

Control



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Range of application

Velox cubicles for switchpoint heating can be supplied to customers order in painted steel, stainless steel, aluminum or fiberglass reinforced polyester.

The cubicles are designed to take modules of 2 switchpoints in a standard size cubicle of 1800 height, 400 depths and 1000 wide using the glass fiber cubicles we are limited to the sizes printed in this catalogue. This can be fit up to 6 switches.

We can do larger cubicles if required but from a point of handling the size we use as standard we found to be the biggest to be handled by 3-4 people. If you have possibility to use crane or other lifting help cubicles up to 1200 Width, 600 depth and 1800 height is max. size.

From the picture you can see mast arrangement. This is standard on our metal cubicles and will normally be used for a weather station.

Technical data



Cubical with mast and weather station installed at Newcastle upon Tyne av Nexus Metro.



Internal layout



Close up mast arrangement.





Characteristics

- Lifting brackets for lifting plus ease of installation
- 3 point locking mechanism with L handle.
- Adjustable unistrut racking.
- Double-door on both sides of cabinet for easy access to equipment.
- Passive ventilation system.
- Large cable entry access.
- Specialised door stay brackets/hooks.
- Fully earthed.
- Hinged, lift off doors.
- Available in single or double location case width.
- Available in galvanised steel and powder coated or stainless steel finish.
- The cubicles are constructed in accordance to EN-60439-1
- We follow local standards where EU-standards are not accepted or are enough.
- All cubicle delivered requires in accordance with EU- standard for CE-marking.
- Our cubicles are delivered with a free space of at least 30% for eventual future components.

New functions: for example measuring of operation to be discussed with customer how space should be used.

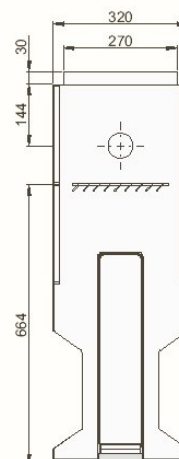
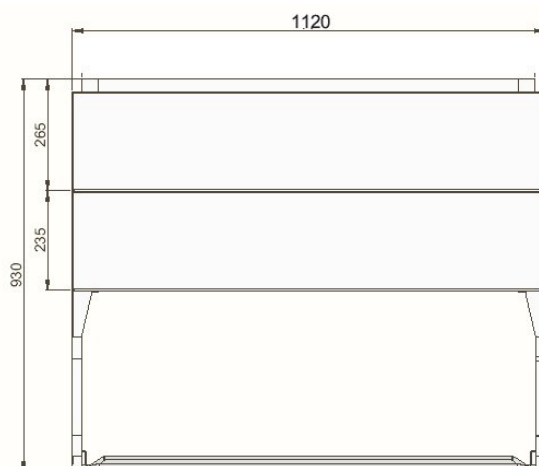
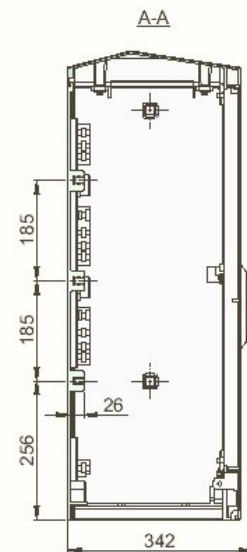
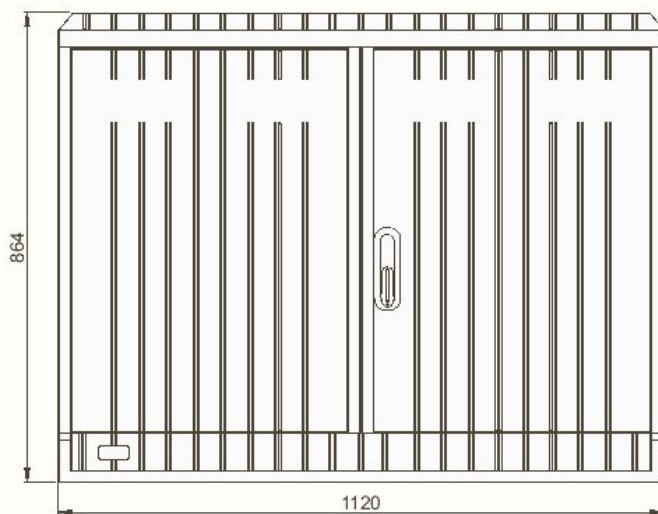
VELOX DCE cabinets, 320mm deep, are widely applied in the industry, energy and telecommunication sectors thanks to their universal qualities. Made of insulating, slow-burning and self-extinguishing composite (fibre glass reinforced polyester) characterized with resistance to atmospheric agents (UV).

The ventilation system (page 16) minimizes the gathering of damp. Parts of the pedestals are removable without the need to use tools, which allows an easy introduction of cables into the installed junction.

