series with Connection Type P

Model "P" Connection	Bottom Port Mounting Plate	Side Port Mounting Plate	Port Connection
VC0.025, VC0.04, VC0.2	MVC 0,2 U3 B04	MVC 0,2 U3 B05	6 SAE
VC0.4	MVC 0,4 U1C08	MVC 0,4 U1C09	8 SAE
VC1	MVC 1 U2 C04	MVC 1 U2 C05	8 SAE
VC3, VC5	MVC 5 U2 E04	MVC 5 U2 E05	16 SAE
VC12	N/A	MVC12V1G09	1-1/2" Code 62

Please consult the factory or your local Stauff distributor for specific application information, dimensional drawings etc. Other configurations available upon request these include meters for RIM, paint, ink, high pressure, and high flow applications.

## ORDERING CODES



### Description

Kracht VCA/VCN series of positive displacement flow meters offers a lower cost option for flow monitoring where the high accuracy of the VC series is not needed. Units are available in aluminum or stainless steel, and have bearing options suitable for hydraulic fluids, lubrication fluids, glycols, etc. Consult the factory for specific application information and for complete engineering catalog



### Technical Specifications VCA/VCN Series

Design	Gear motor, positive displacement
Connection type	In-line
Flow direction	Bi-directional
Operating pressure	to 200 bar (2900 PSI)
Flow rating	to 200 LPM (53 GPM)
Max liquid temp	-10 °C to +80 °C (14°F to 176°F)
Fluid viscosity	20 to 4000 Cst
Measuring accuracy	+/- 1 % to +/- 3% of full range, depending on series
Voltage input	12 to 30 VDC
Output signal	Square wave

### Material

	Housing & Cover	Measuring gears	Bearing
<b>VCA 0.04 FF R1</b>	Aluminum AlMgSi F30 (hardcoated)	Stainless steel 1.4462	Stainless Steel ball bearings
<b>VCN 0.04 FF R1</b>	Stainless steel 1.4404	Stainless steel 1.4462	Stainless Steel ball bearings
<b>VCA 0.2 FA R1</b>	Aluminum AlMgSi F30 (hardcoated)	Steel 1.7139	Plastic plain bearings (iglidur X)
<b>VCN 0.2 FB R1</b>	Stainless steel 1.4404	Stainless steel 1.4462	Plastic plain bearings (iglidur X)
<b>VCA 2 FC R(P)1</b>	Aluminum AlMgSi F30 (hardcoated)	Steel 1.7139	Multicomponent plain bearings (P10)
<b>VCA 5 FE R1</b>	Aluminum AlMgSi F30 (hardcoated)	Steel 1.7139	Ball Bearings

### Operating Characteristics

Type	Geom. tooth volume cm <sup>3</sup>	Measuring range [gpm]	Starting point [gpm]	Resolution [IMP/gal]	Measuring accuracy (at flow range)	Operating pressure max.	Peak pressure	Weight [lbs]
<b>VCA 0.04 FF R1</b>	0.04	.005 - 1.06		94636	± 0.3% at 20 mm <sup>2</sup> /s	200 bar <b>2900 psi</b>	240 bar <b>3480 psi</b>	-
<b>VCN 0.04 FF R1</b>	0.04	.005 - 1.06		94636	± 0.3% at 20 mm <sup>2</sup> /s	160 bar <b>2380 psi</b>	190 bar <b>2755 psi</b>	-
<b>VCA 0.2 FA R1</b>	0.2	.066 - 2.64		18927.2	± 0.3% at 20 mm <sup>2</sup> /s	160 bar <b>2320 psi</b>	200 bar <b>2900 psi</b>	- 1.1
<b>VCN 0.2 FA R1</b>	0.2	.066 - 2.64		18927.2	± 0.3% at 20 mm <sup>2</sup> /s	160 bar 2320 psi	200 bar 2900 psi	- 2.6
<b>VCA 2 FC R(P)1</b>	2	.264 - 17.2	.032 (v = 34 mm <sup>2</sup> /s) .01 (v = 100 mm <sup>2</sup> /s)	1892.72	± 2.5% at 20 mm <sup>2</sup> /s	160 bar <b>2320 psi</b>	200 bar <b>2900 psi</b>	- 4.2
<b>VCA 5 FE R1</b>	5.272	.264 - 52.8	.026 (v = 120 mm <sup>2</sup> /s)	724.9	± 1% at 20 mm <sup>2</sup> /s	80 bar <b>1160 psi</b>	100 bar <b>1450 psi</b>	- 13.2



### SD-1 Indicator/Controller

#### Function

- The plug-in display unit SD1 may be used with any KRACHT flow meter which uses a plug-in connection according to DIN 43650.
- The display unit is simply inserted between the plug and the plug socket on the volume counter. The displayed value will be the actual flow rate or the volume. The square wave signal remains available for external processing.
- Volume counters already supplied can be equipped with the plug-in display unit. To achieve this the amplifier card must be removed from the plug socket.
- The plug-in display unit is freely programmable. All necessary settings can be achieved with two keys. The programmed data is stored on an FRAM and therefore saved in case of power failure.

#### Function + Product Characteristics SD 1 - Service

- The SD1 Service is an - plug-in display unit which may be used with any KRACHT flowmeter with plug-in connection according to DIN 43650.
- The display unit is simply put on the plug socket of the flow meter.
- The battery supplies the SD1 and the sensors with power.
- No separate power supply is necessary.
- If the batteries are empty the SD 1 Service can be operated and charged with the enclosed charger.
- The impulse volume is freely programmable.
- All necessary settings can be achieved with two keys.
- The programmed data are stored on a FRAM and therefore saved in case of empty batteries.
- With the battery pack an operating time of 30 hours is possible without recharging



SD-1



SD-1-Service

### AS8 Single/Dual Channel Controller

#### Function

- The microcontroller AS 8 processes incremental input signals from KRACHT Volume Counters and other sensors.
- The input signals are filtered in the unit, interpreted and converted into the values of flow rate and volume.
- The user may choose to have either flow rate or volume displayed.
- Two relays, one analog output or one serial interface are available for further, external processing.

#### Product Characteristics

- EMC construction
- Programmable microprocessor
- Used for KRACHT Volume Counters and other sensors with 24 volt incremental signals
- Power supply voltage 230/120 V 50/60 Hz 24 VDC/12 VDC
- Integrated sensor power supply 24 VDC 50mA
- Flow rate or volume measurement
- Smoothing function by means of a digital filter
- 2 programmable relays
- User-selected analog output current:  $\pm 20$  mA, 0...20 mA, 4...20 mA
- voltage:  $\pm 10$ V, 0...10V,
- Serial interface RS 232
- Selectable time basis (sec, min, hrs)
- Selectable units for display
- Enclosure with dimensions according to DIN



### ASR20 Multi-channel Controller

#### Function

- The ASR 20 is a combination of operator panel and controller in one device. Many flow specific applications can be realized.
- The ASR 20 processes incremental signals.
- Standardized programs are available for a wide variety of applications.
- Standardized programs are available for different applications.
- The number of in- and outputs can be adjusted to the specific application.
- Relay contacts, analog outputs and serial interfaces are available for further external processing.
- The measured values are indicated on a LC-display.

