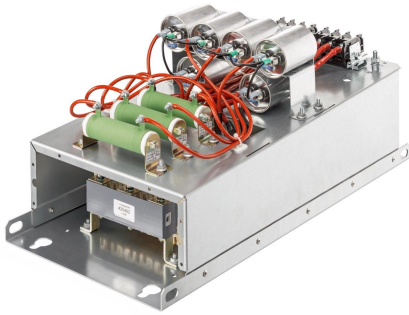


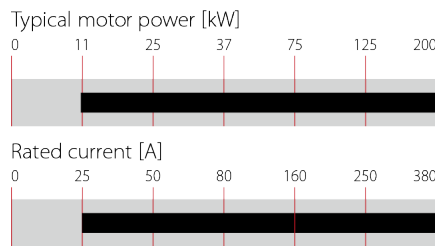
# LCL Filter for Active Front End Motor Drives and Active Infeed Converter



- Line side LCL filtering for AFE and AIC applications
- Mandatory interface to connect the AFE or AIC-system to the grid
- Helps to improve the power quality on the grid side
- Reduces ripple currents and voltage distortions
- All LCL components in one package
- Compact design and ready to be connected



### Performance indicators



## Technical specifications

<b>Nominal operating voltage</b>	3 x 380...480 VAC
<b>Rated operating voltage</b>	3 x 340...530 VAC
<b>Nominal line frequency</b>	50/60 Hz
<b>Switching frequency fPWM</b>	min. 3 kHz up to max. 10 kHz
<b>Rated currents</b>	25 to 380 A @ 50°C
<b>Rated inductance L2 (inverter/converter side)</b>	8% @ 400V, 50 Hz and rated current
<b>Rated inductance L1 (grid/line side)</b>	4% @ 400V, 50 Hz and rated current
<b>Overload capability</b>	1.6 x rated current for 1 min., ones per hour
<b>Filter performance</b>	Prerequisite: Grid supply by insulated transformer Line impedance $L_{grid} \geq 1\%$ THDi $\leq 5\%$ acc. EN61000-3-12 *Remaining ripple current: 5% (max. ripple <sub>pk-pk</sub> vs. fundamental <sub>pk-pk</sub> )
<b>Protection category</b>	IP 00/IP 20 on request
<b>Ambient temperature range</b>	-25°C to +50°C full operation >50°C to 70°C derated operation -25°C to 85°C storage and transportation
<b>Insulation class</b>	EIS 200
<b>Flammability corresponding to</b>	UL 94 V-0
<b>Design corresponding to</b>	Filter: UL61800-5-1, EN61800-5-1 Chokes: EN61558-2-20 or EN60076-6
<b>Creepage and clearance distances</b>	According to UL 61800-5-1

\* Note: for detailed resulting ripple current, please contact your local Schaffner office or partner.

### Approvals



### Features and benefits

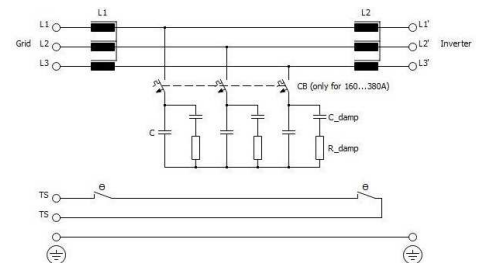
- Improves the power quality for AFE (Active Front End) or AIC (Active Infeed Converter)
- Effective attenuation of converter switching frequency to the grid/line side
- Reduces the current and voltage ripples to acceptable levels for the grid/line side
- Version with passiv damping module for damping oscillation
- Compact and user friendly design for ease of installation

### Typical applications

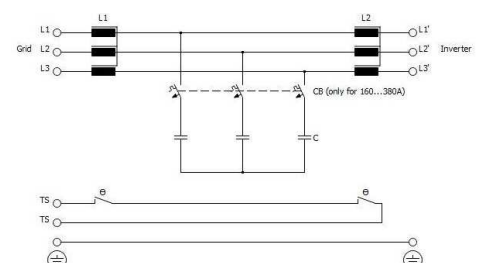
- Hoists and cranes
- Elevators
- Test stands
- Winder/Unwinder
- Multiple motor drive systems with active infeed converter
- Motor drives and -systems with braking energy
- Special machines with high inertia
- Centrifuges
- Transportation systems, e.g. chair lifts etc

