

Flow Measurement

SITRANS F M

MAG 8000 CT for revenue and bulk metering (7ME6820)

Overview



Benefits

Approvals

- MI-001, OIML R 49/OIML R 49 MAA
- PTB K7.2
- FM Fire Service

Easy to install

- Compact or remote solution with factory mounted cable and customer setting from factory
- IP68/NEMA 6P enclosure. Sensor can be buried
- Flexible power supply - internal or external battery pack or mains power supply with battery back-up possibilities

Long-term stability/Low cost of ownership

- No moving parts in a robust construction means less wear and tear
- Basic and advanced transmitter versions with different optional add-on communication modules fulfil various customer requirements for high cost efficiency
- Bi-directional measurement with an outstanding low flow performance
- Up to 10 years maintenance-free operation in typical applications
- Insignificant pressure drop

Intelligent information, easy to access

- Advanced information on site
- Advanced statistics and diagnostics
- Connectable to common AMR systems

Technical specifications

Meter	
Accuracy	OIML R 49/OIML R 49 MAA for DN 50 ... DN 300 (2" ... 12"), Class I and II with turn down up to Q3/Q1 = 400 at Q2/Q1 = 1.6 MI-001 verification for DN 50 ... DN 600 (2" ... 24"), Class II with turn down ratio Q3/Q1 = 250, Q3/Q1 = 200 or Q3/Q1 = 160 at Q2/Q1 = 1.6 FM Fire Service for DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") ± 1.5% (Q _{min} to Q _{max})
Low flow cut-off (default)	15 mm/s
Media conductivity	Clean water > 20 µs/cm
Temperature	
Ambient	-20 ... +60 °C (-4 ... +140 °F) MI-001: -25 ... +55 °C (-13 ... +131 °F)
Media	0.1 ... 50 °C (32 ... 122 °F)
Storage	-40 ... +70 °C (-22 ... +158 °F)
Enclosure rating	
Remote sensor	IP68 to EN 60529/NEMA 6P, 10 mH ₂ O cont.
Compact version	IP68 to EN 60529/NEMA 6P, 3 mH ₂ O for six months
Certificates and approvals	
Calibration (standard)	2 x 25 % and 2 x 90 %
Material certificate EN 10204 3.1	Available when ordering together with meter ¹⁾
Drinking water approvals	<ul style="list-style-type: none"> • NSF/ANSI Standard 61²⁾ (cold water) USA • WRAS (BS 6920 cold water) UK • ACS Listed France • DVGW W270 Germany • Belgaqua (B) • MCERTS (GB)
Fire Service approval	FM Fire Service (1044) ³⁾
Custody transfer approval	<ul style="list-style-type: none"> • OIML R 49 and OIML R 49 MAA approval (DN 50 ... DN 300 (2" ... 12")) • MI-001 approval (DN 50 ... DN 600 (2" ... 24")) (DK-0200-MI-001-011) • PTB K7.2
Conformity	<ul style="list-style-type: none"> • CEN EN 14154, ISO 4064 • PED: 2014/68/EU⁴⁾ • EMC: IEC/EN 61326
Sensor version	DN 50 ... 600 (2" ... 24")
Sensor material	Carbon steel ASTM A 105, with corrosion resistant two-component epoxy coating (150 µm/300 µm) Corrosivity category C4M, according to ISO 12944
Measuring principle	Electromagnetic induction
Excitation frequency	
Basic version	
• Battery-powered	DN 50 ... 150 (2" ... 6"): 1/15 Hz DN 200 ... 600 (8" ... 24"): 1/30 Hz
• Mains-powered	DN 50 ... 150 (2" ... 6"): 6.25 Hz DN 200 ... 600 (8" ... 24"): 3.125 Hz

MAG 8000 CT for revenue and bulk metering (7ME6820)

