Process Validation Plan and Report (PVP&R)

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Projektnummer project no.	Produktbezeichnung product description	Erzeugnis-Nr. part no.	Kunde customer	Kundensachnummer customer part no.	Lastenheft-Nr. specification no.	Rev. rev.	Datum date
EP/639 418 00	**2218F/2TDH**	**929 5420 200**	**intern**			**0**	**25.01.2010**

Test-Nr. test ID	Referenz Lastenheft specifiction / test method	Prüfbeschreibung test description	Besonderes Merkmal	Norm oder Kundenstandard customer standard	Prüfparameter test conditions	Bewertungskriterien assessment criteria	Prüf-dauer test duration	Muster-stand sample status	Prüfverant-wortung test respons-ibillity	Menge Qty.	Kennz. Muster sample marking	Beginn start date	Ende end-date	Test-ergebnis test result	Prüfbericht-Nr. / Bemerkungen test report no / remarks
A1	Incoming inspection	Visual- Function test Noise test (subjectiv))		epS-Standard	current, speed, noise Un=48VDC	Specification	1d	D	090	12	1-11A	21.10	21.10	pass	2010-0003 Ablauf A
A1	Noise test	Structure-borne noise test		eps-Standard	Structure-borne noise	no noticeable bearing frequencies and level	1d	D	514	12	1-11A	22.10	22.10	pass	2010-0003 Ablauf A
A2	Low temperature storage	Low temperature storage test		DIN EN 60068-2-1	Tmin = -40°C / 24h non operating	Specification	1d	D	090	11	1-11A	24.10	24.10	pass	2010-0003 Ablauf A
A3	High temperature storage	High temperature storage test		DIN EN 60068-2-2	Tmax = +85°C / 72h non operating	Specification	3 d	D	090	11	1-11A	24.10	24.10	pass	2010-0003 Ablauf A
A4	Temperature cycling	Temperature cycling test with storage temperature and specified change rate. non operating		DIN EN 60068-2-14, Nb	5 Cycles Tmin = -40°C / Tmax = +85°C change rate: 1,5K/min, Soak time: 3h non operating	Specification	1d	D	090	11	1-11A	24.10	24.10	pass	2010-0003 Ablauf A
A5	Damp heat, steady state	High ambient humidity		DIN EN 60068-2-78	+40°C / 93% R.H. / 96h non operating	Specification	2 d	D	090	11	1-11A	25.10	25.10	pass	2010-0003 Ablauf A
A6	Humid head, cyclic	Humid head cycling test Operating		DIN EN 60068-2-30, Db, Variant 1	2 Cycles Tmax= 55°C / 48h Variant 1	Specification	4 d	D	090	11	1-11A	26.10	26.10	pass	2010-0003 Ablauf A
A7	In-process inspection	Visual- Function test Noise test (subjectiv))		epS-Standard	Current, speed, noise (subjectiv) U=48VDC No. 11 Corrosion Disassembling and Analysis (visual examination)	Specification	1d	D	090	11	1-11A	26.10	26.10	pass	2010-0003 Ablauf A
A8a	Humid head, cyclic	Humid head cycling test Operating		DIN EN 60068-2-30, Db, Variant 1	6 Cycles Tmax= 55°C / 144h Variant 1 100% Operating / Un = 48V	Function	6d	D	090	6	1-4A	26.10	27.10	pass	2010-0003 Ablauf A
A9a	Damp heat, steady state	High ambient humidity		DIN EN 60068-2-78	+40°C / 93% R.H. / 96h 100% operating / Un = 48V	Specification	10 d	D	090	6	1-4A	27.10	28.10	pass	2010-0003 Ablauf A
A8b	Resonance frequency	Resonance frequency search		DIN EN 60068-2-6 WN3-8.00	10-500Hz / 1g / 0,5 Oct/min	no resonance frequencey in the range of the rotary frequency	0,5d	D	090	1	5A	28.10	28.10	pass	2010-0003 Ablauf A

