

# NOVA22

DIN Rail & Panel Mount Solid State Relays



***crydom***<sup>®</sup>

The Global Expert in **Solid State Switching** Technology

  
**Sensata**  
Technologies

# NOVA22



**NOVA22** Solid State Relays were developed combining technology and innovation to offer high performing solid state relays in a 22.5mm industrial package.

## **Highest power available in a 22.5mm wide package**

The advanced design and technology used in NOVA22 products provide greater power density than any other 22.5 mm wide SSR in the market: 35 Amps in DIN Rail mount and 95 Amps in Panel Mount package.

## **Wide and innovative range of connections**

The unique range of terminal options and configurations makes NOVA22 the most versatile solution. Relay or Contactor terminal configurations, screw or spring cage plug-in input terminals, standard or elevator screws, allowing the use of ring terminals, are all options offered within the NOVA22 family.



**NOVA22 Solid state relays are built with high quality components and Crydom's technology and innovation making them the most powerful and versatile solid state relays in a 22.5mm package on the market today!**

## **Diverse Range of Applications**

NOVA22 Solid State Relays can be used in a wide range of AC and DC applications. Ideal for heating applications, NOVA22s are also suitable for motion, power and lighting applications; especially for demanding applications that require higher levels of reliability including:

**Industrial OEMs:** Plastic Machinery, Packaging and Material Handling Equipment, Industrial Ovens, Pumps

**Food & Beverage:** Baking Ovens, Refrigeration, Food Processing Equipment

**Building Equipment:** HVAC&R, Lighting, Access Control

**Energy & Infrastructure:** Renewable Energy, Water and Waste Water Treatments

**Transportation:** Agricultural Machinery, Railway Vehicles (Tested for Shock and Vibration Resistance up to 50g and 500 Hz, per IEC 60068-2)



# Power & Versatility in a 22.5mm Package!

Rated up to 35 Amps (DIN Rail Mount) and 95 Amps (Panel Mount)

600 VAC or 200 VDC models

Built-in overvoltage transient protection

ID marker for easy identification

LED input status indicator

Input control available in DC and AC voltage options

High  $I^2t$  for use with circuit breakers (8320  $A^2sec$ )

Zero Voltage or Instantaneous Turn-On

High resistance to Shock and Vibration

C-UL-US Listed, CE, and TUV certified

100 kA SCCR

Industry standard Panel Mount package available

Screws or spring cage Input terminals

Standard or elevator innovative output screw

Relay or Contactor configuration





## DR22 Series AC & DC Output DIN Rail Mount Solid State Relays

- Ratings up to 35 Amps at 600 VAC and 30 Amps at 200 VDC
- Built-in overvoltage transient protection on AC models
- Relay or Contactor configuration
- Integral heat sink eliminates the need for complex thermal calculations
- DBC substrate for superior thermal performance
- Optional "Elevator" screw suffix "W" allows the use of ring or lug type terminals
- 1kHz Maximum PWM frequency
- C-UL-US Listed and TUV approved

