

# CERTIFICATE

This certifies, that the company

**KSB MIL Controls Limited**  
**Meladoor, Annamanada, Thrissur District,**  
**Kerala – 680741 - India**

Is authorized to provide the product mentioned below

Description of product: **Globe Valves**

**Model:**

**10000 Series – Double Ported Top and Bottom Guided Control Valves**  
**21000 Series – Top Guided Single Seated Control Valves**  
**27000 Series – Compact globe Control Valves**  
**29000 Series – Micro pack control Valves**  
**41000 Series – Heavy Duty Cage Guided Control Valves**  
**70000 Series – High Pressure Angle Body**  
**71000 Series – Angle Body Valves**  
**76000 Series – High Pressure Letdown Control Valves**  
**77000 Series – Multistage Low Lo-dB Control Valves**  
**78000 Series – Multistage Anti Cavitation & Low Noise Control Valves**  
**81000 Series – Three Way Combining and Diverting Control Valves**  
**91000 Series – Matrix Series- severe service control valves with Multi stage Multi Path Trim**

In accordance with: **EN 61508:2010 Parts 1, 2, 4**

Registration No 22 23622 01  
Test Report No PS-23622-23-M  
File reference 23622-01



TÜV NORD Italia S.r.l. (TÜV NORD Group)  
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[www.tuev-nord.it](http://www.tuev-nord.it)

Validity  
from 2023-02-20  
until 2026-02-20

Cerro Maggiore, 2023-02-20  
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Please also pay attention to the information stated overleaf

# ANNEX

Annex 1, Page 2 of 8

To Certificate-Nr. 23 23622 01

E/EE/EP safety-related system (final element)		Globe Valves produced by KSB MIL Controls Limited		
Size (Class)		G1		
Series		21000	27000	70000
Environment / Application <sup>(1)</sup>	Size	1/2" to 12"	1/2" to 4"	1/2" to 10"
	Pressure Rating	150# to 2500#	150# to 300#	150# to 2500#
	Temperature Range	-196 °C to +566 °C	-27 °C to +427 °C	-196 °C to +566 °C
Safety Function Definition		Correct switching (Open to Close / Close to open) on demand , in low demand mode of operation		
Max SIL (with HFT = 0)		SIL2		
Max SIL (with HFT = 1)		SIL3		
SC		SIL3		
$\lambda_{TOT}$		2,84E-08		
$\lambda_S$		0,00E+00		
$\lambda_{DU}$		2,84E-08		
PFD <sub>avg</sub> <sup>(2)</sup> (FPT 12 months)		3,58E-04		
FPT interval		12 months		
$\beta$ and $\beta_D$ factor		10%		
MRT		8 h		
Hardware Safety Integrity		Route 2 <sub>H</sub>		
Systematic Safety Integrity		Route 2 <sub>S</sub>		

# ANNEX

Annex 1, Page 3 of 8

To Certificate-Nr. 23 23622 01

E/EE/EP safety-related system (final element)		Globe Valves produced by KSB MIL Controls Limited	
Size (Class)		G2	
Series		41000	71000
Environment / Application <sup>(1)</sup>	Size	3/4" to 32"	3/4" to 32"
	Pressure Rating	150# to 3000#	150# to 4500#
	Temperature Range	-196 °C to +566 °C	-196 °C to +566 °C
Safety Function Definition		Correct switching (Open to Close / Close to open) on demand , in low demand mode of operation	
Max SIL (with HFT = 0)		SIL2	
Max SIL (with HFT = 1)		SIL3	
SC		SIL3	
$\lambda_{TOT}$		7,25E-08	
$\lambda_s$		0,00E+00	
$\lambda_{DU}$		7,25E-08	
PFD <sub>avg</sub> <sup>(2)</sup> (FPT 12 months)		9,12E-04	
FPT interval		12 months	
$\beta$ and $\beta_D$ factor		10%	
MRT		8 h	
Hardware Safety Integrity		Route 2 <sub>H</sub>	
Systematic Safety Integrity		Route 2 <sub>S</sub>	

# ANNEX

Annex 1, Page 4 of 8

To Certificate-Nr. 23 23622 01

E/EE/EP safety-related system (final element)		Globe Valves produced by KSB MIL Controls Limited	
Size (Class)		G3	
Series		76000	77000
Environment / Application <sup>(1)</sup>	Size	1" to 2"	2" to 6"
	Pressure Rating	150# to 2500#	1500# & 2500#
	Temperature Range	-27 °C to +566 °C	-27 °C to +566 °C
Safety Function Definition		Correct switching (Open to Close / Close to open) on demand , in low demand mode of operation	
Max SIL (with HFT = 0)		SIL2	
Max SIL (with HFT = 1)		SIL3	
SC		SIL3	
$\lambda_{TOT}$		5,98E-08	
$\lambda_S$		0,00E+00	
$\lambda_{DU}$		5,98E-08	
PFD <sub>avg</sub> <sup>(2)</sup> (FPT 12 months)		7,52E-04	
FPT interval		12 months	
$\beta$ and $\beta_D$ factor		10%	
MRT		8 h	
Hardware Safety Integrity		Route 2 <sub>H</sub>	
Systematic Safety Integrity		Route 2 <sub>S</sub>	

