

# DC/DC Converter

75 W

75 FDB 750 M24 □ □ □

$V_{I\text{ nom}} = 600\text{ V}_{\text{DC}}, 750\text{ V}_{\text{DC}}$      $V_{O\text{ nom}} = 24\text{ V}$      $I_{O} = 3.2\text{ A}$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>INPUT</b>						
$V_I$	Input voltage range	Continuous	400		950	VDC
	Input voltage range: dynamic	Pulse @ EN 50163	950		1269	VDC
$V_{I\text{ min}}$	Converter shutdown				390	VDC
$V_{I\text{ max}}$	Converter shutdown		1270			VDC
	Input transients	2 kV / transient pulses	for $t \leq 1\text{ ms} / \geq 10^6$ pulses			
$I_I$	Input current	No load Nominal load Nominal load	$V_I = 950\text{ V}, I_O = 0\text{ A}$ $V_I = 750\text{ V}, I_O = 3.1\text{ A}$ $V_I = 400\text{ V}, I_O = 3.1\text{ A}$	0.12	7 0.25	mA A A
	Input current integral	$V_I = 950\text{ V}, 0\text{ A} \leq I_O \leq 3.1\text{ A}$			5	A <sup>2</sup> s
$I_{I\text{ max}}$	Max. input switch on current $V_I \geq V_{I\text{ min}}$	$I_O = 3.2\text{ A}$ $\Delta t \leq 100\text{ ms}$	on request			
	Input fuse		2 A			
$C_I$	Converter input capacity		on request			
	External line inductance		on request			

## OUTPUT: Power Unit

$P_{O\text{ nom}}$	Output power	$400\text{ V} \leq V_I \leq 900\text{ V}$		75		W
$V_{O\text{ nom}}$	Output voltage adjustment, factory set	$400\text{ V} \leq V_I \leq 900\text{ V}$	23.9	24.0	24.2	V
$\Delta V_O$	Regulation	$0\text{ A} \leq I_O \leq 3.2\text{ A}$ $T_A = -40^\circ\text{C} \dots +70^\circ\text{C}$ $T_A = 70^\circ\text{C} \dots +85^\circ\text{C}$	$\leq 3\% V_{O\text{ nom}}$ $\leq 4\% V_{O\text{ nom}}$			V
$\Delta V_{O\text{ dyn}}$	Load regulation dynamic	$400\text{ V} \leq V_I \leq 1000\text{ V}$ Pulse load: 20 - 80 - 20 % x $I_{O\text{ nom}}$			200	mV
$t_{\text{dyn}}$	Response time	$400\text{ V} \leq V_I \leq 1000\text{ V}$ Pulse load: 20 - 80 - 20 % x $I_{O\text{ nom}}$		2	3	ms
$V_{O\text{ rms}}$	Ripple	$400\text{ V} \leq V_I \leq 950\text{ V}$ Nom. load BW 300 kHz		150	250	mV
$V_{O\text{ pp}}$	Spikes	$400\text{ V} \leq V_I \leq 950\text{ V}$ Nom. load BW 20 MHz			500	mV <sub>pp</sub>
$t_{\text{on}}$	Turn on time $V_O$	$V_I = 400\text{ V}$ $V_I = 750\text{ V}$ $0\text{ A} \leq I_O \leq 3.1\text{ A}$ , Resistive load			1,2 0,4	s s
$t_h$	Hold up time	$400\text{ V} \leq V_I \leq 900\text{ V}$ $0\text{ A} \leq I_O \leq 3.2\text{ A}$	-	-	-	Ms
	Overvoltage shutdown $V_O$	$400\text{ V} \leq V_I \leq 900\text{ V}$ $0\text{ A} \leq I_O \leq 3.2\text{ A}$	converter off: $V_O \leq 32\text{ V}$			V
$I_O$	Output current	$400\text{ V} \leq V_I \leq 950\text{ V}$		3.2		A
	Output current limitation of $I_O$	$400\text{ V} \leq V_I \leq 950\text{ V}$	3.3		4.3	A
	Output short circuit current	Short circuit between + $V_O$ and - $V_O$ $400\text{ V} \leq V_I \leq 950\text{ V}$			5.0	A
$C_O$	Output capacity			10		mF

## OUTPUT: Signals

PF	Option: Power Fail Open Collector Transistor $V_{CE\text{ max}} \leq 70\text{ V}$ , $I_{CE\text{ max}} \leq -20\text{ mA}^*$ Reference: - $V_O$ Option: Relay	Transistor on: PF= low, $V_O < V_{O\text{ min}}$ Transistor off: PF= high, $V_O \geq V_{O\text{ min}}$  Signal defined for $V_O \geq 0.6 \times V_{O\text{ nom}}$	$V_O < 0.95 \times V_{O\text{ nom}} \pm 3\%$ $V_O \geq 0.95 \times V_{O\text{ nom}} \pm 3\%$	V V
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\* - sign: sink current

## GENERAL SPECIFICATIONS

f	Switching frequency	$V_I = 750\text{ V}, I_O = 3.1\text{ A}$		22		kHz
$\eta$	Efficiency	$P_O \geq 0.7 \times P_{O\text{ nom}}$	84	87		%
	MTBF (SN 29500)	$V_I = 750\text{ V}, I_O = 3.1\text{ A}, T_A = +40^\circ\text{C}$		500 000		h
	No load, short circuit proof		continuously			

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
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### SAFETY / DIMENSIONS