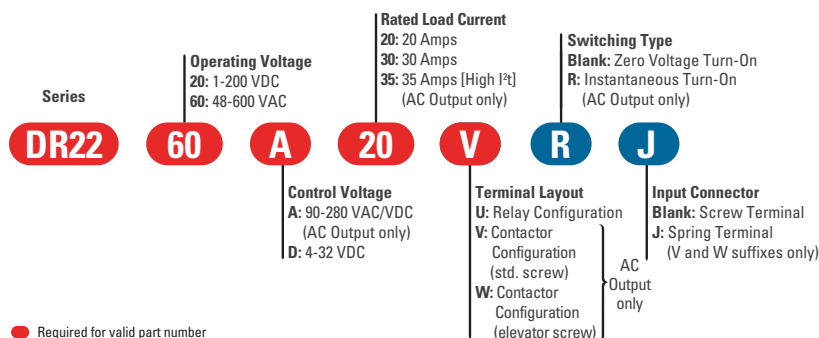


Output Specifications (A)	DR2260x20x	DR2260x30x	DR2260x35x	DR2220D20U	DR2220D30U
Operating Voltage (47-440 Hz)	48-600 V <sub>RMS</sub>	48-600 V <sub>RMS</sub>	48-600 V <sub>RMS</sub>	1-150 VDC	1-150 VDC
Absolute Maximum Rating [VDC]	-	-	-	200	200
Transient Overvoltage [Vpk] (B)	1200	1200	1200	-	-
Maximum Off-State Leakage Current @ Rated Voltage [mA]	1	1	1	0.1	0.2
Minimum Off-State dV/dt @ Maximum Rated Voltage [V/μsec]	500	500	500	-	-
Load Current, General Use UL508/LC A IEC62314 @ 40°C [A <sub>RMS</sub> ]	20	30	35	-	-
Load Current, Motor Starting UL508 FLA / LC B IEC62314 @ 40°C [A <sub>RMS</sub> ]	8.5/4.8	14/7.6	26/14	-	-
Load Current, DC General Use UL508 @ 40°C [ADC]	-	-	-	20	30
Load Current, DC Motor Starting UL508 FLA @ 40°C [ADC]	-	-	-	4.1	5.4
Maximum Load Current	20 A <sub>RMS</sub>	30 A <sub>RMS</sub>	35 A <sub>RMS</sub>	20 ADC	30 ADC
Minimum Load Current (C)	100 mA <sub>RMS</sub>	100 mA <sub>RMS</sub>	150 mA <sub>RMS</sub>	5 mA	5 mA
Maximum 1 Cycle Surge Current (50/60 Hz) [A <sub>pk</sub> ]	286/300	716/750	1290/1350	-	-
Maximum On-State Voltage Drop @ Rated Current	1.35 V <sub>pk</sub>	1.35 V <sub>pk</sub>	1.30 V <sub>pk</sub>	0.68 VDC	0.48 VDC
Maximum 1/2 Cycle I <sup>2</sup> t for Fusing (50/60 Hz) [A <sup>2</sup> sec]	409/375	2563/2343	8320/7593	-	-
Minimum Power Factor (at Maximum load)	0.5	0.5	0.5	-	-
Maximum Surge Current [ADC] (10 msec)	-	-	-	58	86
Maximum On-State Resistance [R <sub>DS-ON</sub> ] [Ohms]	-	-	-	0.034	0.016
Maximum Pulse Width Modulation Frequency [Hz] (D)	-	-	-	1000	900
Motor Rating UL 508/IEC62314 [HP (kW)]: 120 VAC	0.5 (0.37)	1 (0.74)	2 (1.5)	-	-
Motor Rating UL 508/IEC62314 [HP (kW)]: 240 VAC	1.5 (1.1)	3 (2.2)	5 (3.73)	-	-
Motor Rating UL 508/IEC62314 [HP (kW)]: 480 VAC	3 (2.24)	5 (3.7)	10 (7.4)	-	-
Motor Rating UL 508 [HP (kW)]: 120 VDC	-	-	-	1/3 (0.25)	1/2 (0.37)

Input Specifications (A)	DR2260Axxx	DR2260Dxxx	DR2220DxxU
Control Voltage Range	90-280 VAC/VDC (E)	4-32 VDC (F)	4-32 VDC
Maximum Reverse Voltage	-	-32 VDC	-32 VDC
Minimum Turn-On Voltage	90 VAC/VDC	4 VDC	4 VDC
Must Turn-Off Voltage	5 VAC/VDC	1 VDC	1 VDC
Minimum Input Current (for on-state) [mA]	6	10	11
Maximum Input Current [mA]	10	15	15
Nominal Input Impedance [Ohms]	Current Limited	Current Limited	Current Regulated
Maximum Turn-On time	20 msec	1/2 Cycle (G)	75 μsec
Maximum Turn-Off time	30 msec	1/2 Cycle	100 μsec

