Zahteve za tehnično dokumentacijo, ki mora biti priložena zahtevi za ugotavljanje skladnosti merilnega sistema (Modul G)

*Requirements for technical documentation for*

*conformity assessment of measuring system (Modul G)*

1. **UVOD / *INTRODUCTION***

Priglašen organ MIRS izvaja postopke neposredne posamične overitve merila (Modul G) za merilne sisteme za zvezno in dinamično merjenje količin tekočin razen vode s pregledom predložene dokumentacije in izvedbo končnega pregleda celotnega merilnega sistema.

*Notified Body MIRS performs Modul G conformity assessment of measument systems for dynamic measurements of liquids other than water by reviewing submitted documentation and performing a final control of a complete measuring system.*

Referenčni dokumenti:

*Reference documents:*

* Pravilnik o merilnih instrumentih (Uradni list RS, št. 19/16 in 98/23)
* Direktiva/*Directive* 2014/32/EC
* OIML R117-1 (2019)
* WELMEC Guide 10.8 »[Guide for Common Application of MID MI-005 and OIML R 117-1, (R 81, R 80, R 139)](https://www.welmec.org/documents/guides/108/)«, izdaja 2, 2019
* WELMEC Guide 10.11 »[Compatibility Sheet Guideline for Manufacturers to establish Compatibility Sheets for MI-005 measuring instruments](https://www.welmec.org/documents/guides/108/)«, izdaja 1, 2019

**Vsebina dokumentacije**

***Contets of the documentation***

1. **PISNE IZJAVE / *WRITTEN DECLARATIONS***

* Pisno dovoljenje **imetnikov** zahtevi priloženih **certifikatov**, da se vložnik v obravnavi te zahteve lahko sklicuje nanje in na njim pripadajočo tehnično dokumentacijo. *A written declaration of the owner of the relevant certificates and accompanying technical documentation that the applicant may refer to them.*
* Zastopnik proizvajalca je dolžan zahtevi priložiti pisno pooblastilo **proizvajalca** za zastopanje v postopku. *A written declaration of the manufacturer that the applicant is the authorised representative for this project.*

Vzorci pooblastil so podani v Prilogi 1.

*Templates of written declarations may be found in Annex 1.*

1. **SPLOŠNE TEHNIČE ZNAČILNOSTI IN OPISI / *GENERAL TECHNICAL CHARACTERISTICS AND DESCRIPTIONS*:**
2. Splošen opis merila *A general description of the measuring instrument*

* **Splošen opis merilnega sistema** z bistvenimi sestavnimi deli ter razlago, potrebno za razumevanje načina delovanja merilnega sistema. *General description of the measuring system, explanations necessary* to understand functioning of the measuring instrument.
* **Splošen prikaz merilnega sistema** (skica, risba, fotografija) z **identificiranimi sestavnimi deli**. *General presentation of the measuring system with identified components (scatch, drawing, photo)*.
* Predviden **namen in mesto uporabe**. *Intended pupose and location of use****.***
* **Spisek** **z opisom in značilnimi podatki za vse naprave** ter **splošne meroslovne značilnosti merilnega sistema in pogoji delovanja, vključene v merilni** **sistem** (izpolniti Prilogo 2). *List of descriptions and characteristic data of all devices incorporated in the measuring system and general metrological characteristics of the measuring system and rated operating conditions (fill in Annex 2).*
* **Podatkovni listi** posazmeznih sestavnih delov in/ali celotnega merilnega sistema (če EU TEC, TC, PC, EC ne vsebujejo konkretnih podatkov). *Data sheets for single equipment and/or complete system (if EU TEC, TC, PC, EC don’t offer enough precise data).*
* Predvidene **periferne naprave** (npr. tiskalnik, oddaljeni prikazovalnik,…). *Ancillary devices, (e.g. printers, remote displays,…).*
* Osnutek **napisne tablice** merilnega sistema z **znakom CE** in dodatno meroslovno oznako ter mesto njene namestitve in način zaščite (opis/shema). Predlog napisne tablice je podan v Prilogi 3. *Draft of data plate of the measuring system with CE mark and supplementary metrology marking and its location on the instrument and mode of its sealing (description, drawing/photo). Annex 3 offers an example of the data plate.*

1. Razvojna zasnova ter proizvodne skice in načrti sestavnih delov, podsestavov, tokokrogov itd. Conceptual design and manufacturing drawings and plans of components, sub-assemblies, circuits, etc

