



The valmetSP consistency transmitter is used for pulp consistency measurement in the pulp and paper industry. The transmitter's operation is based on shear force measurement and it is mounted directly on the process pipe.

The transmitter is supplied with an operating unit (mA + HART® version may also be supplied without one), a blade type to suit the specified application, and a process coupling.

## TECHNICAL SPECIFICATIONS

**Consistency range:** 0.7% to 16% Cs.

**Span:** Min. 0.8 %Cs  
Max. 30 N - zero elevation

**Zero elevation:** Max. 30 N - Span

**Damping time constant:** 1 to 60s  
Factory setting 2 s (type HL: 20 s)

### valmetSP MA:

#### Output signal

Two-wire transmitter (2W):  
4-20 mA + HART®

**Power supply:** 18 to 35 VDC

#### Load capacity

18 V / 250 Ω

**Note!** HART® requires min. 250 Ω load resistance

### valmetSP PA

#### Output signal

PROFIBUS - PA Slave  
IEC 61158-2

**Power supply:** 9 to 32 V DC

22 mA +/- 2 mA

### Space for later use

**Process pressure:** max. 25 bar  
If process pressure > 10 bar, see if the coupling's mounting hole has to be reinforced. Refer to Operating and Installation Instructions.

### Environmental conditions

Ambient: -20 to 60°C, 0-100% RH (no condensate)  
Process: 0 to 120°C  
Storage: -50 to 80°C

Pulp type	Application ranges of blade types (% Cs)							
	UL	LL	LS	GL	RL	WS	HL	JL
SW unbleached	0.7-3	1.5-6		(1.7-7)	(1.5-6)		4-16	1.5-6
SW bleached	0.7-3	1.5-6		(1.7-7)	(1.5-6)		4-16	1.5-6
HW unbleached	1-3	(1.8-5)		1.8-7.5	1.7-6.5		5-16	1.8-6
HW bleached	1-3	(1.8-5)		1.8-7.5	1.7-6.5		5-16	1.8-6
Groundwood	1-4			1.8-7.5	1.7-6.5		5-16	
RMP, TMP, CSF < 200 ml (SR > 52)	0.7-3			1.5-6.5	1.7-6.5		5-16	
RMP, TMP, CSF > 200 ml (SR < 52)	0.7-3	1.5-5.5	36	(1.5-6)			4-16	
CTMP	0.7-3	1.5-5.5	36		(1.5-5.5)		4-16	
Recycled fiber, OCC, unscreened						2-8		
Recycled fiber, unscreened						2-8		
Recycled fiber, OCC, screened	1-3			1.7-8	1.5-7		4-16	
Recycled fiber, screened	1-5			1.8-8	1.7-8		5-16	

Values in brackets are second choices

HART® is a registered trademark of HART Communication Foundation.

## Type specification selection chart

**valmetSP**

**Signal** \_\_\_\_\_  
MA / PA / \_\_\_\_\_

**Blade type** \_\_\_\_\_  
LL/LLP/LS/LSP/JL/UL/ULP/GL/RL/HL/WS/NO  
Rem. third character P = polished option  
(GL, RL, HL and WS always polished)

**Wetted part's materials \*)** \_\_\_\_\_  
SS AISI316 L (LL/LLP/LS/LSP/UL/ULP/GL/RL/HL/JL)  
TI Titanium (LL/GL/HL/JL)  
HC

**Process coupling and its material \*)** \_\_\_\_\_  
NO No process coupling  
SS Std., AISI316 L  
TI Std. Titanium  
HC Std. Hastelloy C276  
SB Blow line installation for HL blade, AISI316 L  
SW For WS blade, AISI316 L  
TJ For JL blade, Titanium.  
for fibreglass-reinforced plastic pipe.

**Process pipe diameter** \_\_\_\_\_  
For SS Std.: From DN 100 mm to DN 800 mm  
For SW: From DN 100 mm to DN 400 mm  
\*) HC and TI are marked on wetted parts

## PERFORMANCE SPECIFICATIONS

Tested in reference conditions in accordance with IEC60770.  
Linearity of force measurement: ±0.5% of span  
Hysteresis: 0.025 N  
Repeatability: 0.01 N  
Static pressure effect: 0.02 N per 1 bar  
Process temperature effect: 1% of reading per 10°C  
Vibration effect: 2 g per 10-2000 Hz: less than ±0.03 N

### Examples:

- 0.01 N corresponds to 0.005% consistency variation in bleached softwood chemical pulp (e.g. spruce sulphate) at 3.0% consistency when using the LL sensor.  
- 0.1 N corresponds to 0.01% consistency variation in screened recycled fiber pulp at 3% consistency when using the RL sensor.