General Specifications	DR2260xxxx	DR2220DxxU
Dielectric Strength, Input to Output (50/60 Hz) [V <sub>RMS</sub> ]	4000	3750
Dielectric Strength, Input/Output/Case (50/60 Hz) [V <sub>RMS</sub> ]	4000	2500
Minimum Insulation Resistance (@ 500 VDC) [Ohms]	-	10 <sup>9</sup>
Maximum Capacitance, Input/Output [pF]	-	8
Ambient Operating Temperature Range [°C] (H)	-	-40 to 80
Ambient Storage Temperature Range [°C]	-	-40 to 100
Short Circuit Current Rating [kA] (J)	100	-
LED Input Status Indicator	-	Green
Weight (Typical) [oz] (g)	Suffix "U" 10.5 (298), "V" & "W" suffixes 10.6 (301)	10.5 (298)
Housing Material	-	UL94 V-0
Baseplate Material	-	Aluminum
Hardware Finish	-	Nickel Plating
Humidity	-	85% non-condensing

### Part Number Nomenclature



- Required for valid part number
- For options only and not required for valid part number

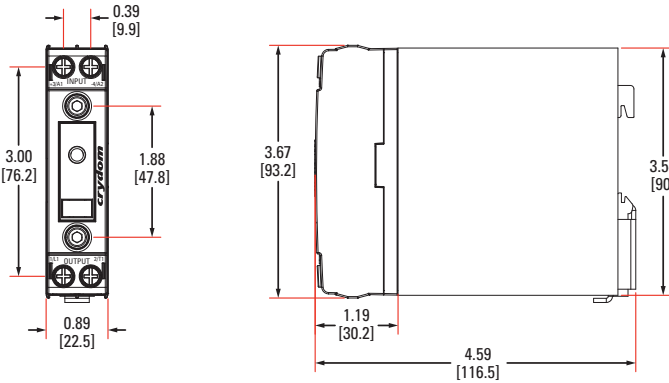
### Recommended Accessories for DR22 Series

Connectors	ID Marker	Lug Terminal	Module
CP201 CP202	CNLB CNLN CNL2	TRM0 TRM6	DRML1

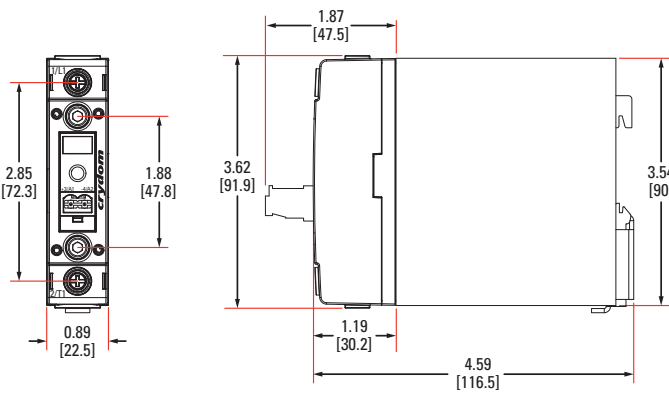
## Mechanical Dimensions

Tolerances: ±0.02 in / 0.5 mm  
All dimensions are in: inches [millimeters]

