CERTIFICATE

Certificate no. 17-SIL-0010009-14-TIC

WE HEREBY CERTIFY THAT

Product description	**PNEUMATIC BAR YOKE QUARTER TURN SPRING RETURN ACTUATORS**
Models	**SERIES BYPS**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-20**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea
TÜV INTERCERT Certification Body

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CERTIFICATE

Certificate no. 17-SIL-0010009-04-TIC

WE HEREBY CERTIFY THAT

Product description	**PARTIAL STROKE TEST DEVICE**
Models	**SERIES SDCU-20**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**
Intended application	is designed to be used in Safety Instrumented Systems (SIS) of any SIL rating for use in low demand applications for partial stroke diagnostic testing of valve systems (emergency shut-down valves) with no negative impact on the safety function performed by the SIS itself. Series SDCU-20 devices are independent, do not contribute to the PFD_{AVG}, when connected according to the instructions for use.
Specific requirements	The instructions of the associated IOM shall be considered.
Codes and standards	**IEC 61508 Parts 1–7:2010**
Assessment Report no.	**RC-1017-SIL-TIC-PC-0010009-17-07**
Expiry date	**30.10.2020**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

END OF CERTIFICATE

PCA 9749

Reggio Emilia, 31.10.2017

Eng. Andrea Vivi
TÜV INTERCERT Certification Body

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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. 17-SIL-0010009-11-TIC

WE HEREBY CERTIFY THAT

Product description **INTELLIGENT TOTAL VALVE CONTROLLERS**

Models **SERIES ITVC**

Manufacturer **DVG AUTOMATION S.p.A.**
Via G. Rossetti 2 - 29016 Cortemaggiore PC

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no. **RC-0718-SIL-TIC-PC-0010009-17-14**

Expiry date **16.07.2021**

Note This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance.
This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 17.07.2018

Dipl. Ing. Feridoon Sergizzarea
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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-11-TIC

Type	B
HFT	1
Safety functions	1. ESD 2. LINE BREAK 3. DIFFERENTIAL LINE BREAK 4. PANIC-BUTTON
Mode of operation	Low Demand Mode

Random failure rates

Safety function	λ_{DU} [1/h]	λ_{DD} [1/h]	λ_S [1/h]
Panic Button (DETT)	5,74E-10	1,54E-08	7,32E-07
Panic Button (ETT)	1,44E-09	4,83E-08	6,87E-07
ESD (DETT)	5,74E-10	1,54E-08	7,06E-07
ESD (ETT)	1,44E-09	4,83E-08	6,61E-07
Line Break 1oo2 (DETT)	6,85E-10	1,54E-08	4,33E-07
Line Break 2oo3 (DETT)	7,46E-10	1,60E-08	4,33E-07
Line Break 1oo3 (DETT)	6,24E-10	1,49E-08	4,33E-07
Line Break 1oo2 (ETT)	1,55E-09	4,84E-08	3,88E-07
Line Break 2oo3 (ETT)	1,61E-09	4,89E-08	3,88E-07
Line Break 1oo3 (ETT)	1,47E-09	4,76E-08	3,88E-07
Differential Line Break 1oo2 (DETT) (Close/Open)	6,85E-10	1,54E-08	4,33E-07
Differential Line Break 1oo2 (ETT) (Close/Open)	1,55E-09	4,84E-08	3,88E-07
Differential Line Break 1oo2 (Stayput)	1,55E-09	4,84E-08	3,88E-07

DETT: De-energise to trip / ETT: Energise to trip

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Not applied
	The product can be used up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SM-ITVC.

END OF CERTIFICATE

Reggio Emilia, 17.07.2018

Dipl. Ing. Feridoon Sergizzarea
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CERTIFICATE

Certificate no. 17-SIL-0010009-12-TIC

WE HEREBY CERTIFY THAT

Product description	**DIRECT GAS BAR YOKE QUARTER TURN SPRING RETURN ACTUATORS**
Models	**SERIES BYGS**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-16**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-12-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the spring, with power fluid exhausted from the cylinder through the control system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
BYGS - No PST	1	2,61E-08	0,00E+00	0,00E+00
BYGS - With PST	1	2,35E-09	2,37E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-BYGS-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

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CERTIFICATE

Certificate no. 17-SIL-0010009-13-TIC

WE HEREBY CERTIFY THAT

Product description	**DIRECT GAS BAR YOKE QUARTER TURN DOUBLE ACTING ACTUATORS**
Models	**SERIES BYG**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-18**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

PC A 12436

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-13-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the piston of cylinder, powered by the specified medium working pressure
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
BYG - No PST	1	4,05E-08	0,00E+00	0,00E+00
BYG - With PST	1	3,65E-09	3,69E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-BYG-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

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CERTIFICATE

Certificate no. **17-SIL-0010009-15-TIC**

WE HEREBY CERTIFY THAT

Product description	**PNEUMATIC BAR YOKE QUARTER TURN DOUBLE ACTING ACTUATORS**
Models	**SERIES BYP**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-22**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV InterCert.

