



Magnetic Inductive Flowmeter

for conductivity liquids



measuring
•
monitoring
•
analysing

PIT



- Measuring range:
up to 10 m/s
- Accuracy:
±1.5% of reading
± 0.5% of full scale
- p_{max} : PN40; t_{max} : -40 ... +150 °C
- Connection:
flange DN 40 ... 80,
ANSI 2" ... 3"
- Material:
stainless steel/PTFE or PFA
- Outputs: Analogue with HART®,
pulse and status

SS



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Description

An electrically conductive medium induces a voltage while flowing through an arranged magnetic field in accordance to the Faraday's induction law. The electrode current is proportional to the flow velocity and therewith to the volume flow. The PIT-Sensor is available with integral or remote mount transmitter. A retracting device for mounting and dismounting under process conditions is available.

The magnetic-inductive PIT flow velocity sensor is used to measure or monitor the volume flow of liquids, slurries, pastes and other electrically conductive media while minimizing pressure drop.

Pressure, temperature, density and viscosity do not affect the volume measurements. Portions of solid particles and small gas pockets should be avoided.

The PIT has following significant characteristics:

- Wide variety of wetted materials
- Electrodes in Hastelloy®, tantalum, platinum and other materials available
- Retracting device for use under process conditions

Technical Details

Sensor

Material armature: Stainless steel / PTFE, PFA
 Material electrodes: Hastelloy®, tantalum, platinum, other materials on request
 Process connection: Flanges acc. EN 1092, ASME B16.5, DIN 2512, special connections on request
 Nominal pressure: PN 16, ASME C1150 / 300 (PFA)
 PN 40, ASME C1150 / 300 (stainless steel / PTFE)
 higher pressures on request
 Process temperature: -40 ... +100 °C (stainless steel / PTFE)
 -40 ... +150 °C (PFA)
 Ambient temperature: -40 ... +60 °C

Protection: IP 67 / IP 68 (EN 60529)

Certification and approvals

Explosion protection: BVS 03 ATEX E 150 X
 ⓧ II 2G EEx e [ia] IIC T3-T6
 NEPSI Approval Cert
 No. GYJ06474X

Range of application for sizes: DN 125 ... DN 2000 (stainless steel / PTFE), DN 125 ... DN 600 (PFA)

Adjustable upper range values

Standard: 1 ... 10 m/s
 Special: 0.5 ... 5 m/s
 Conductivity: ≥ 20 µS/cm

Transmitter UMF and UMF2-... BK

Mounting: Integral or remote
 Power supply: 115/250 V_{AC}
 24 V_{DC}
 24 V_{AC} (only UMF)
 Outputs: Galvanically isolated
 Current: 2 x 0(4) - 20 mA (UMF)
 1 x 0(4) - 20 mA (UMF2-... BK)
 Binary 1: Active, potential free 24 V_{DC}, max. 200 mA (UMF)
 passive, optocoupler, (UMF, UMF2-... BK)
 U_i = 30 V, I_i = 200 mA, P_i = 3 W
 Binary 2 (status): Passive, optocoupler, (UMF)
 U_i = 30 V, I_i = 200 mA, P_i = 3 W
 Binary 3 (optional): Passive, optocoupler, (UMF)
 U_i = 30 V, I_i = 200 mA, P_i = 3 W (only with 1 analogue output)



Technical Details (continuation)

Ambient temperature: -20... +60 °C
 Protection: IP 68 (EN 60529)
 Communication: HART®
 Accuracy: ± 1.5 % of reading
 ± 0.5 % adjusted full scale
 (under reference conditions)
 Repeatability: ± 0.75 % of reading
 ± 0.25 % adjusted full scale
 (under reference conditions)

Signal output/ input: Intrinsically safe or not intrinsically safe

NEPSI Approval Cert No. GYJ06475

CE-Marking: EMC-Directive 2004/108/EC
 Voltage Directive 2006/95/EC
 EN 61010-1:2004