### Relay Configuration

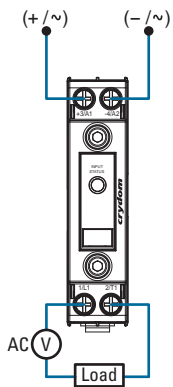


### Contactors Configuration

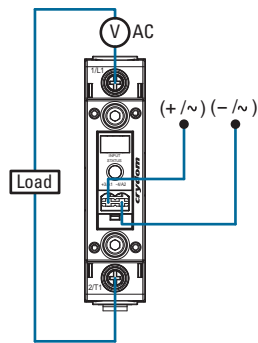


## Wiring Diagrams

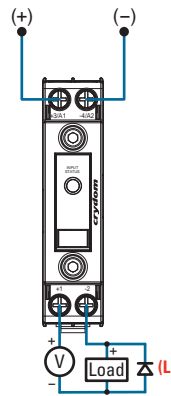
### Relay Configuration AC Output



### Contactors Configuration AC Output

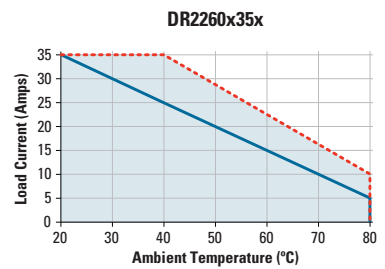
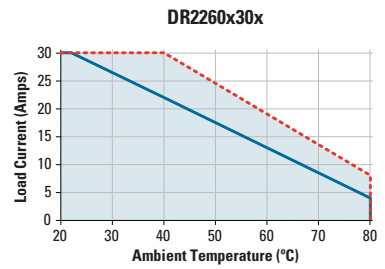
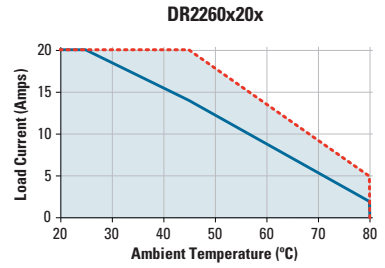


### Relay Configuration DC Output (K)

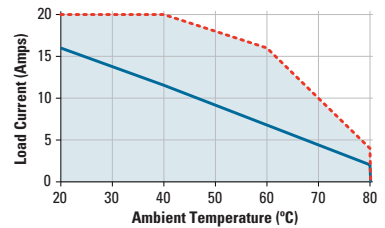


## Derating Curves (H)

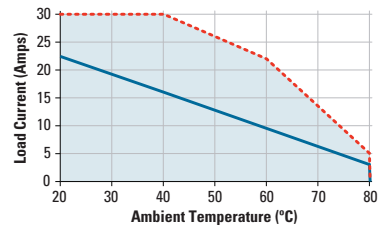
--- Single unit  
— Multiple units, no minimum spacing between components



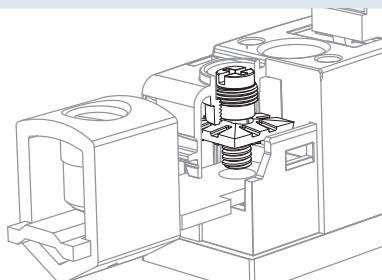
### DR2220D20U



### DR2220D30U



## Elevator Screw (Suffix "W")



The Elevator Screw option allows the screw and clamp to be raised out of the mating threads completely. This provides for the insertion and use of a ring or lug type wire terminal. See datasheet for Compatible Terminals.

## General Notes

- (A) All parameters at 25°C unless otherwise specified.
- (B) Output will self trigger between 900-1200 Vpk. Not suitable for capacitive loads.
- (C) Low current loads and high ambient temperature can affect turn-on time.
- (D) 8 VDC Minimum control voltage. Resistive loads only. Consider switching losses; at maximum frequency reduce to 75% output current. Recommended suppressor diode connected at load side, see wiring diagram.
- (E) Above 40°C ambient temperature the maximum control voltage must not exceed 250 VAC/VDC.
- (F) Increase minimum voltage by 1 V for operations from -20 to -40°C.
- (G) Turn-On Time for Instantaneous Turn-On versions is 0.1 msec.
- (H) Operating range -20 to 60°C for AC control models only.
- (J) With appropriate class and rated fuse, see product datasheet for detailed info
- (K) Load can be wired to either terminal 1 or terminal 2. Proper polarity must be observed for the DC control power supply, with terminal 3 being positive with respect to terminal 4.
- (L) DC inductive loads must be diode suppressed.



## PM22 Series AC Output Panel Mount Solid State Relays

- Ratings up to 95 Amps at 600 VAC
- Built-in overvoltage transient protection
- DBC substrate for superior thermal performance
- LED input status indicator
- IP20 touch safe housing
- AC or DC control voltage options
- 4000 VAC optical isolation
- C-UL-US Recognized and TUV approved

