Declaration on the environmental compatibility for EMC[1)], climate and mechanical load

RE 30030-U/12.11 1/8
Replaces: 07.10

Control electronics for SY(H)DFE...

Control electronics for
pressure and flow control systems

Table of contents

Tested products

This declaration on the environmental compatibility applies to the following products:

- **External control electronics VT 5041-3X...**
- **Analog control electronics**
  attached to (integrated in) the pilot valve
- **Digital control electronics**
  attached to (integrated in) the pilot valve

For an overview of the tested products and their affiliation to the pilot valves and the pressure and flow control systems refer to the following page.

[1)] In the sense of the EMC directive 2004/108/EC

Related pilot valves and pressure and flow control systems

Tested product		Pilot valve		Pressure and flow control system	
Type	Data sheet	Type	Data sheet	Type	Data sheet
External control electronics VT 5041-3X…	RE 30242	VT-DFP...2X	29016	SYDFE1-2X	30030
				SYDFE1-3X	30630
Analog control electronics attached to (integrated in) the pilot valve		VT-DFPE...2X	29016	SYDFEE-2X	30030
				SYDFEE-3X	30630
				SYHDFEE-1X	30035
Digital control electronics attached to (integrated in) the pilot valve		VT-DFPC...2X	29016	SYDFEC-2X	30030
				SYDFEC-3X	30630
				SYHDFEC-1X	30035
		VT-DFPn...2X	29016	SYDFEn-2X	62240
				SYDFEn-3X	62241
				SYHDFEn-1X	62242

External control electronics VT 5041-3X... for SYDFE1

1. EMC (electromagnetic compatibility)

Test according to generic standard **EN 61000-6-2:2005, VDE 0839 part 6-2**

			Interference resistance
EN 61000-4-2: 1995 +A1: 1998 +A2:2000 IEC 1000-4-2	VDE 0847-4-2	ESD (electrostatic discharge)	Air discharge: Severity level 3 / evaluation criterion A Contact discharge: Severity level 4 / evaluation criterion A
EN 61000-4-4: 2004 IEC 1000-4-4	VDE 0847-4-4	BURST (transient interference)	Repetition rate 5 kHz Supply voltage: Severity level 3 / evaluation criterion A Data lines: Severity level 4 / evaluation criterion A Repetition rate 100 kHz Supply voltage: Severity level 3 / evaluation criterion A Data lines: Severity level 4 / evaluation criterion A
EN 61000-4-5: 2006 IEC 1000-4-5	VDE 0847-4-5	SURGE (surge voltage)	Supply voltage: Severity level 1 / evaluation criterion B
EN 61000-4-6: 2007 +Corrigendum August 2007 IEC 1000-4-6	VDE 0847-4-6	HF fields, conducted	Severity level 3 / evaluation criterion A

Test according to generic standard **EN 61000-6-3:2007, VDE 0839 part 6-3**		
		Interference emission
IEC/CISPR16-2-1: 2005-09 Section 7.4.1 IEC/CISPR16-1-2: 2006-08 Section 4.3	Emission Direct voltage / supply voltage connection, conducted	Limits according to EN 61000-6-3:2007 0.15 to 30 MHz Table 1 / line 3

External control electronics VT 5041-3X... for SYDFE1 (continued)

2. Climate

Test according to EN 60068-2 / IEC 68-2 (environmental test)

EN 60068-2-1: 2007	Cold test	2 cycles –5 °C Duration 2 hours
EN 60068-2-2: 1993	Dry heating test	2 cycles +55 °C Duration 2 hours
EN 60068-2-1: 2007 EN 60068-2-2: 1993	Storage temperature	–25 °C, duration 16 hours +85 °C, duration 16 hours
EN 60068-2-14: 1999	Temperature change	2 cycles –5 °C to +55 °C Duration 3 hours at min. / max. temperature
EN 60068-2-30: 2005	Humid heat, cyclic	Variant 2 +25 °C to +40 °C 93 % to 97 % relative humidity 2 cycles 24 hours each

3. Mechanical load

Test according to EN 60068-2 / IEC 68-2 / DIN 40046 (environmental test)
Tested on three axes (X/Y/Z)

EN 60068-2-6: 1995	Vibrations, sinusoidal	10 cycles (20 sweeps) 10 to 500 to 10 Hz with logarithmic frequency changing speed of 1 octave/min. Sweep: 10 to 57 Hz, amplitude 0.3 mm (p-p) 57 to 500 Hz, amplitude 2 g
IEC 68-2-36: 1973 DIN 40046-24: 1977	Vibrations, random (Broadband noise)	20 to 500 Hz, Amplitude 0.01 g^2 / Hz (2.2 g RMS) Testing time 30 min per axis
EN 60068-2-27: 1993	Transport shock	Half sine 15 g / 11 ms, 3 x in positive / 3 x in negative direction per axis

Integrated analog control electronics for SY(H)DFEE

1. EMC (electromagnetic compatibility)

Test according to generic standard **EN 61000-6-2:2001, VDE 0839 part 6-2**

			Interference resistance
EN 61000-4-2:1995 +A1:1998 +A2:2000 IEC 1000-4-2	VDE 0847-4-2	ESD (electrostatic discharge)	Air discharge: Severity level 4 / evaluation criterion A Contact discharge: Severity level 4 / evaluation criterion A
prEN 61000-4-4:2004 IEC 1000-4-4	VDE 0847-4-4	BURST (transient interference)	Repetition rate 5 kHz Supply voltage: Severity level 3 / evaluation criterion A Data lines: Severity level 4 / evaluation criterion A Repetition rate 100 kHz Supply voltage: Severity level 3 / evaluation criterion A Data lines: Severity level 4 / evaluation criterion A
EN 61000-4-5:1995 +A1:2001 IEC 1000-4-5	VDE 0847-4-5	SURGE (surge voltage)	Supply voltage: Severity level 1 / evaluation criterion A
EN 61000-4-6:1996 +A1:2001 IEC 1000-4-6	VDE 0847-4-6	HF fields, conducted	Severity level 3 / evaluation criterion A