Electromagnetic compatibility: EN 61000-6-3:2001 (emissions residential environments)
 EN 61000-6-2:1999 (immunity for industrial environments)
 EN 55011:1998+A1: 1999 Group 1, Class B (radio interference)
 EN 61326-1:2008 safety requirements for electrical measuring, control and laboratory devices

Certification and Approvals

Explosion protection: DMT 99 ATEX E 107 X (UMF)

Increased safety

EEx e (connection area): II (1)/2G EEx de [ia] IIB / IIC T3-T6

Explosion proof

EEx d (connection area): II (1)/2G EEx d [ia] IIB / IIC T3-T6

Order Details Sensor (Example: PIT-S 317B 016 H 0 1 0 0 0K) (continuation see below)

Model/ material/ version	Process connection Flange	Sensor length	Elektrode material	Earthing- electrode	Sensor configuration	Approvals
PIT-S = stainless steel	317B = DN 40 PN 40 form B1 DIN EN 1092-1	016 = 163 mm xxx = special length	H = Hastel- loy® C-4 T = tantalum N = platinum	0 = without	1 = integrated transmitter, IP 68 3²⁾ = remote mounted transmitter, IP 65 4²⁾ = remote mounted transmitter, IP 68 5²⁾ = remote mounted transmitter, IP 68-Ex (only possible with transmitter UMF2)	0 = without E³⁾ = II 2G Eex e [ia] IIC T3-T6 B³⁾ = NEPSI
PIT-A = PFA	321B = DN 50 PN 40 form B1 DIN EN 1092-1			0 = without		
	326B¹⁾ = DN 65 PN 40 form B1 DIN EN 1092-1			H = Hastelloy® C-4		
	331B = DN 80 PN 40 form B1 DIN EN 1092-1			T = tantalum		
	206R = 2" Class 150 RF ASME B16.5-2003		T = tantalum	N = platinum		
	208R = 3" Class 150 RF ASME B16.5-2003					
PIT-U = stainless steel/design for installation	326B = DN 65 PN 40 form B1 DIN EN 1092-1			0 = without		

¹⁾ Not for PIT-A (PFA)

²⁾ Order cable and cable glands separately

³⁾ Only possible with transmitter UMF and transmitter version option 1/3/5

Order Details Sensor (continuation)

Certificates	Supplementary equipment
0 = without	OK = without LK = special design for flow velocity XK = special version
1 = certificate of compliance with the order, 2.1	
2 = test report, 2.2	
B = inspection certificate with material certificate 3.1	
C = inspection certificate with material certificate 3.2	



Order Details Transmitter (Example: UMF- 1 3 1 0 0 1 1 0K)

Model	Power supply	Analogue output	Pulse output	Approval	Type of protection signal output
UMF-	1 = 230 V _{AC} 50/60 Hz 2 = 115 V _{AC} 50/60 Hz 3 = 24 V _{AC} 50/60 Hz 4 = 24 V _{DC}	3 = 4 -20 mA with HART® 4 = 4 -20 mA	1 = active, 24 V _{DC} 2 = passive, U _i = 30 V _{DC}	0 = without	0 = without
				1 = II(1)2G EEx de [ia] IIB/IIC T3-T6 2 = II(1)2G EEx d [ia] IIB/IIC T3-T6 4 = NEPSI	I = EEx ia (intrinsically safe) E² = EEx e (not intrinsically safe)

Continuation Order Details Transmitter (continuation)

Mounting	Thread for cable gland ³⁾	Display / interface board
1 = integrated transmitter 2¹⁾ = remote mounted transmitter	1 = M 20x1.5 2 = ½" NPT	0K = without 1K = with display / interface board

¹⁾ Includes mounting bracket for wall. Adapter for 2" pipe mounting bracket, select from accessories list