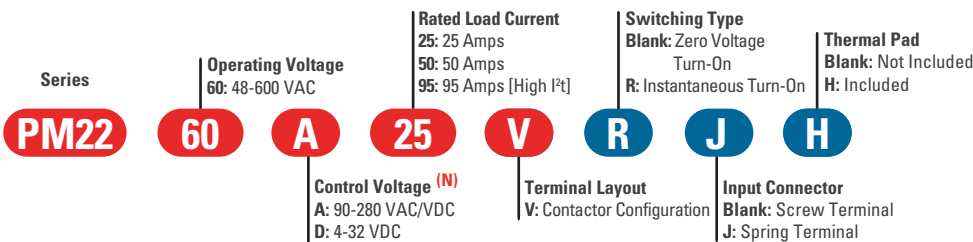


Output Specifications (A)	PM2260x25x	PM2260x50x	PM2260x95x
Operating Voltage (47-440 Hz) [V <sub>RMS</sub> ]	48-600	48-600	48-600
Transient Overvoltage [Vpk] (B)	1200	1200	1200
Maximum Off-State Leakage Current @ Rated Voltage [mA <sub>RMS</sub> ]	1	1	1
Minimum Off-State dV/dt @ Maximum Rated Voltage [V/μsec]	500	500	500
Load Current, General Use UL508/LC A IEC 62314 @ 40°C [A <sub>RMS</sub> ] (M)	25	50	95
Load Current, Motor Starting UL508 FLA /LC B IEC 62314 @ 40°C [A <sub>RMS</sub> ] (M)	8.5/4.8	14/7.6	26/14
Minimum Load Current [mA <sub>RMS</sub> ]	100	100	150
Maximum 1 Cycle Surge Current (50/60 Hz) [A <sub>pk</sub> ]	286/300	716/750	1290/1350
Maximum On-State Voltage Drop @ Rated Current [V <sub>pk</sub> ]	1.35	1.35	1.30
Thermal Resistance Junction to Case (R <sub>jc</sub> ) [°C/W]	0.49	0.27	0.2
Maximum 1/2 Cycle I <sup>2</sup> t for Fusing (50/60 Hz) [A <sup>2</sup> sec]	409/375	2563/2343	8320/7593
Minimum Power Factor (at Maximum load)	0.5	0.5	0.5
Minimum Heat sink for Rated Current @ 40°C	2	0.7	0.23
Motor Rating UL 508/IEC62314 [HP (kW)]: 120 VAC	0.5 (0.37)	1 (0.74)	2 (1.5)
Motor Rating UL 508/IEC62314 [HP (kW)]: 240 VAC	1.5 (1.1)	3 (2.2)	5 (3.73)
Motor Rating UL 508/IEC62314 [HP (kW)]: 480 VAC	3 (2.24)	5 (3.7)	10 (7.4)

Input Specifications (A)	PM2260Axx	PM2260Dxx
Control Voltage Range	90-280 VAC/VDC (E)	4-32 VDC (F)
Maximum Reverse Voltage	-	-32 VDC
Minimum Turn-On Voltage	90 VAC/VDC	4 VDC
Must Turn-Off Voltage	5 VAC/VDC	1 VDC
Minimum Input Current (for on-state) [mA]	6	10
Maximum Input Current [mA]	10	15
Nominal Input Impedance [Ohms]	Current Limited	Current Limited
Maximum Turn-On time	20 msec	1/2 Cycle (G)
Maximum Turn-Off time	30 msec	1/2 cycle

General Specifications	PM2260xxx
Dielectric Strength, Input to Output (50/60 Hz) [V <sub>RMS</sub> ]	4000
Dielectric Strength, Input/Output/Case (50/60 Hz) [V <sub>RMS</sub> ]	4000
Minimum Insulation Resistance (@ 500 VDC) [Ohms]	10 <sup>9</sup>
Maximum Capacitance, Input/Output [pF]	8
Ambient Operating Temperature Range [°C] (H)	-40 to 80
Ambient Storage Temperature Range [°C]	-40 to 100
Short Circuit Current Rating [kA] (J)	100
LED Input Status Indicator	Green
Weight (Typical) [oz] (g)	2.3 (64)
Housing Material	UL94 V-0
Baseplate Material	Aluminum
Hardware Finish	Nickel Plating
Humidity	85% non-condensing