	Creepage / clearance distances Base isolation acc. to EN 50124-1 / 0V 3	Input – Output Input – Baseplate Output – Baseplate	6.0 4.0 2.0			mm mm mm
	Dielectric strength test Series production piece test ramp function 2s – 3s – 2s (type test on request)	Input – Output Input – Baseplate Output – Baseplate			3000 1500 500	V <sub>DC</sub> V <sub>DC</sub> V <sub>DC</sub>
	Connectors	Input: + V <sub>I</sub> and – V <sub>I</sub> Output: + V <sub>O</sub> and – V <sub>O</sub> Option: Power fail Option: Relay			IP00: each one Faston 6.3 x 0.8 mm IP20: screw terminal 3 x Faston 6.3 x 0.8 mm	
	Protection class, protection system	Depends on model			I, IP00 or IP20	
	Dimensions w x h x d	Din rail - or wall mounting IP20 Wall mounting IP00			266 x 240 x 70 236 x 167 x 61	mm mm
	Assembling	Wall mounting with screws			4 x M5	
	Weight	Depends on model	1.1		2.2	kg

### ENVIROMENTAL CONDITIONS

T <sub>A</sub>	Operating temperature range	Continuously for 10 min. EN 50155 Class Tx	- 40 - 40		+ 70 + 85	°C °C
T <sub>Storage</sub>	Storage Temperature		- 40		+ 85	°C
	Cooling				free air convection	
	Humidity	EN 50155, IEC 60571			75% averaged year, 95% 30 days	
	Vibration / shock Valid for wall mounting	IEC 61373, IEC 68-2-27, BN 411002 Cat. I 3 shocks per axis			50 m / s <sup>2</sup> , 30 ms	

### EMC

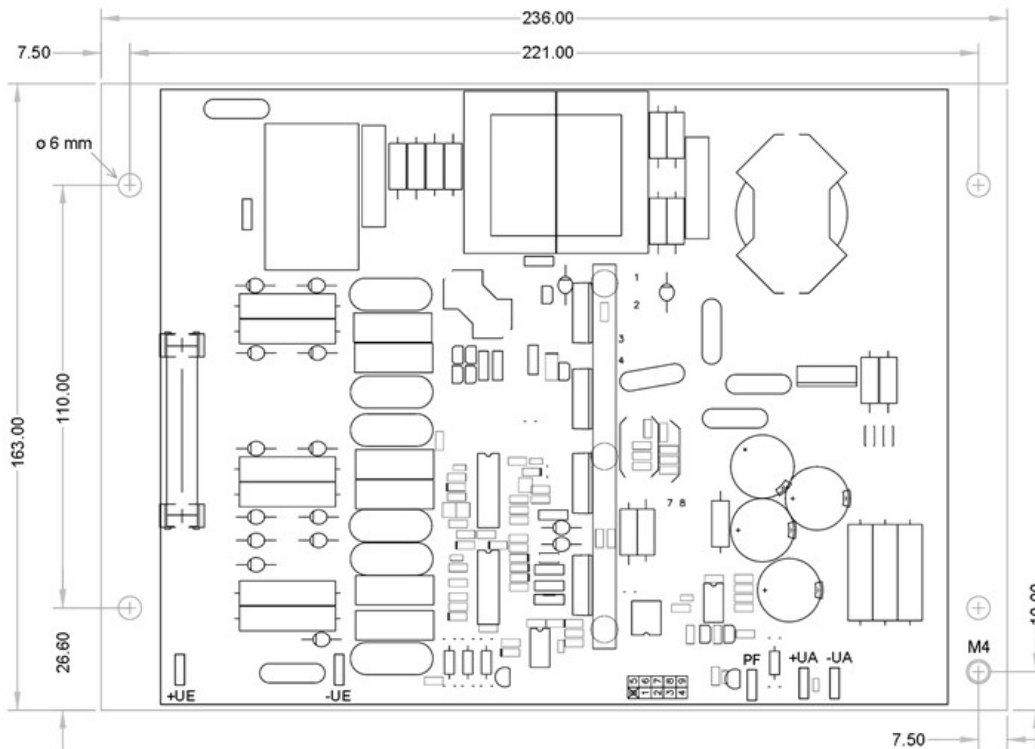
	Emission *)	Line conducted and radiated			EN 50121 - 3 - 2: 2006	
	Transient withstand *)	2 kV 3 kV			for t ≤ 1 ms / ≥ 10 <sup>6</sup> pulses for t ≤ 0,2 ms	

### STANDARDS

	Applied standards:	EN 50155: 2007	BN 411 002	EN 50124 - 1: 2006	EN 50121 - 3 - 2: 2007	IEC 60571
		SN 29500	EN 50121 - 1	EN 50125 - 1	EN 60068 - 2 - 6, 2...27	EN 61000 - 4 - 2...6
		IEC 571	IEC 61373: 1999	EN 60721 - 3 - 5	EN 61373 : 1999	EN 60529
		EN 50163	IEC 1287-1			

Technical specifications valid for: - 40° C ≤ T<sub>A</sub> ≤ + 70° C, 400 V ≤ V<sub>I</sub> ≤ 1269 V, unless otherwise noted.

\*) Measurements in closed housing IP20 version.



(Dimensions in mm)

**Open frame model, IP00: ATTENTION: Heatsink is not grounded – risk of electrical shock!**

**Order code: 75 FDB 750 M24 □□□ *select***

- 0 = No transient filter
- 1 = Input transient filter
- 2 = Input transient filter, Relay
- 3 = Input transient filter, Power fail open collector
- 0 = Open frame - IP00
- 1 = Metal housing - IP20
- W = Wall mounting
- H = Din rail mounting TS35

**Wall mounting, open frame:** e.g.: 75 FDB 750 M24 W00

**Din rail mounting, metal housing:** e.g.: 75 FDB 750 M24 H11