#### Product Characteristics

- Used for KRACHT volume counters and other sensors with 24 V incremental signals.
- Up to 6 additional modules can be used.
- Analogue inputs allow the connection of pressure transducers, temperature sensors and the like.
- The input signals are filtered in the unit interpreted and converted into the physical sizes flow rate and volume.



## Area of Application:

Flow and temperature measuring of fluids (mobile and industrial hydraulics and grease systems)

## Characteristics:

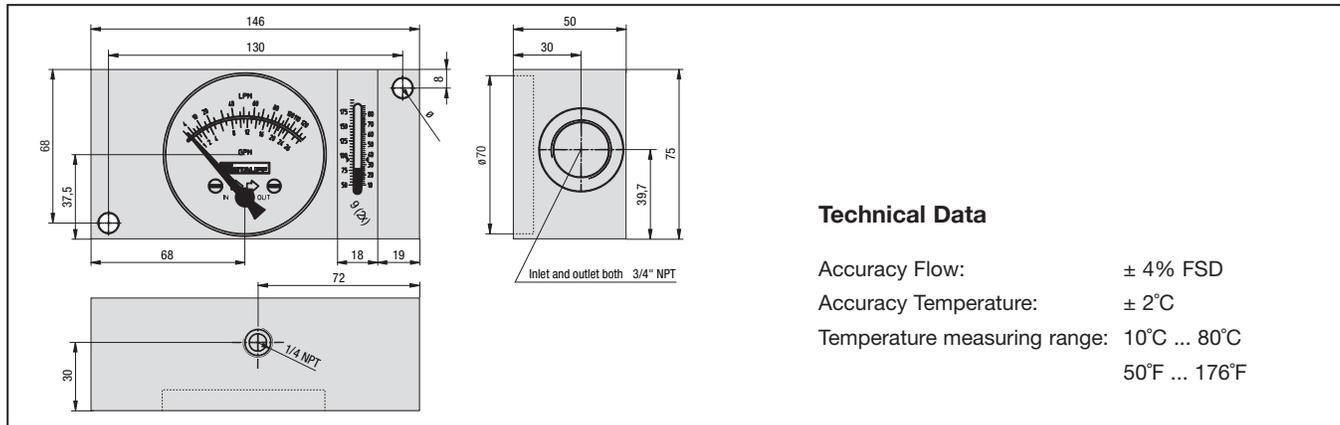
- Aluminum body
- Suitable for mineral oil, HFC fluids
- Designed for in-line installation
- Mechanical process (off the line)
- 1/4 NPT connection for pressure gauge (not included)
- 2 1/2" (63mm) Dial.
- Standard calibration for 150 SSU fluids
- Accuracy within  $\pm 4\%$  full scale deflection

**SDM indicator can offer a simultaneous measurement of pressure, flow and temperature (dual scale in °C and °F).**

- Bronze versions for water available on request



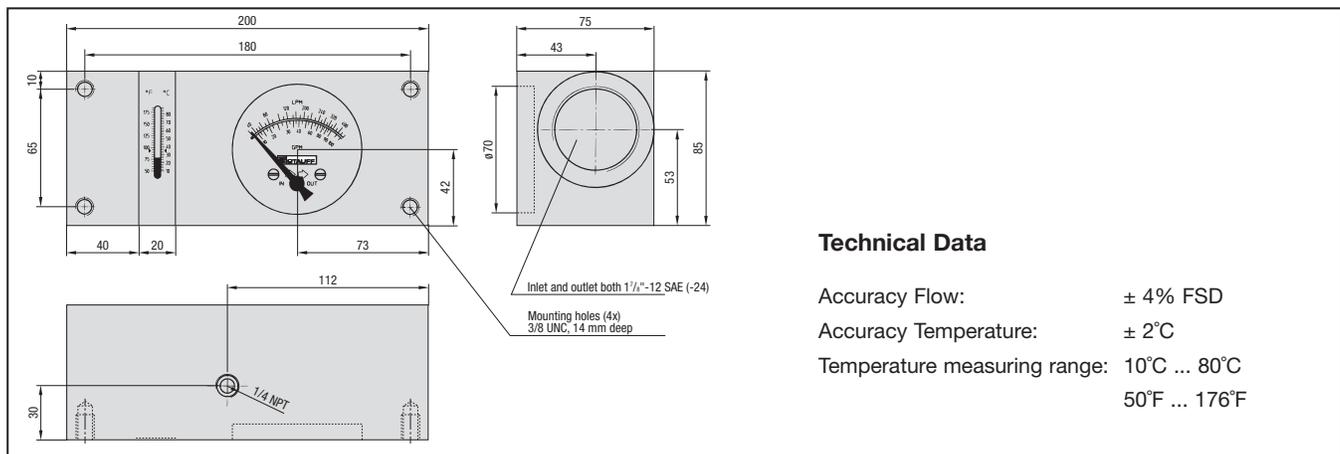
## Dimensions SDM-750



### Technical Data

Accuracy Flow:	$\pm 4\%$ FSD
Accuracy Temperature:	$\pm 2^\circ\text{C}$
Temperature measuring range:	10°C ... 80°C 50°F ... 176°F

## Dimensions SDM-1500



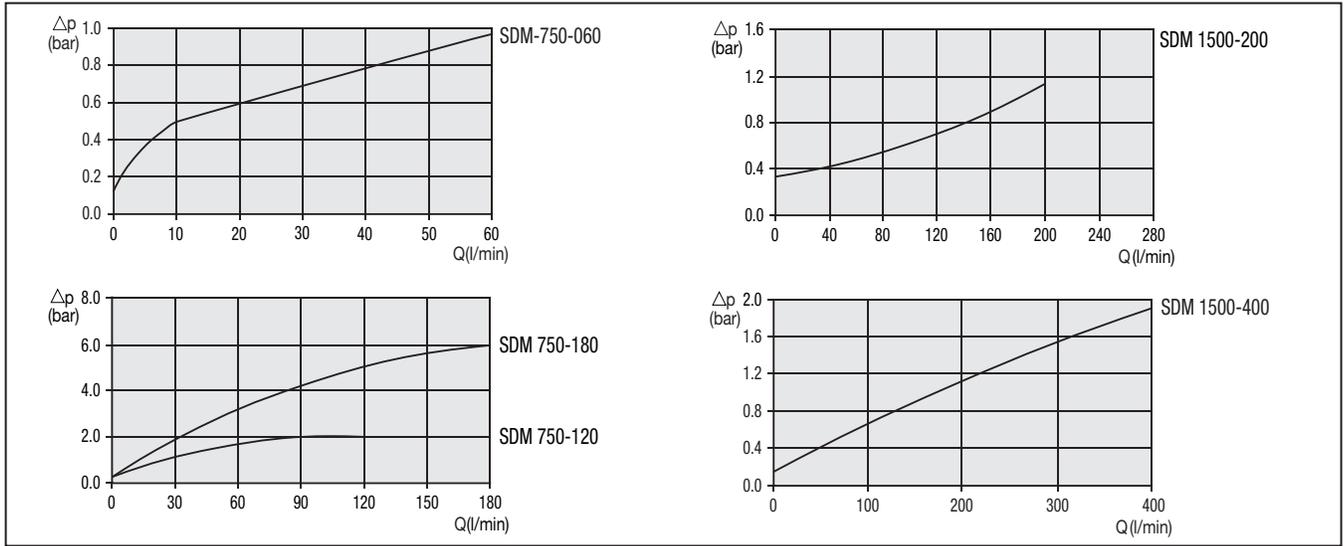
### Technical Data

Accuracy Flow:	$\pm 4\%$ FSD
Accuracy Temperature:	$\pm 2^\circ\text{C}$
Temperature measuring range:	10°C ... 80°C 50°F ... 176°F