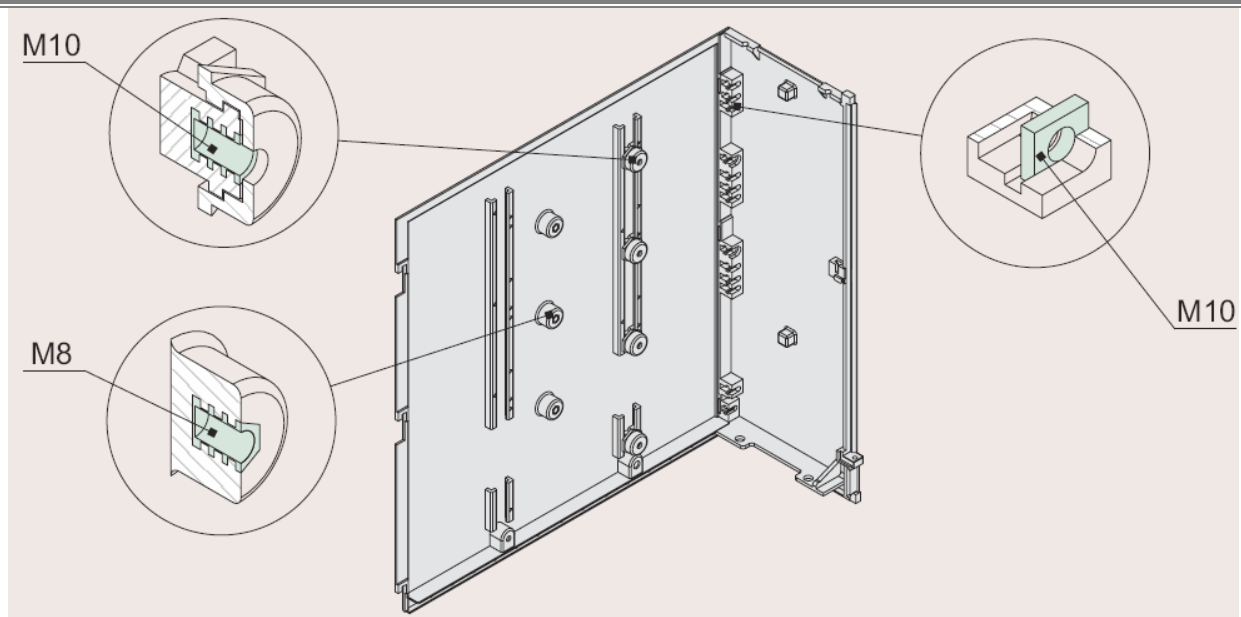
Specially designed construction of the cabinet in connection with additional elements ensures fast and comfortable assembly of equipment.

