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on the examination of a valve proving system

Test Laboratory: TÜV SÜD Industrie Service GmbH
Abteilung Feuerungs- und Wärmetechnik
DVGW-Prüfstelle

Subject of Test: Valve proving system
Type designation **TC1, TC2, TC3**

Models: TC1... 05W/W, TC1... 05W/K, TC1... 05Q/Q,
TC1... 05Q/K, TC1... 05K/K,
TC2... 05W/W, TC2... 05W/K, TC2... 05Q/Q,
TC2... 05Q/K, TC2... 05K/K,
TC3... 05W/W, TC3... 05W/K, TC3... 05Q/Q,
TC3... 05Q/K, TC3... 05K/K

Ordering Company: Elster GmbH
D-49504 Lotte (Büren)

Basis of Test: DIN EN 1643:2014-09,
DIN EN 60730-2-5:2015-10,
DIN EN 61508:2011-02, parts 1 – 7

Test Report: No. C-P 1576-01/17 dated 2017-04-24
No. C-P 1576-02/17 dated 2017-05-09
No. C-P 1576-03/17 dated 2017-05-22

Date: 2017-05-22

Our reference:
IS-TAF-MUC/ku

Order no. 2703071

Document:
CP15760317_Bst.docx

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2 pages

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The test results refer exclusively
to the units under test.

The tests have been performed with positive results.
The results in detail, the evaluation of the results and the conclusions out of
the results are described in the above mentioned test reports. Excerpts from
these test reports and from the test documentation are printed on the reverse.

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Product description	Valve proving system		
Type designation	TC1, TC2, TC3		
Models	TC1... 05W/W, TC1... 05Q/K, TC2... 05W/W, TC2... 05Q/K, TC3... 05W/W, TC3... 05Q/K,	TC1... 05W/K, TC1... 05K/K, TC2... 05W/K, TC2... 05K/K, TC3... 05W/K, TC3... 05K/K,	TC1... 05Q/Q, TC2... 05Q/Q, TC3... 05Q/Q,
Electrical supply data	230 V AC, 50/60 Hz 120 V AC, 50/60 Hz 24 V DC	(models TC...05W/...) (models TC...05Q/...) (models TC...05K/...)	
Control circuit	230 V AC, 50/60 Hz 120 V AC, 50/60 Hz 24 V DC	(models TC...05.../W) (models TC...05.../Q) (models TC...05.../K)	
Leakage testing time	5...30 seconds (adjustable)		

Under consideration of the **conditions** mentioned below the valve proving system conforms to the requirements of DIN EN 1643:2014-09.

The remote reset function conforms to DIN EN 14459:2008-02, annex J, resp. to DIN EN 13611:2015-09, annex M.

Except for external components, e.g. the shut-off devices of the application, the valve proving system conforms to the applicable requirements of DIN EN 61508: 2011-02, parts 1-7, for safety functions up to safety integrity level **SIL 3**. The following safety parameters have been determined:

Probability of a dangerous failure (high demand / continuous mode)	PFH_D	1,7·10⁻⁸ 1/h (17 fit)
Safe failure fraction	SFF	97,5 %
Average diagnostic coverage	DC_{AVG}	91,4 %

These parameters have been calculated under the assumption of a Proof Test Interval T1= 10 years, which is equivalent to the specified life time of the valve proving system, and with a MTTR = MRT = 8 hours. These parameters do not include external components of the VPS, e.g. the shut-off devices of the application.

The following **conditions** shall be considered during installation, commissioning and operation:

1. After installation the degree of protection of the valve proving system and its external valves shall be a minimum of IP 40 – or IP 54 for use in the open air – according to EN 60529.
2. Only resistive loads shall be connected to output terminals 6, 15 and 16. For other loads (e.g. inductive loads) adequate external protective circuits shall be provided.
3. Depending on the volume between the main gas valves and the gas supply pressure the leakage testing time of the valve proving system (VPS) must be adjusted in a way that a leakage rate of 0,1 % of the burner heat input, at least 50 dm³/h, will be safely detected.
4. If discharge of gas into the combustion chamber necessary for the operation of the VPS is not allowed by the application (e.g. if the VPS is used as an alternative for pre-purge or post-purge) then the gas shall be vented into the atmosphere at a safe location.
5. TC1..., TC2...: Auxiliary valves integrated into the functional sequence of the VPS shall conform to DIN EN 161, class A.
6. If a remote reset is implemented without being within the visible sight of the application then the actual status and relevant information of the process under control shall be made visible to the user before, during and after the reset action.
7. Adequate information for adjustment, operation and maintenance of the valve proving system shall be included into the instructions for installation, servicing and use of the gas burner or appliance in an official language of the country in which it is to be used.