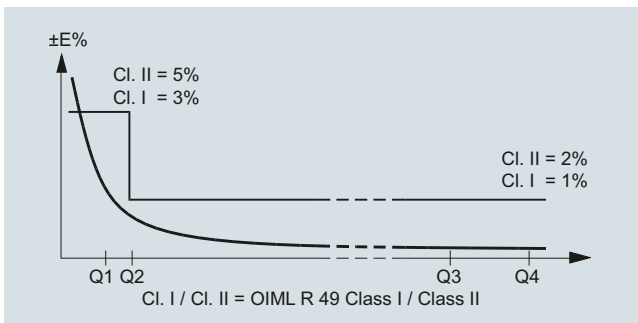
Advanced version	
• Battery-powered	DN 50 ... 150 (2" ... 6"): 1/15 Hz (adjustable up to 6.25 Hz; reduced battery lifetime) DN 200 ... 600 (8" ... 24"): 1/30 Hz (adjustable up to 3.125 Hz; reduced battery lifetime)
• Mains-powered	DN 50 ... 150 (2" ... 6"): 6.25 Hz DN 200 ... 600 (8" ... 24"): 3.125 Hz
Flanges	
EN 1092-1 (DIN 2501)	DN 50 ... 150 (2" ... 6"): PN 16 (232 psi) DN 200 ... 300 (8" ... 12"): PN 10 or PN 16 (145 psi or 232 psi) up to DN 600 (24") in preparation
ANSI 16.5 Class 150	2" ... 12": 20 bar (290 psi) up to DN 600 (24") in preparation
AWWA C-207	28" ... 48": PN 10 (145 psi)
AS 4087	DN 50 ... 300 (2" ... 12"): PN 16 (232 psi) up to DN 600 (24") in preparation
Liner	EPDM
Electrode and grounding electrodes	Hastelloy C276/2.4819
Grounding straps	Grounding straps are premounted from the factory on each side of the sensor

- 1) Has to be ordered with the meter. It is not possible to order the certificate afterwards.
- 2) Including Annex G
- 3) Not for sensors with 300 µm coating.
- 4) For further information on the PED standard and requirements see page 10/15.

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MAG 8000 CT (Revenue program) water meter type approval

MAG 8000 CT program is type approved and verified according to international water meter standard OIML R 49. The custody transfer program is approved as Class I and Class II, for the sensor program from DN 50 to DN 300, at different Q3 and Q3/Q1. Q2/Q1 = 1.6 and follows OIML R 49 specification.

OIML R 49/2006-DK2-10.01 Revision 1 approval specification for Class I (1 %)¹⁾

Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
„R“ Q3/Q1	250	250	250	250	250	250	250	250	125	-	-	-	-	-
Q1 [m³/h]	0.25	0.40	0.63	1.00	1.60	2.50	4.00	6.40	12.8	-	-	-	-	-
Q2 [m³/h]	0.40	0.64	1.00	1.60	2.60	4.00	6.40	10.24	20.48	-	-	-	-	-
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600	-	-	-	-	-
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000	-	-	-	-	-

OIML R 49/2006-DK2-10.01 Revision 1 approval specification for Class II (2 %)¹⁾

Size	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
„R“ Q3/Q1	400	400	400	400	400	400	400	400	200	-	-	-	-	-
Q1 [m³/h]	0.16	0.25	0.40	0.63	1.00	1.60	2.50	4.00	10.00	-	-	-	-	-
Q2 [m³/h]	0.25	0.40	0.63	1.00	1.60	2.50	4.00	6.40	16.00	-	-	-	-	-
Q3 [m³/h]	63	100	160	250	400	630	1000	1600	1600	-	-	-	-	-
Q4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000	-	-	-	-	-

¹⁾ The product will be delivered according to requested specifications, which may deviate from the specifications of the approval frame described in tables below.

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MAG 8000 CT (Revenue program) MI-001

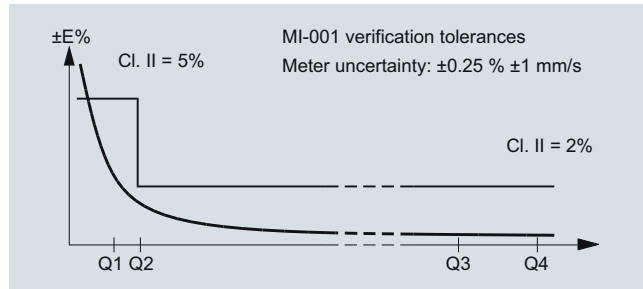
MAG 8000 CT program is type approved according to international water meter standard OIML R 49. Since the first November 2006 the MI-001 water meter directive is in force, which means that all water meters can be sold across the EU borders if the water meters contain a MI-001 label.

The MAG 8000 CT MI-001 verified and labeled products are a Class II approval according to Directive 2014/32/EU of the European Parliament and Council of 26 February, 2014 on measuring instruments, Annex VI Thermal Energy Meters (MI-004) in the sizes from DN 50 to DN 400.

The MID certification is obtained as a B + D module approval according to the above mentioned directive.

