



ROMANIAN ENGINEERING AND DESIGN
INSTITUTE FOR OIL REFINERIES
PLOIESTI - ROMANIA

INDEX EQUIPMENT PROCUREMENT

INSTRUMENTATION

No. 1069.00-36-IN-20

REV.
2

SHEET 1 OF 1

REV.	DATE	BY	CH'D	APP'D
0	07.2014	SVA	RSC	DCR
1	08.2014	SVA	RSC	DCR
2	09.2014	SVA	RSC	DCR
3				
4				

JOB: 1069/2013

CUSTOMER: S.C. PETROTEL-LUKOIL S.A.

UNIT: FCC - REGENERATOR FLUE GAS TREATING

SI. N°:	DOCUMENT		SHEET OR DWG. SIZE	DOCUMENT NAME	NOTES
	NUMBER	REV			
1	1069.00-36-6160.MT.R	2	1	MEMORIU TEHNIC	
2	↓	2	2	↓	
3	↓	2	3	↓	
4					
5	1069.00-36-6161.MR.E	2	1	MATERIAL REQUISITION - FLOWMETERS	
6	↓	2	2	↓	
7		2	3		
8	↓	2	4	↓	
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NOTES:

COD: 04.001-95-1

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 INSTITUTUL DE PROIECTARE PENTRU INSTALAȚII PETROLIERE PLOIESTI - ROMANIA	MEMORIU TEHNIC		NR. 1069.00-36-6160.MT.R		REV. 2	
	AUTOMATIZARI		PAG. 1 DIN 3			
			REV.	DATA	INTOCMIT	VERIFICAT
COMANDA 1069/2013		0	07.2014	SVA	RSC	DCR
BENEFICIAR S.C. PETROTEL-LUKOIL S.A.		1	08.2014	SVA	RSC	DCR
INSTALATIA FCC - REGENERATOR FLUE GAS TREATING		2	09.2014	SVA	RSC	DCR
		3				
		4				

1. GENERALITĂȚI

- △ Prezenta lucrare cuprinde documentația necesară măsurării și monitorizării apelor evacuate din stația de epurare din cadrul S.C. PETROTEL-LUKOIL SA către râul Teleajen.

2. BAZA DE PROIECTARE

- △ La baza întocmirii documentației au stat următoarele:
- contractul de proiectare nr.1069/2013
 - tema internă de proiectare emisă de Departamentul Proces nr. 050 din 04.07.2014
 - documentație (dimensiuni) canale de evacuare apă stație epurare și evacuare în râul Teleajen, transmisă de PLK, mail din 03.09.2014.

3. CONȚINUTUL PROIECTULUI

Proiectul cuprinde documentația de procurare a echipamentelor de automatizare conform Index nr. 1069.00-36-IN-20, astfel:

- s-a elaborat Material Requisition (limba engleza) pentru aparatele montate prin intercalare în circuitul hidraulic al conductelor de ieșire din stația epurare pentru contorizarea apei evacuate de pe platforma S.C. PETROTEL-LUKOIL SA. și deversate în râul Teleajen.

4. SOLUȚIA TEHNICĂ

- △ Pentru realizarea monitorizării în timp real, s-a prevăzut un sistem de măsurare a debitului apelor uzate prin conducte cu nivel liber și grad de umplere variabil, compus din următoarele:

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MEMORIU TEHNIC AUTOMATIZARI

NR. 1069.00-36-6160.MT.R

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- △ 1) Sistem de măsură a debitului de apă montat pe conducta de ieșire din stația de epurare către bazinul colector, având DN = 1000 mm.

Metoda de măsurare va fi cu traductor ultrasonic de viteză lichid - tip Doppler și traductor de nivel lichid aflat în conductă, determinând astfel debitul de curgere (se dorește metoda de măsurare fără intercalarea unui canal de măsură).

Debitmetrul va măsura și va afișa local valoarea debitului [m^3/h] și volumul de apă contorizat [m^3].

Conducta de beton (azbociment) de DN 1000 mm este conectată la un bazin colector aflat la distanța aproximativă de 80 metri. În bazinul colector este deversată și apa pluvială epurată, colectată de pe suprafața incintei rafinării. Amestecul de apă epurată rezultată (apa uzată provenită din conducta DN 1000 mm și apa pluvială) este preluată de acest bazin colector printr-o conductă DN 1400 mm (din beton) și dirijată către emisar – râul Teleajen.