Reggio Emilia, 21.11.2018

Dipl. Ing. Ferdoon Sergizzarea

TÜV InterCert Certification Body

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TÜV INTERCERT SAAR

CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-15-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the piston of cylinder, powered by the specified medium working pressure
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
BYP - No PST	1	4,01E-08	0,00E+00	0,00E+00
BYP - With PST	1	3,61E-09	3,65E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-BYP-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea
TÜV INTERCERT Certification Body

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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. 17-SIL-0010009-16-TIC

WE HEREBY CERTIFY THAT

Product description	**HYDRAULIC BAR YOKE QUARTER TURN SPRING RETURN ACTUATORS**
Models	**SERIES BYHS, BYHS-FA**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-24**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

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TÜV INTERCERT SAAR

CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-16-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the spring, with power fluid exhausted from the cylinder through the control system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
BYHS - No PST	1	2,60E-08	0,00E+00	0,00E+00
BYHS - With PST	1	2,34E-09	2,37E-08	0,00E+00
BYHS-FA (with 1 QEV) - No PST	1	2,70E-08	0,00E+00	0,00E+00
BYHS-FA (with 1 QEV) - With PST	1	2,43E-09	2,46E-08	0,00E+00
BYHS-FA (with 2 QEVs in 2oo2) - No PST	1	2,80E-08	0,00E+00	0,00E+00
BYHS-FA (with 2 QEVs in 2oo2) – With PST	1	2,52E-09	2,55E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied
	The product can be used in: • single channel configuration: ○ up to SIL 2 without external diagnostic tests ○ up to SIL 3 considering external diagnostic tests • double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-BYHS-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. 17-SIL-0010009-17-TIC

WE HEREBY CERTIFY THAT

Product description	**HYDRAULIC BAR YOKE QUARTER TURN DOUBLE ACTING ACTUATORS**
Models	**SERIES BYH**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-26**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

TÜV INTERCERT SAAR PC A 12440

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-17-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the piston of cylinder, powered by the specified medium working pressure
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
BYH - No PST	1	4,12E-08	0,00E+00	0,00E+00
BYH - With PST	1	3,71E-09	3,75E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-BYH-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

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CERTIFICATE

Certificate no. 17-SIL-0010009-18-TIC

WE HEREBY CERTIFY THAT

Product description	**DIRECT GAS SCOTCH YOKE QUARTER TURN SPRING RETURN ACTUATORS**
Models	**SERIES QTGS**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-28**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-18-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the spring, with power fluid exhausted from the cylinder through the control system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
QTGS - No PST	1	2,28E-08	0,00E+00	0,00E+00
QTGS - With PST	1	2,05E-09	2,08E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-QTGS-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea
TÜV InterCert Certification Body

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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. 17-SIL-0010009-19-TIC

WE HEREBY CERTIFY THAT

Product description	**DIRECT GAS SCOTCH YOKE QUARTER TURN DOUBLE ACTING ACTUATORS**
Models	**SERIES QTG**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-30**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

TÜV INTERCERT SAAR PCA 12442

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-19-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the piston of cylinder, powered by the specified medium working pressure
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	λ_{DU} **[1/h]**	λ_{DD} **[1/h]**	λ_S **[1/h]**
QTG - No PST	1	4,01E-08	0,00E+00	0,00E+00
QTG - With PST	1	3,61E-09	3,65E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-QTG-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV InterCert Certification Body

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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. **17-SIL-0010009-20-TIC**

WE HEREBY CERTIFY THAT

Product description	**PNEUMATIC SCOTCH YOKE QUARTER TURN SPRING RETURN ACTUATORS**
Models	**SERIES QTPS**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-32**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

TÜV INTERCERT SAAR PC 1243

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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TÜV INTERCERT SAAR

CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-20-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the spring, with power fluid exhausted from the cylinder through the control system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
QTPS - No PST	1	2,21E-08	0,00E+00	0,00E+00
QTPS - With PST	1	1,99E-09	2,01E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-QTPS-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

Certificate no. 17-SIL-0010009-21-TIC

WE HEREBY CERTIFY THAT

Product description	**PNEUMATIC SCOTCH YOKE QUARTER TURN DOUBLE ACTING ACTUATORS**
Models	**SERIES QTP**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-34**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

TÜV INTERCERT SAAR PCA 12444

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-21-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the piston of cylinder, powered by the specified medium working pressure
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
QTP - No PST	1	4,09E-08	0,00E+00	0,00E+00
QTP - With PST	1	3,68E-09	3,72E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-QTP-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV InterCert Certification Body

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CERTIFICATE

Certificate no. 17-SIL-0010009-22-TIC

WE HEREBY CERTIFY THAT

Product description	**HYDRAULIC SCOTCH YOKE QUARTER TURN SPRING RETURN ACTUATORS**
Models	**SERIES QTHS, QTHS-FA**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-36**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-22-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the spring, with power fluid exhausted from the cylinder through the control system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
QTHS - No PST	1	2,64E-08	0,00E+00	0,00E+00
QTHS - With PST	1	2,38E-09	2,40E-08	0,00E+00
QTHS-FA (with 1 QEV) - No PST	1	2,74E-08	0,00E+00	0,00E+00
QTHS-FA (with 1 QEV) - With PST	1	2,47E-09	2,49E-08	0,00E+00
QTHS-FA (with 2 QEVs in 2oo2) - No PST	1	2,84E-08	0,00E+00	0,00E+00
QTHS-FA (with 2 QEVs in 2oo2) – With PST	1	2,56E-09	2,58E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-QTHS-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. 17-SIL-0010009-23-TIC

WE HEREBY CERTIFY THAT

Product description	**HYDRAULIC SCOTCH YOKE QUARTER TURN DOUBLE ACTING ACTUATORS**
Models	**SERIES QTH**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-1118-SIL-TIC-PC-0010009-17-38**
Expiry date	**20.11.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

TÜV INTERCERT SAAR PC A 12446

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-23-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the piston of cylinder, powered by the specified medium working pressure
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
QTH - No PST	1	4,04E-08	0,00E+00	0,00E+00
QTH - With PST	1	3,63E-09	3,67E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied
	The product can be used in: • single channel configuration: ○ up to SIL 2 without external diagnostic tests ○ up to SIL 3 considering external diagnostic tests • double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-S.-QTH-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV InterCert Certification Body

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CERTIFICATE

Certificate no. **17-SIL-0010009-24-TIC**

WE HEREBY CERTIFY THAT

Product description	**PNEUMATIC QUICK EXHAUST VALVES**
Models	**SERIES AQEP**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-0719-SIL-TIC-PC-0010009-17-03**
Expiry date	**23.07.2022**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 24.07.2019

Dipl. Ing. Feridoon Sergizzarea
TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-24-TIC

Type	A
HFT	0
Safety functions	1. De-energize-to-trip operation: to discharge a chamber of a pneumatic actuator
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
AQEPYZW00XX - No PST	1	2,10E-09	0,00E+00	3,40E-08
AQEPYZW00XX - With PST	1	2,10E-11	2,08E-09	3,40E-08
AQEPYZW0DXX - No PST	1	2,66E-09	0,00E+00	4,23E-08
AQEPYZW0DXX - With PST	1	2,66E-11	2,63E-09	4,23E-08

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied
	The product can be used in single channel configuration up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-QEV-01.

END OF CERTIFICATE

Reggio Emilia, 24.07.2019

Dipl. Ing. Feridoon Sergizzarea
TÜV InterCert Certification Body

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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. 17-SIL-0010009-25-TIC

WE HEREBY CERTIFY THAT

Product description **PNEUMATIC LINEAR SPRING RETURN ACTUATORS**

Models **SERIES LAPS**

Manufacturer **DVG AUTOMATION S.p.A.**
Via G. Rossetti 2 - 29016 Cortemaggiore PC

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no. **RC-0719-SIL-TIC-PC-0010009-17-05**

Expiry date **22.07.2022**

Note This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance.
This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 23.07.2019