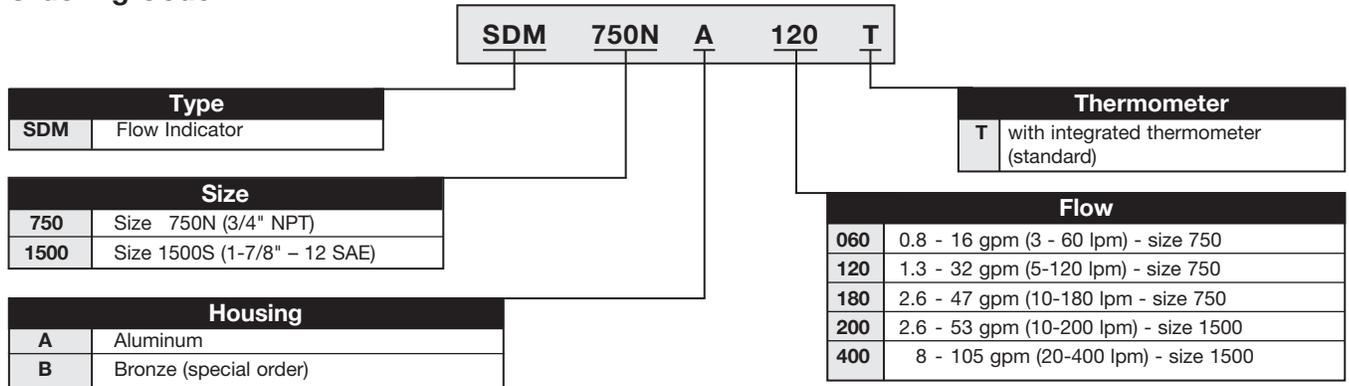
## Technical Data

Part Number	Max Working Pressure		Flow Range		Weight		Connection
SDM-750N-A-060-T	6000 PSI	420 BAR	0.8-16 GPM	3 – 60 L/MIN	3 LBS	1.36 KG	3/4 NPT
SDM-750N-A-120-T	6000 PSI	420 BAR	1.3-32 GPM	5 – 120 L/MIN	3 LBS	1.36 KG	3/4 NPT
SDM-750N-A-180-T	6000 PSI	420 BAR	2.6-47 GPM	10 – 180 L/MIN	3 LBS	1.36 KG	3/4 NPT
SDM-1500S-A-200-T	4000 PSI	280 BAR	2.6-53 GPM	10 – 200 L/MIN	6.6 LBS	3.00 KG	1 7/8-12 SAE
SDM-1500S-A-400-T	4000 PSI	280 BAR	8-105 GPM	30 – 400 L/MIN	6.6 LBS	3.00 KG	1 7/8-12 SAE

## Flow Curves



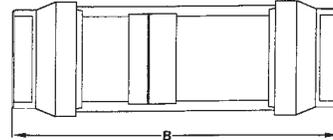
## Ordering Code



## Flowtell In-Line Flow Meters

### Specifications

- Accuracy Flow: ±2.5% of full scale in mid-third of flow range  
±4.0% over entire flow range
- Repeatability: ±1% of full scale
- Max. Operating Pressure: 3500 PSI (240 bar)
- Max. Operating Temperature: 240°F (116°C)
- Material: Aluminum end Caps, Polycarbonate Window  
Tube, Buna-N and Teflon Seals
- Suitable for Mineral-Based Hydraulic Fluid



Model No.	Port Size	Flow Range	Dimensions	
			A	B
<b>FTBAGHB-05</b>	1/2" NPT	0.5-5 GPM	<b>1.88"</b> (48 mm)	<b>6.56"</b> (167 mm)
<b>FTBAGHC-30</b>	3/4" NPT	3-30 GPM	<b>2.38"</b> (60 mm)	<b>7.16"</b> (182 mm)
<b>FTBAGHK-75</b>	1 1/4" NPT	8-75 GPM	<b>3.5"</b> (90 mm)	<b>10.13"</b> (258 mm)



## Laser Particle Counter - LasPaC 1

### PRODUCT DESCRIPTION

The **new STAUFF Laser Particle Counter I** is a microprocessor-controlled 8-channel particle counter designed for monitoring the degree of contamination of mineral based hydraulic fluids. In contrast to other commercially available particle counters, the **LasPaC I** is characterized by a few special features. The readings from the **LasPaC I** will immediately indicate the condition of the hydraulic system, the data will be documented, and you will be able to intervene at an early stage in order to prevent wear and damage to the components in the hydraulic system. This does not only minimize repair costs, but also reduces overall equipment downtime.



#### 1. Mobile ► Light weight and handy

With its comparatively low weight of 8.5 kg (18.7 lbs) – only 18 kg (40 lbs) with its rugged aluminum case – the device is well suited for use in the field, even in areas that are difficult to access.

#### 2. Quick results ► ease of operation

Operator input is conducted via touch-screen and function keys. The control features of the particle counter have been designed so that measurements can be done quickly and easily. User defined measuring programs can be entered and stored with password protection.

#### 3. Flexible ► multi-range calibration (optional) to ISO 11 171 and ISO 4402 (for NAS 1638)

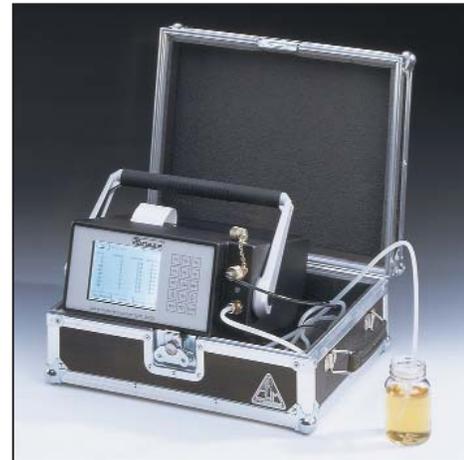
The LasPaC offers several optional calibrations (see Ordering Code): “N” for New calibration ISO 11171, Cleanliness Levels according to ISO 4406 (1999) and SAE AS4059 Rev. D (2001) “O” for Old calibration ISO 4402, Cleanliness levels according to ISO 4406 (1991) and NAS 1638 (1964) “B” for New and Old Calibration. In this case, the LasPaC is set to the latest calibration per ISO 11 171 by default. However, if users wish, they can switch to the older ISO 4402 calibration for comparison. The device also evaluates readings based upon NAS 1638 classes.

#### 4. For any type of application ► various pressure stages

The LasPaC features two integrated pressure ranges for 0 to 6 bar (0 to 87 PSI) low pressure and 5 to 420 bar (73 to 6000 PSI) high pressure. This allows oil samples to be taken from pressureless systems or reservoirs without any other equipment. Many other products available today require special add-ons or pressure cartridges which need to be recharged. The STAUFF TEST hose which are provided with the device, allow easy connection to common test couplings (M16 x 2).

#### 5. Global use ► variable voltage supply

The integrated power supply unit provides a voltage range of 110 V ... 240 V.