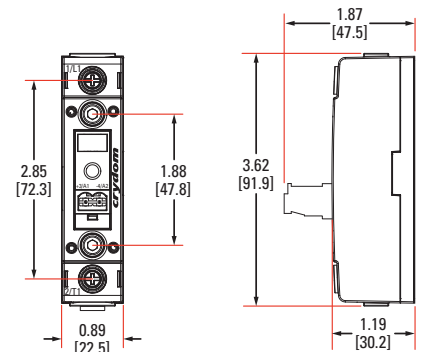
### Part Number Nomenclature



- Required for valid part number
- For options only and not required for valid part number

### Mechanical Dimensions

Tolerances: ±0.02 in / 0.5 mm  
All dimensions are in: inches [millimeters]



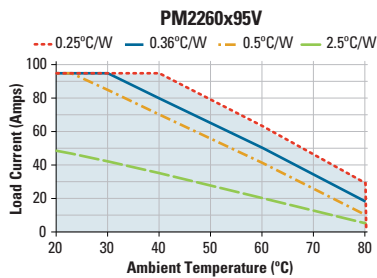
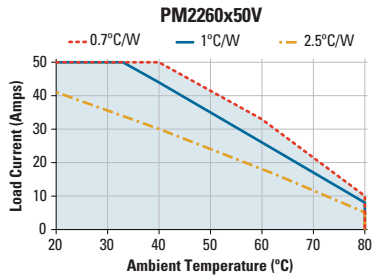
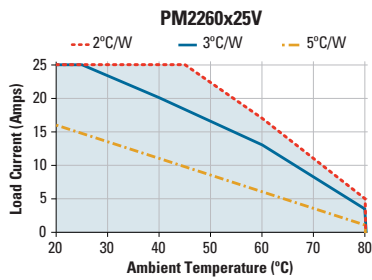
Questions?  
Call or e-mail:

America Tel.: +1 (877) 502 5500  
e-mail: sales@crydom.com

EMEA Tel.: +44 (0) 1202 416170  
e-mail: sales-europe@crydom.com

Asia Tel.: +86 (21) 2306 1648  
e-mail: sales-cn@crydom.com

## Derating Curves (H)



### General Notes

- (A) All parameters at 25°C unless otherwise specified.
- (B) Output will self trigger between 900-1200 Vpk. Not suitable for capacitive loads.
- (E) Above 40°C ambient temperature the maximum control voltage must not exceed 250 VAC/VDC.
- (F) Increase minimum voltage by 1 V for operations from -20 to -40°C.
- (G) Turn-On Time for Instantaneous Turn-On versions is 0.1 msec.
- (H) Operating range -20 to 60°C for AC control models only.
- (M) Heat sink required, see derating curves.
- (N) Control voltage 18-52 VAC/VDC is available upon request.

### Recommended Accessories for PM22 Series

Connectors	ID Marker	Hardware Kit	Heat Sink	Thermal Resistance	Module	Thermal Pad
			Part No.	[°C/W]		
CP201	CNLB	HK8	HS259DR	2.5	DRML1	HSP-7
CP202	CNLN		HS073	0.7		
	CNL2		HS072	0.7		
			HS053	0.5		
			HS033	0.36		
			HS023	0.25		

## New Accessories!

### Connectors

Part number: CP201, CP202



Pluggable input connectors, 2 position, with screw terminals (CP201) or spring type terminals (CP202). Compatible with Contactor configuration NOVA22 SSRs.

### Hardware Kit

Part number: HK8



Bag with 2 SSR mounting screws 8-32 x 3/8, Hex Socket Cap, compatible with PM22 Series Panel Mount SSRs. Used to mount the SSR onto any of our compatible heat sinks.

### Heat Sink

Part number: HS259DR



DIN Rail mountable heat sink with 2.5°C/W thermal resistance. Heat sink material is aluminum with black anodized finish. Suitable for mounting a single PM22 Series Panel Mount SSR.

### Load Monitoring Module

Part number: DRML1



Load monitoring module with a total current range from 1.2 to 50 Amps at 600 VAC. Compatible with DIN Rail and Panel Mount NOVA SSRs (DR2260DxxV/W & PM2260DxxV).