Integrated analog control electronics for SY(H)DFEE (continued)

2. Climate

DIN IEC 68-2-1: 1976	Cold test	2 cycles +20 to –25 °C Duration 2 hours at min. temperature
DIN IEC 68-2-2: 1976	Dry heating test	2 cycles +20 to 70 °C Duration 2 hours at max. temperature
DIN IEC 68-2-1: 1976 DIN IEC 68-2-2: 1976	Storage temperature Cold Storage temperature Dry heat	–54 °C, duration 16 hours +85 °C, duration 16 hours
DIN IEC 68-2-14: 1986	Temperature change	2 cycles –25 to +70 °C Duration 3 hours each at min. / max. temperature
DIN IEC 68-2-30: 1985	Humid heat, cyclic	Variant 2 +25 °C to +55 °C 95 % to 97 % relative humidity 2 cycles 24 hours each

3. Mechanical load

Tested on three axes (X/Y/Z)

EN 60068-2-6: 1994	Vibrations, sinusoidal	10 cycles 5 to 2000 to 5 Hz with logarithmic frequency changing speed of 1 octave/min. 5 to 57 Hz, amplitude 1.5 mm (p-p) 57 to 2000 Hz, amplitude 10 g
IEC 68-2-36: 1973	Vibrations, random (Broadband noise)	20 to 2000 Hz, Amplitude 0.05 g^2 / Hz (10 g RMS) Testing time 30 min per axis
EN 60068-2-27: 1993	Transport shock	Half sine 15 g / 11 ms, 3 x in positive / 3 x in negative direction per axis

Integrated digital control electronics for SY(H)DFEC and SY(H)DFEn

1. EMC (electromagnetic compatibility)

Test according to generic standard **EN 61000-6-2:2001, VDE 0839 part 6-2**

			Interference resistance
EN 61000-4-2:1995 +A1:1998 +A2:2000 IEC 1000-4-2	VDE 0847-4-2	ESD (electrostatic discharge)	Air discharge: Severity level 4 / evaluation criterion A Contact discharge: Severity level 4 / evaluation criterion A
EN 61000-4-4:1995 +A1:2001 +A2:2001 IEC 1000-4-4	VDE 0847-4-4	BURST (transient interference)	Supply voltage: Severity level 3 / evaluation criterion B Data lines: Severity level 4 / evaluation criterion B
EN 61000-4-5:1995 +A1:2001 IEC 1000-4-5	VDE 0847-4-5	SURGE (surge voltage)	Supply voltage: Severity level 1 / evaluation criterion A
EN 61000-4-6:1996 +A1:2001 IEC 1000-4-6	VDE 0847-4-6	HF fields, conducted	Severity level 3 / evaluation criterion A

Test according to generic standard **EN 61000-6-3:2001, VDE 0839 part 6-3**			
			Interference emission
EN 55022:1998	VDE 0878-22	Emission radio interference voltage	Class B / 0.15 to 30 MHz when using the VT-NE32 Rexroth power pack

Integrated digital control electronics for SY(H)DFEC and SY(H)DFEn (continued)

2. Climate

Test according to EN 60068-2 / IEC 68-2 (environmental test)

EN 60068-2-1:1994	Cold test	2 cycles –5 °C Duration 2 hours
EN 60068-2-2:1993	Dry heating test	2 cycles +65 °C Duration 2 hours
EN 60068-2-1:1994 EN 60068-2-2:1993	Storage temperature	–25 °C, duration 16 hours +85 °C, duration 16 hours
EN 60068-2-14: 1986	Temperature change	2 cycles –5 °C to +65 °C Duration 3 hours at min. / max. temperature
EN 60068-2-30:1985	Humid heat, cyclic	Variant 2 +25 °C to +55 °C 93 % to 97 % relative humidity 2 cycles 24 hours each

3. Mechanical load

Test according to EN 60068-2 / IEC 68-2 / DIN 40046 (environmental test)
Tested on three axes (X/Y/Z)

prEN 60068-2-6:1994	Vibrations, sinusoidal	10 cycles 5 to 2000 to 5 Hz with logarithmic frequency changing speed of 1 octave/min. 5 to 57 Hz, amplitude 1.5 mm (p-p) 57 to 2000 Hz, amplitude 10 g
IEC 68-2-36:1973 DIN 40046-24:1977	Vibrations, random (Broadband noise)	20 to 2000 Hz, Amplitude 0.05 g^2 / Hz (10 g RMS) Testing time 30 min per axis
EN 60068-2-27:1993	Shocking	Half sine 15 g / 11 ms, 3 x in positive / 3 x in negative direction per axis
Extended test according to MIL-STD-820 D	Vibrations, random	10 to 89 Hz, 0.04 g^2/Hz 89 to 300 Hz, +4 dB/octave 300 to 1000 Hz, 0.2 g^2/Hz 1000 to 2000 Hz, –6 dB/octave Test time 60 min per axis
	Shocking	Half sine 60 g / 6 ms, 1 x in positive / 1 x in negative direction per axis