## PRODUCT DESCRIPTION

### 6. Independent use ➤ storage-type battery

The integrated rechargeable battery makes it possible to perform on-the-spot measurements, even in cases where a direct connection to an external power supply is not possible. The measured data are stored and can be transferred to a computer later on if necessary.

### 7. "In black and white" ➤ built-in printer

The integrated printer supports printouts in the field, thus providing immediate documentation.

### 8. Making the connection ➤ downloading via a serial interface

The measured data can be downloaded onto any PC or notebook via the device's serial interface, supported by a convenient downloading software. Further processing and storage of the data is done in Microsoft Excel® with the use of specially designed macros. The prepared forms provide for easy transfer of the data. The integrated diagrams represent the data graphically for more clarity. Likewise the data can be assembled to a trend analysis. With Microsoft Excel®, it is possible to edit the data as required, e.g. with the customer's logo.

### 9. Always up-to-date ➤ an integrated clock

An integrated and rechargeable battery-operated clock provides the exact date and time which are shown on every printout. In addition, every download of measured data is marked with date and time. The precise time of measurement is thus documented on all printouts and for all the data stored.

### 10. Adaptable ➤ software updates

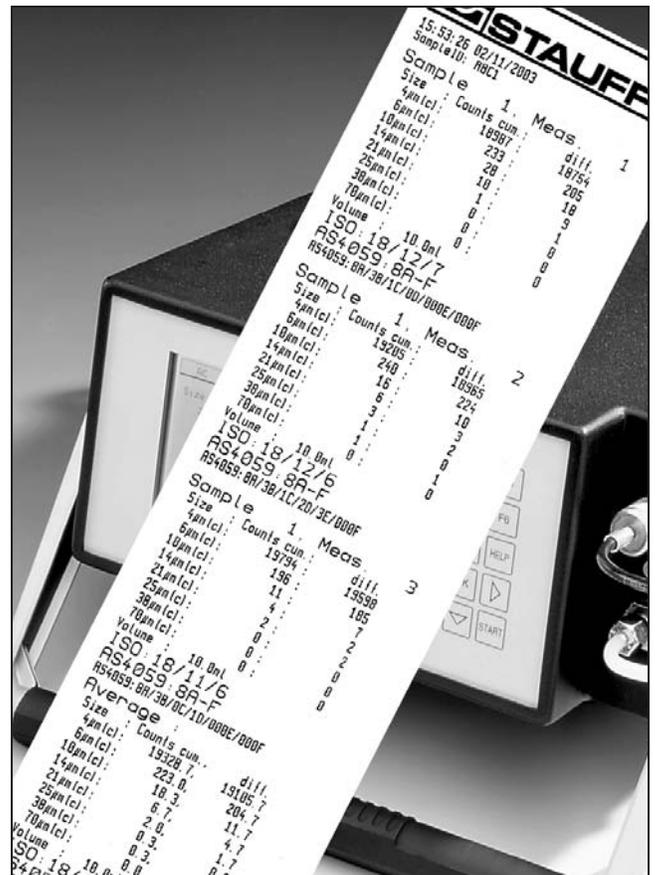
The serial interface ensures flexibility for future developments in terms of calibration, evaluation and output. Moreover, software updates can be installed on the particle counter, without any problems.

### 11. 100% Coverage

The fluid passes a vitreous measuring cell and is rayed by a laser beam. This laser beam is evaluated at the backside of the cell. Dimensions and the number of particles are calculated from electronic impulses transformed by the shadows. With many other particle counters only a part of the measuring cell is lit by the laser beam, the particles are only partially registered and the result is projected. In contrast the cell of the LasPaC is completely examined and all particles are registered. Inaccuracies are avoided as a result of the projections.

### 12. Robust ➤ Ceramic Piston Pump

The integrated piston pump works in both directions: it outputs the fluid in "low pressure" mode and controls the flow in "high pressure" mode. Due to the ceramic pump components this pump is very resistant and nearly indestructible against abrasive, solid contaminants and various fluids.





## LasPaC I Report

according to ISO 11171

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Sample ID / No. : ABC-1  
 Service Hour : 23.581 h  
 Oil Temperature : 41°C  
 Notes : Control  
 Test Date : 18. Nov 2002 13:40  
 Report Date : 20. Nov 2002  
 Profile Name : Std. High Press.

---

Meas. Volume : 10 ml  
 Analysis Volume : 1 ml

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ISO 4406 : 19 / 17 / 12 (Calibr. ISO 11 171: 1999)  
 AS 4059 : 9 A-F (9A/8B/6C/7D/6E/6F) (Calibr. ISO 11 171: 1999)  
 ISO 4406 : 19 / 17 / 13 (Calibr. ISO 4402: 1991)  
 NAS 1638 : 9 (9/8/7/8) (Calibr. ISO 4402: 1991)

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**Analysis ISO 11 171**

Particle Size	Particle / ml
> 4.0 µm (c)	2688.0
> 6.0 µm (c)	738.3
> 10.0 µm (c)	131.2
> 14.0 µm (c)	28.5
> 21.0 µm (c)	8.3
> 25.0 µm (c)	3.5
> 38.0 µm (c)	0.6
> 70.0 µm (c)	0.0

**Analysis ISO 4402**

Particle Size	Particle / ml
> 2.0 µm	2815.8
> 5.0 µm	875.1
> 10.0 µm	247.2
> 15.0 µm	78.4
> 20.0 µm	28.2
> 25.0 µm	13.4
> 50.0 µm	2.2
> 100.0 µm	0.6

## TECHNICAL DATA & ORDERING CODE

### 13. Technical Data

Microprocessor-controlled 8-channel particle counter is ideal for contamination monitoring of mineral based hydraulic fluids. The particle counter is equipped with a laser sensor. The orifice of the sensor has a cross-section of 500 x 500 µm. The maximum concentration is 24,000 p/ml at a flow rate of 25 ml/min (ISO 4406 Code 23). The sensor can be calibrated in accordance with the following standards:

**Calibration according to ISO 11 171 (1999):**  
 4 ... 70 µm(c) relating to ISO 4406 (1999)  
 and SAE AS4059 Rev. D (2001)

**Calibration according to ISO 4402 (1991):**  
 2 ... 100 µm relating to ISO 4406 (1987)  
 and NAS 1638 (1964)

Channels	1	2	3	4	5	6	7	8
ISO 11171 in µm (c)	4	6	10	14	21	25	38	70
ISO 4402 in µm	2	5	10	15	20	25	50	100

#### Fluid compatibility

Mineral oils and phosphate esters  
 (other fluids on request, e.g. Skydrol)

#### Pressure and viscosity

High pressure 5 bar ... 420 bar (73 ... 6000 PSI)  
 Viscosity up to 300 mm<sup>2</sup>/s  
 Low pressure 0 ... 6 bar (0 ... 87 PSI)  
 Viscosity up to 160 mm<sup>2</sup>/s  
 (Through the integrated pump)

#### Power supply

Voltage range: 110 V ... 240 V AC  
 10 V ... 36 V DC  
 Rechargeable battery operation: 2,5 h  
 (battery charger is integrated in the counter)

#### Working conditions

Fluid temperature: 0 ... 90°C (32 ... 194°F)  
 Ambient temperature: 0 ... 40°C (32 ... 104°F)  
 Humidity 20% ... 85%, non-condensing  
 95% by storage

#### Data output:

Cumulative particle counts, as well as cleanliness classes to ISO 4406 / SAE AS4059 Rev. D (2001) and ISO 4406 / NAS 1638 depending on calibration (see ordering code).