Technical data

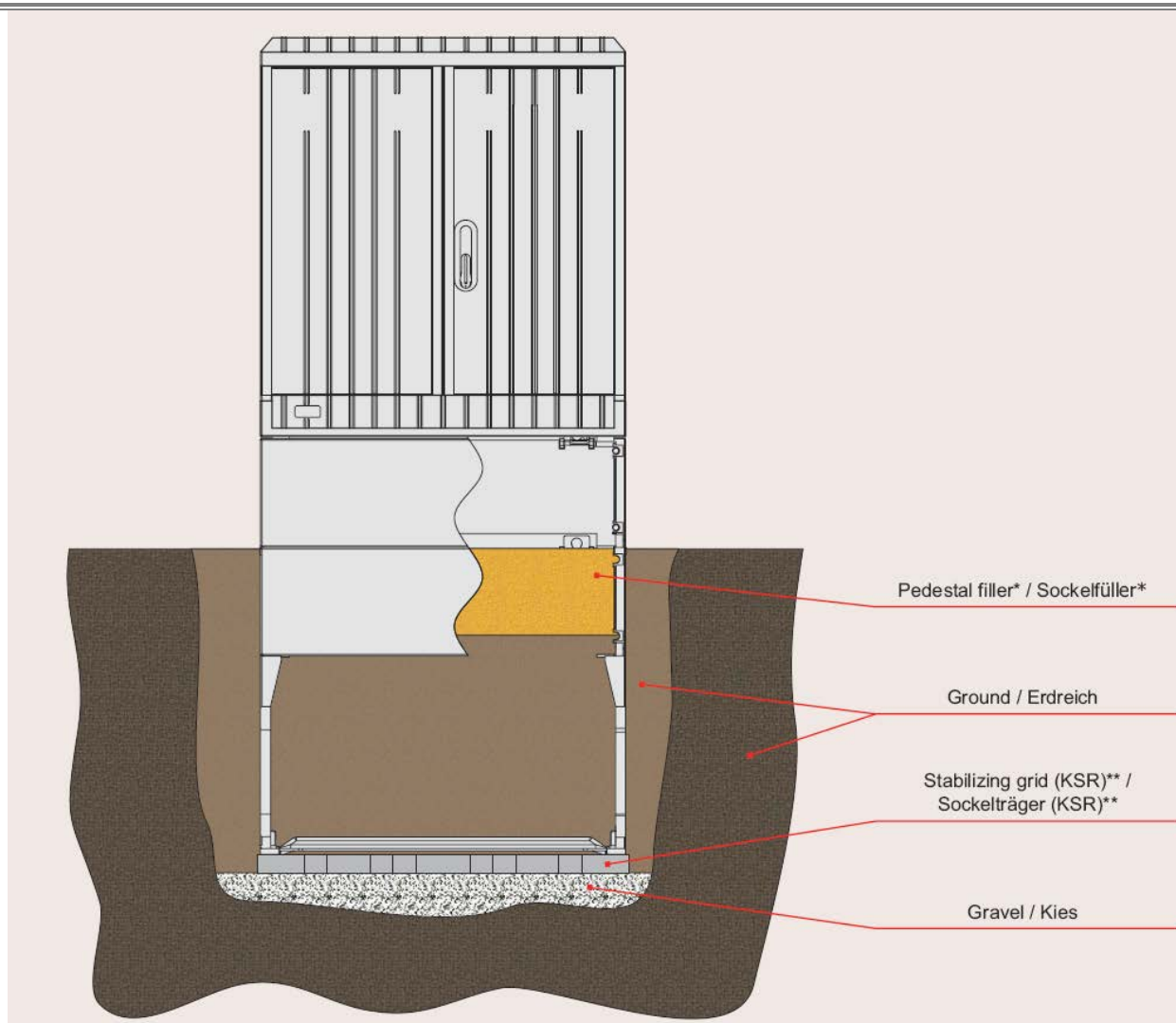
Protection grades / IP.....	IP-44
Flammability category.....	FH2-7mm; V0
Depth.....	320 mm
Colour.....	RAL 7035
Conforming with	DIN 43 629 – 1
.....	DIN 43 629 – 2
.....	DIN 43 629 – 3
.....	EN 60 439 – 1
.....	EN 60 439 – 3
.....	EN 60 439 – 5
.....	EN 62 208
Protection class.....	II
Tracking resistance	CTI 600
Dielectric strength.....	240 kV/cm



