








#### Technical specifications



#### Meter sizes (DN), pressure stages (PN) and permissible flow rates (q) for rotary-piston meters and automatic batchmeters

Design	DN		PN		Rated flow rate		Permissible flow rate													
	mm	(inch)	bar	(psi)	l/min	(USgpm)	With viscosity	Min. <sup>1)</sup> with continuous <sup>2)</sup> operation		Max. with intermittent <sup>3)4)</sup> operation		Max. with continuous operation								
	mm	(inch)	bar	(psi)	l/min	(USgpm)	mPa·s (cp)	l/min	(USgpm)	l/min	(USgpm)	l/min	(USgpm)							
Rotary-piston meter for industrial use																				
 up to PN 16 (MWP 232 psi)	15 <sup>5)</sup>	(½) <sup>5)</sup>	25 40	(363) (580)	20	(5.3)	≤ 1 < 5 800 2 000 5 000 10 000 <sup>7)</sup>	1.5 1.0 0.2 0.2 0.2 0.2	(0.26) (0.2) (0.05) (0.03) (0.03) (0.03)	10 <sup>6)</sup> 20 20 10 4 1	(5.3) (5.3) (5.3) (1.3) (0.53) (0.26)	10 10 10 5 2 1	(2.6) (2.6) (2.6) (1.3) (0.53) (0.26)							
	 up to PN 63 (MWP 914 psi)	25	(1)	10	(145)	100	(26.4)	0.3	12	(3.2)	100	(26)	80	(13)						
				16	(232)			0.6	6	(1.6)	100	(26)	80	(13)						
				25	(363)			1	5	(1.3)	100	(26)	80	(13)						
40				(580)	5			3	(0.8)	100	(26)	80	(13)							
63				(914)	800			1	(0.26)	100	(26)	80	(13)							
 up to PN 63 (MWP 914 psi)	50	(2)	6	(87)	500	(132)	0.3	40	(11)	500	(106)	350	(44)							
			10	(145) <sup>8)</sup>			0.6	20	(5.3)	500	(132)	350	(44)							
			25	(363)			1	18	(4.8)	500	(132)	350	(44)							
			40	(580)			5	10	(2.6)	500	(132)	350	(44)							
			63	(914)			800	2	(0.53)	500	(106)	350	(44)							
 up to PN 63 (MWP 914 psi)	80	(3)	6	(58)	1 000	(264)	0.3	60	(16)	1 000	(211)	700	(93)							
			25	(87) <sup>8)</sup>			0.6	35	(9.3)	1 000	(264)	700	(93)							
			40	(363)			1	25	(6.6)	1 000	(264)	700	(93)							
			63	(580)			5	10	(2.6)	1 000	(264)	700	(93)							
			63	(914)			800	5	(1.3)	1 000	(211)	500	(93)							
 up to PN 63 (MWP 914 psi)	25	(1)	10	(145)	100	(26.4)	0.6	10	(2.6)	100	(26)	50	(13)							
							1	8	(2.1)	100	(26)	50	(13)							
							5	4	(1.0)	100	(26)	50	(13)							
							 up to PN 63 (MWP 914 psi)	50	(2)	6	(87)	500	132	0.3	40	(11)	500	(106)	–	–
														0.6	20	(5.3)	500	(132)	–	–
1	18	(4.8)	500	(132)	–	–														
5	10	(2.6)	500	(132)	–	–														
800 <sup>9)</sup>	2	(0.53)	400	(106)	–	–														

#### Rotary-piston meter acid-resistant mode

	25	(1)	10	(145)	100	(26.4)	0.6	10	(2.6)	100	(26)	50	(13)
							1	8	(2.1)	100	(26)	50	(13)
							5	4	(1.0)	100	(26)	50	(13)

#### Automatic batchmeter (Rotary-piston meter with quantity preset register and mechanical shut-off valve)

	25	(1)	10	(145)	100	(26.4)	0.3	12	(3.2)	100	(26)	–	–
							0.6	6	(1.6)	100	(26)	–	–
							1	5	(1.3)	100	(26)	–	–
							5	3	(0.8)	100	(26)	–	–
							800 <sup>9)</sup>	1	(0.26)	100	(26)	–	–
	50	(2)	6	(87)	500	132	0.3	40	(11)	500	(106)	–	–
							0.6	20	(5.3)	500	(132)	–	–
							1	18	(4.8)	500	(132)	–	–
							5	10	(2.6)	500	(132)	–	–
							800 <sup>9)</sup>	2	(0.53)	400	(106)	–	–

1) For metal rotary-pistons: increase by a factor of 2, for PCTFE and PTFE/graphite filling rotary-pistons: increase by a factor of 3.

2) Continuous operation: over 8 hours a day.

3) For metal pistons: reduce by a factor ≈0.8 to extend service life.

4) Intermittent operation: up to 8 hours a day

5) Note: When using pistons made of carbon, there is danger of break in the case of liquid hammers

6) When using pistons made of carbon.

7) Flow rates for higher viscosities on request; we have experience of up to 350 000 mPa·s (cp).

8) Values in brackets apply to casing in CrNiMo steel.

9) Max. permissible viscosity for exact closing of the shut-off valve and for exact dispensing: viscosities up to 4 000 mPa·s (cp) possible.

#### Note:

In order to extend the service life of the pulse sensor, rotary-piston meters with current and/or pulse output (without intermediate gear) should only be operated at max. 60% of the permissible flow.