TÜV INTERCERT SAAR PC A 12027

Dipl. Ing. Feridoon Sergizzarea
TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-25-TIC

Type	A
HFT	0
Safety functions	1. Stem extended upon the demand of the actuation system 2. Stem retracted upon the demand of the actuation system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
LAPS - No PST	1	2,68E-08	0,00E+00	0,00E+00
LAPS - With PST	1	2,41E-09	2,44E-08	0,00E+00
LAPS - No PST	2	2,63E-08	0,00E+00	0,00E+00
LAPS - With PST	2	2,36E-09	2,39E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied
	The product can be used in: • single channel configuration: ○ up to SIL 2 without external diagnostic tests ○ up to SIL 3 considering external diagnostic tests • double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-LAPS-01.

END OF CERTIFICATE

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea
TÜV InterCert Certification Body

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CERTIFICATE

Certificate no. 17-SIL-0010009-26-TIC

WE HEREBY CERTIFY THAT

Product description **PNEUMATIC LINEAR DOUBLE ACTING ACTUATORS**

Models **SERIES LAP**

Manufacturer **DVG AUTOMATION S.p.A.**
Via G. Rossetti 2 - 29016 Cortemaggiore PC

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no. **RC-0719-SIL-TIC-PC-0010009-17-07**

Expiry date **22.07.2022**

Note This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance.
This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea
TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-26-TIC

Type	A
HFT	0
Safety functions	1. Stem extended upon the demand of the actuation system 2. Stem retracted upon the demand of the actuation system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
LAP - No PST	1	3,92E-08	0,00E+00	0,00E+00
LAP - With PST	1	3,53E-09	3,57E-08	0,00E+00
LAP - No PST	2	4,02E-08	0,00E+00	0,00E+00
LAP - With PST	2	3,62E-09	3,66E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-LAP-01.

END OF CERTIFICATE

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea
TÜV InterCert Certification Body

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CERTIFICATE

Certificate no. 17-SIL-0010009-27-TIC

WE HEREBY CERTIFY THAT

Product description **HYDRAULIC LINEAR SPRING RETURN ACTUATORS**

Models **SERIES LAHS**

Manufacturer **DVG AUTOMATION S.p.A.**
Via G. Rossetti 2 - 29016 Cortemaggiore PC

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no. **RC-0719-SIL-TIC-PC-0010009-17-09**

Expiry date **22.07.2022**

Note This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance.
This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea
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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-27-TIC

Type	A
HFT	0
Safety functions	1. Stem extended upon the demand of the actuation system 2. Stem retracted upon the demand of the actuation system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	λ_{DU} **[1/h]**	λ_{DD} **[1/h]**	λ_S **[1/h]**
LAHS - No PST	1	2,84E-08	0,00E+00	0,00E+00
LAHS - With PST	1	2,55E-09	2,58E-08	0,00E+00
LAHS - No PST	2	2,87E-08	0,00E+00	0,00E+00
LAHS - With PST	2	2,58E-09	2,61E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-LAHS-01.

END OF CERTIFICATE

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea
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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. 17-SIL-0010009-28-TIC

WE HEREBY CERTIFY THAT

Product description **HYDRAULIC LINEAR DOUBLE ACTING ACTUATORS**

Models **SERIES LAH**

Manufacturer **DVG AUTOMATION S.p.A.**
Via G. Rossetti 2 - 29016 Cortemaggiore PC

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no. **RC-0719-SIL-TIC-PC-0010009-17-11**

Expiry date **22.07.2022**

Note This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance.
This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

TÜV INTERCERT SAAR PC A 12929

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea
TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-28-TIC

Type	A
HFT	0
Safety functions	1. Stem extended upon the demand of the actuation system 2. Stem retracted upon the demand of the actuation system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	λ_{DU} **[1/h]**	λ_{DD} **[1/h]**	λ_S **[1/h]**
LAH - No PST	1	3,90E-08	0,00E+00	0,00E+00
LAH - With PST	1	3,51E-09	3,55E-08	0,00E+00
LAH - No PST	2	4,01E-08	0,00E+00	0,00E+00
LAH - With PST	2	3,61E-09	3,65E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-LAH-01.