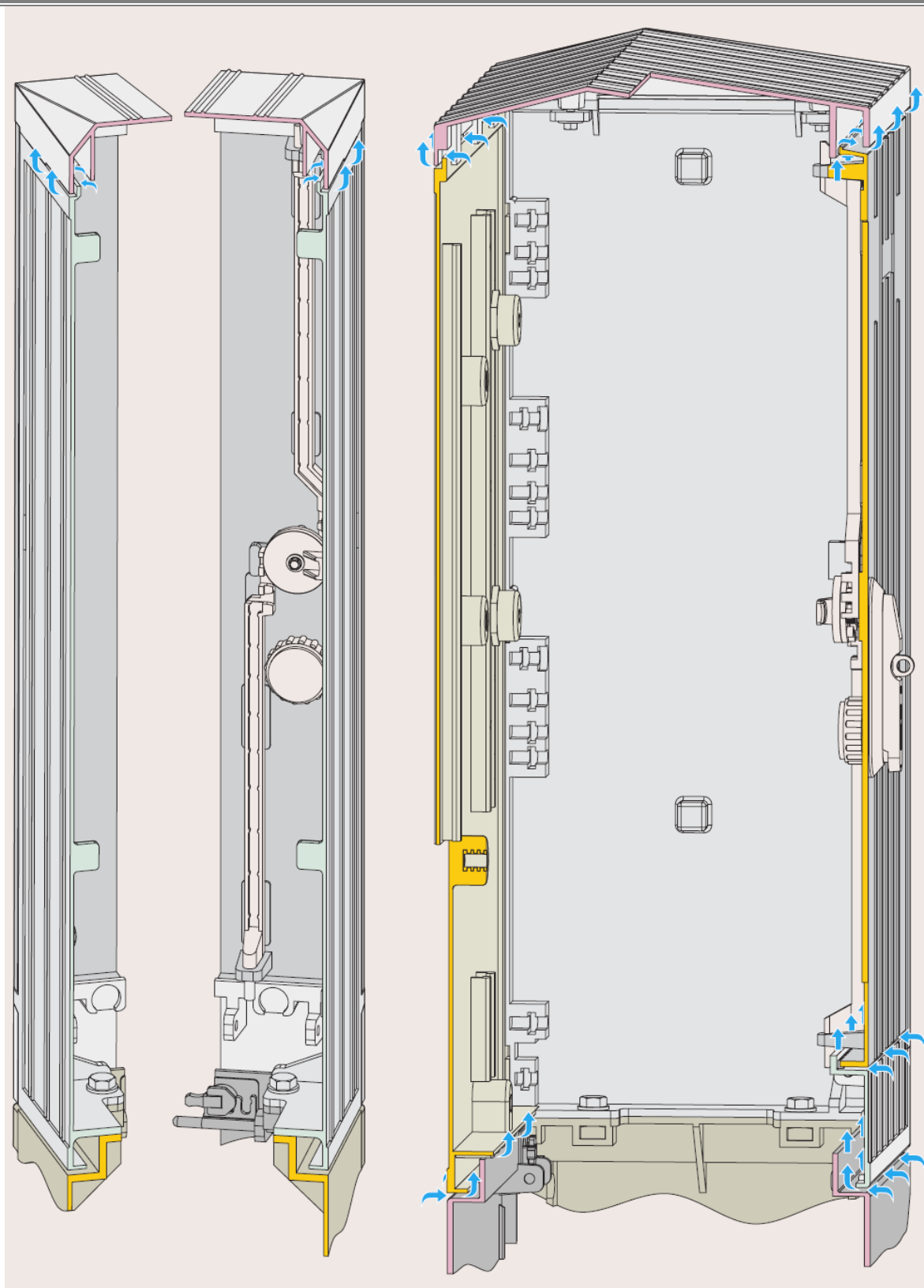
Insulators



Setting cabinet with pedestal



Ventilation system



Switchpoint heating system may not be the first you think of when it comes to running a railway.

In many places switchpoint heating is not an issue but where it is needed, the way of heating and more important cost of the heating is an issue.

In Principle there are 4 ways of keeping the switch free from ice and drifting snow.

Blowing with air is one way which nowadays is not so common.

Steam cleaning have been tested and found not to be very practical.

Gas powered and electrical heating seems to be the two systems used today.

Electrical systems seems to be the future technique mainly, because it is easy to handle and easy to control and most of all it shows low maintenance cost.

Many switchpoint heating systems are today manually operated, i.e. you have to in person switch on and off the system visiting the site

The electrical heating system comes in many different shapes today. Low voltage systems, 48-60 Volts, 110 Volts and 240 volts.

When upgrading a railway line or switch it is normal today that you install a wire-less communication system, based on GSM/GPRS or similar.

Velox MegaPoint System has developed a turn-key system including heating element, clips, connection boxes, cabling and cubicles as well as computer system and communication via internet.

What is Velox MegaPoint System?

Basically it is a computer controlled triac system build in modules of 8 channels.

Each power switching module has eight outputs for heating elements or set of elements (max 20 Amps / channel).

Each output is protected by a combined unit ECLB+ fuse and has a current transformer monitoring power out values that are logged in built in system computer. Element are separately monitored for accurate alarms and easy troubleshooting.

Measuring modules are built with eight channels as well and can be ordered for PT-100, Thermo elements or current transformers

Velox Switchpoint heating system is a development between Sweden and a UK-manufacturer. The Velox system is designed with the idea of having a system which is easy and flexible and possible to expand without changing to a complete new system.

Velox controls can be use for any electrical heating system.

Control sensor is normally placed on the stock rail and has a back-up by ambient temperature combined with a snow sensor

Standard control panels can be ordered for 2 or 4 switchpoints in a fiberglass reinforced enclosure 1.2 x 1m.

To obtain a durable system components shall be easy to replace with commonly stock items found in any market that is why we use mainly Siemens components.

The latest development is to monitor the switchpoint heating over the internet with mobile internet modem. The modem SIM is a simple cash card serviced with a minimum amount of money in order to send out periodical information and alarms. Cash cards and Top Up cards gives you low fixed cost.

Megapoint control panel can be accessed at any time over the internet, status can be checked, values can be adjusted, logs of temperatures, power consumption and on / off time can be viewed or downloaded.

Control panel can send alarms via SMS or the internet

The modems used can handle SIM-Cards, GSM-R/GSM/GPRS and standard telephone line.

Personal safety and system safety are important issues and the foundation for our system. Double insulated elements with personal protection breakers (combined ELCB and fuse) separately for each elements ensures personal safety with the highest durability.

This system has been tested and proven well working in Germany, Sweden, UK in combination with Velox MegaPoint System.

THE MEGAPOINT 8 CHANNEL 16 A 240 VAC SWITCH SYSTEM

The MegaPoint system is a family of devices which communicate with a central computer through a single twisted pair cable.

A switch card has 8 channels 16A whereby one card can supply 2 switchpoint heating systems. Each computer can control up to 10 switch cards.

Power Switching Philosophy

Phase slice power control is easy and can be made to provide smooth control. It is so difficult and expensive to keep the radiated and conducted interference down that it is rarely used. To illustrate this, there is a MegaPoint "Variac" driver for the control of large lamps that need continuous and stable power. For all other purposes zero crossing burst fire is appropriate.