* Načrt **razvoda cevi in opreme** ter **diagram poteka**. *Piping & Instrumentation Diagram (P&ID) and Flow diagram of the system*

1. Če je to potrebno, opisi elektronskih naprav z risbami, diagrami, diagrami poteka logičnih podatkov in informacij o programski opremi, ki pojasnjujejo njihove lastnosti in delovanje *If applicable, a description of the electronic devices with drawings, diagrams, flow diagrams of the logic and general software information explaining their characteristics and operation*

* **Električni načrt**(i) in **načrt**(i) **ožičenja** povezav med posameznimi sestavnimi deli merilnega sistema**.** *Electrical plans and wiring system of single elements.*

1. Opisi in pojasnila, potrebni za razumevanje zahtev iz alinej b), c) in d) 3. točke tega dokumenta, vključno z delovanjem merila *Descriptions and explanations necessary for the understanding of the information referred to in points (b), (c) and (d), including the operation of the measuring instrument*

* **Navodila za uporabo** merilnega sistema. *User manual, Service manual.*
* **Shema tipkovnice krmilne enote z navedbo relevantnih funkcij tipk**. *Control unit keyboard outlook with relevant functions assigned to keyboard keys.*

1. Seznam harmoniziranih standardov in normativnih dokumentov, ki se delno ali v celoti uporabljajo za merilni system *A list of the harmonized standards and/or normative documents applied in full or in part*

* Merilni sistem oziroma njegovi sestavni deli morajo izponjevati bistvene zahteve in zahteve priloge 7 **Pravilnika o merilnih instrumentih** (Uradni list RS, št. 19/16 in 98/23) oz. zahteve **OIML R 117-1** (2019). *Measuring system and/or its components shall fulfil essential requirements and requirements of Annex 7 of Pravilnik o merilnih instrumentih (Ur. L. 19/16 and 98/23) or requirements of OIML R 117-1 (2019).*

1. Kadar harmonizirani standardi in normativni dokumenti niso bili uporabljeni, opis rešitev, sprejetih za izpolnitev bistvenih zahtev, vključno s seznamom drugih ustreznih tehničnih specifikacij, ki so bile uporabljene *Descriptions of the solutions adopted to meet the essential requirements where the harmonized standards and/or normative documents referred to essential requirements, including a list of other relevant technical specifications applied*
2. Poročila o preskusih, ki naj prikažejo, da je merilni sistem in/ali njegovi sestavni deli v skladu z zahtevami v okviru naznačenih pogojev delovanja in navedbami glede vzdržljivosti *The appropriate test results, where necessary, to demonstrate that the measuring instrument complies with the requirements under declared rated operating conditions and under specified environmental disturbances, and the durability specifications*

* Poročilo o preskusu naravnanega merilnega sistema. Test report of the adjusted measuring system.

1. Certifikati o EU-pregledu tipa merila (ki vsebuje dele, identične tistim v zasnovi) ali preskusni certifikati za posamezne sestavne dele merilnega sistema *The EU-design examination certificates in respect of measuring instruments containing parts identical to those in the design*

* Relevantni dokumenti ugotovitve skladnosti: **EU certifikat o pregledu tipa** ali **Preskusni certifikat**, **Delni certifikat, Certifikat o pregledu** ali **Poročila o preskusih** za sestavne elemente merilnega sistema, omenjene v dokumentaciji, izdani s strani drugih priglašenih organov. *Relevant approval certificates: EU TEC or TC, PC, EC, Test reports for measuring system elements, stated in documentation and issued by other notified bodies.*
* **Rezultati preskušanj** s strani proizvajalca ali drugih laboratorijev na ustreznih OIML protokolih. *Results of tests performed by manufacturer or other laboratories, on adequate OIML protocols.*

1. Informacije o načinu in mestu zaščite merila in namestitve oznak *Information on the method and place of protection of the seals*

* Opis načina ter skica ali fotografija **mest namestitve zaščitih in overtivenih oznak**. *Mode and location of verification and security seals.*
* **Verzija** (zakonsko relevantnega dela) **programske opreme** ter način **njene identifikacije** in **zaščite** (npr. kontrolna vsota). Način dostopa/prikaza zahtevanih podatkov. *Version of legally relevant software with its identification and securing (eg. Checksum). Mode of accessing required information.*

1. Pogoji za skladnost z vmesniki in podsestavi, kadar je to ustrezno. *The conditions for compatibility with interfaces and sub-assemblies, where relevant.*