²⁾ Standard protection with Ex-approval EEx d

³⁾ Interconnecting cable and cable glands, select from accessories list



Order Details Transmitter (Example: UMF2- A 1 1 F0BK)

Model	Mounting/ thread for cable gland	Display-/ interface board	Power supply	Outputs/version
UMF2-	A = integrated transmitter IP67 standard / ½" NPT (f) B = integrated transmitter IP67 standard / M20x1.5 C = remote transmitter incl. 2.5 m cable and tube/wall mounting bracket, cable >10 m with box to transmitter / ½" NPT (f) D = remote transmitter incl. 2.5 m cable and tube/wall mounting bracket, cable >10 m with box to transmitter / M20x1.5 L = integrated transmitter IP68 / ½" NPT (f) M = integrated transmitter IP68 / M20x1.5 G = remote transmitter incl. 2.5 m cable and tube/wall mounting bracket, connecting box to transmitter standard / ½" NPT (f) H = remote transmitter incl. 2.5 m cable and tube/wall mounting bracket, connecting box to transmitter standard / M20x1.5	1 = with display/ interface board	1 = 230 V _{AC} (+10%, -15%), 50/60 Hz 2 = 115 V _{AC} (+10%, -15%), 50/60 Hz 4 = 24 V _{DC} (±15%)	F0BK = analogue output 1: 0(4)-20 mA pulse output: passive, U _m =24 V _{DC} status output: passive, U _m =24 V _{DC} G0BK = analogue output 1: 0(4)-20 mA with HART®-protocol pulse output: passive, U _m =24 V _{DC} status output: passive, U _m =24 V _{DC}

¹⁾ Longer interconnecting cable select from accessories list

Order Details Interconnection Cable for Remote Mount Transmitter UMF

(Example: PITKBL- 65 - 0 001)

Model	Protection / Approvals	Cable length
PITKBL - 65 - 0	IP 65 / without approvals	001 = 1 m 002 = 2 m 003 = 3 m XXX = x m
PITKBL - 65 - E	IP 65 /  II 2G EEx e [ia] IIC T3-T6	
PITKBL - 68 - 0	IP 68 / without approvals	
PITKBL - 68 - E	IP 68 /  II 2G EEx e [ia] IIC T3-T6	

Order Details Welding Socket

Order number	Version
60 000 519	stainless steel (1.4571 / 1.4404), DN40 PN40, standard length
60 018 833	stainless steel (1.4571 / 1.4404), DN50 PN40, standard length
60 020 328	stainless steel (1.4571 / 1.4404), 2" Class 150 RF ASME, standard length
60 019 025	stainless steel (1.4571 / 1.4404), 3" Class 150 RF ASME, standard length
60 019 917	stainless steel (1.4571 / 1.4404), DN65 PN40, standard length for installation- / extracting device

Screws on request

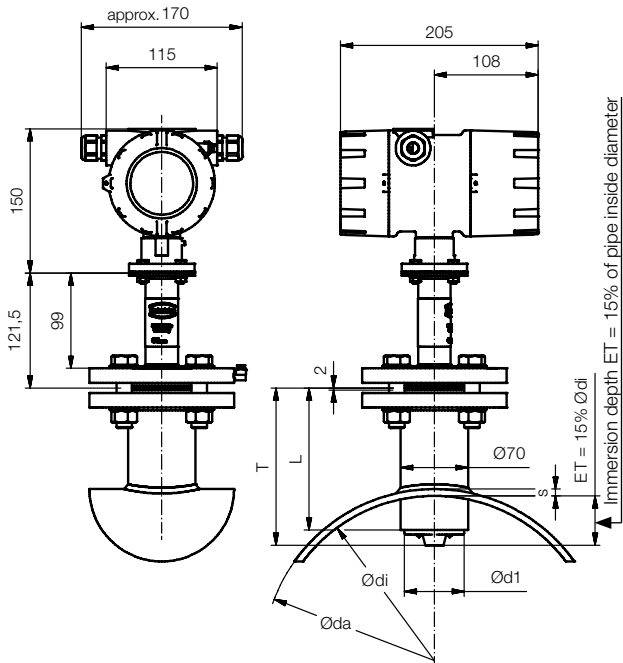
Order Details Installation-, Extracting Device