#### Integrated printer

**Integrated memory:** 500 standard measurements (made of 3 single measurements)

#### Download software

Downloading and storage of the data in ASCII format, as well as the evaluation and the further processing in Microsoft Excel® 2000.

#### Dimensions (w x h x d)

Particle counter 310 x 310 x 145 mm  
 (12.2 x 12.2 x 5.7 in)  
 Case with wheels 410 x 720 x 200 mm  
 (14.3 x 18.5 x 7.1 in)

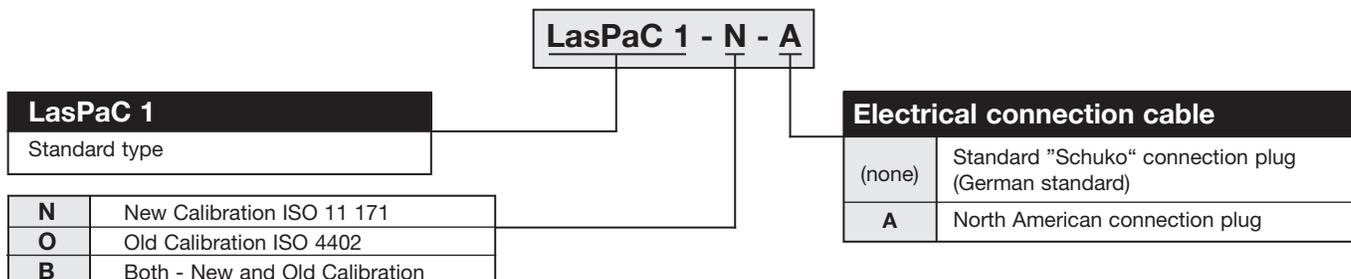
#### Weight

Particle counter 8.5 kg (18.7 lbs)  
 Particle counter with case and accessories  
 18 kg (40 lbs)

### 14. LasPaC 1 Kit includes:

- 1 x LasPaC 1 particle counter
- 1 x Aluminum trolley (case with wheels)
- 1 x Power supply connection cable
- 1 x Serial connection cable for connection to PC or notebook
- 1 x Software Download and Report
- 2 x STAUFF TEST hose (l = 1,5 m) for input/output
- 1 x Suction hose transparent (l = 1,5 m)
- 1 x Adapter low pressure hose to test coupling
- 1 x Control pen with plastic pin for the touchscreen
- 5 x Spare paper roll for built-in printer (order code SPR LasPaC)
- 1 x Operating instructions, in German and in English

### 15. Ordering Code



## Description

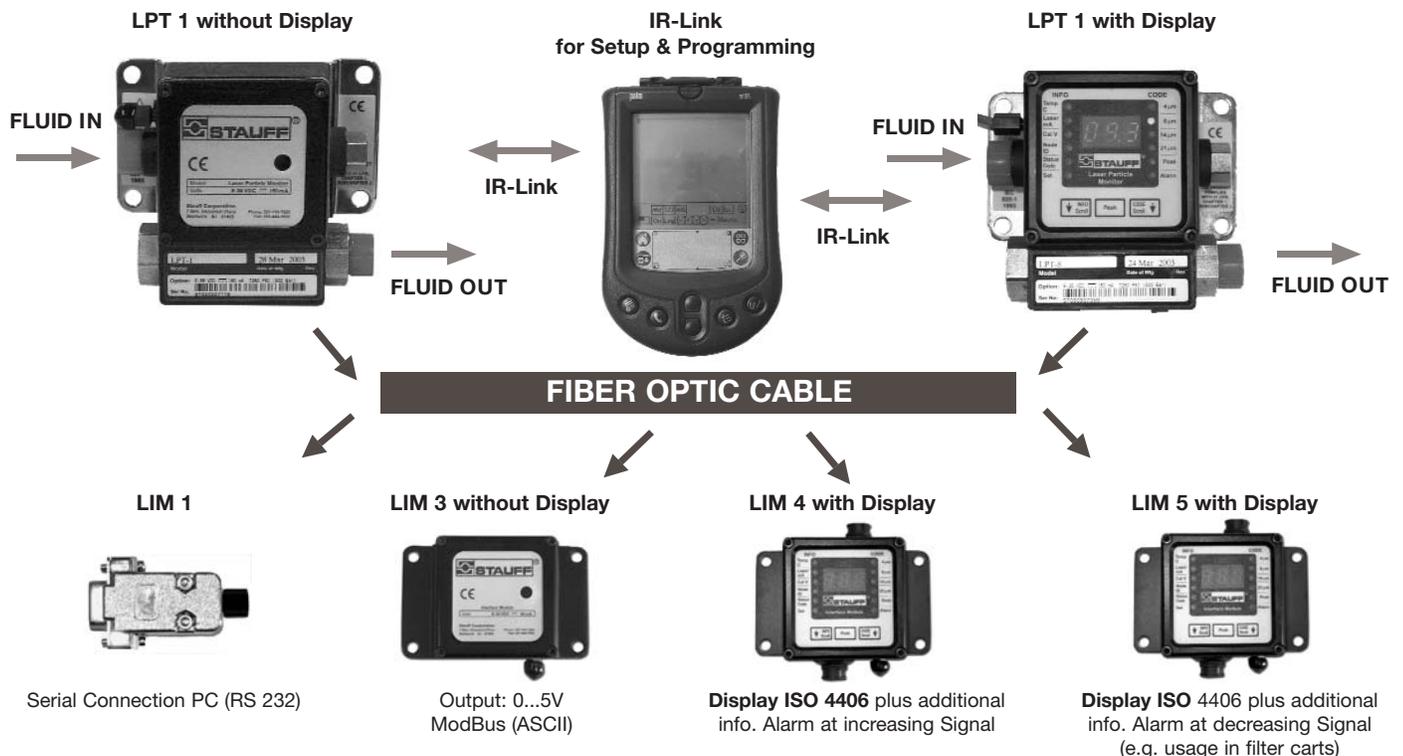
The STAUFF Laser Particle Monitor System LPM 1 is a laser based 4-channel inline particle monitor designed for the continuous monitoring of particle contamination. The LPM 1 provides cumulative particle concentration information at  $>4 \mu\text{m(c)}$ ,  $>6 \mu\text{m(c)}$  and  $>14 \mu\text{m(c)}$  sizes applicable to the ISO 4406, ISO 11943 and ISO 11171 requirements for optical particle counters. A  $>21 \mu\text{m(c)}$  channel is also provided for larger particle concentration information. Machine operators are alerted to changes in particle contamination levels in a

machine's fluid by the indications provided from the LPM 1. The contamination level will be shown on the display or can be transmitted via the RS-232 serial port into a personal computer. With the ModBus-serial port the data can be transferred into a computer network or to an external display. The LPT particle transducer is configured via the IR-port on a Palm or Pocket Computer. The LPM 1 system consists of a Laser Particle Transducer LPT and a Laser Interface Module LIM (see functional diagram).