Even so, conventional burst fire techniques have two significant problems. A typical technique is that for 30% power the power is delivered for 30 half cycles and switched off for 70. This causes heavy flicker even in quartz heating elements. It is not uncommon for all heaters in a multi-heater machine to synchronize, and it has been known for the building lighting to go up and down as the heaters go down and up!

The second problem is more subtle. It is not unusual for a heater to load the utility transformer to near its capacity. Counting half cycles means that there will be times when all heaters are receiving an odd number of half cycles. Sometimes these will average out, but occasionally they will not. This represents a DC load on the transformer.

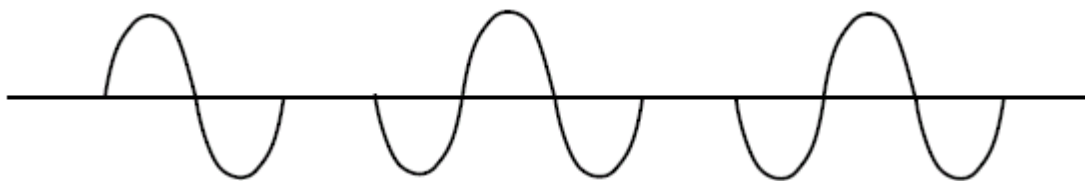
The MegaPoint Triac Assembly Controller

Delivers power only in full cycle bursts which start on a voltage crossing and end on a current crossing. These cycles are spread out as evenly as possible. Thus the load is made as even as possible and has no (appreciable) DC component.

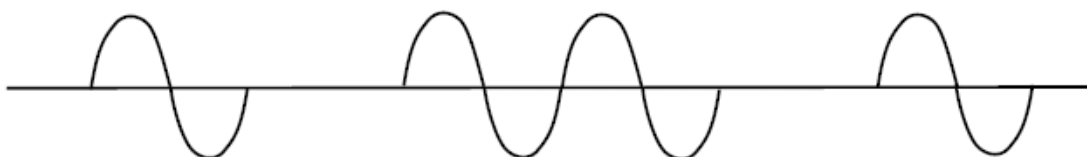
The MegaPoint 8 Channel 16A Triac Assembly

Accepts the eight on/off control signals from the control card. These signals are synchronized to the phase of the power supplied to the control card. The assembly's own card then automatically delays each signal so that each individual triac fires in accordance with the phase of the power of its own circuit.

Each of the eight power connections can therefore be treated as single pole switches which are closed during full cycle bursts which start on its own voltage zero crossing and end on a current crossing of its own.



With many heaters all individually controlled there is the chance that, from time to time, all control channels will do the same thing at the same moment. Overheating of the transformer, perhaps even damage is a possibility. To avoid this, the MegaPoint system always cuts WHOLE cycles:



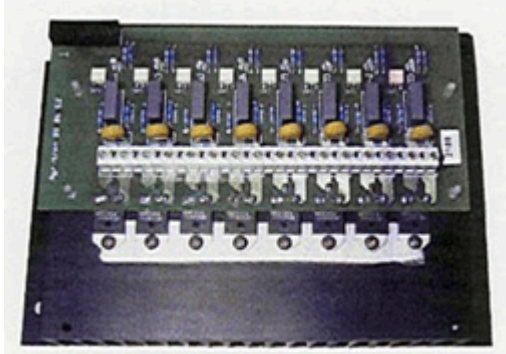
With the MegaPoint system, there will only be complete cycles. For example, at half power, alternate complete cycles are present and absent.

THE MEGAPOINT 8 CHANNEL 16 A 240 VAC SWITCH SYSTEM

A Quick Illustration

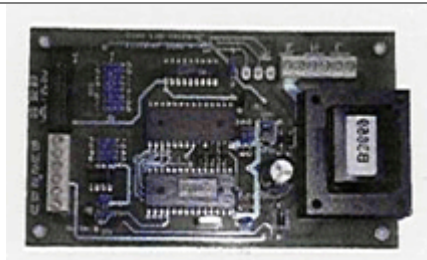
A full sequence period is ninety six cycles. At "one percent" drive there will be one full cycle of power and then a gap of ninety-five. At "two percent", the gap will be forty-seven. After that it cannot always be perfectly even, but it is as near to being evenly spread out as possible.

*The MegaPoint 8 Channel 16A -110-240 VAC Switch**



A 20 way IDC ribbon cable is used to link one, two or three switch assemblies to one control card.

*Control (Driver) Card for the Mega- Point 8 channel 15A 110/240 VAC Switch * Assembly*

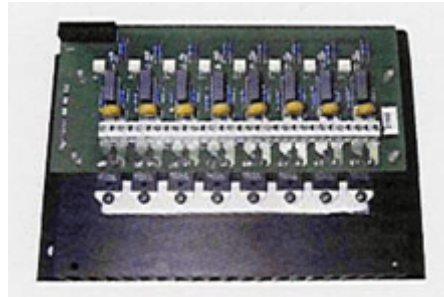


* 20 Ampere also available.