Pe traseul conductei DN 1000 mm, pe axa conductei, se află instalat un dispozitiv de măsură debit tip canal Parshall; canalul Parshall este executat din beton, cote constructive standardizate în stare bună. Sistemul actual este ne funcțional.

- △ 2) Sistem de măsură a debitului de apă uzată și apă pluvială epurată în tronsonul de evacuare către râul Teleajen, acesta fiind identic cu cel menționat la punctul nr. 1). Debitmetrul ultrasonic este montat pe conducta de evacuare având DN = 1400 mm și va măsura și va afișa local valoarea debitului [m^3/h] și volumul de apă contorizat [m^3].

Echipamentele electronice ale celor două debitmetre vor fi introduse într-un singur dulap metalic de automatizare, având gradul de protecție climatică IP65.

Dulapul va fi amplasat într-un mediu ambiant neprotejat, localizat între cele două puncte de măsură debit (distanța dintre acestea este de aproximativ 80 m).

- △ 3) Sistem de transmisie wireless a datelor măsurate de fiecare din cele două traductoare (debit, volum de apă) către două locații distincte, în scopul monitorizării sistemului de măsură debite, respectiv:

- Locația de monitorizare nr.1: Camera Locală de Comandă (distanța aprox. 300 m)

Datele (debit instantaneu și contor volum) vor fi afișate pe display-ul local al dispozitivului de achiziție și afișare date, amplasat în camera locală de comandă.

Modulul de achiziție cu display poate fi integrat în panoul de afișare existent în

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MEMORIU TEHNIC AUTOMATIZARI

NR. 1069.00-36-6160.MT.R

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2

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camera locală de comandă. Dispozitivele de comunicație pot fi montate în aceeași cameră locală de comandă.

- Locația de colectare date din teren nr.2: Dispecerat Central (distanța aprox. 2000 m)
Datele furnizate de debitmetre vor fi transmise wireless către DCS (Dispeceratul Central de Supraveghere), locația fiind amplasată aproximativ pe aceeași direcție cu camera locală de comandă. Dacă este apreciat ca necesar, pe traseu va fi instalat un modul intermediar de retransmisie a semnalelor radio, pentru asigurarea calității transmisiei (acest modul va fi oferat și cotate separat).
- 4) Pachete software și alte kit-uri necesare instalării sistemelor.

△₂ Note:

- Traductoarele trebuie să fie certificate pentru utilizarea în mediu **Ex**.
- Debitmetrele oferite trebuie să fie certificate metrologic de un organism acreditat din cadrul UE.
- Dispozitivele de montaj mecanic al traductoarelor debitmetrelor, cablurile de conectare semnale și de alimentare, vor fi prevăzute în ofertă și vor fi incluse în preț.
- Furnizorul va asigura montajul debitmetrelor, traductoarelor și al unității de control debit oferită.
- Furnizorul va asigura condițiile necesare pentru etalonarea ansamblului de măsurare debit, pentru fiecare debitmetru.
- Tensiunea de alimentare 230Vc.a. la locul de amplasare al aparatelor, va fi asigurată de către beneficiar.
- Se vor stabili de comun acord între beneficiar și furnizor detaliile privind transmisia și recepția datelor (compatibilitatea între emitor-receptor și eventuale componentele adiționale necesare în sistemul existent ce va prelua datele transmise).

