Overview SIL devices

Measuring principle / Function	Device family	Electronics version	Safety function	Assessment type *)	SIL (single channel)	SIL (multiple channel)	Device type	SFF	HFT	λ_{DU} (FIT)	Safety Manual	
Point level												
Vibration	**VEGASWING 61, 63**	Contactless electronic switch	Point level MIN/MAX	FMEDA	SIL 2	SIL 3 (homogenious)	A	> 60%	0	34 FIT	DE	EN
		Relay (DPDT)	Point level MIN/MAX	FMEDA	SIL 2	SIL 3 (homogenious)	A	> 60%	0	32 FIT	DE	EN
		Transistor (NPN/PNP)	Point level MIN/MAX	FMEDA	SIL 2	SIL 3 (homogenious)	A	> 60%	0	30 FIT	DE	EN
		Two-wire (8/16 mA)	Point level MIN/MAX	FMEDA	SIL 2	SIL 3 (homogenious)	A	> 60%	0	35 FIT	DE	EN
		NAMUR-Signal	Point level MIN/MAX	FMEDA	SIL 2	SIL 3 (homogenious)	A	> 60%	0	45 FIT	DE	EN
	VEGASWING 66	Relay (2 x SPDT)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	36 FIT	DE	EN
		Transistor (NPN/PNP)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	31 FIT	DE	EN
		Two-wire (8/16 mA)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	29 FIT	DE	EN
	VEGAVIB 61, 62, 63	Contactless electronic switch	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	56 FIT	DE	EN
		Relay (DPDT)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	37 FIT	DE	EN
		Transistor (NPN/PNP)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	40 FIT	DE	EN
		Two-wire (8/16 mA)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	43 FIT	DE	EN
		NAMUR-Signal	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	52 FIT	DE	EN
	VEGAWAVE 61, 62, 63	Contactless electronic switch	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	56 FIT	DE	EN
		Relay (DPDT)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	37 FIT	DE	EN
		Transistor (NPN/PNP)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	40 FIT	DE	EN
		Two-wire (8/16 mA)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	43 FIT	DE	EN
		NAMUR-Signal	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	52 FIT	DE	EN
Capacitive	**VEGACAP 62 - 66, 69**	Relay (DPDT)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	54 FIT	DE	EN
		Transistor (NPN/PNP)	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	35 FIT	DE	EN
		Two-wire for connection to VEGATOR 14x	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	40 FIT	DE	EN
Radiation-based	**POINTRAC 31**	Four-wire 8/16 mA/HART with SIL qualification	Point level MIN/MAX Relais oder 8/16 mA	Full assessment	SIL 2	SIL 3 (divers)	B	> 90%	0	125 FIT	DE	EN
	MINITRAC 31, 32 SOLITRAC 31 FIBERTRAC 31, 32	Four-wire 4...20 mA/HART with SIL qualification	Point level MIN/MAX Relais oder 8/16 mA oder 4...20 mA	Full assessment	SIL 2	SIL 3 (divers)	B	> 90%	0	125 FIT	DE	EN
	SOLITRAC 31 FIBERTRAC 31, 32	Four-wire 4...20 mA/HART with SIL qualification	Point level MIN/MAX 4...20 mA mit einem Slave	Full assessment	SIL 2	SIL 3 (divers)	B	> 90%	0	245 FIT	DE	EN
Level												
Radar	**VEGAPULS 61 – 68 plics** Hardwareversion ≤ 1.10 Softwareversion ≤ 3.90	Two-wire 4...20 mA/HART	Level MIN/MAX/Range	PiU	SIL 2	SIL 3 (divers)	B	81%	0	358 FIT	DE	EN
TDR – Guided Radar	**VEGAFLEX Serie 80**	Two-wire 4...20 mA/HART with SIL qualification	Level MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	158 FIT	DE	EN
Ultrasonic	**VEGASON 61 – 63**	Two-wire 4...20 mA/HART	Level MIN/MAX/Range	PiU	SIL 2	SIL 3 (divers)	B	85%	0	193 FIT	DE	EN
Capacitive	**VEGACAL 62 – 66, 69**	Two-wire 4...20 mA/HART	Level MIN/MAX/Range	PiU	SIL 2	SIL 3 (divers)	B	76%	0	208 FIT	DE	EN
Radiation-based	**MINITRAC 31, 32 SOLITRAC 31 FIBERTRAC 31, 32**	Four-wire 4...20 mA/HART with SIL qualification	Level MIN/MAX/Range 4...20 mA	Full assessment	SIL 2	SIL 3 (divers)	B	> 90%	0	154 FIT	DE	EN
	SOLITRAC 31 FIBERTRAC 31, 32	Four-wire 4...20 mA/HART with SIL qualification	Level MIN/MAX/Range 4...20 mA mit einem Slave	Full assessment	SIL 2	SIL 3 (divers)	B	> 90%	0	302 FIT	DE	EN
Pressure												
Process pressure / Hydrostatic	**VEGABAR 82, 83, 86, 87**	Two-wire 4...20 mA/HART with SIL qualification	MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	44 FIT	DE	EN
	VEGABAR 81	Two-wire 4...20 mA/HART with SIL qualification	MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	73 FIT	DE	EN
Electronic differential pressure	**VEGABAR 82, 83, 86, 87**	Two-wire 4...20 mA/HART with SIL qualification	MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	63 FIT	DE	EN
	VEGABAR 81	Two-wire 4...20 mA/HART with SIL qualification	MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	124 FIT	DE	EN
Differential pressure	**VEGADIF 85**	Two-wire 4...20 mA/HART with SIL qualification	MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	B	> 90%	0	47 FIT 115 FIT 183 FIT	DE	EN