Proper control of temperature is very important for the reliability of semiconductors. Keep within the rules, and their life is virtually indefinite.

The switch assembly heat sink can be cooled by any convenient method. The design brief foresaw these units being used in groups, perhaps ten or twenty together, and so it was important that the hot air leaving one should not materially heat the next.

On larger installations, the size of the holes differs somewhat to allow for proximity to the fans and also to compensate for the fact that the air reaching the upper heat sinks is inevitably a little warmer than that passing over the lower ones.



Radiated and Power-Cable Con- ducted RF Energy

Radio-frequency energy emitted as electro-magnetic radiation or conducted back up the power feed cables has been investigated using MegaPoint.

Since any actual installation includes everything from internal devices to external cabling, if full certification of a particular installation is required, it will be necessary to test the whole machine in its final form in its working position.

Every installation will of course be very different. Where tests of complete systems have been made the array and control system are set up in the array manufacturer's assembly shop. Emissions were found to be much too small to be measured accurately but were clearly well within limits.

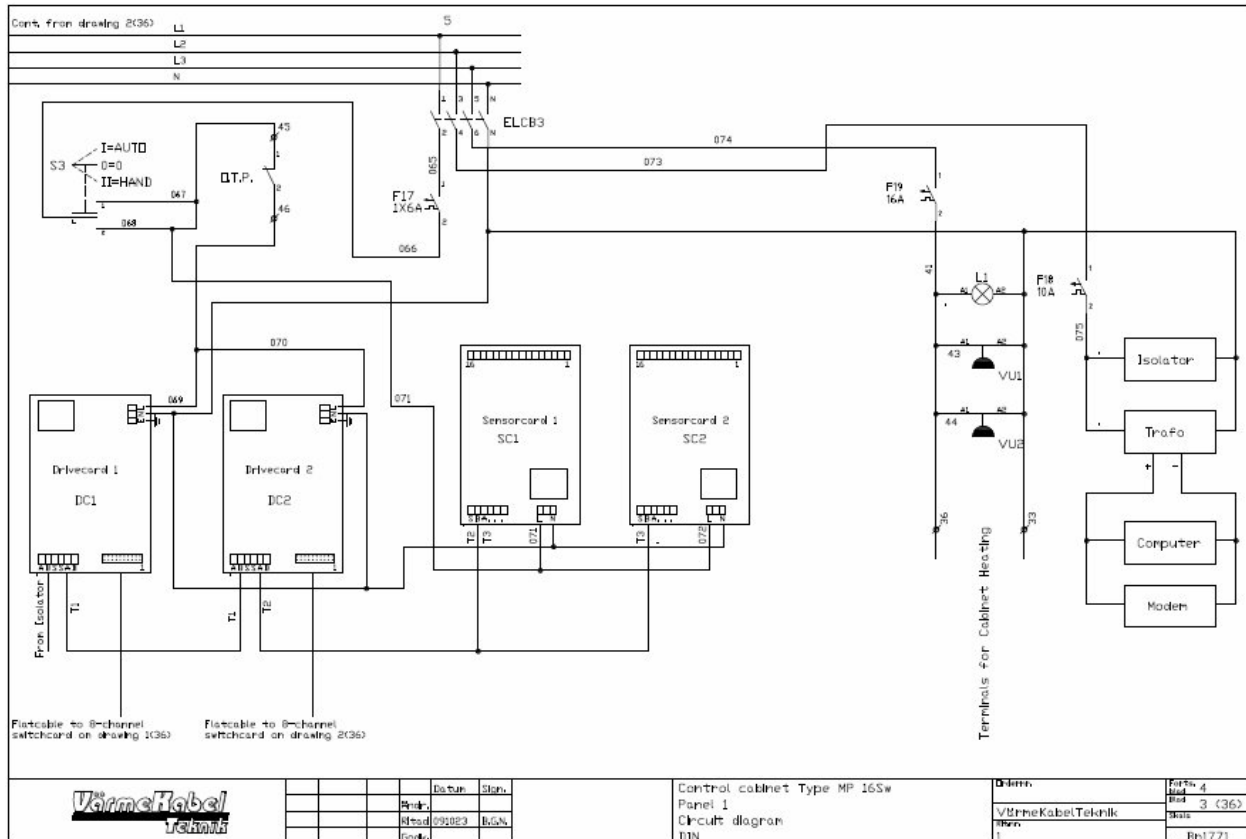
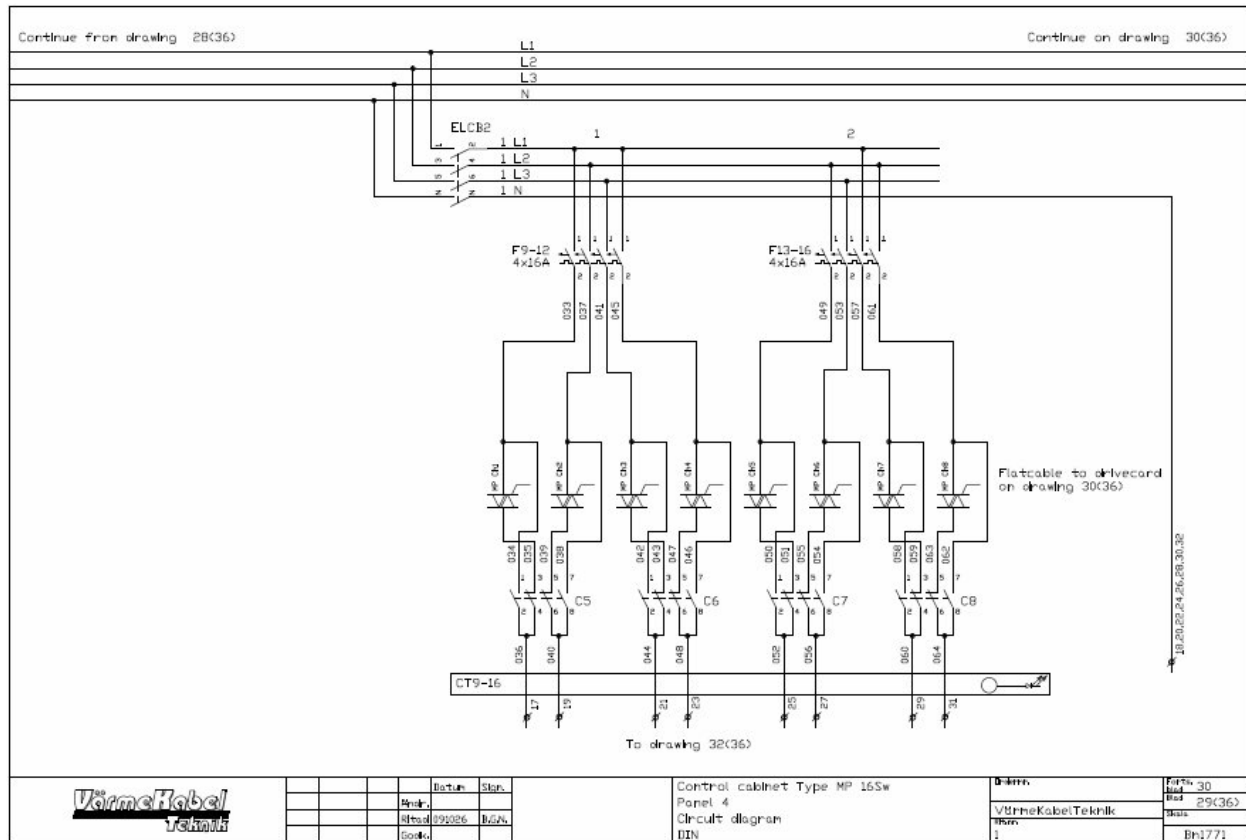
Over the years that these devices have been in use we have not heard of a single report of problems.