### Typical electrical schematic

with damping module:



without damping module - only to be used with motor drive with active damping function:

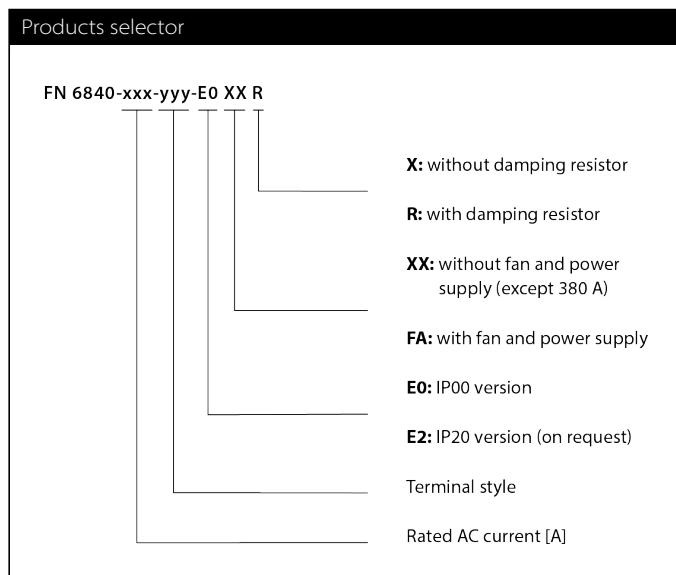


## Filter selection table

Filter	Rated current @ 50°C/50 Hz [A]	*Typical motor drive 400 V/50 Hz [kVA]	Frame size	Nominal inductance		Nominal C capacity [uF]	Nominal R resistance [Ohm]	Typical power loss** [W]	Input/ Output connections	Weight [kg]
				L2 [mH]	L1 [mH]					
<b>with damping module:</b>										
FN 6840-25-113-E0XXR	25	11	D	2.35	1.22	30	15	510	-113	25
FN 6840-50-115-E0XXR	50	25	E	1.18	0.61	60	8.2	825	-115	47
FN 6840-80-115-E0XXR	80	37	F	0.74	0.33	100	4.7	1110	-115	79
FN 6840-160-118-E0XXR	160	75	H	0.37	0.17	200	2.2	2150	-118	125
FN 6840-250-118-E0XXR	250	125	H	0.24	0.11	300	1.5	3095	-118	153
<b>without damping module:</b>										
FN 6840-25-113-E0XXX	25	11	D	2.35	1.22	30		360	-113	24
FN 6840-50-115-E0XXX	50	25	E	1.18	0.61	60		525	-115	46
FN 6840-80-115-E0XXX	80	37	F	0.74	0.33	100		660	-115	77
FN 6840-160-118-E0XXX	160	75	H	0.37	0.17	200		1250	-118	123
FN 6840-250-118-E0XXX	250	125	H	0.24	0.11	300		1595	-118	148
<b>with damping module and with fan:</b>										
FN 6840-380-118-E0FAR	380	200	H	0.15	0.073	500	1.0	4725	-118	159
<b>without damping module and with fan:</b>										
FN 6840-380-118-E0FAX	380	200	H	0.15	0.073	500		2625	-118	164

\* At rated current and 400 VAC/50 Hz. The proper power selection depends upon the drive specification, the motor and the application requirements.

\*\* Losses calculated at 400 VAC/50 Hz and 3 kHz switching frequency.



## Temperature monitoring function

The temperature monitoring device opens a potential-free contact in the case of filter overtemperature (>180°C). The maximum switching capability is 5 A/240 V. **Important Note:** The switch **MUST** be used, for example, as an input of a logic controller (e.g. PLC, CNC etc.) or as the trip of a circuit breaker in order to interrupt the mains power supply.