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 ROMANIAN ENGINEERING AND DESIGN INSTITUTE FOR OIL REFINERIES PLOIESTI - ROMANIA	MATERIAL REQUISITION		NO. 1069.00-36-6161.MR.E		REV. 2
			SHEET 1 OF 4		
	FLOWMETERS		REV. 0 1 2 3 4	DATE 07.2014 08.2014 09.2014 	BY SVA SVA SVA
JOB: 1069/2013 CUSTOMER: S.C. PETROTEL LUKOIL S.A. UNIT: FCC - REGENERATOR FLUE GAS TREATING		APP'D DCR DCR DCR 			
SHOP INSPECTION YES ☐ , NOT ☐		ATTACHMENTS			
1. VENDOR'S DRAWINGS AND DATA REQUIREMENTS					
NO. 1069.00-36-6161.MR.E-02 SHEETS 2/4 ÷ 3/4 $\triangle 2$					
2. DESIGNER REQUEST NO. 1069.00-36-6161.MR.E-02					
SHEET 4/4 $\triangle 2$					
3. FLOWMETER SYSTEM (DOPPLER ULTRASONIC) —					
PROJECT SPECIFICATION NO. 1069.00-36-6162.SP.E-00					
SHEET 1/1 $\triangle 2$					
4. FLOWMETER SYSTEM – PROJECT SPECIFICATION					
NO. 1069.00-36-6163.SP.E-02 SHEET 1/1 $\triangle 2$					
FURNISH AND DELIVER THE ITEMS BELOW TO: _____					MATERIAL REQUIRED AT: _____ NOT LATER THAN: _____
ITEM No.	QUANTITY AND UNIT	SIZE AND DESCRIPTION	CODE		
1.	1 SET	VENDOR'S DRAWINGS AND DATA REQUIREMENTS ACC.			
2.		TO NO. 1069.00-36-6161.MR.E-02 SHEETS 2/4 ÷ 3/4 $\triangle 2$			
1.					
2.	1 LOT	FLOWMETER SYSTEM (DOPPLER ULTRASONIC) — AS PER			
3.		PROJECT SPECIFICATION NO. 1069.00-36-6162.SP.E-00			
4.		SHEET 1/1 $\triangle 2$			
5.					
6.	1 LOT	FLOWMETER SYSTEM AS PER PROJECT SPECIFICATION			
7.		NO. 1069.00-36-6163.SP.E-02 SHEET 1/1 $\triangle 2$			
8.					
9.	1 SET*	SPARE PARTS LIST FOR TWO YEARS OPERATION			
10.					
11.					
12.					
13.					
14.					
NOTES: *WILL BE CONFIRMED BY THE CUSTOMER					

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MATERIAL REQUISITION FLOWMETERS

NO. 1069.00-36-6161.MR.E

REV.
2

SHEET 2 OF 4

VENDOR'S DRAWINGS AND DATA REQUIREMENTS

DWG. CODE	TYPE OF DRAWINGS/DOCUMENTS DESCRIPTION	DWG. REQ'D. (YES/NOT)	REQ'D NO. OF		NO. OF WEEKS
			CD's	PRINTS	
A1	Arrangement drawings with outline dimensions including details for foundation design	-	-	-	-
B	Cross sections and lists of components	-	-	-	-
C1	Hydrostatic and leak test certificates	YES	1	6	6
C2	Calibration certificates and documents	YES	1	6	6
D1	Interconnection diagrams (electrical)	YES	1	3*/6	2*/4
D2	Wire and cable layouts	-	-	-	-
D3	Piping and instrument diagrams (P&ID)	-	-	-	-
D4	Fabrication acceptance tests (FAT) certificates	YES	1	6	6
E1	Certificates & declarations of conformity (see Notes)	YES	1	3*/6	2*/6
E2	Operating instructions	YES	1	6	4
F	Assembly and installation details	YES	1	3*/6	2*/4
G	Handling drawings (weights and weight centers)	YES	1	3*/6	2*/4
H1	List of recommended priced spare parts	YES	1	6	4
H2	Specifications	YES	1	3*/6	2*/4
J1	Material specifications	YES	1	3*/6	2*/4
J2	Calculation sheets	-	-	-	-
J3	Index of documents	YES	1	3*/6	4
K	Rivet and bolt schedule	-	-	-	-
L	List of special tools and devices	-	-	-	-
M	Store instructions	YES	1	6	4
P	Shipment, installation and start up instructions	YES	1	6	4
Q	Maintenance instructions	YES	1	6	4
R	Trouble shooting manual	YES	1	6	4
T	Vendor data book	-	-	-	-
V					
W					
Z					
Y					

NOTES:

EC marking, declarations of conformity and certificates should comply with:

- Directive for machinery 98/37/EEC
- Certification module H
- Declaration of conformity and examination certificate ATEX:94/9/EC
- Declaration of conformity EMC:89/336/EEC with amendments 91/263/EEC, 92/31/EEC, 93/68/EEC
- Declaration of conformity LV:73/23/EEC with amendment 93/68/EEC
- Material certificate: EN 10204 type as per project spec.
- Declaration of conformity PED:97/23/EC

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**MATERIAL REQUISITION
FLOWMETERS**