END OF CERTIFICATE

Reggio Emilia, 23.07.2019

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CERTIFICATE

Certificate no. 17-SIL-0010009-29-TIC

WE HEREBY CERTIFY THAT

Product description	**DIRECT GAS LINEAR SPRING RETURN ACTUATORS**
Models	**SERIES LAGS**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-0719-SIL-TIC-PC-0010009-17-13**
Expiry date	**22.07.2022**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-29-TIC

Type	A
HFT	0
Safety functions	1. Stem extended upon the demand of the actuation system 2. Stem retracted upon the demand of the actuation system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	λ_{DU} **[1/h]**	λ_{DD} **[1/h]**	λ_S **[1/h]**
LAGS - No PST	1	2,84E-08	0,00E+00	0,00E+00
LAGS - With PST	1	2,55E-09	2,58E-08	0,00E+00
LAGS - No PST	2	2,87E-08	0,00E+00	0,00E+00
LAGS - With PST	2	2,58E-09	2,61E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-LAGS-01.

END OF CERTIFICATE

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea
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CERTIFICATE

Certificate no. 17-SIL-0010009-30-TIC

WE HEREBY CERTIFY THAT

Product description	**DIRECT GAS LINEAR DOUBLE ACTING ACTUATORS**
Models	**SERIES LAG**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-0719-SIL-TIC-PC-0010009-17-15**
Expiry date	**22.07.2022**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-30-TIC

Type	A
HFT	0
Safety functions	1. Stem extended upon the demand of the actuation system 2. Stem retracted upon the demand of the actuation system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
LAG - No PST	1	3,90E-08	0,00E+00	0,00E+00
LAG - With PST	1	3,51E-09	3,55E-08	0,00E+00
LAG - No PST	2	4,01E-08	0,00E+00	0,00E+00
LAG - With PST	2	3,61E-09	3,65E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-LAG-01.

END OF CERTIFICATE

Reggio Emilia, 23.07.2019

Dipl. Ing. Feridoon Sergizzarea
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TÜV INTERCERT SAAR

CERTIFICATE

Certificate no. 17-SIL-0010009-10-TIC

WE HEREBY CERTIFY THAT

Product description	**LIMIT SWITCH BOXES**
Models	**Series ASB** **Series SDCU-20 with limit switches kit SDCU-20-LS**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via G. Rossetti 2 - 29016 Cortemaggiore PC**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**RC-0518-SIL-TIC-PC-0010009-17-12**
Expiry date	**17.05.2021**
Note	This certificate is issued upon the request of the manufacturer as voluntary certification; it does not include the production surveillance. This certificate does not allow the manufacturer to use the safety mark of TÜV INTERCERT.

TÜV INTERCERT SAAR PC A 9998

Reggio Emilia, 18.05.2018

Dipl. Ing. Feridoon Sergizzarea

TÜV INTERCERT Certification Body

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CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-10-TIC

Type	A
HFT	0
Safety functions	1. De-energize-to-trip operation: when the actuator, on which the device is mounted, starts to drive the emergency valve to its safe position 2. De-energize-to-trip operation: when the actuator, on which the device is mounted, reaches the "safe position"
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
ASB; SDCU-20 with SDCU-20-LS - No PST - Single switch	1 / 2	1,00E-08	0,00E+00	1,80E-08
ASB; SDCU-20 with SDCU-20-LS - With PST - Single switch	1	1,00E-10	9,90E-09	1,80E-08
ASB; SDCU-20 with SDCU-20-LS - No PST - Redundant switch	1 / 2	1,00E-09	0,00E+00	3,60E-08
ASB; SDCU-20 with SDCU-20-LS - With PST - Redundant switch	1	1,00E-11	9,90E-10	3,60E-08

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single switch configuration:
	  ○ Series ASB:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	  ○ Series SDCU-20 with SDCU-20-LS: up to SIL 3
	• redundant switch configuration: up to SIL 3			

Remarks:

- In case of series SDCU-20 with SDCU-20-LS, the diagnostic test can be performed by the electronic board of the SDCU-20 itself.
- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SM-lsb-safetyman.