# SITRANS F flowmeters

## SITRANS F R

### Rotary-piston meters - Introduction

#### Technical specifications

#### Piston materials

Piston material	Design	Permissible liquid temperature		Max. perm. dyn. viscosity	Order No. code.
		°C	°F		
Carbon		-10 ... 300	14 ... 572	25	<b>K</b>
Cast iron (mat. No. GG 25) Cast iron (mat. No. GG 25)	with slotting	-10 ... 300 -10 ... 300	14 ... 572 14 ... 572		<b>E</b> <b>B</b>
Ni-Resist (mat. No. 0.6660) Ni-Resist (mat. No. 0.6660)	with slotting	-10 ... 300 -10 ... 300	14 ... 572 14 ... 572		<b>N</b> <b>C</b>
Hard rubber Hard rubber	with slotting	-10 ... 40 <sup>1)</sup> -10 ... 40 <sup>1)</sup>	14 ... 104 <sup>1)</sup> 14 ... 104 <sup>1)</sup>	50 50	<b>G</b> <b>D</b>
PTFE/graphite filling PTFE/ graphite filling PTFE/ graphite filling PTFE/ graphite filling	with slotting with slotting	0 ... 40 <sup>2)</sup> 0 ... 40 <sup>2)</sup> 0 ... 90 <sup>2)</sup> 0 ... 90 <sup>2)</sup>	32 ... 104 <sup>2)</sup> 32 ... 104 <sup>2)</sup> 32 ... 194 <sup>2)</sup> 32 ... 194 <sup>2)</sup>	120 120 120 120	<b>F</b> <b>L</b> <b>R</b> <b>M</b>
PCTFE PCTFE	with slotting	-10 ... +40 <sup>2)</sup> -10 ... +40 <sup>2)</sup>	14 ... 104 <sup>2)</sup> 14 ... 104 <sup>2)</sup>	120 120	<b>H</b> <b>J</b>
Gni steel with carbon contact surface (DN 25 (1") only) Gni steel with PTFE contact surface (DN 25 (1") only)	Collar piston	-10 ... +200 -10 ... +40	14 ... 392 14 ... 104	> 10 > 10	<b>S</b> <b>T</b>

<sup>1)</sup> For 120 min max. 65 °C (149 °F); for 20 min max. 90 °C (194 °F), e. g. for cleaning procedures

<sup>2)</sup> Error limit max. 1%; at 90°C (194 °F) max. 2%

#### Further technical specifications

Materials and max. permissible liquid temperatures	
Housing (also lining with acid resistant meters) and measuring chamber	Temperature range
<ul style="list-style-type: none"> <li>Cast iron, spheroidal graphite, cast steel, Cranium steel</li> </ul>	-30 ... +300 °C (-22 ... +572 °F)
<ul style="list-style-type: none"> <li>Cast iron/enamel, Duroplast measuring chamber</li> </ul>	-20 ... +80 °C (-4 ... +176 °F)
General data	
Error limits	Between 0.2 % and 0.5 % of the correct value (depending on the metered fluid, the measuring range and the relevant calibration regulations) except for rotary-piston meters DN 15 (½") and acid-resistant meters with PCTFE pistons; where 1% of the actual value applies.
Reproducibility	Within 0.05 %
Adjustment	In steps from 0.01 %
Pressure drop	Max. permissible 3 bar (43.5 psi), max. 0.5 bar (7.25 psi) for acid resistant meters
Transmission from wet to dry space	Gland-free, via permanent magnet coupling
Installation position (axis of meter mechanism)	
<ul style="list-style-type: none"> <li>Rotary-piston meter for industrial use</li> </ul>	
- Acid-resistant model	Any
- Automatic batchmeter	Vertical
<ul style="list-style-type: none"> <li>Special designs</li> </ul>	
- Rotary-piston meter for oil fuels	Any
- Rotary-piston meter for liquid gas	Meter axis vertical
Special inlet and outlet pipe sections	Not necessary
Pipe connection	Flanges drilled to DIN 2501, DIN 2547 (PN 63 only)
Filter size (mesh width)	0.8 mm (0.031 inch) for rotary-piston meter

#### Note

The material combinations which can be supplied are listed in the Selection and Ordering data.

The maximum permissible liquid temperature is determined by the "weakest link" in the particular combination (the PCTFE rotary-piston, for example, in a meter made of Cranium steel).

#### Automatic batchmeter

With this meter, the maximum permissible liquid temperature is also limited by the operation and design of the shut-off valve.

The following temperatures are permissible for valves with maintenance free

- Gland seal: -10 ... +200 °C (14 ... 392 °F)
- Bellows seals: -10 ... +40 °C, max. 3 bar (14 ... 104 °F, max. 43.5 psi)

Models for higher liquid temperatures on request. The installation of cooling attachments also necessitates a corresponding increase in length of the mechanical shut-off valve.

The following restriction applies to the automatic batchmeters because of the higher flow resistance through the associated shut-off valve:

- with the same value  $q$ ,  $\Delta p$  is increased by approx. 30 %
- with the same value  $\Delta p$ ,  $q$  is reduced by approx. 20 %

In case of a dynamic viscosity 60 mPa·s (cp), constructional details of the shut-off valve cone must be changed.

Furthermore, installation of a filter is omitted for 800 mPa·s (cp) and above.