NO. 1069.00-36-6161.MR.E

REV.
2

SHEET 3 OF 4

VENDOR'S DRAWINGS AND DATA REQUIREMENTS

INSTRUCTIONS

1. THE SUPPLY OF VENDOR DRAWINGS AND DATA CALLED FOR HEREIN SHALL BE COMPLETED BEFORE RENDERING FINAL INVOICES.
 2. DOCUMENTS SHALL SHOW EQUIPMENT NUMBERS, PURCHASE ORDER NUMBERS AND VENDOR'S OWN TITLE DRAWING AND REVISION NUMBERS, ALL IN THE LOWER HAND CORNER.
 3. DOCUMENTS SHALL BE ACCOMPANIED BY QUADRUPLICATE COPIES OF A LETTER LISTING PURCHASE ORDER NUMBERS, EQUIPMENT NUMBERS, WORK REFERENCE NUMBER, AND SHALL BE DISPATCHED (BY MAIL) IN THE FOLLOWING MANNER :
 - a) ONE COPY OF ALL DRAWINGS/DOCUMENTS AS LISTED IN THE TABLE ALONGSIDE TO THE FOLLOWING ADDRESS : **TITULAR OF THE PURCHASE ORDER**
 - b) THE REMAINING COPIES OF ALL DRAWINGS/DOCUMENTS TOGETHER WITH THE CD'S AS LISTED IN THE TABLE ALONGSIDE TO THE FOLLOWING ADDRESS:

S.C. "IPIP S.A."
 18, DILIGENȚEI STR.
 PLOIEȘTI-ROMÂNIA.
- ONE COPY OF ALL DRAWINGS/DOCUMENTS IN ADDITION TO THE NUMBER OF PRINTS LISTED IN THE TABLE ALONGSIDE WILL BE PACKED WITH THE EQUIPMENT / MATERIALS AS PER GENERAL PURCHASE CONDITIONS.
4. DRAWINGS OR DATA RETURNED TO VENDOR FOR REVISION SHALL BE RESUBMITTED WITHIN ONE WEEK. ALL CHANGES INCLUDED IN THE OFFER DURING REVISIONS SHALL BE CLEARLY MARKED WITH REVISION SYMBOL.
 5. CORRESPONDENCE ACCOMPANYING REVISED DRAWINGS AND DATA MUST SHOW PURCHASE ORDER NUMBER.
 6. OPERATING INSTRUCTIONS SHALL COVER ALL COMPONENTS OF THE ORDER IF THE VENDOR IS FURNISHING SIMILAR EQUIPMENT ON SEVERAL ORDERS FOR THE PROJECT, A COMPOSITE INSTRUCTION MANUAL SHALL BE PROVIDED.
 7. BUYER'S APPROVAL OF DRAWING AND DATA IS REQUIRED PRIOR TO FABRICATION.
 8. BUYER'S APPROVAL OF CERTIFIED DRAWINGS IS REQUIRED PRIOR TO SHIPMENT.
 9. EXTERN RIGHT HAND COLUMN SPECIFIES THE MAXIMUM NUMBER OF WEEKS DURING WHICH THE FINAL DRAWINGS MUST BE COMPLETED FROM THE DATE OF PURCHASE ORDER.
 10. ALL DOCUMENTS TO BE SUBMITTED IN THE ENGLISH LANGUAGE.
 11. DIMENSIONS, WEIGHTS AND MEASURES FOR DRAWINGS, ETC., TO BE METRIC UNITS.
 - 12.* DATA REQUIRED WITH BIDS.

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	MATERIAL REQUISITION FLOWMETERS	NO. 1069.00-36-6161.MR.E	REV. 2
		SHEET 4 OF 4	

DESIGNER REQUEST

THE OFFER MUST FULLY COMPLY WITH THE PROJECT SPECIFICATIONS.

IN CASE OF DEVIATIONS FROM THE PROJECT SPECIFICATIONS, THESE DEVIATIONS SHALL BE LISTED SEPARATELY AND EXPLANATIONS INCLUDED (SEE MODEL BELOW).

NO.	SPECIFICATION NO., ARTICLE, PAGE	SPECIFIED REQUIREMENTS	DEVIATIONS	JUSTIFICATIONS

BIDDER'S NAME:

BIDDER'S SIGNATURE:

DATE:

IF THE ABOVE ARE NOT FULFILLED, THE OFFERS SHALL NOT BE TAKEN INTO CONSIDERATION.