# ANNEX

Annex 1, Page 5 of 8

To Certificate-Nr. 23 23622 01

E/EE/EP safety-related system (final element)		Globe Valves produced by KSB MIL Controls Limited	
Size (Class)		G4	G5
Series		78000	81000
Environment / Application (1)	Size	1" to 6"	1" to 12"
	Pressure Rating	upto 2500#	150# to 1500#
	Temperature Range	-29 °C to +260 °C	-30 °C to +454 °C
Safety Function Definition		Correct switching (Open to Close / Close to open) on demand , in low demand mode of operation	Correct switching (Open to Close / Close to open) on demand , in low demand mode of operation
Max SIL (with HFT = 0)		SIL2	SIL2
Max SIL (with HFT = 1)		SIL3	SIL3
SC		SIL3	SIL3
$\lambda_{TOT}$		1,54E-07	4,27E-07
$\lambda_S$		0,00E+00	0,00E+00
$\lambda_{DU}$		1,54E-07	4,27E-07
PFD <sub>avg</sub> <sup>(2)</sup> (FPT 12 months)		1,94E-03	5,37E-03
FPT interval		12 months	12 months
$\beta$ and $\beta_D$ factor		10%	10%
MRT		8 h	8 h
Hardware Safety Integrity		Route 2 <sub>H</sub>	Route 2 <sub>H</sub>
Systematic Safety Integrity		Route 2 <sub>S</sub>	Route 2 <sub>S</sub>

# ANNEX

Annex 1, Page 6 of 8

To Certificate-Nr. 23 23622 01

E/EE/EP safety-related system (final element)		Globe Valves produced by KSB MIL Controls Limited	
Size (Class)		G6	G7
Series		91000	29000
Environment / Application <sup>(1)</sup>	Size	3/4" to 12"	1/2" to 1"
	Pressure Rating	upto 3400#	150# to 1500#
	Temperature Range	-29 °C to +566 °C	-100 °C to +343 °C
Safety Function Definition		Correct switching (Open to Close / Close to open) on demand , in low demand mode of operation	Correct switching (Open to Close / Close to open) on demand , in low demand mode of operation
Max SIL (with HFT = 0)		SIL2	SIL2
Max SIL (with HFT = 1)		SIL3	SIL3
SC		SIL3	SIL3
$\lambda_{TOT}$		2,90E-07	5,57E-08
$\lambda_s$		0,00E+00	1,00E-09
$\lambda_{DU}$		2,90E-07	5,47E-08
PFD <sub>avg</sub> <sup>(2)</sup> (FPT 12 months)		3,66E-03	6.32E-04
FPT interval		12 months	12 months
$\beta$ and $\beta_D$ factor		10%	10%
MRT		8 h	8 h
Hardware Safety Integrity		Route 2 <sub>H</sub>	Route 2 <sub>H</sub>
Systematic Safety Integrity		Route 2 <sub>S</sub>	Route 2 <sub>S</sub>

# ANNEX

Annex 1, Page 7 of 8

To Certificate-Nr. 23 23622 01

E/EE/EP safety-related system (final element)		Globe Valves produced by KSB MIL Controls Limited
Size (Class)		G8
Series		10000
Environment / Application <sup>(1)</sup>	Size	3/4" to 16"
	Pressure Rating	150# to 1500#
	Temperature Range	-29 °C to +454 °C
Safety Function Definition		Correct switching (Open to Close / Close to open) on demand , in low demand mode of operation
Max SIL (with HFT = 0)		SIL2
Max SIL (with HFT = 1)		SIL3
SC		SIL3
$\lambda_{TOT}$		9,97E-07
$\lambda_S$		0,00E+00
$\lambda_{DU}$		9,97E-07
PFD <sub>avg</sub> <sup>(2)</sup> (FPT 3 months)		9,94E-03
FPT interval		3 months
$\beta$ and $\beta_D$ factor		10%
MRT		8 h
Hardware Safety Integrity		Route 2 <sub>H</sub>
Systematic Safety Integrity		Route 2 <sub>S</sub>

# ANNEX

Annex 1, Page 8 of 8

To Certificate-Nr. 23 23622 01

## Remarks

- (1) Category identified according to specific environment and application, in particular for valve design for the specific fluid type and temperature range. Refer to the product safety manual for the detailed information on the categories.
- (2) PFD of reference calculated on the basis of a Full Functional Proof Test with time intervals reported for HFT = 0 configuration only. This time interval is considered by TÜV as reasonably consistent with the implementation of the equipment for safety related-applications, with reference to the overall range of results shown in the report, where other possible combination of time intervals adequate for a classification up to the SIL reported. Note that, concerning Full Proof Tests and the Partial Stroke Test, time intervals respectively higher than 36 months and 12 months are considered by TÜV as not adequate and consistent for equipment for safety related applications.
- (3) Above mentioned valve models are suitable for use in safety related systems in low demand mode of operation as a safety related subsystem according to IEC 61508 up to and including SIL3.