Module B : Type approval according to OIML R 49

Module D : Quality insurance approval of production



MAG 8000 CT MI-001 verified and labeled products at a given $Q3$ and $Q4/Q3 = 1.25$ and $Q2/Q1 = 1.6$ measuring ranges see below table:

7ME6820-xxxx1	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
„R“ Q3/Q1	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Q4 [m³/h]	20	31.25	50	78.75	125	200	312.5	500	787.5	1250	1250	1250	2000	3125
Q3 [m³/h]	16	25	40	63	100	160	250	400	630	630	1000	1000	1600	1600
Q2 [m³/h]	0.96	1.60	2.60	4.03	6.40	10.24	16	25.60	40.3	64	64	64	102.4	160
Q1 [m³/h]	0.60	1	1.60	2.52	4	6.40	10	16	25.2	40	40	40	64	100

7ME6820-xxxx2	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
„R“ Q3/Q1	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Q4 [m³/h]	20	31.25	50	78.75	125	200	312.5	500	750	1250	1250	3125	3125	5000
Q3 [m³/h]	16	25	40	63	100	160	250	400	630	1000	1000	2500	2500	4000
Q2 [m³/h]	0.41	0.63	1.02	1.60	2.54	4.06	6.35	10.16	16	25.4	25.4	63.49	63.49	101.6
Q1 [m³/h]	0.25	0.40	0.63	1	1.59	2.54	3.97	6.35	10	15.9	15.9	39.68	39.68	63.49

7ME6820-xxxx3	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
„R“ Q3/Q1	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Q4 [m³/h]	20	31.25	50	78.75	125	200	312.5	500	1250	2000	2000	5000	5000	7875
Q3 [m³/h]	16	25	40	63	100	160	250	400	1000	1600	1600	4000	4000	6300
Q2 [m³/h]	0.32	0.50	0.80	1.20	2	3.20	5	8	20	32	32	80	80	126
Q1 [m³/h]	0.20	0.31	0.50	0.75	1.25	2	3.13	5	12.50	20	20	50	50	78.75

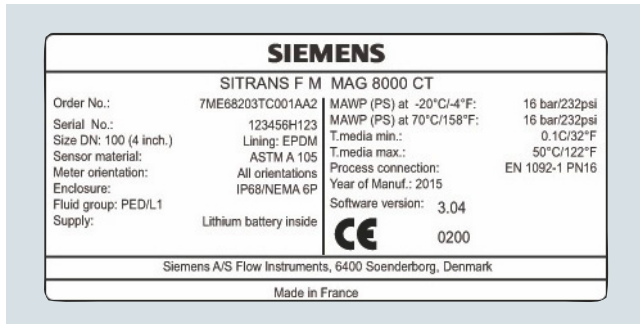
7ME6820-xxxx4	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
„R“ Q3/Q1	160	160	160	160	160	160	160	160	160	160	160	160	160	-
Q4 [m³/h]	50	78.75	125	200	312.5	500	787.5	1250	2000	2000	2000	7875	7875	-
Q3 [m³/h]	40	63	100	160	250	400	630	1000	1600	1600	1600	6300	6300	-
Q2 [m³/h]	0.40	0.63	1	1.60	2.50	4	6.30	10	16	16	16	63	63	-
Q1 [m³/h]	0.25	0.39	0.63	1	1.56	2.50	3.94	6.25	10	10	10	39	39	-

7ME6820-xxxx5	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
„R“ Q3/Q1	200	200	200	200	200	200	200	200	200	-	-	-	-	-
Q4 [m³/h]	50	78.75	125	200	312.5	500	787.5	1250	2000	-	-	-	-	-
Q3 [m³/h]	40	63	100	160	250	400	630	1000	1600	-	-	-	-	-
Q2 [m³/h]	0.32	0.50	0.80	1.28	2	3.20	5.04	8	12.8	-	-	-	-	-
Q1 [m³/h]	0.20	0.32	0.50	0.80	1.25	2	3.15	5	8	-	-	-	-	-

MAG 8000 CT for revenue and bulk metering (7ME6820)

7ME6820- xxxx6	DN 50 (2")	DN 65 (2½")	DN 80 (3")	DN 100 (4")	DN 125 (5")	DN 150 (6")	DN 200 (8")	DN 250 (10")	DN 300 (12")	DN 350 (14")	DN 400 (16")	DN 450 (18")	DN 500 (20")	DN 600 (24")
„R“ Q3/Q1	250	250	250	250	250	250	250	250	-	-	-	-	-	-
Q4 [m³/h]	50	78.75	125	200	312.5	500	787.5	1250	-	-	-	-	-	-
Q3 [m³/h]	40	63	100	160	250	400	630	1000	-	-	-	-	-	-
Q2 [m³/h]	0.26	0.40	0.64	1.02	1.60	2.56	4	6.40	-	-	-	-	-	-
Q1 [m³/h]	0.16	0.25	0.40	0.64	1	1.60	2.52	4	-	-	-	-	-	-

The Label is placed on the side of the encapsulation.
An example of the product label is shown below:



Installation conditions

Please refer to "System information SITRANS F M electromagnetic flowmeters".