## EMC test standards

Radiated interference:  
EN50081 - 1: 1993  
Reference standard EN 55022:  
1987 / Class B  
Interference immunity:  
EN 50082 - 2: 1995  
Reference standards EN 61000-4-2,  
-4, -5, -8, -11, ENV 50140, ENV 50204,  
ENV 50141

## Permissible velocity of flow (m/s)

	Min / max
valmetSP UL	0.1 / 1-3
valmetSP HL	0.4 / 8
ValmetSP WS	0.4 / 4
Other types	0.4 / 5

For detailed specification of flow velocities refer to Operating and Installation Instructions.

## Materials

Wetted materials: See type specification chart  
Electronics housing: PTB  
Mounting clamps and screws: AISI316  
Wetted gaskets: PTFE and special rubber material  
Operator unit: Polycarbonate

## Enclosure class

Transmitter: IP66 (NEMA 4X)  
Operator unit: IP65

## Weight

valmetSP WS: 7.1 kg  
Other transmitter types: 5.8 kg

## Accessories:

### Turbulence Reducer

**FlowTR P Pipe**, Fig. 6  
FlowTR reduces highly turbulent flow in short straight pipe sections.

### Welding guide

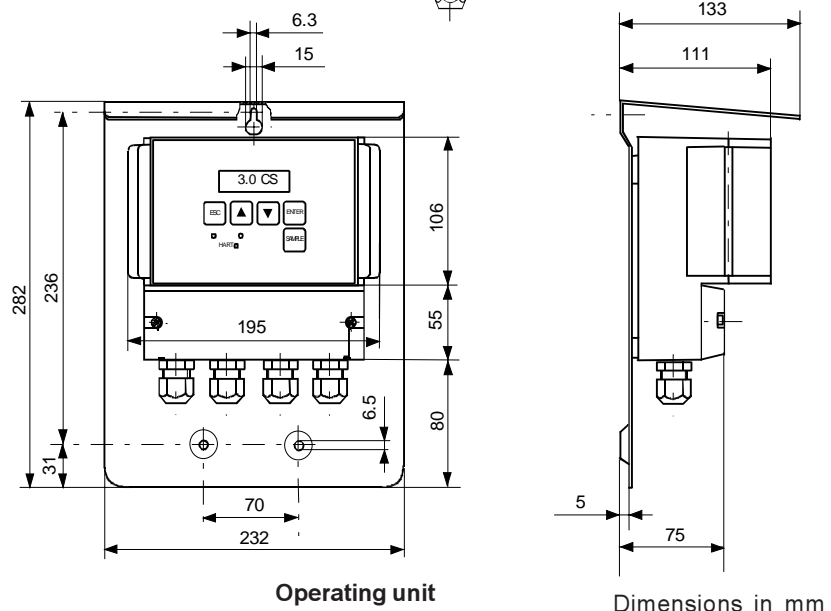
We recommend the use of the welding guide shown in Fig. 5 for the installation of a standard process coupling.

## Patents

AT E77691 B	FR 0274478
DE 3780021	GB 0274478
EP 0274478	SE 0274478
FI 75424	US 4,757,708

## Dimensions

Sens.	Dimension H (from edge of coupling)
LL	95
LS	70
UL	95
GL	95
RL	95
JL	95 Standard coupling
JL	57 Plastic-pipe coupling
HL	60 Standard coupling
HL	38 Blow-line coupling



## Calibration curves and calibration

The transmitter is provided with built-in calibration curves and linearisation for all blade types and recommended pulp types. There are max. 8 customised recipes, each of which contains one automatically calibrated pulp type curve and possible information on filler content.

Active recipe is selected from the display unit's operating keys, through HART® interface or through binary inputs.

## Sampling and calibration support

Includes calculation of shear force, standard deviation of consistency and average consistency during sample taking. Sampling time can be synchronised exactly with average value calculation with a sampler provided with switch function (Valmet NOVE). Each of the 8 recipes can be calibrated

automatically with 1 or 2 samples. Recipe No. 1 can be additionally calibrated with 16 calibration points.

## Recycling of used up units

Almost all parts of units are suitable for recycling. Parts materials are specified in documents dispatched with the product. Also a separate recycling instructions guide is available from the manufacturer. Alternatively the manufacturer takes care of the used up units on a special fee.