## Required drives settings and grid considerations

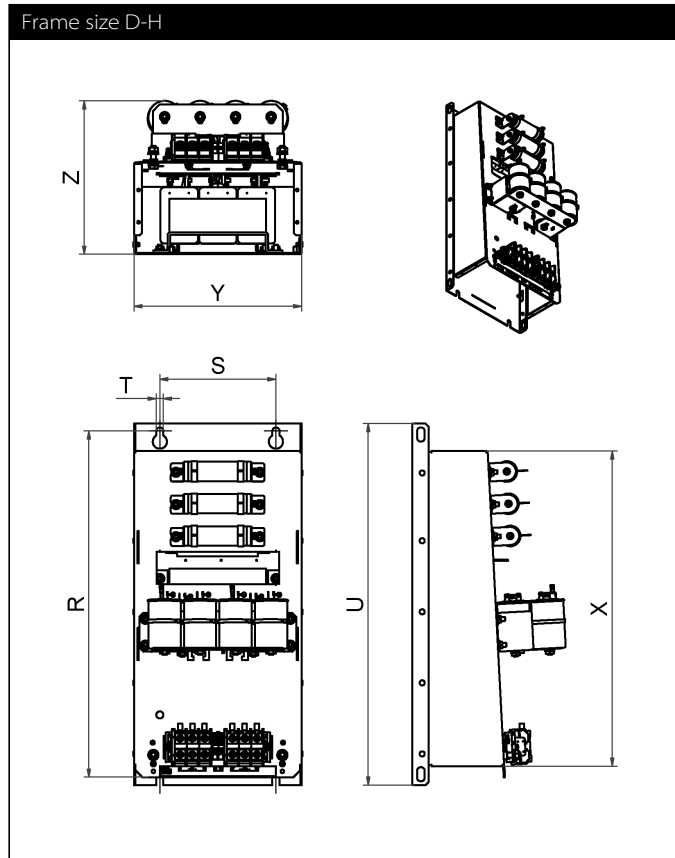
Ensure the drive's switching frequency is set between the required minimum and maximum switching frequency.

The max. permissible motor drives DC link voltage is 850 VDC.

Check the drives manufacturer manual whether special settings are necessary. In any doubt contact the drives manufacturer.

**CAUTION:** If the Active Front End (AFE) motor drives or Active Infeed Converter (AIC) settings are not correct the filter may be damaged.

## FN 6840 Mechanical data of IP 00 enclosure



### Dimensions

	R	S	T	U	X	Y	Z
<b>D</b>	540	180	11	560	489	260	239
<b>E</b>	680	220	11	705	633	290	321
<b>F</b>	730	250	11	752	682	340	322
<b>H</b>	1115	390	11	1150	1051	462	500

All dimensions in mm

Tolerances according to: ISO 2768-m/EN 22768-m, if not stated otherwise

### Filter power terminals

	Screw thread	Cross section [mm <sup>2</sup> ]	Flex wire AWG	Screw torque value [Nm]	Max width** cable lug [mm]	Frame size
<b>-113*</b>	M6	0.75-16	6-18	3	16	D
<b>-115*</b>	M8	10-50	1/0-8	8	22	E, F
<b>-118*</b>	M10	70-240	3/0-500 kcmil	10	30	H

\* Recommended connector type: wire or cable lug for 110 to 115, only cable lug for 115 to 118

\*\* Proof final installation for clearance and creepage

### Filter signal and earth terminals

Terminal type	Screw thread	Screw torque value [Nm]	Frame size
<b>Signal</b>	M3*	0.5	All
<b>Earth (PE)</b>	M8	14	D
<b>Earth (PE)</b>	M8	14	E
<b>Earth (PE)</b>	M10	25	F
<b>Earth (PE)</b>	M10	25	H

\* Max width cable lug = 7 mm

**Note:** For additional information please contact your local Schaffner office or partner.



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