### Lug Terminal

Part number: TRMO



Copper wire lug for AWG 6 (13.3 mm<sup>2</sup>) to AWG 0 (53.5 mm<sup>2</sup>) wire size. For use with "Elevator" screw option ("W" suffix) NOVA22 SSRs.

### Thermal Pad

Part number: HSP-7



Non-adhesive thermal pad for half-puck package SSRs. Compatible with PM22 Series Panel Mount SSRs.

# crydom®

## AMERICAS



### United States & Canada

2475 Paseo de las Americas  
5014 San Diego, CA 92154

#### Sales Support

Tel.: +1 (877) 502 5500  
Fax: +1 (619) 210 1590  
[sales@crydom.com](mailto:sales@crydom.com)

#### Technical Support

Tel.: +1 (877) 702 7700  
[support@crydom.com](mailto:support@crydom.com)

### Southern & Central American Countries

Tel.: +1 (877) 502 5500  
Fax: +1 (619) 210 1590  
[sales@crydom.com](mailto:sales@crydom.com)

## EUROPE, MIDDLE EAST & AFRICA



### United Kingdom

Everdene House, Deansleigh Road  
Wessex Fields, Bournemouth,  
Dorset BH7 7DU

#### Sales Support

Tel.: +44 (0) 1202 416170  
Fax: +44 (0) 1202 416171  
[sales-europe@crydom.com](mailto:sales-europe@crydom.com)

#### Technical Support

[support-europe@crydom.com](mailto:support-europe@crydom.com)

### Austria & Switzerland

Tel.: +44 (0) 1202 416170  
Fax: +44 (0) 1202 416171  
[vertrieb@crydom.com](mailto:vertrieb@crydom.com)

### Belgium

Tel.: +32 (0) 2460 4413  
Fax: +44 (0) 1202 416171  
[sales-europe@crydom.com](mailto:sales-europe@crydom.com)

### France

Tel.: +33 (0) 1707 91389  
Fax: +44 (0) 1202 416171  
[sales-europe@crydom.com](mailto:sales-europe@crydom.com)

### Germany

Tel.: +49 (0) 180 3000 506  
Fax: +44 (0) 1202 416171  
[vertrieb@crydom.com](mailto:vertrieb@crydom.com)

### Italy

Tel.: +39 (0) 2360 26567  
Fax: +44 (0) 1202 416171  
[sales-europe@crydom.com](mailto:sales-europe@crydom.com)

### Spain

Tel.: +34 902 876 217  
Fax: +44 (0) 1202 416171  
[sales-europe@crydom.com](mailto:sales-europe@crydom.com)

### Netherlands

Tel.: +31 (0) 71 582 0068  
Fax: +44 (0) 1202 416171  
[sales-europe@crydom.com](mailto:sales-europe@crydom.com)

### Middle East, Africa & Other European Countries

Tel.: +44 (0) 1202 416170  
Fax: +44 (0) 1202 416171  
[sales-europe@crydom.com](mailto:sales-europe@crydom.com)

## ASIA



### Great China

30th Floor  
BM Intercontinental Biz Centre,  
100 Yutong Road, JingAn District  
Shanghai 200070

#### Sales Support

Tel.: +86 (21) 2306 1648  
Fax: +86 (21) 2306 01  
[sales-cn@crydom.com](mailto:sales-cn@crydom.com)

#### Technical Support

[support-cn@crydom.com](mailto:support-cn@crydom.com)

### South Korea

7th floor of U-space 2, A Building  
670 Daewangpangyo-Ro  
Bundang-Gu  
Seongnam-Si Gyeonggi-Do  
South Korea, 463-400  
Tel.: +82 31 601 2088  
Fax: +82 31 601 2099  
[sales-cn@crydom.com](mailto:sales-cn@crydom.com)

### India and South East Asia Pacific

Level 9, Raheja Towers  
M. G. Road  
Bangalore, 560 001  
India  
Tel.: +91 80 67920879  
[sales-cn@crydom.com](mailto:sales-cn@crydom.com)

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