Model	Version	Length
PIT - EVVS	valve lock 1.4408 (ball valve + mounting socket), DN65 PN40	
PIT - EVDS1G	pressure screw for remote mounted version	$l \leq 1000$ mm
PIT - EVDS2G	pressure screw for remote mounted version	$l \leq 2000$ mm
PIT - EVDS1A	pressure screw for integrated mounted version	$l \leq 1000$ mm
PIT - EVDS2A	pressure screw for integrated mounted version	$l \leq 2000$ mm

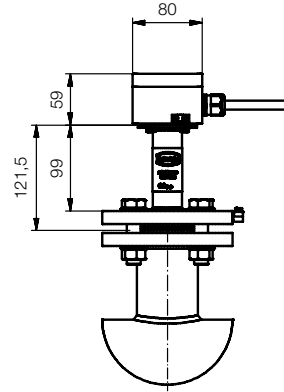
For mounting the installation-, extracting device following things are necessary:
 Sensor in special version PIT-U326B, welding socket 60019917,
 valve lock PIT-EWS and pressure screw set PIT-EVD...

Dimensions [mm]

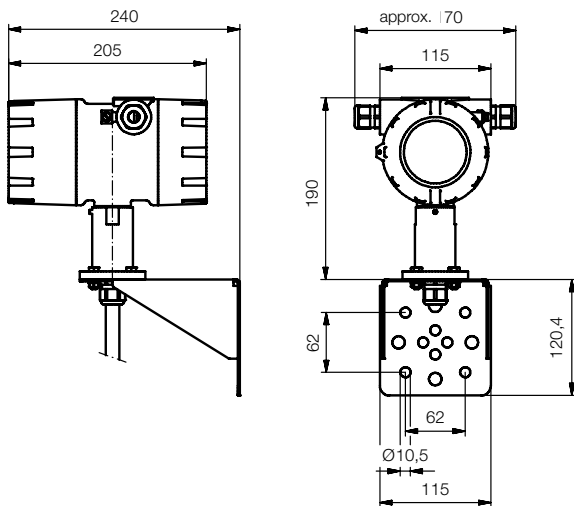
Transmitter compact version



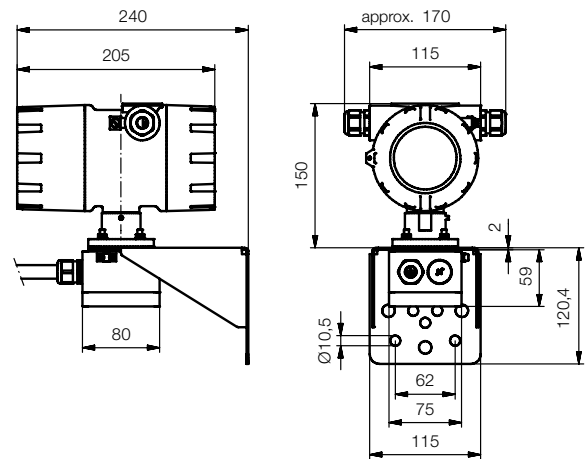
Sensor remote version



Remote transmitter (up to 10 m cable)



Remote transmitter with connecting box



Model	DN	T	Ød1	L
PIT-A (PFA)	150 - 600	163 mm	62 mm	145 mm
PIT-S (SS/PTFE)	150 - 600	163 mm	60,3 mm	145 mm
PIT-S (SS/PTFE)	700 - 1200	263 mm	60,3 mm	170 mm
PIT-S (SS/PTFE)	1400 - 2000	363 mm	60,3 mm	170 mm