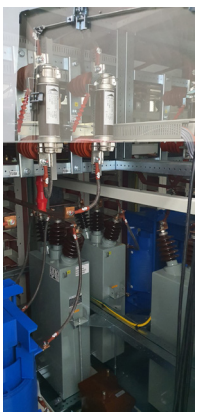
Medium Voltage Equalizer

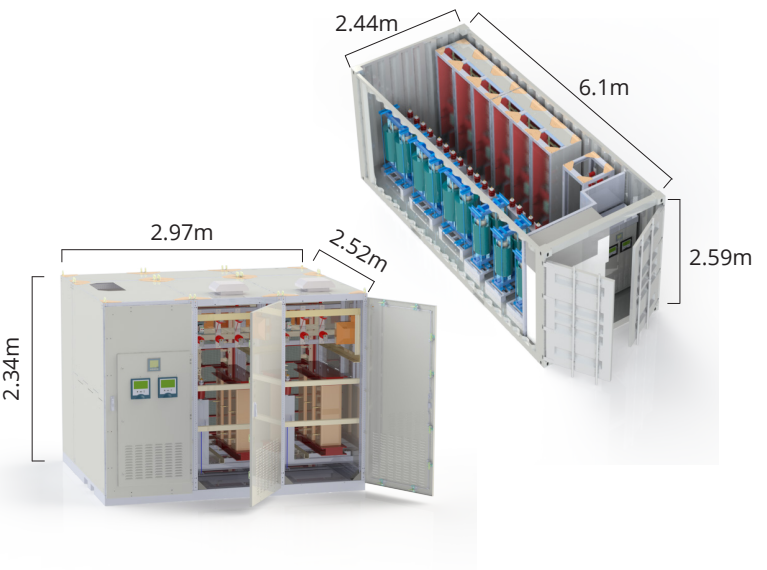
Power factor correction system at medium voltage with real-time reactive power compensation

The medium Voltage Equalizer is a power factor correction system for dynamic loads with extreme fast variations of reactive power demand. It continuously provides real-time response for Reactive Power, Harmonics, Voltage drops, flickering and as a result supports grid's stability. The Equalizer system uses ultra-high power medium voltage thyristor switching technology, providing transient free smooth switching by connecting capacitors at zero-crossing.
Installing the Equalizer system at one or several points of the grid will enhance voltage stability for networks with rapid loads and will prevent machinery downtime. The ability to perform real-time compensation with high efficiency (low losses) makes the Elspec Equalizer one of the most efficient solutions in the market today.
Elspec MV Equalizer solutions are tailor made for our customers' specific needs. We offer wide range of MV power factor correction systems up to 115MVAr. The systems can be operated indoor as well as outdoor.



Typical applications:

Power Utilities
Water Utility (water pumps)
Unbalanced Rapid Loads
Arc Furnaces
Wind Farms
Wood Chippers
Welding Operations
Car Crushers & Shredders
Industrial Mills
Mining Mills, Shovels and Hoists
Harbor Cranes



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MV Equalizer	Enclosure Type	Indoor or Outdoor
	System Size	1.5MVAr - 100MVAr
	Switching	Thyristor Valve
	Nominal voltage	Up to 22kV
	Phase & Frequency	3Ph, 50/60Hz
	Design Ambient Temperature (Elec. Room)	Indoor/Outdoor : 5 ~ 40 deg. C
	Design Relative Humidity	Max.95%
	System Losses	≤0.8%
	Protection Degree	IP54 mounting 20FT container or IP21 Indoor
	Bus material	Copper

Thyristor Valve Panel	No of Valves per group	Wye: 3 (1 per phase), Delta 2
	Valve continuous current	150A without cooling, 250A with direct cooling fan
	Valve rated short time current carrying capacity & duration	4000Amp during 10mSec
	Valve Connection / disconnection	Transient free, switching for connection and disconnection one or several groups. Swithching during current zero crossing., with no limitation for number connections.
	Acquisition time (full compensation to required PF)	One cycle full compensation within 16.6mSec on 60Hz and 20mSec on 50Hz networks (Refer to Appendix)
	PF Rated continuous current	1.3 x In per capacitor groups
	Power frequency withstand voltage (kV)	According With IEC 61936-1:2021 For 3.6kV (Um) - 10kV For 7.2kV (Um) - 20kV For 12kV (Um) - 28kV For 17.5kV (Um) - 38kV For 24kV (Um) - 50kV
	1.2/50 micosec. impulse volt withstand (kV)	According With IEC 61936-1:2021 For 3.6kV (Um) - 40kV For 7.2kV (Um) - 60kV For 12kV (Um) - 95kV For 17.5kV (Um) - 95kV For 24kV (Um) - 125kV

Capacitors	Capacitors rated maximum voltage	1.1 UN 12 Hours Per Day 1.15 UN 0.5 Hour Per Day 1.2 UN 5 Minutes / 200 Times 1.3 UN 1 Minute / 200 Times
	Capacitors peak Current	100In

Reactors	Reactors core type	DRY TYPE
	Reactors Winding	Enmmeled copper wire
	Reactors Terminals	Copper bar
	Reactors Core	Silicon steel
	Reactors Isolation class	class H, 180C°
	Detuned factor	7% / 14%
	Linearity	1.8 In
	Noise	<65db
	Altitute	4000 Meter
	Resonance frequency	50Hz - 189Hz, 60Hz - 227Hz

Protection features and indication	Unit protection	DIGITAL RELAY with VCB / P.F
	Indication for ON/ OFF condition of capacitor	On controller LCD screen
	Trip Interlock for accidental opening of capacitor room	Integral
	Standards	IEC 62271-1, IEC 62271-200, IEC 60871-1-2014, IEC/EN60076-6, EN61558-2-20, IEC 61936-1:2021, IEC60044-1, GB20840.1-2010, GB20840.2-2014 Safety: ENA61010-1, ENA60439-1, UL-508 EMC: EN50081-2, EN50082-2,EN51000-4-2/3/4/5, ENV50204,ENV50141

LV Control Panel	**EQ Controller (G3)**	
	Response Time	Real Time full compensation with acquisition time od 1 cycle maximum
	Elspec Digital Fault Recorder No' 1	
	General	One year cycle by cycle contineus waveform recording of all three phases (mains, load, and capacitors)
	Standards	Refer to Multi Functional recording specification (Attached)
	Scada	Refer to Management software specification (Attached)
	Elspec Digital Fault Recorder No' 2	
	General	One year cycle by cycle recording of all three phases on each group. I^2t equivalent protection for each thyristor vlave (two phases on each group)
	Standards	Refer to Multi Functional recording specification (Attached)
	Scada	Refer to Management software specification (Attached)

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