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A8b	Sinusodial vibration	Sinusodial vibration at room temperature Operating		DIN EN 60068-2-6 WN3-8.00	10-58Hz, 0,15mm 58-500Hz, 2g 10 Cycles per axis 1 Oct/min Operating / Un = 48V	Function no mechanical demaging no contact between impeller und housing	0,25d	D	090	1	6A	28.10	28.10	pass	2010-0003 Ablauf A
A8c	Random vibration	Random vibration at room temperature non Operating		DIN EN 60068-2-64	5-20Hz, 1m²/s³ 20-500, Hz -3dB/Oct. G_{RMS} = 0,91 g all axes 3x30 min test based on ETSI 300 019-2-2 T2.3 (IEC class 2M3)	Function no mechanical demaging	0,5d	D	090	1	7A	28.10	28.10	pass	2010-0003 Ablauf A
A8c	Random vibration	Random vibration at room temperature (broad-band random) operating		DIN EN 60068-2-64	5-20Hz, 1m²/s³ 20-500, Hz -3dB/Oct. G_{RMS} = 0,91 all axes 3x30 min /operating Un = 24V test based on ETSI 300 019-2-5 T5.2 (IEC class 5M2)	Function mechanical demaging no contact between impeller and housing	0,5d	D	090	1	8A	28.10	28.10	pass	2010-0003 Ablauf A
A8c	Mechanical shock	mechanical shock non operating		DIN EN 60068-2-27	acceleration: 50g duration: 11ms shock form: half-sinusodial 10 shocks in each direction non operating total shocks: 60	Function no mechanical demaging	0,25d	D	090	1	9A	28.10	28.10	pass	2010-0003 Ablauf A
A8c	Mechanical shock	Mechanical shock operating		DIN EN 60068-2-29 (IEC class 3M5)	acceleration: 5g duration: 11ms shock form: half-sinusodial 100 Shocks in each directions operating, Un = 48V total shocks: 600	Function no mechanical demaging no contact between impeller and housing	0,25d	D	090	1	9A	28.10	28.10	pass	2010-0003 Ablauf A

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A9b	Temperature cycling	Temperature cycling test with operating temperature and specified change rate. Operating		DIN EN 60068-2-14, Nb	Tmin = -25°C / Tmax = +70°C Change rate :1,5K/min Soak time = 3h 10 cycles at Un=48V 10 cycle at Umin = 36V 10 cycle at Umax = 60V	Function	10d	D	090	10	6-10C	29.10	30.10	pass	2010-0003 Ablauf A
A10	Final inspection	Visual- Function test Noise test (subjectiv))		epS-Standard	current, speed, noise Un=48VDC	Specification	1d	D	090	10	6-10C	31.10	31.10	pass	2010-0003 Ablauf A
A10	Noise test	Structure-borne noise test		eps-Standard	Structure-borne noise	no noticeable bearing frequencies and level	1d	D	514	12	6-10C	31.10	31.10	pass	2010-0003 Ablauf A
		Structure-borne noise test													
C1	Incoming inspection	Visual- Function test Noise test (subjectiv))		epS-Standard	current, speed noise Un=48VDC	Specification	1d	D	090	10	1-10C	21.10	21.10	pass	2010-0003 Ablauf C
	Noise test	Structure-borne noise test		eps-Standard	Structure-borne noise	no noticeable bearing frequencies and level	1d	D	514	10	1-10C	22.10	22.10	pass	2010-0003 Ablauf C
C2	On-Off test	On-Off test with temperatur cycling during the test		eps-Standard	10.000 On-Off cycles 6s "ON", 7s "OFF" Tmin= -20°C / 1h Tmax= +65°C / 1,5h change rate: 1,5 K/min Un = 48V ON-OFF operating between end of soaktime -20°c and end of soaktime +65°C	Function no noticeable bearing frequencies and level (see noise test)	9d	D	090	10	1-10C	24.10	25.10	pass	2010-0003 Ablauf C
C3	final inspection	Visual- Function test Noise test (subjectiv))		epS-Standard	current, speed, noise Un=24VDC	Specification	1d	D	090	10	1-10C	30.10	30.10	pass	2010-0003 Ablauf C
	final inspection	Structure-borne noise test		eps-Standard	Structure-borne noise	no noticeable bearing frequencies and level	1d	D	514	10	1-10C	31.10	31.10	pass	2010-0003 Ablauf C
D1	Incoming inspection	Visual- Function test Noise test (subjectiv))		epS-Standard	current, speed noise Un=48VDC	Specification	1d	D	090	10	1 -6D	21.10	21.10	pass	2010-0003 Ablauf D

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D2	Damp heat, steady state	High ambient humidity		DIN EN 60068-2-78	+45°C / 93% R.H. / 720h Un= 48V, permant	Function no noticeable bearing frequencies and level (see noise test) no scratch between fan-wheel and housing	20d	D	090	6	1-6D	24.10	27.10	pass	2010-0003 Ablauf D
D3	final inspection	Visual- Function test Noise test (subjectiv))		epS-Standard	current, speed, noise Un=84VDC	Specification	1d	D	090	6	1-6D	28.10	28.10	pass	2010-0003 Ablauf D

Produktfreigabe / product approval		X	freigegeben / approved	Name / name Datum / date	05.08.2010 / R. Wasmuth	Verteiler mailing list
für Musterstand / for sample grades:	**D-sample**		freigegeben mit Auflagen approved with requirements	Bemerkung / remarks Maßnahmen siehe Testreport		
			abgelehnt / rejected			
Umweltklasse / Enviromental class		U10				

FB 090 /09 06.08

DV = Design Validation samples

PV = Process Validation samples