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## Functional diagram

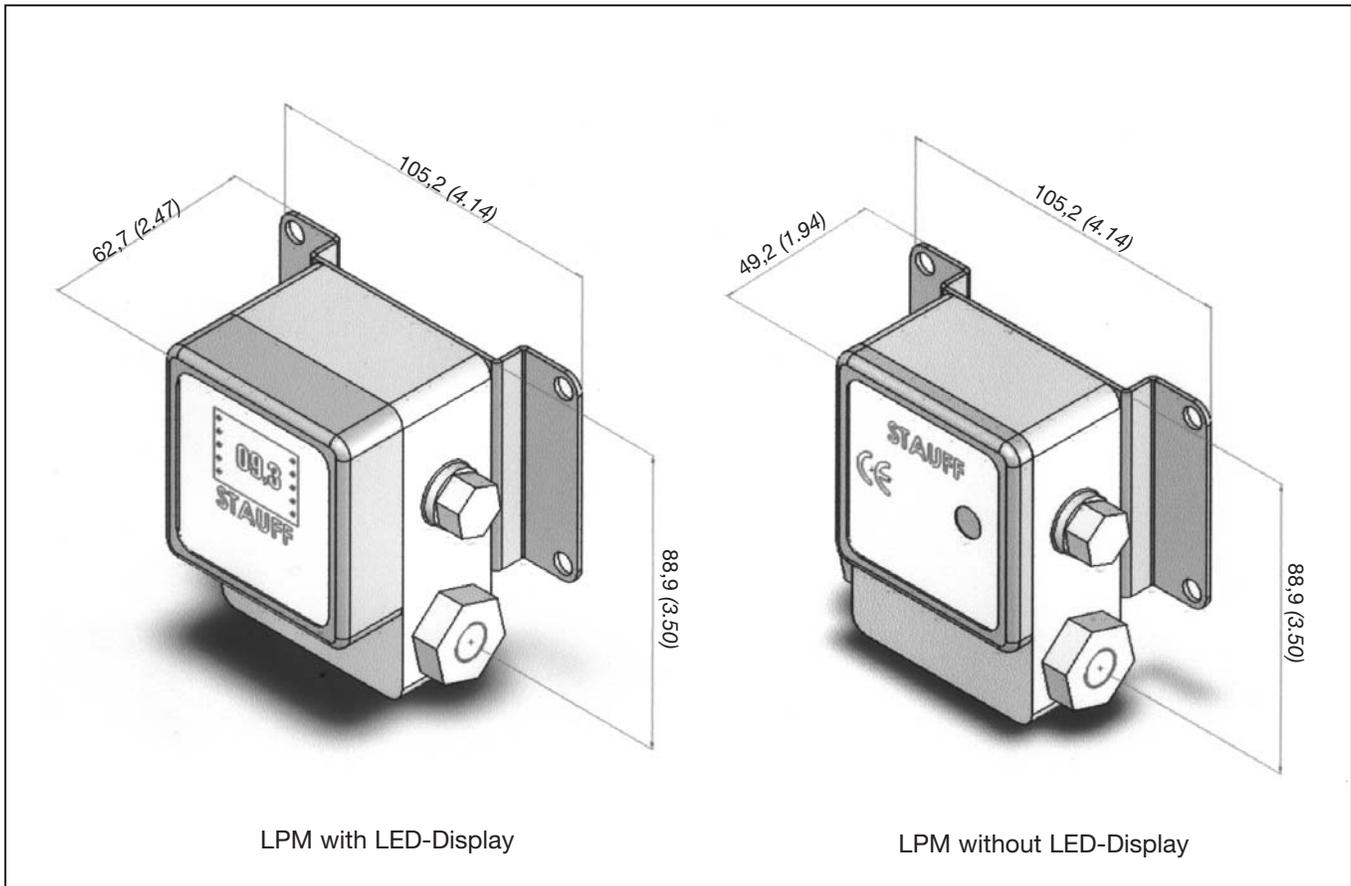


## Technical Specification

Channel Sizes	4, 6, 14 and 21 $\mu\text{m}_{(c)}$ (ISO MTD/ISO 11171)
Light Source	Laser Diode
Verification	Optional certification available
Sampling	Online continuous monitoring
Reproducibility	$\pm 0.5$ ISO code (ISO 4406)
Display	Optional local display presents ISO codes and alarms
Power supply	9 to 36 volts DC
Output	RS-232, RS-485, 0 to 5 volts, Modbus, alarm contacts, local display
Reports	Particles/ml, ISO 4406 codes 4, 6, 14 and additional 21 $\mu\text{m}_{(c)}$ (ISO MTD/ISO 11171)

Connections	SAE – 4 (7/16-20 UNF)
Flow Rate	50 to 500 ml/min through the viewing area. All units offer integrated flow rate monitoring with alarms.
Fluid compatibility	Mineral based hydraulic and lubrication oils. Phosphate Esters optional
Viscosity	2 cSt (32 SUS) minimum
Operating Pressure	1.4 to 500 bar (20 to 7250 PSI)
Operation Temperature	-20 to 60 °C (-4 to 140°F) ambient, -20 to 85 °C (-4 to 185°F) fluid
IP	Rating 67
Accessories Included	DDE Software, 6m (20 ft.) fiber optic cable, operators manual

## Dimensions



All dimensions in mm (inch)

## Description

The LPM 1 system consists of two parts: a LPT Particle Transducer and a LIM Interface module.

### Laser Particle Transducer LPT

The LPT Particle transducer contains the sensing device and electronics for detecting the level of contamination.

The laser based sensor uses light blocking technology for particle detection whereby particles passing through an optical flow cell block an amount of laser light proportional to the particle size.

The resultant particle concentration data from the LPT are sent to the LIM interface module via a fiber optic cable. The configuration of the LPT has to be done through the IrDA port of any PDA with IRA capabilities.



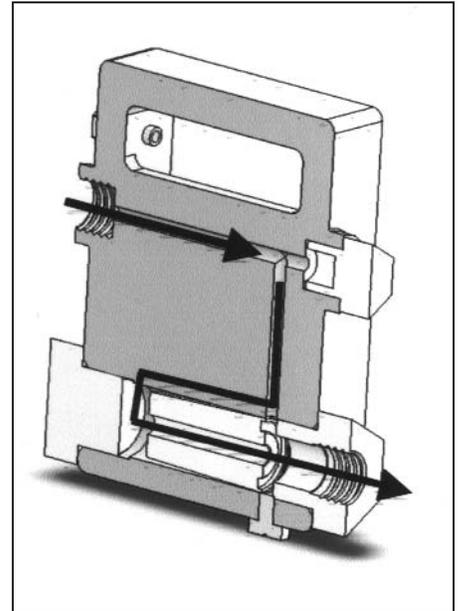
The LPT Particle transducers have a flow inhibitor downstream of the sensor that restricts and controls fluid flow from variable pressure sources.

The pressure is reduced to near atmospheric for return to the hydraulic reservoir. The inlet pressure ranges from 1.4 to 500 bar (20 to 7250 PSI) in three models are listed below.

The LPT's are available with or without a LED display. The three digit display shows the selected ISO code value or other function parameters.