The Standard Way of Mounting the Switch Assemblies

The MegaPoint system has been tested by SP in Borås for England and passed with excellent results.


If requested, we will send copies of the report. The report is scanned in below.

VELOX CONTROL PANEL FOR SWITCHPOINT HEATING – DRAWING (BASE DRAWING FOR 2 SWITCHPOINTHEATING SYSTEMSINCL. WEATHER SYSTEM, GSM-COMMUNICATION, CCTV-CAMERA)



VELOX CONTROL PANEL FOR SWITCHPOINT HEATING – DRAWING (EXAMPLE)

QTY	POST	DESIGNATION	MANUFAC.	TYPE	DATA	NOTE
1	.	LINK 2-POLE	SIEMENS	8WA1842	.	16mm2
1	.	LINK 2-POLE	SIEMENS	8WA1850	.	4mm2
2	.	LINK 3-POLE	SIEMENS	8WA1851	.	4mm2
2	.	LINK 4-POLE	SIEMENS	8WA1852	.	4mm2
2	VU1-2	OUTLETS	SIEMENS	E 2117760	.	.
3	S1-S3	SWITCH	SIEMENS	E 2117792	20A/230V	Hand-0-Auto
1	Trafo	TRAFD	LEGRAND	004252	230V/24/12V	25VA
8	C1-C8	CONTACTOR	SIEMENS	E 3273312	24A	24V AC/DC
1	.	ISOLATOR	MEGAPOINT	A 3950105	.	3x16mm2
1	.	MODEM	VELOX	A	.	3G
1	.	DPU	LEXCOM	A	.	.
1	LCD-1H	SNOW SWITCH	ETI	A 3950116	.	.
2	L1-L2	CABINET LAMP	EMITER	.	230V	.
1	VE1	CABINET HEATER	RD-SE	A 3950194	230V	150W
1	T1	THERMOSTAT	RD-SE	A 3950195	230V	0-60grC
3	TTR1-3	TIMERELAY	LEGRAND	004740	12-230V/ACDC	0,1s-100h
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QTY	POST	DESIGNATION	MANUFAC.	TYP	DATA	NOTE																																		
1	.	CABINET	EMITER	E	960x1160mm	.																																		
1	Q1	MAIN SWITCH	SIEMENS	E 3147040	3x100A	.																																		
1	F2	CIRCUIT BREAKER	SIEMENS	E 2115241	10A	.																																		
1	F1	CIRCUIT BREAKER	SIEMENS	E 2115237	6A	.																																		
1	F3	CIRCUIT BREAKER	SIEMENS	E 2115245	16A	.																																		
2	HD1-2	8 CH. SW. CARD	MEGAPOINT	A 3950101	.	Triac																																		
2	DC1-2	DRIVECARD	MEGAPOINT	A 3950103	.	.																																		
3	SC1-3	SENSORCARD	MEGAPOINT	A 3950104	.	.																																		
16	CT1-16	CURRENT SENSOR	MEGAPOINT	A 3950108	.	.																																		
17	FI1-17	FI/LS-PROTECTOR	CBI	A 3950190	16A/30mA	.																																		
1	ELCB1	ELCB	SIEMENS	E 2168150	25A/30mA	.																																		
2	.	DISTRIBUT BLOCK	LEGRAND	04888	.	125A																																		
14	.	EARTH TERMINAL	SIEMENS	E 2913303	.	4mm2																																		
74	.	TERMINAL	SIEMENS	E 2913121	.	4mm2																																		
5	.	BARRIER	SIEMENS	E 2913110	.	.																																		
16	.	END STOP	SIEMENS	E 2914006	.	.																																		
2	.	EARTH TERMINAL	SIEMENS	E 2913306	.	16mm2																																		
2	.	TERMINAL	SIEMENS	E 2913181	.	16mm2																																		
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			<table><tr><td></td><td></td><td>Datum</td><td>Sign.</td></tr><tr><td></td><td>Andr.</td><td></td><td></td></tr><tr><td></td><td>Ritad</td><td>110211</td><td>B.G.N.</td></tr><tr><td></td><td>Godk.</td><td></td><td></td></tr></table>				Datum	Sign.		Andr.				Ritad	110211	B.G.N.		Godk.			<table><tr><td colspan="2">Control cabinet Type MP 4Sw</td><td>Ordernr.</td><td>Forts. 8</td></tr><tr><td colspan="2">Master</td><td rowspan="2">VärmeKabelTeknik</td><td rowspan="2">Blad 7 (9)</td></tr><tr><td colspan="2">Component list</td></tr><tr><td colspan="2">DIN</td><td>Ritad 1</td><td>Skala</td></tr><tr><td colspan="2"></td><td></td><td>Bn1775</td></tr></table>		Control cabinet Type MP 4Sw		Ordernr.	Forts. 8	Master		VärmeKabelTeknik	Blad 7 (9)	Component list		DIN		Ritad 1	Skala				Bn1775
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INSTALLATION AND TEST PROCEDURE

1. Connect 8-core cable for heating cable to the respective terminal blocks.
b) Heater or equal load should be applied.
2. Connect the temperature sensors to the respective terminal blocks.
3. Connect the incoming power supply.
4. Turn the main switch to ON.
5. Switch on the FI / LS protectors (turned upwards).
6. Switch on the circuit breakers (turned upwards).
7. Check that the test switches are in the "Automatic" position (turned upwards).
8. If all connections have been correctly made, the modem pilot light should flash or have a fixed light, depending on the model.
9. Start up the computer.
10. The lights on the triacs should now begin to flash. If the ambient temperature is below 3 degrees centigrade, the lights will, after a while, change to fixed red. At temperatures above 3 degrees centigrade, the lights will instead go off.
11. In that case, you can temporarily raise the set point for the installation on the system computer, alternately manual test with the help of the test switch as described at the next point
12. To test manually, put the test switch S1 (Eight first channels) & S2 (Only present in 4 Switch units Eight last channels) in the test position (turned downwards) To test each channel individually start by turning off all the FI / LS protectors, then turn S1 to manual position. Now turn on one of the FI / LS protectors at the time. This will as well serve as a check of which point, and which cable, is connected to each particular channel.
13. After the manual test, be sure to put the test switches back in the "Automatic" position (turned upwards).
14. Fill in the form – test report.
15. Sign the test report located on the transparent protection cover in the cubical



NOTES



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