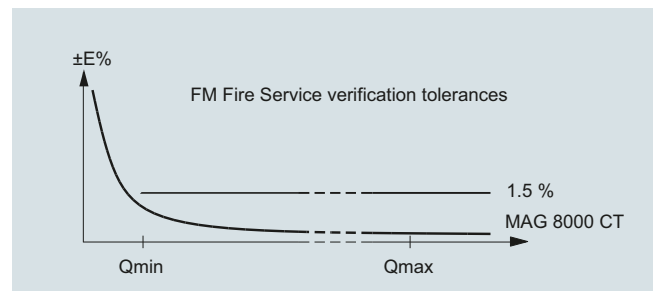
Battery operation time and calculation

The battery operation time depends on the connected battery pack as well as the operation condition of the meter.

MAG 8000 calculates the remaining capacity every 4 hours and includes all consuming elements. Calculation compensates for temperature influence on battery capacity (drawing).

MAG 8000 CT (7ME6820) for Fire Service applications

MAG 8000 CT (7ME6820) is FM Fire Service approved for automatic fire protection systems according to the Fire Service Meters Standard, Class Number 1044. The approval is applicable for the sizes DN 50, DN 80, DN 100, DN 150, DN 200, DN 250, and DN 300 (2", 3", 4", 6", 8", 10", and 12") with ANSI B16.5 Class 150 flanges. The FM Fire Service approved product can be ordered via the Z-options P20, P21 and P22.



Flow Measurement

SITRANS F M

MAG 8000 CT for revenue and bulk metering (7ME6820)

Selection and Ordering data	Article No.
SITRANS F M	
MAG 8000 CT water meter with EPDM liner and Hastelloy electrodes	7 ME 6 8 2 0 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Diameter	
DN 50 (2")	2 Y
DN 65 (2½")	3 F
DN 80 (3")	3 M
DN 100 (4")	3 T
DN 125 (5")	4 B
DN 150 (6")	4 H
DN 200 (8")	4 P
DN 250 (10")	4 V
DN 300 (12")	5 D
DN 350 (14") ¹⁾	5 K
DN 400 (16") ¹⁾	5 R
DN 450 (18") ¹⁾	5 Y
DN 500 (20") ¹⁾	6 F
DN 600 (24") ¹⁾	6 P
Flange norm and pressure rating	
<u>EN 1092-1</u> PN 16	C
<u>ANSI B16.5</u> Class 150	J
<u>AS4087</u> PN 16	N
Sensor version	
EPDM liner and Hastelloy electrodes, 150 µm coating	0
EPDM liner and Hastelloy electrodes, 300 µm coating	4
Approval/Verification³⁾	
Without verification according to OIML R 49 ⁴⁾	0
MI-001 Q3/Q1 = 25	1
MI-001 Q3/Q1 = 63	2
MI-001 Q3/Q1 = 80	3
MI-001 Q3/Q1 = 160	4
MI-001 Q3/Q1 = 200	5
MI-001 Q3/Q1 = 250	6
Without verification calibrated to OIML R 49-Class II (Q3/Q1 = 100)	7
Without verification calibrated to OIML R 49-Class II (Q3/Q1 = 250)	8
Region version	
Europe (m ³ , m ³ /h, 50 Hz)	1
USA (m ³ , m ³ /h, 60 Hz)	2
Transmitter type and installation	
Basic version integral on sensor	A
Basic version, remote cables mounted on sensor with IP68/NEMA 6P plugs	
5 m (16.4 ft)	B
10 m (32.8 ft)	C
20 m (65.6 ft)	D
30 m (98.4 ft)	E
Advanced version integral on sensor	K
Advanced version, remote cables mounted on sensor with IP68/NEMA 6P plugs	
5 m (16.4 ft)	L
10 m (32.8 ft)	M
20 m (65.6 ft)	N
30 m (98.4 ft)	P