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 ROMANIAN ENGINEERING AND DESIGN INSTITUTE FOR OIL REFINERIES PLOIESTI - ROMANIA		PROJECT SPECIFICATION		NO. 1069.00-36-6163.SP.E		REV. 2																																																																																																																																																																																																																				
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<table border="1"> <tr> <td>1</td> <td>Tag no.:</td> <td>09B-FT-1061</td> <td>09B-FT-1060</td> <td></td> </tr> <tr> <td>2</td> <td>Manufacturer:</td> <td>LATER</td> <td>LATER</td> <td></td> </tr> <tr> <td>3</td> <td>Application (Det. 1):</td> <td>INVENTORY</td> <td>INVENTORY</td> <td></td> </tr> <tr> <td>4</td> <td>Service:</td> <td>Evacuation outlet to Teleajen</td> <td>Evacuation pit inlet</td> <td></td> </tr> <tr> <td>5</td> <td>Degree of protection:</td> <td>IP65</td> <td>IP65</td> <td></td> </tr> <tr> <td>6</td> <td>Explosion protection:</td> <td>II 2G EEx d IIB T6</td> <td>II 2G EEx d IIB T6</td> <td></td> </tr> <tr> <td>7</td> <td>Accuracy:</td> <td>± 0,5% of full scale</td> <td>± 0,5% of full scale</td> <td></td> </tr> <tr> <td>8</td> <td>Process line symbol:</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>9</td> <td>Process line size, O.D.xThickness:</td> <td>Φ = 1400 mm</td> <td>Φ = 1000 mm</td> <td></td> </tr> <tr> <td>10</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11</td> <td>Model:</td> <td>LATER</td> <td>LATER</td> <td></td> </tr> <tr> <td>12</td> <td>Measuring principle:</td> <td>Ultrasonic (Doppler)</td> <td>Ultrasonic (Doppler)</td> <td></td> </tr> <tr> <td>13</td> <td>Installation type (Det. 3):</td> <td>Clamp-on</td> <td>Clamp-on</td> <td></td> </tr> <tr> <td>14</td> <td>Pressure rating:</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>15</td> <td>Housing material:</td> <td>Mfr. Std.</td> <td>Mfr. Std.</td> <td></td> </tr> <tr> <td>16</td> <td>Wetted parts material:</td> <td>Mfr. Std.</td> <td>Mfr. Std.</td> <td></td> </tr> <tr> <td>17</td> <td>Process connection (Det.4):</td> <td>G 2"</td> <td>G 2"</td> <td></td> </tr> <tr> <td>18</td> <td>Direction of flow (Det. 5):</td> <td>Standard</td> <td>Standard</td> <td></td> </tr> <tr> <td>19</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>20</td> <td>Model:</td> <td>LATER</td> <td>LATER</td> <td></td> </tr> <tr> <td>21</td> <td>Power supply:</td> <td>230 Vac, 50Hz / 24Vdc</td> <td>230 Vac, 50Hz / 24Vdc</td> <td></td> </tr> <tr> <td>22</td> <td>Outputs:</td> <td>4÷20 mA, HART</td> <td>4÷20 mA, HART</td> <td></td> </tr> <tr> <td>23</td> <td>Local digital display:</td> <td>Yes</td> <td>Yes</td> <td></td> </tr> <tr> <td>24</td> <td>Scale range:</td> <td>0 ÷ 1 m</td> <td>0 ÷ 1 m</td> <td></td> </tr> <tr> <td>25</td> <td>Units of registration (Det.2):</td> <td>m³/h m³</td> <td>m³/h m³</td> <td></td> </tr> <tr> <td>26</td> <td>Electr. conn.:</td> <td>Signal Power</td> <td>Signal Power</td> <td></td> </tr> <tr> <td>27</td> <td>Fluid:</td> <td>Treated water</td> <td>Treated water</td> <td></td> </tr> <tr> <td>28</td> <td>Flow: max. norm. min.</td> <td>3000* 1500 800*</td> <td>3000* 1500 800*</td> <td></td> </tr> <tr> <td>29</td> <td>Flow Temp. (FT) °C: Design Temp. °C</td> <td>amb. -26.6 / 39.9 °C</td> <td>amb. -26.6 / 39.9 °C</td> <td></td> </tr> <tr> <td>30</td> <td>Flow Pressure (barg): Design Press. (barg)</td> <td>atm.</td> <td>atm.</td> <td></td> </tr> <tr> <td>31</td> <td>Density @ 20°C(LIQUID)Kg/m³</td> <td>1000</td> <td>1000</td> <td></td> </tr> <tr> <td>32</td> <td>Density @ F.T.