* Skladnost med posameznimi elementi merilnega sistema se dokazuje s podatki v tabeli v **Prilogi 3**. *Conformity among single elements of the measuring system is demonstrated by data filled in the table in Annex 3.*

1. Analiza in ocena tveganj *Analysis and assessment of the risk(s)*

* Analiza in ocena tveganj je načeloma razvidna iz vlogi predloženih dokumentov ugotovitve skladnosti (točka 3.j)*.* Sicer je potrebo izpolniti tabelo v **Prilogi 4**. *Unless risk analysis is not evident from given certificates (3.j), the table in Annex 4 shall bi filled up.*

PRILOGA 1 (osnutka pooblastil)

*Annex 1 (declarations templates)*

***Template 1:***

Pravilnik o merilnih instrumentih v Prilogi 2 v 2. točki poglavja za Modul G navaja, da mora proizvajalec pripraviti tehnično dokumentacijo iz 15. člena Pravilnika. Kadar proizvajalec izpolnjuje to zahtevo na način, da vlogi priloži relevantne dokumente ugotovitve skladnosti (certifikate), katerih ni tudi sam imetnik, mora vlogi priložiti tudi **pooblastilo imetnika** priloženih **certifikatov**. S pooblastilom imetnik certifikatov vložniku dovoljuje:

* uporabo vlogi priloženih certifikatov,
* Uradu RS za meroslovje dostop do celotne tehnične dokumentacije in proizvodnih postopkov merila.

From: [certificate owner]

To: [manufacturer]

We, [certificate owner], as the owner of certificates **1**

* EU-Type examination certificate
* Evaluation certificate
* Parts Certificate
* Test Certificate

are giving the permission to [manufacturer]

for use of above stated certificates and accompanying technical documentation for application of Modul G conformity assessment according to EC Directive 2014/32/EU in frames of a project [project name / description].

Application shall be addressed to Notified Body Metrology Institute of the Republic of Slovenia, Tkalska ulica 15, 3000 Celje, Slovenia.

***Template 2:***

Kadar proizvajalec merila ni tudi vložnik zahteve za ugotavljanje skladnosti, mora proizvajalec vložnika pooblastiti, da zanj in v njegovem imenu vodi postopek ugotavljanja skladnosti.

From: [manufacturer]

To: [applicant]

We, [manufacturer], are giving the permission to the [applicant]

for applying for the conformity assessment - Module G according to EC Directive 2014/32/EU on our behalf of the measuring system(s) in [location / project] and [ownership].

Application shall be addressed to Notified Body Metrology Institute of the Republic of Slovenia, Tkalska ulica 15, 3000 Celje, Slovenia.

1 … navedite relevantne certifikate

PRILOGA 2 (za merilne sisteme)

*Annex 2 (applicable for Measuring systems)*

Meroslovne značilnosti **posameznih elementov** merilnega sistema in pogoji delovanja:

*Metrological charachteristcs of single elements of a measuring system and operation requirements:*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Naziv / Name | Proizvajalec / Manufacturer | Tip / Type | Identifikacija / Identification | Qmax/Qmin  [ / ] 2 | Tmax/Tmin  [° C] | Pmax/Pmin  [bar] | TEC, EC, PC, TC...3 (Točka / Chapter) |
| **1.1** | **Merilo pretoka / Flow meter**  **[T.m.1 Measuring device]** |  |  |  |  |  |  |  |
| **1.2** | **Krmilna enota / Flow Computer**  **[T.c.1 Calculator]** |  |  |  |  |  |  |  |
| **1.3** | **Dajalnik impulzov / Transducer**  **[T.t.1]** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| 1.4 | Odzračevalnik / Gas elimination device  [T.g.1] |  |  |  |  |  |  |  |
| **1.5** | **Merilo temperature /Temperature sensor**  [T.a.7 Associated measuring device, T.a.8 Associated measuring sensor |  |  |  |  |  |  |  |
| 1.6 |  |  |  |  |  |  |  |  |
| 1.7 |  |  |  |  |  |  |  |  |

2 … vpišite izbrano enoto (l/min, l/h, m3/h, kg/min, kg/h)

3 … v kolikor EU TEC (oz. EC, PC, TC) ne podaja dovolj specifičnih dokazil skladnosti za posamezen element, navedi ustrezna dokazila (npr. kalibracijski certifikat,…)

Splošne meroslovne značilnosti **merilnega sistema** in pogoji delovanja:

*General metrological charachteristcs of a measuring system and operation requirements:*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| razred točnost  *Accuracy class* |  |  | temperaturno območje tekočine  *Liquid temperature range* |  | |
| Q*Max* |  |  | temperaturno območje okolice  *Environment temperature range* |  | |
| Q*del/work* |  |  | okoliška vlažnost  *Evironment humidity* |  | |
| Q*Min* |  |  | mehansko okolje  *Mechanical environment* |  | |
| MMQ |  |  | elektromagnetno okolje  *Elecrtomagnetic environment* |  | |
|  |  |  | območje tlaka tekočine  *Liquid pressure range* |  | |
| ime tekočine ali območje viskoznosti ali območje gostote ali Reynoldsovo število  *Liquid name or viskosity range or density range or Reynolds number* | |  | | |
| nazivna vrednost izmenične napajalne napetosti in/ali meje enosmernega napajanja  *AC/DC values/range* | |  | | |

PRILOGA 3 (Predlog napisne tablice)

*Annex 3 (Data plate example)*

Tabela Predlog napisne tablice

PRILOGA 4 (Preglednica ocene tveganj)

*Annex 4 (Risk assessment table)*

Preglednica je orodje, ki omogoča Priglašenemu organu hitro določitev obsega preskušanj in izvedbo ocene tveganja. *A compatibility sheet is a tool to help NOBOs to quickly assess number and range of tests as well risk.*

Namen oblikovanja in način izpolnjevanja preglednice je (tudi s primeri) podrobneje opisan v vodilu: *The purpose of this tool and mode of filling up the sheet is described (aslo with examples) in:*

* WELMEC Guide 10.11 »[Compatibility Sheet Guideline for Manufacturers to establish Compatibility Sheets for MI-005 measuring instruments](https://www.welmec.org/documents/guides/108/)«, Issue1, 2019

Preglednica naj jasno opredeli medsebojna razmerja med posameznimi elementi merilnega sistema, v katerega so elementi vgrajeni. Namen preglednice ni ugotavljanje skladnosti posameznih elementov. *The purpose of the compatibility sheet is only to describe the compatibility relationship constraints between components when needed (and not to describe the compatibility of component alone (itself).*

Proizvajalec naj: *Producer shall:*

1. sestavi seznam (meroslovno relevantnih) elementov (podsestavov, delov) merilnega sistema (Priloga 2) *Deliver a list of metrologically relevant elements of a measuring system (Annex 2)*
2. določi njihova medsebojna razmerja *Define relationships among them*
3. opiše vsako ugotovljeno razmerje. Pri tem naj se osredotoči na: *Describe each of the relations and focus on:*

* naravo razmerja med elementi (mehanski vliv in vpliv tekočine v zgornjem delu tabele [MFCxx] ter električen, elektronski vpliv in/ali vpliv programske opreme [EESCxx] v spodnejm delu tabele)*. Nature of relation (Mechanical+Fluid at top of table, Electrical/Electric/Software at bottom).*
* skladnost med obravnavanimi elementi merilnega sistema za vsako obravavano medsebojno razmerje. Ugotovitve naj temeljijo na priloženih certifikatih o skladnosti za posamezne elemente (EC/PC/TC). *Compatibility arrangement between related elements for each applicable nature of relation based on EC/PC/TC.*
* nivo tveganja za vsako obravnavano razmerje. Posamezne vrste tveganj naj se ocenijo skladno s podanimi navodili v WELMEC Guide 10.11. *Level of risk for each relationship. Single risks shall be assesed following given instructions in WELMEC Guide 10.11.*
* naravo potrebih preskusov pred dajanjem merila na trg in v uporabo, ki naj se izvedejo za omejitev tveganj*. Nature of test required (if any) to prevent risk.*

Primer preglednice tveganj za modul G (sestavni deli in njihovi medsebojni odnosi so odvisni od obravnavanega merilnega sistema) *An example of Risk assesment table (components and their relationships depend on considered measuring system)*:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Modul G** | Vehicle power | Air seprator | Meter | Pulser | Calculator | Display | Printer | Transfer point |
| Vehicle power | X |  |  |  |  |  |  |  |
| Air seprator |  | X | MFC1 |  |  |  |  |  |
| Meter |  | EESC1 | X | MFC2 |  |  |  |  |
| Pulser |  |  | EESC2 | X | MFC3 |  |  |  |
| Calculator | EESC6 |  |  | EESC3 | X | MFC4 |  | MFC5 |
| Display |  |  |  |  | EESC4 | X |  |  |
| Printer |  |  |  |  | EESC5 |  | X |  |
| Transfer point |  |  |  |  | EESC7 |  |  | X |