Overview SIL devices

Measuring principle / Function	Device family	Electronics version	Safety function	Assessment type *)	SIL (single channel)	SIL (multiple channel)	Device type	SFF	HFT	λ_{DU} (FIT)	Safety Manual	
Signal conditioning												
Controllers	**VEGATOR 11x**	IN: NAMUR-Signal OUT: Relay	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	A	> 60%	0	46 FIT	DE	EN
	VEGATOR 12x	IN: Two-wire 8/16 mA OUT: Relay	Point level MIN/MAX	Full assessment	SIL 2	SIL 3 (homogenious)	A	> 60%	0	49 FIT	DE	EN
	VEGATOR 14x	IN: Two-wire 4...20 mA OUT: Relay	Level MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	A	> 60%	0	76 FIT	DE	EN
	VEGAMET 381	IN: Two-wire 4...20 mA OUT: Relay	Level MIN/MAX/Range	PiU	SIL 2	SIL 3 (divers)	B	84%	0	79 FIT	DE	EN
	VEGAMET 391 SIL	IN: Two-wire 4...20 mA OUT: Relay	Level MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (divers)	B	> 90%	0	24 FIT	DE	EN
Protective and separating instruments	**VEGATRENN 149A**	Two-wire 4...20 mA power supply	Point level MIN/MAX	PiU	SIL 2	SIL 3 (homogenious)	A	> 60%	0	63 FIT	DE	EN
	VEGATRENN 14x	Two-wire 4...20 mA power supply (activ)	Level MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	A	> 60%	0	42 FIT	DE	EN
	VEGATRENN 15x	Two-wire 4...20 mA separator (passive)	Level MIN/MAX/Range	Full assessment	SIL 2	SIL 3 (homogenious)	A	> 60%	0	9 FIT	DE	EN
Overvoltage protection	**B62-36 G**	---	---	non-reactive	---	---	---	---	---	---	DE	EN
	B63-48 G, B63-48 N	---	---	FMEDA	SIL 2	SIL 3 (homogenious)	A	> 60%	0	4 FIT	DE	EN
	B81-35	---	---	non-reactive	---	---	---	---	---	---	DE	EN
Indicating instruments	**PLICSCOM**	---	---	non-reactive	---	---	---	---	---	---	DE	EN
	VEGADIS 81	---	---	non-reactive	---	---	---	---	---	---	DE	EN
	VEGADIS 82	---	---	non-reactive	---	---	---	---	---	---	DE	EN
	VEGADIS 176	---	---	non-reactive	---	---	---	---	---	---	DE	EN

The values stated above are only valid if the conditions/prerequisites in the corresponding safety manuals are fullfilled.

*) Assessment type:

PiU	proven in use
FMEDA	based on Failure Mode Effects and Diagnostic Analysis
Full assessment	developed according to IEC 61508
non-reactive	device does not change the loop current and may be used in safety-related applications