### Available types of LPT

LPT-1	28 to 500 bar (400 to 7250 PSI), without LED-display
LPT-4	28 to 500 bar (400 to 7250 PSI), with LED-display
LPT-7	3.4 to 83 bar (50 to 1200 PSI), without LED-display
LPT-8	3.4 to 83 bar (50 to 1200 PSI), with LED-display
LPT-9	1.4 to 13.8 bar (20 to 200 PSI), without LED-display
LPT-0	1.4 to 13.8 bar (20 to 200 PSI), with LED-display



Flow Pattern

## Interface Module LIM

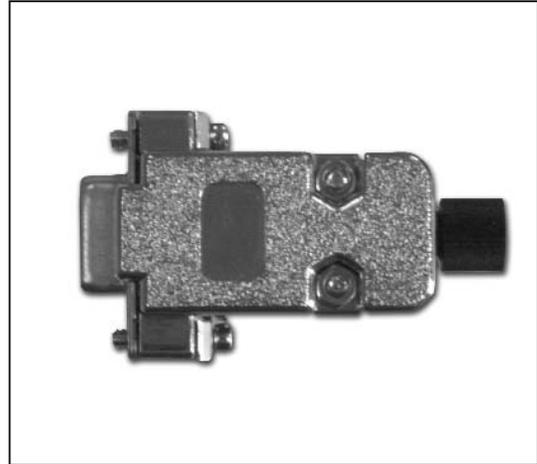
The LIM interface module converts the raw count data from the LPT for display or use in acquisition, logging or control systems. A terminal emulation program can be used to read the ASCII data

string. The LIM interface modules are available in four types to meet a wide variety of applications. The LPT is connected to the LIM via a fiber optic cable with a length up to 50 meters (175 ft.).

### LIM-1

The LIM-1 interface module has a DCE configuration (9-pin female) for attachment directly to a computer's RS-232 serial port. Power for the LIM-1 is supplied by the computer serial port.

The LIM-1 receives the raw serial data from the LPT transducer via a fiber optic cable and transmits them directly to the computer.



### LIM-3

The LIM-3 receives raw serial data input from the LPT transducer via a fiber optic cable. This data string is analyzed and converted into 0 to +5 VDC analog output voltages proportional to the ISO codes and also into ModBus ASCII device protocol for interface to a PLC or computer via RS-485 and RS-232 serial port.

Special adapters also allow the integration into an ethernet-computer network.

All signal outputs, as well as the input supply voltage (9 to 36 VDC), are connected to the LIM-3 through a DB-15 connector.



### LIM-4 and LIM-5

The LIM-4 and LIM-5 receive the raw serial data input from the LPT transducer via a fiber optic cable. Results are displayed on the front panel 3-digit LED display.

The ISO 4406 code number displayed is categorized in four size channels (>4, >6, >14 and >21  $\mu\text{m}$ (c)). The ISO number represents the number of particles counts per ml fluid. The user also can select internal information about the transducer (Temperature C, laser mA, Cal V, Node ID status code).

Alarm levels can be programmed for any of the four particle size channels. When set, an alarm indicator will flash if the alarm level is reached. For the LIM-4 the alarm is activated if the measured ISO numbers exceed the set alarm level and for the LIM-5 the alarm is activated if the ISO number falls below the set level.

Alarms on the LIM-4 and LIM-5 may be deactivated by pressing any button. Supply voltage is external and can be from a 9 to 36 VDC source.

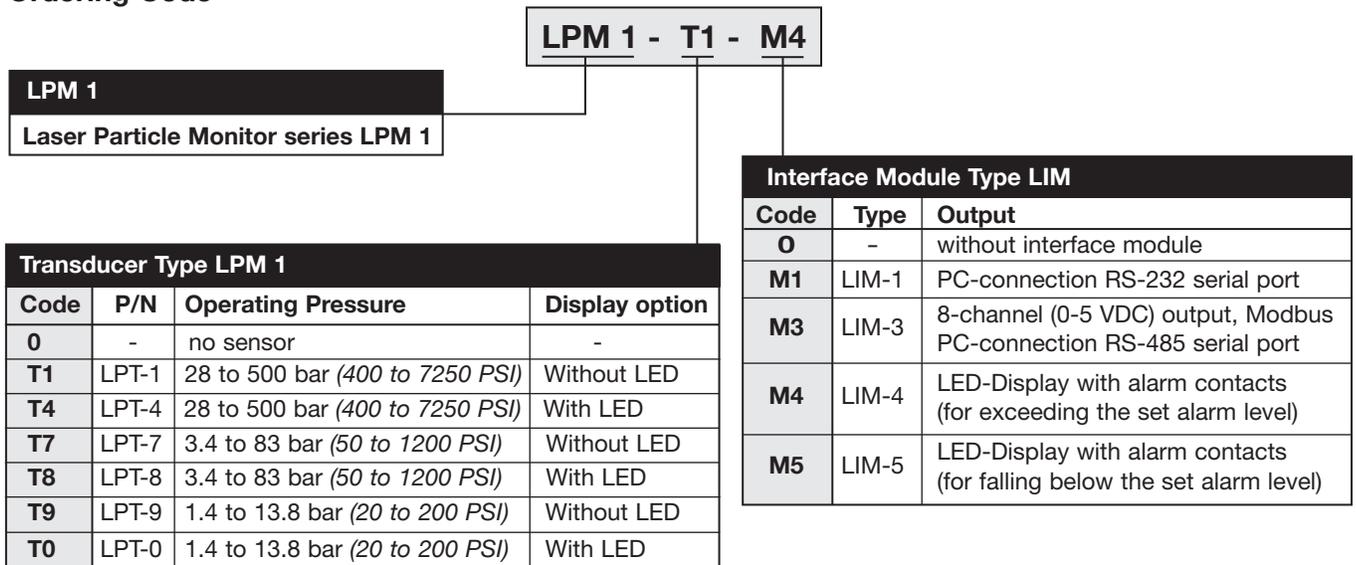


## Software (optional)

The standard software allows the download and the visualization of the measured particle distribution. Upon request a special software is available that allows the customer to control, monitor and analyze

more than one LPM which are connected in a network. For custom configuration, please contact your local STAUFF partner.

## Ordering Code



## Each LPM 1-Kit includes:

- 1 x LPT Laser Particle Transducer
  - includes 3 m (10 ft.) flying lead power cable (9 to 36 VDC required, not supplied)
- 1 x LIM Interface module
  - LIM-1, includes 6 m (20 ft.) interconnecting fiber optic cable
  - LIM-3, includes 6 m (20 ft.) interconnecting fiber optic cable and two 3 m (10 ft.) power cable with 3 pin connector.
  - LIM-4, includes 6 m (20 ft.) interconnecting fiber optic cable and one breakout cable with 15 pin connector
  - LIM-5, includes 6 m (20 ft.) interconnecting fiber optic cable and one breakout cable with 15 pin connector
- 1 x Quick Start Guide
- 1 x Operators Manual
- 1 x Software
  - Includes DDE server
  - Hex and terminal logger for RS-232
  - PDA Shareware

Fluid analysis is a crucial component of any oil management program. Early detection of potential problems can prevent costly

repairs and downtime. Stauff Check Oil Analysis Kits provide a complete laboratory report for your sample.

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## Ordering Information

Part Number	Description
STFC-10	Carton of 10 bottles
STFC-01	Single test bottle

The Stauff Check Fluid Analysis Kit includes complete laboratory analysis of your oil sample as part of the initial purchase price of the kit. Each kit includes an ultra-clean bottle with pre-addressed mailer and sample information sheet.