END OF CERTIFICATE

Reggio Emilia, 18.05.2018

Dipl. Ing. Feridoon Sergizzarea

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TÜV AUSTRIA

Certificate no. TAI-FS-C-20-0009

WE HEREBY CERTIFY THAT

Product description	**PNEUMATIC BOOSTER**
Models	**SERIES ABS**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via Giacomo Rossetti 2** **I-29016 Cortemaggiore (PC)**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**TAI-FS-R-20-0019**
Expiry date	**28.04.2023**
Issue date	**29.04.2020**

29.04.2020, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

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Annex to certificate no. TAI-FS-C-20-0009

Type	A
HFT	0
Safety functions	1. De-energize-to-trip operation: to discharge a chamber of a single acting or double acting pneumatic actuator 2. Energize-to-trip operation: to charge a chamber of a double acting pneumatic actuator
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	λ_{DU} **[1/h]**	λ_{DD} **[1/h]**	λ_{S} **[1/h]**
ABS - No PST	1	1,97E-08	0,00E+00	7,79E-08
ABS - With PST	1	1,97E-10	1,95E-08	7,79E-08
ABS - No PST	2	1,20E-07	0,00E+00	0,00E+00
ABS - With PST	2	1,20E-09	1,19E-07	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-ABS-01.

END OF CERTIFICATE

29.04.2020, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

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TÜV AUSTRIA

Certificate no. TAI-FS-C-20-0010

WE HEREBY CERTIFY THAT

Product description	**SPRING RETURN PNEUMATIC VALVE**
Models	**SERIES APD**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via Giacomo Rossetti 2** **I-29016 Cortemaggiore (PC)**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**TAI-FS-R-20-0021**
Expiry date	**28.04.2023**
Issue date	**29.04.2020**

29.04.2020, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

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Annex to certificate no. TAI-FS-C-20-0010

Type	A
HFT	0
Safety functions	1. De-energize-to-trip operation: to discharge a chamber of a single acting pneumatic actuator
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
APD - No PST	1	2,38E-08	0,00E+00	3,67E-08
APD - With PST	1	2,38E-10	2,35E-08	3,67E-08

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied

	The product can be used in:
	• single channel configuration:
	  ○ up to SIL 2 without external diagnostic tests
	  ○ up to SIL 3 considering external diagnostic tests
	• double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-APD-01.

END OF CERTIFICATE

29.04.2020, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

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TÜV AUSTRIA

Certificate no. TAI-FS-C-20-0011

WE HEREBY CERTIFY THAT

Product description	**PNEUMATIC PRESSURE SWITCH**
Models	**SERIES APS**
Manufacturer	**DVG AUTOMATION S.p.A.** **Via Giacomo Rossetti 2** **I-29016 Cortemaggiore (PC)**

IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE STANDARDS

IEC 61508 Parts 1–7:2010

AS RESULT OF THE ASSESSMENT ACCORDING TO THE PROVISION SET OUT IN THE ABOVE-MENTIONED STANDARDS

Summary Report no.	**TAI-FS-R-20-0023**
Expiry date	**28.04.2023**
Issue date	**29.04.2020**

29.04.2020, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

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Annex to certificate no. TAI-FS-C-20-0011

Type	A
HFT	0
Safety functions	1. De-energize-to-trip operation: to discharge a chamber of a single acting pneumatic actuator
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
APS	1	2,64E-08	0,00E+00	2,10E-07

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied
	The product can be used in: • single channel configuration: up to SIL 2 • double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-APS-01.

END OF CERTIFICATE

29.04.2020, Monte Roberto (AN)

Ing. Crescenzo Di Fratta

TÜV INTERCERT SAAR

CERTIFICATE

ANNEX to Certificate no. 17-SIL-0010009-14-TIC

Type	A
HFT	0
Safety functions	1. Delivery of a full stroke (90° ± tolerance) driven by the spring, with power fluid exhausted from the cylinder through the control system
Mode of operation	Low Demand Mode

Random failure rates				
Configuration	**Safety function**	**λ_{DU} [1/h]**	**λ_{DD} [1/h]**	**λ_S [1/h]**
BYPS - No PST	1	2,40E-08	0,00E+00	0,00E+00
BYPS - With PST	1	2,16E-09	2,18E-08	0,00E+00

Systematic capability	**3** (Route 1_S applied)			
Architectural constraints	**Route 1_H:**	Applied	**Route 2_H:**	Applied
	The product can be used in: • single channel configuration: ○ up to SIL 2 without external diagnostic tests ○ up to SIL 3 considering external diagnostic tests • double channel configuration: up to SIL 3			

Remarks:

- For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, mean repair times, common cause factors and systematic capability constraints, make reference to Safety Manual SCTD-SM-BYPS-01.

END OF CERTIFICATE

Reggio Emilia, 21.11.2018

Dipl. Ing. Feridoon Sergizzarea
TÜV INTERCERT Certification Body

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