Selection and Ordering data	Article No.
SITRANS F M	
MAG 8000 CT water meter with EPDM liner and Hastelloy electrodes	7 ME 6 8 2 0 -
Communication interface	
No additional "add-on" communication module installed	A
Serial RS 485 with Modbus RTU (Terminated as end device)	B
Serial RS 232 with Modbus RTU	C
Encoder interface for ITRON 200WP radio with "Sensus" protocol	D
3G/UMTS communication module with remote antenna; 5 m (16.4 ft) cable	S
3G/UMTS communication module with analog inputs and remote antenna; 5 m (16.4 ft) cable	T
Power supply	
Internal battery (no battery included)	0
Internal battery pack installed ²⁾	1
Power cable (1.5 m (4.9 ft)) with IP68/NEMA 6P plugs for external battery (no battery included)	2
12/24 V AC/DC power supply with battery backup and 3 m (9.8 ft) power cable for external connection (no battery included)	3
115 ... 230 V AC power supply with battery backup and 3 m (9.8 ft) power cable for external connection. (no battery included)	4
1) Under preparation.	
2) Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.	
3) For more details and references of the ranges please see the tables on pages 3/125 to 3/127.	
4) Standard calibration or according to FM Fire Service requirements if P20, P21 or P22 is selected as Z option.	

Operating instructions for SITRANS F M MAG 8000

Description	Article No.
• English	A5E03071515
• German	A5E00740986

All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

Operating instructions for MAG 8000 3G/UMTS communication module

Description	Article No.
• English	A5E03644134

MAG 8000 CT for revenue and bulk metering (7ME6820)

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Additional information		Additional information	
Please add “-Z” to Article No. and specify Order code(s) and plain text.		Please add “-Z” to Article No. and specify Order code(s) and plain text.	
Material certificate according to EN 10204-3.1	C12¹⁾	Region/customer specific label	W28 H20 H21 H22
FP2E marking (France only)	C17		
Totalizer			
Volume calculation (default totalizer 1 = forward and totalizer 2 = reverse)		KCC label (South Korea)	
Totalizer 1 = RV, reverse flow	L20	FP2E label (France)	
Totalizer 1 = NET, net flow	L22	DIN 43863 label ¹⁾	
Totalizer 2 = FW, forward flow	L30	DIN 43863 label with SWM mark ¹⁾	
Totalizer 2 = NET, net flow	L31		
Pulse set up (default pulse A = forward and pulse B = Alarm, pulse width = 50 ms)			
A function = RV, reverse flow	L62		
A function = FWnet, forward net flow	L63		
A function = RVnet, reverse net flow	L64		
A function = Off	L65		
Volume per pulse A = x 0.001 ²⁾	L71		
Volume per pulse A = x 0.01 ²⁾	L72		
Volume per pulse A = x 0.1 ²⁾	L73		
Volume per pulse A = x 1 ²⁾	L74		
B function = FW, forward flow	L80		
B function = RV, reverse flow	L81		
B function = FWnet, forward net flow	L82		
B function = RVnet, reverse net flow	L83		
B function = Alarm	L84		
B function = Call up	L85		
Volume per pulse B = x 0.001 ²⁾	L91		
Volume per pulse B = x 0.01 ²⁾	L92		
Volume per pulse B = x 0.1 ²⁾	L93		
Volume per pulse B = x 1 ²⁾	L94		
Data logger set up (default month logging)			
DataloggerInterval = Daily	M31		
DataloggerInterval = Weekly	M32		
Factory mounted cables			
5 m (16.4 ft) pulse cable A+B	M81		
5 m (16.4 ft) communication cable RS 232/RS 485 terminated as end device	M82		
20 m (65.6 ft) pulse cable A+B	M84		
20 m (65.6 ft) communication cable RS 232/RS 485 terminated as end device	M85		
Cello 2 channel, input cable 3 m (9.84 ft) with Brad Harrison micro-change 3 way connector	M87		
Cello 2 channel, input cable 5 m (16.4 ft) with MIL-C-26482 spec. connectors	M89		
5 ft. Encoder interface cable with connector for ITRON 200WP radio	M91		
25 ft. Encoder interface cable with connector for ITRON 200WP radio	M90		
SOFREL cable 2 m for LS42 data logger	M92		
SOFREL cable 2 m for LS-Flow data logger	M97		
FM Fire Service Approval (with ANSI B16.5 Class 150 flanges)			
DN 50, DN 80 and DN 100 (2", 3" and 4")	P20		
DN 150 and DN 200 (6" and 8")	P21		
DN 250 and DN 300 (10" and 12")	P22		

- ¹⁾ Under preparation
²⁾ Pulse width = 10 ms