### Test carried out include:

- Spectrographic Analysis – 19 elements for wear metals, contaminants and additives
- Viscosity – the kinematic viscosity reported in centistokes (cSt).
- Visible Debris Analysis – microscopic examination of any visible debris in the sample
- Total Acid Number (TAN)
- Particle Count – to determine the cleanliness of the system
- Karl Fisher (KF) – to determine the exact concentration of water present in the oil

## Oil Analysis Reports

In addition to a printed report, the Stauff Check Fluid Analysis service includes access to your test reports on the Internet.

Your reports are hosted on a secure server that you can access with your user ID and password. All that is required is a connection to the Internet and a compatible browser. You can view all your current and previous test results for all of the machines you are monitoring. Track the effectiveness of your oil management program and generate detailed management summary reports.

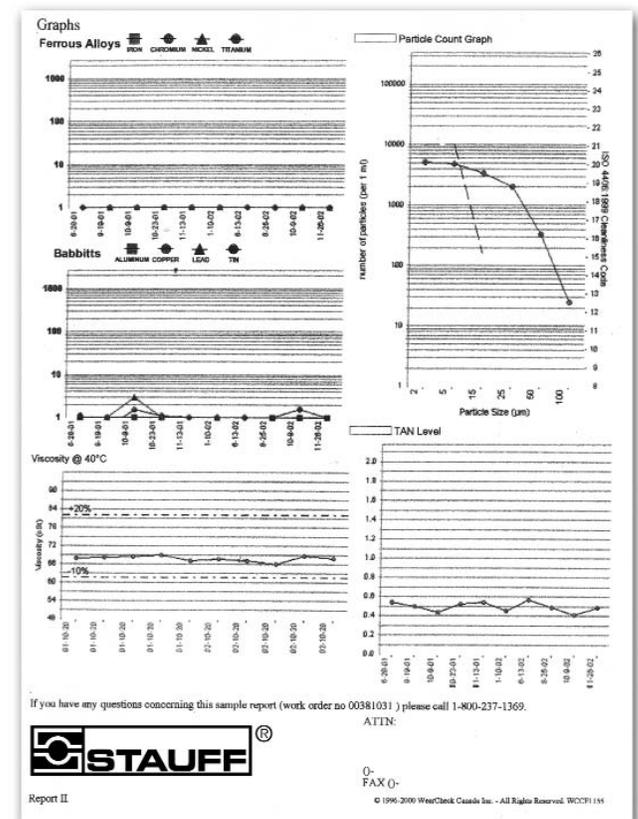
## Review Oil Analysis Results

View oil analysis sample reports, test results, trending graphs and recommendations. Access data that was traditionally accessible only to the laboratory, including, IR spectra, TAN and TBN titration plots, as well as, GC chromatograms.

Enjoy the best possible turn-around of your oil analysis samples by viewing data on-line and in real-time with your oil analysis laboratory.

Improve time management by receiving e-mail alerts notifying you when recently completed samples indicate an equipment problem where corrective action is required.

IND FILTRATION TECHNOLOGY STAUFF INDUSTRIAL OIL ANALYSIS REPORT		CONTAMINATION OIL CONDITION WEAR		ABNORMAL ABNORMAL NORMAL	
<b>CENTRAL 10 BAR - DIRTY - Hydraulic System</b>					
Unit Maked	: 10 BAR SECTION	Date Rec'd	: Nov 27, 2002	Sample Date	: Nov 26, 2002
Unit Model	: (n/a)	Serial No.	: (n/a)	Time on Unit	: 0 hrs
Comp Maked	: (n/a)	Cust. Ref No.	: (n/a)	Time on Oil	: 0 hrs
Comp Model	: (n/a)	Stub No.	: ST-001731	Time on Filter	: 0 hrs
<b>RECOMMENDATION</b> Diagnostician: Doug Bogart					
We recommend you service the filters on this component. Resample at the next service interval to monitor.					
<b>CONTAMINATION</b>					
The system cleanliness is above the acceptable limit for your target ISO 4406 cleanliness code. There is a high amount of particulates (5 to >100 microns in size) present in the oil. Light concentration of visible dirt/debris present in the oil.					
Sample Date	06/13/02	08/25/02	10/09/02	Current	Abn
Silicon	1.0	1.2	1.7	0.0	---
Potassium	5.2	0.0	6.0	6.1	---
Water (%)	0.008	0.008	0.007	0.036	---
>5µm	5305	8280	6785	4740	1300
>15µm	415	671	371	2341	160
>25µm	69	98	41	2015	20
>50µm	5	7	3	324	3
>100µm	0	0	0	25	0
ISO 4406	21/20/16	21/20/17	21/20/16	20/19/19	20/17/14
<b>OIL CONDITION</b>					
Sample Date	06/13/02	08/25/02	10/09/02	Current	Base
Oil Type: 2000 LTR of CASTROL HYSYPIN AWS HYDRAULIC OIL	The condition of the oil is acceptable for the time in service. Sample is lacy in appearance.				
Boron	3.6	3.7	3.1	3.4	---
Barium	0.0	0.0	0.0	0.0	---
Calcium	41	50	45	37	---
Magnesium	0.7	0.9	0.0	0.0	---
Molybdenum	0.0	0.1	0.8	0.0	---
Sodium	1.7	1.4	0.0	0.4	---
Phosphorus	304	384	332	353	---
Sulfur	6261	8930	7538	8708	---
Zinc	398	468	415	437	---
IVisc@40°C	66.65	65.81	68.44	67.61	68
IVisc@100°C	---	---	---	---	7.6
Oxidation	---	---	---	---	---
TAN	0.565	0.487	0.413	0.488	---
ITBN	---	---	---	---	---
<b>WEAR</b>					
All component wear rates are normal.					
Sample Date	06/13/02	08/25/02	10/09/02	Current	Abn
Iron	0.5	0.7	0.5	0.3	---
Nickel	0.2	0.6	0.0	0.0	---
Chromium	0.0	0.0	0.0	0.0	---
Titanium	0.0	0.0	0.0	0.0	---
Copper	0.7	1.0	0.7	0.2	---
Aluminum	0.1	0.0	0.0	0.0	---
Tin	0.0	0.0	1.6	0.0	---
Lead	0.1	0.0	0.0	0.0	---
Silver	0.0	0.0	0.0	0.0	---



## Oil Sampling Kits

- Contains vacuum pump for drawing samples of oil from equipment
- 1 m (3.28 ft.) hose for insertion into tank
- Two Sample Bottles
- Stauff Test Points and Adaptor allows oil sample to be taken from any Stauff Test Points

### Oil Sampling Kit SFSK-1

#### Contains

- 1 x Fluid Sample Pump FSP-38
- 1 x Hose adaptor SHA-20-5, 5mm
- 1m (3.28 ft) Push on 1/4" hose
- 1 x SMK 20-1/4" NPT-VD
- 1 x SMK 20-7/16" UNF-VE
- 2 x Sample Bottles STFC - 01





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Use the Acrobat toolbar buttons to quickly navigate through pages. The chart describes the basic function of each button.

You may also use the bookmark navigation to the left. Just click on a bookmark to get the information desired.

### Toolbar Navigation

Next Page



Navigation Tool  
(for clicking on links or bookmarks)

Previous Page



Magnify  
(use to enlarge type or expand video or graphics to full screen)

First page



Show/Hide Navigation Pane

Last page



View Actual Size

Go to Previous View



View to Fit in Window

Go to Next View



View to Fit Width

*Tip: Always use the Previous View button to retrace your steps.*