(LIQUID)Kg/m³</td> <td>1000</td> <td>1000</td> <td></td> </tr> <tr> <td>33</td> <td>Density @ 1ata,0°C(GAS)Kg/Nm³</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>34</td> <td>Viscosity @ F.T. Cp</td> <td>0.75</td> <td>0.75</td> <td></td> </tr> <tr> <td>35</td> <td>Full scale differential pressure:</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>36</td> <td>Strainer Deaerator</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>37</td> <td>Electr. Tracing Steam Tracing</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>38</td> <td>Flow computer</td> <td>Yes (Note 2)</td> <td>Yes (Note 2)</td> <td></td> </tr> <tr> <td>39</td> <td>Integrated temperature sensor</td> <td>Yes</td> <td>Yes</td> <td></td> </tr> <tr> <td>40</td> <td>Integrated pressure sensor</td> <td>-</td> <td>-</td> <td></td> </tr> <tr> <td>41</td> <td>Connection Cable</td> <td>ISO 1070</td> <td>ISO 1070</td> <td></td> </tr> <tr> <td>42</td> <td>Notes:</td> <td>Note 1, 3</td> <td>Note 1, 3</td> <td></td> </tr> </table>									1	Tag no.:	09B-FT-1061	09B-FT-1060		2	Manufacturer:	LATER	LATER		3	Application (Det. 1):	INVENTORY	INVENTORY		4	Service:	Evacuation outlet to Teleajen	Evacuation pit inlet		5	Degree of protection:	IP65	IP65		6	Explosion protection:	II 2G EEx d IIB T6	II 2G EEx d IIB T6		7	Accuracy:	± 0,5% of full scale	± 0,5% of full scale		8	Process line symbol:	-	-		9	Process line size, O.D.xThickness:	Φ = 1400 mm	Φ = 1000 mm		10					11	Model:	LATER	LATER		12	Measuring principle:	Ultrasonic (Doppler)	Ultrasonic (Doppler)		13	Installation type (Det. 3):	Clamp-on	Clamp-on		14	Pressure rating:	-	-		15	Housing material:	Mfr. Std.	Mfr. Std.		16	Wetted parts material:	Mfr. Std.	Mfr. Std.		17	Process connection (Det.4):	G 2"	G 2"		18	Direction of flow (Det. 5):	Standard	Standard		19					20	Model:	LATER	LATER		21	Power supply:	230 Vac, 50Hz / 24Vdc	230 Vac, 50Hz / 24Vdc		22	Outputs:	4÷20 mA, HART	4÷20 mA, HART		23	Local digital display:	Yes	Yes		24	Scale range:	0 ÷ 1 m	0 ÷ 1 m		25	Units of registration (Det.2):	m³/h m³	m³/h m³		26	Electr. conn.:	Signal Power	Signal Power		27	Fluid:	Treated water	Treated water		28	Flow: max. norm. min.	3000* 1500 800*	3000* 1500 800*		29	Flow Temp. (FT) °C: Design Temp. °C	amb. -26.6 / 39.9 °C	amb. -26.6 / 39.9 °C		30	Flow Pressure (barg): Design Press. (barg)	atm.	atm.		31	Density @ 20°C(LIQUID)Kg/m³	1000	1000		32	Density @ F.T.(LIQUID)Kg/m³	1000	1000		33	Density @ 1ata,0°C(GAS)Kg/Nm³	-	-		34	Viscosity @ F.T. Cp	0.75	0.75		35	Full scale differential pressure:	-	-		36	Strainer Deaerator	-	-		37	Electr. Tracing Steam Tracing	-	-		38	Flow computer	Yes (Note 2)	Yes (Note 2)		39	Integrated temperature sensor	Yes	Yes		40	Integrated pressure sensor	-	-		41	Connection Cable	ISO 1070	ISO 1070		42	Notes:	Note 1, 3	Note 1, 3	
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1. INSTRUMENTS SHALL COMPLY WITH IPIP-S.A. STD. SPEC. No. _____ OR _____ 2. INSTRUMENTS TO BE INSTALLED ACCORD. TO IPIP-SA STD. DWG.No. _____ OR _____ 3. INSTRUMENTS ARE ACCORDING TO PIPING & INST. DIAGRAM No. _____																																																																																																																																																																																																																										
NOTES: 1. Material Certificate acc. EN 10204 Type 3.1. 2. Flow rate/total volume displayed on local display of the data aquisition device situated in the local control room. 3. The electronic parts of the flowmeters shall be placed in a metallic cabinet (IP 65 protection), located between the two meas. points, equipped also with the wireless data transmission system to the local (D1=300m) and central control system (D2=2000m). * Flow rates are given according to client's estimations.																																																																																																																																																																																																																										

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